SITEWIDE FATE AND TRANSPORT REMEDIAL INVESTIGATION REPORT
Part 1 – Groundwater Flow Model

Former Philadelphia Refinery
3144 Passyunk Avenue
Philadelphia, Pennsylvania
Sitewide PADEP Facility ID No. 780190

Stantec

Prepared for:

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June 30, 2022

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ACRONYMS

Act 2	Pennsylvania's Land Recycling and Environmental Remediation Standards Act of 1995
AOI	Area of Interest
ASTM	American Society for Testing and Materials
BRAC	Base Realignment and Closure
Chapter 250	Commonwealth of Pennsylvania, Pennsylvania Code, Title 25: Environmental Protection, Department of Environmental Protection, Chapter 250. Administration of the Land Recycling Program
CO&A	Consent Order and Agreement
CRIV	conductance of the river bed
CSM	Conceptual Site Model
DEM	Digital Elevation Model
DLA	Defense Logistics Agency
DRN	Drain
DSCP	Defense Supply Center Philadelphia
e	mean of all residuals
EPA	United States Environmental Protection Agency
Evergreen	Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
FOIA	Freedom of Information Act
ft/d	feet per day
ft^2/d	square feet per day
GHB	General Head Boundary
GIS	Geographic Information System
gpm	gallons per minute
GWF Model	Groundwater Flow Model
HFB	Horizontal Flow Boundary
in/yr	inches per year
IST	Integrated Science & Technology, Inc.
k	hydraulic conductivity
k_v	vertical hydraulic conductivity
Leidos	Leidos Holdings, Inc.
LNAPL	Light Non-Aqueous Phase Liquid
LNG	Liquified Natural Gas
MGD	million gallons per day
MLLW	mean lower low water
MODFLOW	USGS Modular Finite-Difference Groundwater Flow Model
MT3DMS	Modular Three-Dimensional Multispecies Transport Model
NAPL	Non-Aqueous Phase Liquid
NAVD 88	North American Vertical Datum of 1988
NIR	Notice of Intent to Remediate
NOAA	National Oceanic and Atmospheric Administration
NOV	Notice of Violation
NPL	National Priorities List
PADEP	Pennsylvania Department of Environmental Protection
PaGWIS	Pennsylvania Groundwater Information System
PCGN	preconditioned conjugate gradient with Newtonian
PENNDOT	Pennsylvania Department of Transportation
PESRM	Philadelphia Energy Solutions Refining & Marketing, LLC
PGW	Philadelphia Gas Works
PNSY	Philadelphia Naval Shipyard
POC	point of compliance
PRCP	Post-Remediation Care Plan

PRM	Potomac-Raritan-Magothy aquifer system
PWD	Philadelphia Water Department
QRIV	flow rate across the river bed
RACR	Remedial Action Completion Report
RCH	Recharge
RI	Remedial Investigation
RIR	Remedial Investigation Report
RIV	River
RMSE	Root-Mean-Square Error
RSS	residual sum of squares
RSTD	residual standard deviation
SPT	Standard Penetration Test
SSS	Site-Specific Standard
Sunoco	Sunoco Inc. (R&M)
Stantec	Stantec Consulting Services Inc.
USGS	United States Geological Survey
UST	Underground Storage Tank
Verizon SDWC	South District Work Center of Verizon Pennsylvania, LLC
WEL	Well
Weston	Weston Solutions, Inc.

1.0 Introduction

A two-part Remedial Investigation Report (RIR) has been prepared by Stantec Consulting Services Inc. (Stantec) for Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC (Evergreen) to document a sitewide fate and transport assessment for the former Philadelphia Refinery (facility). Part 1 of the RIR documents the construction and implementation of a sitewide numerical groundwater flow model (GWF Model) and is the focus of this report. The GWF Model was developed to aid Evergreen in meeting and demonstrating compliance with the State of Pennsylvania Department of Environmental Protection (PADEP) Site-Specific Standard (SSS) for remediation of pre-existing contamination under Pennsylvania's Land Recycling and Environmental Remediation Standards Act 2 of 1995 (Act 2). Under the Act 2 regulations (Chapter 250), a sitewide analysis of the fate and transport of petroleum-related constituents is needed at the facility to assess risk to potential receptors, assess plume stability, and estimate time to project closure.

This RIR (Part 1) documents the purpose and goals of the modeling assessment, a hydrogeologic framework for the facility, GWF model selection and rationale, GWF model construction, GWF model calibration, and GWF model verification. The GWF Model development and approach were performed in general accordance with the American Society for Testing Materials (ASTM) Standard Guide for Application of a Numerical Groundwater Flow Model to a Site-Specific Problem (ASTM, 2017), PADEP's Draft Land Recycling Program Technical Guidance Manual Section III.A.2 (Fate & Transport Analysis in the Saturated Zone) (PADEP, 2017), and to be consistent with overall project objectives under the Pennsylvania One Cleanup Program.

In accordance with Act 2, the required public and municipal notices for this Sitewide Fate and Transport RIR have been prepared and issued. A copy of the report notices and proof of receipt/publication for this report are included in Part 2 of the RIR (Part 2; Appendix A).

1.1 DESCRIPTION AND USE OF THE FACILITY

The former Philadelphia Refinery has a long history of petroleum transportation, storage, and processing through multiple owners. The oldest portion of the facility started petroleum related activities in the 1860's, when the Atlantic Refining Company was established as an oil distribution center. In the 1900's, crude oil processing began, and full-scale gasoline production was initiated during World War II. In addition to refining crude oil, various chemicals, such as acids and ammonia, were also produced at the facility for a time. The remediation liability of Sunoco Inc. (R&M) (Sunoco), a former owner and operator of the facility, was transferred to Evergreen on December 30, 2013, and includes petroleum contamination sources released to the environment from operation of the facility up through September 2012 when it was divested to Philadelphia Energy Solutions Refining and Marketing LLC (PESRM).

The facility continued to operate as a refining, product distribution, and storage facility until June 26, 2019, when PESRM announced closure of the then Philadelphia Refining Complex. As of June 26, 2020, Hilco Redevelopment Partners (HRP) completed its purchase of PESRM. HRP plans to redevelop the area of the facility on the east side of the Schuylkill River as a multimodal industrial park with ancillary rail

infrastructure, energy infrastructure, marine capabilities, and commercial uses. HRP has no plans to operate the facility as a refinery. A 2020 amendment to the Buyer-Seller Agreement lays out an updated schedule for Act 2 submissions designed to accommodate the planned site redevelopment and acknowledges the purchase of PESRM by HRP which retains its environmental liability.

The facility is located along the banks of the Schuylkill River in the City of Philadelphia, Philadelphia County, Pennsylvania (**Figure 1-1**). Portions of the facility are present on both the eastern and western Schuylkill River banks. The facility, which is located on industrial property, covers approximately 1,400 acres of land with access restricted by fencing and security measures. The area surrounding the facility is characterized by a mixture of residential, commercial, and industrial properties.

In November 2003, the facility was divided into 11 Areas of Interest (AOI) as a part of Sunoco's Phase I Remediation Plan. **Figure 1-2** displays the locations of the established AOIs which, through a risk-based management approach, generally separate the former and current processing areas, tank farms, and terminals of the facility. The AOI designations [apart from Belmont Terminal which is actively being characterized and remediated under a separate Notice of Intent to Remediate (NIR)] were utilized by Sunoco and Evergreen to document individual remedial investigations (RI) under Act 2 at the facility. AOI former use descriptions are as follows:

- AOI 1: No. 1 and No. 2 Tank Farms of the Point Breeze Refinery South Yard (formerly included Belmont Terminal)
- AOI 2: Point Breeze Refinery South Yard Processing Area
- AOI 3: Impoundment Area
- AOI 4: No. 4 Tank Farm of the Point Breeze Refinery South Yard
- AOI 5: Girard Point Refinery South Tank Field Area
- AOI 6: Girard Point Refinery Chemicals Processing Area
- AOI 7: Girard Point Refinery Fuels Processing Area
- AOI 8: Point Breeze Refinery North Yard
- AOI 9: Schuylkill River Tank Farm
- AOI 10: Point Breeze Refinery West Yard
- AOI 11: formerly designated for discrete investigation of the deeper, water-bearing Cretaceous-age strata beneath the facility (AOI 11 was more recently characterized as a part of other AOI RIs)

Presently surrounding and bisecting the facility are the following properties, features, and general land uses (**Figure 1-2**):

- North: South District Work Center of Verizon Pennsylvania, LLC (Verizon SDWC Property) and other industrial/commercial properties
- East: Vare Avenue, the Schuylkill Expressway, 26th Street, and a mix of residential and commercial properties
- South: commercial and industrial properties, including the Philadelphia International Airport and United States Army Corps of Engineers – Philadelphia District Fort Mifflin Confined Disposal Facility
- West: mix of commercial and residential properties
- Central and Bisecting: Philadelphia Gas Works (PGW) Passyunk Facility and residential properties

- Bisecting: Schuylkill River

Former facilities that were previously or are currently being investigated by others are shown on **Figure 1-2** and are discussed in **Section 2.2.2** of this RIR.

1.2 GROUNDWATER FLOW MODEL OBJECTIVES

The primary objective of the modeling activities is to aid in demonstration of attainment of the Act 2 site-specific standard for remediation liability of historic groundwater contamination at the facility on behalf of Evergreen. Attainment of this standard is predicated on the ability to demonstrate that the extent of contamination attributable to Sunoco has been delineated, contaminant transport pathways unique to the facility have been reasonably characterized, and that unacceptable risks are not posed to human and ecological receptors, if any completed pathways are identified. In accordance with Act 2 guidance, a fate and transport analysis is a required component of an RIR for this purpose. As such, Part 1 of the assessment documented herein describes development of a GWF model that utilizes over 30 years of facility data and, where available, offsite characterization data to meet the initial objective of simulating groundwater flow beneath the facility area. In Part 2 of the RIR, the GWF Model will be coupled with a transport model to complete the fate and transport assessment through predictive simulations.

2.0 MODEL DEVELOPMENT APPROACH

2.1 PREVIOUS STUDIES

The basis of the GWF Model is a conceptual understanding of the hydrogeologic and water balance components that control groundwater flow in the region. The conceptual hydrogeologic model for groundwater flow in the area has evolved through numerous studies. The following key groundwater modeling studies are noted:

- "Simulation of Ground-Water Flow in the Lower Sand Unit of the Potomac-Raritan-Magothy Aquifer System, Philadelphia, Pennsylvania" – Sloto (1988) developed a 2-dimensional, numerical groundwater flow model to evaluate the potential effects of groundwater withdrawal increases from the lower sand unit of the Potomac-Raritan-Magothy (PRM) aquifer system in Philadelphia.

- "Ground-Water Flow and Future Conditions in the Potomac-Raritan-Magothy Aquifer System, Camden Area, New Jersey" – Navoy and Carleton (1995) compiled a comprehensive hydrogeologic dataset for the Camden, New Jersey area and used that dataset to develop a 3-dimensional, finite-difference numerical MODFLOW model to simulate regional groundwater flow (including parts of southern Philadelphia) and evaluate the effects of future groundwater withdrawal scenarios on management of the PRM aquifer's resources.

- "Simulation of Ground-Water Flow in the Potomac-Raritan-Magothy Aquifer System Near the Defense Supply Center Philadelphia, and the Point Breeze Refinery, Southern Philadelphia County, Pennsylvania" – Schreffler (2001) constructed a 3-dimensional, finite-difference numerical MODFLOW model to simulate historical (1900-1995) groundwater flow conditions and water-levels in the PRM aquifer and used that model to evaluate the origins of a hydrocarbon plume near the former and/or Sunoco Philadelphia Refinery and former Defense Supply Center Philadelphia (DSCP).

- "Migration of Benzene and Simulated Groundwater Flow in the Potomac-Raritan-Magothy Aquifer System of South Philadelphia, Pennsylvania" – Sloto (2012) updated the 2001 Schreffler model in an administrative report for the EPA to further study the potential source(s) and migration of benzene identified in the lower sand unit of the PRM near the former and/or Sunoco Philadelphia Refinery.

The United States Geological Survey (USGS) groundwater flow model reports (Schreffler, 2001; Sloto, 2012) incorporate the conceptual understanding of groundwater flow in the region. The GWF Model developed and documented herein uses the USGS modeling activities as a basis and builds upon them with the use of more recent data, additional analysis, and a refined focus on the facility to satisfy the objectives of evaluating fate and transport of petroleum related contaminants related to historical Sunoco operations.

2.2 USGS MODEL REFINEMENT

In accordance with the groundwater modeling objectives stated in **Section 1.2**, Stantec performed significant refinement of the Schreffler (2001) groundwater model. The goal of refining the USGS model

was to utilize as much facility-specific and local hydrogeologic data as was feasible so that the groundwater model to be used for the fate and transport assessment would be representative of the conceptual model developed for the study. The groundwater model was then calibrated to support evaluation of the future extent of groundwater contamination. In general, refinement of the USGS model included re-discretization of the finite-difference grid, model layer thickness and hydraulic properties, boundary condition and flow barrier modifications, and changes to the sources and sinks affecting the water budget. Detailed discussions of the site conceptual model, water balance, and groundwater model construction are presented in **Section 3** and **Section 5** of this RIR.

2.2.1 General Data Resources

The groundwater resources and stratigraphic framework of the facility area have been well-documented through a variety of data sources, including previous groundwater resource investigations dating back to the early 1900's, state and federal geologic mapping projects, groundwater modeling studies, consultant characterization reports, and RIRs. Some of this data was included in the Schreffler (2001) model. In large part, available well and test boring logs from previous on-site and local subsurface investigations were valuable resources in building upon the Schreffler (2001) model and further evaluating the local subsurface stratigraphy. As previously documented by Stantec (2016; 2017a; 2017b), subsurface information from approximately 750 well and test boring logs was considered in the evaluation of regional conditions for this report. A database of stratigraphic "picks" on interpreted vertical lithologic unit boundaries (and where possible, geologic formations) was also developed and includes identified records of boreholes completed to bedrock at and near the facility. In large, these records consist of "deep" wells drilled at the facility; however, a significant amount of subsurface information for adjacent and local properties was incorporated into the facility site model. A brief description of the offsite properties offering significant subsurface data resources to this study is provided in **Section 2.2.2**.

2.2.2 Key Offsite Properties

Several properties adjacent to the facility have undergone or are actively being investigated by others in pursuit of remediation goals, some of which fall under State or Federal regulatory oversight. Based on the modeling objectives for this study, Evergreen and Stantec invested considerable effort in the review and incorporation of subsurface data from offsite properties into this and previous RIRs. The efforts have included collaborative data exchanges between Evergreen and adjacent property owners and/or their consultants, informal file reviews of PADEP Southeast Regional Office Act 2 files, an EPA – Region III Freedom of Information Act (FOIA) request, a Pennsylvania Department of Transportation (PENNDOT) Right-to-Know Request, Pennsylvania Groundwater Information System (PaGWIS) well searches, and internet searches for regulated facilities. A summary of the property investigations and associated data integral to refinement of the facility GWF Model is presented in the following sections.

2.2.2.1 Former DSCP Facility and Passyunk Homes Property

The Defense Logistics Agency (DLA) is the federal entity responsible for the former DSCP facility which was located approximately 550 feet to the east of the boundary of AOI 1 (**Figure 1-2**). According to the Non-Aqueous Phase Liquid (NAPL) Source Study at DSCP prepared by Integrated Science & Technology, Inc. (IST) for Sunoco in March 1998, the federal government acquired an 87-acre parcel in 1917 and began construction of the DSCP facility. The function of the facility was to support the United States military by manufacturing, storing, and distributing supplies. Operations at the facility included printing, vehicle and locomotive repair, woolen fabric treatment and cleaning, painting, chemical laboratory operations, fuel dispensing, and fuel storage. In 1999, the former DSCP was closed under the 1993 Base Realignment and Closure (BRAC) program and has since been redeveloped. South of the former DSCP was the former Passyunk Homes complex. The former residences were razed between 2002 and 2008, and a Philadelphia Housing Authority office and maintenance facility were constructed on the northern portion of the property. The remainder of the former Passyunk Homes property is being redeveloped into a residential neighborhood called Siena Place (**Figure 1-2**) (ARCADIS, 2014).

Early environmental investigations began at the DSCP site in 1988 and centered primarily on historic fuel storage tank areas (IST, 1998). LNAPL was noted to be present in monitoring wells at DSCP (IST, 1998). A significant LNAPL plume has been in existence under the former DSCP property since at least the time of the IST report and has been investigated by teams from multiple interested parties, including Sunoco. In 1996, Sunoco and DLA entered into a Consent Order and Agreement (CO&A) with PADEP which required the two entities to collectively perform a series of tasks to address potential impacts to human health and the environment resulting from the presence of this LNAPL. Under the CO&A, Sunoco installed ventilation systems on the Packer Avenue Sewer, and managed the design and construction of a LNAPL remediation system with financial contributions from DLA. On December 10, 1999, PADEP issued an Administrative Order which required DLA to address impacts related to the LNAPL plume located beneath the former DSCP property and former Passyunk Homes including assuming responsibility for operation of remediation systems. This Administrative Order presently requires that as much LNAPL be removed as is practicable. Currently, LNAPL is being removed via both fixed skimming and vacuum-enhanced skimming systems, which were installed in 2005 (ARCADIS, 2014).

DLA is currently conducting characterization activities at the former DSCP that primarily include LNAPL recovery, vapor recovery, and groundwater monitoring. On behalf of DLA, ARCADIS (2021) has submitted a draft RIR and Cleanup Plan for the former DSCP facility. The former DSCP and associated properties contain over 160 monitoring and/or recovery wells, many of which were used in this modeling study (**Figure 1-2**). DLA and Evergreen have been conducting annual, near-synoptic well gauging events for several years and groundwater data from the last decade is used in this RIR to evaluate local groundwater flow patterns, gradients, and to aid in calibration of the facility GWF Model.

2.2.2.2 PGW Passyunk Facility

The PGW Passyunk Facility is located to the south of AOI 8 and to the north of AOI 2 of the facility and the Belmont Terminal (**Figure 1-2**). The property has been under ownership of PGW (or its predecessor United Gas Improvement Company) since the mid-1800s, and was used to manufacture, process, store, and distribute natural gas. Manufacturing and processing activities were reduced at the property by the 1970s, and many of the associated structures were demolished (Weston, 2004). Historical aerial photographs indicate that many of the former tanks were removed in the mid-2000s, along with other structures. Currently, the property is used for liquefied natural gas (LNG) storage, vaporization, and gas distribution. Laboratory facilities, and maintenance, fueling, and parking of fleet vehicles are also part of operations at the property.

PGW Passyunk Facility RI activities were conducted by Weston Solutions, Inc. (Weston) during 2002-2004, in response to the identification of subsurface petroleum hydrocarbon impacts. Since that time, PGW contractors have performed near-continuous monthly and quarterly monitoring of more than 50 wells installed on the property (**Figure 1-2**). Progress reports of on-going remediation activities at the property, which document groundwater monitoring and operation of remedial systems, are submitted to the PADEP on a quarterly basis by PGW. Like the former DSCP, subsurface and near-synoptic gauging data from a portion of the wells at the PGW Passyunk Facility were used in this RIR.

2.2.2.3 Verizon SDWC Property

The Verizon SDWC Property is located to the north of AOI 8 along Maiden Lane and 34th Street (**Figure 1-2**). There is evidence of a historic landfill near the property in the 1940s, prior to which the property was mainly undeveloped land (Leidos, 2015). The parcel was developed to its current layout in 1974. Currently, the property consists of an asphalt parking lot and a single-story building which includes office areas, as well as a garage that is used for vehicle storage and maintenance. Smaller buildings, used for equipment storage, are also present on the property.

As part of an environmental due diligence performed at the property in February 2011, subsurface petroleum hydrocarbon impacts were identified. A Notice of Violation (NOV) was issued by the PADEP in March 2011, owing to presence of historic underground storage tanks (UST), previous releases, and soil impacts. Under the Act 32 Storage Tank Program, Leidos Holdings, Inc. (Leidos) completed site characterization and remedial investigations during the 2011-2014 timeframe. Investigations included characterization of soil and groundwater, as well as a vapor intrusion investigation for the main building at the property. Leidos submitted a Remedial Action Completion Report (RACR) in 2015, which demonstrated incomplete exposure pathways for soil, groundwater, and vapor impacts. A Post-Remediation Care Plan (PRCP) was presented in the RACR which placed activity and use limitations on the property. In July 2015, the RACR was approved by the PADEP and liability protection was provided by Chapter 5, Section 501 of Act 2.

The Verizon SDWC Property contains 13 monitoring wells that were installed as a part of the Act 32 investigations (**Figure 1-2**). The investigations also included the installation of three monitoring wells inside of the former Philadelphia Refinery property (monitoring wells N-137, N-138, and N-139). Verizon

granted Evergreen access to utilize the wells following the RACR approval. A portion of the available well gauging data from the remedial investigations conducted at the Verizon SDWC Property was used in this report, as well as post-2015 gauging data collected by Stantec.

2.2.2.4 Former Enterprise Avenue Superfund Site

According to the EPA (2017), the City of Philadelphia historically operated a landfill within an approximately 57-acre portion of the present-day Philadelphia International Airport property near Runway 8-26 between 1971 and 1976. Illegal disposal of hazardous chemical waste drums occurred at the landfill and was later discovered by the City of Philadelphia in 1978 (Weston, 1994). According to Weston (1994), the initial remediation approach for the Enterprise Avenue site included removal of the drums and placement of a clay cap resulting in delisting from the National Priorities List (NPL) in 1986. However, changes to proposed site use including construction of the runway led to additional investigations, discovery of additional groundwater contamination, site characterization, and the operation of a groundwater mitigation system until approximately 2008 (EPA, 2017). The facility is currently under a 5-year review plan with EPA – Region III.

Stantec submitted a FOIA request to the EPA in May 2017 to obtain subsurface information related to hydrogeologic studies performed at the Enterprise site in the 1990s. Lithologic, geophysical, and well as-built logs from the mid-1990s reports are utilized in the facility conceptual model. A portion of the monitoring well network used to characterize the Enterprise Avenue site is located on City of Philadelphia Water Department Property at the Southwest Water Pollution Control Plant. Evergreen and the City of Philadelphia Water Department executed a Site Access Agreement on May 15, 2018, allowing Stantec to locate and gauge up to 26 selected wells on City property. Stantec collected gauging data from 14 of these wells during the June 2018 synoptic gauging event and has utilized the data in the GWF Model validation (**Section 6.7**).

3.0 CONCEPTUAL MODEL

This section summarizes the geologic framework and general hydrogeologic properties of sedimentary deposits and bedrock underlying the south Philadelphia area, with emphasis near the facility. A brief discussion of historical and present-day topography and hydrology is also included. The analysis describes the hydrogeologic environment of the facility area and the development of a conceptual site model (CSM) that is used as the basis for selecting groundwater model layers and aquifer parameters within the GWF Model domain. As discussed in **Section 2.1**, the model used in this study is based on a previous USGS model and thereby incorporates a domain that spans a geographical area larger than the facility property, including the Delaware River and a portion of New Jersey. In general, the larger model domain may allow for more accurate simulation of regional groundwater flow conditions and may improve GWF Model simulation results within the area of focus proximal to the facility.

3.1 HYDROLOGY AND TOPOGRAPHY

The facility occupies an area of approximately 2.2 square miles adjacent to the Schuylkill River near its confluence with the Delaware River. This region has a long history of human influence and disturbance, dating back to the early 17th Century when European settlers first arrived. The following sections present a brief discussion of the significant land surface morphologic changes that are apparent when comparing modern environments and topography to that shown on historical maps. These changes are important to note in this RIR when considering natural hydrologic conditions, drainage, and the potential for preferential flow paths in the subsurface that may influence the fate and transport of contaminants.

3.1.1 Historical Topography and Natural Depositional Environments

The Philadelphia City Archives (City of Philadelphia, 2017) and several online archival resources, such as the Greater Philadelphia GeoHistory Network (The Athenaeum of Philadelphia, 2017), the USGS National Map Viewer (USGS, 2017), the Library of Congress (2017), the Library Company of Philadelphia (2017), and the Penn State University Libraries Digital Collections (2018) have catalogued and provide free access to copies of historical maps and photographs of Philadelphia. Based on review of many of those maps, it is apparent that much of the land area occupied by the present-day facility was formerly tidal marsh and lowlands that once fringed the Schuylkill River. **Figure 3-1** presents a geo-referenced USGS topographic map from 1898 (20-foot contour interval). The map indicates that several small tributary streams, digitized on-screen and shown as blue lines, formerly dissected that marshland and presumably would have exchanged water with the tidal Schuylkill River on a semi-diurnal basis. Several islands were also present throughout the lowlands, notably League Island, which are interpreted as erosional remnants of uplands that formed through repetitive cycles of river incision in response to climate changes through the Pleistocene.

The 1898 topographic map shows that relatively higher topography was apparent north and west of the Schuylkill River in the facility area, near Gibson Point. To the south and east, the Schuylkill River coursed through a distinctive meander around Point Breeze and appeared to have formed an erosive cut bank along present-day AOI 2 and the PGW Passyunk Facility where higher elevations were present (and

favoring point bar deposition in AOIs 7 and 8). A southwest-northeast trending ridge of higher elevation was also present south of Point Breeze near AOI 4 (**Figure 3-1**), and between those two areas of higher elevation an unnamed stream was mapped to have been present. That stream appears to have originated in southern AOI 1 and flowed southwest through AOIs 3, 4, and 7, towards its confluence with the Schuylkill River. Another tributary stream, Rambo Creek, bisected AOI 8, coursing to the south and west from a source near the Grays Ferry neighborhood of Philadelphia. Numerous other small streams and ditches draining the lowlands surrounding Hollander Creek were also noted. Additional historic maps indicate that by 1900, an earthen dike had been constructed along the banks of the lower Schuylkill River, and sluices were present at each stream/ditch confluence. Other maps show wooden pilings in places along the Schuylkill River. In general, the construction of containment dikes, sluices, and shoreline hardening would have altered the natural tidal exchange between the Schuylkill River and these historic creeks, thereby limiting the natural accretion of sediment in the marshes that once fringed the river. Moreover, the modifications indicated on these maps would have altered the pre-existing tidal regime and dynamic equilibrium of the Schuylkill River.

3.1.2 Post Industrialization

The area has a history of petroleum industry dating back to approximately 1835, when the City of Philadelphia charted a private gas company, Philadelphia Gas Works, to manufacture gas from coal (Quivik, 2015). The beginnings of what would become the Point Breeze refinery began in approximately 1866 with the storage of petroleum products by the Atlantic Petroleum Storage Company (Quivik, 2015).

Figure 3-1 indicates that by 1898, storage of petroleum near Point Breeze and Gibson Point had already begun. According to City of Philadelphia archives (City of Philadelphia, 2017), much of the remaining tidal marsh and lowland environments nearby were reclaimed and routinely dewatered for farming practices around this same time (generally on the west side of the Schuylkill River). Industrialization warranted further land filling activity and shoreline hardening, including bulk-heading and filling of the tributary streams that modified and generally raised the antecedent topography into its present-day configuration. Farms were displaced in favor of industrial and commercial land uses. Although some clusters of residential property and open space have existed or still exist near the facility, the greater part of land in south Philadelphia has been used for industrial and commercial purposes for over 100 years (IST, 1998).

Stantec reviewed digital reproductions of glass photograph negatives that were collected by Aero Service Corporation during the early 1920s to document the Atlantic Refining Company property (The Library Company of Philadelphia, 2017). Stantec has observed that apparent borrow pits were present in the facility area in these photos. The largest of the visible pits was in the Point Breeze South Yard No. 1 Tank Farm area. It is postulated that these pits were dug to extract clay resources used to support Philadelphia's well-documented brickmaking history, where it is noted that high-quality brickmaking clay was obtained from the "Neck" of land in between the Schuylkill and Delaware Rivers (Encyclopedia of Greater Philadelphia, 2018). Sanborn maps dating back to 1922 indicate that up to four brickmaking facilities were present near Passyunk and Vare Avenues (Penn State University Libraries, 2018). Virtually all of the pits were filled during the early to mid-1900s.

A high-resolution land surface elevation model with integrated bathymetry, obtained from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI, 2017), indicates that present-day topography is relatively flat near the facility, and land surface elevations generally range from a few feet below the North American Vertical Datum of 1988 (NAVD 88) near Mingo Creek to approximately 35 feet near the eastern boundary of the facility in AOIs 1, 4, and 8 (**Figure 3-2**). Schuylkill River depths along the facility generally range from less than 1-foot mean lower low water (MLLW) where shoaling is apparent to more than 45 feet MLLW in areas of scour. Although subtle, the high-resolution surface model displays topographically low areas that, based on location, likely correlate to the locations of former stream valleys (e.g., Franklin Delano Roosevelt Park). In addition to raising the land surface, much of the filled urban areas were either paved and/or rendered relatively impervious, which may have decreased rates of recharge to the water table and necessitated the construction of numerous sewers to convey stormwater runoff (combined with sewage) to the Schuylkill and Delaware Rivers, or deeper intercepting sewers. It is documented that much of the City of Philadelphia's underground wastewater and water supply infrastructure, constructed as early as the late-1800s, is susceptible to leakage either through construction anomalies or degradation through decades of in-situ weathering (Paulachok and Wood, 1984). These conditions further alter the natural hydrology of the area and become important factors in evaluation of local water-table conditions and the sources and sinks of water in the GWF Model.

3.2 GEOLOGIC AND HYDROGEOLOGIC FRAMEWORK

The facility occurs within the up-dip limits of the Atlantic Coastal Plain, generally within two miles of the "Fall Line," where crystalline bedrock of the Appalachian foothills intersects the ground surface (outcrops). The Atlantic Coastal Plain is a physiographic province that is defined as having relatively flat topography and as being underlain by a characteristic wedge of unconsolidated sediments that thicken in a southeasterly direction, away from sediment source areas in the Appalachian Mountains. These sediments were deposited atop a sloping bedrock surface in complex fluvial, estuarine, and marginal marine environments along the passive Atlantic margin. Overall, subsidence of the Piedmont land surface in conjunction with cyclical sea-level fluctuations have been the primary controlling mechanisms driving periods of deposition, non-deposition, and erosion in the Atlantic Coastal Plain (Trapp, 1992). In general, the resulting sedimentary record and stratigraphic framework beneath the facility is complicated, largely incomplete, and under-represented by only Cretaceous and Quaternary deposits, separated by a regional disconformity. **Figure 3-3** and **Figure 3-4** document available bedrock and surficial geologic map data from published sources in Pennsylvania and New Jersey, supplemented by an interpretation of the surficial geology of the facility in regional context.

In the following sections, Stantec presents a summary of the sedimentary deposits and bedrock beneath the facility and surrounding GWF Model domain that is based on review of historical maps, published studies, USGS MODFLOW models, past consultant reports, available well and test boring logs from previous on-site and local subsurface investigations, and test drilling performed as a part of recent AOI characterizations. Subsurface information from approximately 750 well and test boring logs was considered in the development of this CSM. Further, a database of stratigraphic "picks" on interpreted vertical lithologic unit boundaries (and, where possible, geologic formations) was also developed and includes all identified records of boreholes completed to bedrock at the facility. The purpose of the

"picks" database was to archive interpretation of individual borehole lithologies to bedrock, so that the previous USGS lithologic model could be refined and updated for the GWF Model at the facility.

Fourteen stratigraphic profiles are presented in this RIR to support evaluation of the lithologic character, geographic extent, and thickness of each geologic unit identified through correlation to published geologic formations (**Figures 3-5** through **3-19**). The profiles are based on detailed correlation of broadly defined, generalized lithologic categories deemed mappable at a sitewide scale and applicable to the established geologic framework (e.g., Quaternary deposits and the PRM aquifer system). The profiles include well construction information where available, 2018 groundwater elevations and interpolated potentiometric surfaces, high-resolution land surface topography, recent Schuylkill River bathymetry (March 2017), major sewer locations, and for select profiles the interpolated top of bedrock surface. A generalized stratigraphic column adopted and modified from Schreffler (2001) is included as **Table 3-1**.

3.2.1 Coastal Plain Stratigraphy

3.2.1.1 Anthropogenic Fill

Much of the facility and surrounding area is underlain by historical fill material, which was primarily placed for the purpose of reclaiming lowlands along the banks of the tidal Delaware and Schuylkill Rivers during industrialization. These fill materials are heterogeneous in nature and have been described on borehole logs by others as a mixture of compacted soil and anthropogenic debris, including sand, clay, silt, gravel, cinders, concrete, asphalt, crushed stone, ash, glass, brick fragments, and wood. Apparent fill thickness ranges from a veneer where antecedent topography was highest to greater than 50 feet where it was used as railroad ballast just east of the facility. Within the locations of former stream valleys, marshes (**Figure 3-1**), and apparent borrow pits, the historical fill material is generally 20 feet or greater in thickness. The stratigraphic profiles exemplify the relationship between antecedent topography and fill thickness.

Fill materials at the facility are observed as both saturated and unsaturated deposits depending primarily on topographic position. Generally, at locations distal to the Schuylkill River, fill occurs above the regional water-table under average hydraulic head conditions. However, fill may contain isolated lenses of groundwater (perched groundwater) in these areas where coarse or granular fill material is separated from the underlying water table by low permeability sediments. In exception, fill is observed to be saturated and/or in hydraulic connection with the water table along the axes of buried stream channels, where the water-table appears to intersect the fill (former gaining stream reaches). Lastly, where fill was placed to reclaim tidal wetlands fringing the area's river estuaries, it generally supports a water table and may exhibit continuous water bearing properties.

3.2.1.2 Quaternary Deposits

Quaternary sedimentary deposits are present beneath the facility and are generally representative of geologically-recent cycles of deposition and erosion that occurred within the last 200,000 years. These cycles of sedimentation were the result of a series of glacial and interglacial periods, namely the Illinoian and Wisconsinan glaciations, separated by an intervening interglacial period and followed by the present

interglacial period through the Holocene (Sevon et al., 1999). Depositional environments through this period were primarily controlled by sea level and the successive down-cutting, meandering, and infilling of ancestral river valleys, primarily that of the Schuylkill and Delaware Rivers (Owens and Minard, 1979). Details of the Quaternary deposits present at the facility are described in the following sections.

3.2.1.2.1 Recent (Holocene) Alluvium

Predominantly gray, muddy deposits with occasional sandy, gravelly, and organic-rich lenses comprise the youngest alluvium present at the facility. These sediments were deposited in dynamic floodplain, channel, and marsh environments through the Holocene. As noted, the upper surface of alluvium, in many places covered by fill, defines the antecedent topography that pre-dated development under a large portion of the area of the facility along the Schuylkill River. This geologic unit is generally restricted to elevations below present-day sea level and up to a few feet above sea level within former tidal wetlands and tributary valleys. The recent alluvium ranges in thickness from a few feet along its landward fringe of the Schuylkill River perimeter and up the axial troughs of tributary streams, to as much as approximately 60 feet thick (to elevations as low as approximately -70 feet NAVD 88). Where thickest, these deposits represent a transgressive sequence of backfilling of the Schuylkill River valley as it was drowned by rising sea level through the Holocene. **Figure 3-1** provides some estimation of how extensive the area's tidal marshes once were prior to development, existing generally along the Schuylkill River south of and surrounding Point Breeze. Stratigraphic profiles C – C' and M – M' exemplify this interpretation and distribution of the recent alluvial deposits at the facility (**Figures 3-8 and 3-18**).

Because of its relatively young geologic age and stratigraphic position along the Schuylkill River and tributary creeks, recent alluvium at the facility is often poorly consolidated and saturated with groundwater. However, it generally has limited water-transmitting capabilities due to its predominantly fine-grained texture. The regional water-table surface occurs within or just above the Holocene alluvium in former marsh areas along the Schuylkill and Delaware River estuaries.

3.2.1.2.2 Pleistocene Alluvium

Geologically-recent glacial outwash deposits, commonly referred to informally as the "Trenton gravel," have long been recognized in southeastern Pennsylvania along the Delaware River valley. Sevon and Braun (2000) provide a comprehensive map of glacial deposits in Pennsylvania, including the presence of sand and gravel outwash, interpreted as stratified drift, along the present Delaware River. Owens and Minard (1979) published a comprehensive summary of previous research into these deposits and subdivided the "Trenton gravel" into two distinct deposits (the Spring Lake and Van Sciver Lake beds) based on topographical position and lithology at those type sections. Low et al. (2002) indicate that in many places the "Trenton gravel" rests directly atop Cretaceous sediments and is overlain by younger alluvium of Holocene age near the Schuylkill River. However, these and other interpretations available in literature and the nomenclatures utilized in Pennsylvania have been difficult to apply in a regional context when the geology mapped in neighboring states is considered.

Based on literature review, Stantec supports a more recent interpretation of the Pleistocene deposits in southeastern Pennsylvania presented by Jengo (2006) in which the stratigraphic nomenclature includes the glaciofluvial "Trenton gravel" as being spatially restricted to the lower portion of the Delaware River paleochannel, beneath the Holocene transgressive sequence of deposits. Time equivalent deposits

identified as glacial-age tributary alluvium are also defined in that interpretation but are fluvial in origin. Most of the Pleistocene deposits in the area are interpreted by Jengo (2006) to be older, Sangamon-age interglacial deposits belonging to the Cape May Formation Unit 2 mapped across the Delaware River in New Jersey (Stanford, 2006) and south into Delaware (Ramsey, 2005), where the deposits are designated as undifferentiated Delaware Bay Group. Within the facility and proximity where maximum land surface elevations rarely exceed approximately 35 feet NAVD 88, the Pleistocene alluvium within this regional geologic nomenclature is more appropriately assigned to the Cape May Formation Unit 2 terrace (**Figure 3-4**). For the purposes of this and other RIRs, it is considered reasonable to generally describe the Pleistocene deposits as Pleistocene alluvium and distinguish them from the Holocene alluvium. This is primarily based on the lack of detailed stratigraphic data needed to make further distinctions. However, separating the Holocene from the Pleistocene provides enough interpretation to allow for better characterization of the near-surface deposits from a contaminant fate and transport perspective.

At the facility, Pleistocene alluvium is commonly described on boring logs as a brown, reddish-brown or, where stained, black, fine to coarse sand with lenses of gravel. The gravel fraction is often multicolored and comprised of a mixture of sub-angular to sub-rounded, sedimentary and metamorphic rocks derived from the Appalachian Piedmont. Stratification is common and secondary lithologies include silt/clay beds with peat, silty sand, and silty gravel. The Pleistocene alluvium generally ranges in thickness from approximately 10 to 30 feet near the facility. It is commonly capped by fine-grained, muddy deposits that are distinctly different from the Holocene alluvium. The greater part of Pleistocene alluvium is laterally continuous, and its thickness depends on the antecedent Cretaceous topography that it filled and on the degree of erosion from above. Along the present-day Schuylkill River, Stantec has mapped Pleistocene alluvium to be present beneath thick sections of Holocene alluvium to elevations lower than -70 feet NAVD 88 (**Figures 3-8, 3-9, 3-10,** and **3-18**). This is interpreted to represent glacial-age tributary (Schuylkill River) alluvium in the context of Jengo (2006).

The regional water-table at the facility often occurs within the Pleistocene alluvium. Because of its stratigraphic position, this geologic unit comprises a significant portion of the water-table aquifer (along with the PRM aquifer system sand units where they subcrop and localized areas of saturated Holocene alluvium and fill). Published well records indicate that the "Trenton gravel" (Pleistocene alluvium) can be a prolific aquifer (Paulachok, 1991). Nevertheless, due to lateral changes in thickness and to its heterogeneous character, hydraulic properties and groundwater yields can vary widely. Stantec reviewed published data and available on-site aquifer testing data regarding the hydraulic properties of the water-table aquifer and has summarized that data on **Figure 3-20**. It is noted that although the greater part of wells tested at the facility and shown on **Figure 3-20** are predominantly screened through Pleistocene deposits, some test results may represent the hydraulic properties of other geologic units that locally comprise a portion of the water-table aquifer, such as fill and the PRM upper, middle, and/or lower sand units. Hydraulic property information pertaining to the PRM lower and/or middle sand units is presented in **Section 3.2.1.3.4** and **Section 3.2.1.3.6** and is summarized on **Figure 3-21**. A summary of off-site hydraulic property information gathered for both water-bearing units is presented on **Figure 3-22**.

Of importance to this RIR are water-table aquifer hydraulic property data resulting from a nearly 7-day groundwater extraction test conducted at recovery well RW-2 at the facility (IST, 1998). During testing,

RW-2 was pumped at a constant rate of 225 gallons per minute (gpm). Distance-drawdown data analyzed along transects of observation wells suggested that the area of influence extended approximately 1,680 feet from the pumping well under observed relatively isotropic conditions. The hydraulic conductivity (k) was estimated to be greater than 400 feet per day (ft/d). More recently, a 24-hour pumping test was conducted at the former DSCP property at monitoring well DSCP-MW-65, a well that appears to be screened across the Pleistocene and into underlying sandy Cretaceous deposits (ARCADIS, 2013). Analysis of that data provided in the referenced report supports comparable aquifer properties at the DSCP property. However, it is noted that during the test, the "Trenton gravel" was reportedly dewatered and individual aquifer or geologic unit k values could not be calculated/resolved. Other, in-situ, single well instantaneous displacement tests and short-duration pumping tests for remedial system design suggest a lower k for the Pleistocene, on average, but test results vary widely, from less than 1 ft/d to over 600 ft/d. The observed wide range in k values over relatively short distances is consistent with the water-table aquifer's lithologic heterogeneity which can be attributed an appreciable amount to the nature of the Pleistocene deposits.

3.2.1.3 Cretaceous Deposits

Many studies of the Atlantic Coastal Plain near the facility have identified the presence of Cretaceous-age sediments in the subsurface. **Figure 3-3** depicts the subcrop areas of Cretaceous geologic units across the Delaware River in New Jersey. Extrapolation of the units into Pennsylvania has not been formally completed although some authors have indicated their likely presence (Greenman et al., 1961; Navoy and Carlton, 1995). These are the oldest sedimentary deposits in the area and are configured in a southeasterly-thickening wedge, overlain by the much younger Quaternary deposits described in **Section 3.2.1.2** and underlain by Piedmont crystalline bedrock. Greenman et al. (1961) detailed the age, character, configuration, and hydraulic properties of these deposits in southeastern Pennsylvania. At the time of that publication, the Cretaceous deposits were assigned primarily to the Raritan Formation and noted to represent three distinct, fining-upward cycles of non-marine sedimentation. Similarities to lithologic sequences identified on borehole logs were correlated to previously identified strata at their type locality in New Jersey, where the deposits are much thicker and more easily distinguished. Other similar, near time-equivalent geologic formations of Cretaceous age were elsewhere identified in Maryland and Delaware (Jordan, 1962), and geologists began wholly referring to the Cretaceous deposits in south Philadelphia as the PRM aquifer system with focus on hydrostratigraphy.

In south Philadelphia, the PRM aquifer system is subdivided into six geologic units in order of increasing age (Schreffler, 2001):

- upper clay unit
- upper sand unit
- middle clay unit
- middle sand unit
- lower clay unit
- lower sand unit

Sugarman (2017) utilized recent borehole data from offshore New Jersey drilling to refine understanding of the PRM aquifer system relevant to the study area, which indicate that the lower and middle sand units (aquifers) correlate to the Potomac Formation and the upper sand unit likely correlates to the Magothy Formation. Near the facility, it is generally true that the PRM units are discontinuous, relatively thin, intercalate, and exhibit gradual facies changes that make separation of individual continuous units difficult. Where sand units are present discretely or in continuity with other sandy deposits, they can form a deeper (lower) aquifer at the facility or account for a portion of the water-table aquifer. Total thicknesses of PRM deposits at the facility range from 0 feet, where Quaternary deposits are present atop bedrock, to more than 100 feet within paleochannels incised into bedrock (**Section 3.2.2**). Details of the individual units and bedrock configuration based on boring log records and published descriptions are presented in the following sections.

3.2.1.3.1 Upper Clay Unit

The upper clay unit is a variegated clay/silt that is sometimes discernible from older clay units of the PRM where sandy and gravelly. In general, it is thin when compared to the other PRM clay units in south Philadelphia, and in places distal to the Delaware River, the upper clay may be entirely absent (Greenman et al., 1961). Based on geophysical log signature, others have mapped the upper clay to be at least 0.5 feet thick and up to 30 feet thick at the facility, exhibiting its greatest thickness in northern portions of the facility while pinching out to the south (IST, 1998). At the facility, Stantec has assigned the upper clay to first occurrences of light brown, tan, mauve, yellow, gray, and less-commonly, red sandy, silty clay beneath the Quaternary alluvium. However, overall stratigraphic correlation of the PRM across the facility supports the upper clay unit pinching out or being truncated by younger deposits throughout many of the AOIs (e.g., **Figures 3-13** and **3-19**).

The upper clay unit by nature acts as an aquitard. Where present, it can create hydraulic separation between the upper sand unit and overlying Quaternary deposits. Where the upper clay is absent, the upper sand occurs directly beneath, and is typically discernable from, the overlying coarser, poorly-sorted, and more heterogeneous Pleistocene alluvium. The upper sand unit comprises a portion of the water-table aquifer (**Table 3-1**). Stantec (2017a) collected one Shelby tube in the apparent upper clay unit in AOI 4 where its permeability was estimated at 6.2×10^{-4} ft/d. Based on its comparable lithology to the middle clay, it can be reasonably assumed that where present the upper clay unit vertical hydraulic conductivity (k_v) may be like that of the middle clay and range from approximately 10^{-4} to 10^{-6} ft/d (Stantec, 2017b).

3.2.1.3.2 Upper Sand Unit

The upper sand unit is a varicolored but predominantly brown to gray sand with varying amounts of gravel, clay, and silt (Greenman et al., 1961). Nearer the facility, it has been described as mostly silty and/or clayey fine to medium sand (IST, 1998). Where the upper clay is absent, the upper sand occurs directly beneath, and is typically discernable from, the overlying coarser, poorly-sorted, and more heterogeneous Pleistocene alluvium. Stantec used color and lithologic changes, in addition to subtle changes in drilling conditions including Standard Penetration Test (SPT) blow counts, to make "picks" on upper sand occurrences where the upper clay is absent. In general, the upper sand appears most extensive beneath eastern portions of the facility (AOIs 1, 4, and parts of 8) where it subcrops Pleistocene alluvium. Beneath the northern reaches of the facility, the upper sand and other PRM sand units may

subcrop fill (**Figure 3-16**). The upper sand unit, where present, rarely exceeds 10 to 20 feet in total thickness and is thickest along the axes of troughs cut into the middle clay unit (**Figure 3-13**).

The upper sand unit can be a highly productive water bearing zone where its thickness and extent are sufficient (Greenman et al., 1961). Aquifer testing of the upper sand unit in New Jersey has indicated that the aquifer has similar hydraulic properties to the middle and lower sand units where discrete (Navoy and Carleton, 1995). At the facility, Stantec did not identify any existing testing data for wells discretely screened within the upper sand unit from which to infer sole hydraulic properties of that unit. The upper sand is fairly continuous along eastern areas of the facility but generally occurs in pockets nearer the Fall Line where bedrock is shallower and is entirely missing in places along the Schuylkill River. The upper sand unit comprises a portion of the water-table aquifer. Most wells that fully penetrate the water-table aquifer in northern areas of the facility may intersect and be influenced by the hydraulic properties of the upper sand and/or older PRM water-bearing units.

3.2.1.3.3 Middle Clay Unit

Whereas other clay units of the PRM are described as sandy and gravelly in places, the middle clay unit is generally regarded as being a laterally extensive and uniformly massive aquitard consisting of thick, red and white clay with very little sand (Greenman et al., 1961). Near the facility, others have found the middle clay to be nearly continuous in the subsurface (IST, 1998). Based on boring log review and stratigraphic correlation, Stantec would generally agree with these previous findings and has mapped the middle clay unit of the PRM to be the prevailing clay unit at the facility. However as previously discussed in Stantec (2016), Stantec (2017a,b), and Stantec (2021a,b), the interpreted middle clay unit is absent in areas along the perimeter of the Schuylkill River, including portions of AOIs 5, 6, 7, 8, and 9 where recent alluvial deposits are prevalent. Where present, thickness of the middle clay unit generally ranges from less than one foot to more than 20 feet (**Figure 3-23**). The middle clay's characteristically muddy texture can vary and become finely-laminated/bedded and intercalated with muddy sand. Downgradient, nearer AOI 9 and the George C. Platt Bridge, some pockets or thin lenses of middle and/or lower clay may be present under a thick section of Quaternary alluvium and upper sand. At other locations beneath the facility, the middle and lower clay units appear to be in direct contact with each other (where the middle sand is absent).

The middle clay unit, in places resting directly on and combining with the lower clay unit, acts as a mappable and significant aquitard at the facility. In a regional context, it creates hydraulic separation between the water-table aquifer and deeper, semi-confined aquifer of the middle and/or lower sand units (**Section 3.2.3**). However, where it appears to be thin and sandy, notably in the southeastern area of AOI 1, there may be more potential for vertical exchange between groundwater of the deeper aquifer and water-table aquifer, the direction and magnitude of which would depend upon the vertical hydraulic gradients at the time. The middle clay unit is discussed in more detail in **Section 3.2.3**.

Where the middle clay is present, there exists the potential for vertical groundwater exchange (leakage) to occur through the aquitard that is dependent on the permeability of the middle clay among other factors. Stantec reviewed middle clay unit permeability ranges beneath the facility from available laboratory testing data presented in previous RIRs (generally permeability testing by ASTM Method D5084). The

testing data suggests that the middle clay unit permeability may be reasonably estimated between 10^{-3} and 10^{-5} ft/d. This result supports that the middle clay is relatively impervious where present.

3.2.1.3.4 Middle Sand Unit

The middle sand unit is a light-colored, stratified, fine to coarse sand with occasional gravel and clay that was generally deposited in lenticular masses along the axes of troughs carved into the lower clay unit (Greenman et al., 1961). As such, it is by nature discontinuous in the subsurface. Stantec has mapped the presence of middle sand at the facility based on stratigraphic position and where present, is commonly described on boring logs as brown or orange sand and gravel. In some areas where erosion entirely removed the lower clay, it may be indistinguishable from and rest unconformably atop the lower sand unit. At those locations, Stantec used subtle changes in sample descriptions, including color, density, and/or texture of the sequences of sand below the middle clay to infer the contact between those units (in many places the top of the lower sand is fine to medium-grained, white sand with a trace of clay). The middle sand unit, where discernable from the lower sand, has been observed at thicknesses up to approximately 30 feet beneath the facility and is generally thickest in lenticular or tabular bodies.

Much like the other sand units of the PRM, the middle sand unit can be a prolific aquifer where it is laterally continuous and of sufficient thickness. Aquifer testing of the middle sand in New Jersey has indicated that the aquifer has similar hydraulic properties to the lower sand unit (Navoy and Carleton, 1995). At the facility, Stantec did not identify any wells discretely screened within the middle sand unit from which to infer sole hydraulic properties. "Deep" wells at the facility are generally screened across the middle sand and into the lower sand where the two deposits can be reasonably distinguished.

3.2.1.3.5 Lower Clay Unit

Published descriptions of the lower clay unit indicate that it appears very similar to, and is sometimes inseparable from, the middle clay unit where the middle sand is absent. The lower clay is generally a dense red clay but is known from drilling records to contain softer zones of gray clay stratified with fine sand. The lower clay tends to exhibit its greatest thickness along the lateral margins of paleochannels in underlying bedrock and can be thin to absent along the axes of paleochannels where eroded prior to deposition of the middle sand unit (Greenman et al., 1961). Of the PRM clay units, Stantec has interpreted the lower clay unit to be the least significant at the facility in terms of both its lateral extent and vertical thickness. This is based on stratigraphic correlation and likely the result of erosion prior to deposition of the middle sand. Generally gray and red, commonly sandy clay and muddy sand zones were assigned to the lower clay if observed below and distinguishable from the middle clay. Where present, the lower clay was observed at thicknesses ranging from less than 1 foot to no greater than 10 feet. The lower clay appears to thicken and become more continuous to the south and east of the facility.

Where physically connected, the lower and middle clay units combine to form a significant aquitard at the facility. In a regional context, they create hydraulic separation between the water-table aquifer and a deeper, semi-confined aquifer of the lower/middle sand units (**Section 3.2.3**). The lower clay can also create localized areas of hydraulic separation between the lower and middle sands, where discretely present.

3.2.1.3.6 Lower Sand Unit

The lower sand unit is a varicolored but predominantly white to yellow sand with gravel, usually fining upward to a cap of fine to medium sand with occasional yellow and gray clay lenses. The lower sand unit is the oldest of the PRM deposits and rests unconformably atop bedrock. The lower sand is generally thickest (up to 87 feet thick) along the axial troughs of paleochannels carved into bedrock by discharge through former positions of the Schuylkill and Delaware Rivers (Greenman et al., 1961). At the facility, Stantec recognizes the lower sand unit to be present as a nearly continuous deposit, except for areas proximal to the Schuylkill River where it appears that the river entirely removed the PRM. Where present, the lower sand unit is observed to range in thickness from approximately 20 feet to a maximum of just over 50 feet, where it fills a bedrock paleochannel beneath a portion of AOI 1. Borehole logs from the facility indicate that the lower sand unit is commonly yellow, white, and pale gray in color and predominantly medium to coarse sand with gravel, or gravel with sand. The lower sand's gravelly texture beneath the facility has been well documented on drilling logs.

Figures 3-21 and 3-22 summarize hydraulic information available for the lower sand unit (considered the lower aquifer at the facility) based on estimates obtained from well testing at the facility and published aquifer testing results. At the Philadelphia Naval Shipyard (PNSY), historical pumping test data are available providing estimates of regional hydraulic properties for the lower sand unit that can be reasonably applied to the lower aquifer at the facility. This data indicates an average k value of approximately 134 ft/d (Greenman et al., 1961). Other regional data from Greenman et al. (1961) are also presented on the figures. Adjacent properties investigated by others under Act 2 with available hydraulic property data for the lower aquifer include the PGW Passyunk Facility (WESTON, 2004) and Verizon SDWC Property (lower aquifer subcrop area) (Leidos, 2015).

At the facility, Stantec completed slug and short-duration pumping tests on 7 wells open to the lower aquifer. Values of k estimated for the lower aquifer from the slug testing range from approximately 66 ft/d to more than 800 ft/d and may include hydraulic properties of the middle sand, lower sand, and/or Pleistocene alluvium (glacial-age tributary alluvium beneath the Schuylkill River) (**Figure 3-21**). Values of k estimated for the same wells from short duration pumping tests (analysis of drawdown and recovery data) tend to be smaller than those from the slug tests, as a larger portion of the undisturbed aquifer is influenced. Across the Delaware River in New Jersey, lower sand unit k values from pumping tests are documented to be slightly higher, on average (**Figure 3-22**).

3.2.2 Bedrock

Bedrock beneath the Coastal Plain near south Philadelphia has been inferred from surface outcroppings above the "Fall Line," and has been described in the subsurface where penetrated by past drilling activities. Bosbyshell (2008) has mapped schist of the Wissahickon Formation to occur in Philadelphia along the "Fall Line" (**Figure 3-3**). Relatively small bodies of granitic gneiss resulting from igneous intrusions into the country rock during metamorphism can also be present. Most boring log records of deep holes drilled at the facility indicate that schist or saprolite with a schistose fabric is present beneath the Coastal Plain, in agreement with published maps.

Available data pertaining to the bedrock surface beneath the facility suggests that the surface generally dips to the southeast but contains local complexity. Greenman et al. (1961) recognized the presence of

four paleochannels incised into bedrock and attributed those features to previous positions of the Schuylkill River. Two of those channels, referred to as the Point Breeze Trough and the League Island Trough by those authors, occur beneath parts of the facility and influence the total thickness of the Coastal Plain sedimentary sequence above them. **Figure 3-24** was developed from the Greenman et al. (1961) dataset and was refined by Stantec to increase the data density of boreholes to bedrock near the facility (**Section 2.2**). Refinement of the Greenman et al. (1961) dataset has revealed local detail in the bedrock surface underlying the area, including small bedrock paleochannels beneath the eastern portions of AOIs 1 and 4 that appear to be extensions of the League Island Trough, and a few localized bedrock surface highs (pinnacles) particularly within AOI 8 and near the mouth of the present-day Schuylkill River.

In general, bedrock can store and transmit groundwater primarily through secondary porosity structures (e.g., fractures, joints). Bosbyshell (2008) indicates that the Wissahickon Formation can yield up to 20 gpm based on records reviewed for well locations north and west of the facility. Balmer and Davis (1996) indicate that in Delaware County, Pennsylvania, the Wissahickon Formation is generally the peak producer of the consolidated rock aquifers present in the county and can yield anywhere from 0 gpm to 300 gpm to wells (data from 127 wells). The well data included in the referenced reports was for wells generally located above the "Fall Line" where bedrock forms the surficial unit. PaGWIS well searches performed for this RIR have not indicated the presence of water supply wells extracting significant quantities of groundwater from bedrock in the immediate study area. In the context of this RIR and the objectives of the GWF Model, Stantec is of the opinion that the water-bearing properties and potential for pathways for contaminant transport through the Wissahickon Formation beneath the facility are minimal when compared to the Coastal Plain deposits (**Section 3.3.2**).

3.2.3 Hydrostratigraphy

Two aquifers (hydrostratigraphic units) have been established as mappable water-bearing units beneath the facility (Stantec, 2016; Stantec, 2017a,b; Stantec, 2021a,b). In general, these are the water-table (unconfined) and lower (semi-confined) aquifers (**Table 3-1**). The water table aquifer is generally considered to be that part of the saturated zone that is above the middle clay unit and the lower aquifer is that portion of the saturated zone that is below the middle clay and above the bedrock. Stantec assigned hydrostratigraphic units to facility and offsite wells where possible while developing this CSM and the stratigraphic profiles that support hydrogeologic characterization of the Coastal Plain deposits. **Appendix A** contains the pertinent well construction and well gauging data utilized in this RIR and includes the hydrostratigraphic unit assignments. Overall, approximately 95% of existing monitoring wells at the facility are screened in perched water areas or across the water-table aquifer and were constructed to intersect the first occurrence of groundwater and/or LNAPL. The remaining wells are screened in the semi-confined lower aquifer, which may include portions of screened intervals that intersect lithologies correlated to the middle sand, lower clay, and/or lower sand units.

3.2.3.1 Methodology for Evaluation of the Groundwater Flow System

For the purposes of evaluating present-day hydraulic heads, groundwater flow patterns, hydraulic gradients, and any potential variability in those conditions through time for the aquifers identified in this RIR, Stantec compiled, reviewed, and interpreted several large well gauging datasets (**Appendix A**).

Where available, these datasets included near-synoptic data from offsite properties such as the former DSCP, PGW Passyunk Facility, and Verizon SDWC property. Golden Software's Surfer® 15 (2017) was used to interpolate the well data using block and/or point Kriging to generate surfaces for the evaluation of the groundwater flow system. Grid residuals, the calculated difference between the observed and interpolated (gridded) values for the wells used in this RIR, were evaluated as a quantitative measure of how well the data is represented by the surface models. The interpolated surfaces were subsequently contoured and imported into a geographic information system (GIS) where color-floods were applied to visually evaluate flow patterns.

Due to the high well density and data bias in some areas of the facility and the commonality of apparent groundwater anomalies in the shallow subsurface, water-table and lower aquifer elevation datasets were then refined through several iterations of gridding and borehole log review to remove anomalous data, where appropriate. For the water-table aquifer, an evaluation to identify anomalous data points was warranted for those wells screened within areas of apparent groundwater mounding where it was unclear whether those water-level elevations represent true water-table mounds under unconfined conditions, or areas of perched groundwater in fill or alluvium not at equilibrium with atmospheric pressure and positioned above the level of regional saturation. Wells found to contain consistent water-levels when compared to neighboring wells were added to the queries for subsequent datasets to the extent possible to allow for reasonable evaluation of the persistence of groundwater flow patterns in the aquifers. This process was considered crucial to demonstrating the appropriateness of a steady-state GWF Model.

Figures 3-25 through **3-34** show color-flooded groundwater elevation surfaces estimated for both aquifers derived from the analysis of near synoptic gauging events conducted in May of 2014, May of 2015, May of 2016, May of 2017, and June of 2018. These figures are used to support the discussion in the following sections. It is noted that for wells gauged by Stantec, depth-to-water measurements were collected with an optical oil/water interface probe and reported to the nearest hundredth of a foot. Water-table elevations were calculated using surveyed well top-of-casing elevations and, where warranted due to LNAPL accumulations, corrected using appropriate LNAPL density data. It is noted that the integrity of offsite well gauging data utilized but not collected by Stantec personnel was assumed to have been evaluated by others. However, Stantec did spot check and exclude selected offsite well gauging data from contouring where deemed appropriate.

3.2.3.2 Unconfined (Water-Table) Aquifer Configuration

Beneath the facility, the water-table aquifer is primarily composed of saturated and permeable portions of fill, Holocene alluvium, Pleistocene alluvium, and the PRM upper sand unit. Where present in mappable thickness, the water-table aquifer also includes the intervening PRM upper clay unit. On average, the saturated thickness of the water-table aquifer beneath the facility ranges from approximately 5 to 30 feet. In exception, the water-table aquifer saturated thickness can be more than 30 feet where the middle clay unit aquitard is missing and the lower aquifer sediments constitute all or a portion of the aquifer. Hydraulic properties of the geologic units and formations comprising the water-table aquifer were discussed in **Section 3.2.1** and describe a wide range of estimated values of k, likely reflective of several factors applicable to the facility, including heterogeneity in the Pleistocene deposits, heterogeneities in the fill, insufficient well development, separate-phase residual hydrocarbons near the water table, and the

occurrence of a lower aquifer subcrop area. Low values of k may be the result of poor well-aquifer hydraulic communication related to inadequate well development, fouling of the well screen post-installation, residual hydrocarbons, and low permeability sediments enveloping the well screen.

3.2.3.2.1 Groundwater Flow in the Water-Table Aquifer

Figures 3-25 through **3-29** display the study area water-table surface elevation for the annual well gauging events included in the RIR, based on the final interpolations performed after analysis and filtering of the datasets. With localized areas of perched groundwater and/or anomalous data from suspect wells removed from the analyses, the following key features are noted beneath the facility and surrounding study area of focus:

- Patterns of water-table aquifer groundwater flow for the period 2014 through 2018 appear relatively consistent through time suggesting that annual variability is minimal.

- Seasonal variability in water-table aquifer elevations was evaluated through hydrograph review of well gauging and water-level monitoring data from data loggers deployed throughout the facility (**Figure 3-35**; **Appendix B**). Hydrograph data demonstrates that seasonal variability in the water table is generally less than 2 feet and that many wells experience similar magnitude changes, indicating that hydraulic gradients are reasonably consistent (river tide effects are discussed in **Section 3.2.4**).

- Groundwater flow directions follow a pattern that generally mirrors the historical topography shown on **Figure 3-1**. This pattern includes an east-west trending groundwater divide beneath the PGW Passyunk Facility, additional groundwater divides in northcentral AOI 8 and in AOIs 2 and 3 along the Schuylkill River cut bank, and groundwater convergence along buried stream valleys, such as former Rambo Creek, where parts of the features are indicated to have been gaining streams based on the recent hydraulic data presented.

- Hydraulic gradients in the water-table aquifer at the facility are variable. There is an association between topography and the water-table slope whereby the water table is a subdued version of the land surface. However, proximal to leaking sewers and pumping centers, steeper hydraulic gradients are present.

- Groundwater mounding is noted to occur within the filled, former Schuylkill River floodplain. The mounding in these areas is continuous with the regional level of saturation in the subsurface and appears to be partly supported by the presence of sheet pile bulkheads along the Schuylkill River.

- Anthropogenic features appear to disrupt natural patterns of groundwater flow in the study area. Groundwater infiltration into several large, partially to completely submerged sewers is inferred based on groundwater convergence around these features. This is prominent along 26th Street in association with the Lower Schuylkill East Side Intercepting Sewer, and along Passyunk Avenue in association with the Passyunk Relief and Shunk Street Sewers (Stantec, 2016; Stantec, 2017b). Minimal influence is noted because of pumping of facility remediation system wells, as these systems were generally designed for LNAPL recovery. The exception is in AOI 7, where a small area of depressed groundwater would develop behind the Schuylkill River bulkhead during times of past

operation of the 3 Separator Remediation System. Use of this system was discontinued by PESRM in 2021 and groundwater conditions have recovered. Dewatering operations at the Mingo Creek Flood Control Basin control the water-table to significantly low elevations and create a region of capture around the basin (**Section 3.4.2.4**).

3.2.3.3 Semi-Confined (Lower) Aquifer Configuration

Beneath the facility, the lower aquifer is mapped to include the PRM middle sand unit, lower sand unit, and where present, the lower clay unit. The lower aquifer is interpreted to include a less significant portion of Pleistocene alluvium (glacial-age tributary alluvium) beneath and fringing the Schuylkill River, where these deposits are semi-confined by Holocene alluvium and hydraulically connected to the PRM deposits. On average, the saturated thickness of the lower aquifer beneath the facility ranges from 10 to 50 feet. The thickness is largely dependent on the configuration of the underlying bedrock surface and as such, the lower aquifer is thickest where bedrock troughs are inferred (**Figure 3-24**). Hydraulic properties of the geologic units and formations comprising the lower aquifer were discussed in **Section 3.2.1.3.6** and like the water table, describe a wide range of estimated values of k reflective of several potential factors. Low values of k may be the result of poor well-aquifer hydraulic communication related to inadequate well development, fouling of the well screen post-installation, residual hydrocarbons, and low permeability sediments enveloping the well screen.

3.2.3.3.1 Groundwater Flow in the Lower Aquifer

Figures 3-30 through **3-34** display the study area lower aquifer elevation for the annual well gauging events included in the RIR, based on the final interpolations performed after analysis and filtering of the dataset. The following key features are noted beneath the facility and surrounding study area of focus:

- Patterns of lower aquifer groundwater flow from 2014 to 2018 appear relatively consistent through time suggesting that annual variability is minimal.

- Seasonal variability in lower aquifer elevations was evaluated through hydrograph review of well gauging and water-level monitoring data from data loggers deployed throughout the facility (**Figure 3-35**; **Appendix B**). Like the water table, hydrograph data demonstrates that seasonal variability in the lower aquifer is generally less than 2 feet and that many wells experience similar magnitude changes, indicating that hydraulic gradients are reasonably consistent (river tide effects on both aquifers are discussed in **Section 3.2.4**).

- The lower aquifer has artesian conditions or is at least semi-confined beneath a great deal of the facility (major aquitards creating the artesian conditions are the middle clay unit and the Holocene alluvium).

- Lower aquifer groundwater flows in a radial pattern away from its subcrop area in AOI 8 near the "Fall Line." Southerly flow is prevalent beneath the PGW Passyunk Facility and AOIs 1, 2, 3, and 4. A groundwater divide is indicated that separates flow to the southeast, east of 26th Street, from flow to the west and southwest in AOIs 5, 6, and 7. A groundwater convergence area around Mingo Creek Flood Control Basin is supported by the June 2018 dataset. The convergence area appears to extend

under the Schuylkill River and into Girard Point, influencing the flow pattern in that area. It does not appear that sheet pile bulkheads have any significant effect on impeding flow in the lower aquifer along the Schuylkill River.

- Anthropogenic features appear to disrupt natural patterns of groundwater flow in the study area. Groundwater infiltration into several large, partially to completely submerged sewers is inferred based on groundwater convergence around these features. Although this is prominent in the water-table aquifer, some influence is also noted in the lower aquifer.

- Hydraulic gradients in the lower aquifer at the facility are variable but to a lesser degree than the water table due to the semi-confined conditions. Shallower gradients are primarily associated with areas distal to the Schuylkill River and where the middle clay unit aquitard is fairly continuous. In contrast, steeper hydraulic gradients are associated with the lower aquifer subcrop area in AOI 8 (water-table conditions) and near Mingo Creek Flood Control Basin due to dewatering activities (**Section 3.4.2.4**).

- Along the Schuylkill River, lower aquifer groundwater can either flow under, discharge into, or receive surface water from the river depending on the permeability of the riverbed sediments along the shoreline, and on the dynamic head differential between the tidal river and the aquifer.

3.2.4 Influence of River Tides on Aquifer Heads

The Schuylkill River bisects the facility and is a tidal river that experiences astronomical tides on a semidiurnal scale. The head of the tide is located just north of the facility at Fairmount Water Works Dam near Fairmount Park in the City of Philadelphia. According to data obtained from the USGS tide gauge near 30th Street (USGS Station 01474501), the tidal amplitude in the river ranges up to approximately 7 feet per semidiurnal cycle (generally from -3 feet to 4 feet NAVD 88). Cyclical fluctuations of the surface water level in the Schuylkill River may directly or indirectly propagate landward and affect water levels in the aquifers. This could influence gradients and hydraulic heads to an extent and magnitude that is related to the degree of river and aquifer communication.

Greenman et al. (1961) concluded that Delaware River tides propagate landward through the water table no more than a few hundred feet from the river. Those authors also noted a harmonic, sinusoidal pressure wave in the artesian aquifers near the Delaware River that decreased in amplitude with distance from the river. Weston (2004) monitored water levels in wells at the PGW Passyunk Facility to evaluate river tide effects on the aquifers. Interestingly, those data showed that the lower aquifer adjacent to the river (PGW-MW-1D) contained a much more significant tidal signal (amplitude greater than 4 feet) than the water-table aquifer at similar locations (which comparatively displayed minimal tidal influence).

Stantec and Evergreen's decision to deploy data loggers at the facility was based in part on the need to demonstrate the presence or absence, and magnitude, of a river tide signal in both aquifers. **Figure 3-35** illustrates that a semidiurnal tide signal is present in the greater part of wells monitored and that the lower aquifer can fluctuate from a few tenths of a foot up to approximately 1 foot in response to river tides. In contrast, water-table wells generally exhibited a smaller relative response. River bulkheads, low

permeability sediments/fill, and/or the relative elevation of the bottom of the water-table aquifer when compared to the river elevation may explain these observations.

The timing of the arrival of the tidal cycles in the facility aquifers was nearly synchronous in wells near the Schuylkill River but lagged up to approximately 45 minutes in wells over 1,000 feet from the river. The timing of the arrival of tides in lower aquifer wells close to the river supports that there may be a near direct connection between the lower aquifer and the Schuylkill River. Stantec suspects the degree of connection may be greatest where shallow bedrock is present beneath the Schuylkill River and/or where the river is deeply scoured and/or maintenance dredged (e.g., scour between the Passyunk Avenue bridge pilings).

3.3 HYDROLOGIC AND HYDRAULIC BOUNDARIES

3.3.1 The "Fall Line"

As previously noted, the facility occurs very near the "Fall Line" in southeastern Pennsylvania, a narrow zone that trends roughly northeast-southwest where Piedmont foothills of the Appalachia gradually transition to a southeasterly-thickening clastic wedge of Coastal Plain sediments (**Figure 3-2**). Along the "Fall Line," it is assumed herein that Piedmont bedrock and/or saprolite does not supply a significant quantity of groundwater recharge to the Coastal Plain. As documented in this RIR, the "Fall Line" is represented in the GWF Model as a boundary through which no groundwater exchanges. This approach is consistent with the previous USGS models of Schreffler (2001) and Sloto (2012).

3.3.2 Bedrock Surface

As described in **Section 3.2.2**, bedrock (capped with saprolite of variable thickness) exists below the Coastal Plain sediments of primary concern to the GWF Model. Bedrock has the potential to store and transmit groundwater primarily through secondary porosity structures (e.g., fractures, joints). In the context of this RIR and the objectives of the GWF Model, Stantec believes the water-bearing properties and potential for pathways for contaminant transport through the Wissahickon Formation beneath the facility are minimal when compared to the Coastal Plain deposits. As such, the upper bedrock surface beneath the GWF Model (**Figure 3-24** and **Figure 5-2H**) is considered the lower limit of the study area and it is assumed that no groundwater exchanges with fractured bedrock and/or saprolite. This is consistent with the Schreffler (2001) and Sloto (2012) models.

3.3.3 Schuylkill River Bulkheads

Previous authors studying groundwater resources in southeastern Pennsylvania have noted the hydraulic connection between the area's major rivers and aquifers. Greenman et al. (1961) discussed the hydrologic "dynamic equilibrium" that likely existed in the region prior to groundwater production from significant pumping centers in south Philadelphia and noted that discharge from the aquifer system was largely attributable to the transfer of groundwater to streams and rivers. Navoy and Carleton (1995) discussed significant groundwater withdrawals in Camden County, New Jersey, and the significance of the PRM aquifer's connection to the Delaware River in that area.

Along the facility, much of the Schuylkill River shoreline has been hardened with sheet pilings and bulkheads to stabilize the channel, provide shipping access, and mitigate the potential for erosion and flooding. As discussed in **Section 3.1.1** and **Section 3.1.2**, shoreline hardening had already commenced by the turn of the 20th Century near the facility. Where present and not deteriorated, sheet pilings act as hydraulic barriers that limit the horizontal exchange of groundwater with surface water and vice-versa, depending on the depth to which the pilings are anchored. Stantec and Evergreen met with PESRM engineers during January 2018 with the goal of obtaining any available as-built information related to bulkheads and other shoreline structures (**Appendix C**). A site walk was also performed to visually review the structures. Based on the information received from PESRM, Stantec compiled and digitized the locations of bulkheads, bulkhead types, and walls along the Schuylkill River, also noting where the shoreline appears to be open (**Figure 3-36**). Most drawings reviewed did not indicate the installation depth for sheet pilings, only noting that the sheeting is generally driven to refusal based on geotechnical standards. As such, the vertical extent of hydraulic flow barriers in the GWF model was estimated during model calibration to observed hydraulic heads (**Section 6**).

3.4 WATER BALANCE

Recharge and discharge are defined as the contributions of water to a groundwater system (recharge) and the loss of water outside a groundwater system (discharge). The four components of recharge considered in the GWF Model are:

- subsurface inflow
- recharge from rivers, streams, or creeks
- precipitation-related recharge
- infiltration from leaking infrastructure

The four components of discharge for the GWF Model are:

- subsurface outflow
- discharge to rivers, streams, or creeks
- groundwater production (including Mingo Creek pumping)
- exfiltration to sewers

This section reviews the basic concepts of recharge and discharge considered for the GWF Model to adequately simulate average groundwater flow conditions in the water-table and lower aquifers.

3.4.1 Recharge

3.4.1.1 Subsurface Inflow

Contributions of water to any model domain from its boundaries constitute subsurface inflow. Bedrock which forms the northwestern boundary and underlies the facility study area is assumed to contribute a de minimis amount of groundwater flow to the Coastal Plain. Therefore, the area beyond the "Fall Line" to the northwest and the bottom of the PRM are not considered to provide an influx of groundwater. The remaining boundary upgradient of the study area is assumed to provide an influx of groundwater that is dependent upon water levels near the boundary.

3.4.1.2 Stream Recharge

Recharge may enter the model domain through existing rivers, streams, and water bodies. The magnitude of potential recharge from surface water bodies typically depends on the relative head differential between the water body and the model layer(s) it intersects, and on the hydraulic conductivity and thickness of the riverbed materials present.

3.4.1.3 Precipitation-Related Recharge

Recharge from precipitation may enter the study area through the surface layer where land cover is permeable and permits percolation down through the vadose zone. Recharge to deeper aquifers of the PRM may occur along outcrop areas near the "Fall Line" (Navoy and Carleton, 1995). Reese and Risser (2010) have estimated mean annual groundwater recharge for Pennsylvania by watershed for the period 1971-2000 and near the facility that estimate is approximately 10 to 12 inches.

3.4.1.4 Infiltration from Leaking Infrastructures

A relatively minor but locally significant amount of recharge can result from leaking water utilities in industrialized areas. Paulachok and Wood (1984) produced a comprehensive water-table map of Philadelphia and discussed the significance of groundwater mounding associated with recharge from leaking brick and mortar sewers, which at the time comprised 52% of the City's sewer system. Those authors also cite information from the Philadelphia Water Department indicating that during the early 1980s, approximately 80 million gallons per day (MGD) was lost through compromised water mains throughout the City. Many of those sewers remain in service today and undoubtedly continue to leak.

3.4.2 Discharge

3.4.2.1 Subsurface Outflow

Losses of water from the study area domain through the boundaries constitute subsurface outflow. Bedrock is assumed to contribute de minimis amount of groundwater flow to the area; therefore, the area beyond the "Fall Line" to the northwest and the bottom of the PRM are not considered to provide an influx of groundwater. The remaining boundaries of the study area either provide influx into the study area or outflow from the study area dependent upon water levels, transmissivity, and flow direction at the boundary.

3.4.2.2 Stream Discharge

Significant discharge of groundwater from the model domain to existing rivers and streams can occur under favorable head conditions, particularly where riverbed sediments are thin and/or otherwise sufficiently permeable and allow for a good connection between the surface water body and aquifer(s).

3.4.2.3 Groundwater Production

Groundwater extracted from wells for water supply and/or remediation within the GWF Model domain can significantly alter hydraulic heads in the water-table and lower aquifers and affect groundwater flow patterns and gradients. Historically, PRM aquifer groundwater was a major source of water supply in south Philadelphia and large cones of depression developed from that pumping (Greenman et al., 1961). Schreffler (2001) used a transient flow model with 21 stress periods to simulate variable groundwater withdrawal rates and changing potentiometric surfaces through time and noted that by the early 1980s nearly all pumping from the PRM in Pennsylvania had ceased. However, he noted that downward vertical gradients from the water-table to deeper PRM aquifers were maintained by pumping in New Jersey after that time.

Within the GWF Model domain proximal to the facility, Stantec sought to characterize drawdown incorporated with any nearby identifiable pumping centers not included in the Schreffler (2001) and Sloto (2012) models. Pumping of 5 remediation systems at the facility is represented in the GWF Model because they operated, at least periodically, during the calibration period. These are the 26th Street Sewer Area Remediation System, 3 Separator Remediation System, Penrose Avenue Remediation System, Pollock Street Sewer Remediation Systems, and Belmont Terminal Loading Dock Remediation System. Pumping from the Mingo Creek Flood Control Basin to control groundwater elevations in the AOI 9 area (discussed in further detail in **Section 3.4.2.4**) is also incorporated into the GWF Model. Lastly, groundwater production from the PRM in New Jersey is represented by pumping well locations and withdrawal data provided by Sloto (2012) and compared to more recent watershed totals provided by Snook et al. (2013).

3.4.2.4 Mingo Creek Flood Control Basin

As discussed in the CSM, many small tributary creeks were once present along the Schuylkill River near the facility, prior to anthropogenic modification and land filling activities. Mingo Creek, located on the west side of the Schuylkill River just south of AOI 9, was one of the larger of those creeks (see **Figure 3-1**). Based on online review of historical maps and archived manuscripts for the City of Philadelphia, Stantec understands that an earthen dam was constructed near the mouth of Mingo Creek sometime in the late 1800s. On the upstream side of the dam, the creek was widened and deepened to create the present flood control basin and a pumping station was constructed. The basin and pumping station were to be used for dewatering of the area to generate additional farmland. According to archived records, by 1917 approximately 52 acres of land surrounding Mingo Creek had been reclaimed through pumping from the basin, which discharges to the Schuylkill River.

Development in south Philadelphia eventually led to the displacement of farmland for industrial and commercial land uses in that area. By 1934, a plan and profile of Mingo Creek available from the Philadelphia Streets Department indicates that the creek had been restricted to a drainage canal between

the pumping station and Island Avenue. Review of recent aerial photography indicates that the majority of Mingo Creek has been filled and underlies areas developed since that time. Paulachok and Wood (1984) noted that the water-level in Mingo Creek is controlled through continual pumping at an elevation of 6 feet below sea-level and contributes to a localized cone of depression in the water table. Dames and Moore (1991) indicated that the flood control basin is approximately 25 feet deep, although aerial photography suggests that some siltation and shoaling of the basin has likely occurred since the basin was originally excavated and/or last dredged.

Presently, the Philadelphia Water Department (PWD) operates the pumping station at Mingo Creek. According to PWD and presented in Stantec (2021b), pumping from the basin occurs approximately every 1 to 3 days depending on water-level conditions. Large-capacity pumps are programmed to control the water surface elevation between -10.5 and -11 feet NAVD 88. The pumps have the capacity to transfer water from the basin to the Schuylkill River at up to 53,000 gpm. PWD has indicated that pumping the basin down from elevation -10.5 feet to -11 feet NAVD 88 requires approximately 1 hour of runtime and that the span volume of the basin between those controlled elevations is approximately 3 million gallons. As such, a reasonable estimate of average daily pumping from Mingo Creek is approximately 1 to 3 MGD.

3.4.2.5 Exfiltration to Sewers

In contrast to recharge that can occur where leaking water and/or sewer pipes are present in the subsurface above the water table, a significant amount of discharge can result where those same utilities are present below the water table. Paulachok and Wood (1984) attributed localized depressions in the City of Philadelphia water-table to sewer and subway tunnel discharges. Many previous investigations of groundwater in the vicinity of the 26th Street Sewer, present along the eastern border of the facility, have historically attributed altered water-table groundwater flow directions and gradients (including an elongate depression along that utility) in that area to sewer exfiltration (IST, 1998). As discussed in **Section 3.2.3**, the pattern of groundwater flow and gradients in the water-table aquifer are significantly altered by apparent losses to large, combined City of Philadelphia sewers that bisect the facility.

4.0 COMPUTER CODE

This section presents a description of the computer codes used for this project and addresses the selection criteria, assumptions, limitations, and governing equations relative to each computer code. A groundwater flow model was prepared to represent the physical properties of the aquifer system and support fate and transport evaluations. For the purposes of the modeling effort the MODFLOW2005 (Harbaugh, 2005; Harbaugh et al, 2017) computer code was utilized.

4.1 MODFLOW

The selected groundwater flow model utilized for this modeling study was MODFLOW-2005 (Harbaugh, 2005; Harbaugh et al, 2017). The software code MODFLOW-2005 Version 1.12.00 was utilized for this modeling study. MODFLOW-2005 is a publicly-available groundwater flow simulation program developed by the USGS and is designed to simulate three-dimensional groundwater flow using the finite-difference method (Harbaugh, 2005). The first version of MODFLOW (McDonald and Harbaugh, 1984) was developed by the USGS in the early 1980s. By the early 1990s, MODFLOW had become the most widely used ground-water flow model both within and outside the USGS (Harbaugh, 2005). Over the years many additions have been made to expand MODFLOW's capabilities, solvers, and ease of use (e.g., MODFLOW-88, MODFLOW-96, MODFLOW-2000. The program was selected for this study, in part, because it is thoroughly documented, widely used by consultants, government agencies, and researchers, and is consistently accepted in regulatory programs.

MODFLOW-2005 (Harbaugh, 2005) was selected for this project because 1) it has extensive publicly available documentation, 2) it has sustained rigorous USGS and academic peer review, 3) it has a long history of development and use, 4) the code is widely used around the world in public and private sectors, and 5) it can easily operate with additional simulation tools published by others due to its availability and robust framework.

In addition to its attributes of widespread use and acceptance, MODFLOW-2005 was also selected because of its versatile simulation features. MODFLOW-2005 can simulate transient or steady-state saturated groundwater flow in one, two, or three dimensions and offers a variety of boundary conditions, including specified head, areal recharge, hydraulic barriers, injection or extraction wells, evapotranspiration, drains, and rivers or streams. Aquifers simulated by MODFLOW can be confined or unconfined, or convertible between confined and unconfined conditions. MODFLOW's three-dimensional capability and boundary condition versatility are essential for the simulation of groundwater flow conditions given the complex hydrostratigraphy of the study area, which consists of a multi-layered geologic system with variable unit thicknesses and a hydrogeologic framework which necessitates the inclusion of a variety of boundary conditions.

MODFLOW simulates steady state three-dimensional groundwater flow through porous media described by the following partial differential equation for a constant density fluid:

Equation 5-1

$$\frac{\partial}{\partial x}\left(K_{xx}\frac{\partial}{\partial x}\right)+\frac{\partial}{\partial y}\left(K_{yy}\frac{\partial}{\partial y}\right)+\frac{\partial}{\partial z}\left(K_{zz}\frac{\partial}{\partial z}\right)+W=0$$

where:

Kxx, Kyy, and Kzz are values of hydraulic conductivity along the x, y, and z coordinate axes, which are assumed to be parallel to the major axes of hydraulic conductivity (L/T)

h is the potentiometric head (L)

W is a volumetric flux per unit volume and represents sources and/or sinks of water (1/T)

In Equation 5-1, the hydraulic parameters (i.e., Kxx, Kyy, Kzz and Ss) may vary in space, but not in time; the source/sink (W) terms may vary in both space and time.

MODFLOW-2005 uses a numerical approximation technique known as the method of finite differences to solve Equation 5-1 via computer. Using a block-centered finite-difference approach, MODFLOW-2005 replaces the continuous system represented in Equation 5-1 by a set of discrete points in space. This process of discretization ultimately leads to a system of simultaneous linear algebraic equations. MODFLOW-2005 solves these finite-difference equations with one of several iterative solution techniques. The preconditioned conjugate gradient with Newtonian (PCGN) solver was primarily utilized for the GWF Model. The solution of the finite-difference equations produces values of head at each of the discrete points representing the real aquifer system. Given a sufficient number of discrete points, the simulated values of head yield close approximations of the head distributions given by analytical solutions to Equation 5-1.

MODFLOW requires several general assumptions to approximate the partial differential equations that represent flow in a system. The groundwater system must be divided up into a series of finite difference cells, each with uniform hydraulic properties. Typically, layers are identified and linked with Darcy's Law. Boundary conditions must be simplified to constant head, head dependent, or specified flux estimates. Transmissivity is calculated based on the saturated thickness of layers, but it is constant for the entire saturated thickness of each layer. MODFLOW-2005 also assumes all groundwater flow is laminar. For the described activities, the GWF Model was used to simulate fully saturated groundwater flow and lacks the ability to model the unsaturated zone.

5.0 MODEL CONSTRUCTION

This section describes how the hydrogeologic framework of the groundwater system as described in **Section 3** was translated into a numerical model. The numerical translation includes the definition of the model aquifer geometry, the assignment of the initial and boundary conditions, discretization in space, and the selection of hydraulic parameter zonation and heterogeneity. GWF Model construction was accomplished using a host of software packages. The primary software packages used include:

- Groundwater Vistas® version 8.0, developed by Environmental Simulations, Inc. to pre/post-process and prepare MODFLOW-2005 input files as well as process and visualize model output
- Microsoft Excel and Access to manage the data used to prepare model input files and evaluate calibration results
- ArcGIS® version 10.6, developed by ESRI, to create shapefiles that can be imported into Groundwater Vistas® input files

5.1 MODEL CONSTRUCTION APPROACH

Model construction begins with forward simulation of the groundwater flow model. In the case of the GWF Model, this was completed as an iterative process relying heavily upon the model developed by the USGS that covers the same model domain (Schreffler, 2001; Sloto, 2012). The USGS model was used as a basis for the GWF Model updated in a stepwise manner increasing the complexity near the facility in each step. After each model run a check of the water balance and possible errors caused in the process of conversion was performed to maintain a consistent modeling approach. The initial model steps were used to refine the model grid, revise the boundary conditions to accommodate the new model grid, and convert the transmissivity aquifer parameters to hydraulic conductivities and layer thicknesses. Subsequent construction activities incorporated the hydrogeologic framework of the facility and reassigning aquifer parameters based on the conceptual understanding of the study area.

5.2 MODEL DOMAIN AND GRID

The GWF Model domain and finite difference grid (grid) within the domain are shown in **Figure 5-1**. The model grid consists of 430 rows, 423 columns, and seven layers. Horizontally, cell dimensions range from maximum dimensions of 1704.6 feet by 1668.0 feet (at the southwestern limits of the model) to 40 feet by 40 feet in the area of interest and is aligned in a north-south/east-west direction. The grid is based on the USGS Basin Flow Model grid (Schreffler, 2001) which has been further subdivided to provide the necessary detail in the focus area. The refined horizontal cell dimensions were selected to provide for increased computational detail in the area of interest. The horizontal discretization of the model was selected such that the grid spacing refinement in the vicinity of the facility was sufficient to simulate localized patterns of groundwater flow, include closely-spaced monitoring wells for calibration points, assess drawdown proximal to remediation system extraction wells, and to provide a model that is flexible for potential future needs. The grid cells are designated as “inactive” outside the model domain and as

"active" inside the domain. There are a total of 1,273,230 cells with 1,180,578 active cells. The spatial extent of the GWF Model domain was determined by the approximate saturated extent and thickness of the aquifer system and the selected boundary conditions. The model active extent covers an area of approximately 149.5 square miles and was selected to facilitate construction by incorporating the aquifer properties and boundary conditions of the USGS model of the same area (Schreffler, 2001; Sloto; 2012).

The vertical extent of the GFW Model is comprised of seven layers, generally representing the seven hydrostratigraphic layers discussed in **Section 3.2** and previously defined in Schreffler (2001). The model layers are as follows:

- Layer 1 represents the total thickness of fill, Holocene alluvium, and Pleistocene alluvium.
- Layer 2 represents the upper clay unit of the PRM.
- Layer 3 represents the upper sand unit of the PRM.
- Layer 4 represents the middle clay unit of the PRM.
- Layer 5 represents the middle sand unit of the PRM.
- Layer 6 represents the lower clay unit of the PRM.
- Layer 7 represents the lower sand unit of the PRM.

The process of selecting GWF Model layer elevations consisted of several steps. First, model layers from previous USGS models of the same area were adopted (Schreffler, 2001; Sloto; 2012). Secondly, hydrostratigraphic unit boundaries (model layers) were interpreted along transects using the stratigraphic profiles extracted from the conceptual model (**Figures 3-6** through **3-19**). After picking the model layer elevations at the well bores and along cross-sections, interpolation outward across the model domain was conducted. The hydrostratigraphic unit selections were corrected to include a minimum thickness of 1 foot. Bedrock beneath the study area is considered less permeable than the overlying unconsolidated deposits and was treated as a no flow boundary in the numerical model. The publicly-available integrated topographic and bathymetric digital elevation model (DEM) obtained from the NOAA NCEI (**Section 3.1.2**) was used to determine the ground surface elevation across the model domain.

All layers are classified as constant transmissivity (MODFLOW layer type LAYCON 0) within the GWF Model. As the layers approach the "Fall Line," the clastic wedge of Coastal Plain sediments that forms the active portion of the model thins. In this area, some of the heterogeneities that result in the classification as "confining" or "water bearing" tend to be less distinct. However, for numerical purposes the model layers are maintained throughout and layer properties for the layers are similar in the areas where they cease to function as separate water bearing or confining units. A minimum thickness of 1 foot is maintained for each of the model layers. Layer elevations are indicated on **Figures 5-2A** through **5-2H**. **Figures 5-3A** through **5-3C** present a comparison of the model layers and the conceptual stratigraphic profiles (layer configuration and generalized lithology).

5.3 HYDRAULIC PROPERTIES

The primary aquifer hydraulic properties defined in the GWF Model are horizontal and vertical hydraulic conductivity. Although the hydrogeologic systems in the alluvial and Coastal Plain sediments are inherently heterogeneous on many scales, site-scale hydrogeologic heterogeneity was incorporated into this model, where feasible. The hydraulic properties are directly related to the lithology of the water bearing units and aquitards. The values of hydraulic conductivity are generally higher in coarse-grained deposits than in fine-grained deposits.

5.3.1 Hydraulic Conductivity

Hydraulic conductivity is the measure of a fluid's ability to flow through a medium. The value relates to fluid density, dynamic viscosity, and the effective grain size in unconsolidated deposits. In general, hydraulic conductivity values increase with the median grain size. For a given median grain size, hydraulic conductivity is lower in a poorly-sorted medium than in a well-sorted medium because poorly-sorted mediums have a smaller effective grain size. The initial horizontal hydraulic conductivity values were estimated based on lithologies described in the hydrogeologic framework (**Section 3.2.3**). Aquifer hydraulic conductivity data collected at the site over numerous investigations and published documents available in the area were compiled to constrain the estimated hydraulic conductivity based upon reasonable values for the sediment types observed (**Section 3.2.3**).

Figures 5-5A through **5-5G** present the horizontal hydraulic conductivity distribution for each model layer. The model domain was subdivided into zones primarily based on geological and hydrogeologic conditions. These conditions were postulated based on sediment facies, lithologic descriptions in well completion reports, pump test data, and water level measurements in wells. During calibration, each of the zones were iteratively adjusted by varying the lithologically-derived hydraulic conductivity by a multiplier. The hydraulic conductivity values were iteratively adjusted from the initial estimation during the model calibration to reduce the residual values between the measured and model-generated groundwater levels.

The horizontal hydraulic conductivity values for the GWF Model range from 3.2×10^{-5} to 323 ft/d except for pinch out zones (described below). Hydraulic conductivities are highest in the areas where sands and gravels predominate sediments identified as Pleistocene alluvium, PRM water bearing units, and occasionally fill and some Holocene alluvium. Silt and clay dominate in the recent (Holocene) alluvial mud deposits along the Schuylkill River and within the aquitards of the PRM clastic wedge.

Vertical flow through the model domain is primarily controlled by the heterogeneities assigned to the model cells based upon lithology type. For example, flow from the middle sand unit (approximately 1 to 100 ft/d) to the lower sand unit (approximately 197 ft/d) may be controlled by a hydraulic conductivity several orders of magnitude lower that is assigned to the lower clay unit aquitard (4.0×10^{-3} ft/d). Vertical flow is additionally assigned a multiplier to horizontal flow for layers that may contain additional anisotropy due to depositional environment (e.g., highly interbedded or stratified). The exception to this is that the methods of Schreffler (2001) to assign hydraulic conductivity layer pinch outs were continued, where appropriate. Because of the depositional environment and the underlying dipping bedrock, many

units pinch out near the "Fall Line" in the northwestern part of the study area. Also, units are discontinuous throughout the study area. Modflow-2005 requires that continuous layers are present throughout the model domain. In order to simulate these discontinuities, Schreffler (2001) utilized a method where the areas of the layer pinch outs were assigned a small value of thickness (1 ft). The horizontal hydraulic conductivity was set to 3.28 x 10^{-5} ft/d, and the vertical hydraulic conductivity was set to 32,808 ft/d. This procedure permitted water in the GWF Model to connect through the pinched-out units to underlying units, numerically simulating a single water bearing unit. On **Figures 5-5A** through **5-5G**, zone 1 (darkest shade of green) represents areas of pinched-out or discontinuous units.

5.4 STEADY-STATE CONDITIONS

Although true steady-state conditions generally are not observed in natural systems, steady-state models are widely used to represent natural conditions, when appropriate. All groundwater systems fluctuate in response to climatic and boundary condition variations that can be temporal (daily, seasonal, anthropogenic, etc.). For the GWF Model, the assumption is made that the system can be represented by a state of approximate equilibrium conditions. An evaluation of the purpose of this modeling effort was conducted to determine whether a transient calibration was necessary.

The primary objective of the model is to accurately simulate the fate of dissolved-phase petroleum hydrocarbon-related constituents under recent historical, current, and future groundwater flow conditions. Based upon the long history of petroleum processing and environmental investigations at the facility, it is anticipated that the contaminants-of-interest in the aquifers have been present for many years, if not decades, and that the average flow conditions are anticipated to be reflective of future transport conditions. The driving force in this type of evaluation is the overall gradient with time under typical conditions and not specific water level variations over short time periods. Hence, a comparison was made of the gradient across the study area and regionally over time. Analysis of historic water level data for the facility and adjacent properties indicated that the magnitude and direction of the gradient changed very little over the analyzed period. Thus, a transient model was determined to be unnecessary in view of the consistent gradient with time as demonstrated in **Section 3.2.3**. The assumption of approximate equilibrium conditions in recent years was further tested during calibration. This process is discussed in detail in **Section 6**.

This approach is consistent with previous modeling conducted in the area, in which the transient conditions were simulated primarily based upon multi-year pumping time steps. The remaining boundary conditions such as recharge, general head boundaries, and river elevations were either held constant or minimally varied (e.g., recharge remained constant from 1969 through 2006 and river elevations were held constant throughout the entire model simulation period) (Schreffler, 2001; Sloto, 2012). While the transience of pumping was necessary for the regional models, particularly the effects of increased pumping that occurred between 1900 and 1970 and the subsequent decreases from approximately 1970 to 1999, pumping rates were reported to level off beginning in the year 2000 with a relatively minor decrease of 2% occurring between the periods 2000-2003 and 2004-2007 (Sloto, 2012).

5.5 BOUNDARY CONDITIONS

Boundary conditions are necessary in solving numerical groundwater flow problems. Ideally, in groundwater investigations, the study area is bound by identifiable hydrogeologic features that can be quantified relative to the groundwater system. These boundaries can also occur within the active model domain (e.g., a stream, river or pumping well).

The boundary conditions in the GWF Model consist of three types: (1) constant flux boundaries (recharge and wells) (2) head dependent flow boundaries (general heads, drains, and rivers) and (3) no flow boundaries. A fourth type of boundary condition is included in the model to simulate horizontal barriers to flow such as bulkheads and sheet pilings located along the Schuylkill River. These barriers are simulated within the model by reducing the conductance between individual pairs of cells. Each boundary condition and its numerical simulation in MODFLOW-2005 is described in the following sections, with locations of application in the model shown in **Figures 5-4, 5-6** and **5-7**.

5.5.1 Recharge (RCH) Package

The Recharge package (McDonald and Harbaugh, 1988) was used to simulate the deep percolation (areal recharge) from precipitation, recharge from local runoff as a result of precipitation (precipitation accumulated in catchment basins and storm water retention structures) and return flow (the portion of groundwater production that is returned to the aquifer via localized landscaping, water, and sewer line losses and irrigation). This package was used to assign a constant flux for each active cell in the model layer 1. The initial flux rates were selected based upon the USGS model (Schreffler, 2001).

The spatial distribution of recharge for the GWF Model is shown on **Figure 5-6**. The spatial distribution for the zoning of recharge parameters was based on the work of Navoy and Carleton (1995). Navoy and Carleton (1995) used recharge estimates on the Pennsylvania side of the river in their calibrated model in the Camden, New Jersey area that ranged from 4 to 9 in/yr. Additional parameterization in the area of focus was required during model calibration to match observed areas of groundwater mounding in the water-table aquifer.

5.5.2 Well (WEL) Package

The Well package was used to simulate the withdrawal of water from aquifers by wells. The Well package can also be used to simulate any other source of withdrawal or recharge that occurs at a known rate, including specified flow boundaries.

Groundwater extracted from wells for water supply and/or remediation within the GWF Model domain are simulated through the well package. The GWF Model incorporates groundwater production from identified areas of current and/or former pumping, as summarized in **Section 3.4.2.3**. Pumping of 5 remedial systems at the facility (26th Street Sewer Area Remediation System, 3 Separator Remediation System, Penrose Avenue Remediation System, Pollock Street Sewer Remediation Systems, and Belmont Terminal Loading Dock Remediation System) (**Figure 1-2**) is represented in the GWF Model by the average daily withdrawal calculated during 2017 for the years when the systems were operating.

Groundwater production from the PRM in New Jersey is represented by pumping well locations and withdrawal data provided by Sloto (2012) and compared to watershed totals provided by Snook et al. (2013). Total groundwater withdrawal from the PRM in New Jersey is estimated to be 15.1 MGD. Modeled pumping well locations are indicated in **Figure 5-7**.

5.5.3 General Head Boundary (GHB) Package

The General Head Boundary package is used to simulate head-dependent flux boundaries in MODFLOW-2005. In all GWF Model layers, the lateral northern, eastern, southern, and western boundaries were simulated with general head boundaries. In the General Head Boundary package (GHB) the flux is proportional to the difference in head. Schreffler (2001) assigned no-flow boundaries to the "Fall Line" along the northern margin of the flow model and at the bedrock surface beneath the Coastal Plain. The GWF Model adopts a refinement of these no-flow boundary conditions (**Figure 5-4**). For the remaining boundaries, it is assumed that the average heads from recent water-level data, based on available well measurements, are representative of the average hydraulic heads at those boundary cells to simulate steady-state conditions. Sloto (2012) simulated approximately 0.5 to 8.0 MGD of subsurface boundary inflow. The relatively large range of simulated fluxes in Sloto (2012) was the direct result of the simulation of variable pumping conditions over the 108-year simulation. The more recent simulation stress periods (1996-1999, 2000-2003, and 2003-2007) ranged from 0.45 to 0.79 MGD. The GHB in each layer at each boundary is approximated by adopting the general head boundary data from the final stress period of Sloto (2012).

5.5.4 River (RIV) Package

The River (RIV) package (Harbaugh et. al., 2000) was used to simulate river-aquifer interactions for the portions of the Schuylkill and Delaware Rivers which flow through the GWF Model domain. The RIV package calculates flow to and from the aquifer based on the elevation of a river bed, water level in the river, piezometric surface of the aquifer, and conductance of the river bed. The shift from recharge of the aquifer to discharge to the river occurs at the point where the head in the aquifer equals the head in the river.

Rivers were divided into reaches with each reach corresponding to a range of cells in MODFLOW-2005. Reaches were grouped into segments where each segment consists of a series of contiguous reaches where flows can be routed. Each cell of the RIV package was delineated based on publicly available aerial photography and the National Hydrography Dataset. The area used for simulation of interactions between river and aquifer is fixed. A total of 11 "reaches" were identified. **Figure 5.4** shows the river cells in the GWF Model. The surface elevations (stage) along the Schuylkill River were assigned based upon the long-term average stage estimated at 0.69 feet NAVD88 from publicly available data for the Schuylkill River Near 30th Street (USGS Station 01474501). The surface elevations (stage) of the Delaware River were adopted from Sloto (2012).

In addition to the Schuylkill and Delaware Rivers, interaction between the surface water and groundwater in several minor water boundaries were simulated with the head dependent RIV package. These included the ponds and wetlands south of the former DSCP and the on-site water basins within AOI 3. Creeks and

channels were extracted from the lithology model cell by cell. Heads were assigned based upon the DEM and leakage was computed based upon bed conductance and simulated groundwater head for each model cell.

Flow between a stream and an aquifer is computed using the streambed's conductance, the head in the stream, and the calculated head of the aquifer in each cell. Volumetric flow between the streambed and groundwater system is computed as:

QRIV = CRIV (hRIV – h(i,j,k))

Where QRIV is the flow rate across the river bed, CRIV is the conductance of the river bed, hRIV is the head in stream stage, and h(i,j,k) is the hydraulic head in the cell of row i, column j, and layer k underlying the streambed.

The conductance of the riverbed is given by:

CRIV = (KvLW)/M

Where Kv is the vertical hydraulic conductivity of the riverbed sediment, L is the length of the river reach, W is the width of the river reach, and M is the thickness of riverbed sediment.

Because of the local hydrogeology, the bottoms of the rivers are in different geologic units. River bottoms for the Schuylkill River were based upon bathymetry data (NCEI, 2017). For this model, the rivers were zoned spatially on the basis of which model layer the bottom of the river was located. The riverbed conductance values are spatially variable and are based on work done by Schreffler (2001). The rivers in the study area are tidal; however, for the evaluation of equilibrium flow conditions, average river stage was held constant for all stress periods.

5.5.5 Drain (DRN) Package

As discussed in **Section 3**, a significant amount of discharge can result where utilities, particularly large diameter sewers, are present below the water table. The Drain (DRN) package (Harbaugh et al., 2000) is used to simulate head-dependent flux boundaries. In the DRN package if the head in the cell falls below a certain threshold, the flux from the drain to the model cell drops to zero. In the GWF Model, drains have been added to represent sewer elevations and drain properties have been adjusted to reflect areas where apparent groundwater losses to sewers have either been observed or are suspected. **Figure 5-4** shows the locations of major sewers simulated as drains within the area of focus.

In addition, the water-level in Mingo Creek is controlled through continual pumping at an elevation of -10.5 to -11 feet below NAVD88 and contributes to a localized cone of depression in the water table. Dames and Moore (1991) indicated that the flood control basin is approximately 25 feet deep, although aerial photography suggests that some siltation and shoaling of the basin has likely occurred since the basin was originally excavated and/or last dredged. The Mingo Creek Basin is simulated within the GWF Model as a drain set to the management level of -11 feet NAVD88.

5.5.6 Horizontal Flow Barrier (HFB) Package

The GWF Model considers hardening to the shoreline of the Schuylkill River through installation of bulkheads and sheet piles to be "partial" barriers to groundwater flow within the aquifer system (**Section 3.3.3**). The groundwater barriers were simulated in the model using the Horizontal Flow Barrier (HFB) package (Hsieh and Freckleton, 1993) by assigning a lower hydraulic characteristic value (the barrier transmissivity divided by the width of the horizontal flow barrier) to the boundary of the barrier (**Figure 5-4**).

The hydraulic characteristic values were estimated based on literature values and calibration. The vertical extent of hydraulic flow barriers in the GWF model was estimated during model calibration to observed hydraulic heads (**Section 6**). It is assumed, based upon typical construction, that the bulkheads at the facility may be deeply anchored into confining units of the PRM, limiting the natural discharge of groundwater from the water-table aquifer to the river. Examination of the relative groundwater elevations in comparison to average Schuylkill River stage validate this assumption in the bulk of areas.

5.5.7 No Flow Boundaries

No flow boundaries represent model cells across which groundwater flow cannot occur. No flow boundaries (inactive cells) were used along the northwestern portion of the model domain beyond the "Fall Line" delineating the general extent of the clastic wedge (**Figure 5-4**). In addition, the bedrock interface (bottom of layer 7) is simulated as a no flow boundary.

6.0 CALIBRATION

Calibration is the process of adjusting the model parameters to produce a match between simulated and observed groundwater system responses. This section describes the procedure for calibrating the GWF Model and discusses the selection of calibration data, residual analysis, and model verification.

6.1 OBJECTIVES OF CALIBRATION

The objective of the calibration process is to refine the GWF Model so that it provides satisfactory agreement between model results and the hydrologic conditions observed within the study area. In this way, the GWF Model can produce reliable predictive results for use in the support of the contaminant fate and transport analysis. The calibration approach and procedures have been designed for implementation in logical, systematic, and iterative processes that will meet the calibration objectives while minimizing potential human (modeler) and numerical biases. The following sections present a description of the proposed calibration approach including an overview of the general calibration methods, a description of the calibration phases, and an overview of the model calibration process.

6.2 MODEL CALIBRATION APPROACH

The calibration approach has been designed to follow accepted industry standard practices while building upon the work of previous modeling efforts performed within and adjacent to the facility. The major steps in the model calibration processes are outlined in the following sections.

The first step is to determine which model parameters should be subject to change during the calibration process. The model parameters include the hydraulic properties of the aquifer, boundary conditions, and any other aspect of the model that can be parameterized. It is unnecessary to adjust all of the model parameters in the calibration process, and not all of the selected parameters should be subjected to each iterative optimization process. In general, reducing the number of estimated parameters can significantly simplify calibration. The selection criterion for deciding which parameters were varied during the calibration process depended on the importance of the parameters, which can be measured by the model sensitivity to parameter adjustment.

Calibration data points are a key element to the success or failure of model development. Information about the model parameters is drawn from measurements of the groundwater system. Model output and measured data are compared at discrete points in space and time to the calibration data points. The differences between the measured and the computed system responses at the calibration points are termed residuals. Calibration is the process of minimizing the residuals by updating the model parameters. Numerous forward simulations of MODFLOW-2005 were performed with varying parameter values to obtain the simulated water levels that correspond to measured water levels in terms of location and scale. Adjustments were held within reasonable ranges to obtain a match between the observed and simulated head calibration targets. The range over which the parameters were varied were derived from the conceptual model. In addition, the principle of parameter parsimony was applied, where appropriate, to achieve an adequate calibration of the model through the use of the fewest number of

model parameters. It should be noted that the use of greater numbers of model parameters during model calibration creates a situation in which different combinations of model parameter values produce similar calibration results. In this case, the model calibration parameters are considered non-unique. Following the principal of parameter parsimony reduces the degree of non-uniqueness and results in more reliable calibrated parameter values.

An analysis of residuals was performed after each model simulation. The calculated and measured system responses (water levels) are compared. If the measured data are not properly reproduced by the model (i.e., if the final residuals are large or exhibit system errors), the resulting parameters are likely to be inadequate or highly biased. Another possibility is that inconsistencies and/or errors exist in a developed conceptual model.

Finally, as a validation of the calibration process, the water levels from the June 2018 gauging event were withheld from the original model construction. A separate simulation was then conducted using this data set and the model calibrated values, as an independent verification of how well the calibrated model could be anticipated to reproduce future scenarios.

6.3 SELECTION OF CALIBRATION DATA

The calibration targets consist of observed groundwater head values (water levels). In the calibration of a groundwater flow model, use of point data mitigates the potential for interpretive bias that may result from attempting to match a contoured potentiometric surface or potentially inaccurate averaging of data, representing extended periods of time or representing non-uniform conditions.

Groundwater monitoring points were selected on the following criteria:

- robust period of record
- proximity to important features such as remediation wells
- horizontal distribution in the modeled area
- vertical distribution in the model layers

Model calibration was initially conducted using a total of 955 groundwater elevation measurements collected in May of 2017. Following calibration to the 2017 dataset, the GWF Model simulated results were compared to water level observations in the years 2014 (850 measurements), 2015 (862 measurements), 2016 (920 measurements), 2018 (995 measurements), 2019 (1,009 measurements), and 2021 (878 measurements). The objective of evaluating the suitability of calibration with historic data is to validate the assumption that steady state conditions are representative of the flow field for historic and succeeding datasets.

Figure 6-1 shows the locations of the selected calibration wells (targets) in the GWF Model. For the calibration wells that span multiple layers, a comparison was performed between the observed and the

simulated water levels and an appropriate layer was selected. **Appendices A** and **D** present a summary of the data calibration and validation points used in the model calibration.

6.4 CALIBRATION CRITERIA

During the calibration process, each model simulation was compared to site-specific measured head values (water levels). The degree of agreement between the model simulation and the physical hydrogeological system data can then be compared to that for previous simulations to ascertain the success of alterations made in response to previous calibration efforts and to identify potentially beneficial directions for further calibration. Qualitative and quantitative comparisons are both essential in the calibration process (ASTM, 1993). Both were used to evaluate the degree of agreement between the GWF Model simulation and site-specific information.

The primary criterion for evaluating the quantitative calibration was the head residual. A residual or model error, e_i, is defined as the difference between an observed and simulated variable measured at a target location:

$$e_i = h_i - h'_i$$

where h_i is the measured value and h'_i is the simulated value at a specific target location. Spatial or temporal correlation among residuals can indicate systematic trends or bias in the model. Correlations among the residuals may be evaluated through scattergrams or temporal and spatial plots.

Residual analysis is significant in evaluating the calibration. However, this does not imply that a real groundwater system is properly represented by a model. If a conceptual model fails to reproduce the salient features of a system, the given calibrated model may not be able to match observed data as expected. Residual analysis can reveal potential trends in residuals, indicating a systematic error in a model or the data, and can point out aspects in a model that need to be modified.

The calibration procedure seeks to minimize a function, the residual sum of squares (RSS):

$$RSS = \sum_{i=l}^{n} (h_i - h'_i)^2$$

where n is the total number of calibration targets. The RSS is the primary measure of model agreement. Second order statistics can be used to quantify the amount of spread (range of variability) of the residuals about the residual mean. One example is the residual standard deviation (RSTD), which normalizes the RSS by the number of calibration targets and number of estimated parameters (P), is defined as follows:

$$RSTD = \sqrt{\frac{\sum(x - x')^2}{n - 1}}$$

The RSTD is useful for comparing model calibrations with different numbers of calibration targets. Smaller values of standard deviation indicate better correlation between model simulations and observed

field data. A large variance or standard deviation either indicates that the data were nosier than expected or that there is a trend in the residuals.

Another calibration measure is the mean of all residuals (e):

$$e = \frac{1}{n}\sum_{i=l}^{n} e_i$$

A mean residual significantly different from zero indicates model bias. A large positive or negative mean indicates that data are systematically under-predicted or over-predicted by a model. Calibration may be viewed as a regression analysis designed to bring the mean of the residual close to zero and to minimize the standard deviation of the residuals. Statistics on hydraulic head residuals aid in the evaluation of model calibration.

Statistics on hydraulic head residuals aid in the evaluation of model calibration. The mean of the residuals is expected to be close to zero. A large positive or negative mean indicates that data are systematically under-predicted or over-predicted by a model. The standard error in a regression is the square root of the calculated error variance.

6.5 CALIBRATION RESULTS

A qualitative evaluation of the calibration can be made by comparing the observed potentiometric surface for the study area with the simulated potentiometric surfaces (**Figures 6-2A** through **6-2D**). It is apparent from a comparison of the observed potentiometric surface map and the GWF Model simulated potentiometric surface maps that the calibrated model is generally capturing the major features of the groundwater flow system. The elevation, shape, magnitude, gradient, and position of the potentiometric surface are accurately simulated by the calibrated model.

Residual analysis was used to reveal potential trends in residuals, indicating a systematic error in the model or the data, and can point out aspects in a model that need to be modified. The calibration of the GWF Model sought to minimize the residuals and the relative error computed for the 955 groundwater elevation data points in the calibration dataset. Using the model residuals, a quantitative comparison of the model's fit to observed data may be made.

Figure 6-3 shows each 2017-year calibration well and the relative size of the residual by geographic location. The residual distribution is near random; however, there are some minor spatial trends. For example, the monitoring wells along the Pollock Street Sewer Remediation Systems are generally simulated lower than the observed values and the residuals near Mingo Creek basin are generally simulated higher than the observations. In addition, a few select monitoring wells located along the 3 Separator Remediation System area were omitted from the calibration target datasets based on the delayed water level responses observed when the system is off for extended periods. These areas are still considered to be calibrated and not anticipated to adversely affect the purpose and scope of the model simulation because the model substantially captures the gradient and flow direction which are considered essential for fate and transport analysis. In general, the disagreement between observed and simulated

groundwater levels is likely the result of assumptions contained in the GWF Model, such as time averaging of well pumping rates, usage of calibration wells spanning multiple aquifers, inferred subsurface geology based on limited data points, and potential unidentified or unincorporated influences on local water levels.

Figure 6-4 graphically presents a 2017-year summary of the calibration and summary statistics for the calibrated model. **Figure 6-4** also shows a graphical representation of the fit of simulated to observed data. In a perfectly calibrated model, all the points would fall directly on the 1:1 ratio (match) line. A poorly calibrated model would show many points falling very far from the match line. Hence, **Figure 6-4** shows that the fit is good, with the larger part of points falling very close to the match line. Also, there is no apparent bias as to whether the points fall above or below the line.

The calibration statistics indicate that the model accurately represents the measured potentiometric surface. The residual mean of 0.48 feet is close to zero, indicating that the GWF Model is not consistently over- or under-predicting the groundwater elevation. Residual standard deviation is 1.65 feet and the range of observed heads is 26.94 feet, resulting in a scaled Root-Mean-Square Error (scaled RMSE) of 6.40%. Based upon review of residuals as shown in **Figure 6-4**, there are minor "outliers" however, the vast majority of the data do not indicate the presence of important but unrepresented groundwater conditions. Given the absolute size of the model and range in heads across it, these values are considered to indicate a satisfactory calibration. The minor disagreement between observed and simulated groundwater levels are likely the result of assumptions contained in the model, such as inferred subsurface geology based on limited data points, possible external influences, and the difference between measured groundwater levels representing partially penetrating screens and model simulated cells representing layers of average lithology.

Appendix D presents a summary of the calibration to groundwater elevation measurements for the years 2014, 2015, 2016, 2019, and 2021. **Appendix A** includes the calibration summary statistics for each year. As described for the primary dataset, the additional years 2014, 2015, 2016, 2019, and 2021 indicate that:

- The GWF Model is not consistently over- or under-predicting the groundwater elevation.
- There are no major "outliers" that point to important but unrepresented groundwater conditions.
- The calibration is satisfactory.
- There is no apparent simulated bias.

Based upon the consistency of calibration across the data sets it is concluded that the steady state model is accurately capturing the variability in elevations observed on an annual scale and thus the assumption of equilibrium (or steady-state) conditions is appropriate.

6.6 CONVERGENCE CRITERIA

The quality of an iterative solution is measured by a number of convergence statistics. These parameters include the maximum head change for all model cells (residual change) and the percentage discrepancy between the total flow into and out of the model (volumetric flow budget discrepancy). Generally, the head change should be small and the volumetric flow budget discrepancy should be less than 0.1% (Konikow, 1978).

The convergence statistics for the final calibrated model are as follows: 0.0003 feet head change and 0.00010 percent volumetric flow budget discrepancy.

6.7 VERIFICATION

Calibration of the GWF Model to the field measurements (calibration heads) does not guarantee a unique model solution. Therefore, in an effort to reduce the concerns of non-uniqueness the GWF Model was compared to another set of field data that represent a different set of stresses. This process is referred to as verification. Successful verification results in a higher degree of confidence in the model's predictive ability.

For the purposes of verification, model data was compiled and a separate model simulation was performed for the time period of June 2018 (near-synoptic gauging data). The well gauging data collected during June 2018 (a few wells were gauged into the first few days of July 2018) included 995 observations acquired in the absence of facility remediation system pumping (all systems turned off for approximately 15 days prior to well gauging).

Verification of the GWF Model ability to simulate the aquifer system was performed by the monitoring well responses in the absence of pumping. The extraction systems had been in near-continuous operation (except for minor maintenance shutdowns) for several months. Due to the limited area of influence around each of the extraction systems, this verification simulation is limited in its use; however, when coupled with the multiple year calibration results it provides additional reassurance that the model is functioning as designed.

Using the GWF Model verification residuals, a quantitative comparison of the model's fit to observed data may be made. **Figure 6-5** presents a summary of the calibration for each of the verification targets. The calibration statistics are presented in a chart on **Figure 6-6**.

In general, the verification simulation had similar or slightly better residual statistics than for the 2017 calibration period. The residual distribution is near random; however, there are some of the same spatial trends observed in the calibrated model. **Figure 6-5** shows each calibration well and its mean residual by geographic location. The calibration statistics indicate that the model accurately represents the measured potentiometric surface. The residual mean of 0.14 feet is close to zero, indicating that the GWF Model is not consistently over- or under-predicting the groundwater elevation. Residual standard deviation is 1.86 feet and the range of observed heads is 27.00 feet, resulting in a scaled RMSE of 6.90%. **Figure 6-6** shows a graphical representation of the model fit to observed data. **Figure 6-6** shows that the fit is good,

with the larger part of points falling very close to the match line. Also, there is no apparent bias as to whether the points fall above or below the line. **Appendix D** includes additional, more recent datasets from 2019 and 2021 with new facility wells that continued to show good fit between the observed and simulated conditions.

7.0 SENSITIVITY ANALYSIS

This section focuses on parameter sensitivity analysis. Parameter sensitivity measures the impact of a small parameter change on the calculated system response. For example, if a small hydraulic parameter change results in a large change in the simulated water levels, the parameter is regarded as highly sensitive. Because certain parameter values, such as hydraulic conductivity, differ greatly in orders of magnitude and are incomparable for parameter sensitivities, sensitivities are best discussed within the context of the anticipated reasonable range of values. This allows for assessing the relative sensitivity of a calibration and for evaluating the importance of the parameters. Assessment of sensitivity can provide a framework of how the model outputs respond to changes in the inputs, and thus increase the confidence in the model and its predictive abilities.

The purpose of a sensitivity analysis is to assess the uncertainty in the calibrated model caused by the uncertainty in the estimates of aquifer parameters, stresses, and boundary conditions. In addition to the uncertainty of the parameter values, there is also uncertainty associated with the geometry of the hydrogeologic system. Both stratigraphy and structure have some degree of inference associated with them. Often times these are features that are not rigorously investigated within the model domain.

Table 7-1 lists the GWF Model parameter sensitivities, relative sensitivities, and sensitivity rankings. This table demonstrates that the horizontal hydraulic conductivities and recharge are highly sensitive and important while boundary conditions associated with Mingo Basin and the river bulkheads are locally sensitive. Regional boundaries such as river bed conductance and regional pumping are less sensitive. Parameters such as horizontal flow barrier conductance may be important in certain areas but not enough to influence the larger model to a great degree.

7.1 SENSITIVITY APPROACH

Sensitivity analysis of the model was performed during all stages of the model calibration to determine which parameters would be part of the calibration process. The following model parameters were considered accurate and held constant through the calibration process:

- layer thickness
- pumping rates of remediation extraction systems

During the sensitivity/calibration process the following parameters were considered for systematic and logical variation:

- hydraulic conductivity
- recharge
- river bed conductance

- horizontal flow barriers
- annual net pumping of water supply wells

It is noted that to fulfill the objectives of the modeling, the GWF Model will ultimately be coupled with a fate and transport model. It is anticipated that sensitivity of contaminant transport results to changes in aquifer and transport parameters will be of particular relevance when discussing the results of the fate and transport assessment. It is noted that the discussion below is the first phase of sensitivity analysis and a more rigorous analysis will be completed following the development of the fate and transport model.

7.2 DISCUSSION OF SENSITIVITY

7.2.1 Hydraulic Conductivity

During calibration it was determined that the GWF Model was sensitive to horizontal hydraulic conductivity. Hydraulic conductivity in the environment can vary several orders of magnitude depending upon degree of sediment size distribution, compaction, and sediment size sorting. During calibration it was observed that relatively small perturbations of hydraulic conductivity (in the range of 0.5 to 2 times the initial value) resulted in substantial changes in observed head, particularly near the remediation system extraction wells, Mingo Creek Basin, and sewers that act as drains.

As discussed in **Section 5.3.1**, the GWF Model domain was subdivided into hydraulic conductivity zones primarily based on geological and hydrogeologic conditions. Each of the zones was iteratively adjusted by varying the lithologically-derived hydraulic conductivity by a multiplier. The hydraulic conductivity values were iteratively adjusted by a range of 0.1 to 10 times the initial estimation and the residual errors were observed.

Observations made during the sensitivity analysis indicated that the GWF Model was sensitive to horizontal hydraulic conductivity and as such this was a primary calibration parameter. However, this parameter is believed to be generally representative of the facility aquifer system.

7.2.2 Recharge

Initial recharge near the facility is approximately 10 to 12 inches (Navoy and Carleton, 1995; Reese and Risser, 2010). During sensitivity analysis recharge was varied between 0.5 to 2 times initial estimates. Based upon the sensitivity analyses, recharge is deemed to be a sensitive parameter and was most sensitive in areas of low hydraulic conductivity assigned in GWF Model layer 1.

7.2.3 River Bed Conductance

The initial river bed conductance for each reach was derived based on the values used in the original USGS Model (Schreffler, 2001; Sloto, 2012). During model sensitivity analysis, river bed conductance was varied over a reasonable range. During the sensitivity analysis, it was noted that the model is not sensitive

to river bed conductance, and that increases in streambed conductance result in little influence on the overall flow direction and gradient based on groundwater levels.

7.2.4 Horizontal Flow Barriers

The barrier conductance was evaluated through a series of sensitivity simulations designed to recreate the observed water levels. The barrier was evaluated using a conductance ranging from 0.01 to 1. The model is locally sensitive to variations in the barrier conductance. The simulations performed indicate that at lower conductance, the simulated barrier locally modifies the groundwater gradient, groundwater flow direction, and creates a drop in groundwater from the west to the east sides of the bulkheads.

7.2.5 Annual Net Pumping from Water Supply Wells

Groundwater production from the PRM in New Jersey is represented by pumping well locations and withdrawal data provided by Sloto (2012) and compared to more recent watershed totals. Annual net pumping from the water supply wells was evaluated through a series of sensitivity simulations in which the annual pumping was varied between 0.5 and 2 times the estimated values. The sensitivity analysis resulted in localized influence in groundwater flow proximal to the wells but little substantive change in the area of interest at the facility.

8.0 CONCLUSIONS

Based on construction, calibration, verification, and simulation of the GWF Model the following conclusions are provided.

The purpose of the modeling effort was to construct a GWF Model capable of simulating groundwater flow within and around the facility at a sufficient level of detail and precision to accurately forecast the potential effects of fate and transport of petroleum-related contaminants in groundwater. If model simulations of fate and transport predict potential adverse impacts, the GWF Model may be used to explore potential mitigation measures.

Calibration statistics indicate that the GWF Model accurately represents the measured potentiometric surfaces included in this RIR. Through the conceptual model development, construction, and calibration process, it has been noted that the model is capable of simulating groundwater flow in the area of focus within the central GWF Model domain. Near the model edges, uncertainty associated with geologic structure, lithology, and stratigraphy as well as assumptions regarding boundary flow conditions render the model less precise in these areas. Model calibration and verification have indicated that the GWF Model is capable of simulating flow near the facility at a sufficient level of detail to meet the objectives of the project.

9.0 MODEL LIMITATIONS

The GWF Model is demonstrated to be a well-calibrated groundwater model. In addition, the confidence in using the model for predictive simulations is increased through the reasonable simulation of the verification period. Even with this, there is always uncertainty associated with the numerical simulation of groundwater. The simulated system represents a simplified version of the current conceptual model of a complex hydrogeologic system. Therefore, even though the groundwater model is considered reliable, prudence should be used in its application as a planning tool.

It is expected that the GWF Model will be utilized by Evergreen on an on-going basis to simulate the groundwater flow system and evaluate fate and transport of petroleum-related constituents until Act 2 liability release goals have been achieved. As such, it is essential that the model be diligently maintained, and additional data incorporated into the model and/or conceptual model as it is made available. If additional hydraulic data such as aquifer testing, production data, and synoptic water level measurements are obtained, they could be used to further verify the GWF Model and develop further understanding of the hydraulic parameters and groundwater flow in the hydrogeologic system.

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FIGURES

Sitewide Fate and Transport Remedial Investigation Report
Part 1 – Groundwater Flow Model
Former Philadelphia Refinery
Philadelphia, Pennsylvania
Philadelphia Refinery Operations,
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue, Philadelphia, Pennsylvania

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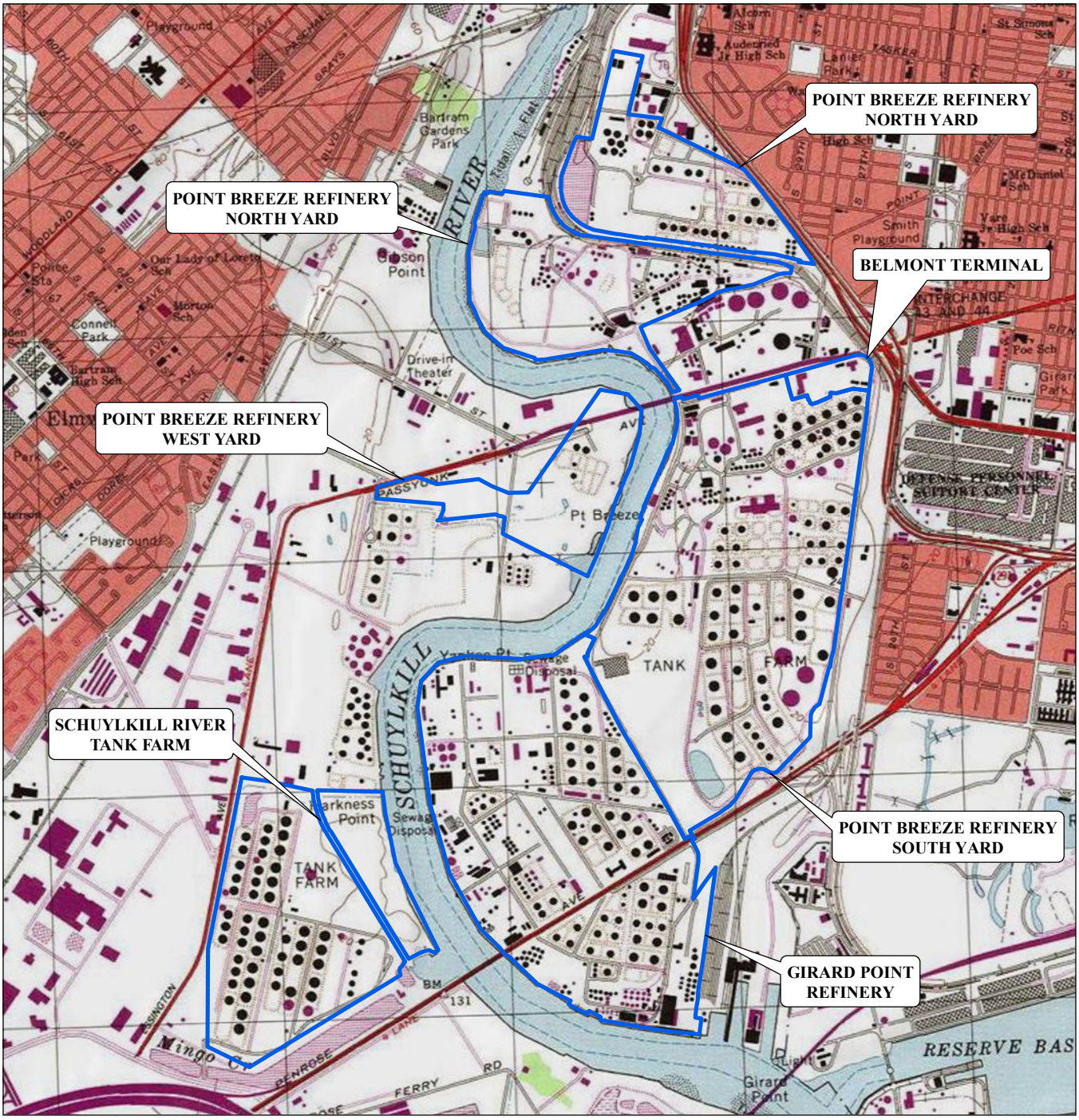

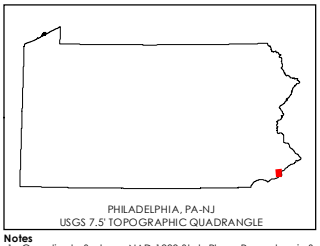

LEGEND

FORMER PHILADELPHIA REFINERY BOUNDARY

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Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
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Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/12/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
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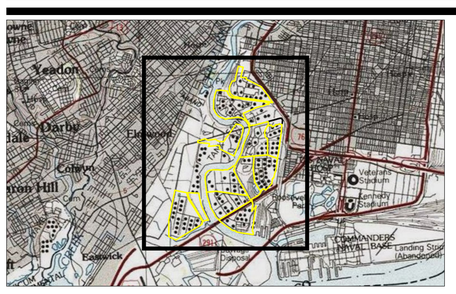
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE
PHILADELPHIA, PA 19145

Figure No.
1-1

Title
FORMER PHILADELPHIA REFINERY LOCATION MAP



Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
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Legend

- MONITORING WELL
- RECOVERY WELL
- DAMAGED MONITORING WELL
- DESTROYED MONITORING WELL
- PIEZOMETER
- UNABLE TO ACCESS OR UNABLE TO LOCATE
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- REMEDIATION SYSTEMS DESIGNATED AS CURRENTLY ACTIVE
- AREA OF INTEREST (AOI)
- BELMONT TERMINAL
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY PROPERTY BOUNDARY
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY

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Figure No.

1-2

Title

SITE PLAN

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213403364

Prepared by GWC on 2/24/2022
Technical Review by JLM on 3/11/2022
Independent Review by AJB on 6/28/2022

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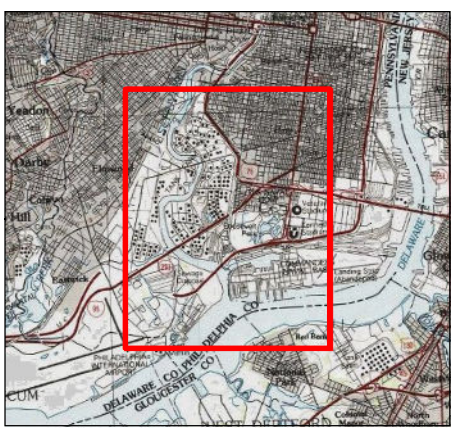

LEGEND

- MARSH AREA
- STREAM LOCATION (1898)
- TOPOGRAPHIC CONTOUR
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL

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N

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EVERGREEN

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/10/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.

3-1

Title

HISTORIC STREAM AND MARSH LOCATIONS (CIRCA 1898)

Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
4. Service Layer Credits: Imagery courtesy of USGS Earthstar Geographics SIO © 2015 Microsoft Corporation
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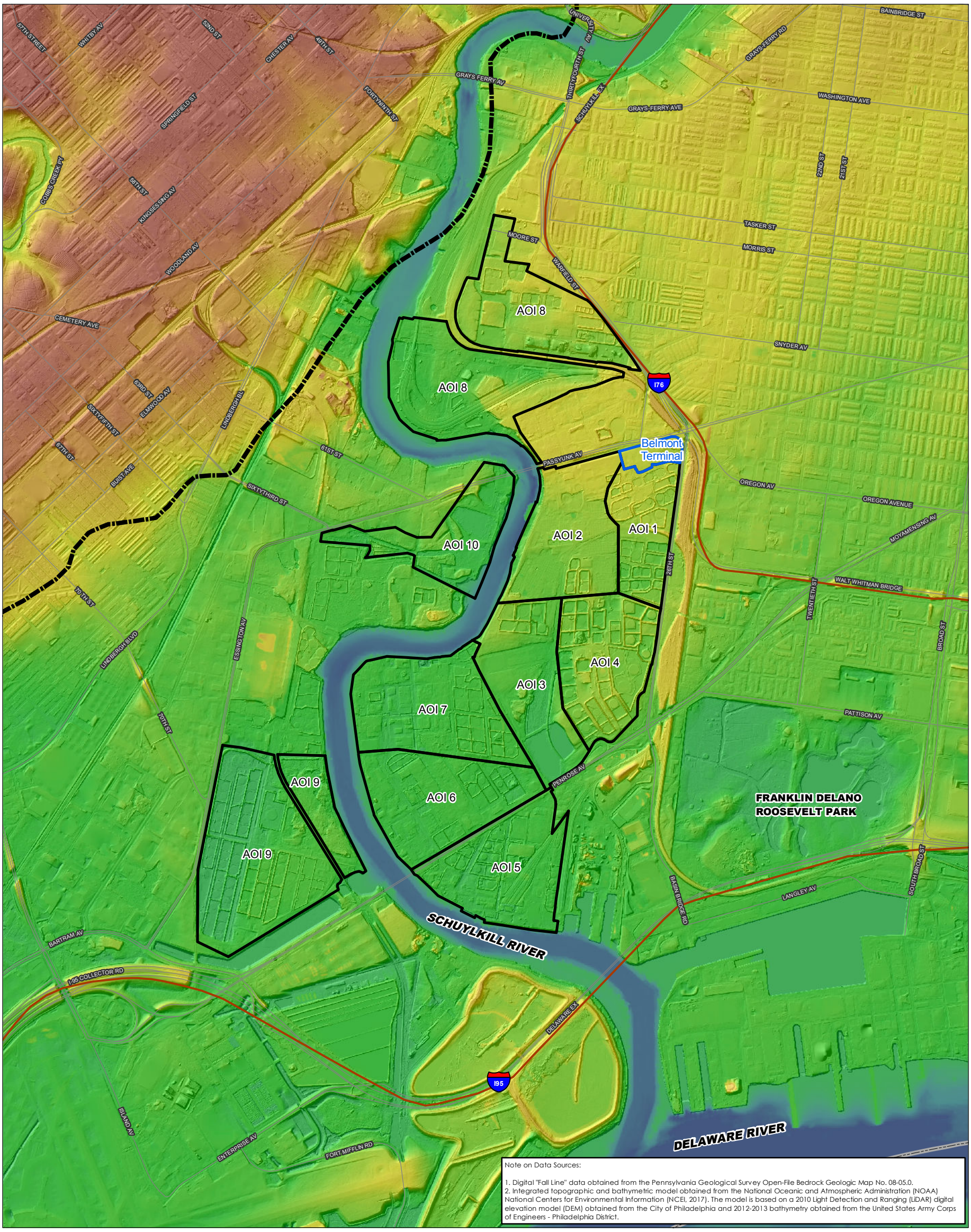
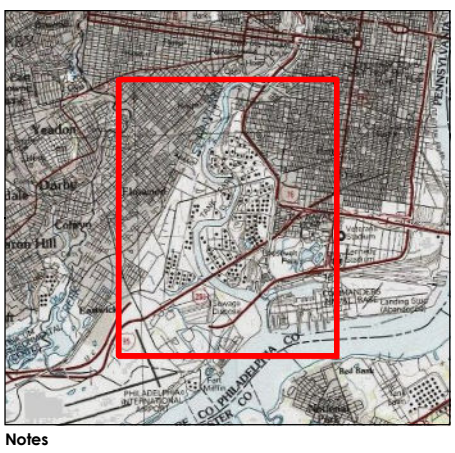


Note on Data Sources:

1. Digital "Fall Line" data obtained from the Pennsylvania Geological Survey Open-File Bedrock Geologic Map No. 08-05.0.
2. Integrated topographic and bathymetric model obtained from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI, 2017). The model is based on a 2010 Light Detection and Ranging (LiDAR) digital elevation model (DEM) obtained from the City of Philadelphia and 2012-2013 bathymetry obtained from the United States Army Corps of Engineers - Philadelphia District.



LEGEND

- "FALL LINE"
- STREAM
- WATERBODY
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- STATE BOUNDARY

INTEGRATED TOPOGRAPHIC AND BATHYMETRIC MODEL (NCEI, 2017)

FEET NAVD88

High : 110

Low : -59

0.25 0 0.25 0.5 Miles

1:24,000 (At Original document size of 11x17)

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Stantec

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Philadelphia County,
Pennsylvania

213402454
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FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.

3-2

Title

GEOGRAPHIC SETTING

Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
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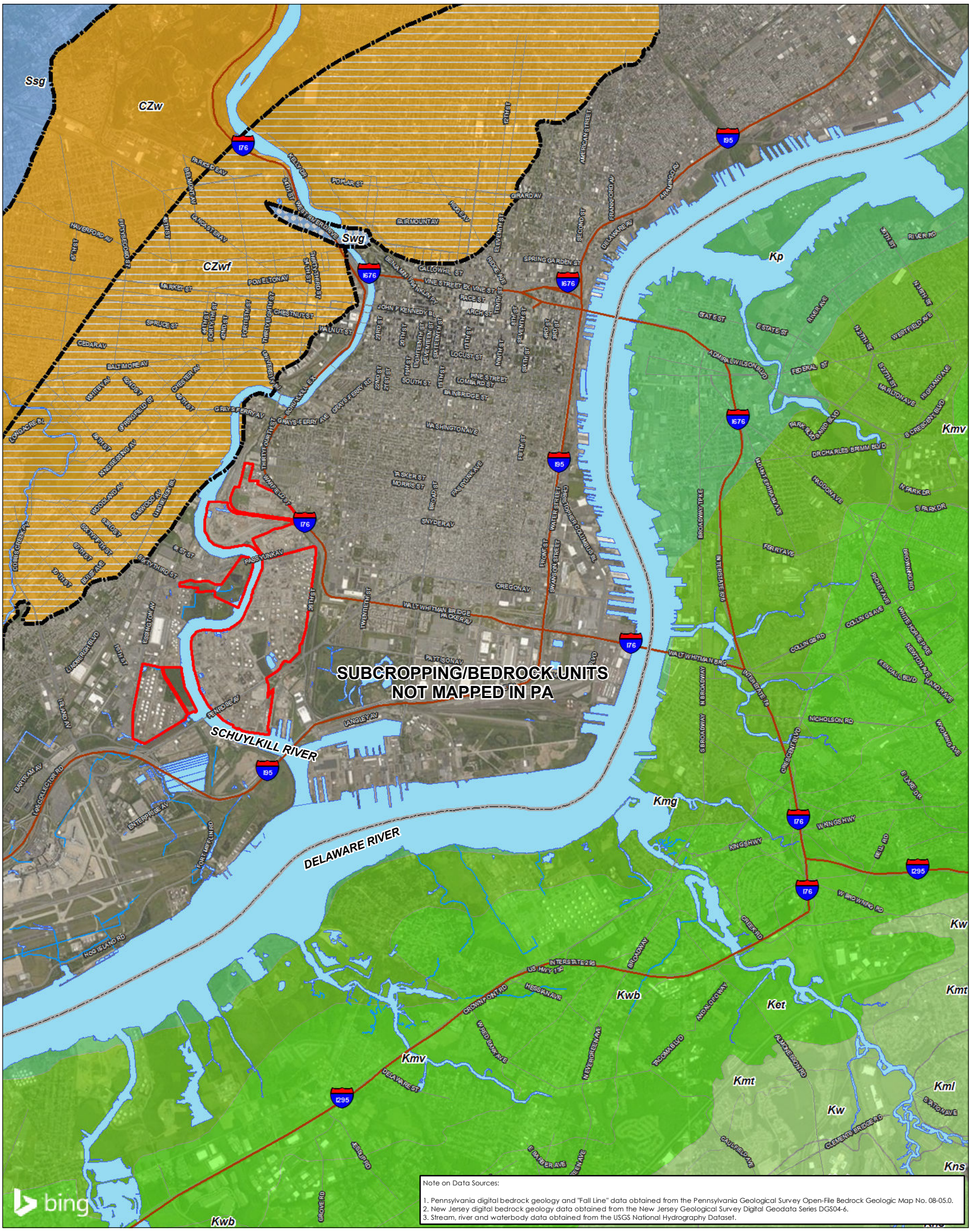

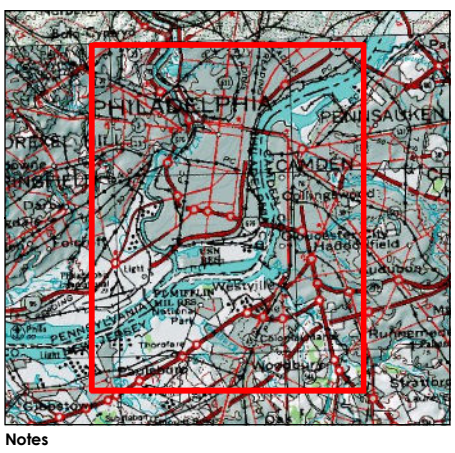

LEGEND

- FALL LINE/INFERRED GEOLOGIC CONTACT
- STREAM
- WATERBODY
- FORMER PHILADELPHIA REFINERY
- STATE BOUNDARY
- *SPRINGFIELD GRANODIORITE FORMATION (Ssg)*
- *WATERWORKS GNEISS FORMATION (Swg)*
- *WISSAHICKON FORMATION (CZw)*
- *WISSAHICKON FORMATION - FAIRMOUNT MEMBER (CZwf)*
- *MT. LAUREL FORMATION (Kml)*
- *WENONAH FORMATION (Kw)*
- *MARSHALLTOWN FORMATION (Kmt)*
- *ENGLISHTOWN FORMATION (Ket)*
- *WOODBURY FORMATION (Kwb)*
- *MERCHANTVILLE FORMATION (Kmv)*
- *MAGOTHY FORMATION (Kmg)*
- *POTOMAC FORMATION (Kp)*

0.5 0 0.5 1 Miles

1:63,360 (At Original document size of 11x17)

N

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Project Location
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Pennsylvania

213402454
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FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
3-3

Title
GENERALIZED BEDROCK GEOLOGIC MAP

Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
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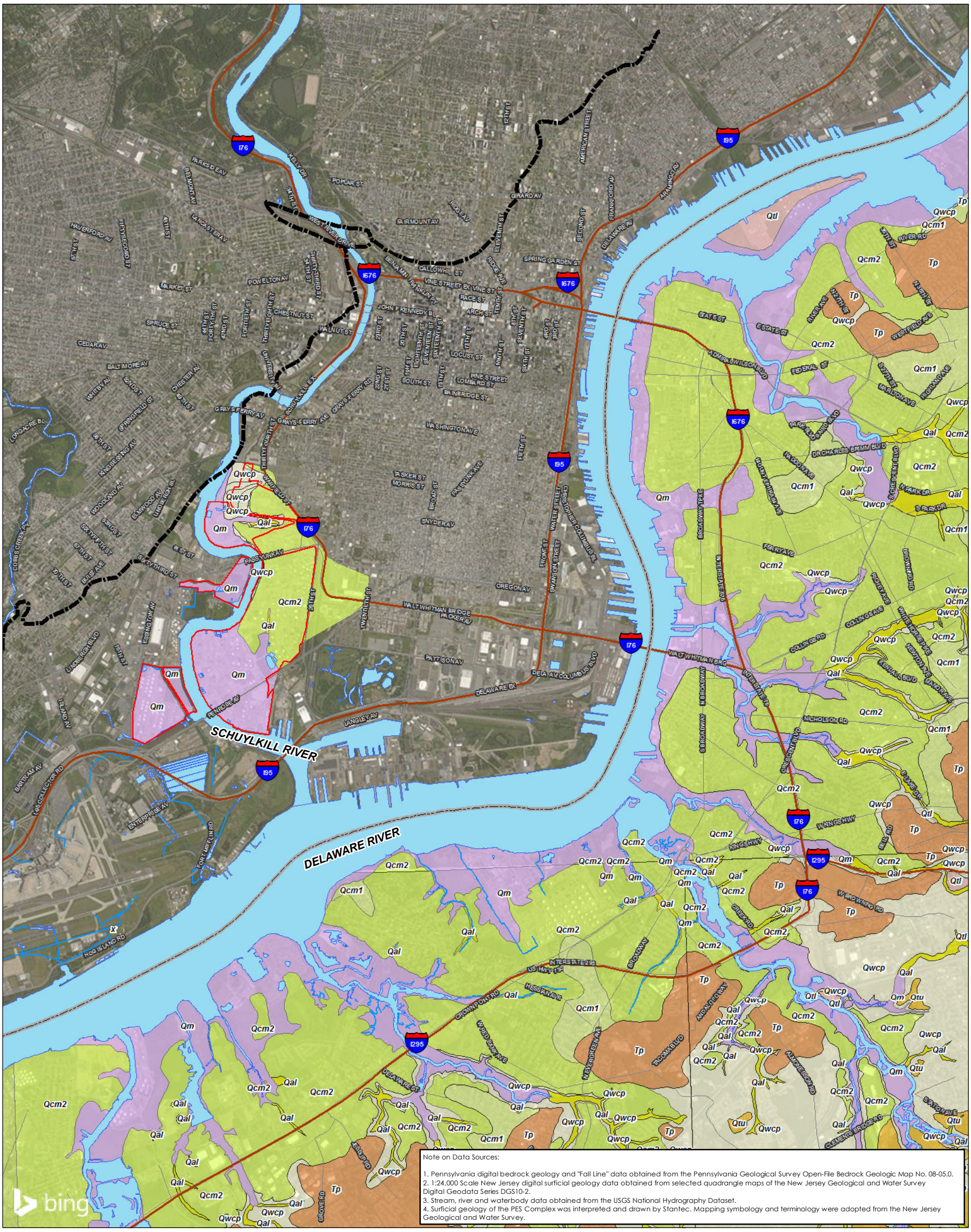

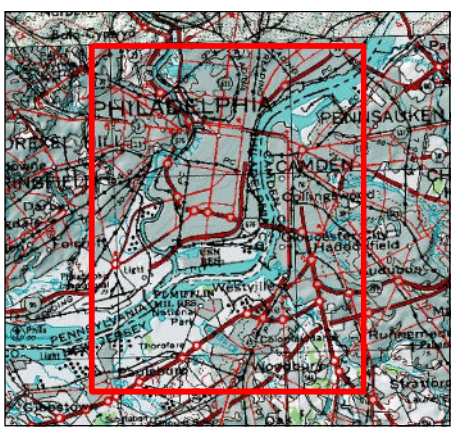

LEGEND

- FALL LINE/INFERRED GEOLOGIC CONTACT
- STREAM
- WATERBODY
- FORMER PHILADELPHIA REFINERY
- STATE BOUNDARY
- ALLUVIUM (Qal)
- CAPE MAY FORMATION UNIT 1 (Qcm1)
- CAPE MAY FORMATION UNIT 2 (Qcm2)
- SALT-MARSH AND ESTUARINE DEPOSITS (Qm)
- OUTCROP OF COASTAL PLAIN FORMATIONS (Qwcp)
- PENSAUKEN FORMATION (Tp)

0.5 0 0.5 1 Miles

1:63,360 (At Original document size of 11x17)

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Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
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Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/10/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.

3-4

Title

GENERALIZED SURFICIAL GEOLOGIC MAP

Figure No.
3-5

Title
STRATIGRAPHIC PROFILE LOCATION MAP

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/13/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

0 1,000 2,000 Feet
1:29,937 (At original document size of 11x17)

N

LEGEND

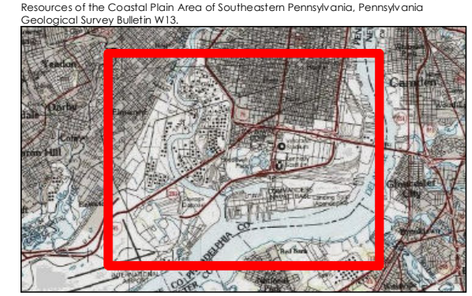
STRATIGRAPHIC 'PICK' LOCATION

- Soil/Test Boring Record
- Well Record
- Greenman et al. (1961) Historic Record
- **FORMER PHILADELPHIA REFINERY**

STRATIGRAPHIC PROFILE

- A - A'
- B - B'
- C - C'
- D - D'
- E - E'
- F - F'
- G - G'
- H- H'
- I - I'
- J - J'
- K - K'
- L - L'
- M - M'
- N - N'

Reference:
Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H. (1961). Groundwater Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Geological Survey Bulletin W13.



Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
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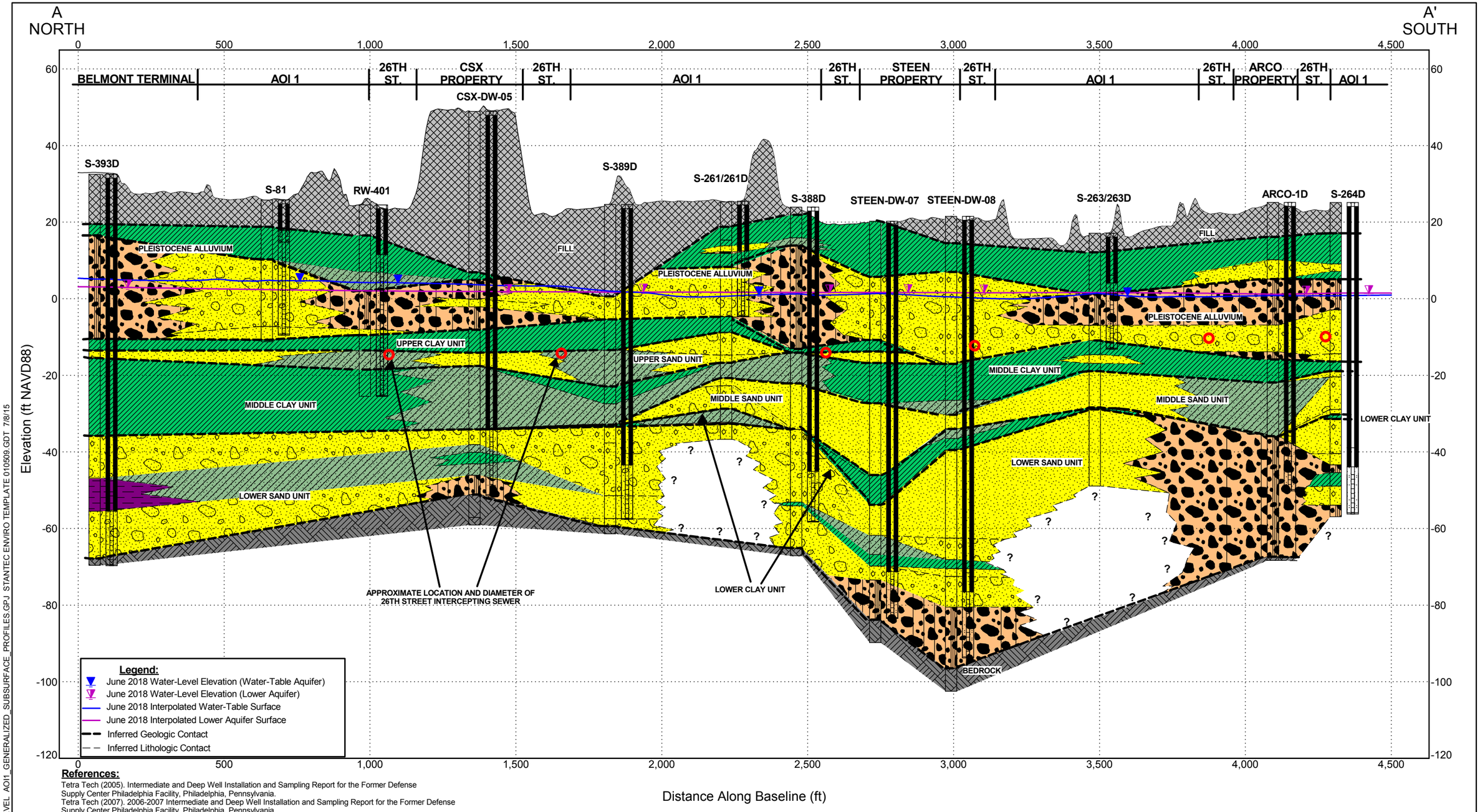


References:

Tetra Tech (2005). Intermediate and Deep Well Installation and Sampling Report for the Former Defense Supply Center Philadelphia Facility, Philadelphia, Pennsylvania.

Tetra Tech (2007). 2006-2007 Intermediate and Deep Well Installation and Sampling Report for the Former Defense Supply Center Philadelphia Facility, Philadelphia, Pennsylvania.

Stantec

STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- Peat

Notes:

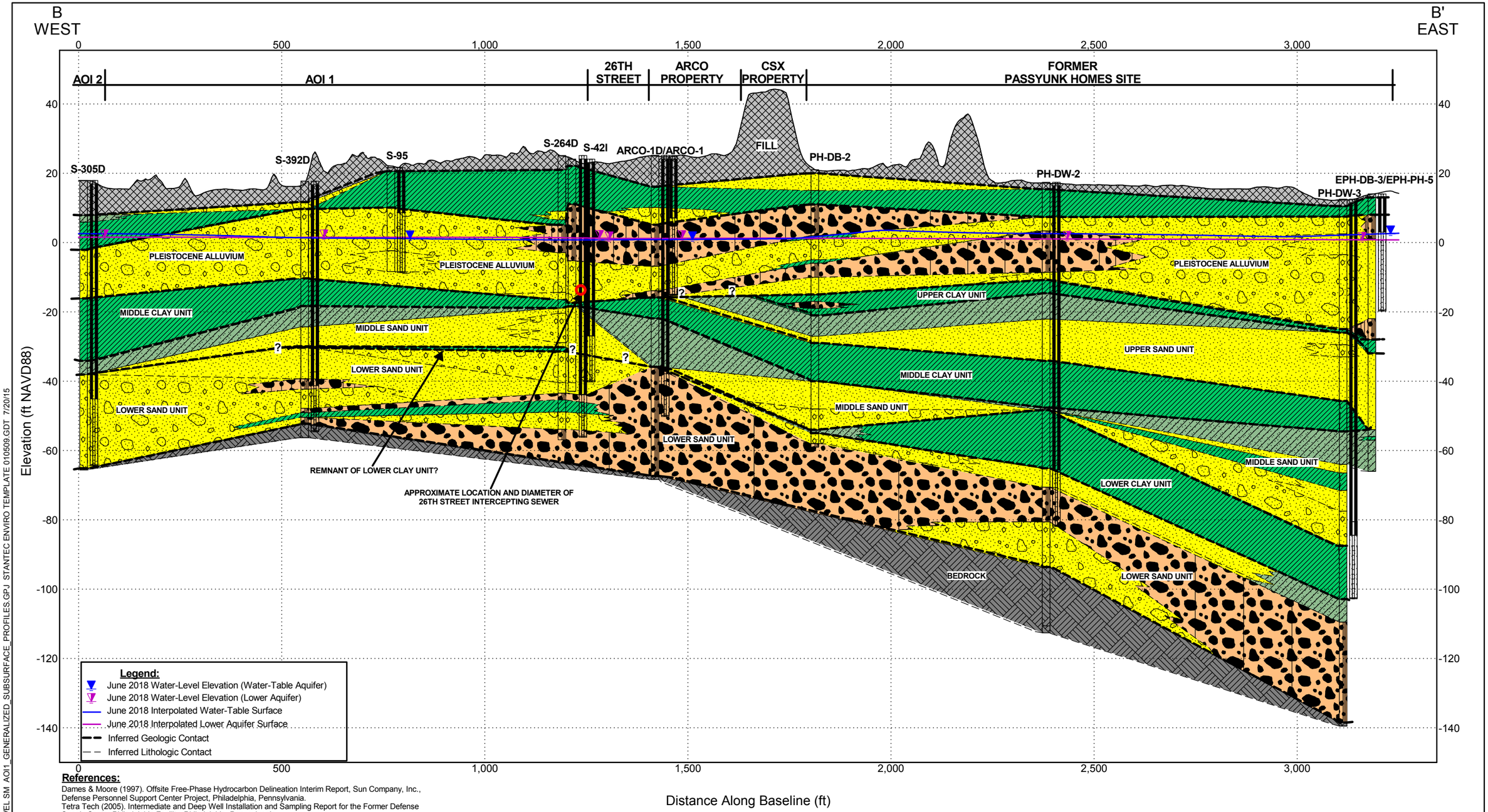
1. Land surface profile obtained from a 2010 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Lithologic logs, well construction, and survey data for wells CSX-DW-05, STEEN-DW-07, and STEEN-DW-08 were obtained from Tetra Tech (2005) and Tetra Tech (2007).
3. Water-table and lower aquifer surfaces were interpolated from selected June 2018 gauging data using point kriging.
4. Water depths for the Schuylkill River are estimated from a March 2017 channel conditions survey obtained from the United States Army Corps of Engineers - Philadelphia District.
5. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
6. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method. Actual conditions between boreholes may vary from what is shown on this profile.
7. Sewer data obtained from the Philadelphia Water Department Water Transport Records.
8. North American Vertical Datum of 1988 = NAVD 88
9. Vertical Exaggeration ~ 14 X

Figure 3-6. Stratigraphic Profile A - A'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454

STRAT COLUMN WELL AND WAT LEVEL_AOI1_GENERALIZED_SUBSURFACE_PROFILES.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 7/8/15



References:

Dames & Moore (1997). Offsite Free-Phase Hydrocarbon Delineation Interim Report, Sun Company, Inc., Defense Personnel Support Center Project, Philadelphia, Pennsylvania.

Tetra Tech (2005). Intermediate and Deep Well Installation and Sampling Report for the Former Defense Supply Center Philadelphia Facility, Philadelphia, Pennsylvania.

Stantec

STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- Peat

Notes:

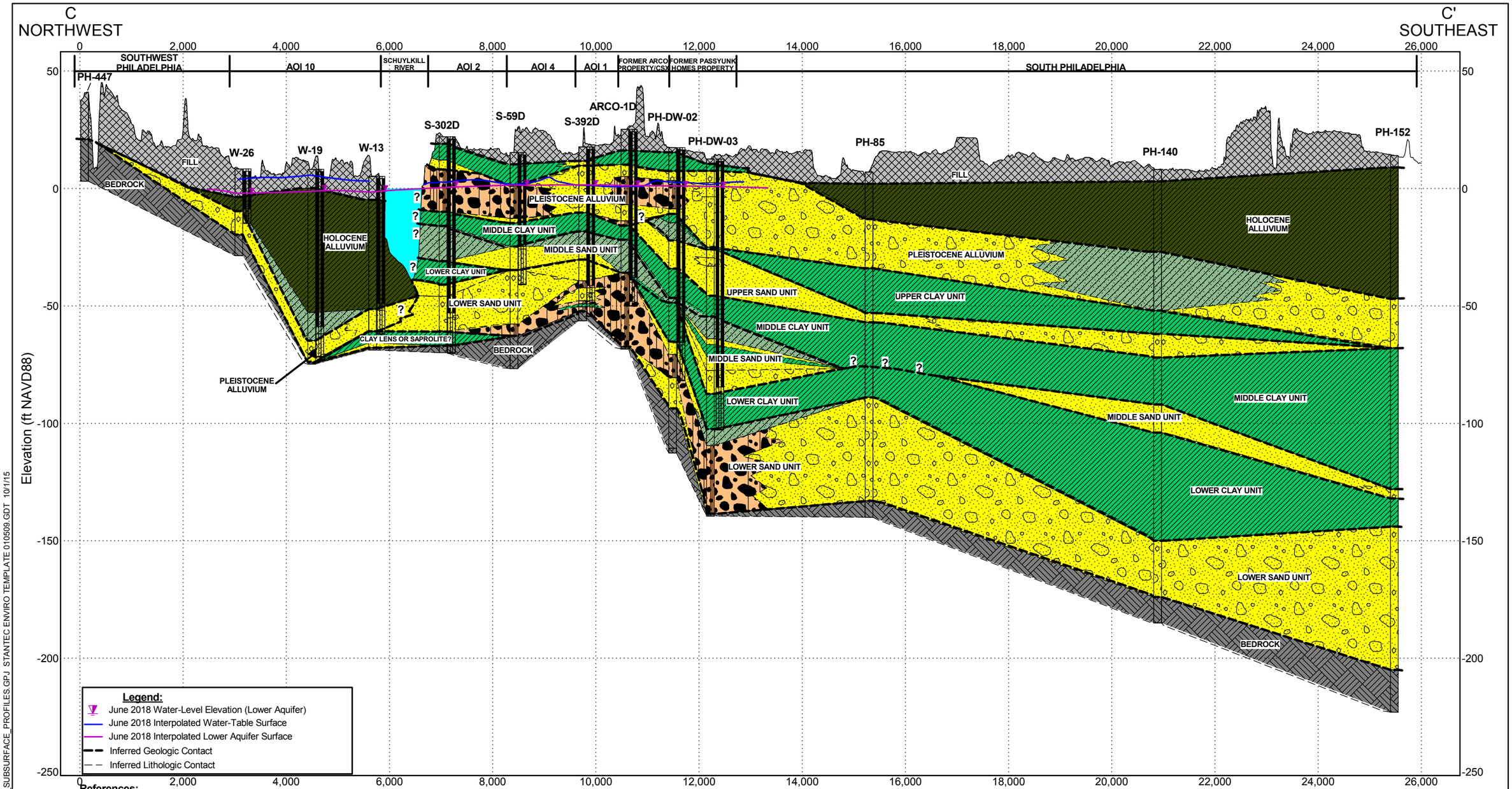
1. Land surface profile obtained from a 2010 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Lithologic logs for borings PH-DB-2, PH-DW-2, PH-DW-3, and EPH-DB-3/EPH-PH-5 were obtained from Tetra Tech (2005) and Dames & Moore (1997).
3. Water-table and lower aquifer surfaces were interpolated from selected June 2018 gauging data using point kriging.
4. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
5. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method. Actual conditions between boreholes may vary from what is shown on this profile.
6. Sewer data obtained from the Philadelphia Water Department Water Transport Records.
7. North American Vertical Datum of 1988 = NAVD 88
8. Vertical Exaggeration ~ 9 X

Figure 3-7. Stratigraphic Profile B - B'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454

STRAT COLUMN WELL AND WAT LEVEL SM AOI1_GENERALIZED_SUBSURFACE_PROFILES.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 7/20/15



References:

Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H., 1961, Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Topographic and Geologic Survey Bulletin W-13: 375 pgs.
Tetra Tech (2005). Intermediate and Deep Well Installation and Sampling Report for the Former Defense Supply Center Philadelphia Facility, Philadelphia, Pennsylvania.

Stantec

STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand

Notes:

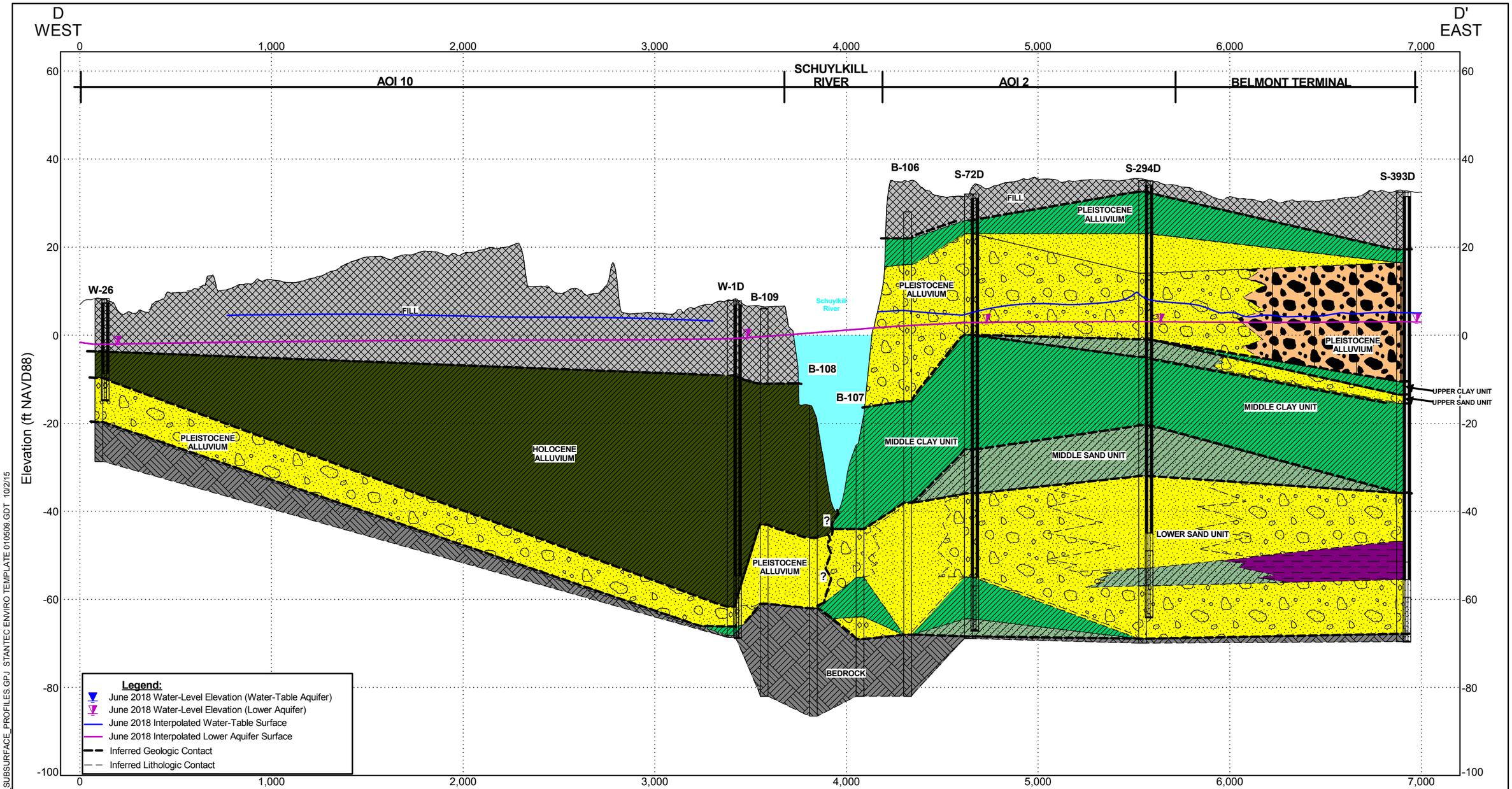
1. Land surface profile obtained from a 2010 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Lithologic logs for borings PH-447, PH-85, PH-140, and PH-152 were obtained from Tables 13 and 14 of Greenman et al., 1961. Geographic locations for those borings were digitized on-screen by Stantec. Lithologic logs, well construction, and survey data for wells PH-DW-02 and PH-DW-03 were obtained from Tetra Tech (2005).
3. Water-table and lower aquifer surfaces were interpolated from selected June 2018 gauging data using point kriging.
4. Water depths for the Schuylkill River are estimated from a March 2017 channel conditions survey obtained from the United States Army Corps of Engineers - Philadelphia District.
5. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
6. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method. Actual conditions between boreholes may vary from what is shown on this profile.
7. North American Vertical Datum of 1988 = NAVD 88
8. Vertical Exaggeration ~ 45 X

Figure 3-8. Stratigraphic Profile C - C'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454

STRAT COLUMN SMALL AOI1_GENERALIZED_SUBSURFACE_PROFILES.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/1/15



Reference:
Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H., 1961, Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Topographic and Geologic Survey Bulletin W-13: 375 pgs.

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STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- Peat

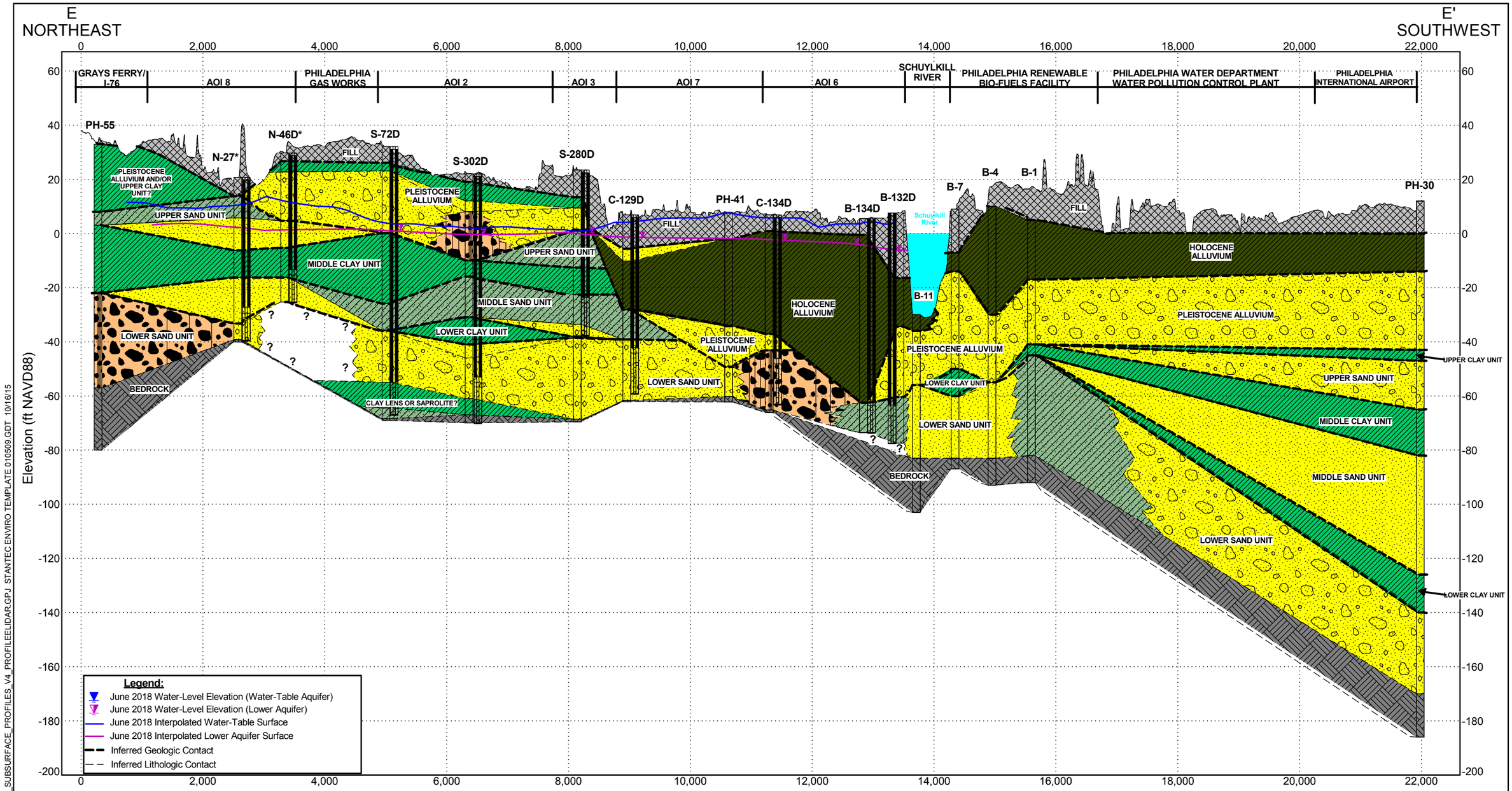
Notes:
1. Land surface profile obtained from a 2010 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Lithologic logs for borings B-106, B-107, B-108, and B-109 were obtained from Greenman et al. (1961).
3. Water-table and lower aquifer surfaces were interpolated from selected June 2018 gauging data using point kriging.
4. Water depths for the Schuylkill River are estimated from a March 2017 channel conditions survey obtained from the United States Army Corps of Engineers - Philadelphia District.
5. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
6. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method. Actual conditions between boreholes may vary from what is shown on this profile.
7. Sewer data obtained from the Philadelphia Water Department Water Transport Records.
8. North American Vertical Datum of 1988 = NAVD 88
9. Vertical Exaggeration ~ 23 X

Figure 3-9. Stratigraphic Profile D - D'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454

STRAT COLUMN SMALL AOI1_GENERALIZED_SUBSURFACE_PROFILES.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/2/15



Reference:
Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H., 1961, Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Topographic and Geologic Survey Bulletin W-13: 375 pgs.

Stantec

STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- Peat

Notes:

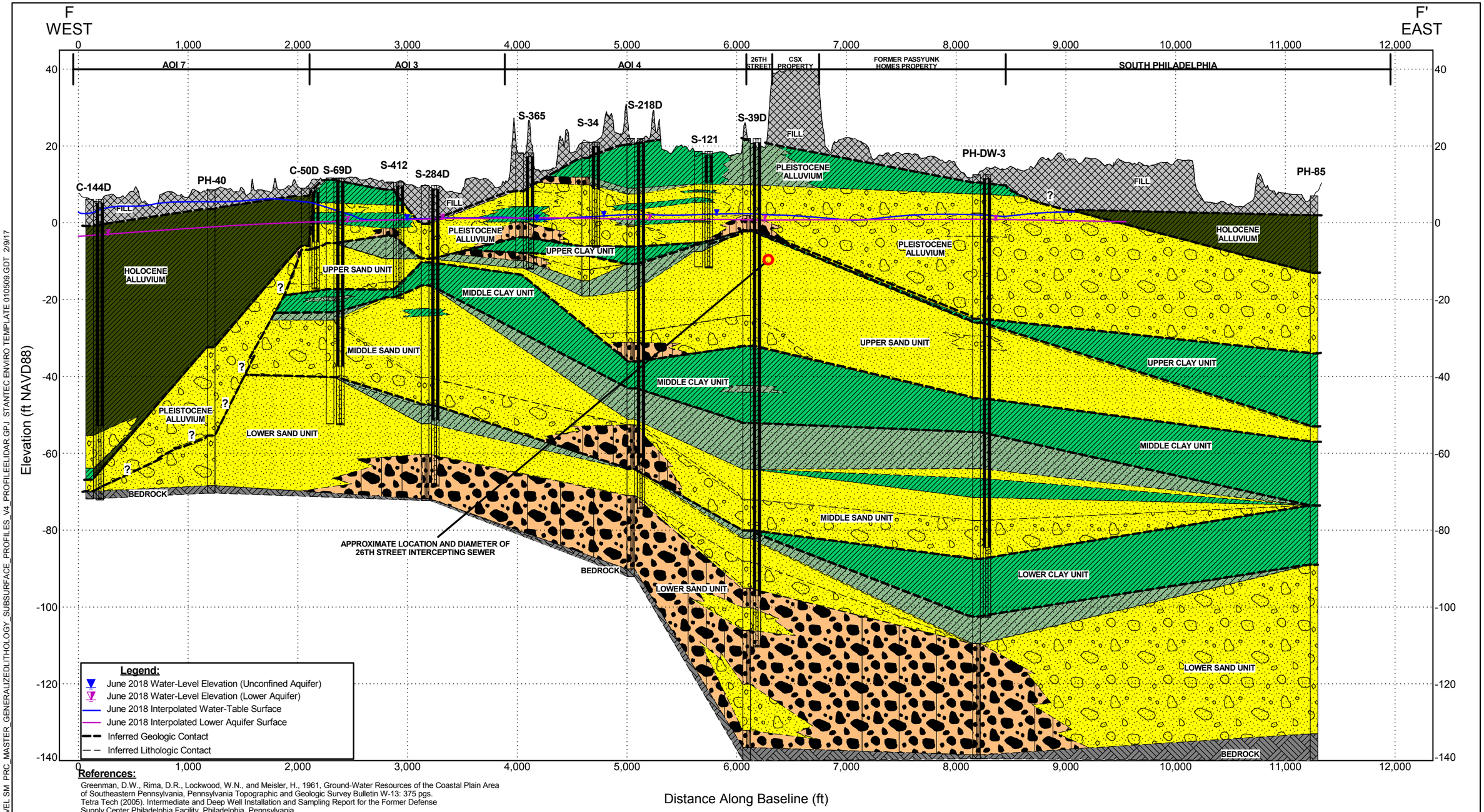
1. Land surface profile obtained from a 2010 light detection and ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Lithologic logs for borings PH-30, PH-55, B-1, B-4, B-7, and B-11 were obtained from Tables 13 and 14 of Greenman et al., 1961. Geographic locations for those borings were digitized on-screen by Stantec using a georeferenced image of Greenman et al., 1961, Plate 1.
3.Water depths for the Schuylkill River are estimated from a March 2017 channel conditions survey obtained from the United States Army Corps of Engineers - Philadelphia District.
4. Water table and lower aquifer surfaces were interpolated from selected June 2018 gauging data using point kriging. *damaged/destroyed well with estimated screen length.
5. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes."Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
6. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method. Actual conditions between boreholes may vary from what is shown on this profile.
7. NAVD88 = North American Vertical Datum of 1988
8. Vertical Exaggeration ~ 45 X

Figure 3-10. Stratigraphic Profile E - E'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454

STRAT COLUMN SMALL_AOI1_GENERALIZED_SUBSURFACE_PROFILES_V4_PROFILEELIDAR.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 10/16/15



References:

Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H., 1961, Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Topographic and Geologic Survey Bulletin W-13: 375 pgs.
Tetra Tech (2005). Intermediate and Deep Well Installation and Sampling Report for the Former Defense Supply Center Philadelphia Facility, Philadelphia, Pennsylvania.

Stantec

STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sandy Gravel
- Gravelly Sand
- Sand (incl. trace to little silt/clay/gravel)
- "Muddy" Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Bedrock (incl. saprolite where indicated)
- Peat

Notes:

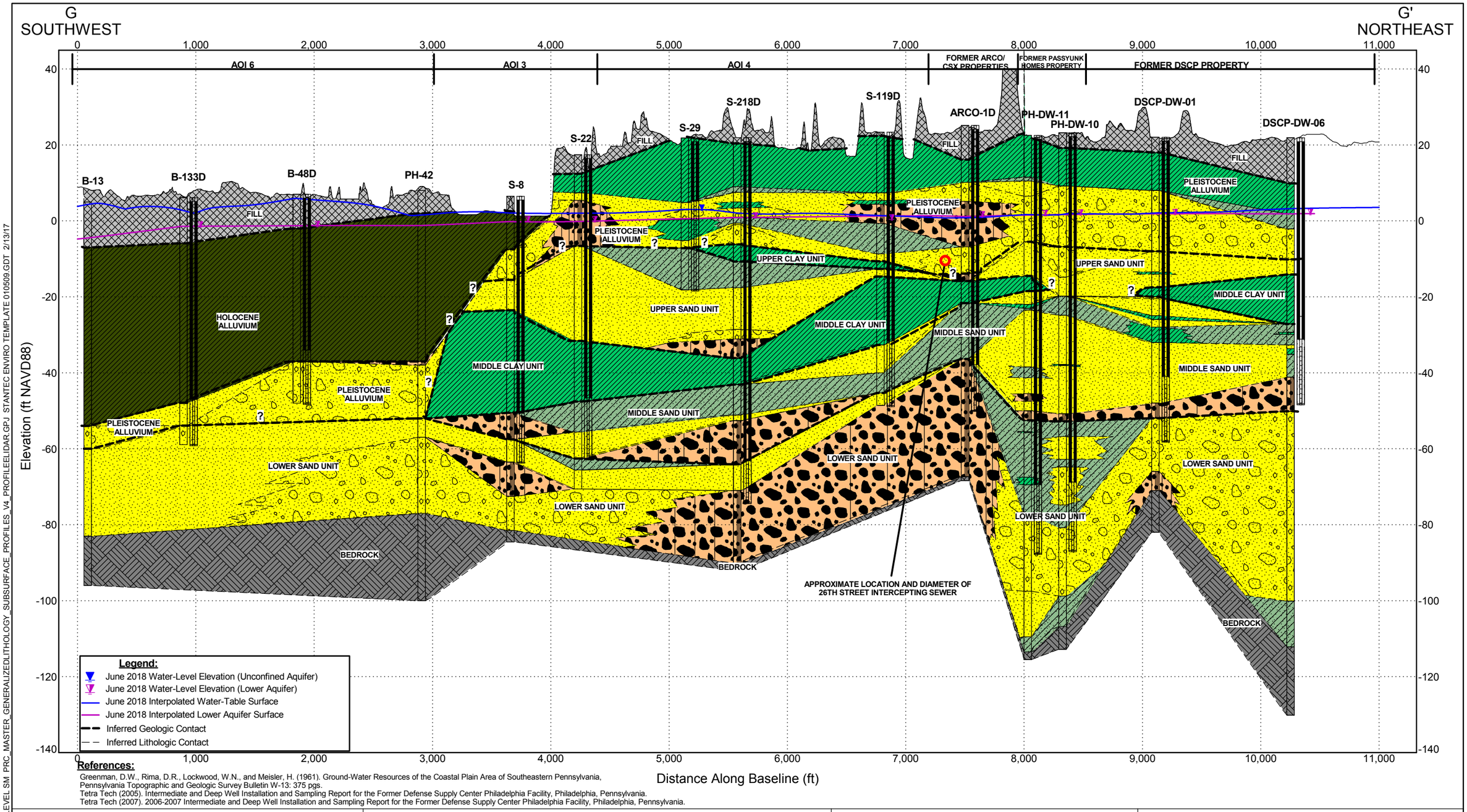
1. Land surface profile obtained from a 2010 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Lithologic logs for borings PH-40 and PH-85 were obtained from Tables 13 and 14 of Greenman et al., 1961. Geographic locations for those borings were digitized on-screen by Stantec. Lithologic logs, well construction, and survey data for well PH-DW-03 was obtained from Tetra Tech (2005).
3. Water-table and lower aquifer surfaces were interpolated from selected June 2018 gauging data using point kriging.
4. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
5. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method. Actual conditions between boreholes may vary from what is shown on this profile.
6. North American Vertical Datum of 1988 = NAVD 88
7. Vertical Exaggeration ~ 36 X

Figure 3-11. Stratigraphic Profile F - F'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454

STRAT COLUMN WELL AND WAT LEVEL SM PRC_MASTER_GENERALIZEDLITHOLOGY_SUBSURFACE_PROFILES_V4_PROFILEELIDAR.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 2/9/17



References:

Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H. (1961). Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Topographic and Geologic Survey Bulletin W-13: 375 pgs.
Tetra Tech (2005). Intermediate and Deep Well Installation and Sampling Report for the Former Defense Supply Center Philadelphia Facility, Philadelphia, Pennsylvania.
Tetra Tech (2007). 2006-2007 Intermediate and Deep Well Installation and Sampling Report for the Former Defense Supply Center Philadelphia Facility, Philadelphia, Pennsylvania.

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STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- Peat

Notes:

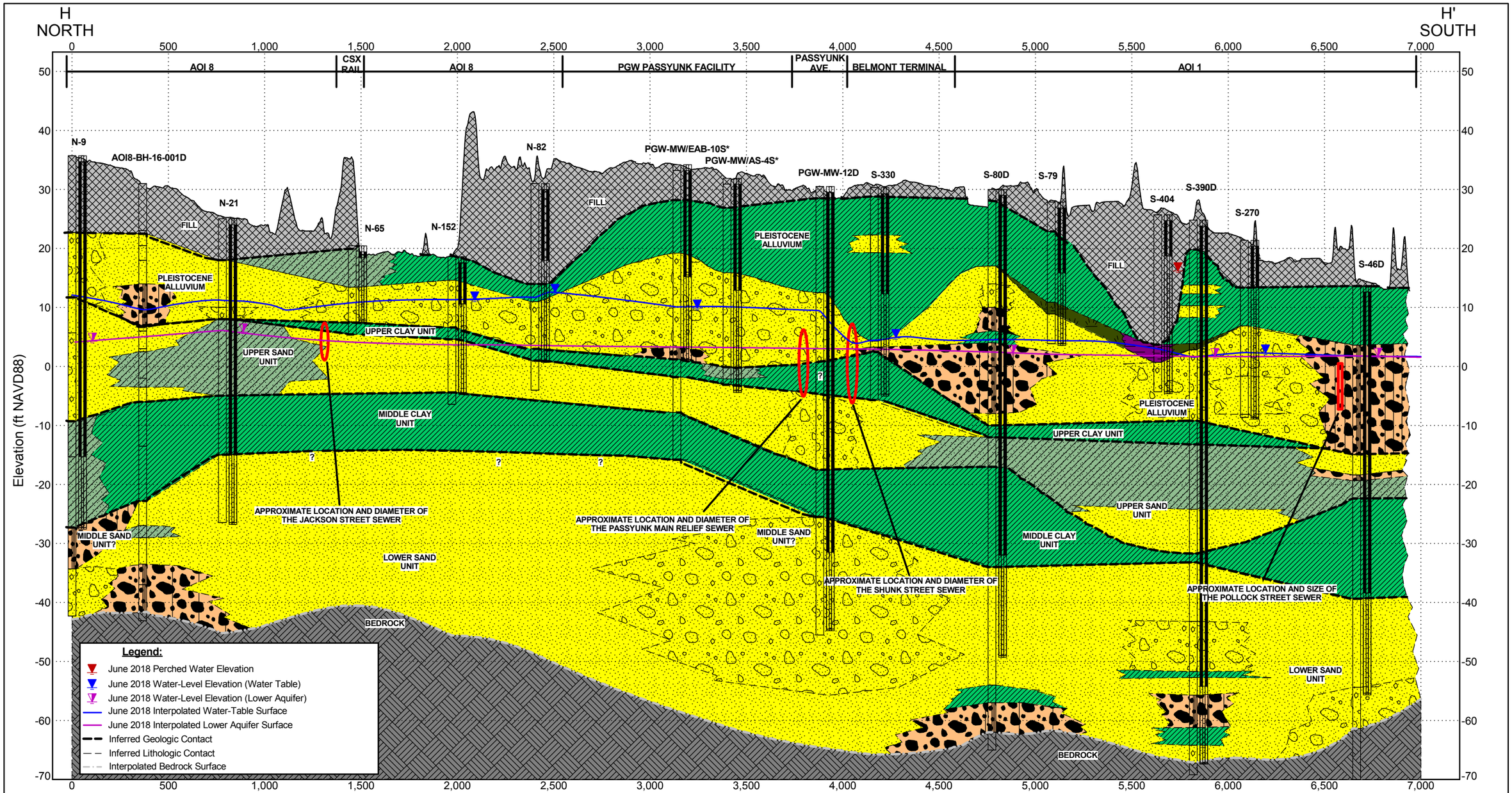
1. Land surface profile obtained from a 2010 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Lithologic log for boring PH-42 was obtained from Tables 13 and 14 of Greenman et al. (1961). Geographic location for the boring was digitized on-screen by Stantec. Lithologic logs, well construction, and survey data for wells DSCP-DW-01, DSCP-DW-06, PH-DW-10, and PH-DW-11 were obtained from Tetra Tech (2005; 2007).
3. Water-table and lower aquifer surfaces were interpolated from selected June 2018 gauging data using point kriging.
4. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
5. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method. Actual conditions between boreholes may vary from what is shown on this profile.
6. North American Vertical Datum of 1988 = NAVD 88
7. Vertical Exaggeration ~ 32 X

Figure 3-12. Stratigraphic Profile G - G'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454

STRAT COLUMN WELL AND WAT LEVEL SM PRC_MASTER_GENERALIZEDLITHOLOGY_SUBSURFACE_PROFILES_V4_PROFILEELIDAR.GPJ STANTEC ENVIRO TEMPLATE 010509.GDT 2/13/17



References:

TRC (2014). Pilot Test Report for Groundwater and Soil Remediation, Philadelphia Gas Works Passyunk Plant & Porter FSD Station, Philadelphia, Pennsylvania.
WESTON (2004). Passyunk Facility, Philadelphia Gas Works, Remedial Investigation Report.

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STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- Peat

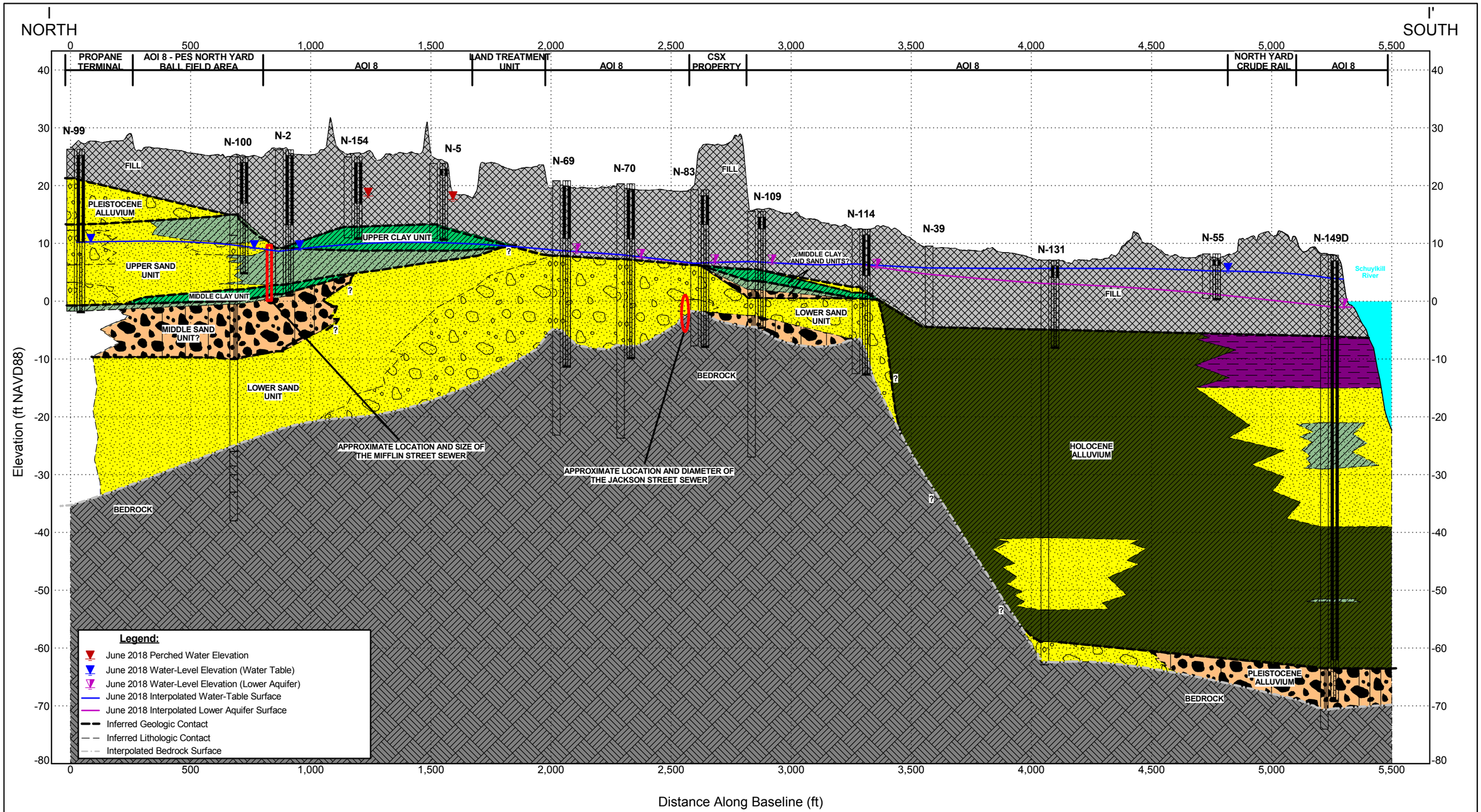
Notes:

1. Land surface profile obtained from a 2015 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Well logs for Philadelphia Gas Works (PGW) were obtained from Weston (2004). Asterisks denote where lithologic data was obtained from TRC (2014).
3. Water-table, lower aquifer, and bedrock surfaces were interpolated from selected June 2018 gauging and stratigraphic "pick" data using point and block kriging, respectively. Screen lengths estimated for wells N-9 and N-21.
4. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments.
5. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method with additional stratigraphic interpretation where subsurface data is limited. Actual conditions between boreholes may vary from what is shown on this profile.
6. Sewer data obtained from the Philadelphia Water Department Water Transport Records.
7. North American Vertical Datum of 1988 = NAVD 88
8. Vertical Exaggeration ~ 31 X

Figure 3-13. Stratigraphic Profile H - H'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454



Stantec

STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- Peat

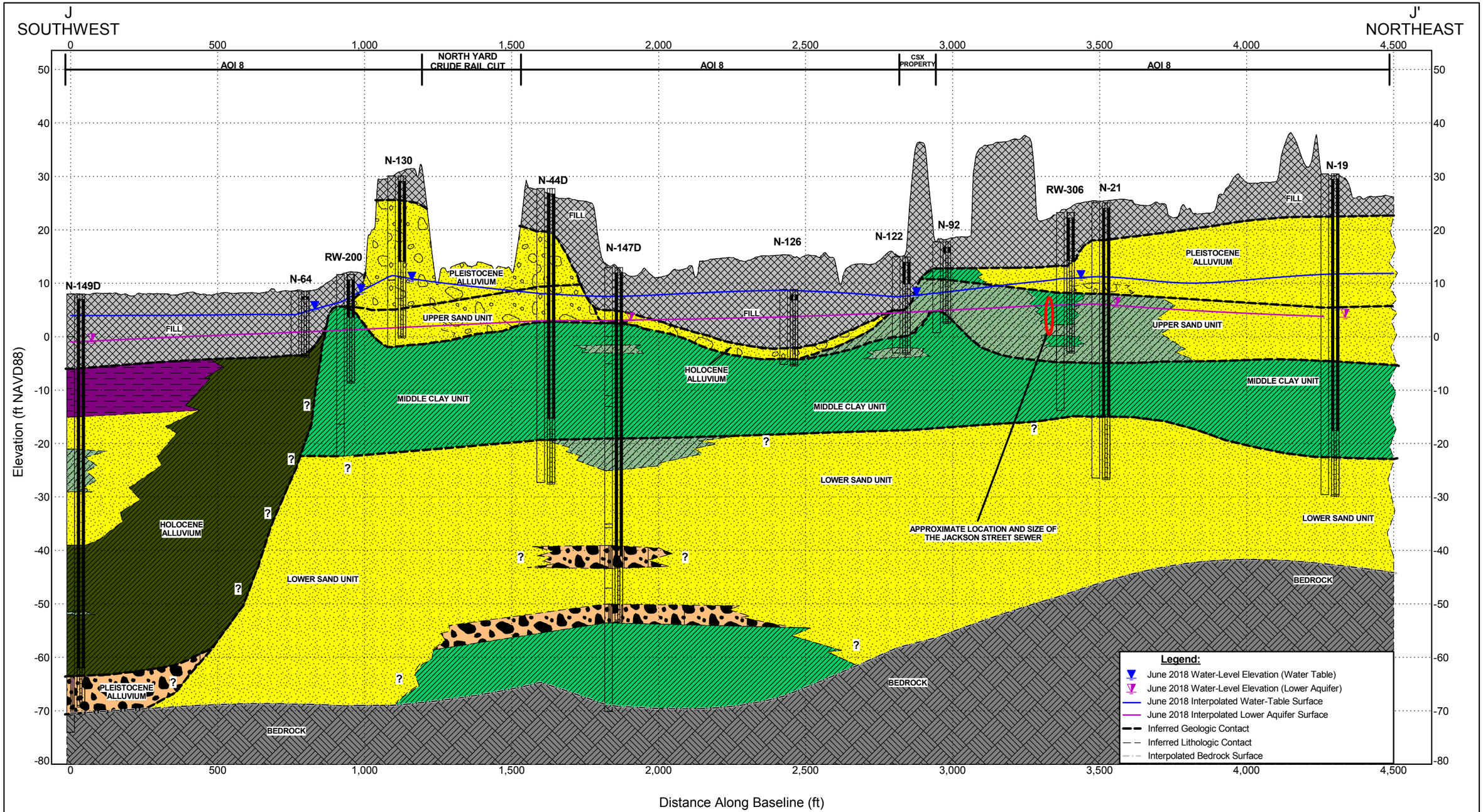
Notes:

1. Land surface profile obtained from a 2015 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Water depths for the Schuylkill River are estimated from a March 2017 channel conditions survey obtained from the United States Army Corps of Engineers - Philadelphia District.
3. Water-table, lower aquifer, and bedrock surfaces were interpolated from selected June 2018 gauging and stratigraphic "pick" data using point and block kriging, respectively. Screen lengths estimated for wells N-2 and N-5.
4. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
5. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method with additional stratigraphic interpretation where subsurface data is limited. Actual conditions between boreholes may vary from what is shown on this profile.
6. Sewer data obtained from the Philadelphia Water Department Water Transport Records.
7. North American Vertical Datum of 1988 = NAVD 88
8. Vertical Exaggeration ~ 25 X

Figure 3-14. Stratigraphic Profile I - I'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454



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STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- Peat

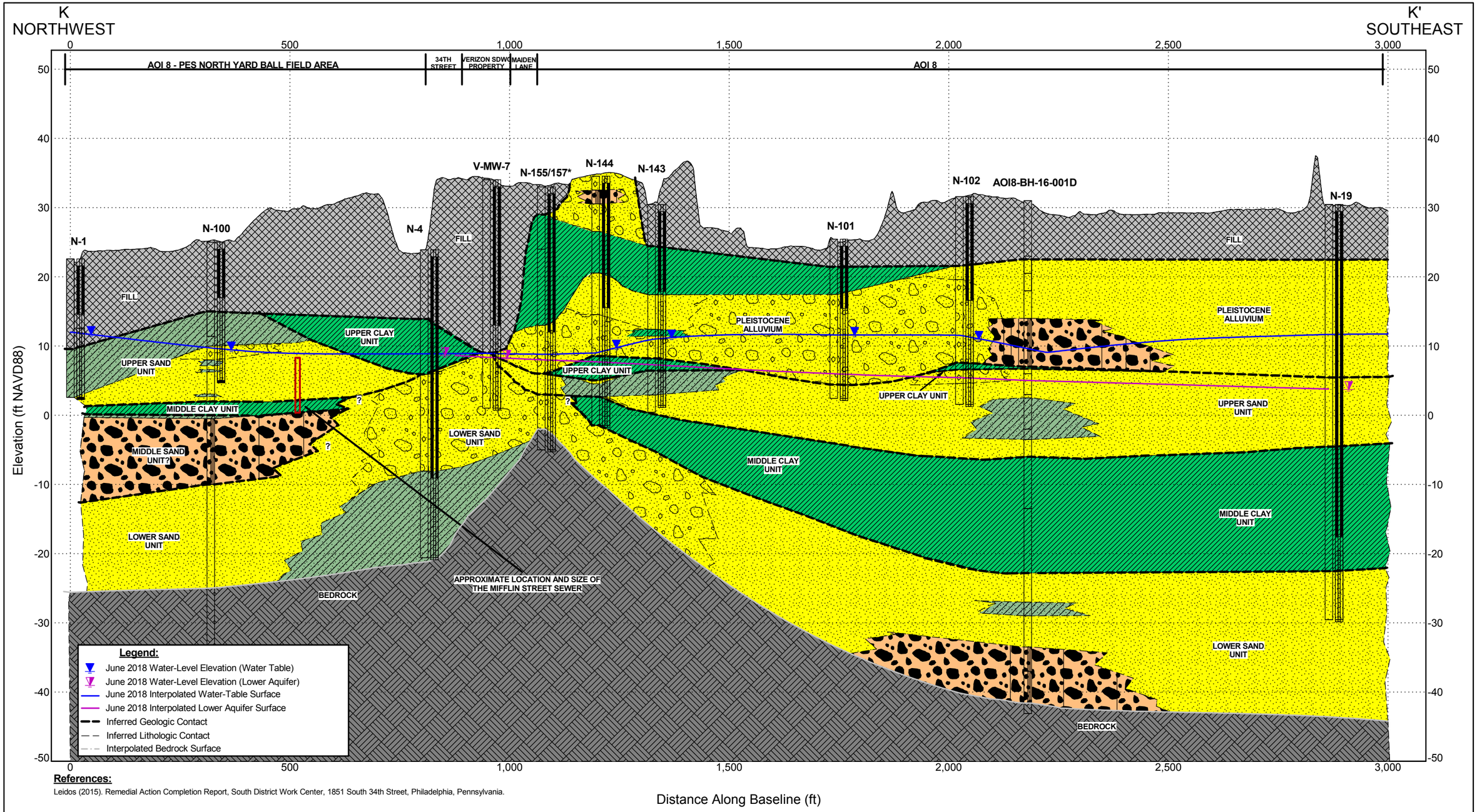
Notes:

1. Land surface profile obtained from a 2015 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Water-table, lower aquifer, and bedrock surfaces were interpolated from selected June 2018 gauging and stratigraphic "pick" data using point and block kriging, respectively. Screen lengths estimated for wells N-44D, N-21, and N-19.
3. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
4. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method with additional stratigraphic interpretation where subsurface data is limited. Actual conditions between boreholes may vary from what is shown on this profile.
5. Sewer data obtained from the Philadelphia Water Department Water Transport Records.
6. North American Vertical Datum of 1988 = NAVD 88
7. Vertical Exaggeration ~ 17 X

Figure 3-15. Stratigraphic Profile J - J'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454



References:

Leidos (2015). Remedial Action Completion Report, South District Work Center, 1851 South 34th Street, Philadelphia, Pennsylvania.

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STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- Peat

Notes:

1. Land surface profile obtained from a 2015 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Verizon SDWC well log for V-MW-7 obtained from Leidos (2015).
3. *Subsurface information was combined for wells N-155 and N-157.
4. Water-table, lower aquifer, and bedrock surfaces were interpolated from selected June 2018 gauging and stratigraphic "pick" data using point and block kriging, respectively. Screen lengths estimated for wells N-1, N-4, and N-19.
5. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments.
6. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method with additional stratigraphic interpretation where subsurface data is limited. Actual conditions between boreholes may vary from what is shown on this profile.
7. Sewer data obtained from the Philadelphia Water Department Water Transport Records.
8. North American Vertical Datum of 1988 = NAVD 88
9. Vertical Exaggeration ~ 16 X

Figure 3-16. Stratigraphic Profile K - K'

Philadelphia Refinery Operations
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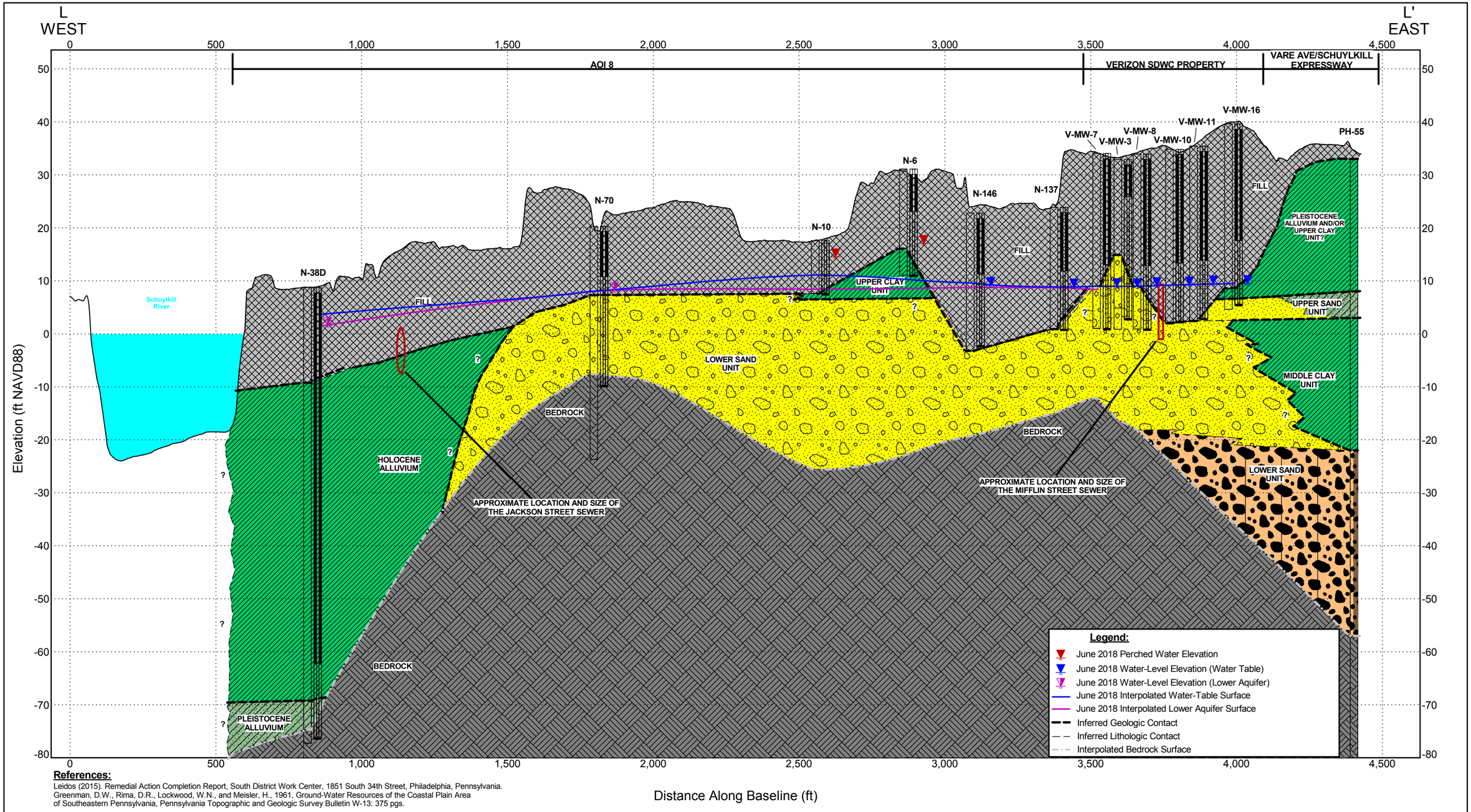
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454



References:

Leidos (2015). Remedial Action Completion Report, South District Work Center, 1851 South 34th Street, Philadelphia, Pennsylvania.
Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H., 1961, Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Topographic and Geologic Survey Bulletin W-13: 375 pgs.

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STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- Peat

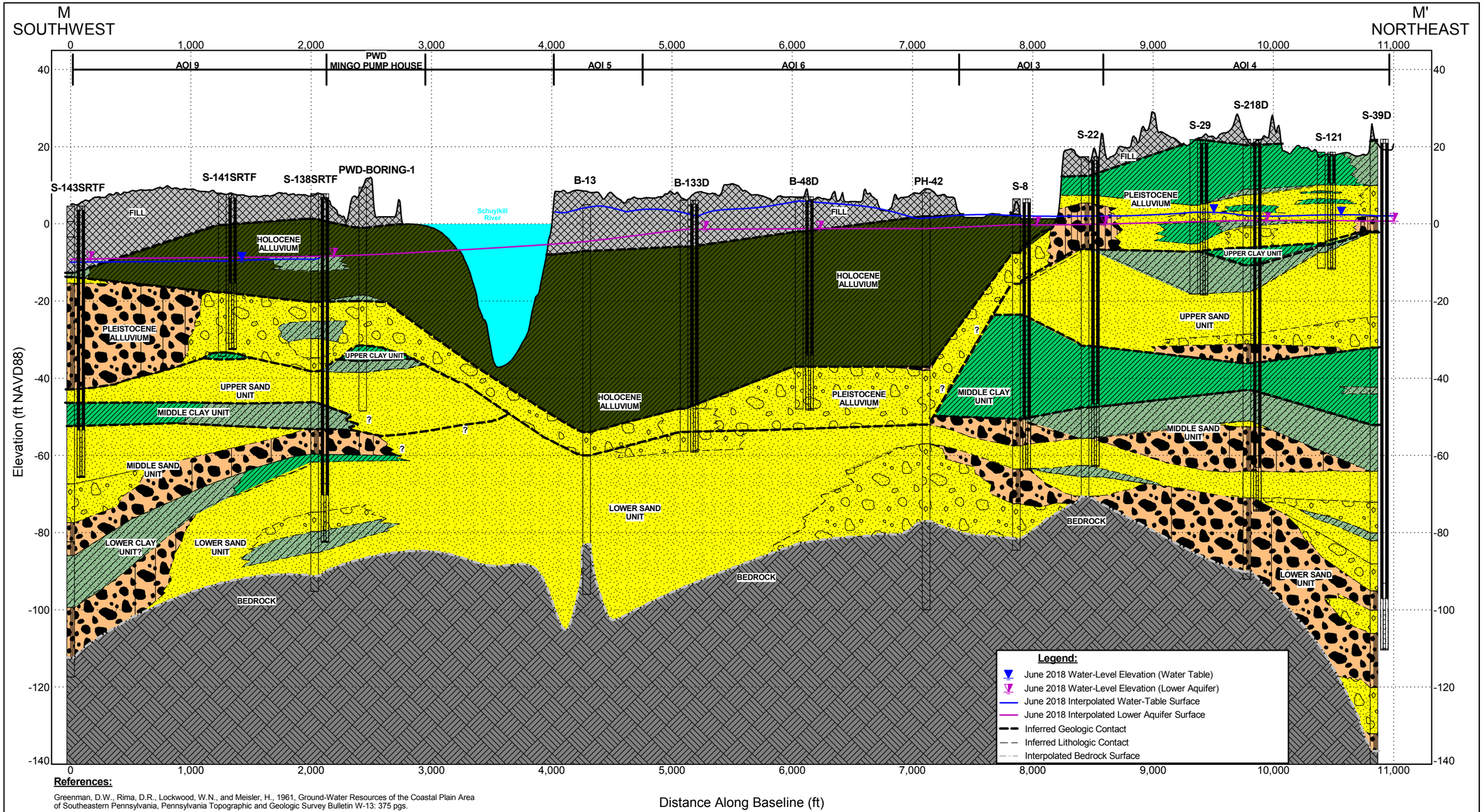
Notes:

1. Land surface profile obtained from a 2015 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Schuylkill River bathymetry obtained from NOAA National Centers for Environmental Information and is based on a 1/9 arc second, 2014 elevation model referenced to NAVD 88. Verizon SDWC Property well logs obtained from Leidos (2015). PH-55 well log obtained from Greenman et al. (1961).
3. Water-table, lower aquifer, and bedrock surfaces were interpolated from selected June 2018 gauging and stratigraphic "pick" data using point and block kriging. Screen lengths estimated for wells N-6 and N-10.
4. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
5. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method with additional stratigraphic interpretation where subsurface data is limited. Actual conditions between boreholes may vary from what is shown on this profile.
6. Sewer data obtained from the Philadelphia Water Department Water Transport Records.
7. North American Vertical Datum of 1988 = NAVD 88
8. Vertical Exaggeration ~ 18 X

Figure 3-17. Stratigraphic Profile L - L'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454



References:

Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H., 1961, Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Topographic and Geologic Survey Bulletin W-13: 375 pgs.

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STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sandy Gravel
- Gravelly Sand
- Sand (incl. trace to little silt/clay/gravel)
- "Muddy" Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Bedrock (incl. saprolite where indicated)
- Peat

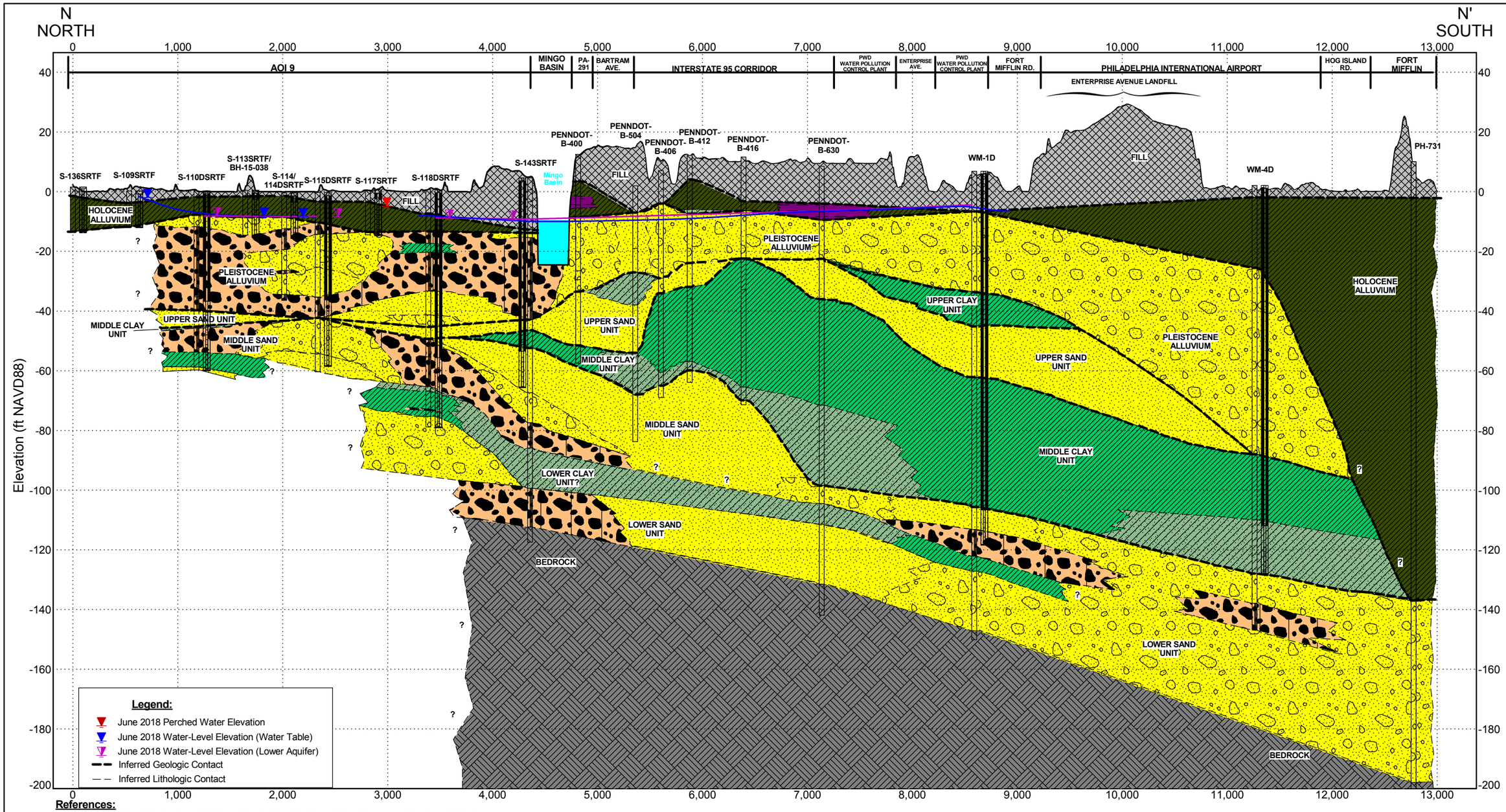
Notes:

1. Land surface profile obtained from a 2015 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Schuylkill River bathymetry obtained from NOAA National Centers for Environmental Information and is based on a 1/9 arc second, 2014 elevation model referenced to NAVD 88. B-13 and PH-42 logs obtained from Greenman et al. (1961).
3. Water-table, lower aquifer, and bedrock surfaces were interpolated from selected June 2018 gauging and stratigraphic "pick" data using point and block kriging, respectively. Screen lengths estimated for wells N-6 and N-10.
4. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
5. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method with additional stratigraphic interpretation where subsurface data is limited. Actual conditions between boreholes may vary from what is shown on this profile.
6. Sewer data and log for boring PWD-BORING-1 obtained from the Philadelphia Water Department Water Transport Records.
7. North American Vertical Datum of 1988 = NAVD 88
8. Vertical Exaggeration ~ 30 X

Figure 3-18. Stratigraphic Profile M - M'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454



References:

Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H., 1961, Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Topographic and Geologic Survey Bulletin W-13: 375 pgs.
Weston (1994). Phase I Site Hydrogeologic Investigation at the Enterprise Avenue Landfill, Final Report of Hydrogeologic Results.
Greiner (1977). Soils and Geological Engineering Investigation for L.R. 795 Section B-6, Philadelphia, Pennsylvania.

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STRATIGRAPHIC PROFILE INTERPRETED BY ANDREW D. KLINGBEIL, PENNSYLVANIA PROFESSIONAL GEOLOGIST PG005029

GENERALIZED LITHOLOGY GRAPHICS

- Apparent Fill
- Sand (incl. trace to little silt/clay/gravel)
- "Mud" (silt/clay, incl. trace to little sand/gravel)
- Sandy Gravel
- "Muddy" Sand
- Bedrock (incl. saprolite where indicated)
- Gravelly Sand
- Organic-Rich "Mud" (silt/clay, incl. some organic material)
- Peat

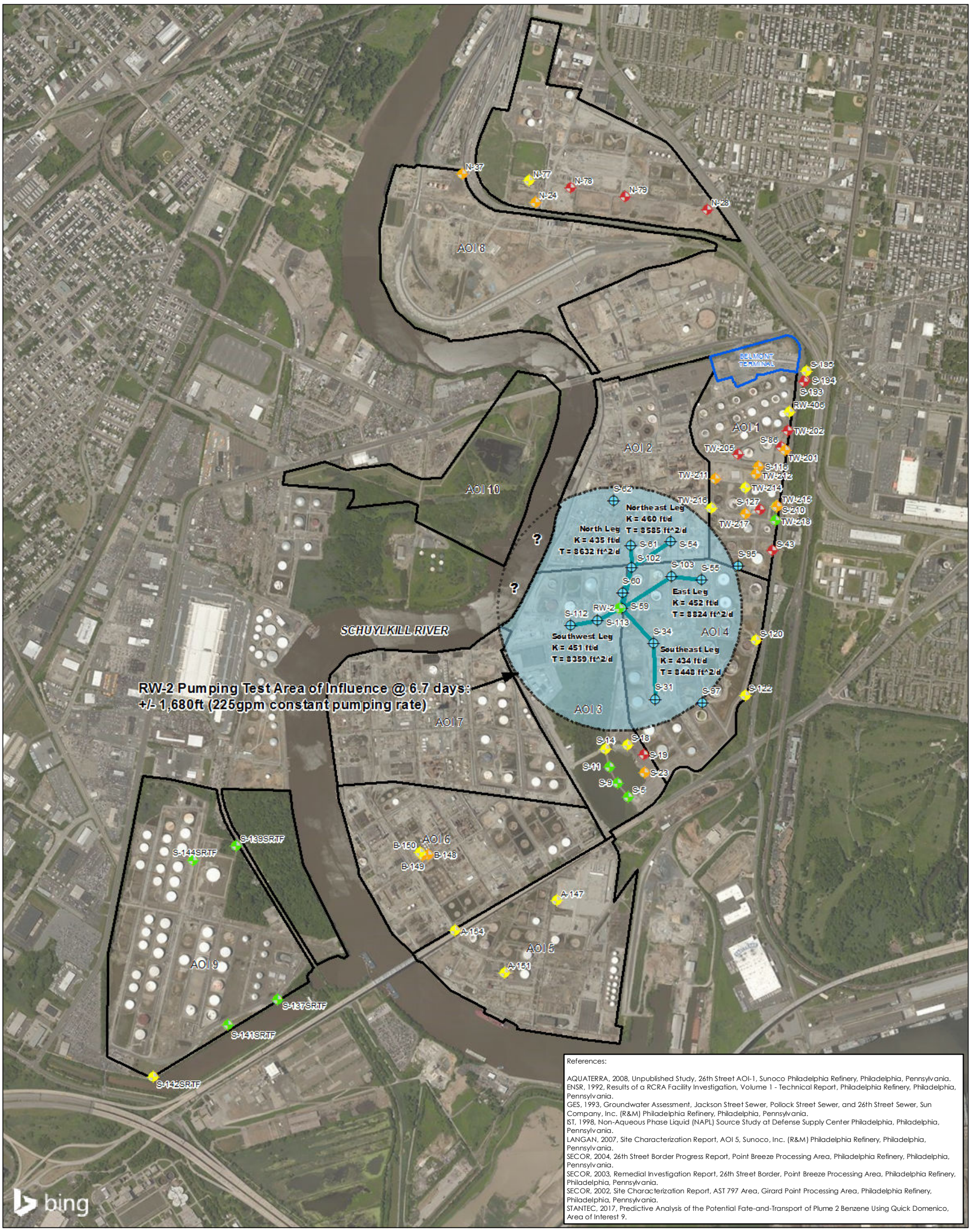
Notes:

1. Land surface profile obtained from a 2015 Light Detection and Ranging (LiDAR) elevation model available from the United States Geological Survey (USGS).
2. Mingo basin depth estimated at 25 feet based on historical reports. Mingo basin water surface controlled between elevations -10.5 feet and -11 feet NAVD 88 according to the Philadelphia Water Department.
3. Enterprise Avenue Landfill well logs obtained from Weston (1994). PH-731 well log obtained from Greenman et al. (1961). L.R. 795 boring logs obtained from Greiner (1977) and Weston (1994).
4. Water-table and lower aquifer surfaces were interpolated from selected June 2018 gauging data using point kriging.
5. Stantec generalized lithologic data from available borehole logs into 9 categories as indicated for interpretive purposes. "Mud" is utilized in these profiles to generally represent clay/silt mixtures, or clay and silt-rich sandy sediments. Holocene-age muds are colored a darker shade of green so they can be more easily distinguished from older units.
6. Correlation between lithologies and, where applicable, geologic units is based primarily on the straight-line method with additional stratigraphic interpretation where subsurface data is limited. Actual conditions between boreholes may vary from what is shown on this profile.
7. Sewer data obtained from the Philadelphia Water Department (PWD) Water Transport Records.
8. North American Vertical Datum of 1988 = NAVD 88
9. Vertical Exaggeration ~ 30 X

Figure 3-19. Stratigraphic Profile N - N'

Philadelphia Refinery Operations
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue
Philadelphia, PA 19145

Project Number: 213402454



References:

AQUATERRA, 2008, Unpublished Study, 26th Street AOI-1, Sunoco Philadelphia Refinery, Philadelphia, Pennsylvania.
ENSR, 1992, Results of a RCRA Facility Investigation, Volume 1 - Technical Report, Philadelphia Refinery, Philadelphia, Pennsylvania.
GES, 1993, Groundwater Assessment, Jackson Street Sewer, Pollock Street Sewer, and 26th Street Sewer, Sun Company, Inc. (R&M) Philadelphia Refinery, Philadelphia, Pennsylvania.
IST, 1998, Non-Aqueous Phase Liquid (NAPL) Source Study at Defense Supply Center Philadelphia, Philadelphia, Pennsylvania.
LANGAN, 2007, Site Characterization Report, AOI 5, Sunoco, Inc. (R&M) Philadelphia Refinery, Philadelphia, Pennsylvania.
SECOR, 2004, 26th Street Border Progress Report, Point Breeze Processing Area, Philadelphia Refinery, Philadelphia, Pennsylvania.
SECOR, 2003, Remedial Investigation Report, 26th Street Border, Point Breeze Processing Area, Philadelphia Refinery, Philadelphia, Pennsylvania.
SECOR, 2002, Site Characterization Report, AST 797 Area, Girard Point Processing Area, Philadelphia Refinery, Philadelphia, Pennsylvania.
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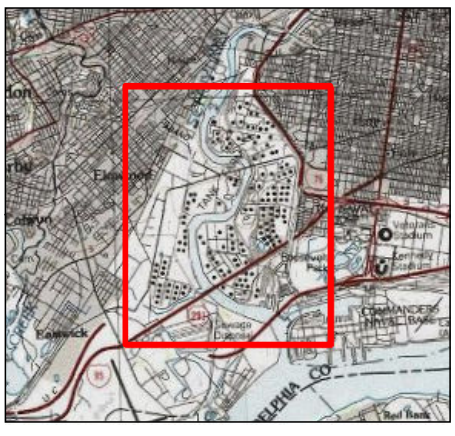

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic
4. Society, i-cubed
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LEGEND

AVAILABLE ESTIMATES OF K (FT/D)

- 0 - 1
- 1 - 10
- 10 - 100
- 100+
- OBSERVATION WELL FOR RW-2 PUMPING TEST
- RW-2 PUMPING TEST LEG
- RW-2 TEST AREA OF INFLUENCE (APPROXIMATED)
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL

K	HYDRAULIC CONDUCTIVITY
T	TRANSMISSIVITY
ft/d	FEET PER DAY
gpm	GALLONS PER MINUTE
ft ^ 2/d	SQUARE FEET PER DAY

0 1,400 Feet
1:16,800 (At Original document size of 11x17)

N

Stantec

EVERGREEN

Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/13/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
3-20

Title
SUMMARY OF AVAILABLE AQUIFER TESTING DATA FOR THE UNCONFINED AQUIFER AT THE FORMER PHILADELPHIA REFINERY

References:

ENSR (1992). Results of a RCRA Facility Investigation, Volume 1 - Technical Report, Philadelphia Refinery, Philadelphia, Pennsylvania.
Stantec (2017a). Remedial Investigation Report, Area of Interest 4, Philadelphia Refining Complex, Philadelphia, Pennsylvania.
Stantec (2017b). Remedial Investigation Report, Area of Interest 8, Philadelphia Refining Complex, Philadelphia, Pennsylvania.

LEGEND

- LOWER AQUIFER
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- K — HYDRAULIC CONDUCTIVITY
- ft/d — FEET PER DAY

0 1,300 Feet

1:15,600 (At Original document size of 11x17)

N

Stantec

EVERGREEN

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/13/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.

3-21

Title

SUMMARY OF AVAILABLE AQUIFER TESTING DATA FOR THE LOWER AQUIFER AT THE FORMER PHILADELPHIA REFINERY

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. K values are rounded to the nearest ft/d for display purposes.
4. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
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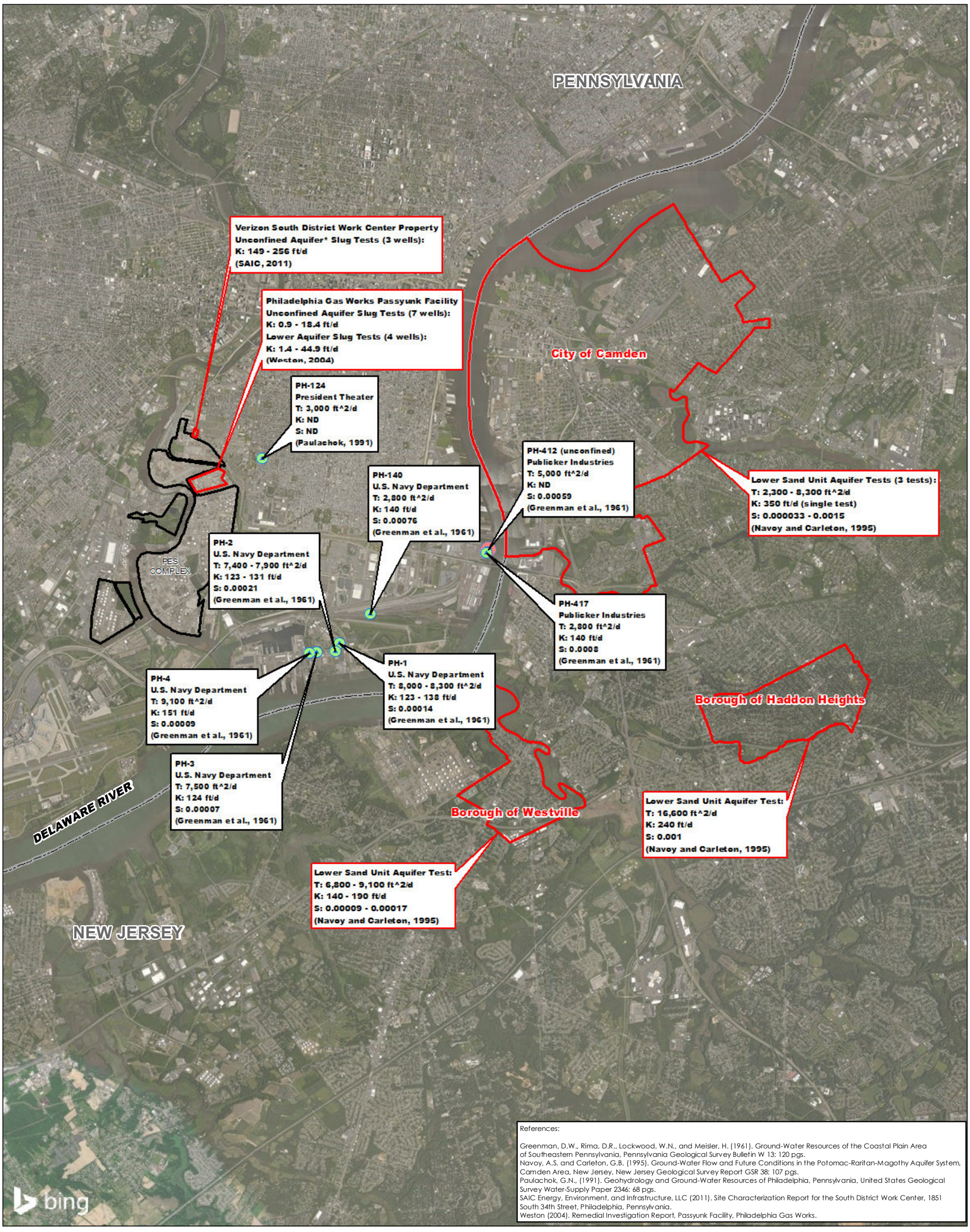

References:

Greenman, D.W., Rima, D.R., Lockwood, W.N., and Meisler, H. (1961). Ground-Water Resources of the Coastal Plain Area of Southeastern Pennsylvania, Pennsylvania Geological Survey Bulletin W 13: 120 pgs.
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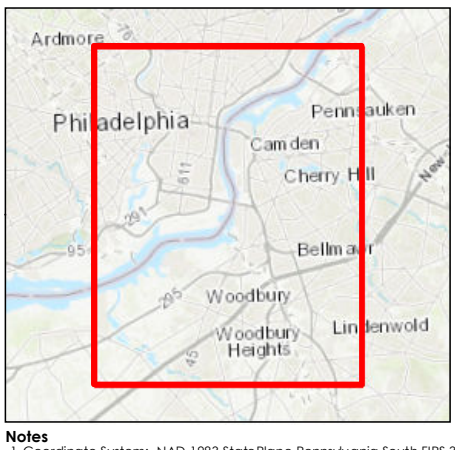

LEGEND

- LOWER SAND UNIT AQUIFER TEST LOCATION
- UNCONFINED AQUIFER TEST LOCATION
- FORMER PHILADELPHIA REFINERY
- GENERAL LOCATION OF AQUIFER TESTING
- STATE BOUNDARY

K	HYDRAULIC CONDUCTIVITY
T	TRANSMISSIVITY
S	STORATIVITY
ft/d	FEET PER DAY
ft ^ 2/d	SQUARE FEET PER DAY
ND	NOT DETERMINED

0 1.25 2.5 Miles

1:79,200 (At Original document size of 11x17)

N

Stantec

EVERGREEN

Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by GWC on 8/13/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
3-22

Title
SUMMARY OF PUBLISHED AQUIFER TESTING DATA FOR THE UNCONFINED AND LOWER AQUIFERS NEAR THE FORMER PHILADELPHIA REFINERY

Notes
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Source: Stantec
3. *Verizon SDWC slug test results may be influenced by the lower aquifer which subcrops locally
4. Service Layer Credits: Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community
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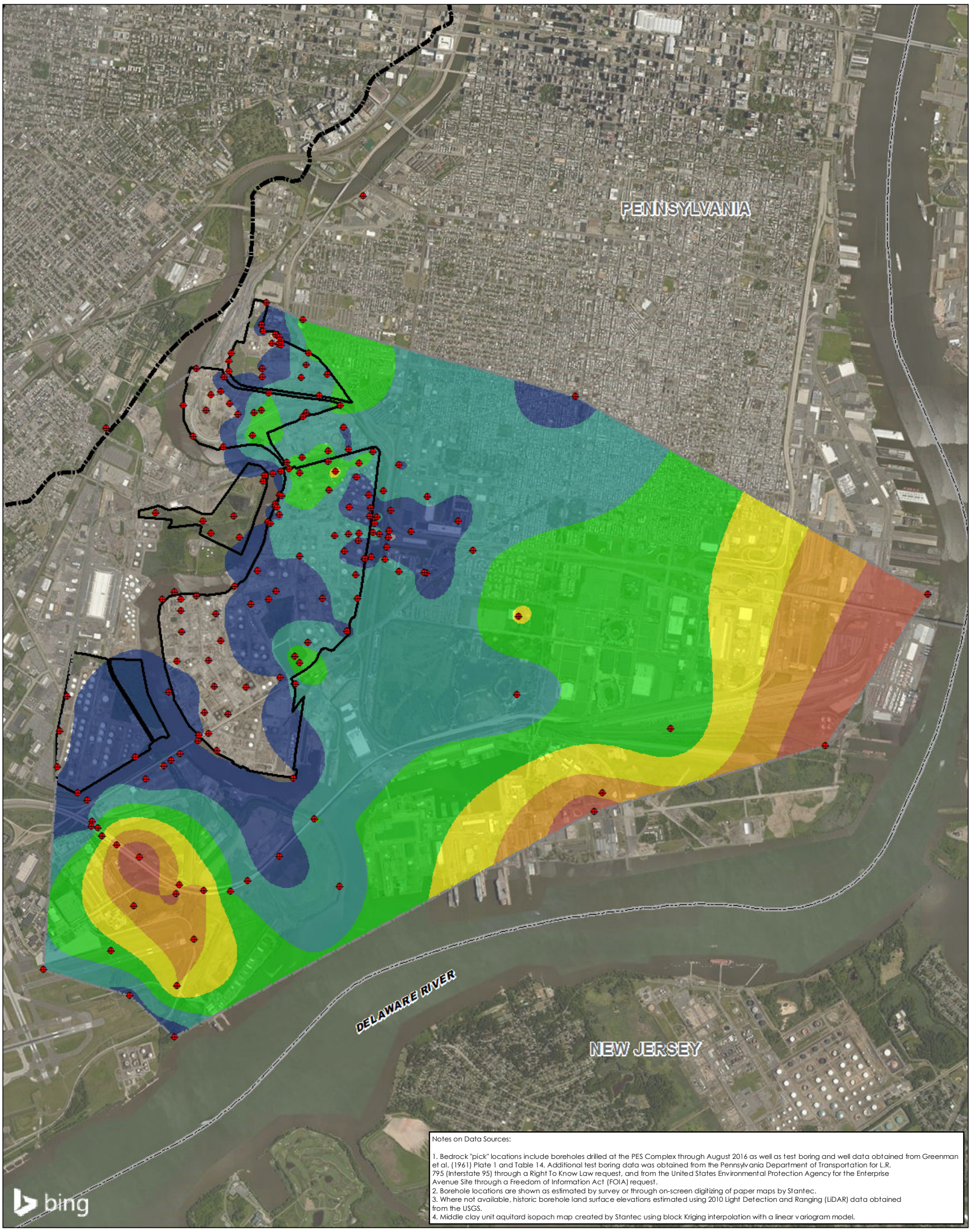

Notes on Data Sources:

1. Bedrock "pick" locations include boreholes drilled at the PES Complex through August 2016 as well as test boring and well data obtained from Greenman et al. (1961) Plate 1 and Table 14. Additional test boring data was obtained from the Pennsylvania Department of Transportation for L.R. 795 (Interstate 95) through a Right To Know Law request, and from the United States Environmental Protection Agency for the Enterprise Avenue Site through a Freedom of Information Act (FOIA) request.
2. Borehole locations are shown as estimated by survey or through on-screen digitizing of paper maps by Stantec.
3. Where not available, historic borehole land surface elevations estimated using 2010 Light Detection and Ranging (LiDAR) data obtained from the USGS.
4. Middle clay unit aquitard isopach map created by Stantec using block Kriging interpolation with a linear variogram model.

Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
4. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed © 2018 Microsoft Corporation © 2018 DigitalGlobe ©CNES (2018) Distribution Airbus DS
5. Contour Interval = 10 feet

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LEGEND

- MIDDLE CLAY UNIT "PICK" LOCATION
- "FALL LINE"
- FORMER PHILADELPHIA REFINERY
- STATE BOUNDARY
- DATA LIMITS FOR MIDDLE CLAY INTERPRETATION

THICKNESS OF MIDDLE CLAY UNIT AQUITARD

FEET

- 1 - 10
- 11 - 20
- 21 - 30
- 31 - 40
- 41 - 50
- 51 - 60+

0 3,000 Feet

1:36,000 (At Original document size of 11x17)

N

Stantec

EVERGREEN

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/14/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

Client/Project

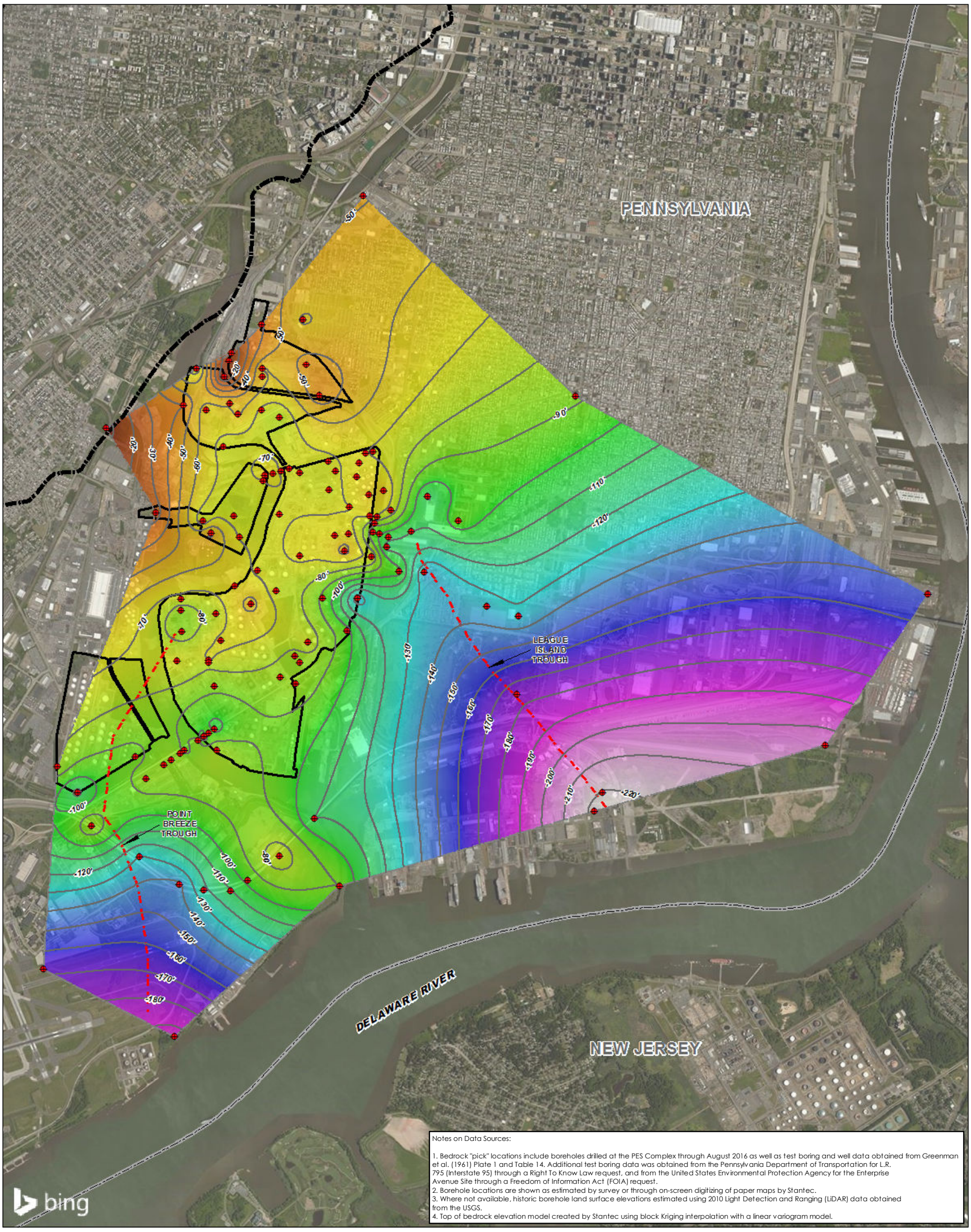
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.

3-23

Title

ISOPACH MAP OF THE MIDDLE CLAY UNIT AQUITARD



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2. Borehole locations are shown as estimated by survey or through on-screen digitizing of paper maps by Stantec.
3. Where not available, historic borehole land surface elevations estimated using 2010 Light Detection and Ranging (LiDAR) data obtained from the USGS.
4. Top of bedrock elevation model created by Stantec using block Kriging interpolation with a linear variogram model.

LEGEND

- TOP OF BEDROCK "PICK" LOCATION
- ESTIMATED BEDROCK ELEVATION (ft NAVD 88)
- "FALL LINE"
- APPROXIMATE AXIS OF MAIN CHANNEL OF BEDROCK TROUGH
- FORMER PHILADELPHIA REFINERY
- EXTENT OF INTERPOLATED BEDROCK SURFACE
- STATE BOUNDARY

BEDROCK ELEVATION MODEL (ft NAVD 88)

High : -7

Low : -223

0 3,000 Feet

1:36,000 (At Original document size of 11x17)

N

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Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/14/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
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3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.

3-24

Title

BEDROCK STRUCTURE CONTOUR MAP - TOP OF BEDROCK

Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec
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5. Contour Interval = 10 feet

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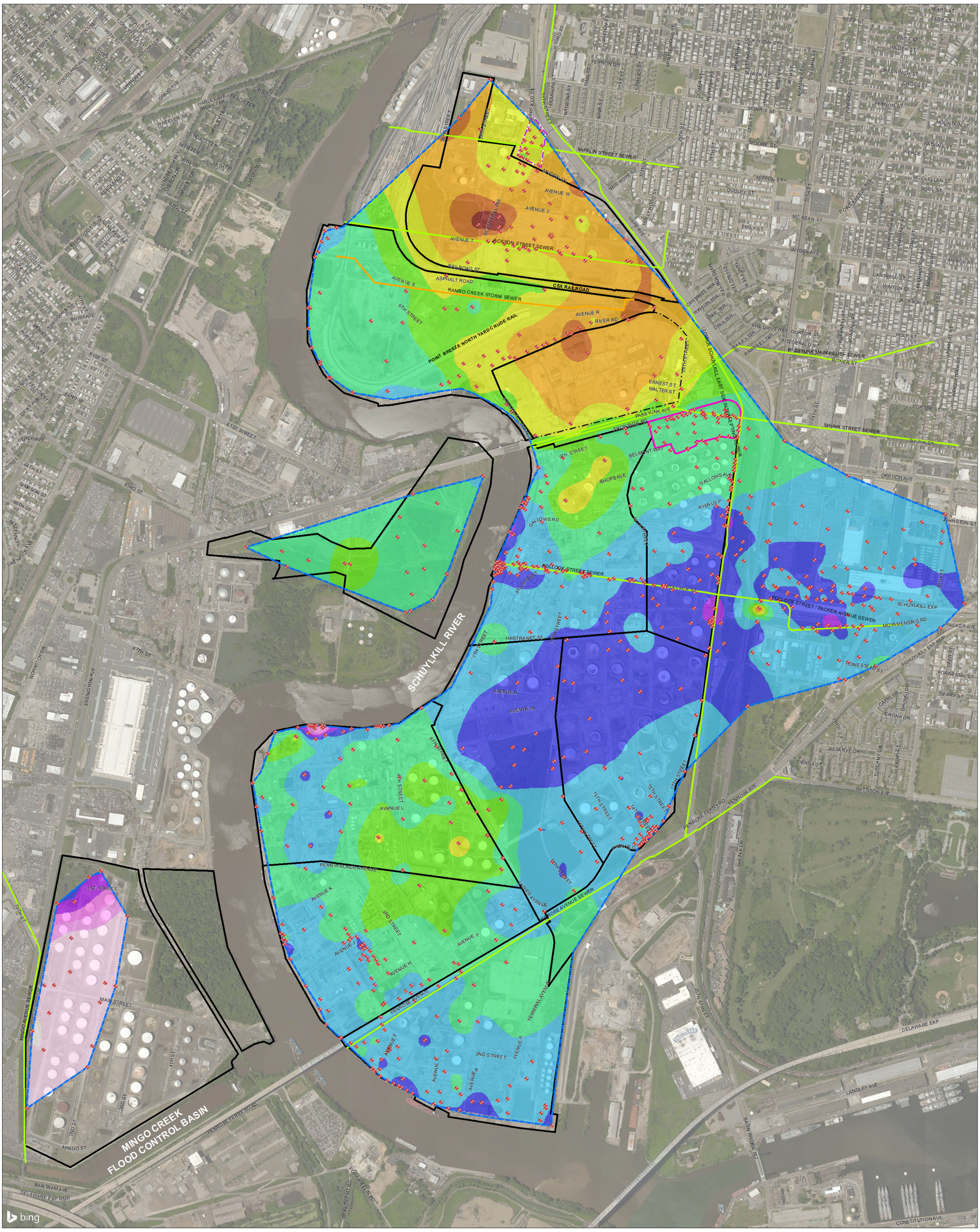

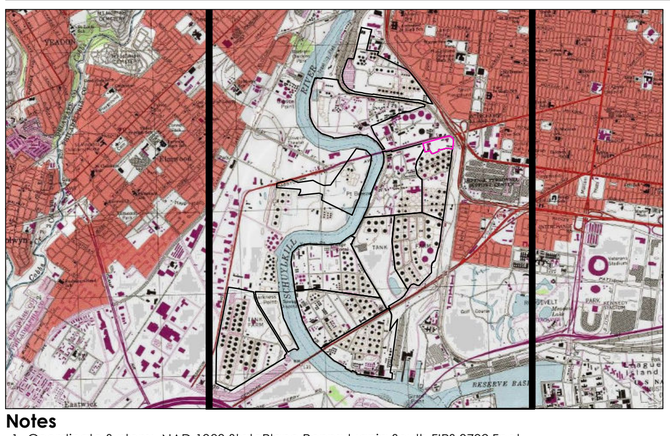

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet North American Vertical Datum of 1988 (NAVD 88)
2. Sources: Stantec, Philadelphia Gas Works (PGW), and Defense Logistics Agency (DLA)
3. Depth to groundwater and LNAPL, where present, were measured in each well to the nearest one-hundredth of a foot using an interface probe.
4. FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
5. Groundwater elevation data was interpolated using point kriging with a linear variogram model in Surfer to produce a surface model. The model is interpreted to be a reasonable approximation of the water-table elevation within the limits of the available well data.
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LEGEND

- WELL UTILIZED FOR THE MAY 2014 WATER-TABLE ELEVATION SURFACE
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- APPROXIMATE LOCATION OF RAMBO CREEK STORM SEWER
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- APPROXIMATE LIMITS OF WATER-TABLE WELL CONTROL

MAY 2014 WATER-TABLE ELEVATION

FT NAVD88

- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8

0 500 1,000 1,500 Feet

1:7,000 (At original document size of 24x36)

N

Figure No.

3-25

Title

MAY 2014 WATER-TABLE ELEVATION

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454

Prepared by ADK on 8/14/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/18/2018

Stantec

EVERGREEN

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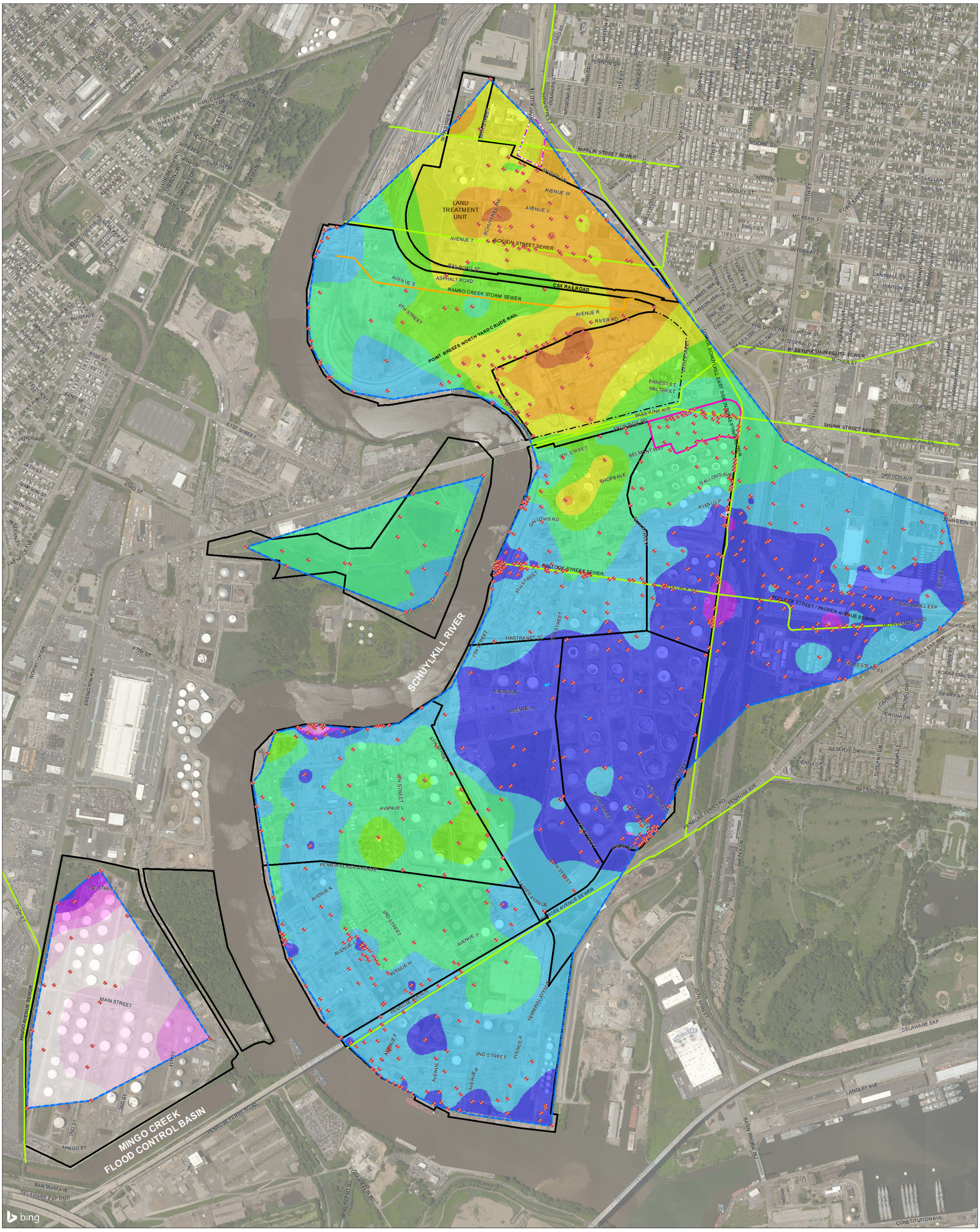

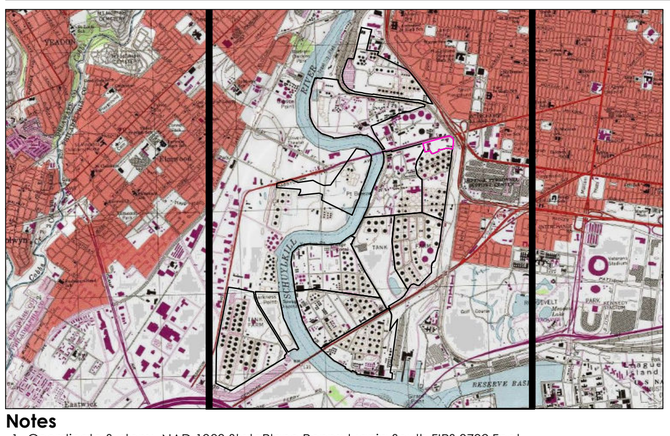

Notes

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LEGEND

- WELL UTILIZED FOR THE MAY 2015 WATER-TABLE ELEVATION SURFACE
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- APPROXIMATE LOCATION OF RAMBO CREEK STORM SEWER
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- APPROXIMATE LIMITS OF WATER-TABLE WELL CONTROL

MAY 2015 WATER-TABLE ELEVATION

FT NAVD88

- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8

0 500 1,000 1,500 Feet

1:7,000 (At original document size of 24x36)

N

Figure No.

3-26

Title

MAY 2015 WATER-TABLE ELEVATION

Client/Project

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FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454

Prepared by ADK on 8/14/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/19/2018

Stantec

EVERGREEN

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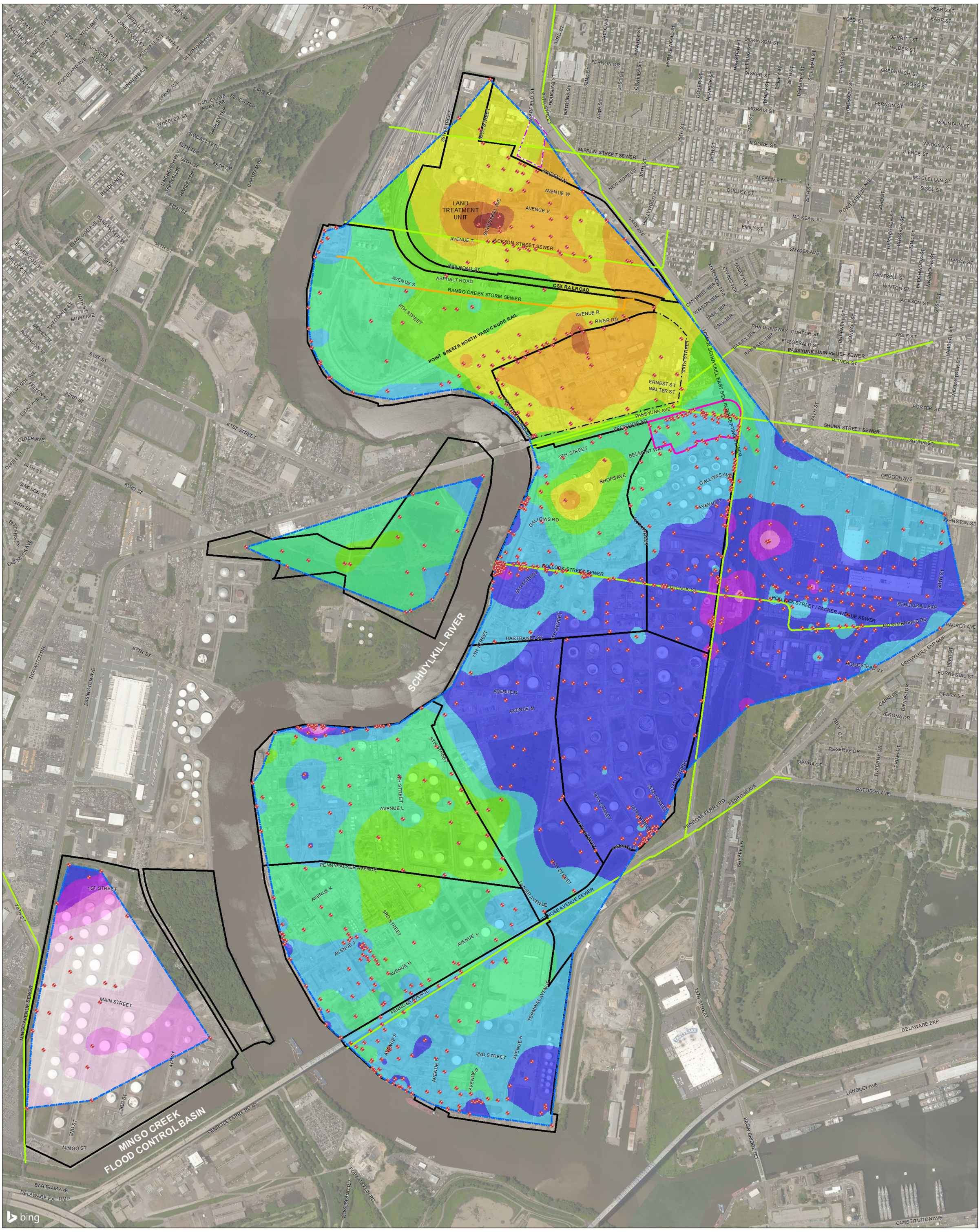

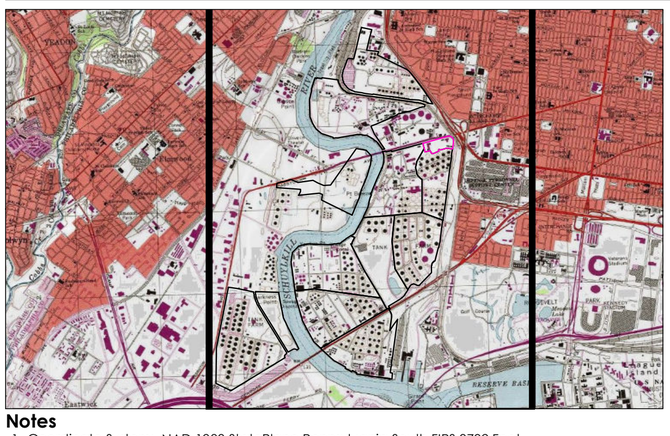

Notes

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2. Sources: Stantec, Philadelphia Gas Works (PGW), and Defense Logistics Agency (DLA)
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4. FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
5. Groundwater elevation data was interpolated using point kriging with a linear variogram model in Surfer to produce a surface model. The model is interpreted to be a reasonable approximation of the water-table elevation within the limits of the available well data.
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LEGEND

- WELL UTILIZED FOR THE MAY 2016 WATER-TABLE ELEVATION SURFACE
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- APPROXIMATE LOCATION OF RAMBO CREEK STORM SEWER
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- APPROXIMATE LIMITS OF WATER-TABLE WELL CONTROL

MAY 2016 WATER-TABLE ELEVATION
FT NAVD88

- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8

0 500 1,000 1,500 Feet

1:7,000 (At original document size of 24x36)

N

Figure No.
3-27

Title
MAY 2016 WATER-TABLE ELEVATION

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/14/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/19/2018

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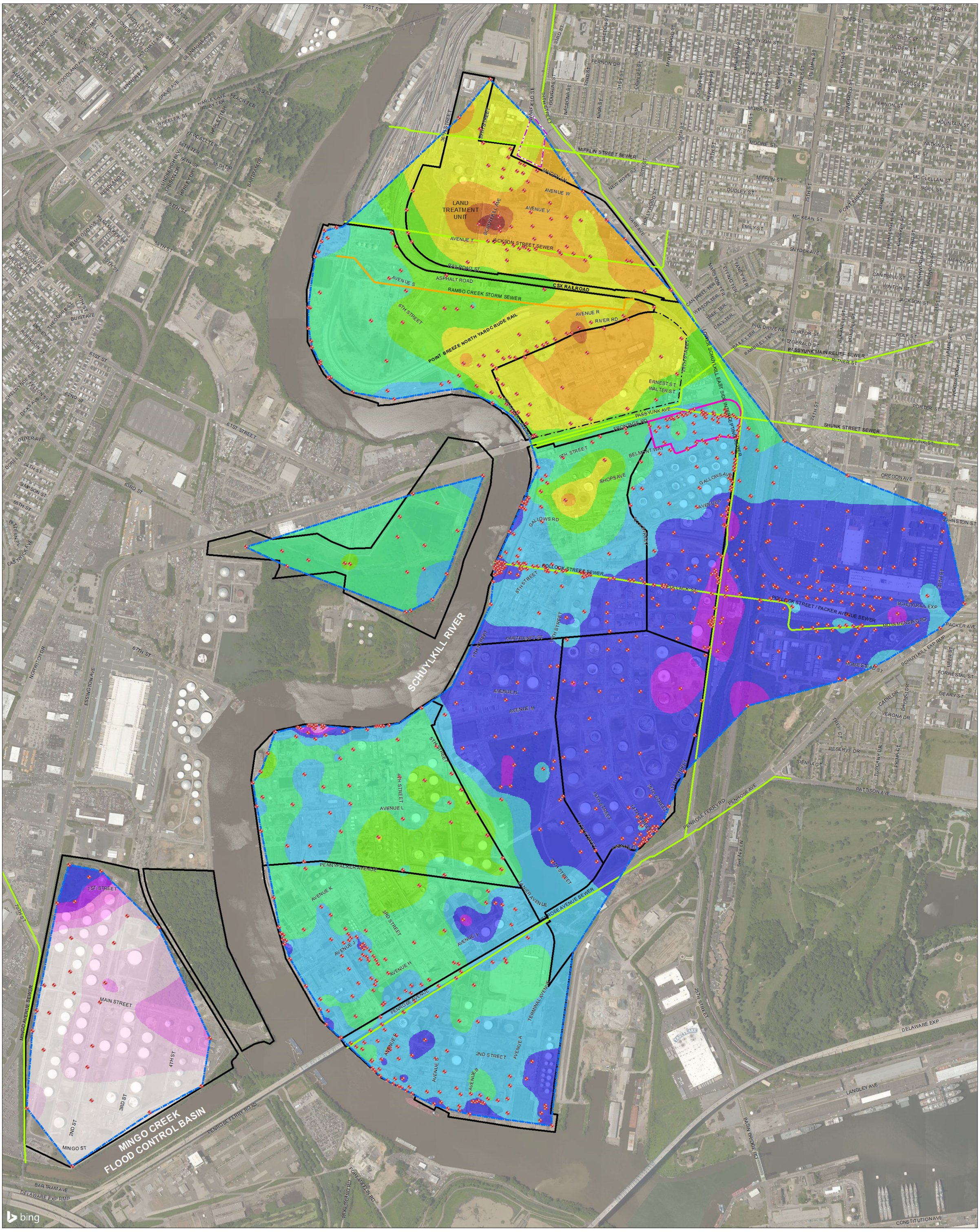

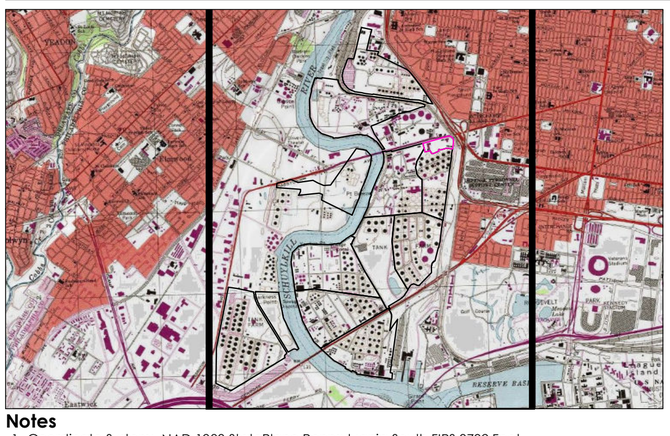

Notes

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2. Sources: Stantec, Philadelphia Gas Works (PGW), and Defense Logistics Agency (DLA)
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4. FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
5. Groundwater elevation data was interpolated using point kriging with a linear variogram model in Surfer to produce a surface model. The model is interpreted to be a reasonable approximation of the water-table elevation within the limits of the available well data.
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LEGEND

- WELL UTILIZED FOR THE MAY 2017 WATER-TABLE ELEVATION SURFACE
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- APPROXIMATE LOCATION OF RAMBO CREEK STORM SEWER
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- APPROXIMATE LIMITS OF WATER-TABLE WELL CONTROL

MAY 2017 WATER-TABLE ELEVATION

FT NAVD88

- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8

0 500 1,000 1,500 Feet

1:7,000 (At original document size of 24x36)

N

Figure No.

3-28

Title

MAY 2017 WATER-TABLE ELEVATION

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454

Prepared by ADK on 8/14/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/19/2018

Stantec

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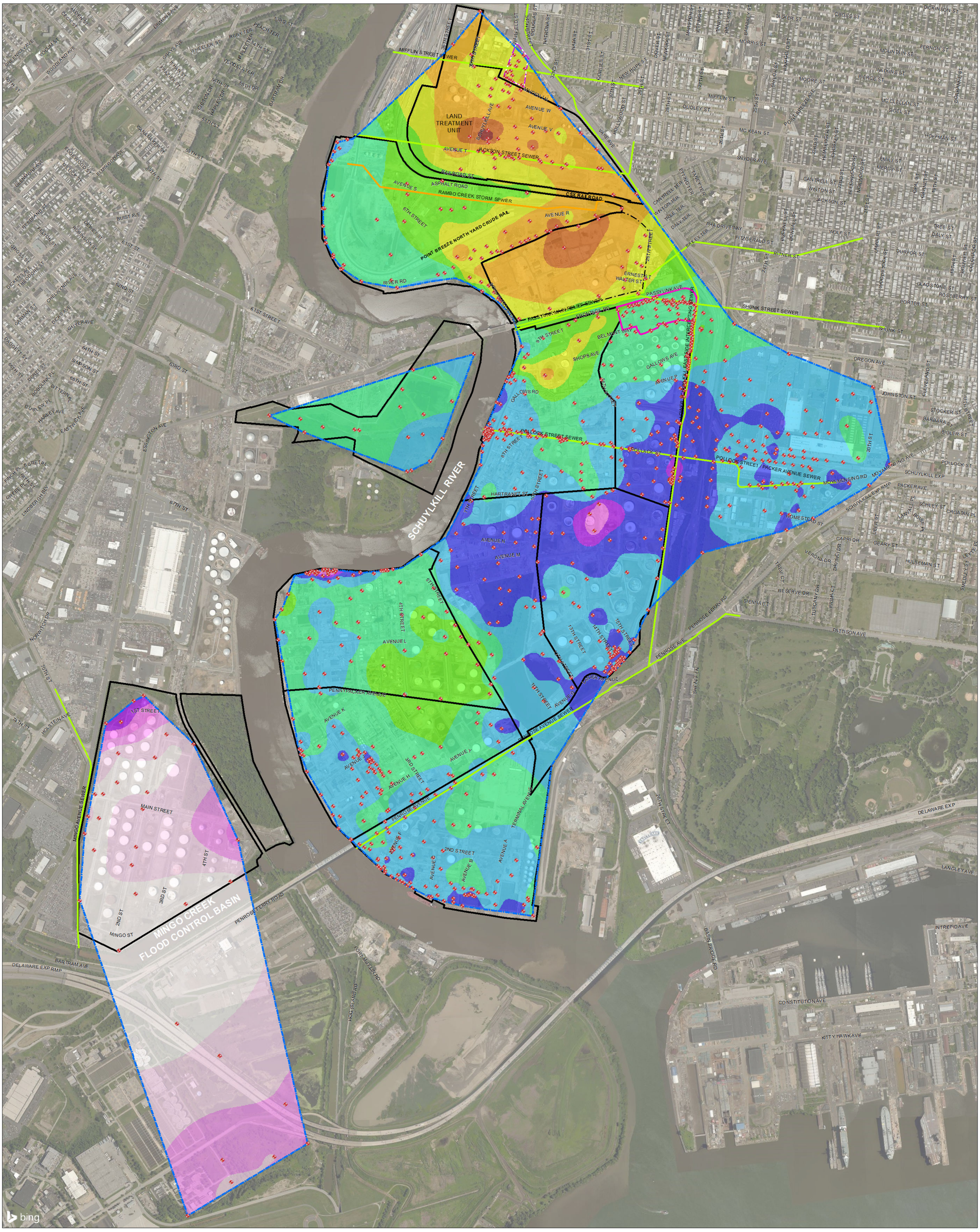

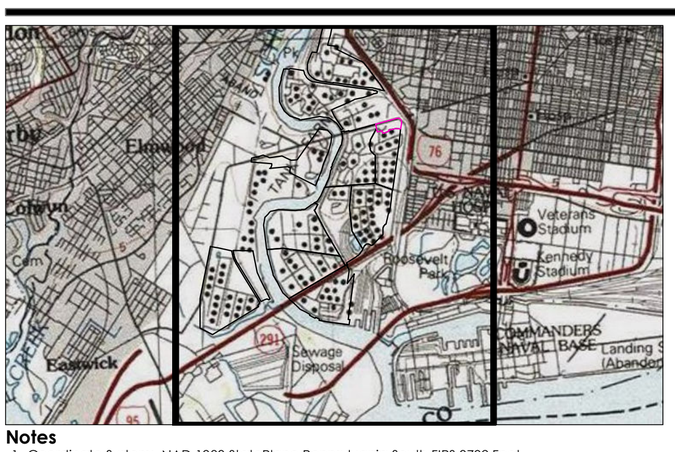

Notes

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LEGEND

- WELL UTILIZED FOR THE JUNE 2018 WATER-TABLE ELEVATION SURFACE
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- APPROXIMATE LOCATION OF RAMBO CREEK STORM SEWER
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- APPROXIMATE LIMITS OF WATER-TABLE WELL CONTROL

JUNE 2018 WATER-TABLE ELEVATION
FT NAVD88

- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8

0 500 1,000 1,500 Feet

1:8,100 (At original document size of 24x36)

N

Figure No.
3-29

Title
JUNE 2018 WATER-TABLE ELEVATION

Client/Project
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EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location
City of Philadelphia,
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213402454
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Stantec

EVERGREEN

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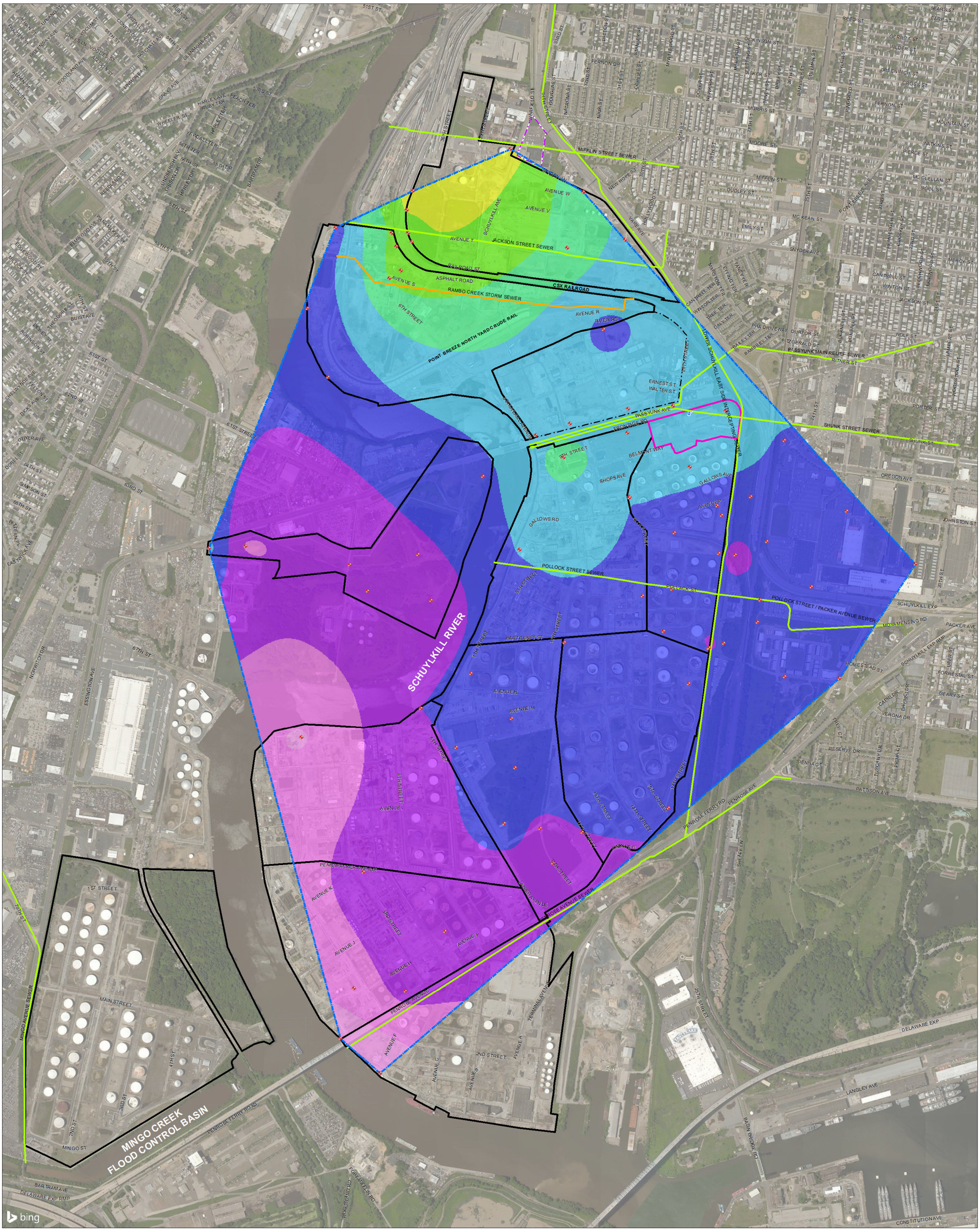

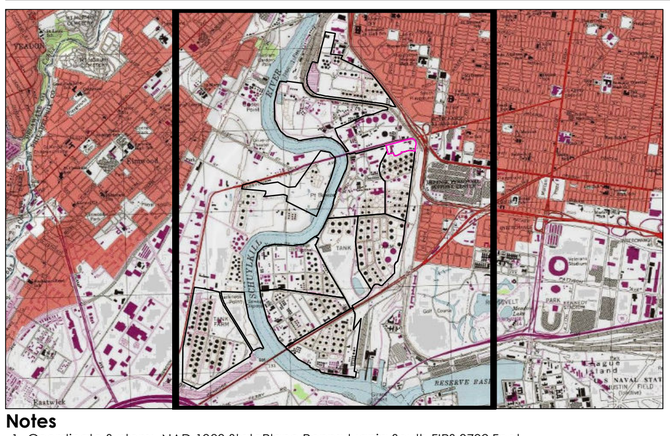

Notes

1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet North American Vertical Datum of 1988 (NAVD 88)
2. Sources: Stantec, Philadelphia Gas Works (PGW), and Defense Logistics Agency (DLA)
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LEGEND

- WELL UTILIZED FOR THE MAY 2014 LOWER AQUIFER ELEVATION SURFACE
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- APPROXIMATE LOCATION OF RAMBO CREEK STORM SEWER
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- APPROXIMATE LIMITS OF LOWER AQUIFER WELL CONTROL

MAY 2014 LOWER AQUIFER ELEVATION

FT NAVD88

- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8

0 500 1,000 1,500 Feet

1:7,000 (At original document size of 24x36)

N

Figure No.

3-30

Title

MAY 2014 LOWER AQUIFER ELEVATION

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454

Prepared by ADK on 8/14/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/20/2018

Stantec

EVERGREEN

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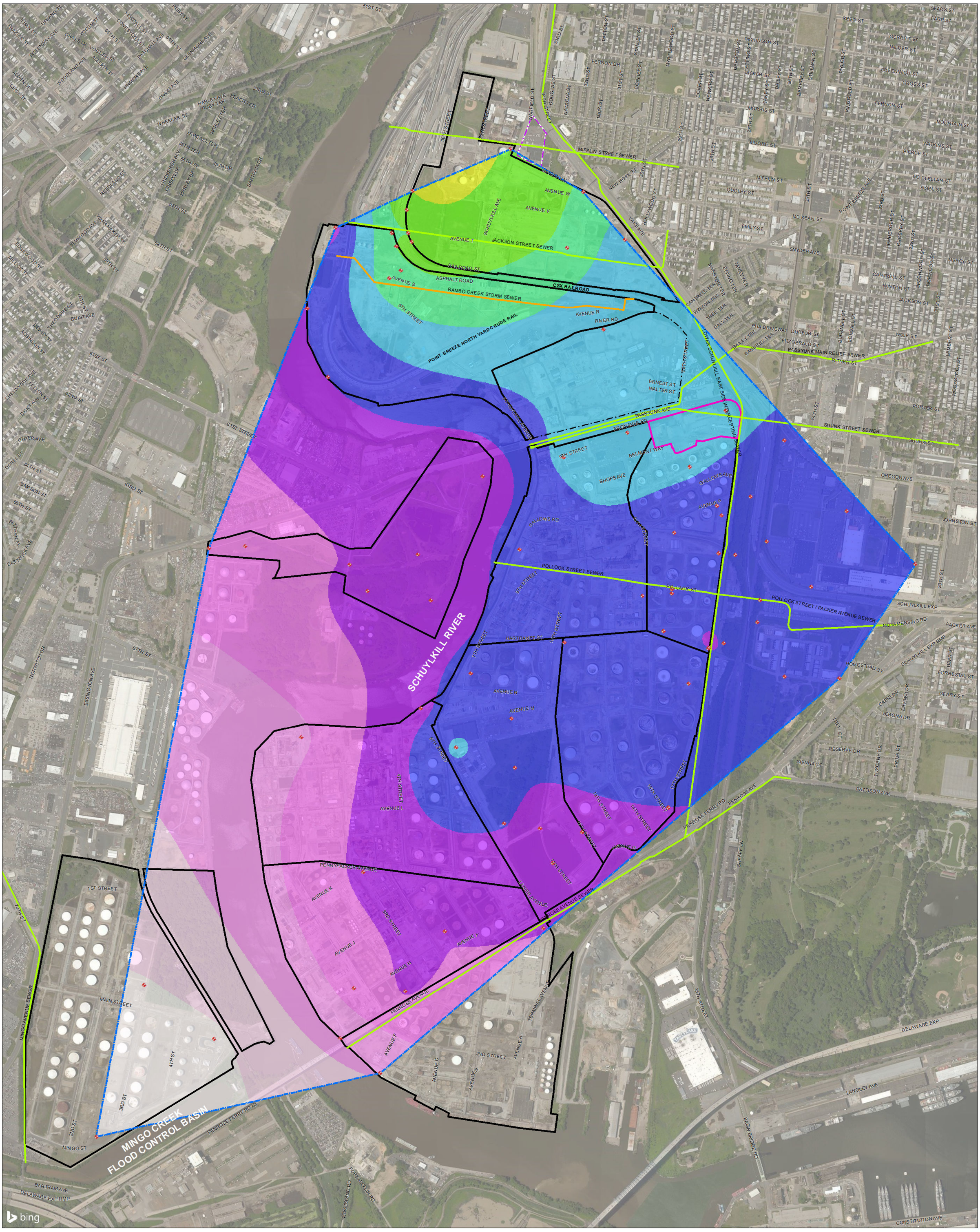

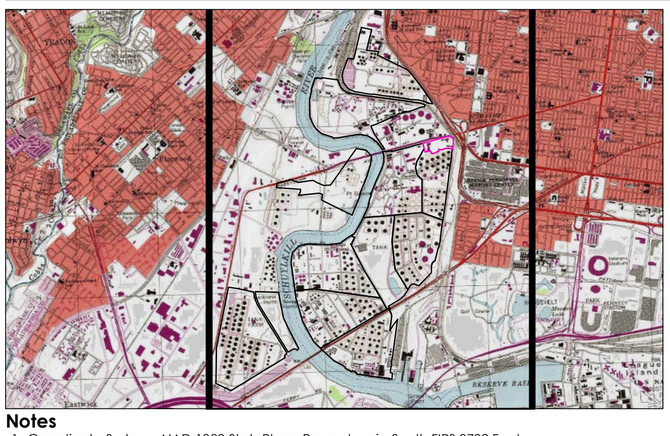

Notes

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LEGEND

- WELL UTILIZED FOR THE MAY 2015 LOWER AQUIFER ELEVATION SURFACE
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- APPROXIMATE LOCATION OF RAMBO CREEK STORM SEWER
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- APPROXIMATE LIMITS OF LOWER AQUIFER WELL CONTROL

MAY 2015 LOWER AQUIFER ELEVATION

FT NAVD88

- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8

0 500 1,000 1,500 Feet

1:7,000 (At original document size of 24x36)

N

Figure No.

3-31

Title

MAY 2015 LOWER AQUIFER ELEVATION

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454

Prepared by ADK on 8/14/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/19/2018

Stantec

EVERGREEN

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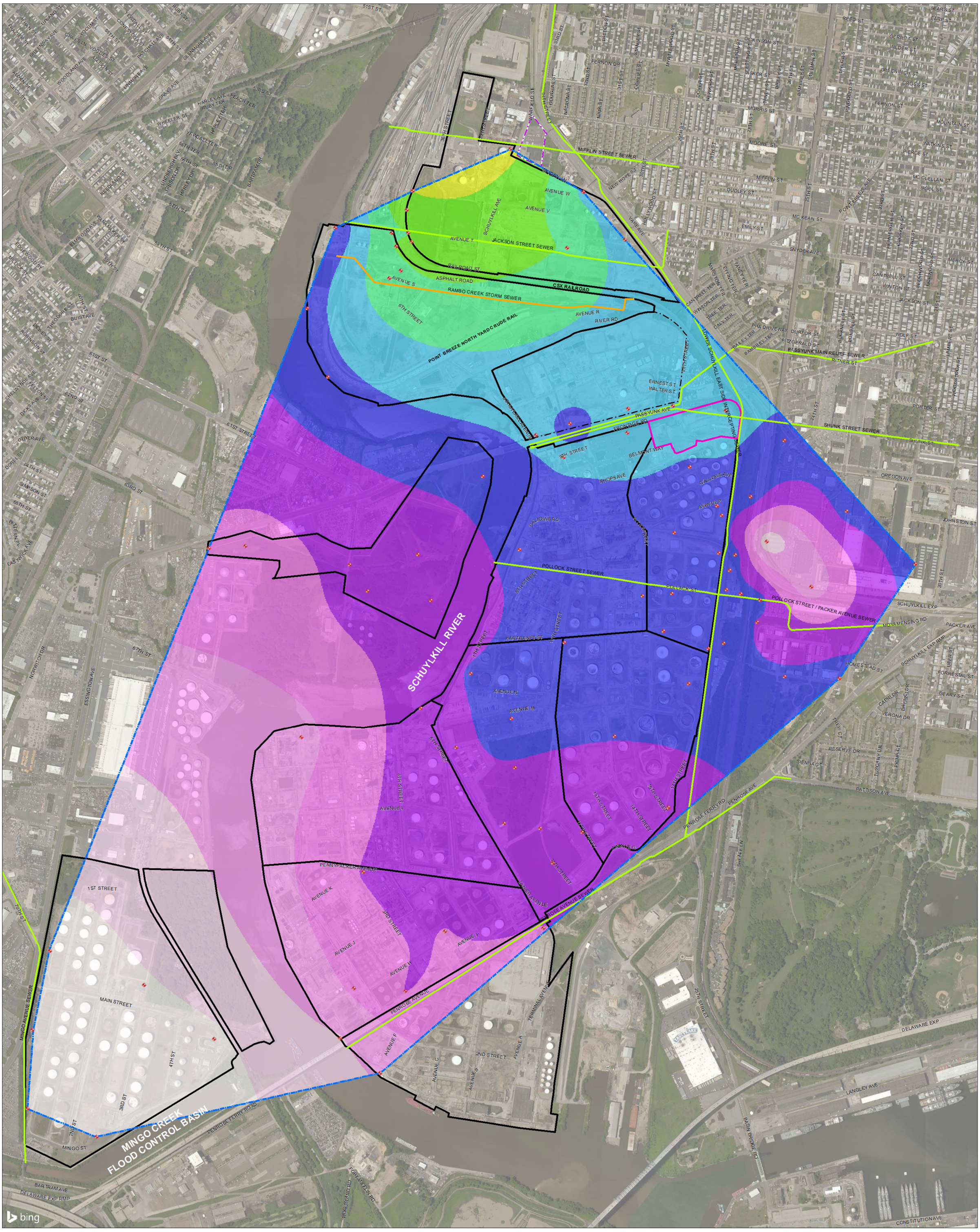

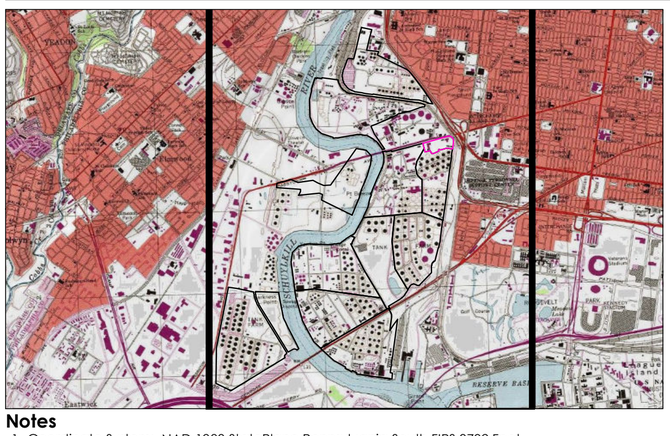

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LEGEND

- WELL UTILIZED FOR THE MAY 2016 LOWER AQUIFER ELEVATION SURFACE
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- APPROXIMATE LOCATION OF RAMBO CREEK STORM SEWER
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- APPROXIMATE LIMITS OF LOWER AQUIFER WELL CONTROL

MAY 2016 LOWER AQUIFER ELEVATION

FT NAVD88

- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8

0 500 1,000 1,500 Feet

1:7,000 (At original document size of 24x36)

N

Figure No.

3-32

Title

MAY 2016 LOWER AQUIFER ELEVATION

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454

Prepared by ADK on 8/14/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/19/2018

Stantec

EVERGREEN

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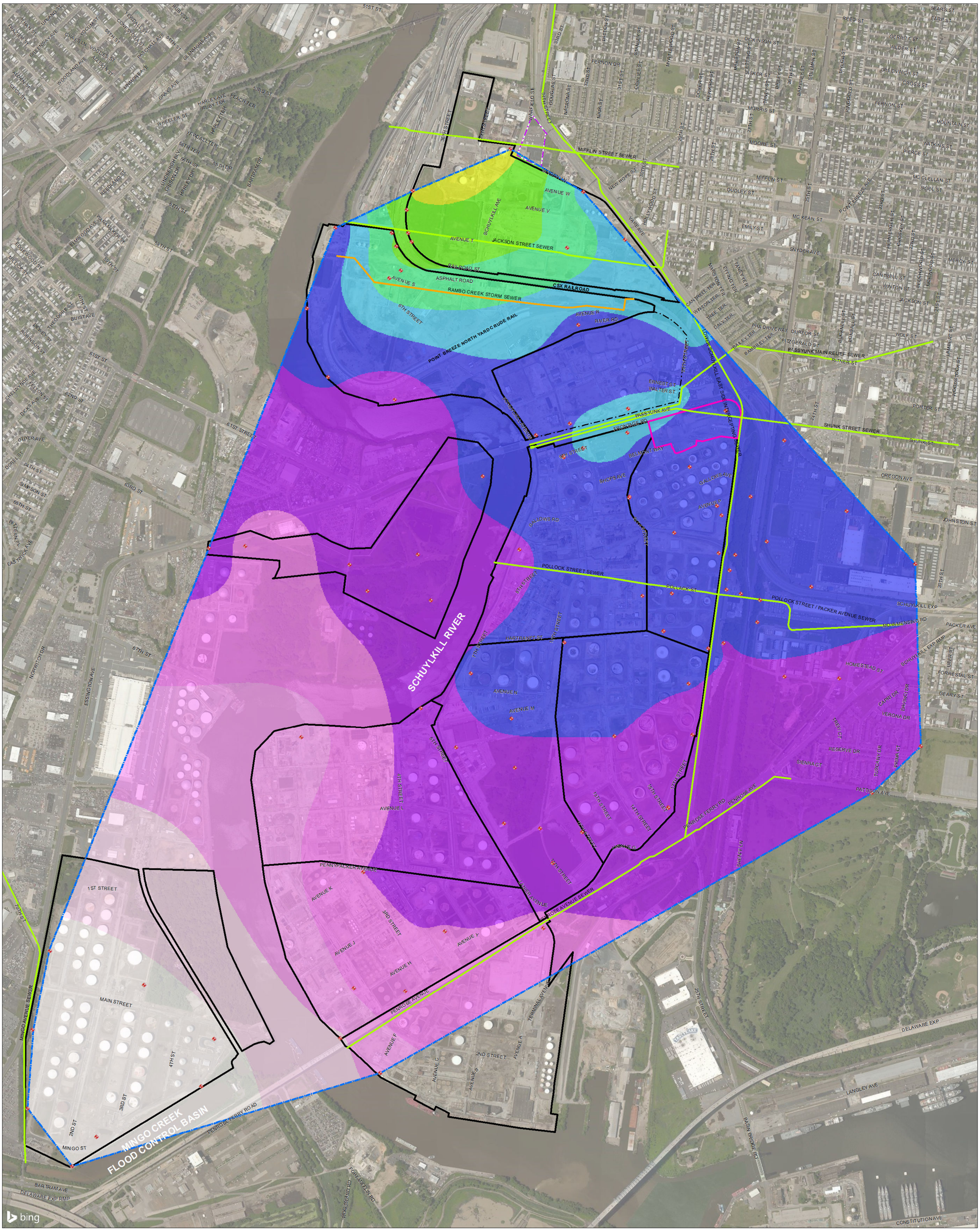

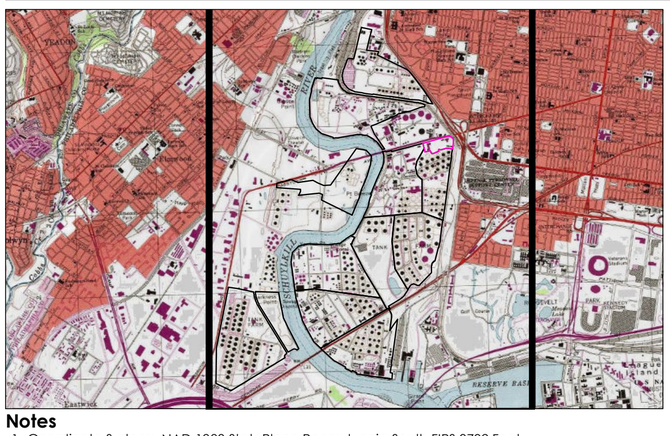

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LEGEND

- WELL UTILIZED FOR THE MAY 2017 LOWER AQUIFER ELEVATION SURFACE
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- APPROXIMATE LOCATION OF RAMBO CREEK STORM SEWER
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- APPROXIMATE LIMITS OF LOWER AQUIFER WELL CONTROL

MAY 2017 LOWER AQUIFER ELEVATION

FT NAVD88

- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8

0 500 1,000 1,500 Feet

1:7,000 (At original document size of 24x36)

N

Figure No.

3-33

Title

MAY 2017 LOWER AQUIFER ELEVATION

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location

City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454

Prepared by ADK on 8/14/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/19/2018

Stantec

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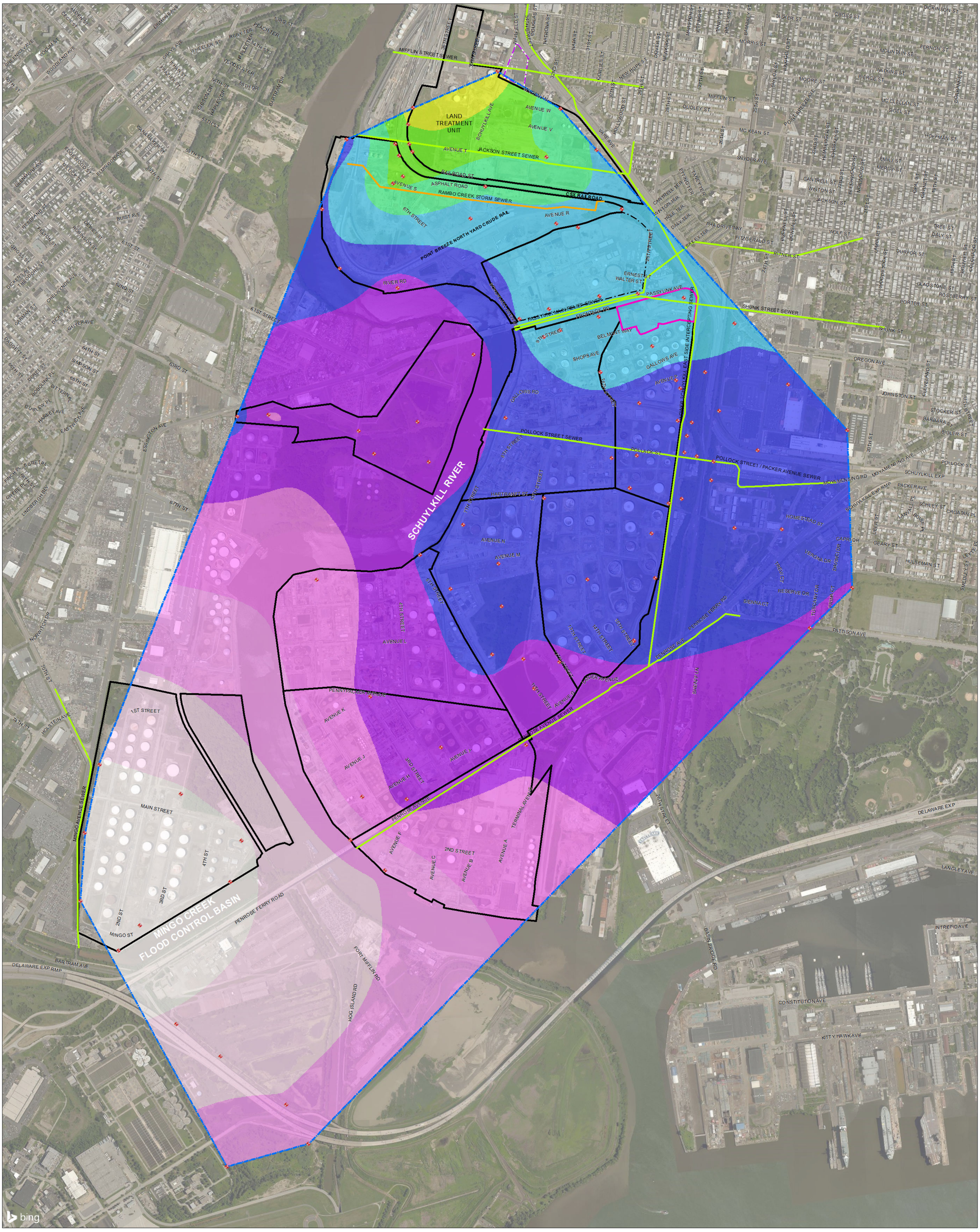

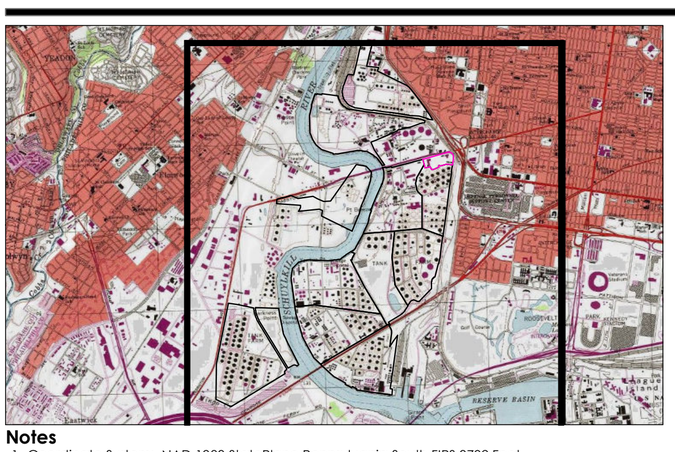

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LEGEND

- WELL UTILIZED FOR THE JUNE 2018 LOWER AQUIFER ELEVATION SURFACE
- APPROXIMATE LOCATION OF PHILADELPHIA WATER DEPARTMENT SEWER
- APPROXIMATE LOCATION OF RAMBO CREEK STORM SEWER
- PHILADELPHIA GAS WORKS (PGW) PASSYUNK FACILITY
- VERIZON SOUTH DISTRICT WORK CENTER (SDWC) PROPERTY
- AREA OF INTEREST (AOI) BOUNDARY
- BELMONT TERMINAL
- APPROXIMATE LIMITS OF LOWER AQUIFER WELL CONTROL

JUNE 2018 LOWER AQUIFER ELEVATION
FT NAVD88

- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8

0 500 1,000 1,500 Feet
1:8,100 (At original document size of 24x36)

N

Figure No.
3-34

Title
JUNE 2018 LOWER AQUIFER ELEVATION

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location
City of Philadelphia,
Philadelphia County,
Pennsylvania

213402454
Prepared by ADK on 8/14/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/19/2018

Stantec

EVERGREEN

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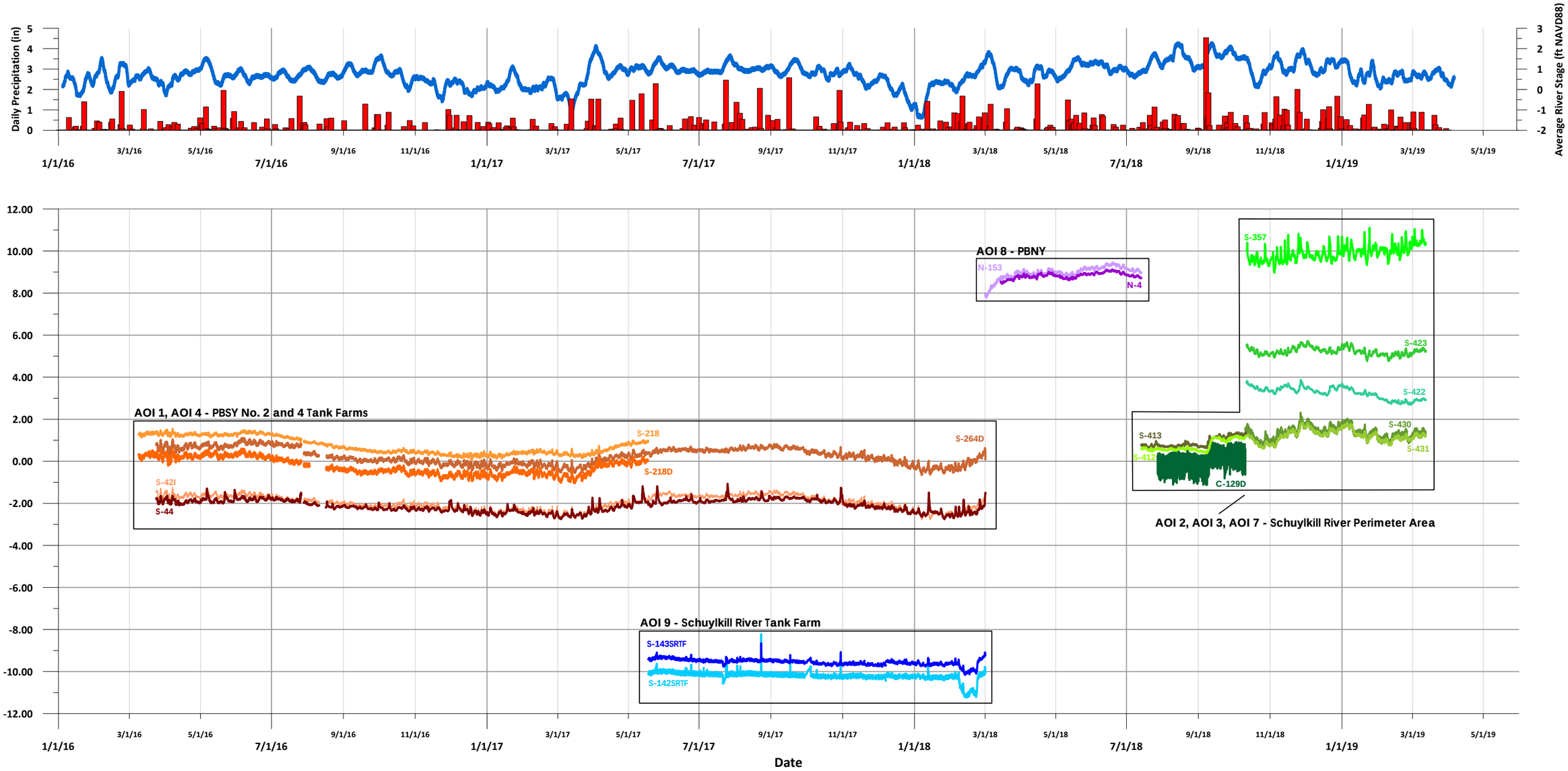

Notes

1. Monitoring well water levels were continuously recorded using non-vented data loggers set to record water depth at 10 minute intervals. Water depths were compensated for barometric pressure using linear correction to synoptic measurements collected with a barometric data logger. Water depths were converted to water-level elevations using surveyed top of well casing elevations and were verified using manual water-level measurements. Water-level elevations are corrected for light, non-aqueous phase liquid (LNAPL) where present in wells.
2. River stage data obtained from the United States Geological Survey for Gage Station 01474501.
3. Precipitation data obtained from the NOAA National Center for Environmental Information (NCEI) for Philadelphia International Airport (PHL).
4. Aerial photograph obtained from the Pennsylvania Spatial Data Access (PASDA) internet mapping service.
5. FT NAVD 88 = feet referenced to the North American Vertical Datum of 1988
6. in = inches; ft = feet; hr = hour
7. AOI = Area of Interest; PBNY = Point Breeze North Yard; PBSY = Point Breeze South Yard

Upper Plot

- PHL Total Daily Precipitation (in)
- 12 Hour Running Average - Schuylkill River at 30th Street

Lower Plot

Water-Table Wells

N-153, S-44, S-423, S-142SRTF, S-412, S-430, S-218, S-413, S-431, S-357, S-422

Lower Aquifer Wells

C-129D, S-143SRTF, N-4, S-218D, S-42I, S-264D

Stantec

Project Location
Former Philadelphia Refinery
Philadelphia, Pennsylvania

213402454
Prepared/Updated by ADK on 3/20/2019
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/19/2018

Client/Project
PHILADELPHIA REFINERY OPERATIONS,
A SERIES OF EVERGREEN RESOURCES GROUP, LLC
3144 PASSYUNK AVENUE
PHILADELPHIA, PA 19145

Figure No.
3-35

Title
FORMER PHILADELPHIA REFINERY WATER-LEVEL MONITORING DATA LOGGER HYDROGRAPHS

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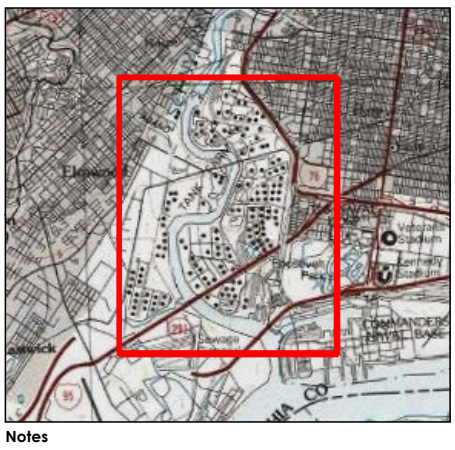
Note on Data Sources:

1. Information related to bulkhead construction and condition obtained from Philadelphia Energy Solutions Refining and Marketing, LLC (PES) in January 2018 and observed by Stantec on April 3, 2018.
2. Integrated topographic and bathymetric model obtained from the National Oceanic and Atmospheric Administration (NOAA) National Centers for Environmental Information (NCEI, 2017). The model is based on a 2010 Light Detection and Ranging (LiDAR) digital elevation model (DEM) obtained from the City of Philadelphia and 2012-2013 bathymetry obtained from the United States Army Corps of Engineers - Philadelphia District.



LEGEND

Bulkhead Penetration Location

- Combined Sewer Outfall
- Open Pipe
- Capped/Sealed Pipe
- Pipe With Flap Gate
- Pipe End Submerged (Unknown)
- Approximate Location of Philadelphia Water Department Sewer
- Approximate Location of Rambo Creek Storm Sewer

Bulkhead Location

General Construction

- Concrete Cutoff Wall/ Concrete Sheeting
- Steel Sheeting
- Masonry Wall
- Timber Sheeting

INTEGRATED TOPOGRAPHIC AND BATHYMETRIC MODEL (NCEI, 2017)

FEET NAVD88

High : 110

Low : -59

500 0 500 1,000 Feet

1:16,000 (At Original document size of 11x17)

N

Stantec

EVERGREEN

Project Location

City of Philadelphia, Philadelphia County, Pennsylvania

213402454

Prepared by ADK on 8/10/2018
Technical Review by ANP on 9/20/2018
Independent Review by JLM on 10/19/2018

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.

3-36

Title

FORMER PHILADELPHIA REFINERY - SCHUYLKILL RIVER SHORELINE AND BULKHEAD DATA

Notes

1. Vertical Datum: North American Vertical Datum of 1988 (NAVD 88)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Source: Stantec and Philadelphia Energy Solutions Refining and Marketing, LLC (PES)
4. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation

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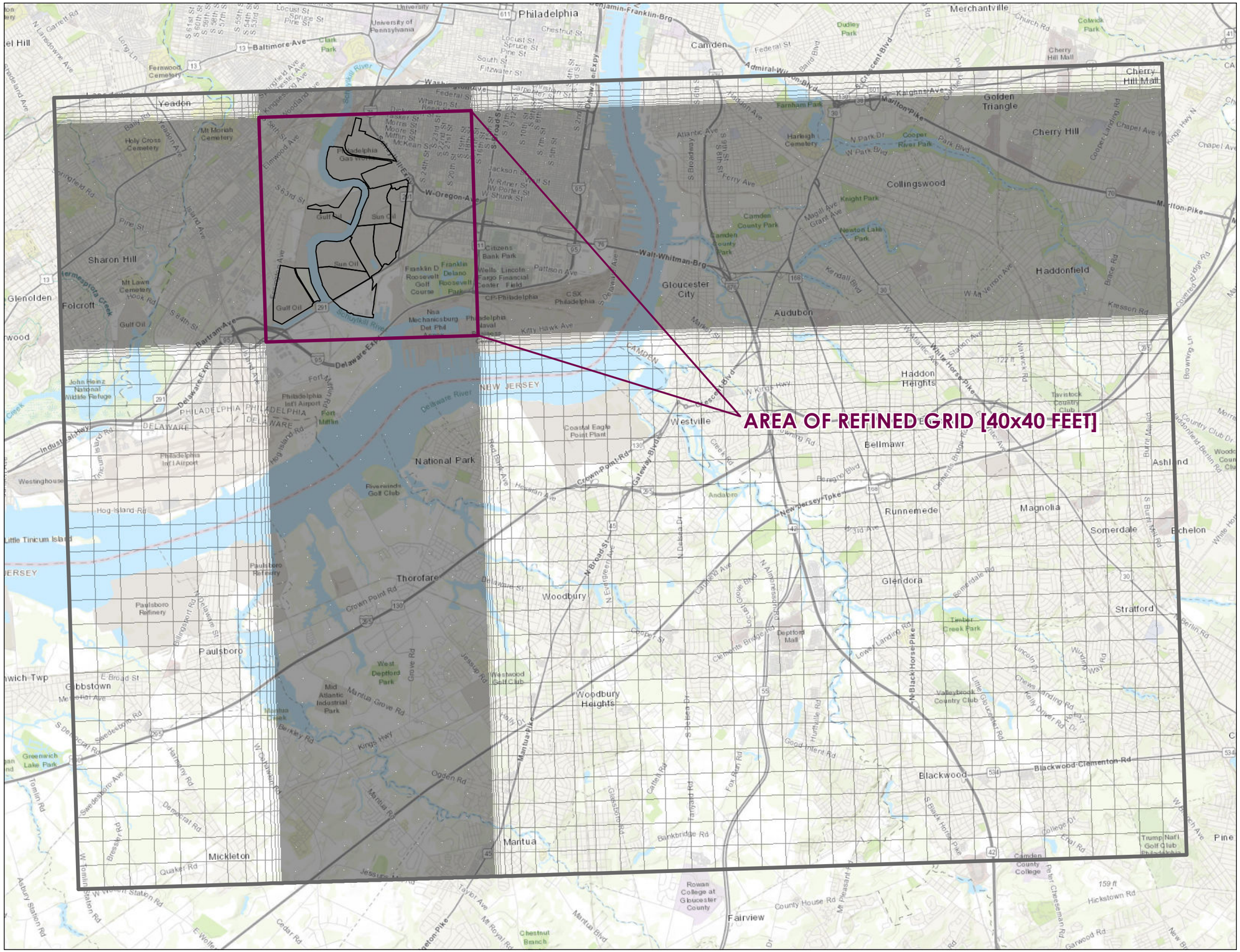


Figure No.
5-1

Title
MODEL DOMAIN AND FINITE DIFFERENCE GRID

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

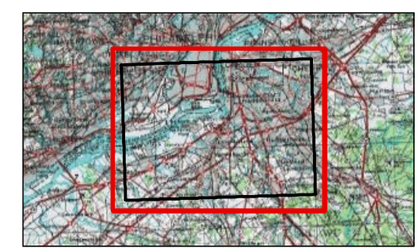
Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/19/2018

0 5,250 10,500 Feet
1:80,000 (At Original document size of 11x17)

N

Legend
- Area of Interest (AOI) Boundary
- Model Domain
- Refined Finite Grid
- Finite Difference Grid



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

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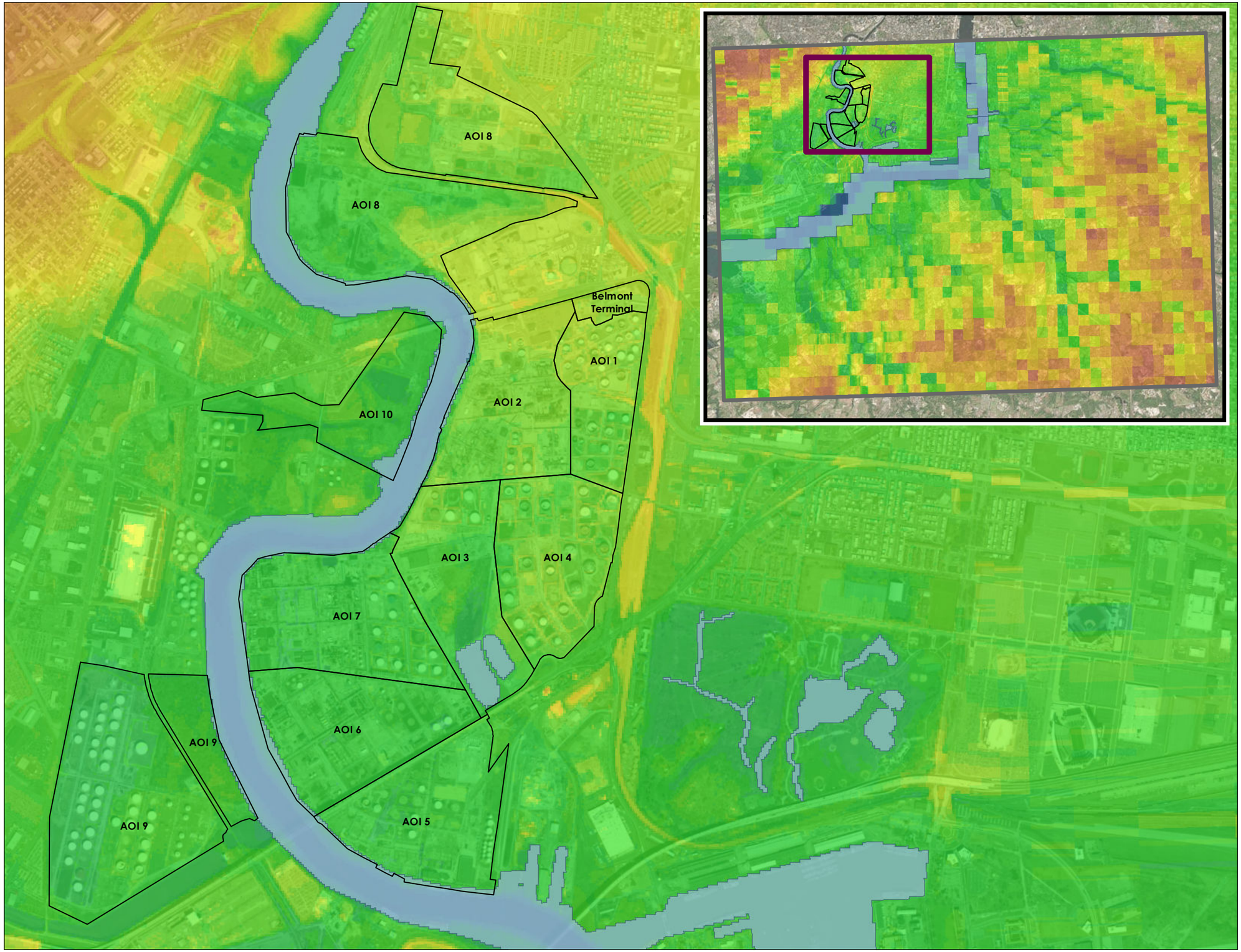


Figure No.
5-2A

Title

TOP OF LAYER 1 ELEVATION

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia,
Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 12,000 24,000 Feet
1:18,000 (At Original document size of 11x17)

N

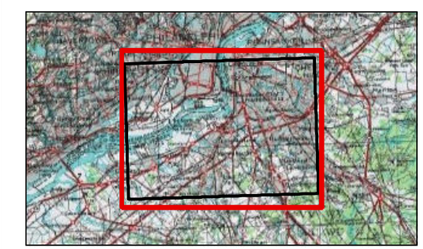
Legend

- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River (RIV) Cell

Surface/Top of Layer 1 Elevation (FT NAVD88)

High : 124

Low : -59



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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EVERGREEN

V:\2134\active\213402454\03_data\dwgs_design\gis\mxds\mod\flow_fr_mxds\st_paul_draft\Model Figures\fig5-2a_pescomplex_top1elevation_ansi_b.mxd Revised: 2018-12-21 By: aldingbeil

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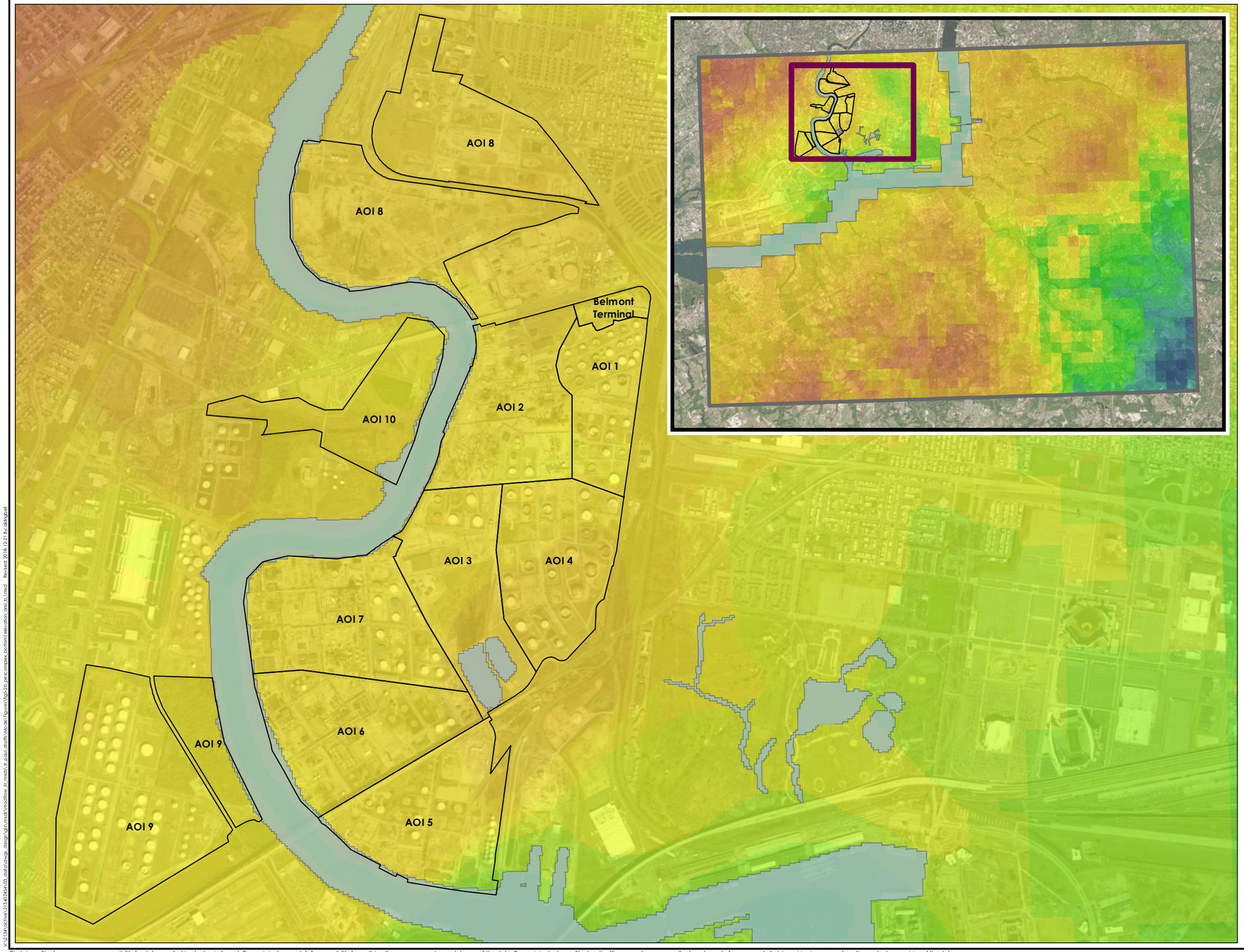

Figure No.
5-2B

Title

BOTTOM OF LAYER 1 ELEVATION

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:180,000 (At Original document size of 11x17)

N

Legend
- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River (RIV) Cell

Bottom of Layer 1 Elevation (FT NAVD88)
High : 111
Low : -216

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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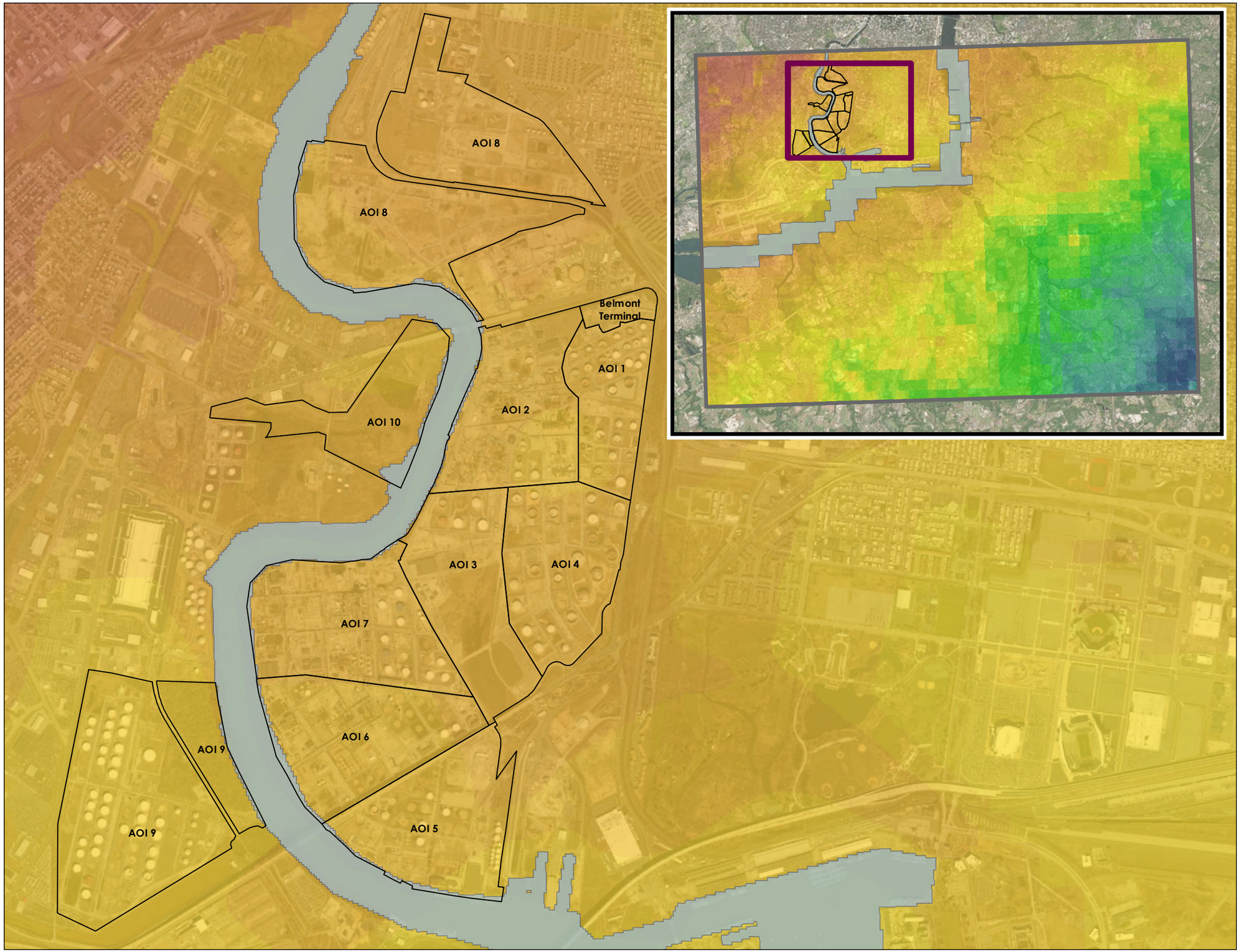


Figure No.
5-2C

Title

BOTTOM OF LAYER 2 ELEVATION

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

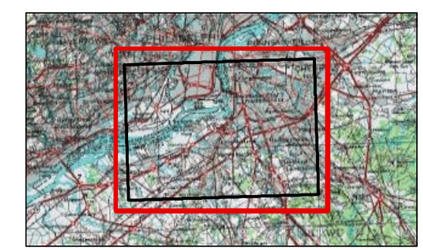
213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 12,000 24,000 Feet
1:18,000 (At Original document size of 11x17)

N

Legend
- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River (RIV) Cell

Bottom of Layer 2 Elevation (FT NAVD88)
High : 110
Low : -397



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
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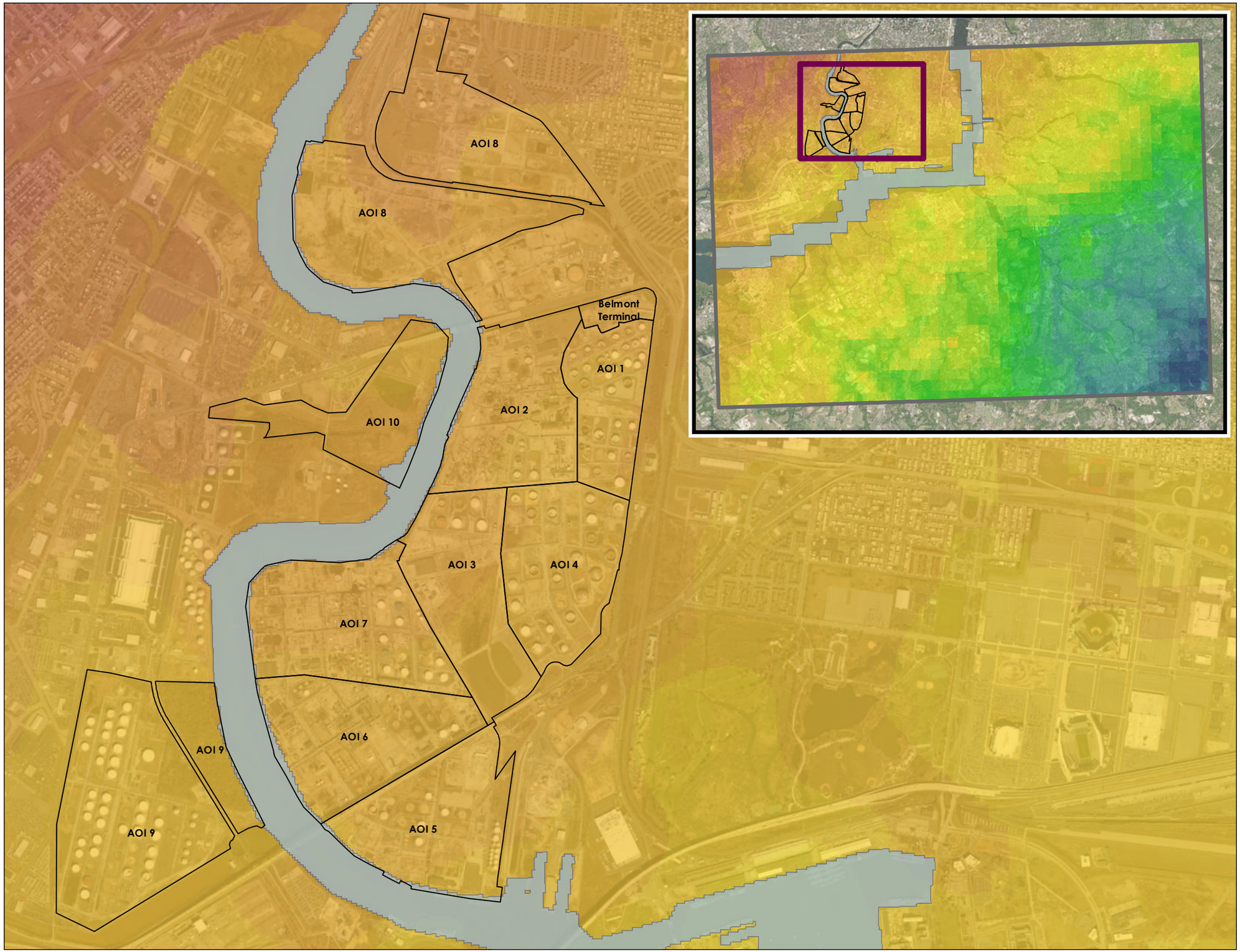

Figure No.
5-2D

Title

BOTTOM OF LAYER 3 ELEVATION

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend
- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River (RIV) Cell

Bottom of Layer 3 Elevation (FT NAVD88)
High : 109
Low : -479

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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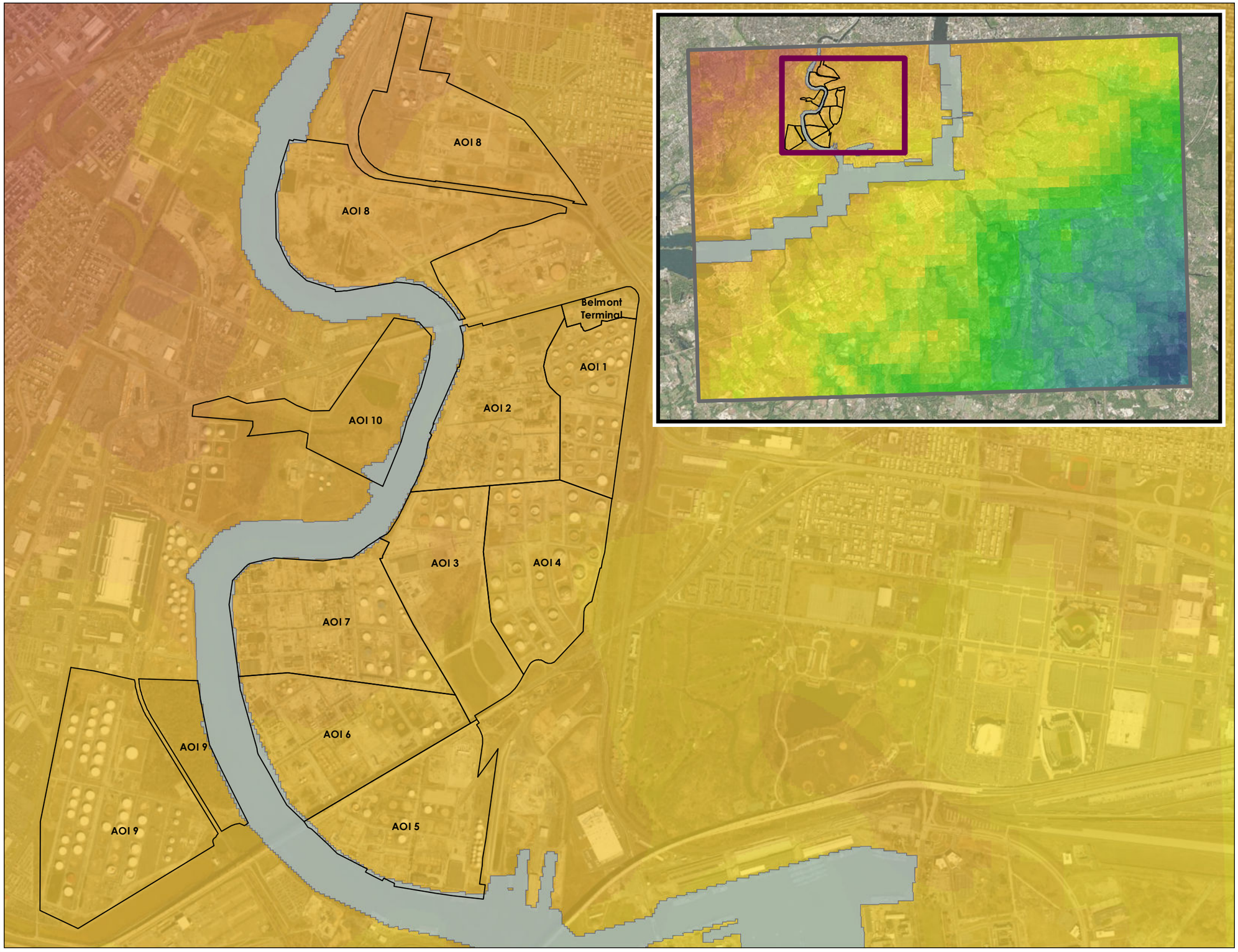


Figure No.
5-2E

Title

BOTTOM OF LAYER 4 ELEVATION

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

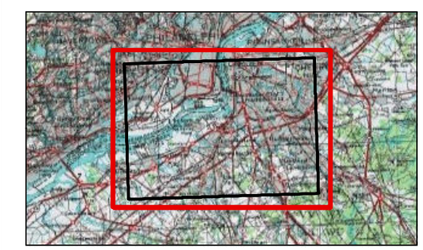
213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 12,000 24,000 Feet
1:18,000 (At Original document size of 11x17)

N

Legend
- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River (RIV) Cell

Bottom of Layer 4 Elevation (FT NAVD88)
High : 108
Low : -480



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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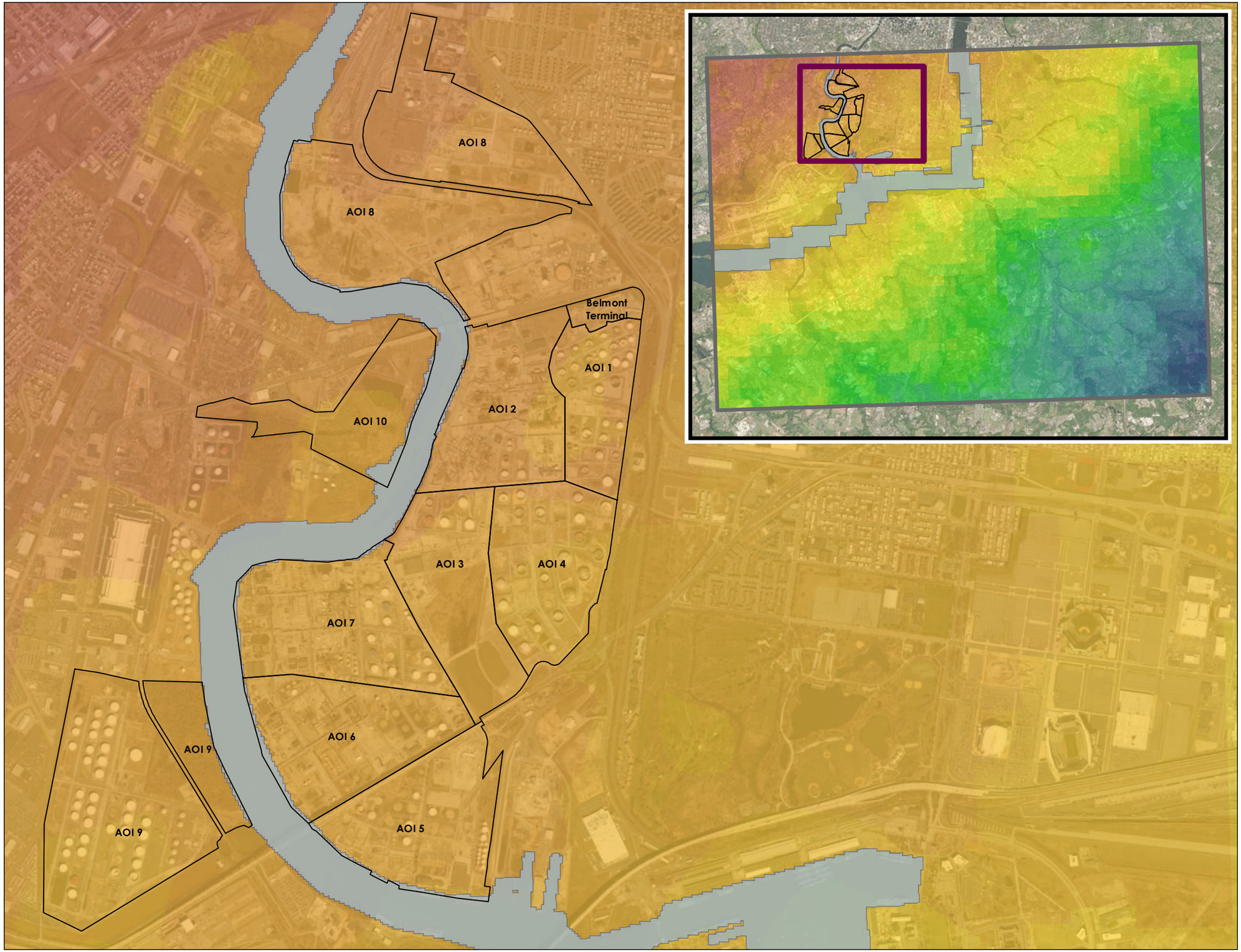


Figure No.
5-2F

Title

BOTTOM OF LAYER 5 ELEVATION

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

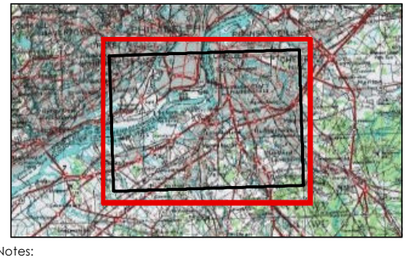
213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend
- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River (RIV) Cell

Bottom of Layer 5 Elevation (FT NAVD88)
High : 109
Low : -479



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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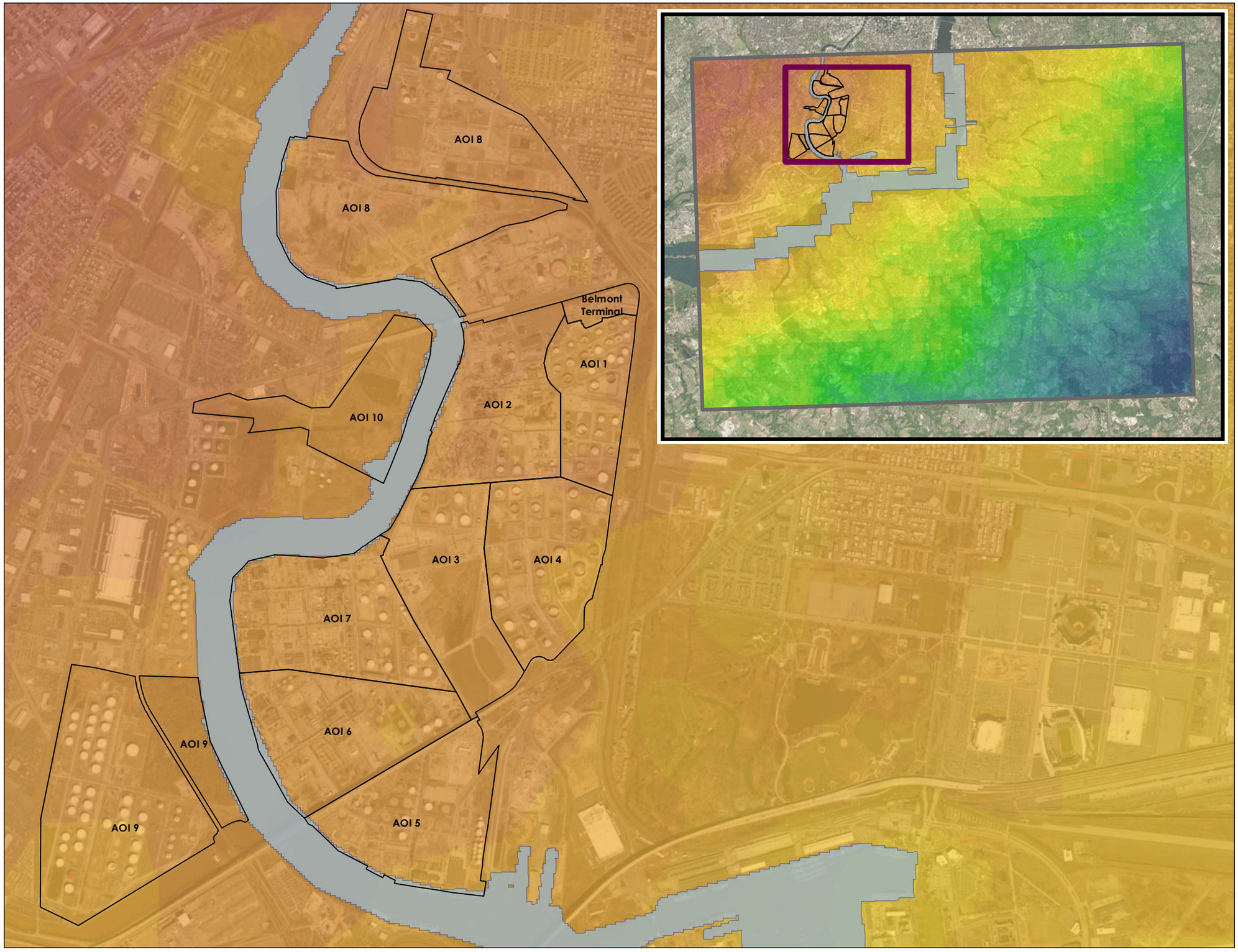

Figure No.
5-2G

Title

BOTTOM OF LAYER 6 ELEVATION

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,200 2,400 Feet
1:18,000 (At Original document size of 11x17)

N

Legend
- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River (RIV) Cell

Bottom of Layer 6 Elevation (FT NAVD88)
High : 106
Low : -830.5

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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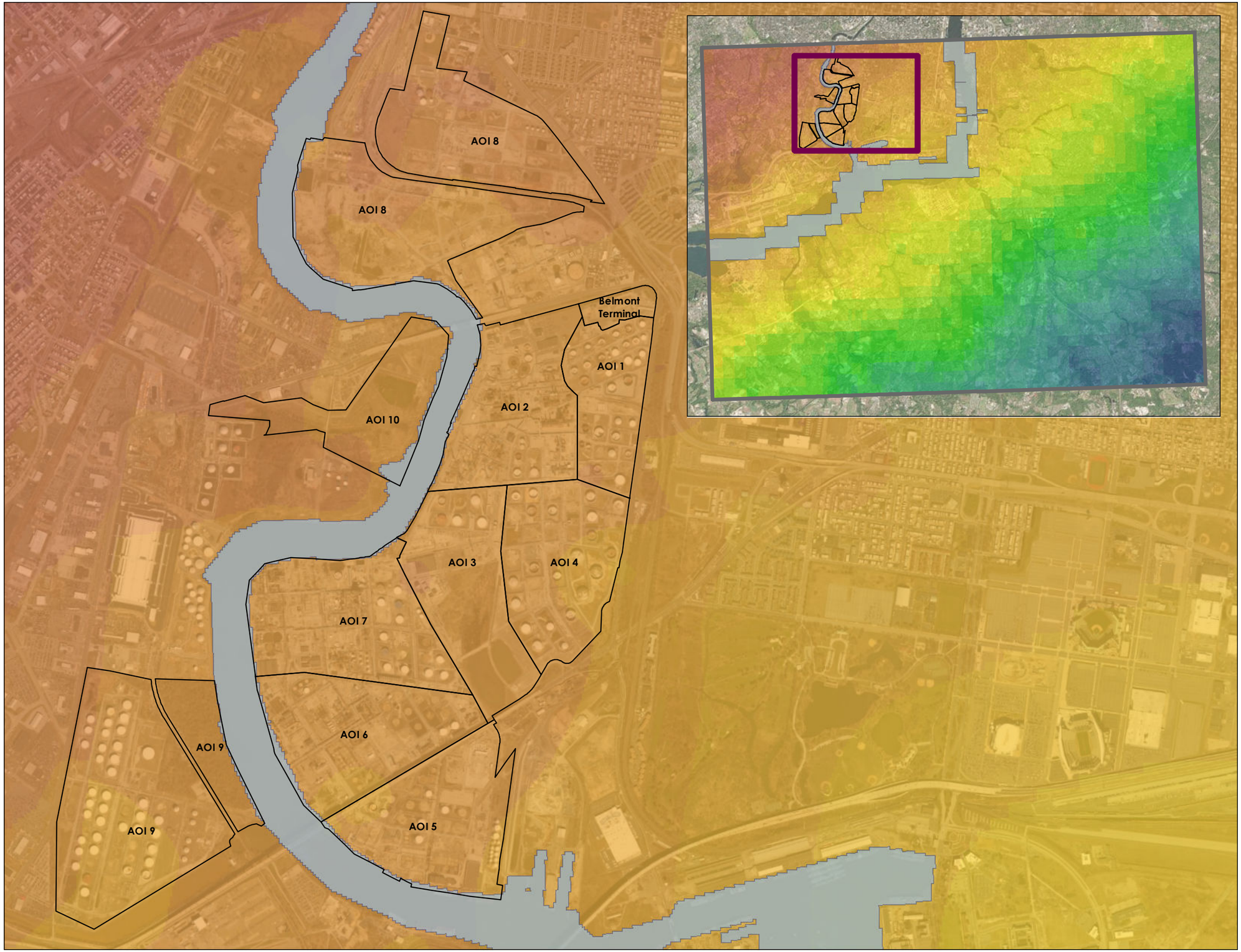


Figure No.
5-2H

Title

BOTTOM OF LAYER 7 ELEVATION

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

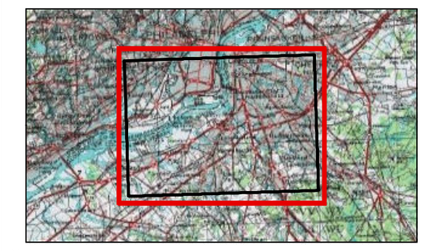
213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend
- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River (RIV) Cell

Bottom of Layer 7 Elevation (FT NAVD88)
High : 105
Low : -960



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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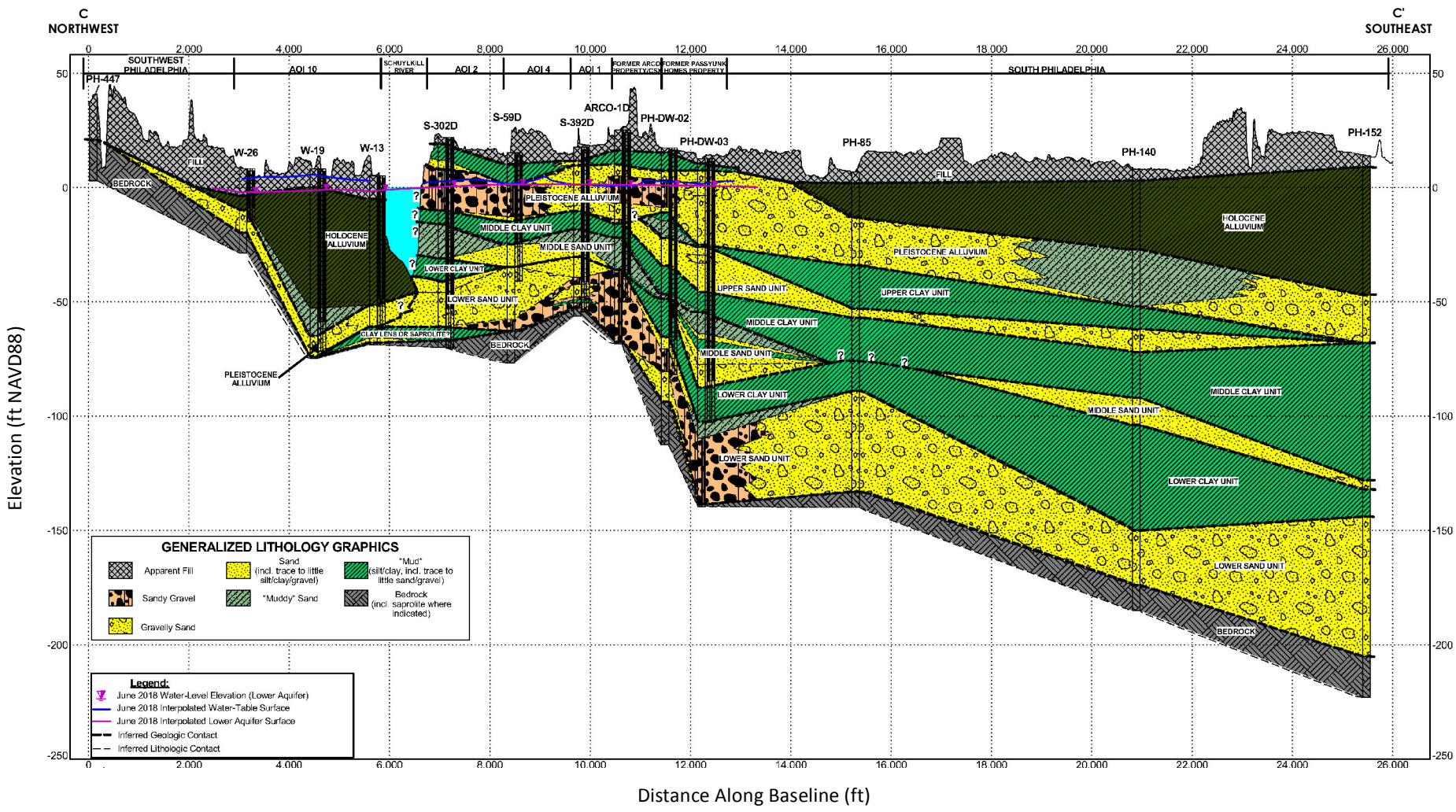

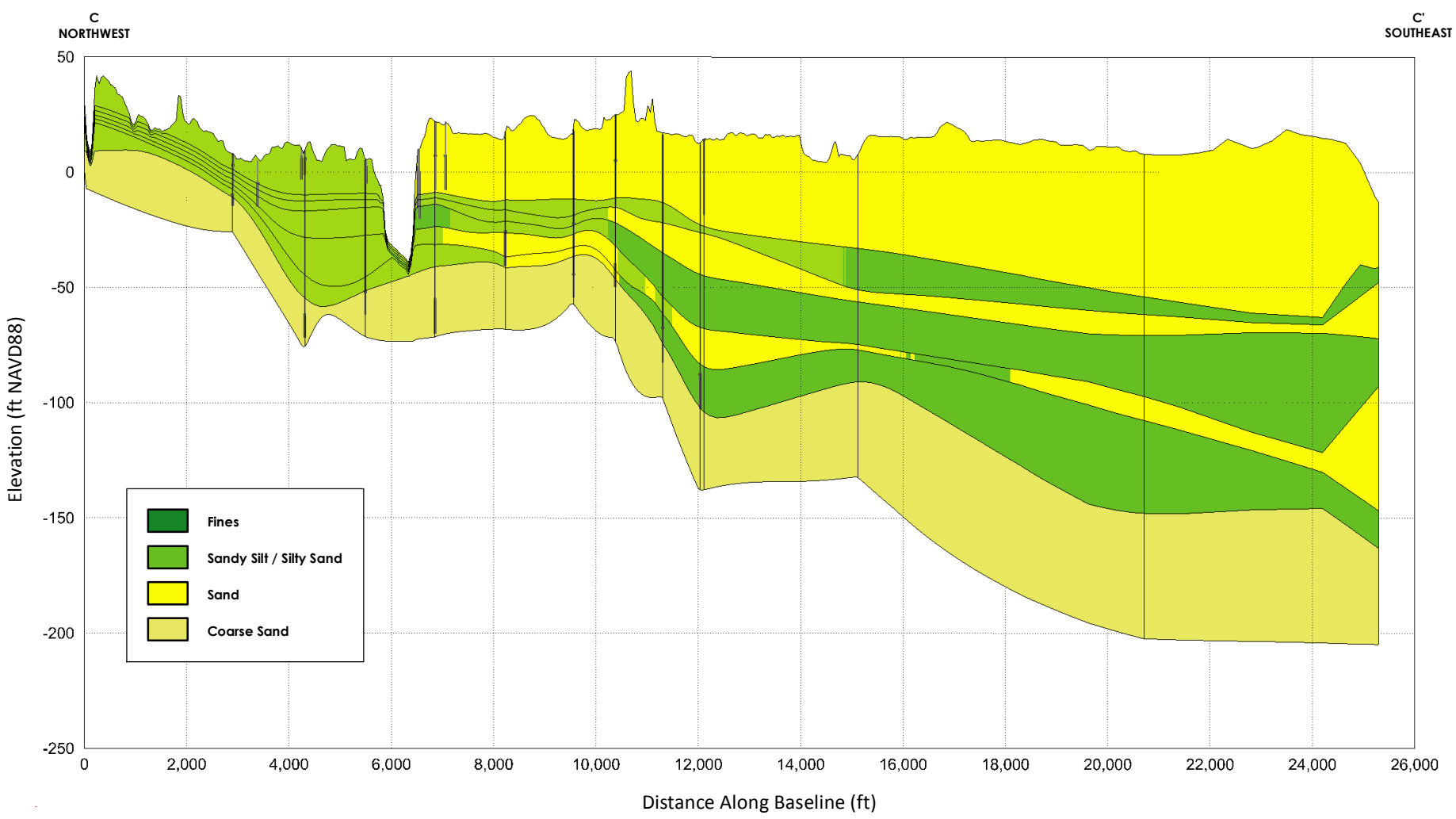

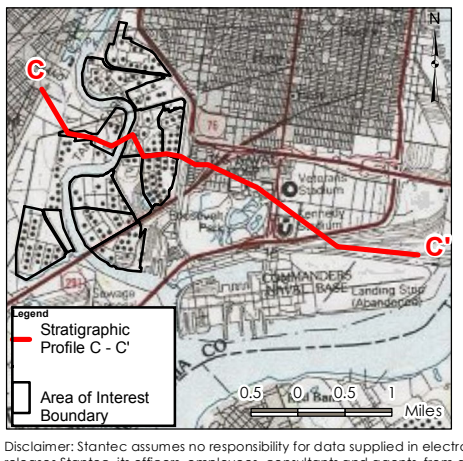

Notes

1. Vertical Datum and Units: North American Vertical Datum of 1988 (NAVD 88); feet (ft)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Refer to Figure 3-8 of this report for greater detail on Stratigraphic Profile C-C'.
4. The lower panel on this figure was generated using C Tech Development Corporation's Earth Volumetric Studio (EVS) software and represents a generalization of the GWF Model's hydraulic conductivity properties for each model layer intersected by the profile. The most prevalent lithologies associated with the model layer hydraulic properties across the profile are indicated by the legend. "Fines" is used to descibe deposits dominated by clay and silt content.
5. Source: Stantec
6. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation

Stantec

EVERGREEN

Project Location

City of Philadelphia, Philadelphia County, Pennsylvania

213402454
Prepared by MDB/AK on 8/18/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.

5-3A

Title

FORMER PHILADELPHIA REFINERY MODEL DOMAIN COMPARISON -STRATIGRAPHIC PROFILE C-C'

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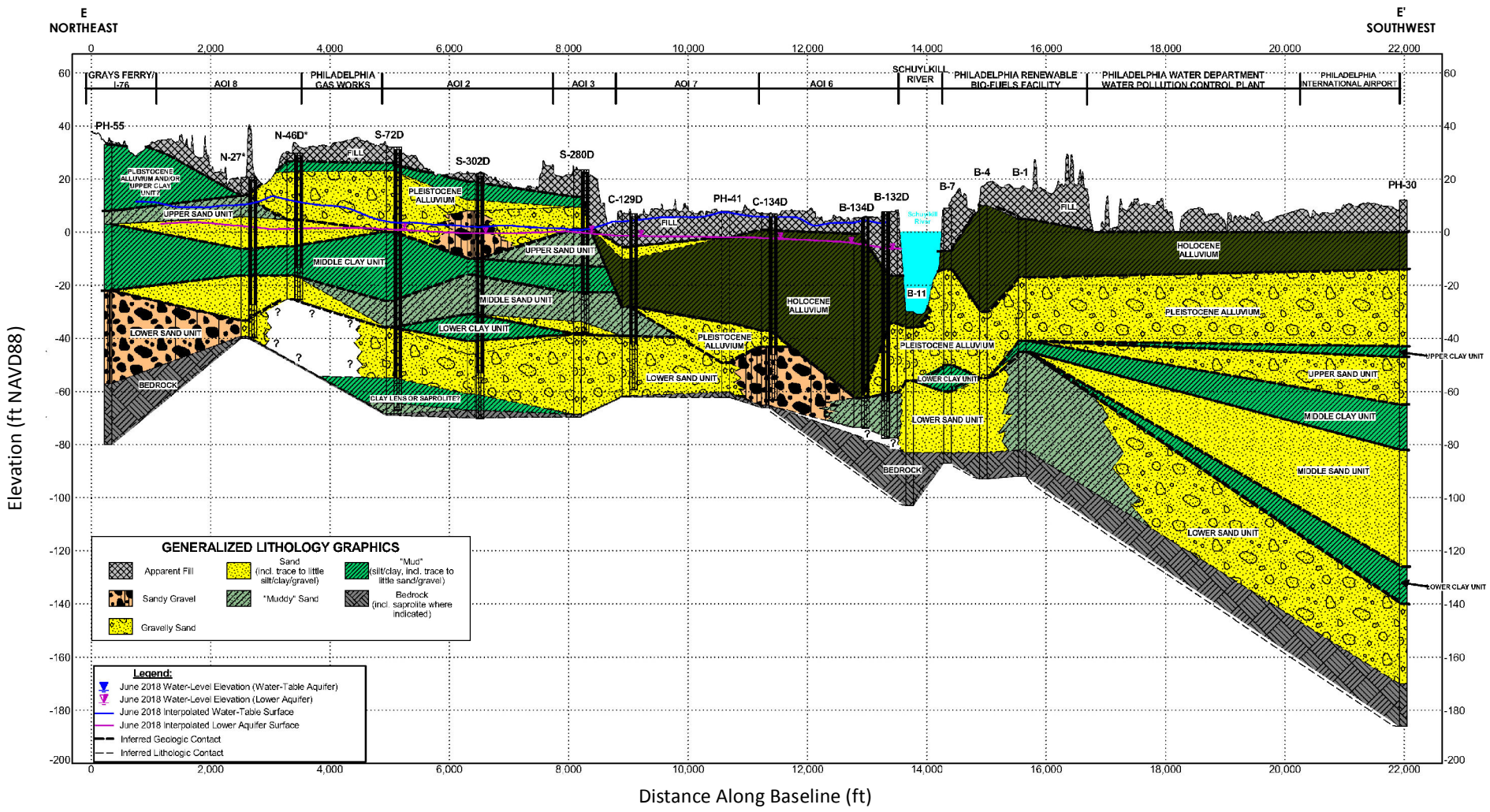

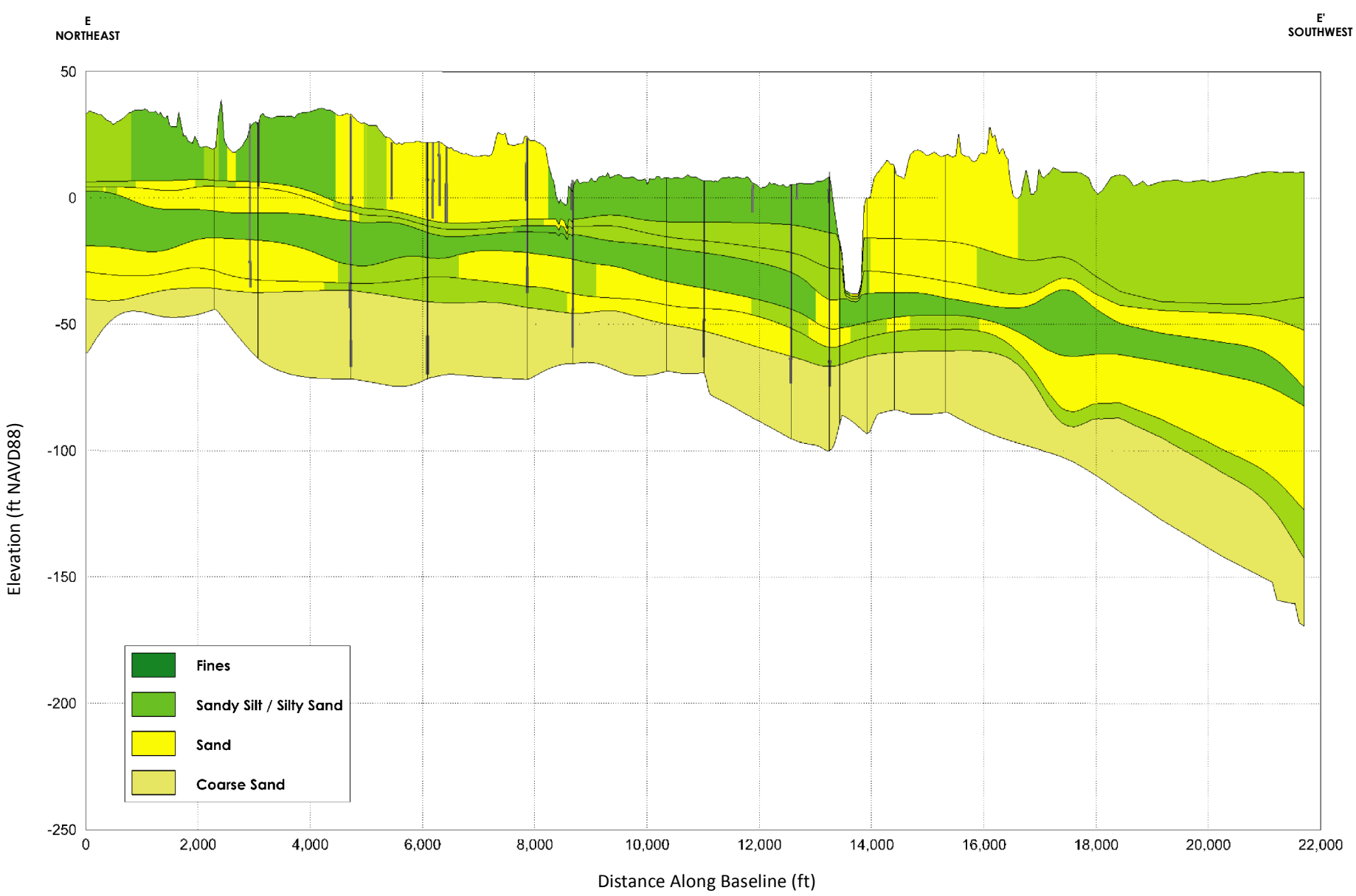

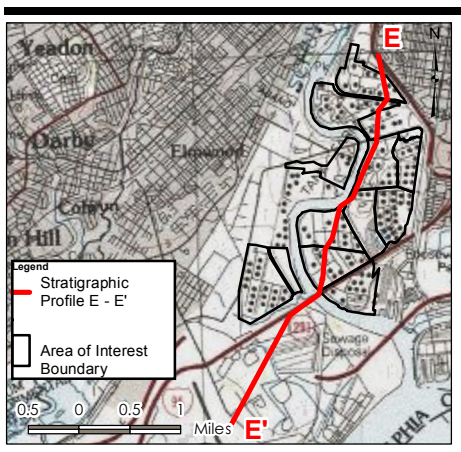

Notes

1. Vertical Datum and Units: North American Vertical Datum of 1988 (NAVD 88); feet (ft)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Refer to Figure 3-10 of this report for greater detail on Stratigraphic Profile E-E'.
4. The lower panel on this figure was generated using C Tech Development Corporation's Earth Volumetric Studio (EVS) software and represents a generalization of the GWF Model's hydraulic conductivity properties for each model layer intersected by the profile. The most prevalent lithologies associated with the model layer hydraulic properties across the profile are indicated by the legend. "Fines" is used to descibe deposits dominated by clay and silt content.
5. Source: Stantec
6. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation

Stantec

EVERGREEN

Project Location

City of Philadelphia, Philadelphia County, Pennsylvania

213402454
Prepared by MDB/AK on 8/18/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

Client/Project

PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.

5-3B

Title

FORMER PHILADELPHIA REFINERY MODEL DOMAIN COMPARISON -STRATIGRAPHIC PROFILE E-E'

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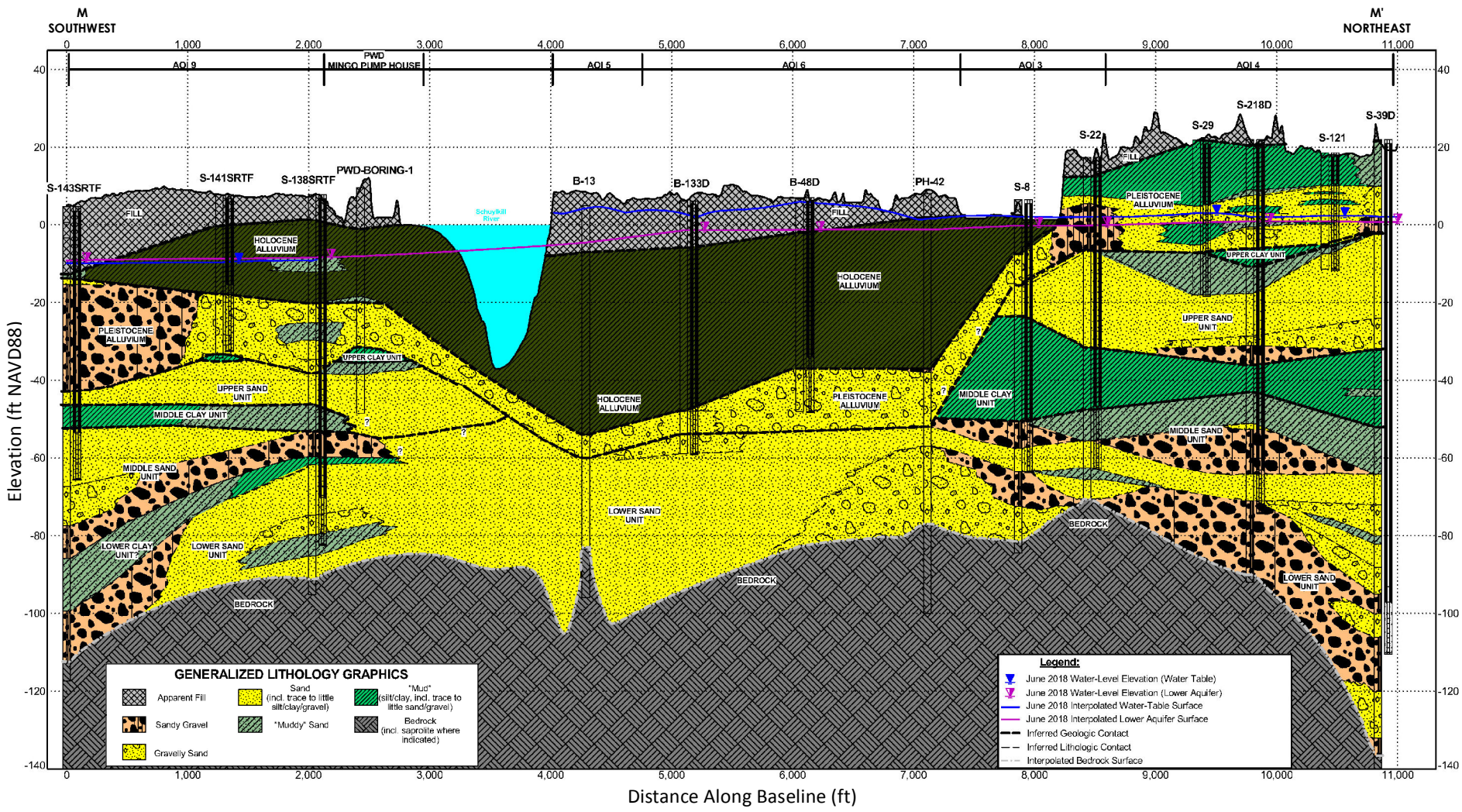
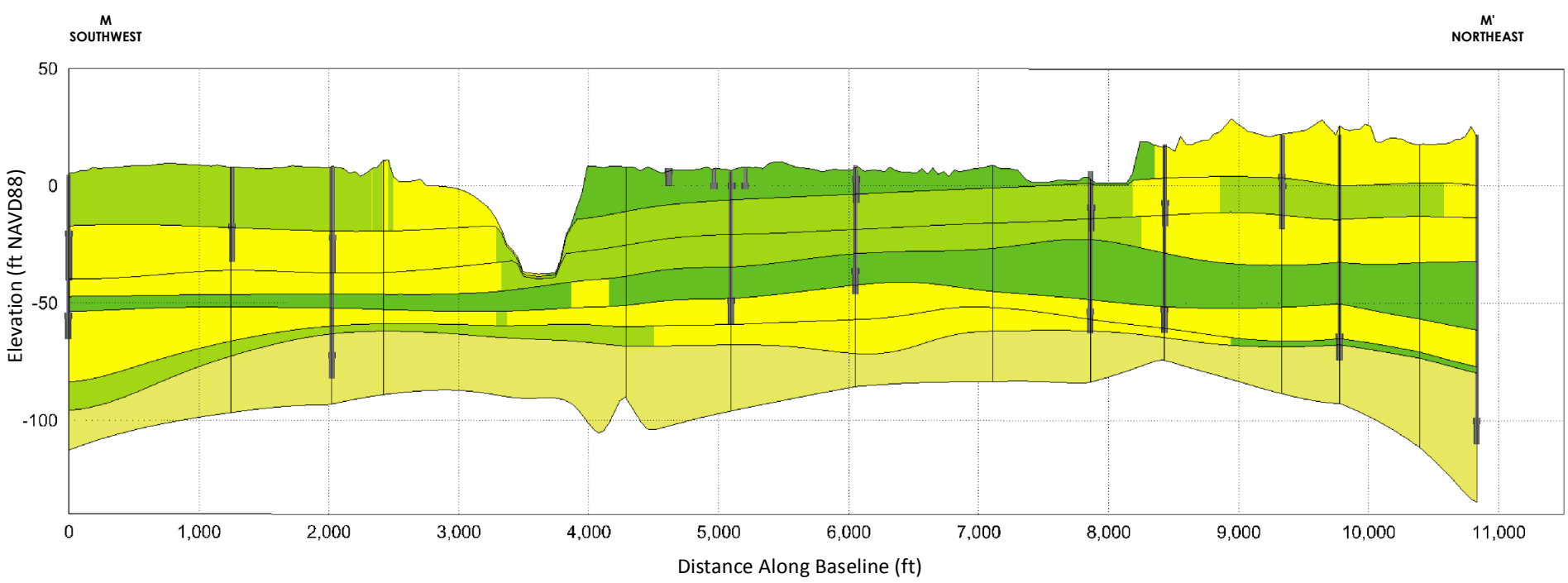
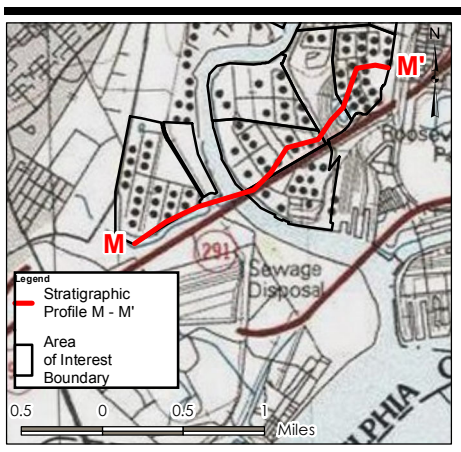




- Fines
- Sandy Silt / Silty Sand
- Sand
- Coarse Sand



Notes

1. Vertical Datum and Units: North American Vertical Datum of 1988 (NAVD 88); feet (ft)
2. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
3. Refer to Figure 3-18 of this report for greater detail on Stratigraphic Profile M-M'.
4. The lower panel on this figure was generated using C Tech Development Corporation's Earth Volumetric Studio (EVS) software and represents a generalization of the GWF Model's hydraulic conductivity properties for each model layer intersected by the profile. The most prevalent lithologies associated with the model layer hydraulic properties across the profile are indicated by the legend. "Fines" is used to descibe deposits dominated by clay and silt content.
5. Source: Stantec
6. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed © Harris Corp, Earthstar Geographics LLC Earthstar Geographics SIO © 2015 Microsoft Corporation

Stantec

Project Location
City of Philadelphia, Philadelphia County, Pennsylvania

213402454
Prepared by MDB/AK on 8/18/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Figure No.
5-3C

Title
FORMER PHILADELPHIA REFINERY MODEL DOMAIN COMPARISON - STRATIGRAPHIC PROFILE M-M'

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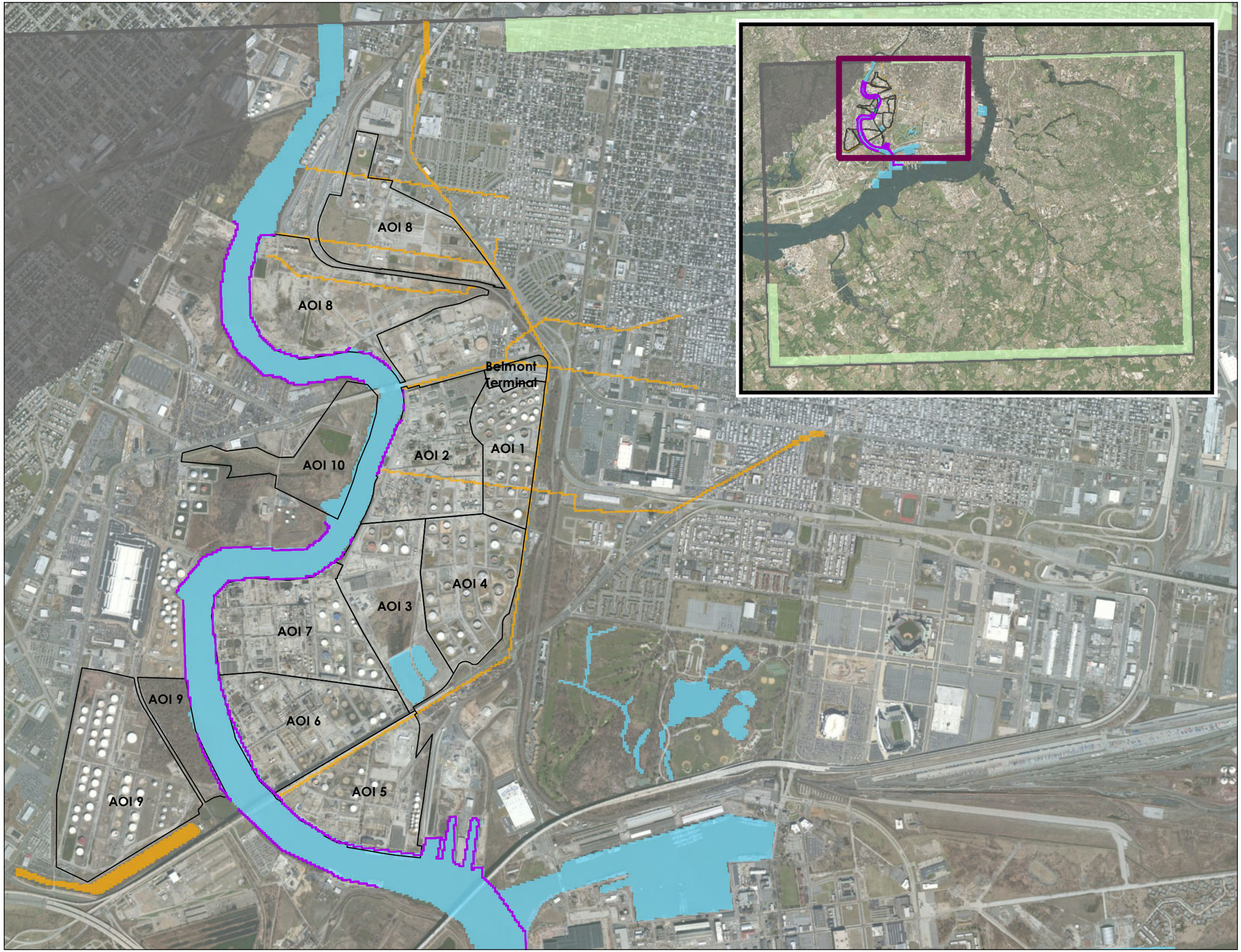

Figure No.
5-4

Title
MODEL GROUNDWATER BARRIERS AND BOUNDARY CONDITIONS

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,400 2,800 Feet
1:22,000 (At Original document size of 11x17)

N

Legend
- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)

Model Boundary Conditions
- Drain Boundary
- River Boundary
- General Head Boundary
- No Flow Boundary
- Horizontal Flow Boundary

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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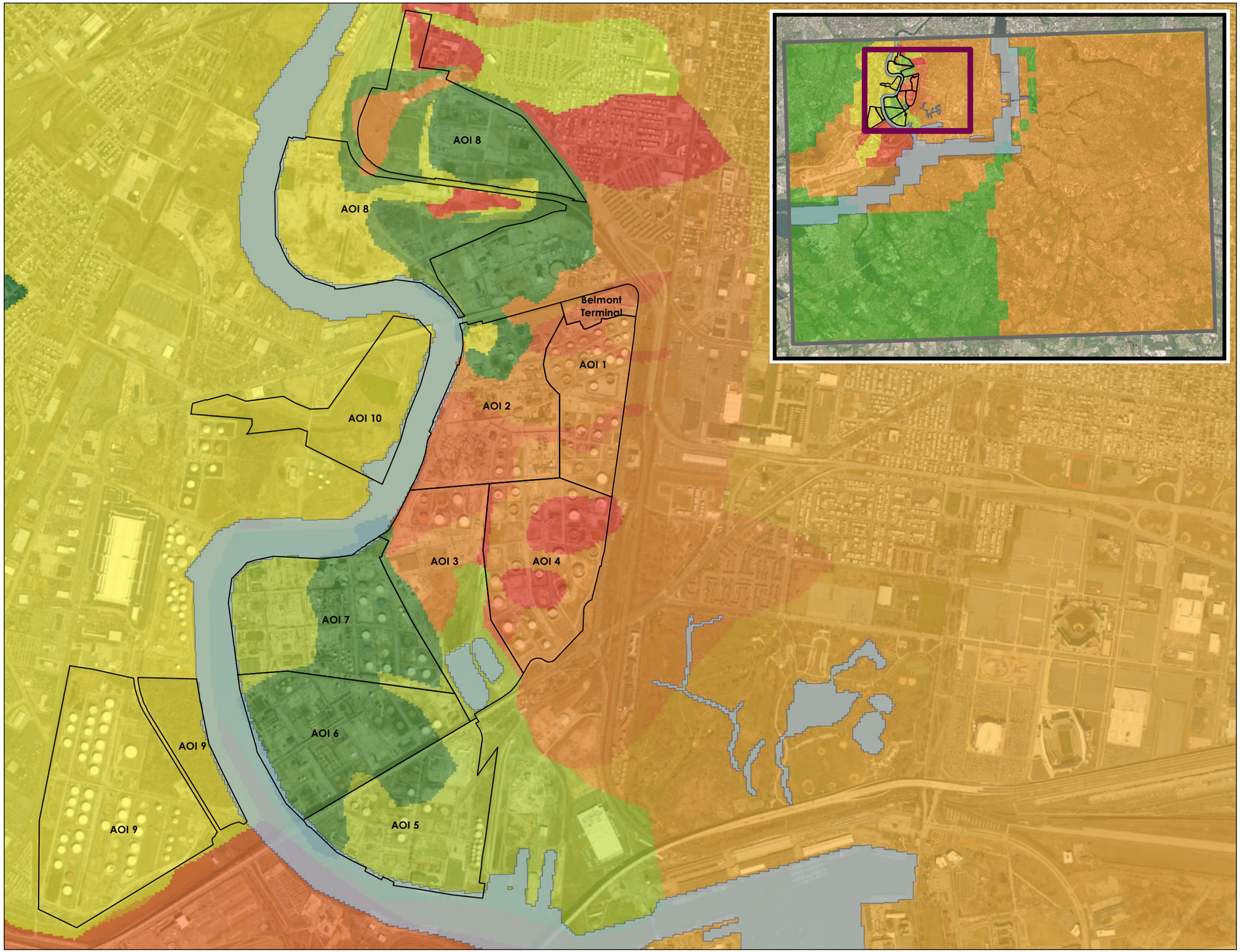

Figure No.
5-5A

Title
HYDRAULIC CONDUCTIVITY ZONES LAYER 1

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River Boundary

Hydraulic Conductivity

- Kx = 3.33E-5 ft/day, Ky = 3.28E-5 ft/day, Kz = 3.28E4 ft/day
- Kx = 4.32E-3 ft/day, Ky = 4.32E-3 ft/day, Kz = 4.32E-3 ft/day
- Kx = 1.2E-2 ft/day, Ky = 1.2E-2 ft/day, Kz = 1.2E-2 ft/day
- Kx = 1.2E-2 ft/day, Ky = 1.2E-2 ft/day, Kz = 1.2E-3 ft/day
- Kx = 0.12 ft/day, Ky = 0.12 ft/day, Kz = 1.2E-2 ft/day
- Kx = 1 ft/day, Ky = 1 ft/day, Kz = 0.1 ft/day
- Kx = 1.2 ft/day, Ky = 1.2 ft/day, Kz = 0.12 ft/day
- Kx = 1.80 ft/day, Ky = 1.80 ft/day, Kz = 1.80 ft/day
- Kx = 5.47 ft/day, Ky = 5.47 ft/day, Kz = 5.47 ft/day
- Kx = 16.8 ft/day, Ky = 16.8 ft/day, Kz = 1.68 ft/day
- Kx = 20 ft/day, Ky = 20 ft/day, Kz = 2 ft/day
- Kx = 60 ft/day, Ky = 60 ft/day, Kz = 6 ft/day

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
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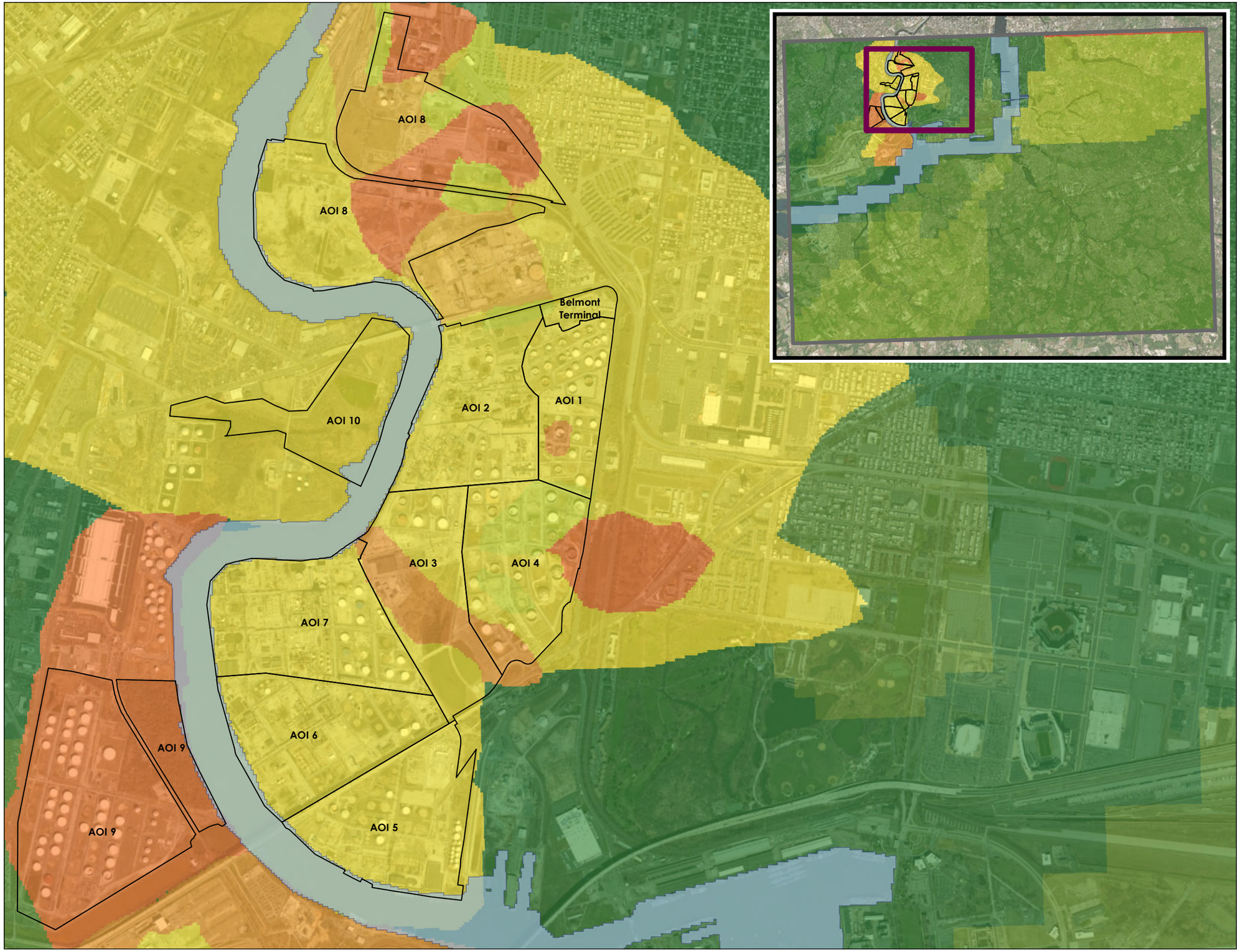

Figure No.
5-5B

Title
HYDRAULIC CONDUCTIVITY ZONES LAYER 2

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River Boundary

Hydraulic Conductivity

- Kx = 3.2E-5 ft/day, Ky = 3.2E-5 ft/day, Kz = 3.2E4 ft/day
- Kx = 3.5E-4 ft/day, Ky = 3.5E-4 ft/day, Kz = 3.5E-4 ft/day
- Kx = 0.33 ft/day, Ky = 0.33 ft/day, Kz = 0.33 ft/day
- Kx = 0.35 ft/day, Ky = 0.35 ft/day, Kz = 0.35 ft/day
- Kx = 1 ft/day, Ky = 1 ft/day, Kz = 0.1 ft/day
- Kx = 1.2 ft/day, Ky = 1.2 ft/day, Kz = 0.12 ft/day
- Kx = 16.8 ft/day, Ky = 16.8 ft/day, Kz = 1.68 ft/day
- Kx = 20 ft/day, Ky = 20 ft/day, Kz = 2 ft/day
- Kx = 60 ft/day, Ky = 60 ft/day, Kz = 6 ft/day
- Kx = 114.83 ft/day, Ky = 114.83 ft/day, Kz = 114.83 ft/day

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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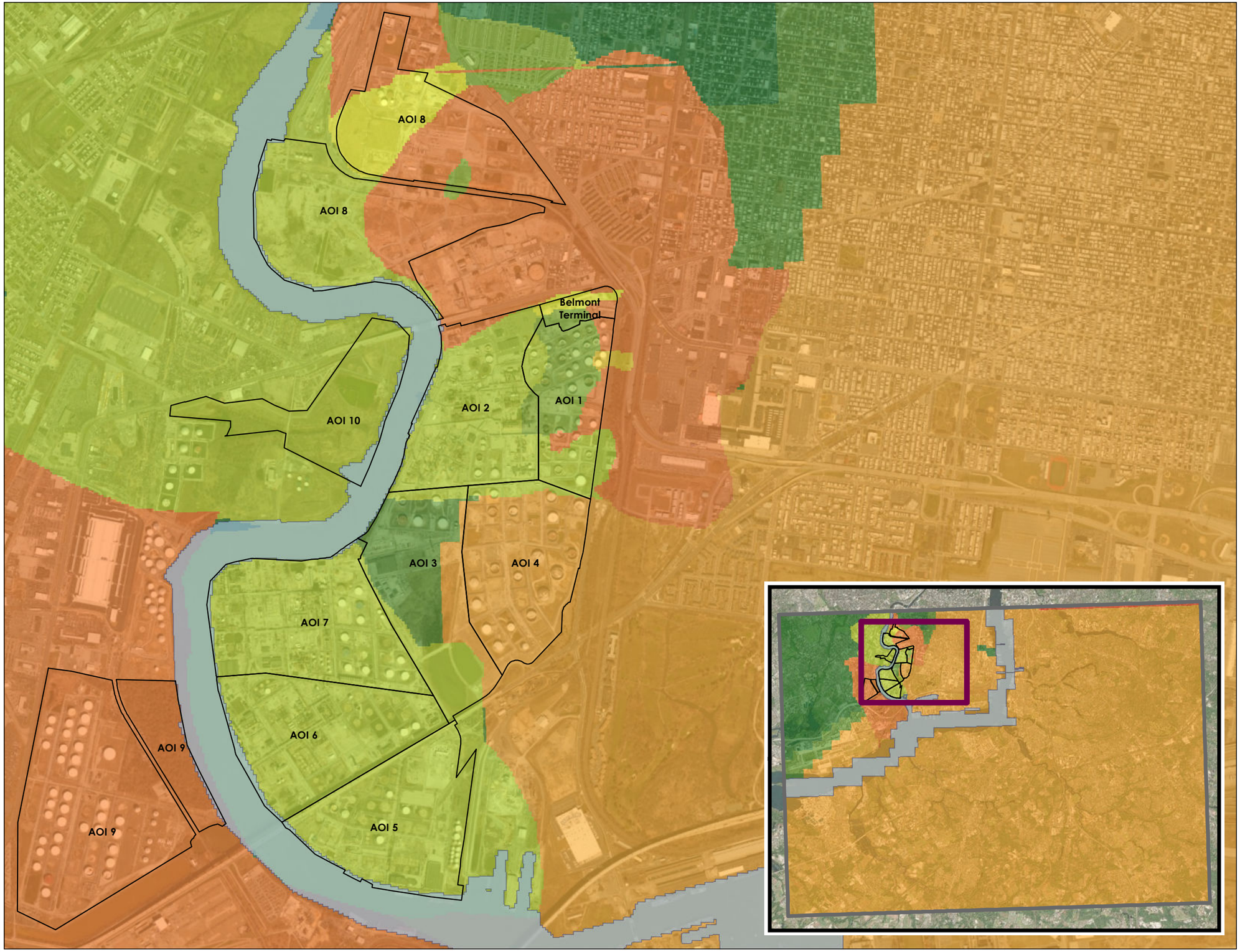
Figure No.
5-5C

Title
HYDRAULIC CONDUCTIVITY ZONES LAYER 3

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018



0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River Boundary

Hydraulic Conductivity

- Kx = 3.28E-5 ft/day, Ky = 3.28E-5 ft/day, Kz = 3.28E4 ft/day
- Kx = 3.3E-2 ft/day, Ky = 3.3E-2 ft/day, Kz = 35.00 ft/day
- Kx = 1 ft/day, Ky = 1 ft/day, Kz = 0.1 ft/day
- Kx = 1.2 ft/day, Ky = 1.2 ft/day, Kz = 0.12 ft/day
- Kx = 16.8 ft/day, Ky = 16.8 ft/day, Kz = 1.68 ft/day
- Kx = 20 ft/day, Ky = 20 ft/day, Kz = 2 ft/day
- Kx = 35.00 ft/day, Ky = 35.00 ft/day, Kz = 35.00 ft/day
- Kx = 60 ft/day, Ky = 60 ft/day, Kz = 6 ft/day
- Kx = 114.83 ft/day, Ky = 114.83 ft/day, Kz = 114.83 ft/day

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

K:\213\4\active\213402454\03_data\dwgs_design\gis\mxds\modflow_fr_mesh_if_good_depth\Model Figures\fig5-5c-perscriptex_hydraulicconductivity3_orig_fr.1.mxd Revised 2019-01-02 by dkingel

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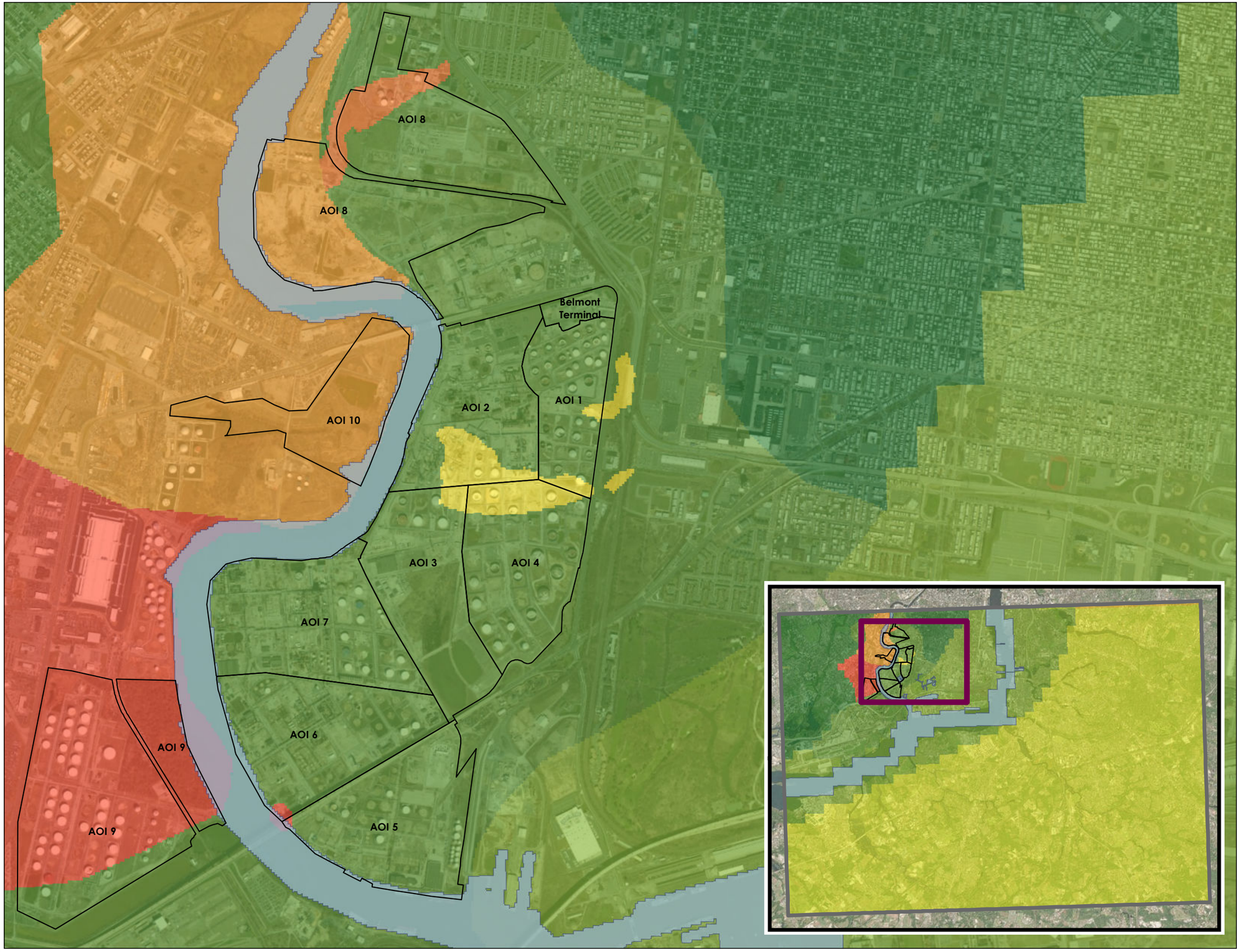

Figure No.
5-5D

Title
HYDRAULIC CONDUCTIVITY ZONES LAYER 4

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River Boundary

Hydraulic Conductivity

- Kx = 3.28E-5 ft/day, Ky = 3.28E-5 ft/day, Kz = 3.28E4 ft/day
- Kx = 0.012 ft/day, Ky = 0.012 ft/day, Kz = 0.012 ft/day
- Kx = 0.012 ft/day, Ky = 0.012 ft/day, Kz = 0.012 ft/day
- Kx = 0.039 ft/day, Ky = 0.039 ft/day, Kz = 0.039 ft/day
- Kx = 0.35 ft/day, Ky = 0.35 ft/day, Kz = 0.35 ft/day
- Kx = 1 ft/day, Ky = 1 ft/day, Kz = 0.1 ft/day
- Kx = 1.15 ft/day, Ky = 1.15 ft/day, Kz = 1.15 ft/day
- Kx = 1.2 ft/day, Ky = 1.2 ft/day, Kz = 0.12 ft/day
- Kx = 16.8 ft/day, Ky = 16.8 ft/day, Kz = 1.68 ft/day
- Kx = 20 ft/day, Ky = 20 ft/day, Kz = 2 ft/day

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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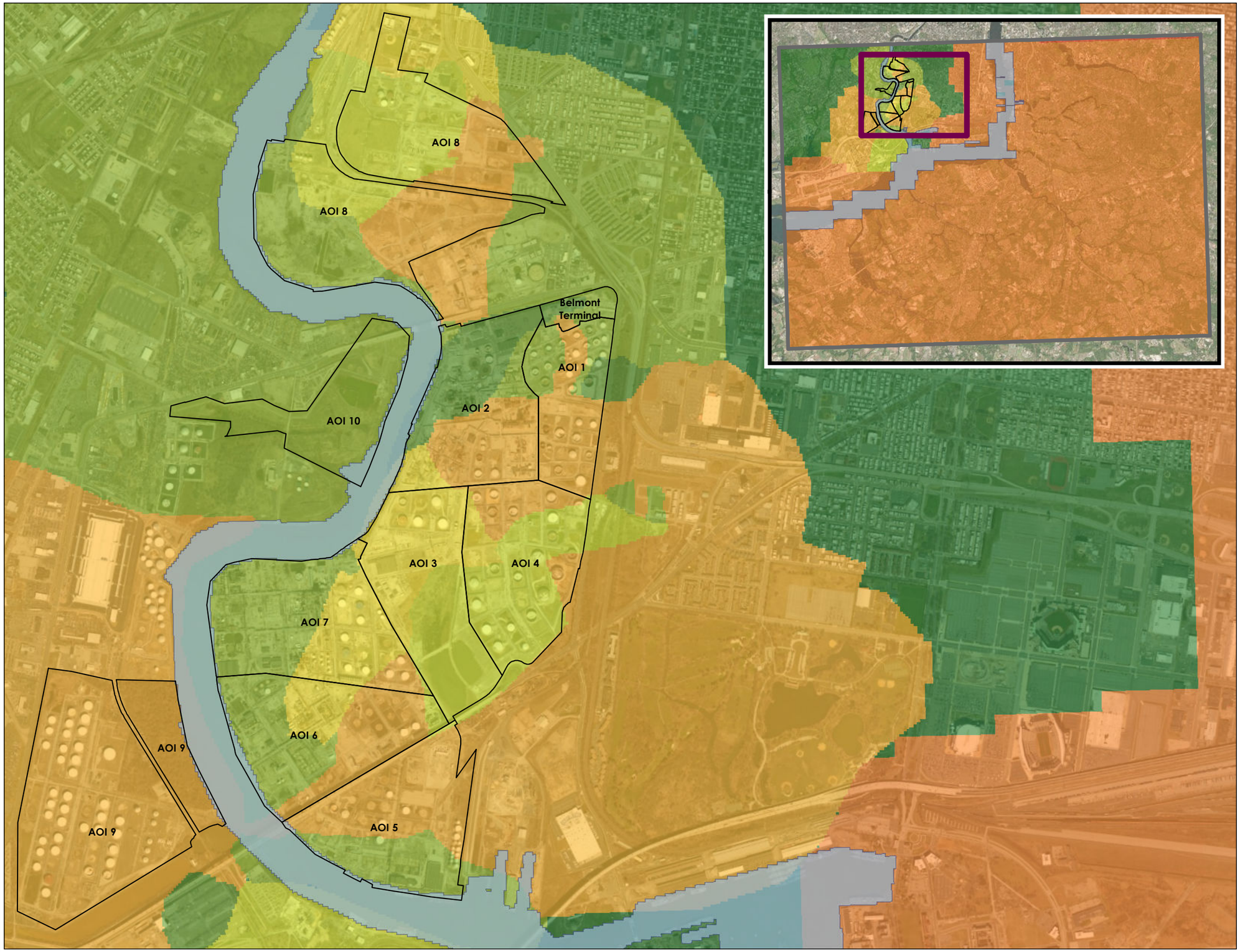

Figure No.
5-5E

Title
HYDRAULIC CONDUCTIVITY ZONES LAYER 5

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River Boundary

Hydraulic Conductivity

- Kx = 3.28E-5 ft/day, Ky = 3.28E-5 ft/day, Kz = 3.28E4 ft/day
- Kx = 1 ft/day, Ky = 1 ft/day, Kz = 0.1 ft/day
- Kx = 1.2 ft/day, Ky = 1.2 ft/day, Kz = 0.12 ft/day
- Kx = 16.8 ft/day, Ky = 16.8 ft/day, Kz = 1.68 ft/day
- Kx = 20 ft/day, Ky = 20 ft/day, Kz = 2 ft/day
- Kx = 60 ft/day, Ky = 60 ft/day, Kz = 6 ft/day
- Kx = 98.43 ft/day, Ky = 98.43 ft/day, Kz = 8.43 ft/day
- Kx = 322.92 ft/day, Ky = 322.92 ft/day, Kz = 322.92 ft/day

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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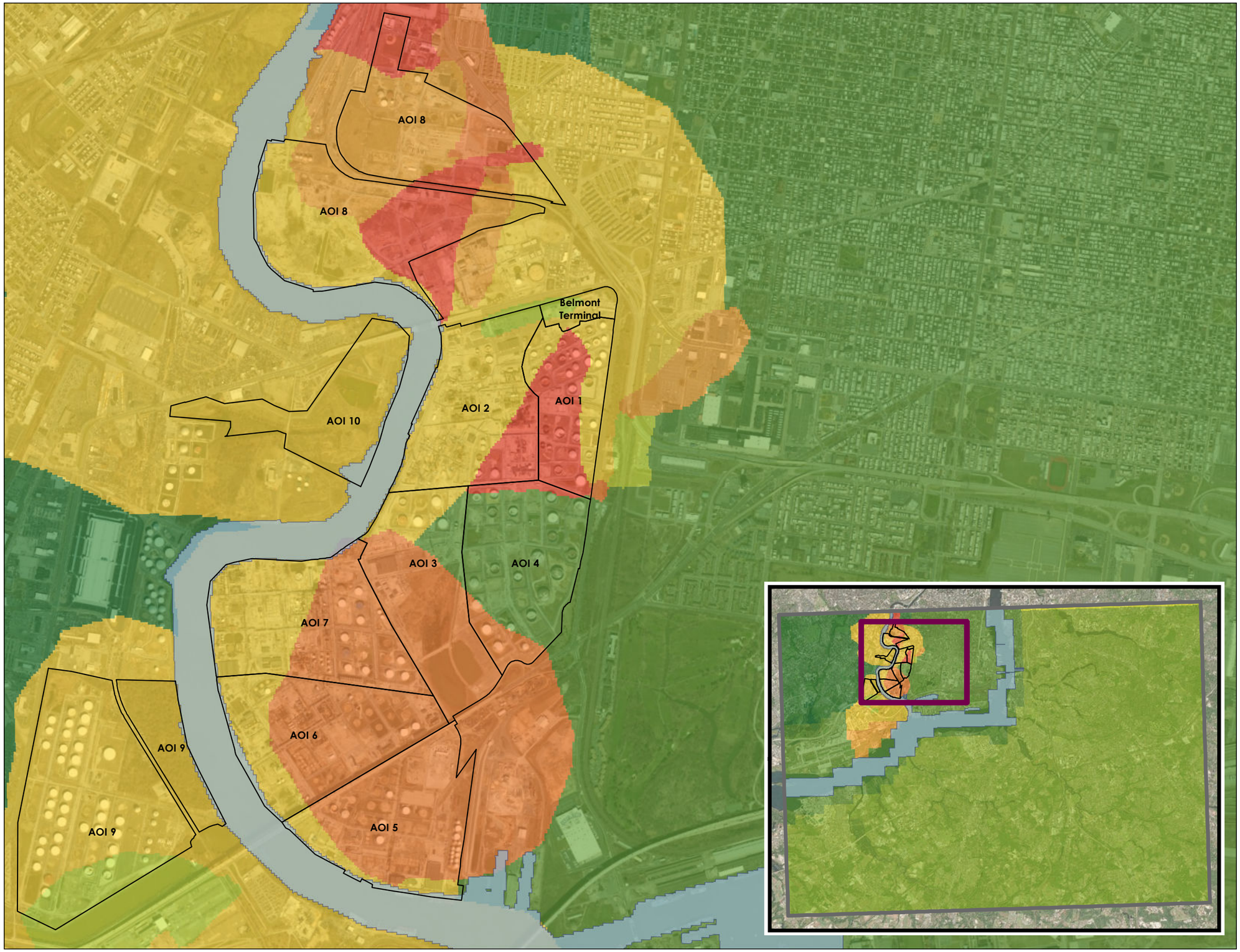

Figure No.
5-5F

Title
HYDRAULIC CONDUCTIVITY ZONES LAYER 6

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,200 2,400 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River Boundary

Hydraulic Conductivity

- Kx = 3.28E-5 ft/day, Ky = 3.28E-5 ft/day, Kz = 3.28E4 ft/day
- Kx = 0.004 ft/day, Ky = 0.004 ft/day, Kz = 0.004 ft/day
- Kx = 0.35 ft/day, Ky = 0.35 ft/day, Kz = 0.35 ft/day
- Kx = 1 ft/day, Ky = 1 ft/day, Kz = 0.1 ft/day
- Kx = 1.15 ft/day, Ky = 1.15 ft/day, Kz = 1.15 ft/day
- Kx = 1.2 ft/day, Ky = 1.2 ft/day, Kz = 0.12 ft/day
- Kx = 16.8 ft/day, Ky = 16.8 ft/day, Kz = 1.68 ft/day
- Kx = 20 ft/day, Ky = 20 ft/day, Kz = 2 ft/day
- Kx = 60 ft/day, Ky = 60 ft/day, Kz = 6 ft/day

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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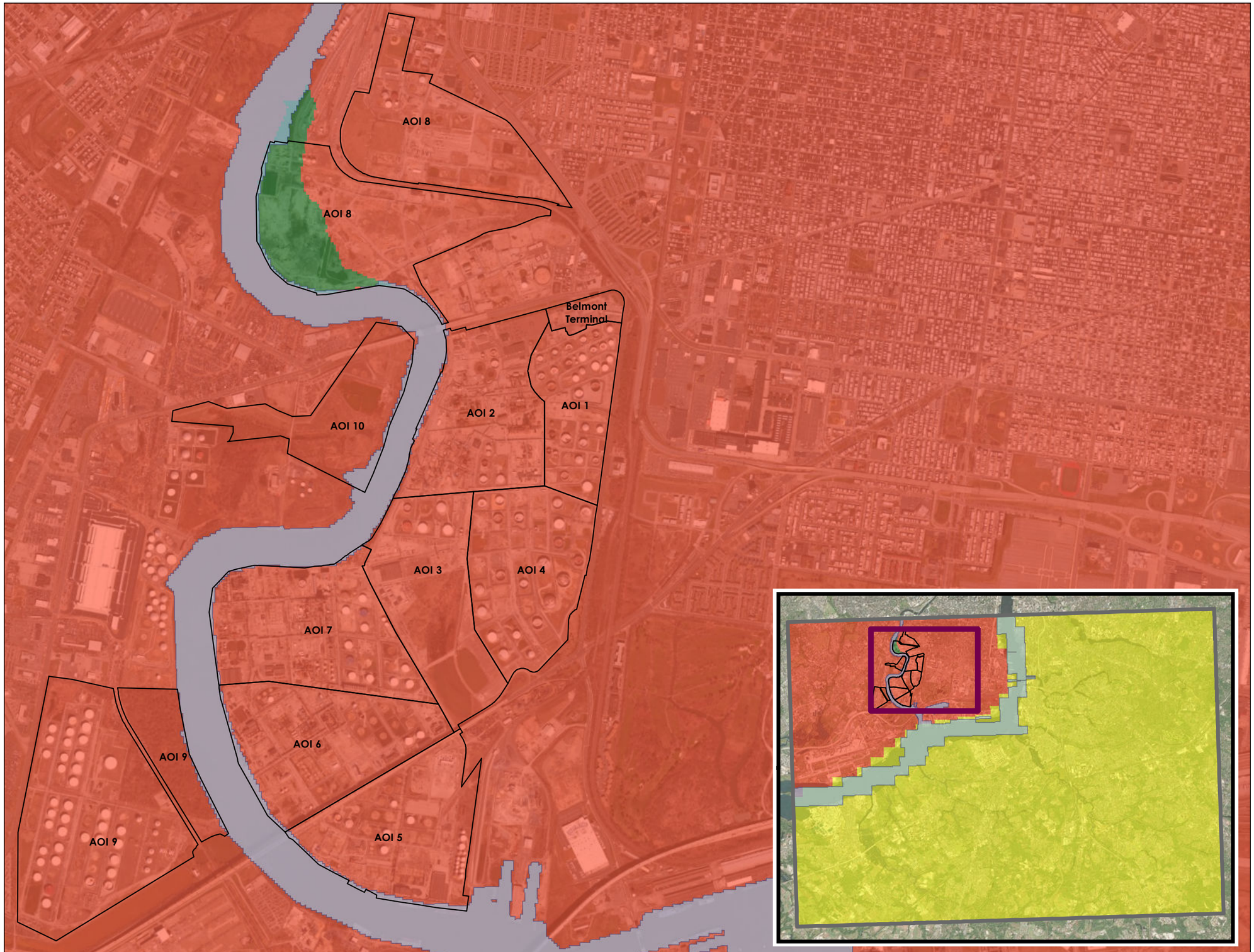

Figure No.
5-5G

Title
HYDRAULIC CONDUCTIVITY ZONES LAYER 7

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend
- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River Boundary

Hydraulic Conductivity
- Kx = 1.2 ft/day, Ky = 1.2 ft/day, Kz = 0.12 ft/day
- Kx = 164 ft/day, Ky = 164 ft/day, Kz = 164 ft/day
- Kx = 196.8 ft/day, Ky = 196.8 ft/day, Kz = 196.8 ft/day

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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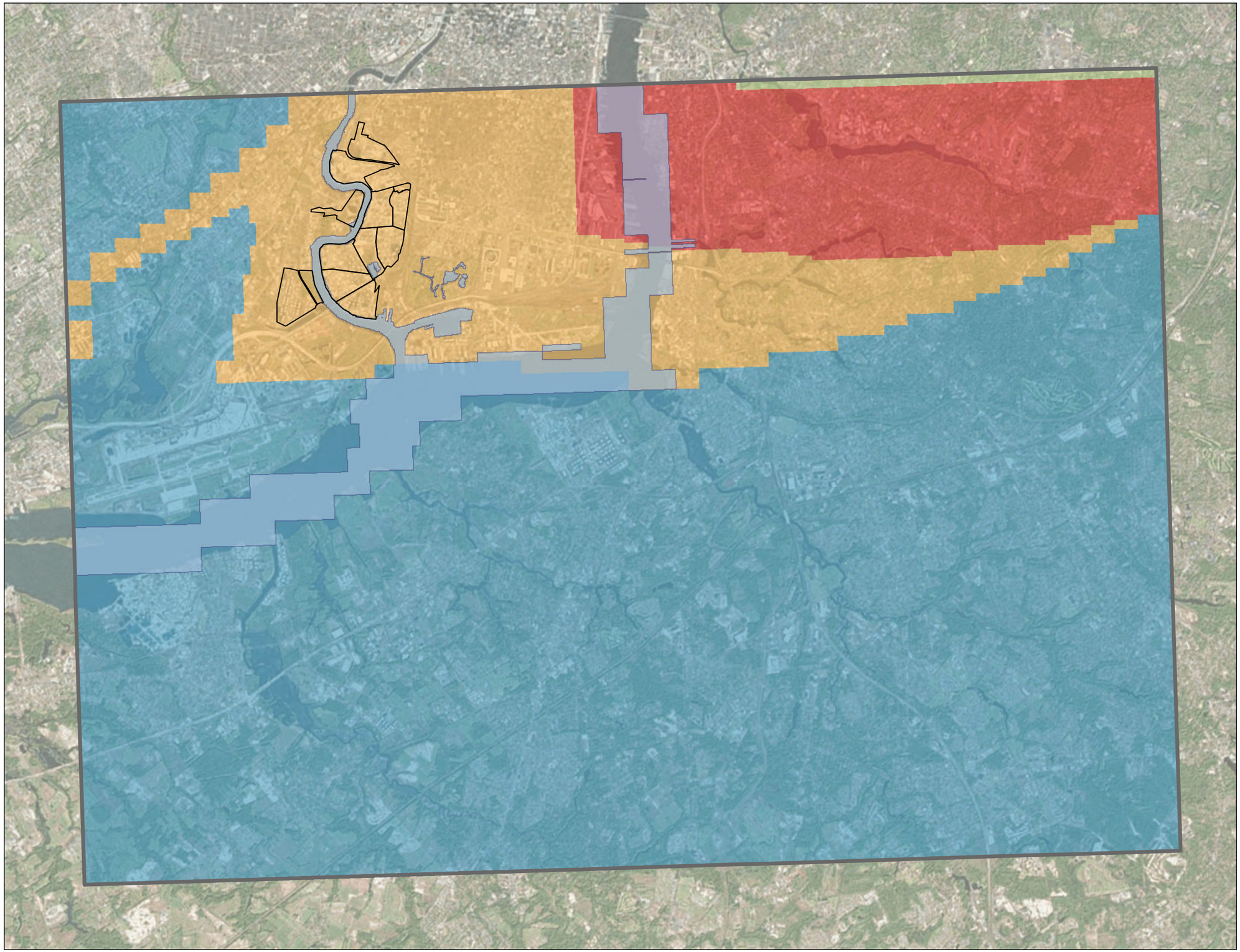


Figure No.
5-6

Title
MODEL RECHARGE ZONATION

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF
EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia,
Pennsylvania

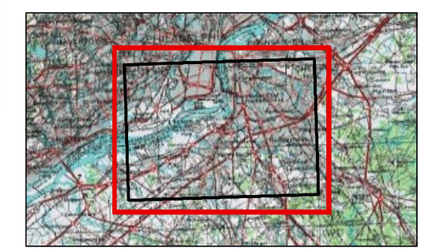
213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 5,300 10,600 Feet
1:80,894 (At Original document size of 11x17)

N

Legend
- Area of Interest (AOI) Boundary
- Model Domain
- River Boundary

Recharge Zone
- 0.0 ft/day
- 0.0001 ft/day
- 0.0013 ft/day
- 0.0018 ft/day



Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

EVERGREEN

V:\2134\active\213402454\03_data\dwgs_design\gis\mxds\modflow_rir_mxds\st_paul_drafts\Model Figures\fig5-6_pescomplex_rechargezonation_ansi_b.mxd Revised: 2019-01-03 By: aklingbel

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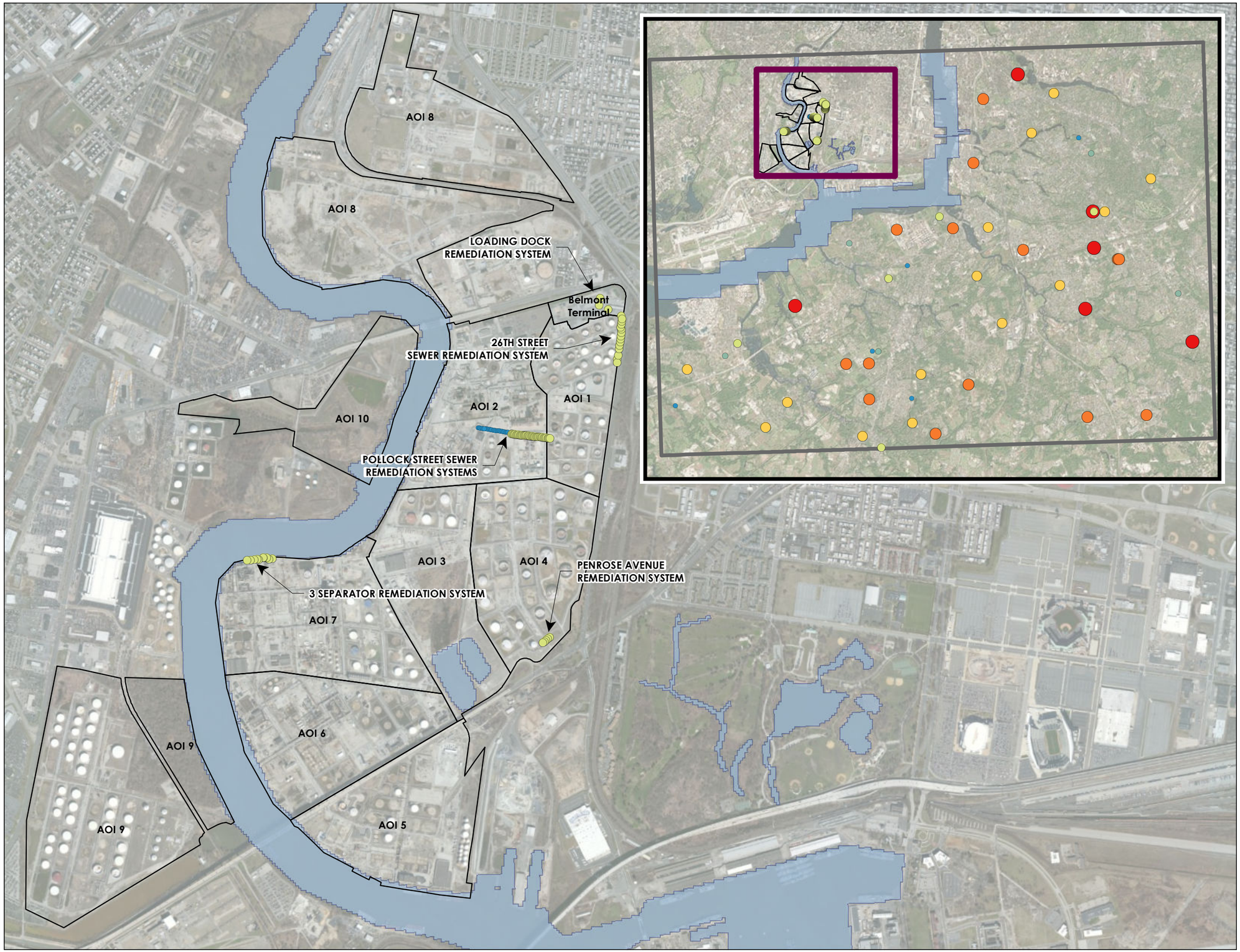

Figure No.
5-7

Title
MODEL PRODUCTION WELL LOCATIONS

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Area of Interest (AOI) Boundary
- Model Domain
- Area of Focus (Refined Grid)
- River Boundary

Groundwater/Total Fluids Extraction Rate (cubic feet per day)

- 3 to 50
- 50 to 100
- 100 to 500
- 500 to 1000
- 1000 to 2500
- 2500 to 5350

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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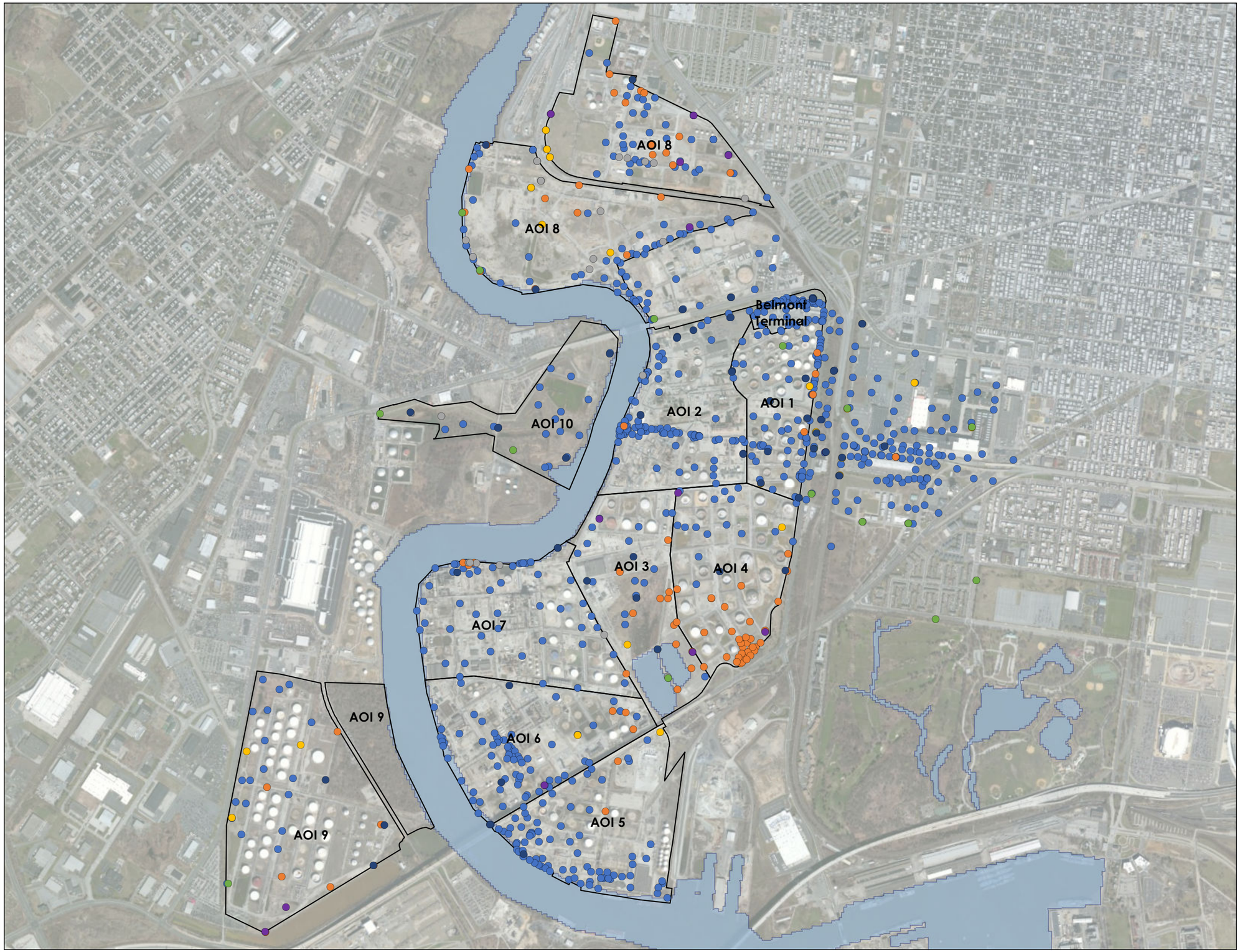
Figure No.
6-1

Title
CALIBRATION WELL LOCATIONS

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018



0 1,200 2,400 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Area of Interest (AOI) Boundary
- River Boundary

Calibration Well (Target) Locations

- Layer 1
- Layer 2
- Layer 3
- Layer 4
- Layer 5
- Layer 6
- Layer 7

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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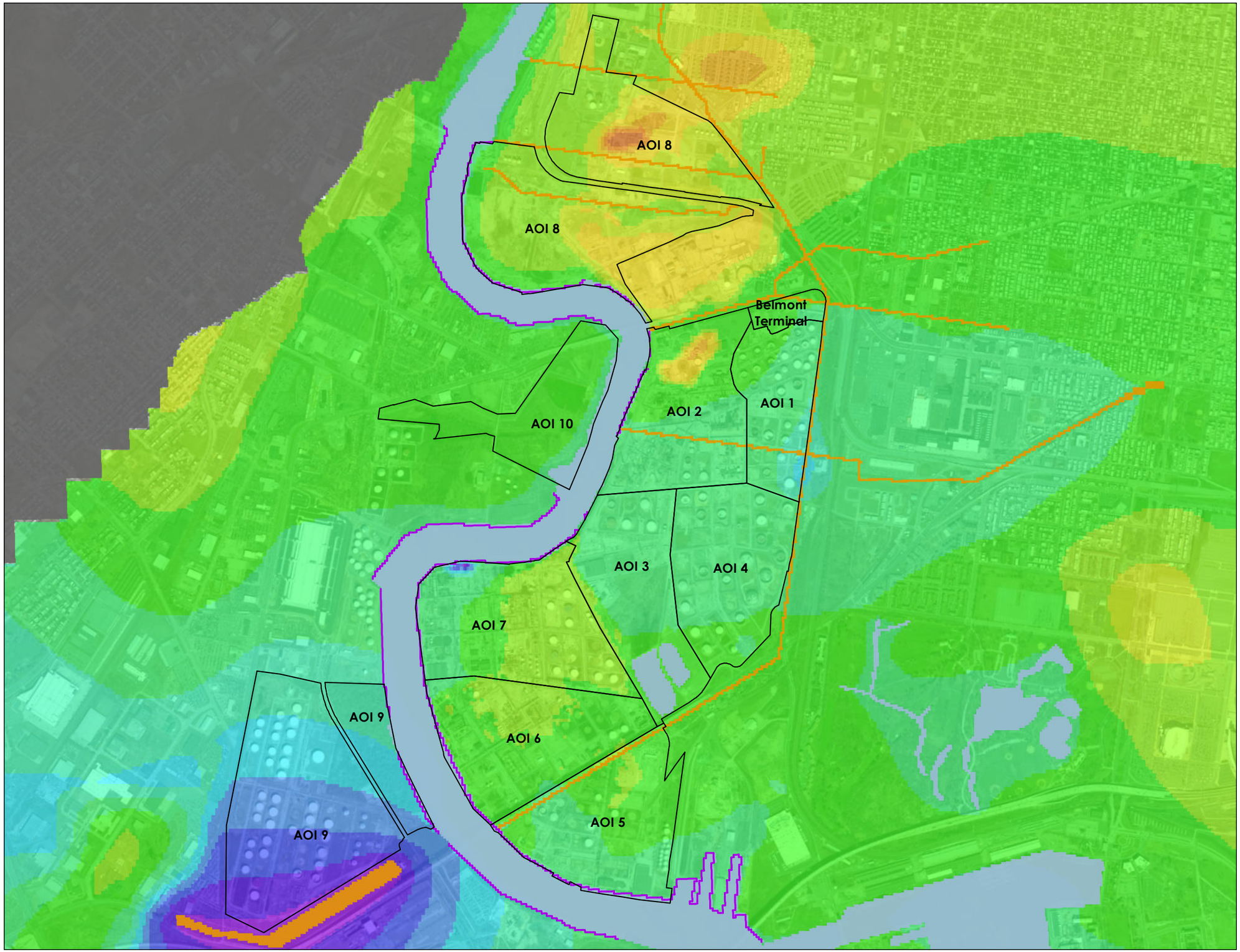

Figure No.
6-2A

Title
SIMULATED POTENTIOMETRIC SURFACE LAYER 1

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

Area of Interest (AOI) Boundary

Model Boundary Conditions

- Drain Boundary
- River Boundary
- No Flow Boundary
- Horizontal Flow Boundary

Layer 1 Simulated Potentiomtric Surface

FT NAVD88

- 18 - 20
- 16 - 18
- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8
- -12 - -10
- -14 - -12
- -16 - -14
- -18 - -16
- -20 - -18

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet; FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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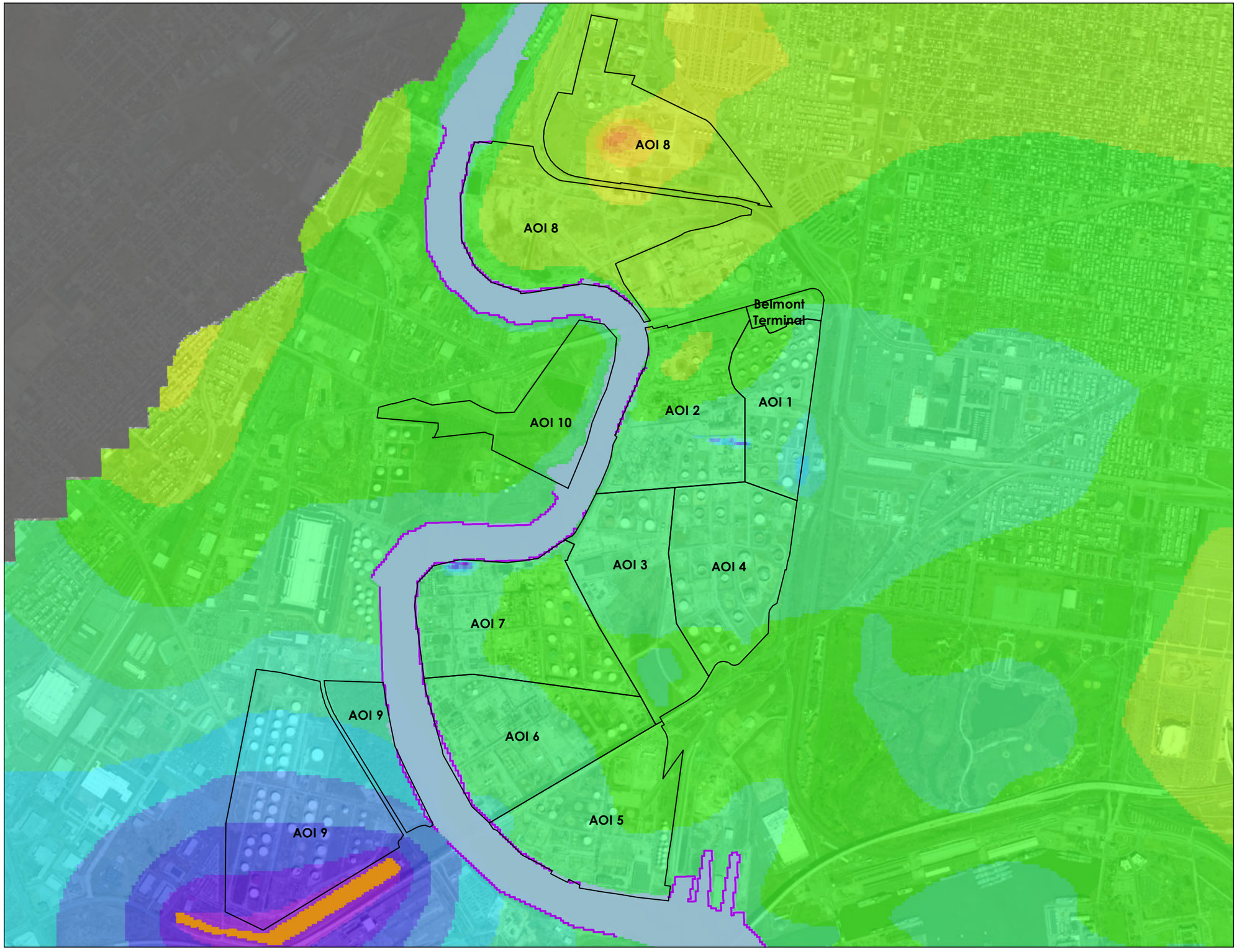

Figure No.
6-2B

Title
SIMULATED POTENTIOMETRIC SURFACE LAYER 3

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

Area of Interest (AOI) Boundary

Model Boundary Conditions

- Drain Boundary
- River Boundary
- No Flow Boundary
- Horizontal Flow Boundary

Layer 3 Simulated Potentiomtric Surface

FT NAVD88

- 18 - 20
- 16 - 18
- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8
- -12 - -10
- -14 - -12
- -16 - -14
- -18 - -16
- -20 - -18

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet; FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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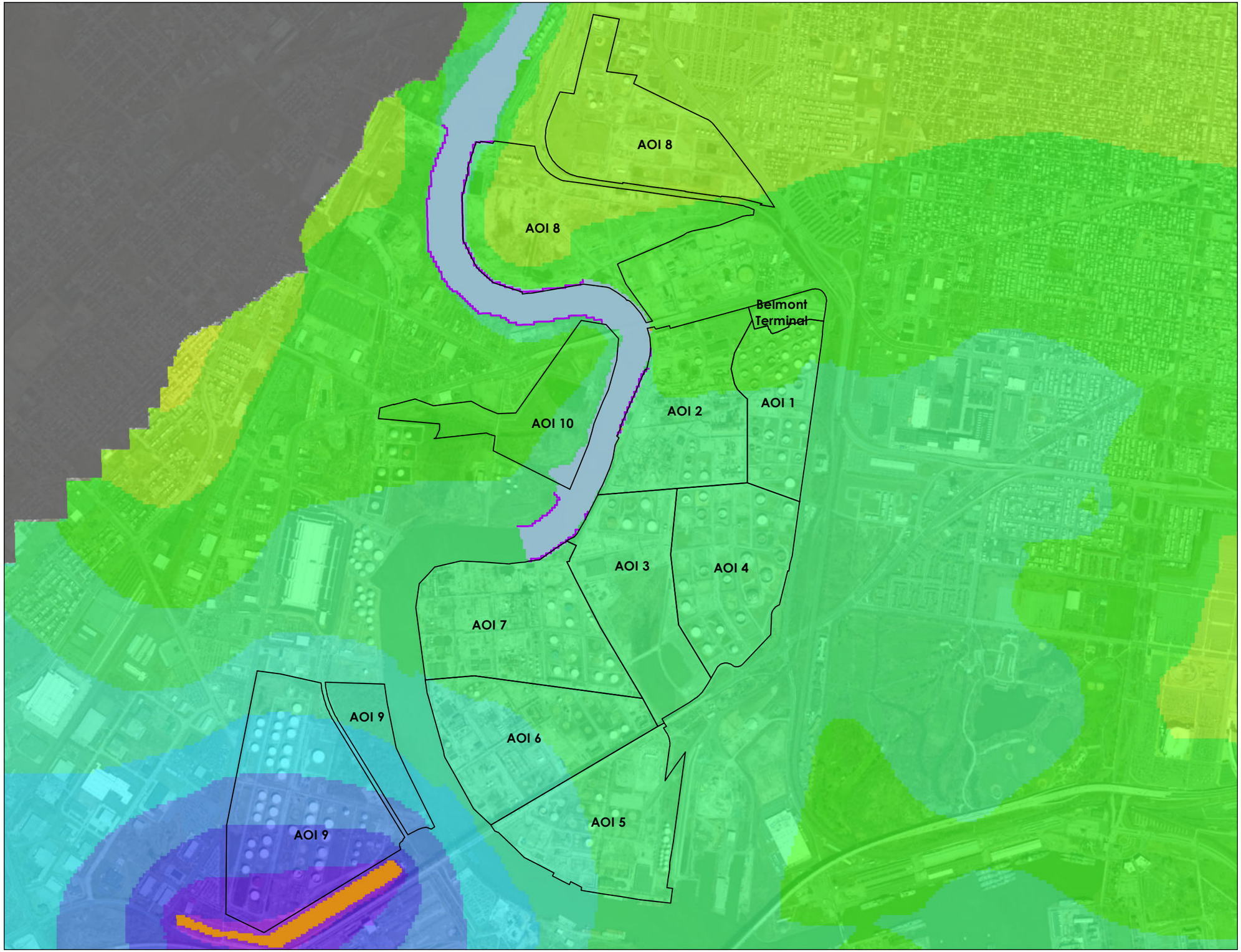

Figure No.
6-2C

Title
SIMULATED POTENTIOMETRIC SURFACE LAYER 5

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

Area of Interest (AOI) Boundary

Model Boundary Conditions

- Drain Boundary
- River Boundary
- No Flow Boundary
- Horizontal Flow Boundary

Layer 5 Simulated Potentiomtric Surface

FT NAVD88

- 18 - 20
- 16 - 18
- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8
- -12 - -10
- -14 - -12
- -16 - -14
- -18 - -16
- -20 - -18

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet; FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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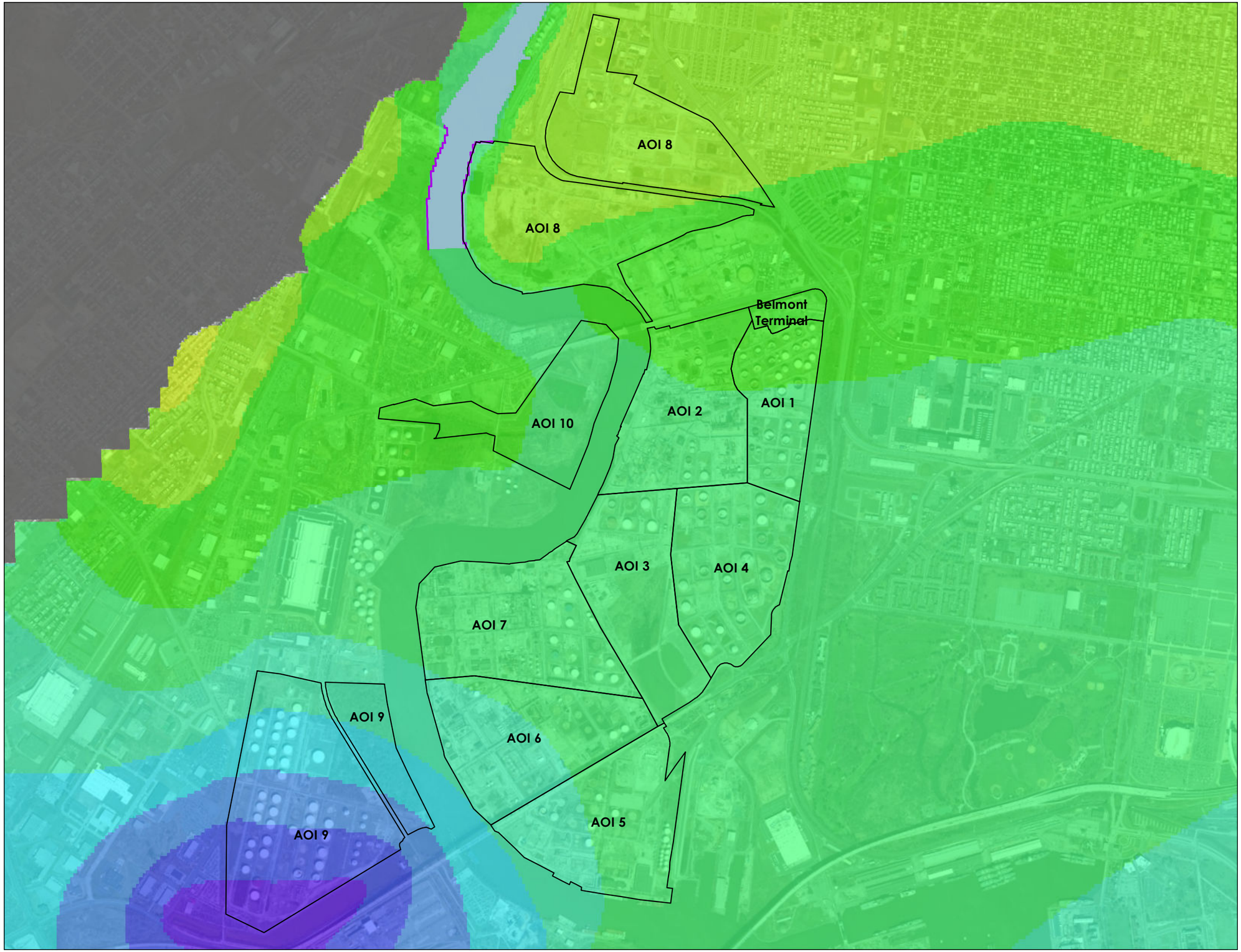

Figure No.
6-2D

Title
SIMULATED POTENTIOMETRIC SURFACE LAYER 7

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,200 2,400 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

Area of Interest (AOI) Boundary

Model Boundary Conditions

- River Boundary
- No Flow Boundary
- Horizontal Flow Boundary

Layer 7 Simulated Potentiomtric Surface

FT NAVD88

- 18 - 20
- 16 - 18
- 14 - 16
- 12 - 14
- 10 - 12
- 8 - 10
- 6 - 8
- 4 - 6
- 2 - 4
- 0 - 2
- -2 - 0
- -4 - -2
- -6 - -4
- -8 - -6
- -10 - -8
- -12 - -10
- -14 - -12
- -16 - -14
- -18 - -16
- -20 - -18

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet; FT NAVD88 = feet referenced to the North American Vertical Datum of 1988
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Stantec

EVERGREEN

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Figure No.
6-3

Title
2017 CALIBRATION TARGET RESIDUAL PLOT (BUBBLE PLOT)

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Area of Interest (AOI) Boundary
- River Boundary

2017 Calibration Well (Target) Residual (feet)

- < -10
- -10 - -7.5
- -7.5 - -5.0
- -5.0 - -2.5
- -2.5 - 0.0
- 0.0 - 2.5
- 2.5 - 5.0
- 5.0 -7.5
- 7.5 - 10
- > 10

Number of Observations	964
Residual Mean	0.59 ft
Residual Std. Deviation	1.85 ft
Relative Error	6.85%

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet; ft = feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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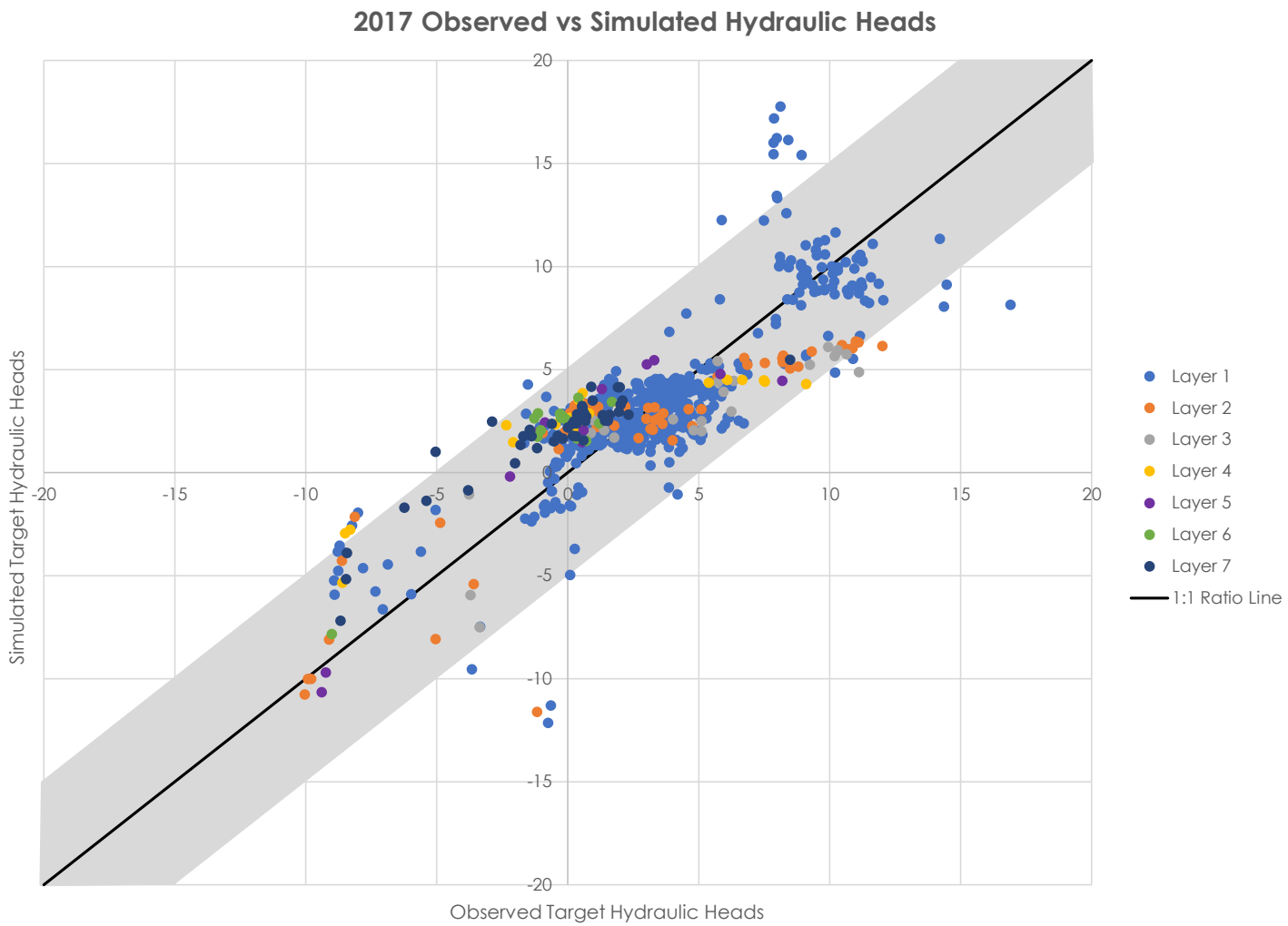

Figure No.
6-4

Title
2017 CALIBRATION OBSERVED VERSUS SIMULATED CHART

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

Number of Observations	964
Residual Mean	0.59 ft
Residual Std. Deviation	1.85 ft
Relative Error	6.85%

Notes:
1. Sources: Stantec
2. GWF Model simulated and observed hydraulic heads from well gauging measurements are provided in units of feet (ft).
3. GWF Model layers 1 through 7 are color coded to intersecting well locations based on the legend shown.

Stantec

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Figure No.
6-5

Title
2018 VERIFICATION TARGET RESIDUAL PLOT (BUBBLE PLOT)

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,100 2,200 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Area of Interest (AOI) Boundary
- River Boundary

2018 Verification Well (Target) Residual (feet)

- < -5.0
- -5.0 - -2.5
- -2.5 - 0.0
- 0.0 - 2.5
- 2.5 - 5.0
- > 5.0

Number of Observations	981
Residual Mean	0.96 ft
Residual Std. Deviation	1.93 ft
Relative Error	7.15%

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet; ft = feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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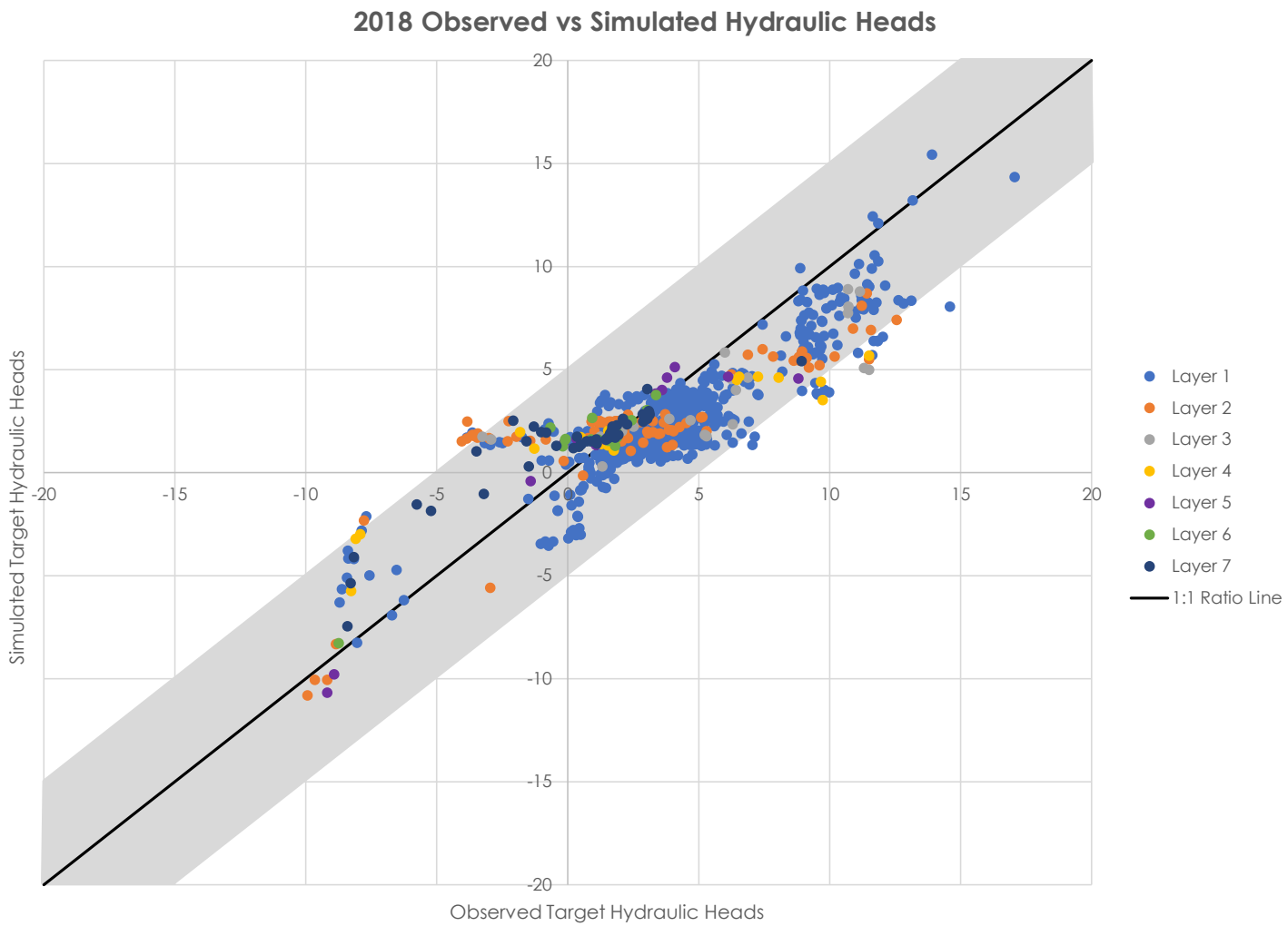

Figure No.
6-6

Title
2018 VERIFICATION OBSERVED VERSUS SIMULATED CHART

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

Number of Observations	981
Residual Mean	0.96 ft
Residual Std. Deviation	1.93 ft
Relative Error	7.15%

Notes:
1. Sources: Stantec
2. GWF Model simulated and observed hydraulic heads from well gauging measurements are provided in units of feet (ft).
3. GWF Model layers 1 through 7 are color coded to intersecting well locations based on the legend shown.

Stantec

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TABLES

Sitewide Fate and Transport Remedial Investigation Report
Part 1 – Groundwater Flow Model
Former Philadelphia Refinery
Philadelphia, Pennsylvania
Philadelphia Refinery Operations,
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue, Philadelphia, Pennsylvania

Stantec

Table 3-1
Generalized Stratigraphic Section and Interpreted Hydrostratigraphic Units
Former Philadelphia Refinery
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

<table>
<tr><th>System</th><th>Series</th><th colspan="2">Hydrogeologic Unit</th><th>Hydrostratigraphic Unit</th></tr>
<tr><td rowspan="2">Quaternary</td><td>Holocene</td><td colspan="2">alluvium</td><td rowspan="8">Water-Table aquifer
(unconfined)</td></tr>
<tr><td>Pleistocene</td><td colspan="2">Pleistocene alluvium</td></tr>
<tr><td rowspan="7">Cretaceous</td><td rowspan="6">Upper Cretaceous</td><td rowspan="7">Potomac-Raritan-Magothy aquifer system</td><td>Upper clay unit</td></tr>
<tr><td>Upper sand unit</td></tr>
<tr><td>Middle clay unit</td><td>Aquitard</td></tr>
<tr><td>Middle sand unit</td><td rowspan="4">Lower aquifer
(semi-confined)</td></tr>
<tr><td>Lower clay unit</td></tr>
<tr><td rowspan="2">Lower sand unit</td></tr>
<tr><td>Lower Cretaceous</td></tr>
<tr><td>Pre-Cretaceous</td><td></td><td>Wissahickon Formation</td><td></td><td></td></tr>
</table>

Notes:
1. Adopted from Figure 2 of Schreffler, 2001.
2. Hydrostratigraphic units interpreted by Stantec based on observed subsurface conditions at the former Philadelphia Refinery.

Table 7-1
Results of Sensitivity Analysis
Former Philadelphia Refinery
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

Parameter Varied	Range Tested	Sensitivity Analysis Result
Hydraulic Conductivity	0.1 to 10 times initial estimates	Highly sensitive. Modifications to horizontal hydraulic conductivity significantly modified model calibration, regional and local groundwater gradients and flow velocities.
Recharge	0.5 to 2 times initial estimates	Sensitive. Water levels increased substatively and calibration was significantly poorer. Most sensitive in areas of low hydraulic conductivity assigned in GWF Model layer 1.
Horizontal Flow Barriers	0.01 to 10 times initial estimates	Locally sensitive. Primarily sensitivity is greatest to increases in barrier conductance. The simulations performed indicate that at higher conductance the simulated barrier locally modifies the groundwater gradient and results in a lower hydraulic gradient adjacent to the flow barrier.
Mingo Creek Drain Boundary	drain stage ranged from -15 feet to -5 feet	Locally sensitive. The affects are most prominent in the groundwater flow direction and gradient in the lower aquifer and in AOI-9.
River Bed Conductance	0.1 to 10 times initial estimates	Low sensitivity. Variable conductance has little susbstantive effect on groundwater flow. The river remains a prominant discharge point over the range of evaluated conductance.
Regional Groundwater Extraction	0.5 and 2 times initial estimates	Low sensitivity. The location of the regional pumping across the Delaware River affects regional gradients but has little effect on groundwater flow at the PES Complex.

APPENDIX A
2014 – 2019, 2021 FIELD GAUGING AND GWF MODEL DATA

Sitewide Fate and Transport Remedial Investigation Report
Part 1 – Groundwater Flow Model
Former Philadelphia Refinery
Philadelphia, Pennsylvania
Philadelphia Refinery Operations,
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue, Philadelphia, Pennsylvania

Stantec

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
A-10	AOI 5	2682406	215428	unconfined	-1.33	1	4.54	3.66	0.88
A-11	AOI 5	2682016	215380	unconfined	-3.91	1	2.46	2.93	-0.47
A-118	AOI 5	2683071	217109	unconfined	5.91	1	5.63	5.94	-0.31
A-12	AOI 5	2682183	215379	unconfined	-3.12	1	2.37	3.28	-0.91
A-122	AOI 5	2682278	215930	unconfined	2.54	1	2.59	3.69	-1.10
A-133	AOI 5	2681282	215805	unconfined	0.13	1	3.74	4.54	-0.80
A-134	AOI 5	2681409	215810	unconfined	-2.79	1	1.52	4.61	-3.09
A-135	AOI 5	2681633	215823	unconfined	-1.64	1	3.31	2.94	0.37
A-136	AOI 5	2681693	215556	unconfined	-3.48	1	1.88	2.50	-0.62
A-137	AOI 5	2683597	215161	unconfined	-1.71	1	2.21	1.61	0.60
A-142	AOI 5	2683676	214931	unconfined	-2.36	1	0.84	1.34	-0.50
A-143	AOI 5	2683340	215553	unconfined	1.08	1	3.86	2.71	1.15
A-148	AOI 5	2682641	216806	unconfined	-1.3	1	4.49	5.46	-0.97
A-149	AOI 5	2682443	216327	unconfined	-2.41	1	5.04	5.26	-0.22
A-151	AOI 5	2682129	215824	unconfined	-3.4	1	3.06	3.48	-0.42
A-152	AOI 5	2681987	216073	unconfined	-7.07	1	1.64	3.40	-1.76
A-155	AOI 5	2681449	216208	unconfined	-2.6	1	3.21	4.58	-1.37
A-156	AOI 5	2681355	216058	unconfined	3.1	1	4.19	4.62	-0.43
A-157	AOI 5	2681414	216278	unconfined	1.8	1	3.76	4.47	-0.71
A-163	AOI 5	2681070	215985	unconfined	3.65	1	4.14	3.78	0.36
A-164	AOI 5	2681178	216039	unconfined	3.03	1	3.89	4.13	-0.24
A-22	AOI 5	2680996	216032	unconfined	-2.24	1	2.21	1.83	0.38
A-23	AOI 5	2682143	216385	unconfined	-4.21	1	3.14	3.74	-0.60
A-24	AOI 5	2681515	215977	unconfined	-1.44	1	3.14	4.48	-1.34
A-25	AOI 5	2682468	216982	unconfined	0.82	1	4.27	5.67	-1.40
A-26	AOI 5	2682167	216793	unconfined	0.5	1	3.80	5.47	-1.67
A-27	AOI 5	2681846	216592	unconfined	-0.5	1	3.90	3.52	0.38
A-3	AOI 5	2683412	215785	unconfined	-0.34	1	3.72	3.36	0.36
A-4	AOI 5	2683520	215001	unconfined	-4.15	1	2.45	1.47	0.98
A-40	AOI 5	2683592	215201	unconfined	-1.98	1	2.27	1.61	0.66
A-41	AOI 5	2683535	215097	unconfined	-2.23	1	2.38	1.59	0.79
A-44	AOI 5	2683121	215462	unconfined	-0.39	1	3.66	3.07	0.59
A-45	AOI 5	2682742	215239	unconfined	-3.13	1	0.86	3.12	-2.26
A-46	AOI 5	2682464	215347	unconfined	1.56	1	3.48	3.57	-0.09
A-48	AOI 5	2682295	215157	unconfined	-2.87	1	1.81	2.23	-0.42
A-49	AOI 5	2682249	215647	unconfined	-1.2	1	3.84	3.61	0.23
A-5	AOI 5	2682620	215251	unconfined	-5.35	1	0.23	3.28	-3.05
A-6	AOI 5	2682954	215268	unconfined	-1.99	1	3.07	2.82	0.25
A-7	AOI 5	2683087	215287	unconfined	-1.13	1	3.73	2.54	1.19
A-9	AOI 5	2683089	215096	unconfined	-2.05	1	2.53	1.86	0.67
ARCO-1	AOI 1	2685973	221361	unconfined	-4.89	1	0.92	0.57	0.35
ARCO-2	AOI 1	2685882	221258	unconfined	-5.11	1	0.78	0.93	-0.15
ARCO-3	AOI 1	2685928	221631	unconfined	-7.51	1	0.25	-1.45	1.70

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
B-115	AOI 6	2682825	218059	unconfined	5.03	1	4.82	4.77	0.05
B-123	AOI 6	2681458	217146	unconfined	6.25	1	6.01	4.88	1.13
B-124	AOI 6	2681316	216811	unconfined	-4.09	1	3.85	4.54	-0.69
B-125	AOI 6	2681099	216829	unconfined	3.79	1	3.74	4.10	-0.36
B-126	AOI 6	2680974	217022	unconfined	3.6	1	3.50	4.06	-0.56
B-130	AOI 6	2680131	217397	unconfined	-1.89	1	4.06	3.46	0.60
B-131	AOI 6	2680693	216460	unconfined	-2.8	1	3.24	4.23	-0.99
B-132	AOI 6	2681171	217351	unconfined	-3.73	1	1.95	4.03	-2.08
B-133	AOI 6	2681207	217307	unconfined	-2.7	1	2.21	4.16	-1.95
B-134	AOI 6	2681163	217285	unconfined	-2.62	1	1.67	4.11	-2.44
B-135	AOI 6	2681137	217329	unconfined	-2.69	1	1.51	4.06	-2.55
B-136	AOI 6	2681253	217259	unconfined	-0.69	1	4.31	4.49	-0.18
B-137	AOI 6	2681298	217188	unconfined	-0.78	1	4.42	4.59	-0.17
B-138	AOI 6	2681330	217138	unconfined	-0.94	1	4.98	4.61	0.37
B-142	AOI 6	2681209	217178	unconfined	-0.19	1	2.72	4.44	-1.72
B-143	AOI 6	2681159	217208	unconfined	-0.64	1	3.74	4.39	-0.65
B-144	AOI 6	2681235	217134	unconfined	-0.84	1	4.21	4.45	-0.24
B-145	AOI 6	2681362	217086	unconfined	0.16	1	5.34	4.67	0.67
B-147	AOI 6	2681125	217146	unconfined	-0.4	1	2.91	4.29	-1.38
B-148	AOI 6	2681077	217444	unconfined	-0.81	1	1.59	4.29	-2.70
B-149	AOI 6	2680999	217436	unconfined	-0.2	1	4.85	4.35	0.50
B-150	AOI 6	2680966	217480	unconfined	-0.17	1	4.67	4.39	0.28
B-151	AOI 6	2680729	217738	unconfined	-0.23	1	4.21	4.28	-0.07
B-152	AOI 6	2680603	217848	unconfined	-0.5	1	3.79	4.25	-0.46
B-153	AOI 6	2680102	217475	unconfined	0.67	1	3.94	2.88	1.06
B-154	AOI 6	2680927	217552	unconfined	0.43	1	5.73	4.38	1.35
B-155	AOI 6	2680975	217400	unconfined	0.54	1	4.01	4.28	-0.27
B-156	AOI 6	2680904	217366	unconfined	0.65	1	3.61	4.20	-0.59
B-158	AOI 6	2679969	217967	unconfined	1.66	1	5.01	3.80	1.21
B-160	AOI 6	2681840	217371	unconfined	2.95	1	4.59	5.36	-0.77
B-161	AOI 6	2681270	216894	unconfined	-0.02	1	3.89	4.59	-0.70
B-163	AOI 6	2681199	217531	unconfined	1.68	1	6.14	4.56	1.58
B-164	AOI 6	2680585	216480	unconfined	-1.14	1	3.19	3.75	-0.56
B-165	AOI 6	2680187	217152	unconfined	2.97	1	2.95	1.14	1.81
B-166	AOI 6	2682932	217409	unconfined	0.89	1	4.45	5.86	-1.41
B-167	AOI 6	2683188	217814	unconfined	3.56	1	3.38	5.03	-1.65
B-168	AOI 6	2680070	217495	unconfined	4.05	1	3.82	2.33	1.49
B-169	AOI 6	2680092	217416	unconfined	4.23	1	4.15	1.29	2.86
B-170	AOI 6	2680111	217350	unconfined	-1.71	1	-1.86	1.55	-3.41
B-39	AOI 6	2680590	216614	unconfined	-3.46	1	3.48	4.06	-0.58
B-43	AOI 6	2680085	217611	unconfined	-1.61	1	2.29	3.90	-1.61
B-45	AOI 6	2680393	218353	unconfined	-4.1	1	4.05	4.23	-0.18
B-46	AOI 6	2681909	218131	unconfined	1.32	1	6.59	5.41	1.18

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
B-48	AOI 6	2682248	217529	unconfined	-2.2	1	6.22	5.30	0.92
B-92	AOI 6	2681498	216966	unconfined	-3.2	1	5.11	4.83	0.28
B-95	AOI 6	2680373	217541	unconfined	4.93	1	3.85	4.23	-0.38
BF-103R	AOI 3	2682491	219959	unconfined	3.43	1	0.93	1.84	-0.91
BF-105	AOI 3	2682998	219443	unconfined	0.61	1	1.19	2.05	-0.86
BF-106	AOI 3	2683176	219737	unconfined	0.19	1	1.16	1.98	-0.82
BF-107	AOI 3	2683307	219941	unconfined	0.55	1	1.16	2.11	-0.95
BF-88	AOI 3	2683465	220156	unconfined	-2.14	1	1.32	2.12	-0.80
BF-99	AOI 3	2683159	219974	unconfined	-4.18	1	1.14	1.89	-0.75
C-104	AOI 7	2679742	219188	unconfined	2.85	1	2.67	1.88	0.79
C-105	AOI 7	2679690	219497	unconfined	5.29	1	4.86	1.66	3.20
C-108	AOI 7	2680856	219819	unconfined	3.88	1	3.50	2.98	0.52
C-109	AOI 7	2682312	219231	unconfined	5.58	1	5.36	5.12	0.24
C-110	AOI 7	2682469	219406	unconfined	6.82	1	6.97	5.19	1.78
C-111	AOI 7	2682561	219232	unconfined	6.62	1	6.82	5.38	1.44
C-112	AOI 7	2682431	218697	unconfined	-1.62	1	8.75	5.89	2.86
C-113	AOI 7	2682817	218798	unconfined	7.07	1	6.91	6.19	0.72
C-113	AOI 7	2682817	218798	unconfined	7.07	1	6.81	6.19	0.62
C-114	AOI 7	2683001	218348	unconfined	7.17	1	6.56	6.07	0.49
C-127	AOI 7	2680897	220182	unconfined	-3.3	1	1.51	2.76	-1.25
C-129	AOI 7	2681937	220497	unconfined	0.2	1	4.06	3.22	0.84
C-130	AOI 7	2682140	219981	unconfined	0.29	1	5.20	5.07	0.13
C-131	AOI 7	2682329	218971	unconfined	-0.72	1	6.44	5.40	1.04
C-133	AOI 7	2681694	218336	unconfined	-0.82	1	5.52	5.17	0.35
C-136	AOI 7	2680991	219217	unconfined	-2.22	1	4.19	2.97	1.22
C-137	AOI 7	2680719	219098	unconfined	-4.29	1	1.66	2.85	-1.19
C-138	AOI 7	2680453	218658	unconfined	-2.52	1	1.82	2.71	-0.89
C-139	AOI 7	2680633	219444	unconfined	-1.53	1	4.31	2.85	1.46
C-140	AOI 7	2679799	218858	unconfined	0.99	1	5.65	2.12	3.53
C-142	AOI 7	2680660	220134	unconfined	0.62	1	2.02	0.48	1.54
C-155	AOI 7	2680525	220082	unconfined	3.23	1	2.18	-0.33	2.51
C-156	AOI 7	2681408	220254	unconfined	-6.48	1	3.51	4.07	-0.56
C-157	AOI 7	2681432	220255	unconfined	-6.67	1	3.69	4.02	-0.33
C-159	AOI 7	2681506	220269	unconfined	-6.56	1	3.74	3.61	0.13
C-163	AOI 7	2681332	220248	unconfined	2.58	1	3.13	3.97	-0.84
C-164	AOI 7	2681359	220252	unconfined	1.98	1	2.43	3.85	-1.42
C-165	AOI 7	2681386	220255	unconfined	2.4	1	2.92	3.90	-0.98
C-168	AOI 7	2679988	220174	unconfined	3.45	1	3.38	1.69	1.69
C-50	AOI 7	2682341	219619	unconfined	-1.17	1	5.51	5.11	0.40
C-51	AOI 7	2681621	220073	unconfined	-1.1	1	4.24	4.71	-0.47
C-52	AOI 7	2681216	220206	unconfined	-1.32	1	2.60	4.13	-1.53
C-53A	AOI 7	2681031	219940	unconfined	-0.88	1	5.48	4.11	1.37
C-54	AOI 7	2680975	219459	unconfined	-2.51	1	6.24	2.99	3.25

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
C-55	AOI 7	2680864	218851	unconfined	-3.51	1	4.00	2.89	1.11
C-56	AOI 7	2681367	218776	unconfined	0.4	1	8.50	5.09	3.41
C-57	AOI 7	2681651	219572	unconfined	-1.05	1	5.76	4.97	0.79
C-58	AOI 7	2681692	219017	unconfined	-0.61	1	5.31	5.11	0.20
C-60	AOI 7	2680151	218657	unconfined	-1.98	1	3.70	2.58	1.12
C-61	AOI 7	2679819	219306	unconfined	-0.12	1	4.07	2.49	1.58
C-62	AOI 7	2679892	219890	unconfined	0.35	1	6.43	2.75	3.68
C-63	AOI 7	2680379	219611	unconfined	-3.83	1	1.12	2.84	-1.72
C-64	AOI 7	2680431	220167	unconfined	-1.83	1	-1.47	-11.19	9.72
C-65	AOI 7	2680266	220116	unconfined	-0.53	1	8.73	-4.15	12.88
C-96	AOI 7	2681980	219529	unconfined	-2.18	1	7.06	5.18	1.88
C-97	AOI 7	2680616	220230	unconfined	-2.45	1	-6.51	-8.71	2.20
C-98	AOI 7	2680220	219208	unconfined	-0.66	1	4.55	2.73	1.82
CSX-IW-5	DSCP	2686326	223316	unconfined	-0.56	1	1.92	2.42	-0.50
CSX-MW2	DSCP	2686231	222459	unconfined	16.03	1	3.61	1.65	1.96
CSX-MW3A	DSCP	2686250	222972	unconfined	15.34	1	2.26	2.01	0.25
CSX-MW4	DSCP	2686223	222715	unconfined	19.24	1	1.47	1.78	-0.31
CSX-MW5	DSCP	2686326	223321	unconfined	21.42	1	3.98	2.42	1.56
CSX-MW7	DSCP	2686132	222540	unconfined	13.97	1	1.19	1.46	-0.27
CSX-MW8	DSCP	2686196	222613	unconfined	15.28	1	1.38	1.65	-0.27
CSX-MW9	DSCP	2686193	223091	unconfined	18.28	1	1.94	1.96	-0.02
DSCP-MW-1	DSCP	2686587	222951	unconfined	4.34	1	2.34	2.55	-0.21
DSCP-MW-10	DSCP	2688682	221989	unconfined	1.1	1	2.22	2.64	-0.42
DSCP-MW-11	DSCP	2688509	222483	unconfined	2.46	1	2.41	2.99	-0.58
DSCP-MW-12	DSCP	2688887	222849	unconfined	-7.38	1	2.86	3.40	-0.54
DSCP-MW-13	DSCP	2688362	222878	unconfined	4.5	1	3.02	3.29	-0.27
DSCP-MW-14	DSCP	2687863	222366	unconfined	2.72	1	2.06	2.73	-0.67
DSCP-MW-15	DSCP	2687278	222669	unconfined	5.52	1	1.95	2.75	-0.80
DSCP-MW-16	DSCP	2686924	222962	unconfined	4.46	1	2.40	2.76	-0.36
DSCP-MW-17	DSCP	2687015	223191	unconfined	6.12	1	2.88	2.98	-0.10
DSCP-MW-19	DSCP	2686631	223493	unconfined	7.08	1	4.33	2.95	1.38
DSCP-MW-1A	DSCP	2688112	222563	unconfined	7.56	1	2.46	2.96	-0.50
DSCP-MW-2	DSCP	2686659	222486	unconfined	3.77	1	1.78	2.26	-0.48
DSCP-MW-20	DSCP	2686775	224059	unconfined	9.29	1	4.80	3.89	0.91
DSCP-MW-21A	DSCP	2687617	223591	unconfined	6.69	1	3.70	3.59	0.11
DSCP-MW-23A	DSCP	2686572	222722	unconfined	4.3	1	2.03	2.39	-0.36
DSCP-MW-24	DSCP	2687351	222881	unconfined	7.33	1	2.36	2.94	-0.58
DSCP-MW-27A	DSCP	2687880	222716	unconfined	5.82	1	2.55	3.02	-0.47
DSCP-MW-28	DSCP	2686735	222344	unconfined	2.77	1	2.03	2.20	-0.17
DSCP-MW-29	DSCP	2686965	222161	unconfined	3.43	1	2.04	2.19	-0.15
DSCP-MW-2B	DSCP	2687618	223121	unconfined	3.44	1	3.00	3.26	-0.26
DSCP-MW-32	DSCP	2687645	222120	unconfined	3.44	1	2.83	2.46	0.37
DSCP-MW-33	DSCP	2687847	222091	unconfined	1.31	1	1.80	2.50	-0.70

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WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
DSCP-MW-35A	DSCP	2687607	222354	unconfined	3.14	1	2.06	2.64	-0.58
DSCP-MW-36	DSCP	2688198	221951	unconfined	2.55	1	2.12	2.49	-0.37
DSCP-MW-3A	DSCP	2687182	222473	unconfined	3.56	1	1.82	2.55	-0.73
DSCP-MW-44A	DSCP	2686629	223212	unconfined	2.46	1	2.73	2.72	0.01
DSCP-MW-45A	DSCP	2686661	223705	unconfined	6.36	1	4.56	3.25	1.31
DSCP-MW-4A	DSCP	2687066	222254	unconfined	5.19	1	1.83	2.32	-0.49
DSCP-MW-5	DSCP	2687276	222313	unconfined	3.9	1	2.14	2.47	-0.33
DSCP-MW-53	DSCP	2688910	223078	unconfined	1.45	1	3.07	3.59	-0.52
DSCP-MW-54	DSCP	2688606	222975	unconfined	3.05	1	3.04	3.44	-0.40
DSCP-MW-59	DSCP	2688866	222696	unconfined	2.2	1	2.71	3.26	-0.55
DSCP-MW-6	DSCP	2687259	222070	unconfined	4.38	1	1.91	2.26	-0.35
DSCP-MW-65	DSCP	2687428	222124	unconfined	-2.03	1	1.81	2.38	-0.57
DSCP-MW-7	DSCP	2688049	221962	unconfined	6.39	1	2.17	2.46	-0.29
DSCP-MW-9	DSCP	2688453	221927	unconfined	2.75	1	2.11	2.54	-0.43
DSCP-RW-10	DSCP	2688044	222360	unconfined	1.24	1	2.42	2.78	-0.36
DSCP-RW-11	DSCP	2687629	222027	unconfined	2.29	1	2.70	2.38	0.32
DSCP-RW-1A	DSCP	2687406	222061	unconfined	1.83	1	1.76	2.32	-0.56
DSCP-RW-2	DSCP	2686840	222240	unconfined	3.66	1	2.05	2.18	-0.13
DSCP-RW-3	DSCP	2687102	222099	unconfined	3.44	1	1.95	2.21	-0.26
DSCP-RW-4	DSCP	2687542	222032	unconfined	2.26	1	2.33	2.35	-0.02
DSCP-RW-5/MW-25	DSCP	2687690	222012	unconfined	5.6	1	1.79	2.39	-0.60
DSCP-RW-6	DSCP	2687840	221992	unconfined	1.34	1	1.85	2.42	-0.57
DSCP-RW-7	DSCP	2687993	221974	unconfined	1.87	1	2.06	2.45	-0.39
DSCP-RW-8	DSCP	2687444	222376	unconfined	1.59	1	2.29	2.59	-0.30
DSCP-RW-9	DSCP	2688233	222374	unconfined	1.4	1	2.26	2.84	-0.58
EPH-MW-39	DSCP	2688284	221752	unconfined	-0.27	1	2.10	2.35	-0.25
EPH-MW-48	DSCP	2687984	221540	unconfined	0.59	1	2.40	1.66	0.74
EPH-MW-49	DSCP	2687860	221395	unconfined	2.81	1	2.44	1.96	0.48
EPH-MW-50	DSCP	2687767	221178	unconfined	1.38	1	2.37	2.23	0.14
EPH-MWS-10	DSCP	2687988	221053	unconfined	5.46	1	5.07	2.47	2.60
EPH-MWS-11	DSCP	2687625	221111	unconfined	5.11	1	2.53	2.25	0.28
EPH-MWS-5	DSCP	2688545	221597	unconfined	0.46	1	2.01	1.80	0.21
EPH-PH-5	DSCP	2687579	220875	unconfined	-2.32	1	2.10	2.46	-0.36
EPH-PH-7	DSCP	2688852	221563	unconfined	-1.09	1	3.61	2.26	1.35
MW-26	BELMONT	2685920	224123	unconfined	-7.91	1	4.90	3.34	1.56
MW-27	BELMONT	2685686	224065	unconfined	9.55	1	4.90	3.65	1.25
MW-28	BELMONT	2685581	224169	unconfined	9.26	1	4.72	3.93	0.79
MW-29	BELMONT	2685481	223955	unconfined	9.5	1	4.83	3.81	1.02
MW-30	BELMONT	2684982	224261	unconfined	4.5	1	4.63	4.60	0.03
MW-31	BELMONT	2685353	224156	unconfined	11.48	1	4.85	4.20	0.65
MW-32	BELMONT	2685565	224286	unconfined	9.59	1	4.70	4.11	0.59
MW-33	BELMONT	2685300	224346	unconfined	12.3	1	5.14	4.48	0.66
MW-35	BELMONT	2685572	224473	unconfined	3.34	1	4.20	4.40	-0.20

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
MW-36	BELMONT	2685830	224431	unconfined	5.25	1	5.15	4.05	1.10
MW-37	BELMONT	2685985	224470	unconfined	5.05	1	5.34	4.20	1.14
MW-38	BELMONT	2686166	224255	unconfined	0.48	1	4.87	3.70	1.17
MW-39	BELMONT	2686158	224193	unconfined	0.49	1	4.92	3.48	1.44
MW-40	BELMONT	2686146	224123	unconfined	3.81	1	4.94	3.13	1.81
MW-41	BELMONT	2686036	224120	unconfined	0.16	1	4.48	3.22	1.26
MW-43	BELMONT	2685063	224183	unconfined	3.48	1	4.64	4.46	0.18
MW-44	BELMONT	2685403	224419	unconfined	2.32	1	4.20	4.48	-0.28
N-1	AOI 8	2682437	228366	unconfined	18.57	1	13.78	7.46	6.32
N-100	AOI 8	2682716	228210	unconfined	9.99	1	9.70	6.35	3.35
N-101	AOI 8	2683653	227222	unconfined	7.43	1	11.44	10.94	0.50
N-106	AOI 8	2682977	227044	unconfined	7.5	1	14.88	16.38	-1.50
N-107	AOI 8	2683133	226910	unconfined	7.38	1	11.34	13.39	-2.05
N-108	AOI 8	2682983	226849	unconfined	9.97	1	12.02	13.04	-1.02
N-11	AOI 8	2682915	227226	unconfined	14.83	1	12.21	11.16	1.05
N-118	AOI 8	2683077	226461	unconfined	6.49	1	8.90	8.57	0.33
N-129	AOI 8	2683241	225470	unconfined	5.12	1	10.44	9.24	1.20
N-134	AOI 8	2685262	226063	unconfined	10.79	1	11.62	7.51	4.11
N-137	AOI 8	2683096	227832	unconfined	5.87	1	8.35	7.64	0.71
N-14	AOI 8	2683665	227011	unconfined	17.14	1	11.26	10.10	1.16
N-140	AOI 8	2683133	227411	unconfined	8.16	1	10.24	9.89	0.35
N-141	AOI 8	2683308	227396	unconfined	7.54	1	11.00	11.09	-0.09
N-142	AOI 8	2683211	227652	unconfined	6.99	1	8.47	9.28	-0.81
N-143	AOI 8	2683358	227513	unconfined	8.22	1	10.83	10.59	0.24
N-144	AOI 8	2683293	227623	unconfined	6.77	1	8.76	9.76	-1.00
N-145	AOI 8	2683032	227680	unconfined	7.36	1	8.54	8.27	0.27
N-15	AOI 8	2684060	226993	unconfined	17.05	1	9.00	8.03	0.97
N-16	AOI 8	2684409	226993	unconfined	18.4	1	12.06	7.70	4.36
N-17	AOI 8	2684410	226993	unconfined	19.05	1	12.00	7.70	4.30
N-18	AOI 8	2684650	226744	unconfined	17.65	1	11.90	7.84	4.06
N-20	AOI 8	2683878	226645	unconfined	22.12	1	11.26	9.05	2.21
N-24	AOI 8	2682554	226437	unconfined	10.03	1	9.43	7.50	1.93
N-29	AOI 8	2685039	225835	unconfined	21.6	1	11.91	10.03	1.88
N-37	AOI 8	2681543	226828	lower aquifer	4.26	1	6.28	5.87	0.41
N-42	AOI 8	2682412	225813	unconfined	4.59	1	7.31	8.12	-0.81
N-47	AOI 8	2683936	225489	unconfined	17.05	1	13.28	9.20	4.08
N-48	AOI 8	2683476	225312	unconfined	15.42	1	10.68	9.43	1.25
N-49	AOI 8	2683115	225175	unconfined	17.05	1	9.98	9.79	0.19
N-503	AOI 8	2680566	226576	unconfined	11.46	1	3.85	4.27	-0.42
N-504	AOI 8	2680652	226857	unconfined	11.36	1	3.30	3.80	-0.50
N-51	AOI 8	2682956	225253	unconfined	16.92	1	9.92	9.71	0.21
N-55	AOI 8	2681474	225122	unconfined	4.39	1	5.06	8.44	-3.38
N-56	AOI 8	2681266	225659	unconfined	4.18	1	4.93	8.74	-3.81

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
N-57	AOI 8	2680586	226031	unconfined	3.8	1	5.17	7.28	-2.11
N-64	AOI 8	2682309	224842	unconfined	2.5	1	6.80	3.68	3.12
N-67	AOI 8	2682698	226940	unconfined	14.9	1	14.93	14.11	0.82
N-68	AOI 8	2682973	226911	unconfined	14.87	1	16.60	15.28	1.32
N-72	AOI 8	2680686	226761	unconfined	1.26	1	3.79	6.39	-2.60
N-8	AOI 8	2684092	227375	unconfined	18.53	1	12.44	10.23	2.21
N-82	AOI 8	2684634	225723	unconfined	8.48	1	12.27	9.08	3.19
N-85	AOI 8	2684734	226448	unconfined	8.95	1	11.93	7.14	4.79
N-86	AOI 8	2684119	226463	unconfined	16.3	1	11.16	8.70	2.46
N-87	AOI 8	2683965	226550	unconfined	10.89	1	11.17	9.12	2.05
N-89	AOI 8	2682824	226717	unconfined	9.87	1	9.36	9.85	-0.49
N-93	AOI 8	2683794	226550	unconfined	10.05	1	10.41	8.70	1.71
N-97	AOI 8	2684187	226513	unconfined	9.12	1	9.51	8.34	1.17
N-98	AOI 8	2683479	227658	unconfined	7.46	1	11.41	9.94	1.47
OW-12	BELMONT	2685686	224424	unconfined	15.24	1	2.94	4.17	-1.23
OW-13	BELMONT	2685988	224385	unconfined	16.45	1	5.14	3.98	1.16
OW-17	BELMONT	2685587	224388	unconfined	15.15	1	4.50	4.24	0.26
OW-18	BELMONT	2685520	224437	unconfined	10.75	1	4.17	4.40	-0.23
OW-19	BELMONT	2685717	224415	unconfined	11.22	1	5.17	4.10	1.07
OW-2	BELMONT	2685939	224392	unconfined	16.22	1	5.22	3.99	1.23
OW-20	BELMONT	2685840	224404	unconfined	12.43	1	5.27	3.96	1.31
PGW-MW-10S	PGW	2685131	225179	unconfined	6.2	1	10.22	9.33	0.89
PGW-MW-11S	PGW	2685405	224756	unconfined	4.33	1	9.32	4.91	4.41
PGW-MW-12S	PGW	2685295	224521	unconfined	3.36	1	9.55	4.70	4.85
PGW-MW-1S	PGW	2683457	224135	unconfined	6.3	1	8.22	6.27	1.95
PGW-MW-2S	PGW	2683928	224288	unconfined	8.2	1	10.13	7.37	2.76
PGW-MW-3S	PGW	2684683	224482	unconfined	8	1	10.45	7.06	3.39
PGW-MW-44	PGW	2684147	225231	unconfined	11.99	1	12.07	9.32	2.75
PGW-MW-45	PGW	2684686	225671	unconfined	11.66	1	12.02	9.57	2.45
PGW-MW-4S	PGW	2685044	224934	unconfined	2.84	1	10.14	7.81	2.33
PGW-MW-5	AOI 8	2683138	224445	unconfined	8.12	1	7.93	7.20	0.73
PGW-MW-5S	PGW	2685404	225420	unconfined	3.2	1	9.31	7.59	1.72
PGW-MW-6S	PGW	2685348	224948	unconfined	7.5	1	9.34	5.48	3.86
PGW-MW-7S	PGW	2685067	224606	unconfined	3.2	1	7.89	4.90	2.99
PGW-MW-8	AOI 8	2683074	224544	unconfined	8.2	1	6.34	7.98	-1.64
PH-MW-40	DSCP	2687731	221480	unconfined	0.07	1	2.36	1.72	0.64
PH-MW-41	DSCP	2687413	221534	unconfined	3.62	1	2.20	1.34	0.86
PH-MW-42	DSCP	2686769	221821	unconfined	2.08	1	1.71	1.71	0.00
PH-MW-43	DSCP	2686438	221827	unconfined	6.95	1	13.58	1.34	12.24
PH-MW-51	DSCP	2687500	221132	unconfined	0.97	1	2.39	2.17	0.22
PH-MW-55	DSCP	2686505	222267	unconfined	6.17	1	1.74	2.01	-0.27
PH-MW-56	DSCP	2686556	221083	unconfined	1.46	1	2.13	1.78	0.35
PH-MW-57	DSCP	2686282	220525	unconfined	3.31	1	1.56	2.13	-0.57

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
PH-MW-58	DSCP	2686349	221238	unconfined	4.88	1	2.21	1.45	0.76
PH-MW-60	DSCP	2687960	221802	unconfined	-1.78	1	2.14	2.32	-0.18
PH-MWS-1	DSCP	2686452	221928	unconfined	9.79	1	1.61	1.49	0.12
PH-MWS-2A	DSCP	2687207	221520	unconfined	0.6	1	2.10	1.33	0.77
PH-MWS-3	DSCP	2687763	221556	unconfined	-1.45	1	2.34	1.47	0.87
PH-MWS-4	DSCP	2687804	221600	unconfined	3.58	1	2.38	1.56	0.82
PH-PH-1	DSCP	2686489	222120	unconfined	7.22	1	1.77	1.89	-0.12
PH-PH-13	DSCP	2687220	221617	unconfined	2.67	1	1.87	1.27	0.60
PH-PH-14	DSCP	2687012	221567	unconfined	5.04	1	1.99	1.06	0.93
PH-PH-16	DSCP	2687623	221740	unconfined	2.57	1	2.58	2.12	0.46
PH-PH-17	DSCP	2687678	221881	unconfined	1.18	1	2.00	2.29	-0.29
PH-PH-18	DSCP	2687410	221922	unconfined	1.47	1	1.89	2.22	-0.33
PH-PH-19	DSCP	2687210	221950	unconfined	1.28	1	1.81	2.15	-0.34
PH-PH-2	DSCP	2686821	222025	unconfined	4.86	1	1.58	1.99	-0.41
PH-PH-20	DSCP	2686939	221991	unconfined	2.97	1	1.74	2.03	-0.29
PH-PH-21	DSCP	2686682	222101	unconfined	6.66	1	1.70	1.98	-0.28
PH-PH-22	DSCP	2686409	221643	unconfined	5.46	1	1.95	1.20	0.75
PH-PH-23	DSCP	2686701	221254	unconfined	1.71	1	2.37	1.70	0.67
PH-PH-24	DSCP	2687242	221174	unconfined	1.84	1	3.27	2.02	1.25
PH-PH-3	DSCP	2687314	221945	unconfined	5.63	1	1.96	2.20	-0.24
PH-PH-4	DSCP	2687928	221845	unconfined	0.99	1	2.16	2.34	-0.18
PH-PZ-4	DSCP	2687319	221943	unconfined	9.96	1	1.99	2.20	-0.21
PH-RW-A	DSCP	2686638	222124	unconfined	4.55	1	3.46	1.98	1.48
PH-RW-B	DSCP	2686815	222035	unconfined	3.87	1	2.01	1.99	0.02
PH-RW-C	DSCP	2687070	221975	unconfined	4.07	1	2.55	2.09	0.46
PH-RW-CA	DSCP	2687084	221963	unconfined	5.03	1	1.76	2.09	-0.33
PH-RW-E	DSCP	2687539	221910	unconfined	1.97	1	1.90	2.26	-0.36
PH-RW-F	DSCP	2687826	221867	unconfined	0.03	1	2.12	2.33	-0.21
PH-RW-G	DSCP	2687154	221567	unconfined	7.55	1	2.02	1.16	0.86
PH-RW-N	DSCP	2687810	221599	unconfined	1.74	1	2.20	1.56	0.64
PH-RW-O	DSCP	2687693	221589	unconfined	0.4	1	2.30	1.45	0.85
PH-RW-P	DSCP	2687599	221597	unconfined	1.15	1	2.61	1.47	1.14
PH-RW-Q	DSCP	2687510	221586	unconfined	-1.75	1	-1.58	1.38	-2.96
PH-RW-S	DSCP	2687350	221602	unconfined	-1.01	1	-2.56	1.38	-3.94
PH-RW-U	DSCP	2686879	221846	unconfined	2.62	1	1.72	1.85	-0.13
PH-RW-V	DSCP	2686705	221936	unconfined	2.59	1	1.72	1.83	-0.11
PH-RW-W	DSCP	2686591	221952	unconfined	2.53	1	1.50	1.82	-0.32
PZ-100	AOI 2	2683602	222350	unconfined	1.42	1	2.94	2.37	0.57
PZ-132A	AOI 6	2680866	216104	unconfined	0.62	1	4.04	1.65	2.39
PZ-2	AOI 5	2681495	215938	unconfined	2.56	1	2.78	4.56	-1.78
PZ-201	AOI 8	2683718	225409	unconfined	10.21	1	11.64	9.24	2.40
PZ-202	AOI 8	2683876	225484	unconfined	11.24	1	12.40	9.17	3.23
PZ-203	AOI 8	2684037	225560	unconfined	13.93	1	13.80	9.07	4.73

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WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
PZ-204	AOI 8	2684196	225633	unconfined	8.03	1	9.56	8.82	0.74
PZ-3	AOI 5	2681511	215958	unconfined	2.87	1	3.22	4.50	-1.28
PZ-300	AOI 8	2683295	226640	unconfined	9.39	1	9.70	9.22	0.48
PZ-400	BELMONT	2686131	224096	unconfined	13.86	1	4.92	3.01	1.91
PZ-402	AOI 1	2686061	223552	unconfined	-2.82	1	4.45	2.19	2.26
PZ-403	AOI 1	2685965	222935	unconfined	0.8	1	2.11	1.35	0.76
PZ-404	AOI 1	2685981	222933	unconfined	5.62	1	-0.15	1.28	-1.43
PZ-500	AOI 8	2680478	225305	unconfined	5.13	1	5.08	3.14	1.94
PZ-501	AOI 8	2680429	225835	unconfined	4.37	1	4.89	3.51	1.38
PZ-502	AOI 8	2680434	225562	unconfined	6.14	1	5.14	3.44	1.70
PZ-503	AOI 8	2680590	225085	unconfined	4.58	1	4.58	2.87	1.71
PZ-504	AOI 8	2680730	224903	unconfined	4.54	1	4.64	3.85	0.79
PZ-505	AOI 8	2681024	224708	unconfined	4.56	1	4.67	3.72	0.95
PZ-507	AOI 8	2682206	224812	unconfined	3.68	1	4.42	3.24	1.18
RW-1	BELMONT	2685680	224407	unconfined	-4.42	1	4.80	4.14	0.66
RW-100	AOI 2	2683341	222349	unconfined	-3.66	1	1.78	2.39	-0.61
RW-101	AOI 2	2683489	222384	unconfined	-3.63	1	2.37	2.42	-0.05
RW-102	AOI 2	2683599	222321	unconfined	-4.76	1	1.99	2.35	-0.36
RW-103	AOI 2	2683770	222358	unconfined	-5.24	1	2.29	2.27	0.02
RW-104	AOI 2	2682960	222446	unconfined	-6.89	1	-1.68	2.06	-3.74
RW-105	AOI 2	2682964	222412	unconfined	-2.87	1	0.38	2.28	-1.90
RW-106	AOI 2	2682946	222348	unconfined	-2.71	1	1.69	2.26	-0.57
RW-107	AOI 2	2682915	222272	unconfined	1.3	1	0.55	2.26	-1.71
RW-108	AOI 2	2682895	222181	unconfined	-3.66	1	1.97	2.26	-0.29
RW-109	AOI 2	2682883	222084	unconfined	-3.488	1	2.51	2.25	0.26
RW-110	AOI 1	2685160	222136	unconfined	5.7	1	1.45	1.37	0.08
RW-111	AOI 1	2685197	222112	unconfined	5.8	1	1.37	1.34	0.03
RW-112	AOI 1	2685156	222113	unconfined	3.71	1	1.36	1.36	0.00
RW-113	AOI 2	2682988	222409	unconfined	-8.9	1	1.42	2.29	-0.87
RW-115	AOI 2	2682980	222371	unconfined	-8.7	1	1.59	2.28	-0.69
RW-116	AOI 2	2682987	222340	unconfined	-8.11	1	1.67	2.29	-0.62
RW-117	AOI 2	2682964	222320	unconfined	-9.06	1	1.57	2.28	-0.71
RW-118	AOI 2	2682999	222302	unconfined	-7.03	1	1.70	2.31	-0.61
RW-120	AOI 2	2683027	222353	unconfined	0.27	1	1.79	2.31	-0.52
RW-121	AOI 2	2683050	222376	unconfined	1.3	1	1.68	2.32	-0.64
RW-123	AOI 2	2682969	222296	unconfined	-9.02	1	1.68	2.29	-0.61
RW-125	AOI 2	2683040	222428	unconfined	-4.3	1	1.77	2.34	-0.57
RW-126	AOI 2	2682936	222285	unconfined	-9.65	1	1.47	2.27	-0.80
RW-127	AOI 2	2683036	222383	unconfined	-4.65	1	1.61	2.31	-0.70
RW-129	AOI 2	2683008	222434	unconfined	-8.55	1	1.02	2.32	-1.30
RW-201	AOI 8	2682704	225060	unconfined	4.11	1	9.65	9.78	-0.13
RW-202	AOI 8	2682881	225065	unconfined	3.54	1	9.57	9.91	-0.34
RW-204	AOI 8	2683190	225163	unconfined	3.84	1	10.18	9.80	0.38

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
RW-205	AOI 8	2683343	225251	unconfined	7.8	1	11.42	9.59	1.83
RW-206	AOI 8	2683557	225332	unconfined	7.08	1	10.80	9.37	1.43
RW-22	BELMONT	2685892	224304	unconfined	-0.9	1	5.06	3.75	1.31
RW-25	BELMONT	2685725	224365	unconfined	2.24	1	4.97	3.97	1.00
RW-26	BELMONT	2685474	224410	unconfined	0.6	1	4.71	4.40	0.31
RW-27	BELMONT	2685423	224396	unconfined	0.74	1	4.13	4.43	-0.30
RW-28	BELMONT	2685357	224378	unconfined	0.1	1	5.32	4.47	0.85
RW-29	BELMONT	2685286	224360	unconfined	0.19	1	4.15	4.51	-0.36
RW-30	BELMONT	2685257	224352	unconfined	0.33	1	4.29	4.52	-0.23
RW-303	AOI 8	2683167	226663	unconfined	10.73	1	10.55	9.57	0.98
RW-307	AOI 8	2683080	226604	unconfined	22.82	1	8.30	9.28	-0.98
RW-308	AOI 8	2683240	226623	unconfined	25.27	1	8.61	9.24	-0.63
RW-309	AOI 8	2683373	226602	unconfined	24.81	1	9.37	8.95	0.42
RW-31	BELMONT	2685206	224339	unconfined	0.31	1	4.11	4.55	-0.44
RW-401	AOI 1	2686040	223555	unconfined	-7.99	1	4.80	2.23	2.57
RW-404	AOI 1	2686015	223152	unconfined	-3.81	1	2.07	1.50	0.57
RW-500	AOI 8	2680478	225305	unconfined	6.79	1	5.11	3.18	1.93
RW-501	AOI 8	2681487	224727	unconfined	7.98	1	3.70	5.13	-1.43
RW-502	AOI 8	2680607	226714	unconfined	11.4	1	3.94	4.74	-0.80
RW-6	BELMONT	2686038	224377	unconfined	16.24	1	5.05	3.98	1.07
RW-600	AOI 2	2683369	223296	unconfined	-5.51	1	3.95	2.80	1.15
RW-601	AOI 2	2683325	223213	unconfined	-2.44	1	2.36	2.68	-0.32
RW-6S	AOI 5	2681520	215947	unconfined	5.22	1	3.20	4.43	-1.23
RW-7	BELMONT	2685894	224363	unconfined	-5.93	1	5.05	3.90	1.15
RW-9	AOI 6	2681446	216562	unconfined	3.71	1	3.76	4.59	-0.83
RWBH-2	AOI 5	2682109	215220	unconfined	-0.67	1	2.23	2.48	-0.25
S-100	AOI 1	2686178	223523	unconfined	0.09	1	4.52	2.35	2.17
S-101	AOI 1	2686296	223163	unconfined	-1.73	1	2.55	2.23	0.32
S-102	AOI 4	2683874	221407	unconfined	3.13	1	1.38	2.21	-0.83
S-103	AOI 4	2684428	221275	unconfined	6.05	1	1.71	2.00	-0.29
S-104	AOI 4	2684804	221448	unconfined	0.63	1	3.13	1.79	1.34
S-105	AOI 2	2683300	223164	unconfined	4.64	1	2.33	2.63	-0.30
S-107	AOI 2	2683338	223258	unconfined	1.5	1	3.03	2.71	0.32
S-108	AOI 2	2683362	223294	unconfined	-1.04	1	5.19	2.78	2.41
S-108SRTF	AOI 9	2677667	218321	unconfined	-5.93	1	0.26	-1.18	1.44
S-109SRTF	AOI 9	2677084	217894	unconfined	-6.76	1	-0.05	-1.88	1.83
S-111SRTF	AOI 9	2677273	217432	unconfined	-8.64	1	-7.32	-2.87	-4.45
S-112SRTF	AOI 9	2677256	216984	unconfined	-8.41	1	-7.83	-3.84	-3.99
S-113SRTF	AOI 9	2676915	216800	unconfined	-9.57	1	-7.85	-4.20	-3.65
S-114SRTF	AOI 9	2676978	216435	unconfined	-10.44	1	-7.92	-5.14	-2.78
S-115SRTF	AOI 9	2676754	216194	unconfined	-9.8	1	-8.08	-5.68	-2.40
S-116SRTF	AOI 9	2676903	215942	unconfined	-11.68	1	-7.98	-6.34	-1.64
S-117	AOI 1	2685492	222352	unconfined	0.6	1	1.67	1.33	0.34

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
S-118	AOI 1	2685533	221629	unconfined	-0.41	1	1.01	0.20	0.81
S-118SRTF	AOI 9	2676678	215161	unconfined	-8.98	1	-7.16	-8.28	1.12
S-119	AOI 4	2685393	220753	unconfined	-0.18	1	1.52	1.84	-0.32
S-121SRTF	AOI 9	2677486	215710	unconfined	-8.54	1	-6.98	-6.96	-0.02
S-122SRTF	AOI 9	2677653	216573	unconfined	-7.96	1	-6.11	-4.76	-1.35
S-123SRTF	AOI 9	2677861	216790	unconfined	-5.7	1	-7.64	-4.20	-3.44
S-125	AOI 1	2686079	223506	unconfined	3.84	1	4.69	2.11	2.58
S-127	AOI 1	2685644	222203	unconfined	-3.62	1	1.14	0.73	0.41
S-130	AOI 2	2684124	222280	unconfined	2.41	1	2.82	1.86	0.96
S-131	AOI 2	2684100	222307	unconfined	2.91	1	3.11	1.90	1.21
S-132	AOI 2	2684095	222243	unconfined	1.24	1	2.61	1.87	0.74
S-133	AOI 2	2684056	222303	unconfined	1.63	1	3.40	1.91	1.49
S-134	AOI 2	2684441	222209	unconfined	2.61	1	2.69	1.40	1.29
S-135	AOI 2	2684162	222278	unconfined	2.34	1	2.19	1.82	0.37
S-136	AOI 2	2684135	222257	unconfined	2.95	1	2.72	1.84	0.88
S-139	AOI 2	2683570	222392	unconfined	0.9	1	3.08	2.41	0.67
S-141	AOI 2	2683427	222387	unconfined	1.97	1	2.64	2.43	0.21
S-152	AOI 2	2683337	223247	unconfined	-0.9	1	2.69	2.70	-0.01
S-154	AOI 2	2683290	223236	unconfined	0.14	1	-0.64	2.59	-3.23
S-156	AOI 2	2684180	222281	unconfined	3.18	1	2.88	1.81	1.07
S-157	AOI 2	2684107	222285	unconfined	2.29	1	3.13	1.87	1.26
S-159	AOI 2	2683730	222304	unconfined	6.67	1	2.67	2.26	0.41
S-162	AOI 1	2685202	222131	unconfined	4.93	1	1.96	1.35	0.61
S-164	AOI 1	2685039	222134	unconfined	2.9	1	1.68	1.30	0.38
S-166	AOI 2	2684909	222170	unconfined	3.22	1	1.85	1.15	0.70
S-175	AOI 2	2684500	222226	unconfined	5.9	1	2.43	1.34	1.09
S-193	AOI 1	2686254	223959	unconfined	3.48	1	4.88	3.00	1.88
S-196	AOI 1	2686419	224117	unconfined	2.46	1	5.02	3.65	1.37
S-198	AOI 1	2685879	224076	unconfined	0.74	1	4.83	3.34	1.49
S-199	AOI 1	2685732	224027	unconfined	1.21	1	4.81	3.54	1.27
S-200	AOI 1	2685486	223945	unconfined	1.93	1	4.74	3.79	0.95
S-201	AOI 1	2685877	223831	unconfined	1.24	1	4.85	2.97	1.88
S-202	AOI 1	2684881	223417	unconfined	2.89	1	4.62	3.64	0.98
S-203	AOI 1	2685245	223217	unconfined	4.39	1	4.36	3.11	1.25
S-206	AOI 1	2684727	223201	unconfined	4.04	1	4.67	3.38	1.29
S-208	AOI 1	2685225	222409	unconfined	-0.42	1	1.96	1.68	0.28
S-209	AOI 1	2685750	222525	unconfined	-3.56	1	1.43	1.23	0.20
S-210	AOI 1	2685876	222247	unconfined	-6.86	1	0.09	0.16	-0.07
S-211	AOI 1	2685021	221956	unconfined	-7.28	1	1.75	1.46	0.29
S-213	AOI 1	2685087	221871	unconfined	-7.39	1	1.56	1.49	0.07
S-214	AOI 1	2685145	221577	unconfined	-5.77	1	1.39	1.47	-0.08
S-216	AOI 4	2684618	220867	unconfined	-3.93	1	1.74	1.96	-0.22
S-226	AOI 1	2685805	222280	unconfined	-8.14	1	0.70	0.53	0.17

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
S-227	AOI 1	2685786	221654	unconfined	-4.72	1	-0.19	-2.22	2.03
S-228	AOI 1	2685779	221657	unconfined	-6.29	1	-0.11	-2.13	2.02
S-231	AOI 1	2685897	222219	unconfined	2.38	1	0.37	-0.03	0.40
S-232	AOI 1	2685891	222167	unconfined	0.59	1	0.38	-0.27	0.65
S-246A	AOI 2	2682915	222348	unconfined	1.85	1	0.21	1.92	-1.71
S-247	AOI 2	2682921	222381	unconfined	1.18	1	1.57	1.80	-0.23
S-248	AOI 2	2682933	222394	unconfined	1.05	1	0.60	2.15	-1.55
S-249	AOI 2	2682939	222444	unconfined	1.57	1	-1.72	1.79	-3.51
S-25	AOI 3	2684275	218447	unconfined	12.06	1	2.26	2.77	-0.51
S-251	AOI 2	2683286	222362	unconfined	5.61	1	1.88	2.39	-0.51
S-252	AOI 2	2683257	222357	unconfined	5.36	1	1.81	2.38	-0.57
S-253	AOI 2	2683301	222420	unconfined	7.11	1	2.55	2.43	0.12
S-254	AOI 2	2683168	222414	unconfined	6.91	1	6.76	2.39	4.37
S-256	AOI 1	2685775	221633	unconfined	-5.83	1	0.12	-2.04	2.16
S-257	AOI 1	2685811	221589	unconfined	-1.33	1	0.42	-2.38	2.80
S-258	AOI 1	2685820	221665	unconfined	-1.64	1	-0.74	-2.69	1.95
S-259	AOI 1	2685827	221704	unconfined	-2	1	-1.84	-2.88	1.04
S-260	AOI 1	2685846	221830	unconfined	-3.02	1	-1.27	-2.66	1.39
S-262	AOI 1	2685590	222045	unconfined	-4.78	1	1.31	0.42	0.89
S-263	AOI 1	2685576	221829	unconfined	-5.34	1	1.13	-0.04	1.17
S-268	AOI 1	2686298	224224	unconfined	25.14	1	5.07	3.76	1.31
S-269	AOI 1	2685044	222590	unconfined	0.63	1	2.91	2.18	0.73
S-270	AOI 1	2685422	222589	unconfined	1.38	1	2.47	1.86	0.61
S-271	AOI 1	2686090	223898	unconfined	1.45	1	4.90	2.50	2.40
S-273	AOI 1	2686121	223810	unconfined	0.81	1	5.26	2.29	2.97
S-274	AOI 1	2686114	223761	unconfined	0.41	1	7.18	2.32	4.86
S-275	AOI 1	2686107	223710	unconfined	0.05	1	4.96	2.15	2.81
S-276	AOI 1	2686101	223661	unconfined	-0.32	1	4.80	2.05	2.75
S-277	AOI 1	2686071	223444	unconfined	-1.4	1	4.80	2.00	2.80
S-280	AOI 3	2682599	220966	unconfined	6.23	1	2.63	1.91	0.72
S-282	AOI 4	2683960	220827	unconfined	5.99	1	1.18	2.10	-0.92
S-288	AOI 3	2683003	219276	unconfined	7.25	1	7.46	2.15	5.31
S-294	AOI 2	2684673	224162	unconfined	2.62	1	4.99	4.66	0.33
S-295	AOI 2	2684379	223801	unconfined	16.63	1	9.05	10.64	-1.59
S-297	AOI 2	2683613	223495	unconfined	-0.28	1	4.19	6.43	-2.24
S-298	AOI 2	2683859	223263	unconfined	12.98	1	10.32	9.66	0.66
S-299	AOI 2	2683545	222978	unconfined	1.27	1	3.36	2.81	0.55
S-300	AOI 2	2684308	222830	unconfined	1.485	1	4.34	2.82	1.52
S-301	AOI 2	2684442	222551	unconfined	2.99	1	3.89	2.26	1.63
S-302	AOI 2	2683251	222613	unconfined	-0.36	1	2.51	2.53	-0.02
S-303	AOI 2	2683678	222409	unconfined	2.21	1	3.01	2.39	0.62
S-305	AOI 2	2684883	221997	unconfined	-3.29	1	1.84	1.43	0.41
S-306	AOI 2	2683117	222297	unconfined	-2.42	1	1.69	2.35	-0.66

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
S-307	AOI 2	2683508	221764	unconfined	-2.05	1	2.77	2.35	0.42
S-308	AOI 2	2682915	221383	unconfined	12.89	1	5.23	2.11	3.12
S-309	AOI 2	2683391	221512	unconfined	4.522	1	2.53	2.29	0.24
S-311	AOI 2	2684448	221518	unconfined	-0.99	1	1.70	1.97	-0.27
S-313	AOI 2	2683327	222420	unconfined	-0.36	1	2.68	2.44	0.24
S-314	AOI 2	2683250	222411	unconfined	-0.4	1	2.27	2.41	-0.14
S-317	AOI 2	2683227	222440	unconfined	-1.13	1	2.29	2.43	-0.14
S-318	AOI 2	2683216	222516	unconfined	-0.69	1	2.00	2.47	-0.47
S-32	AOI 4	2684136	219917	unconfined	1.15	1	1.50	2.32	-0.82
S-328	AOI 2	2683642	222582	unconfined	3.972	1	3.17	2.56	0.61
S-330	BELMONT	2685219	224246	unconfined	2.79	1	4.72	4.42	0.30
S-331	BELMONT	2685176	224033	unconfined	6.68	1	4.28	4.21	0.07
S-332	BELMONT	2685110	224237	unconfined	4.34	1	4.41	4.49	-0.08
S-333	AOI 2	2682920	222372	unconfined	1.41	1	0.54	1.83	-1.29
S-335	AOI 2	2683113	222843	unconfined	0.09	1	-2.51	2.22	-4.73
S-336	AOI 2	2683167	222813	unconfined	2.42	1	1.61	2.55	-0.94
S-337	AOI 2	2683260	223172	unconfined	1.9	1	2.00	2.47	-0.47
S-338	AOI 2	2683320	223145	unconfined	2.96	1	2.63	2.67	-0.04
S-34	AOI 4	2684177	220357	unconfined	-1.11	1	1.30	2.16	-0.86
S-346	AOI 2	2684760	222200	unconfined	-5.25	1	1.92	1.16	0.76
S-347	AOI 2	2684712	222199	unconfined	-5.24	1	1.74	1.17	0.57
S-348	AOI 2	2683866	222330	unconfined	0.11	1	6.82	2.10	4.72
S-349	AOI 2	2683819	222324	unconfined	-0.73	1	3.75	2.18	1.57
S-350	AOI 2	2684656	224223	unconfined	10	1	4.87	4.71	0.16
S-351	AOI 2	2684319	224112	unconfined	11.5	1	5.08	4.86	0.22
S-354	AOI 2	2683499	223705	unconfined	10	1	3.68	4.02	-0.34
S-355	AOI 2	2683594	223590	unconfined	12.5	1	4.11	4.02	0.09
S-357	AOI 2	2683533	223382	unconfined	0.9	1	5.70	6.52	-0.82
S-359	AOI 2	2683809	222117	unconfined	5.5	1	2.92	2.21	0.71
S-360	AOI 2	2684419	221893	unconfined	7.5	1	1.86	1.86	0.00
S-361	AOI 2	2684109	221779	unconfined	9.5	1	2.93	2.13	0.80
S-363	AOI 2	2684410	221643	unconfined	7.5	1	1.63	1.97	-0.34
S-365	AOI 4	2683839	220855	unconfined	1.61	1	1.06	2.10	-1.04
S-366	AOI 4	2684586	221392	unconfined	-1.99	1	1.36	1.92	-0.56
S-367	AOI 4	2684688	221274	unconfined	-6.99	1	1.48	1.88	-0.40
S-369	AOI 4	2685726	221204	unconfined	-0.19	1	0.65	1.22	-0.57
S-380	AOI 4	2685674	220596	unconfined	-0.71	1	2.07	1.92	0.15
S-384	AOI 3	2683220	220831	unconfined	-1.8	1	1.20	1.98	-0.78
S-395	BELMONT	2685991	224465	unconfined	-1.25	1	5.19	4.19	1.00
S-396	AOI 1	2685872	223191	unconfined	-7.15	1	1.74	2.02	-0.28
S-406	AOI 2	2683062	222569	unconfined	2.33	1	2.32	2.42	-0.10
S-41	AOI 1	2685772	221298	unconfined	-4.51	1	0.64	0.75	-0.11
S-43	AOI 1	2685816	221634	unconfined	-0.54	1	-0.23	-2.53	2.30

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WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
S-46	AOI 1	2685283	222077	unconfined	-11.73	1	1.47	1.27	0.20
S-48	AOI 2	2684871	222221	unconfined	1.48	1	2.11	1.23	0.88
S-50	AOI 1	2685881	222241	unconfined	8.12	1	0.35	0.13	0.22
S-51	AOI 1	2685939	222520	unconfined	-1.82	1	0.66	0.86	-0.20
S-53	AOI 2	2684179	222279	unconfined	-2.21	1	3.35	1.81	1.54
S-54	AOI 2	2684412	221766	unconfined	1.26	1	1.79	1.94	-0.15
S-60	AOI 3	2683756	221051	unconfined	0.68	1	1.18	2.13	-0.95
S-61	AOI 2	2683869	221701	unconfined	1.67	1	2.37	2.25	0.12
S-62	AOI 2	2683630	222319	unconfined	-2.11	1	2.44	2.34	0.10
S-63	AOI 2	2683223	222269	unconfined	0.95	1	1.72	2.37	-0.65
S-71	AOI 2	2683535	223178	unconfined	-0.5	1	3.69	2.88	0.81
S-72	AOI 2	2683825	223836	unconfined	4.24	1	4.88	4.53	0.35
S-75	BELMONT	2686144	224096	unconfined	3.71	1	4.96	3.05	1.91
S-76	BELMONT	2685601	224035	unconfined	15.61	1	4.80	3.75	1.05
S-77P	AOI 1	2685250	223931	unconfined	13.37	1	4.64	4.03	0.61
S-77SRTF	AOI 9	2678019	217724	unconfined	-6.55	1	-7.08	-2.18	-4.90
S-78	AOI 1	2684757	223423	unconfined	3.43	1	4.89	3.71	1.18
S-78SRTF	AOI 9	2677724	216834	unconfined	-8.36	1	-7.72	-4.14	-3.58
S-79P	AOI 1	2685644	223426	unconfined	10.61	1	4.61	2.89	1.72
S-79SRTF	AOI 9	2677551	215992	unconfined	-7.81	1	-6.18	-6.22	0.04
S-80	AOI 1	2685607	223707	unconfined	7.44	1	4.73	3.31	1.42
S-81SRTF	AOI 9	2677042	216806	unconfined	-8.84	1	-7.57	-4.23	-3.34
S-82SRTF	AOI 9	2677316	217918	unconfined	-8.07	1	-0.20	-1.91	1.71
S-83	AOI 1	2686061	223399	unconfined	1.13	1	4.81	1.83	2.98
S-83SRTF	AOI 9	2677510	218241	unconfined	-6.73	1	-0.06	-1.33	1.27
S-85	AOI 1	2686023	223173	unconfined	0.44	1	2.25	1.53	0.72
S-86	AOI 1	2685945	223065	unconfined	-6.38	1	1.20	1.61	-0.41
S-88	AOI 1	2686005	223039	unconfined	-1.36	1	-0.85	1.39	-2.24
S-88A	AOI 1	2686013	223107	unconfined	2.19	1	0.61	1.44	-0.83
S-89	AOI 1	2685989	222922	unconfined	-1.09	1	-0.15	1.22	-1.37
S-91	AOI 2	2684188	222271	unconfined	1.3	1	3.67	1.79	1.88
S-93	AOI 2	2683259	222338	unconfined	-0.57	1	1.84	2.38	-0.54
S-95	AOI 1	2685351	221422	unconfined	-0.89	1	1.34	1.17	0.17
S-96	AOI 4	2684857	220719	unconfined	0.76	1	1.57	1.94	-0.37
S-99	AOI 1	2686084	222766	unconfined	-2.2	1	0.63	1.43	-0.80
SSEPTA-PH-8	DSCP	2689175	221890	unconfined	7.51	1	1.45	2.01	-0.56
SW-1	AOI 5	2681673	215437	unconfined	7.19	1	1.86	1.57	0.29
SW-2	AOI 5	2681633	215458	unconfined	2.84	1	2.14	1.70	0.44
SW-3	AOI 5	2681565	215492	unconfined	1.98	1	1.91	1.42	0.49
SW-4	AOI 5	2681486	215534	unconfined	7.22	1	2.16	1.39	0.77
SW-5	AOI 5	2681322	215655	unconfined	7.84	1	5.19	2.35	2.84
SWR-1	AOI 5	2681283	215697	unconfined	3.49	1	2.89	2.67	0.22
SWR-2	AOI 5	2681737	215397	unconfined	2.28	1	1.60	1.76	-0.16

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
SWR-3	AOI 5	2681811	215359	unconfined	3.61	1	1.70	1.80	-0.10
TW-11	BELMONT	2686135	224364	unconfined	16.31	1	4.92	3.98	0.94
TW-3	BELMONT	2685838	224405	unconfined	16.21	1	5.64	3.96	1.68
TW-5	BELMONT	2685994	224416	unconfined	16.17	1	5.73	4.06	1.67
TW-8	BELMONT	2685682	224456	unconfined	15.19	1	4.80	4.25	0.55
TW-9	BELMONT	2686092	224400	unconfined	16.22	1	5.01	4.05	0.96
U-1	AOI 6	2681638	216621	unconfined	3.31	1	3.40	3.36	0.04
U-2	AOI 6	2681798	216694	unconfined	2.8	1	3.18	3.53	-0.35
U-3	AOI 6	2681941	216811	unconfined	3.74	1	3.88	4.44	-0.56
U-4	AOI 6	2682043	216875	unconfined	5.41	1	4.52	5.29	-0.77
U-5	AOI 6	2681801	216801	unconfined	2.27	1	2.27	3.60	-1.33
URS-1	AOI 6	2680859	216101	unconfined	4.34	1	4.23	1.37	2.86
URS-2	AOI 6	2681727	216726	unconfined	4.06	1	4.16	3.47	0.69
URS-4	AOI 6	2680671	216277	unconfined	0.85	1	2.74	1.41	1.33
URS-5	AOI 6	2680401	216794	unconfined	2.84	1	2.72	1.83	0.89
V-MW-1	AOI 8	2683500	227736	unconfined	12.74	1	10.76	9.27	1.49
V-MW-10	AOI 8	2683407	228034	unconfined	7.34	1	8.25	6.60	1.65
V-MW-11	AOI 8	2683447	228107	unconfined	7.92	1	8.36	6.60	1.76
V-MW-12	AOI 8	2683544	227991	unconfined	7.38	1	8.97	6.77	2.20
V-MW-16	AOI 8	2683530	228193	unconfined	10.61	1	8.40	6.65	1.75
V-MW-2	AOI 8	2683289	227840	unconfined	13.98	1	7.96	7.86	0.10
V-MW-3	AOI 8	2683267	227930	unconfined	12.89	1	8.05	6.85	1.20
V-MW-4	AOI 8	2683376	228206	unconfined	10.2	1	8.51	6.57	1.94
V-MW-5	AOI 8	2683343	227807	unconfined	7	1	7.96	8.25	-0.29
V-MW-6	AOI 8	2683352	227888	unconfined	6.76	1	8.05	7.24	0.81
V-MW-7	AOI 8	2683239	227863	unconfined	6.02	1	7.98	7.57	0.41
V-MW-8	AOI 8	2683326	227957	unconfined	5.92	1	8.15	6.70	1.45
W-1	AOI 10	2682762	223594	unconfined	-1.81	1	3.62	3.80	-0.18
W-10	AOI 10	2681973	222348	unconfined	-1.4	1	4.70	6.32	-1.62
W-11	AOI 10	2682276	222286	unconfined	0.8	1	4.28	4.53	-0.25
W-12	AOI 10	2682078	221939	unconfined	-1.42	1	3.96	3.87	0.09
W-14	AOI 10	2681747	222310	unconfined	-1.06	1	4.83	6.72	-1.89
W-15	AOI 10	2681624	222775	unconfined	2.3	1	5.67	6.45	-0.78
W-16	AOI 10	2681794	221795	unconfined	-1	1	4.47	3.77	0.70
W-17	AOI 10	2681731	221777	unconfined	-0.93	1	4.16	4.68	-0.52
W-2	AOI 10	2681822	223350	unconfined	0.77	1	4.59	6.38	-1.79
W-20	AOI 10	2680987	222415	unconfined	2.34	1	6.94	7.07	-0.13
W-22	AOI 10	2680429	222466	unconfined	2	1	5.54	5.80	-0.26
W-28	AOI 10	2682420	222857	unconfined	-3.21	1	5.34	5.22	0.12
W-29	AOI 10	2682149	223225	unconfined	0.09	1	4.74	6.39	-1.65
W-30	AOI 10	2681983	222661	unconfined	-1.42	1	5.27	6.33	-1.06
W-31	AOI 10	2681808	222013	unconfined	-3.574	1	5.26	6.06	-0.80
W-33	AOI 10	2680145	222385	unconfined	2.36	1	5.85	5.26	0.59

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
W-34	AOI 10	2680919	222425	unconfined	1.78	1	6.31	6.98	-0.67
W-5	AOI 10	2681651	223047	unconfined	-2	1	4.83	6.05	-1.22
W-9	AOI 10	2681893	222543	lower aquifer	0.96	1	-0.39	6.53	-6.92
WP-14	AOI 5	2682199	215243	unconfined	2.06	1	2.17	2.85	-0.68
WP16-3	AOI 5	2682402	216899	unconfined	3.45	1	3.51	5.54	-2.03
WP-8	AOI 5	2682441	215137	unconfined	-6.02	1	1.80	2.41	-0.61
WP9-3	AOI 6	2681300	216733	unconfined	0.4	1	4.08	4.51	-0.43
WP9-4	AOI 6	2681422	216537	unconfined	0.55	1	6.43	4.63	1.80
WP9-8	AOI 5	2681391	216377	unconfined	3.09	1	3.60	4.49	-0.89
WP-A	AOI 5	2681387	215594	unconfined	5.19	1	4.90	2.45	2.45
WP-B	AOI 5	2681311	215667	unconfined	3.67	1	3.04	2.46	0.58
WP-C	AOI 5	2681378	215681	unconfined	2.7	1	2.02	4.17	-2.15
WP-D	AOI 5	2681484	215914	unconfined	3.13	1	3.00	4.57	-1.57
WP-E	AOI 5	2681622	215986	unconfined	2.72	1	2.63	3.00	-0.37
WPM-11	AOI 6	2682371	217106	unconfined	5.63	1	5.63	5.44	0.19
WPM-3	AOI 6	2682433	217085	unconfined	4.94	1	4.93	5.55	-0.62
A-15	AOI 5	2682689	216314	unconfined	-5.21	2	3.70	3.51	0.19
B-129	AOI 6	2683018	217874	unconfined	-3.67	2	1.97	4.20	-2.23
B-94	AOI 6	2683137	217610	unconfined	-1.79	2	3.00	4.23	-1.23
BF-100	AOI 3	2683128	219458	unconfined	-5.04	2	1.15	2.08	-0.93
BF-104	AOI 3	2682830	219137	unconfined	-5.8	2	6.54	2.75	3.79
C-150	AOI 7	2680607	220263	unconfined	-5.86	2	-6.41	-7.29	0.88
C-49	AOI 7	2683022	218495	unconfined	-4.66	2	4.55	4.08	0.47
C-49	AOI 7	2683022	218495	unconfined	-4.66	2	4.39	4.08	0.31
N-102	AOI 8	2683870	227035	unconfined	6.59	2	11.38	8.04	3.34
N-103	AOI 8	2683660	226782	unconfined	5.41	2	12.29	8.48	3.81
N-104	AOI 8	2683420	226914	unconfined	5.96	2	11.15	9.71	1.44
N-105	AOI 8	2683443	226745	unconfined	6.26	2	11.00	9.10	1.90
N-111	AOI 8	2680519	226514	unconfined	-1.4	2	4.22	2.07	2.15
N-113	AOI 8	2681733	226054	unconfined	2.32	2	5.71	5.69	0.02
N-115	AOI 8	2682246	225824	unconfined	2.43	2	7.81	6.53	1.28
N-122	AOI 8	2683577	226074	unconfined	2.93	2	7.83	6.96	0.87
N-138	AOI 8	2683256	227757	unconfined	5.29	2	8.37	6.31	2.06
N-139	AOI 8	2683309	227732	unconfined	5	2	8.22	6.48	1.74
N-146	AOI 8	2682830	227726	unconfined	4.89	2	9.27	6.10	3.17
N-34	AOI 8	2682271	226259	unconfined	3.7	2	9.85	6.59	3.26
N-38	AOI 8	2680805	226899	unconfined	-0.73	2	3.31	3.95	-0.64
N-58	AOI 8	2680455	225832	unconfined	-2.29	2	5.10	4.65	0.45
N-74	AOI 8	2680701	224898	unconfined	-1.7	2	2.88	1.99	0.89
N-84	AOI 8	2684677	226457	unconfined	5.32	2	11.87	6.91	4.96
N-99	AOI 8	2682855	228875	unconfined	3.26	2	9.86	6.41	3.45
PH-RW-D	DSCP	2687308	221945	unconfined	-10.68	2	2.33	2.17	0.16
RW-128	AOI 2	2682988	222438	unconfined	-10.2	2	0.32	2.30	-1.98

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
RW-203	AOI 8	2683032	225154	unconfined	1.57	2	9.33	6.06	3.27
RW-306	AOI 8	2683768	226581	unconfined	4.72	2	10.27	8.09	2.18
RW-403	AOI 1	2686035	223262	unconfined	-8.89	2	4.43	1.83	2.60
RW-405	AOI 1	2685990	222933	unconfined	-6.5	2	-0.29	1.42	-1.71
RW-705	AOI 4	2685080	218913	unconfined	-3.59	2	2.30	2.57	-0.27
RW-707	AOI 4	2685021	218852	unconfined	-4.67	2	2.18	2.56	-0.38
RW-709	AOI 4	2684982	218812	unconfined	-6.48	2	2.28	2.57	-0.29
RW-710	AOI 4	2684962	218790	unconfined	-5.29	2	1.95	2.59	-0.64
RW-711	AOI 4	2684955	218782	unconfined	-6.79	2	2.24	2.59	-0.35
RW-712	AOI 4	2684936	218762	unconfined	-4.82	2	2.12	2.61	-0.49
RW-713	AOI 4	2684924	218748	unconfined	-5.41	2	1.64	2.62	-0.98
RW-714	AOI 4	2684903	218728	unconfined	-5.53	2	1.97	2.64	-0.67
RW-715	AOI 4	2684883	218706	unconfined	-5.64	2	2.17	2.65	-0.48
RW-716	AOI 4	2684864	218684	unconfined	-5.6	2	2.20	2.66	-0.46
RW-717	AOI 4	2684844	218663	unconfined	-5.64	2	2.28	2.67	-0.39
S-120	AOI 4	2685597	220403	unconfined	-3.53	2	2.36	2.07	0.29
S-122	AOI 4	2685443	219647	unconfined	-2.08	2	2.47	2.51	-0.04
S-123	AOI 4	2684990	219320	unconfined	-0.77	2	2.27	2.54	-0.27
S-124	AOI 4	2685004	218885	unconfined	0.46	2	2.20	2.52	-0.32
S-16	AOI 3	2683817	218965	unconfined	-9.17	2	2.22	2.31	-0.09
S-20	AOI 3	2684072	218851	unconfined	-12.2	2	2.21	2.55	-0.34
S-219	AOI 4	2684850	219892	unconfined	0.38	2	2.36	2.35	0.01
S-220	AOI 4	2684262	219152	unconfined	-4	2	2.27	2.52	-0.25
S-221	AOI 4	2684933	219006	unconfined	-2.48	2	2.26	2.40	-0.14
S-222	AOI 4	2684862	218677	unconfined	-3.61	2	2.46	2.67	-0.21
S-223	AOI 4	2685064	218859	unconfined	-6.02	2	2.33	2.59	-0.26
S-224	AOI 4	2685158	218991	unconfined	-5.47	2	2.37	2.61	-0.24
S-23	AOI 3	2684062	218579	unconfined	-2.55	2	2.24	2.68	-0.44
S-233	AOI 4	2684874	218923	unconfined	-0.87	2	5.30	2.26	3.04
S-234	AOI 4	2684899	218762	unconfined	-1.46	2	2.02	2.61	-0.59
S-235	AOI 4	2684962	218844	unconfined	-2.29	2	2.27	2.53	-0.26
S-236	AOI 4	2684954	219018	unconfined	-4.78	2	2.18	2.41	-0.23
S-237	AOI 4	2684943	218984	unconfined	-5.11	2	2.21	2.37	-0.16
S-238	AOI 4	2685034	218917	unconfined	-2.63	2	2.28	2.52	-0.24
S-239	AOI 4	2684997	218789	unconfined	-1.31	2	2.32	2.60	-0.28
S-240	AOI 4	2684848	218980	unconfined	-1.53	2	2.15	2.44	-0.29
S-241	AOI 4	2684819	219045	unconfined	0.59	2	1.80	2.50	-0.70
S-242	AOI 4	2684857	218813	unconfined	0.92	2	2.30	2.56	-0.26
S-243	AOI 4	2684934	218722	unconfined	1.1	2	2.48	2.64	-0.16
S-245	AOI 4	2684999	219051	unconfined	0.96	2	2.51	2.49	0.02
S-26	AOI 4	2684616	218758	unconfined	1.01	2	2.29	2.65	-0.36
S-278	AOI 4	2684810	218753	unconfined	-3.8	2	2.32	2.63	-0.31
S-279	AOI 4	2684702	219165	unconfined	1.86	2	2.39	2.54	-0.15

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
S-285	AOI 3	2683687	219690	unconfined	0.2	2	1.92	2.39	-0.47
S-29	AOI 4	2684380	219695	unconfined	-7.17	2	3.03	2.37	0.66
S-291	AOI 3	2683972	218061	unconfined	-3.036	2	4.62	4.07	0.55
S-3	AOI 3	2683570	217784	unconfined	-2.33	2	3.48	3.60	-0.12
S-30	AOI 4	2684380	219703	unconfined	0.9	2	2.04	2.36	-0.32
S-329	AOI 4	2684779	218690	unconfined	-4.3	2	2.06	2.66	-0.60
S-370	AOI 4	2683833	219839	unconfined	-7.94	2	1.42	2.32	-0.90
S-372	AOI 3	2683824	219317	unconfined	-5.17	2	2.03	2.40	-0.37
S-38	AOI 4	2685232	219184	unconfined	0.93	2	2.36	2.62	-0.26
S-381	AOI 4	2684590	219563	unconfined	-1.31	2	1.96	2.42	-0.46
S-385	AOI 3	2683689	220624	unconfined	-9.3	2	1.33	2.08	-0.75
S-386	AOI 3	2683705	219789	unconfined	-5	2	1.33	2.37	-1.04
S-39	AOI 4	2685582	220133	unconfined	-9.4	2	2.45	2.25	0.20
S-47I	AOI 1	2685275	222077	lower aquifer	-17.73	2	1.43	1.30	0.13
S-5	AOI 3	2683838	218242	unconfined	-0.14	2	1.84	3.24	-1.40
S-82	AOI 1	2686056	223599	unconfined	-10.4	2	4.87	2.30	2.57
V-MW-9	AOI 8	2683312	228061	unconfined	5.44	2	8.21	6.39	1.82
C-145	AOI 7	2681007	220222	unconfined	-12.64	3	1.60	1.94	-0.34
C-146	AOI 7	2680640	220255	unconfined	-12.8	3	-4.77	-2.19	-2.58
C-95	AOI 3,7	2682674	219113	unconfined	-15.07	3	6.17	2.76	3.41
DSCP-IW-12	DSCP	2687131	222110	unconfined	-25.28	3	1.63	2.21	-0.58
N-109	AOI 8	2681605	226649	lower aquifer	3.04	3	6.84	5.53	1.31
N-112	AOI 8	2681664	226328	lower aquifer	1.35	3	6.83	5.38	1.45
N-116	AOI 8	2682617	225844	unconfined	1.49	3	5.12	6.76	-1.64
N-130	AOI 8	2682501	225088	unconfined	-2.93	3	9.31	6.21	3.10
N-61	AOI 8	2680588	225119	unconfined	-2.71	3	4.82	3.66	1.16
N-76	AOI 8	2683610	225362	unconfined	-3.25	3	11.06	6.07	4.99
PGW-MW-21	AOI 8	2682672	224785	unconfined	-5.052	3	8.76	5.38	3.38
PH-IW-3	DSCP	2687505	220886	unconfined	-37.05	3	2.07	2.39	-0.32
RW-200	AOI 8	2682439	224925	unconfined	-3.37	3	6.43	5.89	0.54
RW-301	AOI 8	2682907	226707	unconfined	0.45	3	10.04	9.82	0.22
RW-302	AOI 8	2683040	226687	unconfined	0.42	3	10.27	9.74	0.53
RW-304	AOI 8	2683322	226635	unconfined	1.45	3	10.03	9.03	1.00
RW-305	AOI 8	2683458	226615	unconfined	1.39	3	10.10	8.74	1.36
S-10	AOI 3	2683682	218444	unconfined	-14.17	3	2.18	2.01	0.17
S-12	AOI 3	2683521	218879	unconfined	-13.11	3	2.00	2.05	-0.05
S-153	AOI 2	2683289	223237	unconfined	-11.05	3	0.01	2.51	-2.50
S-52	AOI 1	2685894	222553	unconfined	-13.3	3	1.15	1.18	-0.03
W-23	AOI 10	2680081	222589	unconfined	-9.79	3	5.52	3.75	1.77
W-25	AOI 10	2679601	222643	unconfined	-1.97	3	4.36	2.60	1.76
B-48D	AOI 6,11	2682251	217522	lower aquifer	-41.23	4	-1.29	1.04	-2.33
BF-90D	AOI 3,11	2683040	218957	lower aquifer	-25.15	4	0.50	1.87	-1.37
DSCP-DW-6	DSCP	2687606	223122	lower aquifer	-40.83	4	1.60	3.42	-1.82

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
DSCP-IW-1	DSCP	2686539	222709	unconfined	-22.65	4	2.00	2.70	-0.70
DSCP-IW-13	DSCP	2688517	222412	unconfined	-47.99	4	1.67	2.93	-1.26
N-114	AOI 8	2681511	226225	lower aquifer	-5.03	4	6.14	5.38	0.76
N-127	AOI 8	2682768	225193	unconfined	-4.25	4	9.73	5.29	4.44
N-132	AOI 8	2681685	225634	unconfined	-10.94	4	5.82	5.66	0.16
N-70	AOI 8	2681745	227136	lower aquifer	0.29	4	8.17	5.55	2.62
N-83	AOI 8	2681761	226828	lower aquifer	1.77	4	6.57	5.58	0.99
PH-IW-10	DSCP	2686456	221925	unconfined	-27.44	4	1.60	2.03	-0.43
PH-IW-11	DSCP	2686416	221650	unconfined	-27.93	4	1.56	1.82	-0.26
RW-300	AOI 8	2681810	226710	lower aquifer	-0.17	4	7.59	5.56	2.03
S-119D	AOI 4,11	2685498	220820	lower aquifer	-41.14	4	1.35	2.00	-0.65
S-397	AOI 1	2685305	222831	unconfined	-29.9	4	1.39	2.90	-1.51
S-399	AOI 1	2685166	221521	lower aquifer	-24.7	4	1.15	1.99	-0.84
S-87I	AOI 1	2685940	223065	lower aquifer	-23.46	4	1.53	1.91	-0.38
B-133D	AOI 6,11	2681722	216723	lower aquifer	-53.9	5	-1.34	-0.47	-0.87
N-19	AOI 8,11	2684651	226737	lower aquifer	-24.54	5	3.65	5.77	-2.12
N-21	AOI 8,11	2683879	226628	lower aquifer	-21.46	5	5.46	5.63	-0.17
N-69	AOI 8	2681822	227392	lower aquifer	-1.14	5	8.86	5.50	3.36
N-9	AOI 8,11	2684097	227375	lower aquifer	-22.3	5	4.42	6.13	-1.71
S-22	AOI 3	2684081	218842	lower aquifer	-57.59	5	-0.01	1.68	-1.69
S-280D	AOI 3,11	2682596	220955	lower aquifer	-32.58	5	0.38	1.55	-1.17
S-38D2	AOI 4,11	2685229	219163	lower aquifer	-59.16	5	0.30	2.09	-1.79
S-398	AOI 1	2685902	222554	lower aquifer	-27.8	5	1.29	2.80	-1.51
S-42I	AOI 1	2685770	221301	lower aquifer	-36.52	5	-0.99	2.40	-3.39
S-59D	AOI 4,11	2683843	221368	lower aquifer	-33.24	5	1.60	2.04	-0.44
ARCO-1D	AOI 1	2685966	221359	lower aquifer	-44.86	6	1.00	2.46	-1.46
DSCP-DW-1	DSCP	2686539	222715	lower aquifer	-50.55	6	1.65	3.10	-1.45
DSCP-DW-13	DSCP	2688518	222417	lower aquifer	-79.81	6	1.69	3.17	-1.48
N-73	AOI 8	2680415	225822	lower aquifer	-30.81	6	0.55	1.66	-1.11
N-75	AOI 8	2680694	224909	lower aquifer	-32.35	6	0.74	1.91	-1.17
PGW-MW-12D	PGW	2685290	224520	lower aquifer	-39.93	6	3.07	4.12	-1.05
PGW-MW-1D	PGW	2683465	224134	lower aquifer	-36.43	6	3.07	3.17	-0.10
PH-DW-2	DSCP	2686776	220911	lower aquifer	-74.96	6	1.05	2.42	-1.37
PH-DW-3	DSCP	2687507	220890	lower aquifer	-95.24	6	0.91	2.56	-1.65
S-8	AOI 3,11	2683688	218428	lower aquifer	-58.27	6	-0.23	1.46	-1.69
S-80D	AOI 1,11	2685512	223710	lower aquifer	-39.76	6	2.40	3.59	-1.19
W-27	AOI 10	2679107	222626	lower aquifer	-3.33	6	2.57	2.63	-0.06
W-32D	AOI 10	2681222	222055	lower aquifer	-58	6	-0.46	2.64	-3.10
A-21D	AOI 5,11	2681388	215630	lower aquifer	-72.06	7	-5.83	-1.62	-4.21
B-132D	AOI 6,11	2680857	216098	lower aquifer	-69.69	7	-5.26	-1.97	-3.29
B-134D	AOI 6,11	2681037	216764	lower aquifer	-68.55	7	-3.06	-1.12	-1.94
BF-108	AOI 3,11	2683185	219701	lower aquifer	-66.04	7	0.51	1.59	-1.08
C-129D	AOI 7,11	2681929	220492	lower aquifer	-51.65	7	0.00	1.25	-1.25

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2014 OBSERVED HYDRAULIC HEAD [FT]	MAY 2014 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2014 HYDRAULIC HEAD RESIDUAL [FT]
C-134D	AOI 6,7,11	2681165	218306	lower aquifer	-55.65	7	-1.19	0.22	-1.41
C-144D	AOI 7,11	2680337	220108	lower aquifer	-64.36	7	-4.23	0.91	-5.14
CSX-DW-4	DSCP	2686121	222537	lower aquifer	-49.91	7	-1.54	2.89	-4.43
CSX-DW-5	DSCP	2686325	223310	lower aquifer	-43.89	7	1.69	3.49	-1.80
DSCP-DW-12	DSCP	2687135	222110	lower aquifer	-79.9	7	1.69	2.97	-1.28
DSCP-MW-20D	DSCP	2686776	224063	lower aquifer	-58.69	7	1.88	4.06	-2.18
N-38D	AOI 8,11	2680792	226897	lower aquifer	-71.23	7	1.11	2.42	-1.31
N-4	AOI 8,11	2683123	227945	lower aquifer	-15.59	7	8.66	6.25	2.41
PGW-MW-2D	PGW	2683918	224286	lower aquifer	-42.84	7	3.16	3.55	-0.39
PGW-MW-3D	PGW	2684691	224483	lower aquifer	-45.27	7	3.23	3.91	-0.68
PGW-MW-42D	PGW	2684364	225540	lower aquifer	-41	7	1.49	4.72	-3.23
PH-DW-10	DSCP	2686452	221935	lower aquifer	-76.6	7	1.57	2.74	-1.17
PH-DW-11	DSCP	2686415	221643	lower aquifer	-80.46	7	1.49	2.66	-1.17
S-13	AOI 3,11	2683522	218892	lower aquifer	-63.46	7	-0.26	1.51	-1.77
S-264D	AOI 1,11	2685762	221289	lower aquifer	-50.81	7	1.21	2.40	-1.19
S-284D	AOI 3,11	2683136	220356	lower aquifer	-60.79	7	0.85	1.67	-0.82
S-294D	AOI 2,11	2684682	224165	lower aquifer	-56.43	7	2.76	3.68	-0.92
S-302D	AOI 2,11	2683248	222607	lower aquifer	-62.45	7	2.13	2.13	0.00
S-305D	AOI 2,11	2684882	221990	lower aquifer	-56.6	7	1.39	2.38	-0.99
S-388D	AOI 1	2685903	222561	lower aquifer	-53.1	7	1.37	2.86	-1.49
S-389D	AOI 1	2685876	223190	lower aquifer	-52.4	7	1.54	3.29	-1.75
S-390D	AOI 1	2685310	222830	lower aquifer	-62.2	7	1.41	2.93	-1.52
S-391D	AOI 1	2684710	223313	lower aquifer	-64.2	7	2.28	3.11	-0.83
S-392D	AOI 1	2685166	221525	lower aquifer	-49.3	7	1.16	2.33	-1.17
S-393D	BELMONT	2685996	224457	lower aquifer	-64.5	7	2.79	4.22	-1.43
S-394	BELMONT	2685993	224461	lower aquifer	-52.5	7	2.61	4.22	-1.61
S-400	AOI 1	2684704	223296	lower aquifer	-43	7	2.04	3.10	-1.06
S-69D	AOI 3,11	2682399	219971	lower aquifer	-47.3	7	0.09	1.38	-1.29
S-72D	AOI 2,11	2683834	223838	lower aquifer	-61.93	7	5.07	3.12	1.95
W-13	AOI 10	2682065	221929	lower aquifer	-56.84	7	-1.15	1.67	-2.82
W-19	AOI 10	2680982	222405	lower aquifer	-66.83	7	-0.76	2.28	-3.04
W-1D	AOI 10	2682756	223584	lower aquifer	-63.63	7	1.46	2.27	-0.81
W-26	AOI 10	2679592	222651	lower aquifer	-12.15	7	-2.23	2.50	-4.73

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
A-10	AOI 5	2682406	215428	unconfined	-1.33	1	4.08	3.66	0.42
A-11	AOI 5	2682016	215380	unconfined	-3.91	1	2.02	2.93	-0.91
A-118	AOI 5	2683071	217109	unconfined	5.91	1	5.07	5.94	-0.87
A-12	AOI 5	2682183	215379	unconfined	-3.12	1	1.85	3.28	-1.43
A-122	AOI 5	2682278	215930	unconfined	2.54	1	1.99	3.69	-1.70
A-133	AOI 5	2681282	215805	unconfined	0.13	1	3.22	4.54	-1.32
A-134	AOI 5	2681409	215810	unconfined	-2.79	1	1.93	4.61	-2.68
A-135	AOI 5	2681633	215823	unconfined	-1.64	1	2.95	2.94	0.01
A-136	AOI 5	2681693	215556	unconfined	-3.48	1	2.02	2.50	-0.48
A-137	AOI 5	2683597	215161	unconfined	-1.71	1	0.97	1.61	-0.64
A-142	AOI 5	2683676	214931	unconfined	-2.36	1	1.49	1.34	0.15
A-143	AOI 5	2683340	215553	unconfined	1.08	1	2.38	2.71	-0.33
A-148	AOI 5	2682641	216806	unconfined	-1.3	1	5.37	5.46	-0.09
A-149	AOI 5	2682443	216327	unconfined	-2.41	1	3.73	5.26	-1.53
A-151	AOI 5	2682129	215824	unconfined	-3.4	1	2.82	3.48	-0.66
A-152	AOI 5	2681987	216073	unconfined	-7.07	1	0.72	3.40	-2.68
A-155	AOI 5	2681449	216208	unconfined	-2.6	1	2.64	4.58	-1.94
A-156	AOI 5	2681355	216058	unconfined	3.1	1	3.69	4.62	-0.93
A-157	AOI 5	2681414	216278	unconfined	1.8	1	2.95	4.47	-1.52
A-163	AOI 5	2681070	215985	unconfined	3.65	1	3.47	3.78	-0.31
A-164	AOI 5	2681178	216039	unconfined	3.03	1	3.12	4.13	-1.01
A-166	AOI 5	2681273	215790	unconfined	4.85	1	3.10	4.40	-1.30
A-167	AOI 5	2681257	216200	unconfined	3.76	1	3.62	4.35	-0.73
A-168	AOI 5	2681699	216444	unconfined	3.85	1	3.07	3.28	-0.21
A-22	AOI 5	2680996	216032	unconfined	-2.24	1	1.24	1.83	-0.59
A-23	AOI 5	2682143	216385	unconfined	-4.21	1	1.84	3.74	-1.90
A-24	AOI 5	2681515	215977	unconfined	-1.44	1	2.69	4.48	-1.79
A-25	AOI 5	2682468	216982	unconfined	0.82	1	3.83	5.67	-1.84
A-26	AOI 5	2682167	216793	unconfined	0.5	1	3.09	5.47	-2.38
A-27	AOI 5	2681846	216592	unconfined	-0.5	1	3.05	3.52	-0.47
A-3	AOI 5	2683412	215785	unconfined	-0.34	1	2.24	3.36	-1.12
A-4	AOI 5	2683520	215001	unconfined	-4.15	1	1.23	1.47	-0.24
A-40	AOI 5	2683592	215201	unconfined	-1.98	1	1.00	1.61	-0.61
A-41	AOI 5	2683535	215097	unconfined	-2.23	1	0.88	1.59	-0.71
A-44	AOI 5	2683121	215462	unconfined	-0.39	1	2.27	3.07	-0.80
A-45	AOI 5	2682742	215239	unconfined	-3.13	1	0.91	3.12	-2.21
A-46	AOI 5	2682464	215347	unconfined	1.56	1	2.37	3.57	-1.20

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
A-48	AOI 5	2682295	215157	unconfined	-2.87	1	1.98	2.23	-0.25
A-49	AOI 5	2682249	215647	unconfined	-1.2	1	3.64	3.61	0.03
A-5	AOI 5	2682620	215251	unconfined	-5.35	1	0.32	3.28	-2.96
A-6	AOI 5	2682954	215268	unconfined	-1.99	1	2.84	2.82	0.02
A-7	AOI 5	2683087	215287	unconfined	-1.13	1	2.51	2.54	-0.03
A-9	AOI 5	2683089	215096	unconfined	-2.05	1	1.91	1.86	0.05
ARCO-1	AOI 1	2685973	221361	unconfined	-4.89	1	0.64	0.57	0.07
ARCO-2	AOI 1	2685882	221258	unconfined	-5.11	1	0.55	0.93	-0.38
ARCO-3	AOI 1	2685928	221631	unconfined	-7.51	1	0.08	-1.45	1.53
B-115	AOI 6	2682825	218059	unconfined	5.03	1	3.64	4.77	-1.13
B-123	AOI 6	2681458	217146	unconfined	6.25	1	5.06	4.88	0.18
B-124	AOI 6	2681316	216811	unconfined	-4.09	1	3.21	4.54	-1.33
B-125	AOI 6	2681099	216829	unconfined	3.79	1	3.22	4.10	-0.88
B-126	AOI 6	2680974	217022	unconfined	3.6	1	3.00	4.06	-1.06
B-130	AOI 6	2680131	217397	unconfined	-1.89	1	4.00	3.46	0.54
B-131	AOI 6	2680693	216460	unconfined	-2.8	1	2.41	4.23	-1.82
B-132	AOI 6	2681171	217351	unconfined	-3.73	1	1.93	4.03	-2.10
B-133	AOI 6	2681207	217307	unconfined	-2.7	1	2.07	4.16	-2.09
B-134	AOI 6	2681163	217285	unconfined	-2.62	1	1.63	4.11	-2.48
B-135	AOI 6	2681137	217329	unconfined	-2.69	1	1.46	4.06	-2.60
B-136	AOI 6	2681253	217259	unconfined	-0.69	1	2.92	4.49	-1.57
B-137	AOI 6	2681298	217188	unconfined	-0.78	1	3.61	4.59	-0.98
B-138	AOI 6	2681330	217138	unconfined	-0.94	1	3.99	4.61	-0.62
B-142	AOI 6	2681209	217178	unconfined	-0.19	1	2.40	4.44	-2.04
B-143	AOI 6	2681159	217208	unconfined	-0.64	1	3.12	4.39	-1.27
B-144	AOI 6	2681235	217134	unconfined	-0.84	1	3.48	4.45	-0.97
B-145	AOI 6	2681362	217086	unconfined	0.16	1	4.15	4.67	-0.52
B-147	AOI 6	2681125	217146	unconfined	-0.4	1	2.59	4.29	-1.70
B-148	AOI 6	2681077	217444	unconfined	-0.81	1	1.71	4.29	-2.58
B-149	AOI 6	2680999	217436	unconfined	-0.2	1	3.81	4.35	-0.54
B-150	AOI 6	2680966	217480	unconfined	-0.17	1	3.70	4.39	-0.69
B-151	AOI 6	2680729	217738	unconfined	-0.23	1	3.11	4.28	-1.17
B-152	AOI 6	2680603	217848	unconfined	-0.5	1	2.98	4.25	-1.27
B-153	AOI 6	2680102	217475	unconfined	0.67	1	3.82	2.88	0.94
B-154	AOI 6	2680927	217552	unconfined	0.43	1	4.52	4.38	0.14
B-155	AOI 6	2680975	217400	unconfined	0.54	1	2.97	4.28	-1.31
B-156	AOI 6	2680904	217366	unconfined	0.65	1	2.66	4.20	-1.54

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
B-158	AOI 6	2679969	217967	unconfined	1.66	1	4.22	3.80	0.42
B-160	AOI 6	2681840	217371	unconfined	2.95	1	4.11	5.36	-1.25
B-161	AOI 6	2681270	216894	unconfined	-0.02	1	3.09	4.59	-1.50
B-163	AOI 6	2681199	217531	unconfined	1.68	1	4.85	4.56	0.29
B-164	AOI 6	2680585	216480	unconfined	-1.14	1	4.33	3.75	0.58
B-165	AOI 6	2680187	217152	unconfined	2.97	1	2.35	1.14	1.21
B-166	AOI 6	2682932	217409	unconfined	0.89	1	4.38	5.86	-1.48
B-167	AOI 6	2683188	217814	unconfined	3.56	1	2.89	5.03	-2.14
B-168	AOI 6	2680070	217495	unconfined	4.05	1	3.72	2.33	1.39
B-169	AOI 6	2680092	217416	unconfined	4.23	1	3.88	1.29	2.59
B-170	AOI 6	2680111	217350	unconfined	-1.71	1	-2.31	1.55	-3.86
B-39	AOI 6	2680590	216614	unconfined	-3.46	1	2.72	4.06	-1.34
B-43	AOI 6	2680085	217611	unconfined	-1.61	1	3.56	3.90	-0.34
B-45	AOI 6	2680393	218353	unconfined	-4.1	1	3.24	4.23	-0.99
B-46	AOI 6	2681909	218131	unconfined	1.32	1	5.84	5.41	0.43
B-48	AOI 6	2682248	217529	unconfined	-2.2	1	5.69	5.30	0.39
B-92	AOI 6	2681498	216966	unconfined	-3.2	1	3.76	4.83	-1.07
B-95	AOI 6	2680373	217541	unconfined	4.93	1	2.68	4.23	-1.55
BF-103R	AOI 3	2682491	219959	unconfined	3.43	1	0.39	1.84	-1.45
BF-105	AOI 3	2682998	219443	unconfined	0.61	1	0.58	2.05	-1.47
BF-106	AOI 3	2683176	219737	unconfined	0.19	1	0.60	1.98	-1.38
BF-107	AOI 3	2683307	219941	unconfined	0.55	1	0.68	2.11	-1.43
BF-88	AOI 3	2683465	220156	unconfined	-2.14	1	0.85	2.12	-1.27
BF-99	AOI 3	2683159	219974	unconfined	-4.18	1	0.67	1.89	-1.22
C-104	AOI 7	2679742	219188	unconfined	2.85	1	2.48	1.88	0.60
C-105	AOI 7	2679690	219497	unconfined	5.29	1	4.34	1.66	2.68
C-108	AOI 7	2680856	219819	unconfined	3.88	1	3.29	2.98	0.31
C-109	AOI 7	2682312	219231	unconfined	5.58	1	4.90	5.12	-0.22
C-110	AOI 7	2682469	219406	unconfined	6.82	1	6.63	5.19	1.44
C-111	AOI 7	2682561	219232	unconfined	6.62	1	6.30	5.38	0.92
C-112	AOI 7	2682431	218697	unconfined	-1.62	1	7.66	5.89	1.77
C-113	AOI 7	2682817	218798	unconfined	7.07	1	6.19	6.19	0.00
C-114	AOI 7	2683001	218348	unconfined	7.17	1	5.64	6.07	-0.43
C-127	AOI 7	2680897	220182	unconfined	-3.3	1	0.73	2.76	-2.03
C-129	AOI 7	2681937	220497	unconfined	0.2	1	3.83	3.22	0.61
C-130	AOI 7	2682140	219981	unconfined	0.29	1	4.94	5.07	-0.13
C-131	AOI 7	2682329	218971	unconfined	-0.72	1	6.14	5.40	0.74

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Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
C-132	AOI 7	2682248	218271	unconfined	-0.91	1	4.80	4.05	0.75
C-133	AOI 7	2681694	218336	unconfined	-0.82	1	5.22	5.17	0.05
C-136	AOI 7	2680991	219217	unconfined	-2.22	1	3.58	2.97	0.61
C-137	AOI 7	2680719	219098	unconfined	-4.29	1	2.01	2.85	-0.84
C-138	AOI 7	2680453	218658	unconfined	-2.52	1	1.72	2.71	-0.99
C-139	AOI 7	2680633	219444	unconfined	-1.53	1	3.95	2.85	1.10
C-140	AOI 7	2679799	218858	unconfined	0.99	1	5.50	2.12	3.38
C-142	AOI 7	2680660	220134	unconfined	0.62	1	2.06	0.48	1.58
C-155	AOI 7	2680525	220082	unconfined	3.23	1	2.18	-0.33	2.51
C-156	AOI 7	2681408	220254	unconfined	-6.48	1	2.87	4.07	-1.20
C-157	AOI 7	2681432	220255	unconfined	-6.67	1	2.94	4.02	-1.08
C-159	AOI 7	2681506	220269	unconfined	-6.56	1	2.84	3.61	-0.77
C-163	AOI 7	2681332	220248	unconfined	2.58	1	2.58	3.97	-1.39
C-164	AOI 7	2681359	220252	unconfined	1.98	1	2.64	3.85	-1.21
C-165	AOI 7	2681386	220255	unconfined	2.4	1	2.74	3.90	-1.16
C-168	AOI 7	2679988	220174	unconfined	3.45	1	6.39	1.69	4.70
C-50	AOI 7	2682341	219619	unconfined	-1.17	1	4.80	5.11	-0.31
C-51	AOI 7	2681621	220073	unconfined	-1.1	1	3.54	4.71	-1.17
C-52	AOI 7	2681216	220206	unconfined	-1.32	1	2.43	4.13	-1.70
C-53A	AOI 7	2681031	219940	unconfined	-0.88	1	5.37	4.11	1.26
C-54	AOI 7	2680975	219459	unconfined	-2.51	1	5.78	2.99	2.79
C-55	AOI 7	2680864	218851	unconfined	-3.51	1	4.10	2.89	1.21
C-56	AOI 7	2681367	218776	unconfined	0.4	1	8.37	5.09	3.28
C-57	AOI 7	2681651	219572	unconfined	-1.05	1	5.44	4.97	0.47
C-58	AOI 7	2681692	219017	unconfined	-0.61	1	4.54	5.11	-0.57
C-60	AOI 7	2680151	218657	unconfined	-1.98	1	3.58	2.58	1.00
C-61	AOI 7	2679819	219306	unconfined	-0.12	1	4.25	2.49	1.76
C-62	AOI 7	2679892	219890	unconfined	0.35	1	6.73	2.75	3.98
C-63	AOI 7	2680379	219611	unconfined	-3.83	1	0.83	2.84	-2.01
C-64	AOI 7	2680431	220167	unconfined	-1.83	1	-1.39	-11.19	9.80
C-65	AOI 7	2680266	220116	unconfined	-0.53	1	6.57	-4.15	10.72
C-96	AOI 7	2681980	219529	unconfined	-2.18	1	6.38	5.18	1.20
C-97	AOI 7	2680616	220230	unconfined	-2.45	1	-6.76	-8.71	1.95
C-98	AOI 7	2680220	219208	unconfined	-0.66	1	4.23	2.73	1.50
CSX-IW-5	DSCP	2686326	223316	unconfined	-0.56	1	1.52	2.42	-0.90
CSX-MW2	DSCP	2686231	222459	unconfined	16.03	1	1.28	1.65	-0.37
CSX-MW3A	DSCP	2686250	222972	unconfined	15.34	1	2.02	2.01	0.01

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
CSX-MW4	DSCP	2686223	222715	unconfined	19.24	1	1.20	1.78	-0.58
CSX-MW5	DSCP	2686326	223321	unconfined	21.42	1	3.51	2.42	1.09
CSX-MW7	DSCP	2686132	222540	unconfined	13.97	1	0.93	1.46	-0.53
CSX-MW8	DSCP	2686196	222613	unconfined	15.28	1	1.11	1.65	-0.54
CSX-MW9	DSCP	2686193	223091	unconfined	18.28	1	1.60	1.96	-0.36
DSCP-MW-1	DSCP	2686587	222951	unconfined	4.34	1	2.09	2.55	-0.46
DSCP-MW-10	DSCP	2688682	221989	unconfined	1.1	1	2.23	2.64	-0.41
DSCP-MW-11	DSCP	2688509	222483	unconfined	2.46	1	3.17	2.99	0.18
DSCP-MW-12	DSCP	2688887	222849	unconfined	-7.38	1	3.04	3.40	-0.36
DSCP-MW-13	DSCP	2688362	222878	unconfined	4.5	1	3.42	3.29	0.13
DSCP-MW-14	DSCP	2687863	222366	unconfined	2.72	1	1.92	2.73	-0.81
DSCP-MW-15	DSCP	2687278	222669	unconfined	5.52	1	1.71	2.75	-1.04
DSCP-MW-16	DSCP	2686924	222962	unconfined	4.46	1	2.26	2.76	-0.50
DSCP-MW-17	DSCP	2687015	223191	unconfined	6.12	1	2.78	2.98	-0.20
DSCP-MW-19	DSCP	2686631	223493	unconfined	7.08	1	3.98	2.95	1.03
DSCP-MW-1A	DSCP	2688112	222563	unconfined	7.56	1	2.58	2.96	-0.38
DSCP-MW-2	DSCP	2686659	222486	unconfined	3.77	1	1.47	2.26	-0.79
DSCP-MW-20	DSCP	2686775	224059	unconfined	9.29	1	4.46	3.89	0.57
DSCP-MW-21A	DSCP	2687617	223591	unconfined	6.69	1	4.04	3.59	0.45
DSCP-MW-23A	DSCP	2686572	222722	unconfined	4.3	1	1.73	2.39	-0.66
DSCP-MW-24	DSCP	2687351	222881	unconfined	7.33	1	2.20	2.94	-0.74
DSCP-MW-27A	DSCP	2687880	222716	unconfined	5.82	1	2.53	3.02	-0.49
DSCP-MW-28	DSCP	2686735	222344	unconfined	2.77	1	1.88	2.20	-0.32
DSCP-MW-29	DSCP	2686965	222161	unconfined	3.43	1	1.79	2.19	-0.40
DSCP-MW-2B	DSCP	2687618	223121	unconfined	3.44	1	3.06	3.26	-0.20
DSCP-MW-30	DSCP	2687219	222184	unconfined	2.63	1	1.47	2.33	-0.86
DSCP-MW-32	DSCP	2687645	222120	unconfined	3.44	1	2.48	2.46	0.02
DSCP-MW-33	DSCP	2687847	222091	unconfined	1.31	1	1.58	2.50	-0.92
DSCP-MW-35A	DSCP	2687607	222354	unconfined	3.14	1	2.02	2.64	-0.62
DSCP-MW-36	DSCP	2688198	221951	unconfined	2.55	1	1.84	2.49	-0.65
DSCP-MW-3A	DSCP	2687182	222473	unconfined	3.56	1	1.52	2.55	-1.03
DSCP-MW-44A	DSCP	2686629	223212	unconfined	2.46	1	2.47	2.72	-0.25
DSCP-MW-45A	DSCP	2686661	223705	unconfined	6.36	1	4.21	3.25	0.96
DSCP-MW-4A	DSCP	2687066	222254	unconfined	5.19	1	1.48	2.32	-0.84
DSCP-MW-5	DSCP	2687276	222313	unconfined	3.9	1	1.90	2.47	-0.57
DSCP-MW-53	DSCP	2688910	223078	unconfined	1.45	1	3.18	3.59	-0.41
DSCP-MW-54	DSCP	2688606	222975	unconfined	3.05	1	3.29	3.44	-0.15

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
DSCP-MW-59	DSCP	2688866	222696	unconfined	2.2	1	2.09	3.26	-1.17
DSCP-MW-6	DSCP	2687259	222070	unconfined	4.38	1	1.61	2.26	-0.65
DSCP-MW-65	DSCP	2687428	222124	unconfined	-2.03	1	1.65	2.38	-0.73
DSCP-MW-7	DSCP	2688049	221962	unconfined	6.39	1	1.86	2.46	-0.60
DSCP-MW-9	DSCP	2688453	221927	unconfined	2.75	1	1.83	2.54	-0.71
DSCP-RW-10	DSCP	2688044	222360	unconfined	1.24	1	2.27	2.78	-0.51
DSCP-RW-11	DSCP	2687629	222027	unconfined	2.29	1	2.06	2.38	-0.32
DSCP-RW-1A	DSCP	2687406	222061	unconfined	1.83	1	1.61	2.32	-0.71
DSCP-RW-2	DSCP	2686840	222240	unconfined	3.66	1	1.74	2.18	-0.44
DSCP-RW-3	DSCP	2687102	222099	unconfined	3.44	1	1.61	2.21	-0.60
DSCP-RW-4	DSCP	2687542	222032	unconfined	2.26	1	2.03	2.35	-0.32
DSCP-RW-5/MW-25	DSCP	2687690	222012	unconfined	5.6	1	-0.37	2.39	-2.76
DSCP-RW-6	DSCP	2687840	221992	unconfined	1.34	1	1.60	2.42	-0.82
DSCP-RW-7	DSCP	2687993	221974	unconfined	1.87	1	1.76	2.45	-0.69
DSCP-RW-8	DSCP	2687444	222376	unconfined	1.59	1	2.10	2.59	-0.49
DSCP-RW-9	DSCP	2688233	222374	unconfined	1.4	1	2.17	2.84	-0.67
EPH-MW-39	DSCP	2688284	221752	unconfined	-0.27	1	1.82	2.35	-0.53
EPH-MW-48	DSCP	2687984	221540	unconfined	0.59	1	1.91	1.66	0.25
EPH-MW-49	DSCP	2687860	221395	unconfined	2.81	1	1.84	1.96	-0.12
EPH-MW-50	DSCP	2687767	221178	unconfined	1.38	1	1.71	2.23	-0.52
EPH-MWS-10	DSCP	2687988	221053	unconfined	5.46	1	4.39	2.47	1.92
EPH-MWS-11	DSCP	2687625	221111	unconfined	5.11	1	1.79	2.25	-0.46
EPH-MWS-5	DSCP	2688545	221597	unconfined	0.46	1	1.68	1.80	-0.12
EPH-PH-5	DSCP	2687579	220875	unconfined	-2.32	1	1.46	2.46	-1.00
EPH-PH-7	DSCP	2688852	221563	unconfined	-1.09	1	3.15	2.26	0.89
MW-26	BELMONT	2685920	224123	unconfined	-7.91	1	4.11	3.34	0.77
MW-27	BELMONT	2685686	224065	unconfined	9.55	1	4.24	3.65	0.59
MW-28	BELMONT	2685581	224169	unconfined	9.26	1	4.20	3.93	0.27
MW-29	BELMONT	2685481	223955	unconfined	9.5	1	4.17	3.81	0.36
MW-30	BELMONT	2684982	224261	unconfined	4.5	1	4.52	4.60	-0.08
MW-31	BELMONT	2685353	224156	unconfined	11.48	1	4.83	4.20	0.63
MW-32	BELMONT	2685565	224286	unconfined	9.59	1	4.35	4.11	0.24
MW-33	BELMONT	2685300	224346	unconfined	12.3	1	4.04	4.48	-0.44
MW-35	BELMONT	2685572	224473	unconfined	3.34	1	3.91	4.40	-0.49
MW-36	BELMONT	2685830	224431	unconfined	5.25	1	4.62	4.05	0.57
MW-37	BELMONT	2685985	224470	unconfined	5.05	1	4.90	4.20	0.70
MW-38	BELMONT	2686166	224255	unconfined	0.48	1	4.35	3.70	0.65

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
MW-39	BELMONT	2686158	224193	unconfined	0.49	1	4.43	3.48	0.95
MW-40	BELMONT	2686146	224123	unconfined	3.81	1	4.38	3.13	1.25
MW-41	BELMONT	2686036	224120	unconfined	0.16	1	4.30	3.22	1.08
MW-44	BELMONT	2685403	224419	unconfined	2.32	1	3.94	4.48	-0.54
N-1	AOI 8	2682437	228366	unconfined	18.57	1	10.88	7.46	3.42
N-100	AOI 8	2682716	228210	unconfined	9.99	1	9.24	6.35	2.89
N-101	AOI 8	2683653	227222	unconfined	7.43	1	11.33	10.94	0.39
N-106	AOI 8	2682977	227044	unconfined	7.5	1	13.47	16.38	-2.91
N-107	AOI 8	2683133	226910	unconfined	7.38	1	11.31	13.39	-2.08
N-108	AOI 8	2682983	226849	unconfined	9.97	1	11.24	13.04	-1.80
N-11	AOI 8	2682915	227226	unconfined	14.83	1	11.52	11.16	0.36
N-118	AOI 8	2683077	226461	unconfined	6.49	1	8.79	8.57	0.22
N-129	AOI 8	2683241	225470	unconfined	5.12	1	9.76	9.24	0.52
N-134	AOI 8	2685262	226063	unconfined	10.79	1	10.50	7.51	2.99
N-137	AOI 8	2683096	227832	unconfined	5.87	1	8.17	7.64	0.53
N-14	AOI 8	2683665	227011	unconfined	17.14	1	11.25	10.10	1.15
N-140	AOI 8	2683133	227411	unconfined	8.16	1	9.81	9.89	-0.08
N-141	AOI 8	2683308	227396	unconfined	7.54	1	10.73	11.09	-0.36
N-142	AOI 8	2683211	227652	unconfined	6.99	1	7.99	9.28	-1.29
N-143	AOI 8	2683358	227513	unconfined	8.22	1	10.63	10.59	0.04
N-144	AOI 8	2683293	227623	unconfined	6.77	1	8.42	9.76	-1.34
N-145	AOI 8	2683032	227680	unconfined	7.36	1	7.93	8.27	-0.34
N-15	AOI 8	2684060	226993	unconfined	17.05	1	9.03	8.03	1.00
N-16	AOI 8	2684409	226993	unconfined	18.4	1	12.00	7.70	4.30
N-17	AOI 8	2684410	226993	unconfined	19.05	1	11.98	7.70	4.28
N-18	AOI 8	2684650	226744	unconfined	17.65	1	11.71	7.84	3.87
N-20	AOI 8	2683878	226645	unconfined	22.12	1	11.19	9.05	2.14
N-24	AOI 8	2682554	226437	unconfined	10.03	1	7.94	7.50	0.44
N-29	AOI 8	2685039	225835	unconfined	21.6	1	10.58	10.03	0.55
N-37	AOI 8	2681543	226828	lower aquifer	4.26	1	5.60	5.87	-0.27
N-42	AOI 8	2682412	225813	unconfined	4.59	1	6.85	8.12	-1.27
N-47	AOI 8	2683936	225489	unconfined	17.05	1	12.46	9.20	3.26
N-48	AOI 8	2683476	225312	unconfined	15.42	1	9.84	9.43	0.41
N-49	AOI 8	2683115	225175	unconfined	17.05	1	9.23	9.79	-0.56
N-503	AOI 8	2680566	226576	unconfined	11.46	1	3.20	4.27	-1.07
N-504	AOI 8	2680652	226857	unconfined	11.36	1	2.53	3.80	-1.27
N-51	AOI 8	2682956	225253	unconfined	16.92	1	9.18	9.71	-0.53

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
N-55	AOI 8	2681474	225122	unconfined	4.39	1	2.43	8.44	-6.01
N-56	AOI 8	2681266	225659	unconfined	4.18	1	4.12	8.74	-4.62
N-57	AOI 8	2680586	226031	unconfined	3.8	1	4.36	7.28	-2.92
N-64	AOI 8	2682309	224842	unconfined	2.5	1	5.78	3.68	2.10
N-67	AOI 8	2682698	226940	unconfined	14.9	1	11.98	14.11	-2.13
N-68	AOI 8	2682973	226911	unconfined	14.87	1	10.38	15.28	-4.90
N-72	AOI 8	2680686	226761	unconfined	1.26	1	2.70	6.39	-3.69
N-8	AOI 8	2684092	227375	unconfined	18.53	1	11.90	10.23	1.67
N-82	AOI 8	2684634	225723	unconfined	8.48	1	10.95	9.08	1.87
N-85	AOI 8	2684734	226448	unconfined	8.95	1	11.55	7.14	4.41
N-86	AOI 8	2684119	226463	unconfined	16.3	1	10.87	8.70	2.17
N-87	AOI 8	2683965	226550	unconfined	10.89	1	11.06	9.12	1.94
N-89	AOI 8	2682824	226717	unconfined	9.87	1	9.12	9.85	-0.73
N-93	AOI 8	2683794	226550	unconfined	10.05	1	10.24	8.70	1.54
N-97	AOI 8	2684187	226513	unconfined	9.12	1	9.27	8.34	0.93
N-98	AOI 8	2683479	227658	unconfined	7.46	1	11.19	9.94	1.25
OW-12	BELMONT	2685686	224424	unconfined	15.24	1	4.38	4.17	0.21
OW-13	BELMONT	2685988	224385	unconfined	16.45	1	4.57	3.98	0.59
OW-17	BELMONT	2685587	224388	unconfined	15.15	1	4.04	4.24	-0.20
OW-18	BELMONT	2685520	224437	unconfined	10.75	1	3.94	4.40	-0.46
OW-19	BELMONT	2685717	224415	unconfined	11.22	1	5.74	4.10	1.64
OW-2	BELMONT	2685939	224392	unconfined	16.22	1	4.91	3.99	0.92
OW-20	BELMONT	2685840	224404	unconfined	12.43	1	4.68	3.96	0.72
PGW-MW-1	PGW	2683228	224438	unconfined	8.66	1	8.63	8.60	0.03
PGW-MW-11	PGW	2683813	224768	unconfined	10.55	1	10.64	9.40	1.24
PGW-MW-13	PGW	2683949	224490	unconfined	10.2	1	10.39	8.89	1.50
PGW-MW-15	PGW	2683427	224122	unconfined	8.21	1	8.28	6.20	2.08
PGW-MW-17	PGW	2683385	224541	unconfined	9.47	1	9.54	9.73	-0.19
PGW-MW-18S	PGW	2683206	224683	unconfined	9.41	1	9.40	9.92	-0.52
PGW-MW-20	AOI 8	2682870	224701	unconfined	9.02	1	9.12	7.62	1.50
PGW-MW-22	PGW	2682953	224875	unconfined	10.03	1	9.91	9.94	-0.03
PGW-MW-23	PGW	2684193	224341	unconfined	10.74	1	10.96	5.01	5.95
PGW-MW-24	AOI 8	2682932	225026	unconfined	10.08	1	10.07	9.98	0.09
PGW-MW-26A	PGW	2684200	225064	unconfined	11.37	1	11.63	9.28	2.35
PGW-MW-2A	PGW	2683341	224285	unconfined	8.12	1	8.20	7.95	0.25
PGW-MW-3	PGW	2683356	224400	unconfined	10.46	1	11.29	9.13	2.16
PGW-MW-30	PGW	2684088	225511	unconfined	12.87	1	13.74	9.24	4.50

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
PGW-MW-33	PGW	2683509	225248	unconfined	11.26	1	13.03	9.61	3.42
PGW-MW-34	PGW	2683317	225168	unconfined	11.68	1	10.72	9.81	0.91
PGW-MW-37	PGW	2683017	225030	unconfined	10.23	1	9.92	10.05	-0.13
PGW-MW-39	PGW	2683023	224810	unconfined	9.77	1	9.68	9.94	-0.26
PGW-MW-40A	PGW	2684160	225162	unconfined	11.54	1	11.69	9.32	2.37
PGW-MW-44	PGW	2684147	225231	unconfined	11.99	1	11.97	9.32	2.65
PGW-MW-45	PGW	2684686	225671	unconfined	11.66	1	11.93	9.57	2.36
PGW-MW-5	AOI 8	2683138	224445	unconfined	8.12	1	8.24	7.20	1.04
PGW-MW-6	AOI 8	2682885	224559	unconfined	3.06	1	-0.69	3.36	-4.05
PGW-MW-7	AOI 8	2682986	224648	unconfined	8.2	1	9.29	8.45	0.84
PGW-MW-8	AOI 8	2683074	224544	unconfined	8.2	1	8.28	7.98	0.30
PGW-MW-9	AOI 8	2683174	224408	unconfined	8.05	1	8.15	7.16	0.99
PH-MW-40	DSCP	2687731	221480	unconfined	0.07	1	1.80	1.72	0.08
PH-MW-41	DSCP	2687413	221534	unconfined	3.62	1	1.69	1.34	0.35
PH-MW-42	DSCP	2686769	221821	unconfined	2.08	1	1.34	1.71	-0.37
PH-MW-43	DSCP	2686438	221827	unconfined	6.95	1	1.22	1.34	-0.12
PH-MW-51	DSCP	2687500	221132	unconfined	0.97	1	1.74	2.17	-0.43
PH-MW-55	DSCP	2686505	222267	unconfined	6.17	1	1.42	2.01	-0.59
PH-MW-56	DSCP	2686556	221083	unconfined	1.46	1	1.41	1.78	-0.37
PH-MW-57	DSCP	2686282	220525	unconfined	3.31	1	0.79	2.13	-1.34
PH-MW-58	DSCP	2686349	221238	unconfined	4.88	1	1.70	1.45	0.25
PH-MW-60	DSCP	2687960	221802	unconfined	-1.78	1	1.87	2.32	-0.45
PH-MWS-1	DSCP	2686452	221928	unconfined	9.79	1	1.26	1.49	-0.23
PH-MWS-13	DSCP	2686359	221371	unconfined	6.95	1	1.52	1.31	0.21
PH-MWS-2A	DSCP	2687207	221520	unconfined	0.6	1	1.45	1.33	0.12
PH-MWS-3	DSCP	2687763	221556	unconfined	-1.45	1	1.74	1.47	0.27
PH-MWS-4	DSCP	2687804	221600	unconfined	3.58	1	2.01	1.56	0.45
PH-PH-1	DSCP	2686489	222120	unconfined	7.22	1	1.52	1.89	-0.37
PH-PH-13	DSCP	2687220	221617	unconfined	2.67	1	1.46	1.27	0.19
PH-PH-14	DSCP	2687012	221567	unconfined	5.04	1	1.56	1.06	0.50
PH-PH-16	DSCP	2687623	221740	unconfined	2.57	1	2.13	2.12	0.01
PH-PH-17	DSCP	2687678	221881	unconfined	1.18	1	1.70	2.29	-0.59
PH-PH-18	DSCP	2687410	221922	unconfined	1.47	1	1.60	2.22	-0.62
PH-PH-19	DSCP	2687210	221950	unconfined	1.28	1	1.50	2.15	-0.65
PH-PH-2	DSCP	2686821	222025	unconfined	4.86	1	1.45	1.99	-0.54
PH-PH-20	DSCP	2686939	221991	unconfined	2.97	1	1.44	2.03	-0.59
PH-PH-21	DSCP	2686682	222101	unconfined	6.66	1	1.40	1.98	-0.58

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
PH-PH-22	DSCP	2686409	221643	unconfined	5.46	1	1.29	1.20	0.09
PH-PH-23	DSCP	2686701	221254	unconfined	1.71	1	1.80	1.70	0.10
PH-PH-24	DSCP	2687242	221174	unconfined	1.84	1	2.49	2.02	0.47
PH-PH-3	DSCP	2687314	221945	unconfined	5.63	1	1.60	2.20	-0.60
PH-PH-4	DSCP	2687928	221845	unconfined	0.99	1	1.87	2.34	-0.47
PH-PZ-4	DSCP	2687319	221943	unconfined	9.96	1	1.64	2.20	-0.56
PH-RW-A	DSCP	2686638	222124	unconfined	4.55	1	3.10	1.98	1.12
PH-RW-A2	DSCP	2686640	222131	unconfined	10.8	1	1.39	1.98	-0.59
PH-RW-B	DSCP	2686815	222035	unconfined	3.87	1	1.74	1.99	-0.25
PH-RW-B2	DSCP	2686821	222030	unconfined	10.81	1	1.46	1.99	-0.53
PH-RW-C	DSCP	2687070	221975	unconfined	4.07	1	1.39	2.09	-0.70
PH-RW-CA	DSCP	2687084	221963	unconfined	5.03	1	1.28	2.09	-0.81
PH-RW-E	DSCP	2687539	221910	unconfined	1.97	1	1.59	2.26	-0.67
PH-RW-F	DSCP	2687826	221867	unconfined	0.03	1	1.79	2.33	-0.54
PH-RW-G	DSCP	2687154	221567	unconfined	7.55	1	1.67	1.16	0.51
PH-RW-I2	DSCP	2686803	221923	unconfined	10.23	1	1.51	1.87	-0.36
PH-RW-N	DSCP	2687810	221599	unconfined	1.74	1	1.84	1.56	0.28
PH-RW-O	DSCP	2687693	221589	unconfined	0.4	1	1.77	1.45	0.32
PH-RW-P	DSCP	2687599	221597	unconfined	1.15	1	2.13	1.47	0.66
PH-RW-Q	DSCP	2687510	221586	unconfined	-1.75	1	-2.02	1.38	-3.40
PH-RW-S	DSCP	2687350	221602	unconfined	-1.01	1	-2.91	1.38	-4.29
PH-RW-U	DSCP	2686879	221846	unconfined	2.62	1	1.40	1.85	-0.45
PH-RW-V	DSCP	2686705	221936	unconfined	2.59	1	1.35	1.83	-0.48
PH-RW-W	DSCP	2686591	221952	unconfined	2.53	1	1.29	1.82	-0.53
PZ-100	AOI 2	2683602	222350	unconfined	1.42	1	1.78	2.37	-0.59
PZ-132A	AOI 6	2680866	216104	unconfined	0.62	1	2.53	1.65	0.88
PZ-2	AOI 5	2681495	215938	unconfined	2.56	1	5.29	4.56	0.73
PZ-201	AOI 8	2683718	225409	unconfined	10.21	1	10.87	9.24	1.63
PZ-202	AOI 8	2683876	225484	unconfined	11.24	1	11.84	9.17	2.67
PZ-204	AOI 8	2684196	225633	unconfined	8.03	1	8.66	8.82	-0.16
PZ-3	AOI 5	2681511	215958	unconfined	2.87	1	2.71	4.50	-1.79
PZ-300	AOI 8	2683295	226640	unconfined	9.39	1	9.49	9.22	0.27
PZ-400	BELMONT	2686131	224096	unconfined	13.86	1	4.33	3.01	1.32
PZ-402	AOI 1	2686061	223552	unconfined	-2.82	1	4.05	2.19	1.86
PZ-403	AOI 1	2685965	222935	unconfined	0.8	1	1.51	1.35	0.16
PZ-404	AOI 1	2685981	222933	unconfined	5.62	1	-0.25	1.28	-1.53
PZ-500	AOI 8	2680478	225305	unconfined	5.13	1	4.32	3.14	1.18

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
PZ-501	AOI 8	2680429	225835	unconfined	4.37	1	4.08	3.51	0.57
PZ-502	AOI 8	2680434	225562	unconfined	6.14	1	4.24	3.44	0.80
PZ-503	AOI 8	2680590	225085	unconfined	4.58	1	4.11	2.87	1.24
PZ-504	AOI 8	2680730	224903	unconfined	4.54	1	4.06	3.85	0.21
PZ-505	AOI 8	2681024	224708	unconfined	4.56	1	4.00	3.72	0.28
PZ-507	AOI 8	2682206	224812	unconfined	3.68	1	2.81	3.24	-0.43
RW-1	BELMONT	2685680	224407	unconfined	-4.42	1	4.35	4.14	0.21
RW-100	AOI 2	2683341	222349	unconfined	-3.66	1	2.23	2.39	-0.16
RW-101	AOI 2	2683489	222384	unconfined	-3.63	1	1.96	2.42	-0.46
RW-102	AOI 2	2683599	222321	unconfined	-4.76	1	2.50	2.35	0.15
RW-103	AOI 2	2683770	222358	unconfined	-5.24	1	2.58	2.27	0.31
RW-104	AOI 2	2682960	222446	unconfined	-6.89	1	-2.72	2.06	-4.78
RW-105	AOI 2	2682964	222412	unconfined	-2.87	1	0.08	2.28	-2.20
RW-106	AOI 2	2682946	222348	unconfined	-2.71	1	1.72	2.26	-0.54
RW-107	AOI 2	2682915	222272	unconfined	1.3	1	0.38	2.26	-1.88
RW-108	AOI 2	2682895	222181	unconfined	-3.66	1	1.98	2.26	-0.28
RW-109	AOI 2	2682883	222084	unconfined	-3.488	1	2.45	2.25	0.20
RW-110	AOI 1	2685160	222136	unconfined	5.7	1	1.57	1.37	0.20
RW-111	AOI 1	2685197	222112	unconfined	5.8	1	1.47	1.34	0.13
RW-112	AOI 1	2685156	222113	unconfined	3.71	1	1.48	1.36	0.12
RW-113	AOI 2	2682988	222409	unconfined	-8.9	1	1.26	2.29	-1.03
RW-115	AOI 2	2682980	222371	unconfined	-8.7	1	1.58	2.28	-0.70
RW-116	AOI 2	2682987	222340	unconfined	-8.11	1	1.71	2.29	-0.58
RW-117	AOI 2	2682964	222320	unconfined	-9.06	1	1.66	2.28	-0.62
RW-118	AOI 2	2682999	222302	unconfined	-7.03	1	1.76	2.31	-0.55
RW-120	AOI 2	2683027	222353	unconfined	0.27	1	1.69	2.31	-0.62
RW-121	AOI 2	2683050	222376	unconfined	1.3	1	1.75	2.32	-0.57
RW-123	AOI 2	2682969	222296	unconfined	-9.02	1	1.76	2.29	-0.53
RW-125	AOI 2	2683040	222428	unconfined	-4.3	1	1.19	2.34	-1.15
RW-126	AOI 2	2682936	222285	unconfined	-9.65	1	1.53	2.27	-0.74
RW-127	AOI 2	2683036	222383	unconfined	-4.65	1	1.68	2.31	-0.63
RW-129	AOI 2	2683008	222434	unconfined	-8.55	1	0.42	2.32	-1.90
RW-201	AOI 8	2682704	225060	unconfined	4.11	1	9.03	9.78	-0.75
RW-202	AOI 8	2682881	225065	unconfined	3.54	1	9.19	9.91	-0.72
RW-204	AOI 8	2683190	225163	unconfined	3.84	1	9.46	9.80	-0.34
RW-205	AOI 8	2683343	225251	unconfined	7.8	1	9.70	9.59	0.11
RW-206	AOI 8	2683557	225332	unconfined	7.08	1	9.96	9.37	0.59

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
RW-21	BELMONT	2685822	224345	unconfined	14.76	1	4.38	3.83	0.55
RW-22	BELMONT	2685892	224304	unconfined	-0.9	1	4.34	3.75	0.59
RW-25	BELMONT	2685725	224365	unconfined	2.24	1	4.40	3.97	0.43
RW-26	BELMONT	2685474	224410	unconfined	0.6	1	3.96	4.40	-0.44
RW-27	BELMONT	2685423	224396	unconfined	0.74	1	3.87	4.43	-0.56
RW-28	BELMONT	2685357	224378	unconfined	0.1	1	4.40	4.47	-0.07
RW-29	BELMONT	2685286	224360	unconfined	0.19	1	3.90	4.51	-0.61
RW-30	BELMONT	2685257	224352	unconfined	0.33	1	4.01	4.52	-0.51
RW-303	AOI 8	2683167	226663	unconfined	10.73	1	10.94	9.57	1.37
RW-307	AOI 8	2683080	226604	unconfined	22.82	1	8.48	9.28	-0.80
RW-308	AOI 8	2683240	226623	unconfined	25.27	1	8.80	9.24	-0.44
RW-309	AOI 8	2683373	226602	unconfined	24.81	1	9.58	8.95	0.63
RW-31	BELMONT	2685206	224339	unconfined	0.31	1	4.06	4.55	-0.49
RW-401	AOI 1	2686040	223555	unconfined	-7.99	1	4.15	2.23	1.92
RW-404	AOI 1	2686015	223152	unconfined	-3.81	1	1.73	1.50	0.23
RW-500	AOI 8	2680478	225305	unconfined	6.79	1	4.27	3.18	1.09
RW-501	AOI 8	2681487	224727	unconfined	7.98	1	2.49	5.13	-2.64
RW-502	AOI 8	2680607	226714	unconfined	11.4	1	3.27	4.74	-1.47
RW-6	BELMONT	2686038	224377	unconfined	16.24	1	4.68	3.98	0.70
RW-600	AOI 2	2683369	223296	unconfined	-5.51	1	4.34	2.80	1.54
RW-601	AOI 2	2683325	223213	unconfined	-2.44	1	2.88	2.68	0.20
RW-6S	AOI 5	2681520	215947	unconfined	5.22	1	2.79	4.43	-1.64
RW-7	BELMONT	2685894	224363	unconfined	-5.93	1	4.41	3.90	0.51
RW-9	AOI 6	2681446	216562	unconfined	3.71	1	3.14	4.59	-1.45
RWBH-2	AOI 5	2682109	215220	unconfined	-0.67	1	1.20	2.48	-1.28
S-100	AOI 1	2686178	223523	unconfined	0.09	1	4.05	2.35	1.70
S-101	AOI 1	2686296	223163	unconfined	-1.73	1	2.25	2.23	0.02
S-102	AOI 4	2683874	221407	unconfined	3.13	1	1.47	2.21	-0.74
S-103	AOI 4	2684428	221275	unconfined	6.05	1	1.92	2.00	-0.08
S-104	AOI 4	2684804	221448	unconfined	0.63	1	2.88	1.79	1.09
S-105	AOI 2	2683300	223164	unconfined	4.64	1	2.36	2.63	-0.27
S-107	AOI 2	2683338	223258	unconfined	1.5	1	4.00	2.71	1.29
S-108	AOI 2	2683362	223294	unconfined	-1.04	1	5.64	2.78	2.86
S-108SRTF	AOI 9	2677667	218321	unconfined	-5.93	1	-0.43	-1.18	0.75
S-109SRTF	AOI 9	2677084	217894	unconfined	-6.76	1	-0.10	-1.88	1.78
S-111SRTF	AOI 9	2677273	217432	unconfined	-8.64	1	-7.94	-2.87	-5.07
S-112SRTF	AOI 9	2677256	216984	unconfined	-8.41	1	-8.52	-3.84	-4.68

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
S-113SRTF	AOI 9	2676915	216800	unconfined	-9.57	1	-8.51	-4.20	-4.31
S-114SRTF	AOI 9	2676978	216435	unconfined	-10.44	1	-8.54	-5.14	-3.40
S-115SRTF	AOI 9	2676754	216194	unconfined	-9.8	1	-8.69	-5.68	-3.01
S-116SRTF	AOI 9	2676903	215942	unconfined	-11.68	1	-8.70	-6.34	-2.36
S-117	AOI 1	2685492	222352	unconfined	0.6	1	1.64	1.33	0.31
S-118	AOI 1	2685533	221629	unconfined	-0.41	1	0.88	0.20	0.68
S-118SRTF	AOI 9	2676678	215161	unconfined	-8.98	1	-7.79	-8.28	0.49
S-119	AOI 4	2685393	220753	unconfined	-0.18	1	1.33	1.84	-0.51
S-121SRTF	AOI 9	2677486	215710	unconfined	-8.54	1	-7.30	-6.96	-0.34
S-122SRTF	AOI 9	2677653	216573	unconfined	-7.96	1	-6.63	-4.76	-1.87
S-123SRTF	AOI 9	2677861	216790	unconfined	-5.7	1	-8.20	-4.20	-4.00
S-125	AOI 1	2686079	223506	unconfined	3.84	1	4.13	2.11	2.02
S-127	AOI 1	2685644	222203	unconfined	-3.62	1	1.03	0.73	0.30
S-130	AOI 2	2684124	222280	unconfined	2.41	1	3.92	1.86	2.06
S-131	AOI 2	2684100	222307	unconfined	2.91	1	4.10	1.90	2.20
S-132	AOI 2	2684095	222243	unconfined	1.24	1	3.15	1.87	1.28
S-133	AOI 2	2684056	222303	unconfined	1.63	1	3.77	1.91	1.86
S-134	AOI 2	2684441	222209	unconfined	2.61	1	3.33	1.40	1.93
S-135	AOI 2	2684162	222278	unconfined	2.34	1	3.96	1.82	2.14
S-136	AOI 2	2684135	222257	unconfined	2.95	1	3.30	1.84	1.46
S-139	AOI 2	2683570	222392	unconfined	0.9	1	2.18	2.41	-0.23
S-141	AOI 2	2683427	222387	unconfined	1.97	1	1.80	2.43	-0.63
S-142	AOI 2	2683609	222348	unconfined	-0.19	1	0.79	2.36	-1.57
S-152	AOI 2	2683337	223247	unconfined	-0.9	1	3.21	2.70	0.51
S-154	AOI 2	2683290	223236	unconfined	0.14	1	1.44	2.59	-1.15
S-156	AOI 2	2684180	222281	unconfined	3.18	1	3.80	1.81	1.99
S-157	AOI 2	2684107	222285	unconfined	2.29	1	3.96	1.87	2.09
S-159	AOI 2	2683730	222304	unconfined	6.67	1	2.62	2.26	0.36
S-162	AOI 1	2685202	222131	unconfined	4.93	1	1.42	1.35	0.07
S-164	AOI 1	2685039	222134	unconfined	2.9	1	1.89	1.30	0.59
S-166	AOI 2	2684909	222170	unconfined	3.22	1	2.70	1.15	1.55
S-175	AOI 2	2684500	222226	unconfined	5.9	1	3.31	1.34	1.97
S-193	AOI 1	2686254	223959	unconfined	3.48	1	4.35	3.00	1.35
S-196	AOI 1	2686419	224117	unconfined	2.46	1	4.58	3.65	0.93
S-198	AOI 1	2685879	224076	unconfined	0.74	1	4.13	3.34	0.79
S-199	AOI 1	2685732	224027	unconfined	1.21	1	4.15	3.54	0.61
S-200	AOI 1	2685486	223945	unconfined	1.93	1	4.29	3.79	0.50

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WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
S-201	AOI 1	2685877	223831	unconfined	1.24	1	4.29	2.97	1.32
S-202	AOI 1	2684881	223417	unconfined	2.89	1	4.50	3.64	0.86
S-203	AOI 1	2685245	223217	unconfined	4.39	1	4.45	3.11	1.34
S-206	AOI 1	2684727	223201	unconfined	4.04	1	4.60	3.38	1.22
S-208	AOI 1	2685225	222409	unconfined	-0.42	1	2.11	1.68	0.43
S-209	AOI 1	2685750	222525	unconfined	-3.56	1	1.30	1.23	0.07
S-210	AOI 1	2685876	222247	unconfined	-6.86	1	0.12	0.16	-0.04
S-211	AOI 1	2685021	221956	unconfined	-7.28	1	2.20	1.46	0.74
S-213	AOI 1	2685087	221871	unconfined	-7.39	1	1.75	1.49	0.26
S-214	AOI 1	2685145	221577	unconfined	-5.77	1	1.20	1.47	-0.27
S-216	AOI 4	2684618	220867	unconfined	-3.93	1	1.63	1.96	-0.33
S-226	AOI 1	2685805	222280	unconfined	-8.14	1	0.54	0.53	0.01
S-227	AOI 1	2685786	221654	unconfined	-4.72	1	-0.29	-2.22	1.93
S-228	AOI 1	2685779	221657	unconfined	-6.29	1	-0.21	-2.13	1.92
S-231	AOI 1	2685897	222219	unconfined	2.38	1	0.14	-0.03	0.17
S-232	AOI 1	2685891	222167	unconfined	0.59	1	-0.31	-0.27	-0.04
S-246A	AOI 2	2682915	222348	unconfined	1.85	1	0.31	1.92	-1.61
S-247	AOI 2	2682921	222381	unconfined	1.18	1	0.34	1.80	-1.46
S-248	AOI 2	2682933	222394	unconfined	1.05	1	0.28	2.15	-1.87
S-249	AOI 2	2682939	222444	unconfined	1.57	1	-1.82	1.79	-3.61
S-25	AOI 3	2684275	218447	unconfined	12.06	1	1.70	2.77	-1.07
S-251	AOI 2	2683286	222362	unconfined	5.61	1	1.91	2.39	-0.48
S-252	AOI 2	2683257	222357	unconfined	5.36	1	1.82	2.38	-0.56
S-253	AOI 2	2683301	222420	unconfined	7.11	1	1.99	2.43	-0.44
S-254	AOI 2	2683168	222414	unconfined	6.91	1	1.50	2.39	-0.89
S-256	AOI 1	2685775	221633	unconfined	-5.83	1	0.03	-2.04	2.07
S-257	AOI 1	2685811	221589	unconfined	-1.33	1	0.30	-2.38	2.68
S-258	AOI 1	2685820	221665	unconfined	-1.64	1	-0.83	-2.69	1.86
S-259	AOI 1	2685827	221704	unconfined	-2	1	-1.73	-2.88	1.15
S-260	AOI 1	2685846	221830	unconfined	-3.02	1	-1.49	-2.66	1.17
S-262	AOI 1	2685590	222045	unconfined	-4.78	1	1.17	0.42	0.75
S-263	AOI 1	2685576	221829	unconfined	-5.34	1	0.96	-0.04	1.00
S-268	AOI 1	2686298	224224	unconfined	25.14	1	4.61	3.76	0.85
S-269	AOI 1	2685044	222590	unconfined	0.63	1	2.92	2.18	0.74
S-270	AOI 1	2685422	222589	unconfined	1.38	1	2.20	1.86	0.34
S-271	AOI 1	2686090	223898	unconfined	1.45	1	4.33	2.50	1.83
S-273	AOI 1	2686121	223810	unconfined	0.81	1	4.43	2.29	2.14

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
S-274	AOI 1	2686114	223761	unconfined	0.41	1	4.41	2.32	2.09
S-275	AOI 1	2686107	223710	unconfined	0.05	1	4.38	2.15	2.23
S-276	AOI 1	2686101	223661	unconfined	-0.32	1	4.41	2.05	2.36
S-277	AOI 1	2686071	223444	unconfined	-1.4	1	4.28	2.00	2.28
S-280	AOI 3	2682599	220966	unconfined	6.23	1	1.71	1.91	-0.20
S-282	AOI 4	2683960	220827	unconfined	5.99	1	1.03	2.10	-1.07
S-288	AOI 3	2683003	219276	unconfined	7.25	1	5.64	2.15	3.49
S-294	AOI 2	2684673	224162	unconfined	2.62	1	4.88	4.66	0.22
S-295	AOI 2	2684379	223801	unconfined	16.63	1	9.28	10.64	-1.36
S-297	AOI 2	2683613	223495	unconfined	-0.28	1	3.86	6.43	-2.57
S-298	AOI 2	2683859	223263	unconfined	12.98	1	11.05	9.66	1.39
S-299	AOI 2	2683545	222978	unconfined	1.27	1	3.10	2.81	0.29
S-300	AOI 2	2684308	222830	unconfined	1.485	1	4.54	2.82	1.72
S-301	AOI 2	2684442	222551	unconfined	2.99	1	4.39	2.26	2.13
S-302	AOI 2	2683251	222613	unconfined	-0.36	1	2.07	2.53	-0.46
S-303	AOI 2	2683678	222409	unconfined	2.21	1	2.64	2.39	0.25
S-305	AOI 2	2684883	221997	unconfined	-3.29	1	2.74	1.43	1.31
S-306	AOI 2	2683117	222297	unconfined	-2.42	1	1.74	2.35	-0.61
S-307	AOI 2	2683508	221764	unconfined	-2.05	1	2.81	2.35	0.46
S-308	AOI 2	2682915	221383	unconfined	12.89	1	4.11	2.11	2.00
S-309	AOI 2	2683391	221512	unconfined	4.522	1	2.40	2.29	0.11
S-311	AOI 2	2684448	221518	unconfined	-0.99	1	1.84	1.97	-0.13
S-313	AOI 2	2683327	222420	unconfined	-0.36	1	2.09	2.44	-0.35
S-314	AOI 2	2683250	222411	unconfined	-0.4	1	1.73	2.41	-0.68
S-317	AOI 2	2683227	222440	unconfined	-1.13	1	1.77	2.43	-0.66
S-318	AOI 2	2683216	222516	unconfined	-0.69	1	1.49	2.47	-0.98
S-32	AOI 4	2684136	219917	unconfined	1.15	1	1.46	2.32	-0.86
S-328	AOI 2	2683642	222582	unconfined	3.972	1	3.05	2.56	0.49
S-330	BELMONT	2685219	224246	unconfined	2.79	1	4.49	4.42	0.07
S-331	BELMONT	2685176	224033	unconfined	6.68	1	3.91	4.21	-0.30
S-332	BELMONT	2685110	224237	unconfined	4.34	1	4.26	4.49	-0.23
S-333	AOI 2	2682920	222372	unconfined	1.41	1	0.16	1.83	-1.67
S-335	AOI 2	2683113	222843	unconfined	0.09	1	3.21	2.22	0.99
S-336	AOI 2	2683167	222813	unconfined	2.42	1	2.13	2.55	-0.42
S-337	AOI 2	2683260	223172	unconfined	1.9	1	1.82	2.47	-0.65
S-338	AOI 2	2683320	223145	unconfined	2.96	1	2.77	2.67	0.10
S-34	AOI 4	2684177	220357	unconfined	-1.11	1	1.06	2.16	-1.10

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
S-346	AOI 2	2684760	222200	unconfined	-5.25	1	2.67	1.16	1.51
S-347	AOI 2	2684712	222199	unconfined	-5.24	1	2.56	1.17	1.39
S-348	AOI 2	2683866	222330	unconfined	0.11	1	6.70	2.10	4.60
S-349	AOI 2	2683819	222324	unconfined	-0.73	1	3.60	2.18	1.42
S-350	AOI 2	2684656	224223	unconfined	10	1	4.75	4.71	0.04
S-351	AOI 2	2684319	224112	unconfined	11.5	1	4.76	4.86	-0.10
S-354	AOI 2	2683499	223705	unconfined	10	1	3.13	4.02	-0.89
S-355	AOI 2	2683594	223590	unconfined	12.5	1	3.75	4.02	-0.27
S-357	AOI 2	2683533	223382	unconfined	0.9	1	7.25	6.52	0.73
S-359	AOI 2	2683809	222117	unconfined	5.5	1	3.06	2.21	0.85
S-359	AOI 2	2683809	222117	unconfined	5.5	1	3.17	2.21	0.96
S-360	AOI 2	2684419	221893	unconfined	7.5	1	2.73	1.86	0.87
S-361	AOI 2	2684109	221779	unconfined	9.5	1	3.32	2.13	1.19
S-363	AOI 2	2684410	221643	unconfined	7.5	1	1.80	1.97	-0.17
S-365	AOI 4	2683839	220855	unconfined	1.61	1	0.75	2.10	-1.35
S-366	AOI 4	2684586	221392	unconfined	-1.99	1	1.63	1.92	-0.29
S-367	AOI 4	2684688	221274	unconfined	-6.99	1	1.64	1.88	-0.24
S-369	AOI 4	2685726	221204	unconfined	-0.19	1	0.53	1.22	-0.69
S-380	AOI 4	2685674	220596	unconfined	-0.71	1	1.65	1.92	-0.27
S-382	AOI 3	2682250	220408	unconfined	-2.4	1	2.99	1.91	1.08
S-384	AOI 3	2683220	220831	unconfined	-1.8	1	0.67	1.98	-1.31
S-395	BELMONT	2685991	224465	unconfined	-1.25	1	4.76	4.19	0.57
S-396	AOI 1	2685872	223191	unconfined	-7.15	1	1.53	2.02	-0.49
S-406	AOI 2	2683062	222569	unconfined	2.33	1	1.85	2.42	-0.57
S-41	AOI 1	2685772	221298	unconfined	-4.51	1	0.48	0.75	-0.27
S-417	AOI 1	2684867	223781	unconfined	5.7	1	5.11	4.12	0.99
S-43	AOI 1	2685816	221634	unconfined	-0.54	1	-2.96	-2.53	-0.43
S-43	AOI 1	2685816	221634	unconfined	-0.54	1	-0.28	-2.53	2.25
S-46	AOI 1	2685283	222077	unconfined	-11.73	1	1.55	1.27	0.28
S-48	AOI 2	2684871	222221	unconfined	1.48	1	2.64	1.23	1.41
S-50	AOI 1	2685881	222241	unconfined	8.12	1	0.16	0.13	0.03
S-51	AOI 1	2685939	222520	unconfined	-1.82	1	0.55	0.86	-0.31
S-53	AOI 2	2684179	222279	unconfined	-2.21	1	4.26	1.81	2.45
S-54	AOI 2	2684412	221766	unconfined	1.26	1	2.49	1.94	0.55
S-60	AOI 3	2683756	221051	unconfined	0.68	1	1.06	2.13	-1.07
S-61	AOI 2	2683869	221701	unconfined	1.67	1	2.51	2.25	0.26
S-62	AOI 2	2683630	222319	unconfined	-2.11	1	2.41	2.34	0.07

*see notes on last page

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WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
S-63	AOI 2	2683223	222269	unconfined	0.95	1	1.76	2.37	-0.61
S-71	AOI 2	2683535	223178	unconfined	-0.5	1	3.31	2.88	0.43
S-72	AOI 2	2683825	223836	unconfined	4.24	1	4.46	4.53	-0.07
S-75	BELMONT	2686144	224096	unconfined	3.71	1	4.37	3.05	1.32
S-76	BELMONT	2685601	224035	unconfined	15.61	1	4.17	3.75	0.42
S-77P	AOI 1	2685250	223931	unconfined	13.37	1	4.48	4.03	0.45
S-77SRTF	AOI 9	2678019	217724	unconfined	-6.55	1	-7.82	-2.18	-5.64
S-78	AOI 1	2684757	223423	unconfined	3.43	1	4.83	3.71	1.12
S-78SRTF	AOI 9	2677724	216834	unconfined	-8.36	1	-8.33	-4.14	-4.19
S-79P	AOI 1	2685644	223426	unconfined	10.61	1	4.31	2.89	1.42
S-79SRTF	AOI 9	2677551	215992	unconfined	-7.81	1	-5.95	-6.22	0.27
S-80	AOI 1	2685607	223707	unconfined	7.44	1	4.34	3.31	1.03
S-81SRTF	AOI 9	2677042	216806	unconfined	-8.84	1	-8.26	-4.23	-4.03
S-82SRTF	AOI 9	2677316	217918	unconfined	-8.07	1	-0.20	-1.91	1.71
S-83	AOI 1	2686061	223399	unconfined	1.13	1	4.27	1.83	2.44
S-83SRTF	AOI 9	2677510	218241	unconfined	-6.73	1	-0.57	-1.33	0.76
S-85	AOI 1	2686023	223173	unconfined	0.44	1	1.77	1.53	0.24
S-86	AOI 1	2685945	223065	unconfined	-6.38	1	1.05	1.61	-0.56
S-88	AOI 1	2686005	223039	unconfined	-1.36	1	-0.86	1.39	-2.25
S-88A	AOI 1	2686013	223107	unconfined	2.19	1	2.21	1.44	0.77
S-89	AOI 1	2685989	222922	unconfined	-1.09	1	-0.23	1.22	-1.45
S-91	AOI 2	2684188	222271	unconfined	1.3	1	5.03	1.79	3.24
S-93	AOI 2	2683259	222338	unconfined	-0.57	1	1.87	2.38	-0.51
S-95	AOI 1	2685351	221422	unconfined	-0.89	1	1.12	1.17	-0.05
S-96	AOI 4	2684857	220719	unconfined	0.76	1	1.55	1.94	-0.39
S-99	AOI 1	2686084	222766	unconfined	-2.2	1	0.64	1.43	-0.79
SSEPTA-PH-8	DSCP	2689175	221890	unconfined	7.51	1	1.12	2.01	-0.89
SW-1	AOI 5	2681673	215437	unconfined	7.19	1	1.36	1.57	-0.21
SW-2	AOI 5	2681633	215458	unconfined	2.84	1	2.32	1.70	0.62
SW-3	AOI 5	2681565	215492	unconfined	1.98	1	2.35	1.42	0.93
SW-4	AOI 5	2681486	215534	unconfined	7.22	1	2.46	1.39	1.07
SW-5	AOI 5	2681322	215655	unconfined	7.84	1	4.31	2.35	1.96
SWR-1	AOI 5	2681283	215697	unconfined	3.49	1	2.58	2.67	-0.09
SWR-2	AOI 5	2681737	215397	unconfined	2.28	1	2.07	1.76	0.31
SWR-3	AOI 5	2681811	215359	unconfined	3.61	1	3.03	1.80	1.23
TW-11	BELMONT	2686135	224364	unconfined	16.31	1	4.44	3.98	0.46
TW-3	BELMONT	2685838	224405	unconfined	16.21	1	4.56	3.96	0.60

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
TW-5	BELMONT	2685994	224416	unconfined	16.17	1	4.83	4.06	0.77
TW-8	BELMONT	2685682	224456	unconfined	15.19	1	4.39	4.25	0.14
TW-9	BELMONT	2686092	224400	unconfined	16.22	1	4.60	4.05	0.55
U-2	AOI 6	2681798	216694	unconfined	2.8	1	2.11	3.53	-1.42
U-3	AOI 6	2681941	216811	unconfined	3.74	1	3.17	4.44	-1.27
U-4	AOI 6	2682043	216875	unconfined	5.41	1	2.73	5.29	-2.56
U-5	AOI 6	2681801	216801	unconfined	2.27	1	1.18	3.60	-2.42
URS-1	AOI 6	2680859	216101	unconfined	4.34	1	2.60	1.37	1.23
URS-2	AOI 6	2681727	216726	unconfined	4.06	1	3.28	3.47	-0.19
URS-4	AOI 6	2680671	216277	unconfined	0.85	1	2.20	1.41	0.79
URS-5	AOI 6	2680401	216794	unconfined	2.84	1	2.42	1.83	0.59
W-1	AOI 10	2682762	223594	unconfined	-1.81	1	3.44	3.80	-0.36
W-10	AOI 10	2681973	222348	unconfined	-1.4	1	3.80	6.32	-2.52
W-11	AOI 10	2682276	222286	unconfined	0.8	1	3.27	4.53	-1.26
W-12	AOI 10	2682078	221939	unconfined	-1.42	1	3.40	3.87	-0.47
W-14	AOI 10	2681747	222310	unconfined	-1.06	1	4.03	6.72	-2.69
W-15	AOI 10	2681624	222775	unconfined	2.3	1	5.49	6.45	-0.96
W-16	AOI 10	2681794	221795	unconfined	-1	1	3.82	3.77	0.05
W-17	AOI 10	2681731	221777	unconfined	-0.93	1	3.61	4.68	-1.07
W-2	AOI 10	2681822	223350	unconfined	0.77	1	4.54	6.38	-1.84
W-20	AOI 10	2680987	222415	unconfined	2.34	1	5.71	7.07	-1.36
W-22	AOI 10	2680429	222466	unconfined	2	1	5.02	5.80	-0.78
W-28	AOI 10	2682420	222857	unconfined	-3.21	1	4.89	5.22	-0.33
W-29	AOI 10	2682149	223225	unconfined	0.09	1	4.66	6.39	-1.73
W-30	AOI 10	2681983	222661	unconfined	-1.42	1	4.70	6.33	-1.63
W-31	AOI 10	2681808	222013	unconfined	-3.574	1	4.11	6.06	-1.95
W-33	AOI 10	2680145	222385	unconfined	2.36	1	5.32	5.26	0.06
W-34	AOI 10	2680919	222425	unconfined	1.78	1	5.91	6.98	-1.07
W-5	AOI 10	2681651	223047	unconfined	-2	1	4.64	6.05	-1.41
W-9	AOI 10	2681893	222543	lower aquifer	0.96	1	-1.24	6.53	-7.77
WP-14	AOI 5	2682199	215243	unconfined	2.06	1	1.99	2.85	-0.86
WP16-3	AOI 5	2682402	216899	unconfined	3.45	1	2.23	5.54	-3.31
WP-8	AOI 5	2682441	215137	unconfined	-6.02	1	1.73	2.41	-0.68
WP9-4	AOI 6	2681422	216537	unconfined	0.55	1	3.05	4.63	-1.58
WP9-8	AOI 5	2681391	216377	unconfined	3.09	1	3.57	4.49	-0.92
WP-A	AOI 5	2681387	215594	unconfined	5.19	1	3.44	2.45	0.99
WP-B	AOI 5	2681311	215667	unconfined	3.67	1	2.65	2.46	0.19

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Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
WP-C	AOI 5	2681378	215681	unconfined	2.7	1	2.42	4.17	-1.75
WP-D	AOI 5	2681484	215914	unconfined	3.13	1	2.58	4.57	-1.99
WP-E	AOI 5	2681622	215986	unconfined	2.72	1	2.45	3.00	-0.55
WPM-11	AOI 6	2682371	217106	unconfined	5.63	1	5.65	5.44	0.21
WPM-3	AOI 6	2682433	217085	unconfined	4.94	1	4.57	5.55	-0.98
A-15	AOI 5	2682689	216314	unconfined	-5.21	2	3.53	3.51	0.02
B-129	AOI 6	2683018	217874	unconfined	-3.67	2	1.41	4.20	-2.79
B-162	AOI 6	2682803	217903	unconfined	-3.57	2	4.91	3.97	0.94
B-94	AOI 6	2683137	217610	unconfined	-1.79	2	3.32	4.23	-0.91
BF-100	AOI 3	2683128	219458	unconfined	-5.04	2	0.60	2.08	-1.48
BF-104	AOI 3	2682830	219137	unconfined	-5.8	2	5.84	2.75	3.09
C-150	AOI 7	2680607	220263	unconfined	-5.86	2	-6.59	-7.29	0.70
C-49	AOI 7	2683022	218495	unconfined	-4.66	2	3.88	4.08	-0.20
N-102	AOI 8	2683870	227035	unconfined	6.59	2	11.39	8.04	3.35
N-103	AOI 8	2683660	226782	unconfined	5.41	2	12.32	8.48	3.84
N-104	AOI 8	2683420	226914	unconfined	5.96	2	11.11	9.71	1.40
N-105	AOI 8	2683443	226745	unconfined	6.26	2	11.01	9.10	1.91
N-111	AOI 8	2680519	226514	unconfined	-1.4	2	3.25	2.07	1.18
N-113	AOI 8	2681733	226054	unconfined	2.32	2	4.70	5.69	-0.99
N-115	AOI 8	2682246	225824	unconfined	2.43	2	7.28	6.53	0.75
N-122	AOI 8	2683577	226074	unconfined	2.93	2	6.45	6.96	-0.51
N-138	AOI 8	2683256	227757	unconfined	5.29	2	8.17	6.31	1.86
N-139	AOI 8	2683309	227732	unconfined	5	2	7.85	6.48	1.37
N-146	AOI 8	2682830	227726	unconfined	4.89	2	8.63	6.10	2.53
N-34	AOI 8	2682271	226259	unconfined	3.7	2	9.31	6.59	2.72
N-38	AOI 8	2680805	226899	unconfined	-0.73	2	2.38	3.95	-1.57
N-74	AOI 8	2680701	224898	unconfined	-1.7	2	1.60	1.99	-0.39
N-84	AOI 8	2684677	226457	unconfined	5.32	2	11.43	6.91	4.52
N-99	AOI 8	2682855	228875	unconfined	3.26	2	9.60	6.41	3.19
PH-RW-D	DSCP	2687308	221945	unconfined	-10.68	2	1.96	2.17	-0.21
RW-128	AOI 2	2682988	222438	unconfined	-10.2	2	-0.39	2.30	-2.69
RW-203	AOI 8	2683032	225154	unconfined	1.57	2	8.67	6.06	2.61
RW-306	AOI 8	2683768	226581	unconfined	4.72	2	10.69	8.09	2.60
RW-403	AOI 1	2686035	223262	unconfined	-8.89	2	3.53	1.83	1.70
RW-405	AOI 1	2685990	222933	unconfined	-6.5	2	-2.33	1.42	-3.75
RW-705	AOI 4	2685080	218913	unconfined	-3.59	2	1.66	2.57	-0.91
RW-707	AOI 4	2685021	218852	unconfined	-4.67	2	1.70	2.56	-0.86

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
RW-709	AOI 4	2684982	218812	unconfined	-6.48	2	1.63	2.57	-0.94
RW-710	AOI 4	2684962	218790	unconfined	-5.29	2	1.46	2.59	-1.13
RW-711	AOI 4	2684955	218782	unconfined	-6.79	2	1.70	2.59	-0.89
RW-712	AOI 4	2684936	218762	unconfined	-4.82	2	1.64	2.61	-0.97
RW-713	AOI 4	2684924	218748	unconfined	-5.41	2	1.66	2.62	-0.96
RW-714	AOI 4	2684903	218728	unconfined	-5.53	2	2.00	2.64	-0.64
RW-715	AOI 4	2684883	218706	unconfined	-5.64	2	1.73	2.65	-0.92
RW-716	AOI 4	2684864	218684	unconfined	-5.6	2	2.03	2.66	-0.63
RW-717	AOI 4	2684844	218663	unconfined	-5.64	2	1.80	2.67	-0.87
S-120	AOI 4	2685597	220403	unconfined	-3.53	2	1.83	2.07	-0.24
S-120DSRTF	AOI 9,11	2677542	215267	unconfined	-20.65	2	-8.90	-8.33	-0.57
S-122	AOI 4	2685443	219647	unconfined	-2.08	2	1.86	2.51	-0.65
S-123	AOI 4	2684990	219320	unconfined	-0.77	2	1.70	2.54	-0.84
S-124	AOI 4	2685004	218885	unconfined	0.46	2	1.69	2.52	-0.83
S-16	AOI 3	2683817	218965	unconfined	-9.17	2	1.82	2.31	-0.49
S-17	AOI 3	2683786	219271	unconfined	1.17	2	2.21	2.40	-0.19
S-20	AOI 3	2684072	218851	unconfined	-12.2	2	2.05	2.55	-0.50
S-219	AOI 4	2684850	219892	unconfined	0.38	2	1.80	2.35	-0.55
S-220	AOI 4	2684262	219152	unconfined	-4	2	1.81	2.52	-0.71
S-221	AOI 4	2684933	219006	unconfined	-2.48	2	1.79	2.40	-0.61
S-222	AOI 4	2684862	218677	unconfined	-3.61	2	1.89	2.67	-0.78
S-223	AOI 4	2685064	218859	unconfined	-6.02	2	1.78	2.59	-0.81
S-224	AOI 4	2685158	218991	unconfined	-5.47	2	1.80	2.61	-0.81
S-23	AOI 3	2684062	218579	unconfined	-2.55	2	1.76	2.68	-0.92
S-233	AOI 4	2684874	218923	unconfined	-0.87	2	4.78	2.26	2.52
S-234	AOI 4	2684899	218762	unconfined	-1.46	2	1.43	2.61	-1.18
S-235	AOI 4	2684962	218844	unconfined	-2.29	2	1.73	2.53	-0.80
S-236	AOI 4	2684954	219018	unconfined	-4.78	2	1.67	2.41	-0.74
S-237	AOI 4	2684943	218984	unconfined	-5.11	2	1.70	2.37	-0.67
S-238	AOI 4	2685034	218917	unconfined	-2.63	2	1.75	2.52	-0.77
S-239	AOI 4	2684997	218789	unconfined	-1.31	2	1.75	2.60	-0.85
S-240	AOI 4	2684848	218980	unconfined	-1.53	2	1.61	2.44	-0.83
S-241	AOI 4	2684819	219045	unconfined	0.59	2	1.46	2.50	-1.04
S-242	AOI 4	2684857	218813	unconfined	0.92	2	1.89	2.56	-0.67
S-243	AOI 4	2684934	218722	unconfined	1.1	2	1.90	2.64	-0.74
S-245	AOI 4	2684999	219051	unconfined	0.96	2	1.92	2.49	-0.57
S-26	AOI 4	2684616	218758	unconfined	1.01	2	1.71	2.65	-0.94

*see notes on last page

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
S-278	AOI 4	2684810	218753	unconfined	-3.8	2	1.81	2.63	-0.82
S-279	AOI 4	2684702	219165	unconfined	1.86	2	2.06	2.54	-0.48
S-285	AOI 3	2683687	219690	unconfined	0.2	2	1.70	2.39	-0.69
S-29	AOI 4	2684380	219695	unconfined	-7.17	2	2.96	2.37	0.59
S-291	AOI 3	2683972	218061	unconfined	-3.036	2	3.94	4.07	-0.13
S-3	AOI 3	2683570	217784	unconfined	-2.33	2	2.83	3.60	-0.77
S-30	AOI 4	2684380	219703	unconfined	0.9	2	1.66	2.36	-0.70
S-329	AOI 4	2684779	218690	unconfined	-4.3	2	1.49	2.66	-1.17
S-370	AOI 4	2683833	219839	unconfined	-7.94	2	1.12	2.32	-1.20
S-372	AOI 3	2683824	219317	unconfined	-5.17	2	1.66	2.40	-0.74
S-38	AOI 4	2685232	219184	unconfined	0.93	2	1.72	2.62	-0.90
S-381	AOI 4	2684590	219563	unconfined	-1.31	2	1.46	2.42	-0.96
S-385	AOI 3	2683689	220624	unconfined	-9.3	2	1.33	2.08	-0.75
S-386	AOI 3	2683705	219789	unconfined	-5	2	0.91	2.37	-1.46
S-39	AOI 4	2685582	220133	unconfined	-9.4	2	1.84	2.25	-0.41
S-47I	AOI 1	2685275	222077	lower aquifer	-17.73	2	1.53	1.30	0.23
S-5	AOI 3	2683838	218242	unconfined	-0.14	2	2.66	3.24	-0.58
S-74D2SRTF	AOI 9	2679122	216095	unconfined	-26.33	2	-4.47	-5.64	1.17
S-82	AOI 1	2686056	223599	unconfined	-10.4	2	4.70	2.30	2.40
C-145	AOI 7	2681007	220222	unconfined	-12.64	3	0.87	1.94	-1.07
C-146	AOI 7	2680640	220255	unconfined	-12.8	3	-4.86	-2.19	-2.67
C-95	AOI 3,7	2682674	219113	unconfined	-15.07	3	5.78	2.76	3.02
DSCP-IW-12	DSCP	2687131	222110	unconfined	-25.28	3	1.32	2.21	-0.89
N-109	AOI 8	2681605	226649	lower aquifer	3.04	3	5.99	5.53	0.46
N-112	AOI 8	2681664	226328	lower aquifer	1.35	3	5.20	5.38	-0.18
N-116	AOI 8	2682617	225844	unconfined	1.49	3	4.42	6.76	-2.34
N-130	AOI 8	2682501	225088	unconfined	-2.93	3	10.95	6.21	4.74
N-59	AOI 8	2680470	225387	unconfined	-2.69	3	4.33	4.27	0.06
N-61	AOI 8	2680588	225119	unconfined	-2.71	3	4.16	3.66	0.50
N-76	AOI 8	2683610	225362	unconfined	-3.25	3	9.88	6.07	3.81
PGW-MW-21	AOI 8	2682698	224771	unconfined	-5.052	3	9.16	5.43	3.73
PH-IW-2	DSCP	2686781	220911	unconfined	-25.15	3	1.73	2.06	-0.33
PH-IW-3	DSCP	2687505	220886	unconfined	-37.05	3	1.40	2.39	-0.99
RW-200	AOI 8	2682439	224925	unconfined	-3.37	3	5.62	5.89	-0.27
RW-301	AOI 8	2682907	226707	unconfined	0.45	3	10.31	9.82	0.49
RW-302	AOI 8	2683040	226687	unconfined	0.42	3	10.79	9.74	1.05
RW-304	AOI 8	2683322	226635	unconfined	1.45	3	10.41	9.03	1.38

*see notes on last page

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
RW-305	AOI 8	2683458	226615	unconfined	1.39	3	10.46	8.74	1.72
S-10	AOI 3	2683682	218444	unconfined	-14.17	3	1.94	2.01	-0.07
S-12	AOI 3	2683521	218879	unconfined	-13.11	3	1.35	2.05	-0.70
S-153	AOI 2	2683289	223237	unconfined	-11.05	3	2.49	2.51	-0.02
S-52	AOI 1	2685894	222553	unconfined	-13.3	3	0.94	1.18	-0.24
W-23	AOI 10	2680081	222589	unconfined	-9.79	3	5.08	3.75	1.33
W-25	AOI 10	2679601	222643	unconfined	-1.97	3	4.23	2.60	1.63
A-19D	AOI 5,11	2683563	217563	lower aquifer	-44.36	4	-1.94	2.02	-3.96
B-48D	AOI 6,11	2682251	217522	lower aquifer	-41.23	4	-1.96	1.04	-3.00
BF-90D	AOI 3,11	2683040	218957	lower aquifer	-25.15	4	0.09	1.87	-1.78
DSCP-DW-6	DSCP	2687606	223122	lower aquifer	-40.83	4	1.42	3.42	-2.00
DSCP-IW-1	DSCP	2686539	222709	unconfined	-22.65	4	1.71	2.70	-0.99
DSCP-IW-13	DSCP	2688517	222412	unconfined	-47.99	4	1.48	2.93	-1.45
N-114	AOI 8	2681511	226225	lower aquifer	-5.03	4	5.25	5.38	-0.13
N-127	AOI 8	2682768	225193	unconfined	-4.25	4	9.11	5.29	3.82
N-132	AOI 8	2681685	225634	unconfined	-10.94	4	7.06	5.66	1.40
N-70	AOI 8	2681745	227136	lower aquifer	0.29	4	7.33	5.55	1.78
N-83	AOI 8	2681761	226828	lower aquifer	1.77	4	5.84	5.58	0.26
PH-IW-10	DSCP	2686456	221925	unconfined	-27.44	4	1.24	2.03	-0.79
PH-IW-11	DSCP	2686416	221650	unconfined	-27.93	4	1.20	1.82	-0.62
RW-300	AOI 8	2681810	226710	lower aquifer	-0.17	4	7.23	5.56	1.67
S-119D	AOI 4,11	2685498	220820	lower aquifer	-41.14	4	1.13	2.00	-0.87
S-397	AOI 1	2685305	222831	unconfined	-29.9	4	1.25	2.90	-1.65
S-399	AOI 1	2685166	221521	lower aquifer	-24.7	4	0.98	1.99	-1.01
S-87I	AOI 1	2685940	223065	lower aquifer	-23.46	4	1.36	1.91	-0.55
B-133D	AOI 6,11	2681722	216723	lower aquifer	-53.9	5	-1.83	-0.47	-1.36
N-19	AOI 8,11	2684651	226737	lower aquifer	-24.54	5	3.02	5.77	-2.75
N-21	AOI 8,11	2683879	226628	lower aquifer	-21.46	5	5.53	5.63	-0.10
N-69	AOI 8	2681822	227392	lower aquifer	-1.14	5	7.99	5.50	2.49
N-9	AOI 8,11	2684097	227375	lower aquifer	-22.3	5	5.60	6.13	-0.53
S-106DSRTF	AOI 9,11	2677610	214778	lower aquifer	-77.13	5	-9.00	-9.79	0.79
S-22	AOI 3	2684081	218842	lower aquifer	-57.59	5	-0.35	1.68	-2.03
S-280D	AOI 3,11	2682596	220955	lower aquifer	-32.58	5	0.95	1.55	-0.60
S-38D2	AOI 4,11	2685229	219163	lower aquifer	-59.16	5	-0.01	2.09	-2.10
S-398	AOI 1	2685902	222554	lower aquifer	-27.8	5	1.13	2.80	-1.67
S-42I	AOI 1	2685770	221301	lower aquifer	-36.52	5	-1.25	2.40	-3.65
S-59D	AOI 4,11	2683843	221368	lower aquifer	-33.24	5	1.40	2.04	-0.64

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							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
ARCO-1D	AOI 1	2685966	221359	lower aquifer	-44.86	6	0.71	2.46	-1.75
DSCP-DW-1	DSCP	2686539	222715	lower aquifer	-50.55	6	1.42	3.10	-1.68
DSCP-DW-13	DSCP	2688518	222417	lower aquifer	-79.81	6	1.46	3.17	-1.71
N-73	AOI 8	2680415	225822	lower aquifer	-30.81	6	0.02	1.66	-1.64
N-75	AOI 8	2680694	224909	lower aquifer	-32.35	6	0.04	1.91	-1.87
PH-DW-2	DSCP	2686776	220911	lower aquifer	-74.96	6	0.54	2.42	-1.88
PH-DW-3	DSCP	2687507	220890	lower aquifer	-95.24	6	0.48	2.56	-2.08
S-8	AOI 3,11	2683688	218428	lower aquifer	-58.27	6	-0.68	1.46	-2.14
S-80D	AOI 1,11	2685512	223710	lower aquifer	-39.76	6	2.21	3.59	-1.38
W-27	AOI 10	2679107	222626	lower aquifer	-3.33	6	-2.82	2.63	-5.45
W-32D	AOI 10	2681222	222055	lower aquifer	-58	6	-0.87	2.64	-3.51
A-21D	AOI 5,11	2681388	215630	lower aquifer	-72.06	7	-5.86	-1.62	-4.24
B-132D	AOI 6,11	2680857	216098	lower aquifer	-69.69	7	-5.31	-1.97	-3.34
B-134D	AOI 6,11	2681037	216764	lower aquifer	-68.55	7	-3.26	-1.12	-2.14
BF-108	AOI 3,11	2683185	219701	lower aquifer	-66.04	7	0.17	1.59	-1.42
C-129D	AOI 7,11	2681929	220492	lower aquifer	-51.65	7	-0.64	1.25	-1.89
C-134D	AOI 6,7,11	2681165	218306	lower aquifer	-55.65	7	-1.48	0.22	-1.70
C-144D	AOI 7,11	2680337	220108	lower aquifer	-64.36	7	-4.39	0.91	-5.30
CSX-DW-4	DSCP	2686121	222537	lower aquifer	-49.91	7	1.22	2.89	-1.67
CSX-DW-5	DSCP	2686325	223310	lower aquifer	-43.89	7	1.47	3.49	-2.02
DSCP-DW-12	DSCP	2687135	222110	lower aquifer	-79.9	7	1.40	2.97	-1.57
DSCP-MW-20D	DSCP	2686776	224063	lower aquifer	-58.69	7	1.70	4.06	-2.36
N-38D	AOI 8,11	2680792	226897	lower aquifer	-71.23	7	-0.52	2.42	-2.94
N-4	AOI 8,11	2683123	227945	lower aquifer	-15.59	7	7.96	6.25	1.71
PGW-MW-42D	PGW	2684364	225540	lower aquifer	-41	7	2.17	4.72	-2.55
PH-DW-10	DSCP	2686452	221935	lower aquifer	-76.6	7	1.24	2.74	-1.50
PH-DW-11	DSCP	2686415	221643	lower aquifer	-80.46	7	1.15	2.66	-1.51
S-13	AOI 3,11	2683522	218892	lower aquifer	-63.46	7	-0.61	1.51	-2.12
S-264D	AOI 1,11	2685762	221289	lower aquifer	-50.81	7	0.95	2.40	-1.45
S-284D	AOI 3,11	2683136	220356	lower aquifer	-60.79	7	0.73	1.67	-0.94
S-294D	AOI 2,11	2684682	224165	lower aquifer	-56.43	7	2.84	3.68	-0.84
S-302D	AOI 2,11	2683248	222607	lower aquifer	-62.45	7	1.03	2.13	-1.10
S-305D	AOI 2,11	2684882	221990	lower aquifer	-56.6	7	1.07	2.38	-1.31
S-388D	AOI 1	2685903	222561	lower aquifer	-53.1	7	1.21	2.86	-1.65
S-389D	AOI 1	2685876	223190	lower aquifer	-52.4	7	1.35	3.29	-1.94
S-390D	AOI 1	2685310	222830	lower aquifer	-62.2	7	1.24	2.93	-1.69
S-392D	AOI 1	2685166	221525	lower aquifer	-49.3	7	0.99	2.33	-1.34

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2015 OBSERVED HYDRAULIC HEAD [FT]	MAY 2015 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2015 HYDRAULIC HEAD RESIDUAL [FT]
S-393D	BELMONT	2685996	224457	lower aquifer	-64.5	7	2.39	4.22	-1.83
S-394	BELMONT	2685993	224461	lower aquifer	-52.5	7	2.29	4.22	-1.93
S-46D	AOI 1,11	2685274	222026	lower aquifer	-47.87	7	1.41	2.49	-1.08
S-69D	AOI 3,11	2682399	219971	lower aquifer	-47.3	7	2.44	1.38	1.06
S-72D	AOI 2,11	2683834	223838	lower aquifer	-61.93	7	2.54	3.12	-0.58
S-74D1SRTF	AOI 9	2679175	216087	lower aquifer	-63.15	7	-8.39	-5.41	-2.98
S-76DSRTF	AOI 9	2678241	216807	lower aquifer	-69.5	7	-8.13	-4.16	-3.97
W-13	AOI 10	2682065	221929	lower aquifer	-56.84	7	-2.02	1.67	-3.69
W-19	AOI 10	2680982	222405	lower aquifer	-66.83	7	-1.92	2.28	-4.20
W-1D	AOI 10	2682756	223584	lower aquifer	-63.63	7	-1.71	2.27	-3.98
W-26	AOI 10	2679592	222651	lower aquifer	-12.15	7	-2.75	2.50	-5.25

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
A-10	AOI 5	2682406	215428	unconfined	-1.33	1	4.73	3.66	1.07
A-11	AOI 5	2682016	215380	unconfined	-3.91	1	2.71	2.93	-0.22
A-118	AOI 5	2683071	217109	unconfined	5.91	1	5.91	5.94	-0.03
A-12	AOI 5	2682183	215379	unconfined	-3.12	1	2.67	3.28	-0.61
A-122	AOI 5	2682278	215930	unconfined	2.54	1	2.54	3.69	-1.15
A-133	AOI 5	2681282	215805	unconfined	0.13	1	6.26	4.54	1.72
A-134	AOI 5	2681409	215810	unconfined	-2.79	1	1.62	4.61	-2.99
A-135	AOI 5	2681633	215823	unconfined	-1.64	1	3.20	2.94	0.26
A-136	AOI 5	2681693	215556	unconfined	-3.48	1	1.97	2.50	-0.53
A-137	AOI 5	2683597	215161	unconfined	-1.71	1	1.84	1.61	0.23
A-142	AOI 5	2683676	214931	unconfined	-2.36	1	2.94	1.34	1.60
A-143	AOI 5	2683340	215553	unconfined	1.08	1	1.46	2.71	-1.25
A-148	AOI 5	2682641	216806	unconfined	-1.3	1	5.47	5.46	0.01
A-149	AOI 5	2682443	216327	unconfined	-2.41	1	5.11	5.26	-0.15
A-151	AOI 5	2682129	215824	unconfined	-3.4	1	3.00	3.48	-0.48
A-152	AOI 5	2681987	216073	unconfined	-7.07	1	1.58	3.40	-1.82
A-155	AOI 5	2681449	216208	unconfined	-2.6	1	3.07	4.58	-1.51
A-156	AOI 5	2681355	216058	unconfined	3.1	1	3.30	4.62	-1.32
A-157	AOI 5	2681414	216278	unconfined	1.8	1	3.88	4.47	-0.59
A-163	AOI 5	2681070	215985	unconfined	3.645	1	4.35	3.78	0.57
A-164	AOI 5	2681178	216039	unconfined	3.025	1	3.90	4.13	-0.23
A-166	AOI 5	2681273	215790	unconfined	4.845	1	3.33	4.40	-1.07
A-167	AOI 5	2681257	216200	unconfined	3.755	1	3.67	4.35	-0.68
A-168	AOI 5	2681699	216444	unconfined	3.85	1	4.62	3.28	1.34
A-169	AOI 5	2681150	215953	unconfined	-2.4	1	4.06	4.21	-0.15
A-170	AOI 5	2681811	215867	unconfined	-6.3	1	1.93	3.10	-1.17
A-171	AOI 5	2681590	215555	unconfined	-3.8	1	1.91	2.15	-0.24
A-172	AOI 5	2681780	215441	unconfined	-3.8	1	1.96	2.33	-0.37
A-174	AOI 5	2683052	217150	unconfined	3.15	1	3.63	5.92	-2.29
A-175	AOI 5	2682663	215245	unconfined	2.5	1	0.55	3.23	-2.68
A-176	AOI 5	2682694	215260	unconfined	2.4	1	0.64	3.27	-2.63
A-179	AOI 5	2682824	215290	unconfined	3.75	1	5.03	3.20	1.83
A-181	AOI 5	2682444	215193	unconfined	2.65	1	3.07	2.91	0.16
A-182	AOI 5	2682580	215083	unconfined	2.5	1	1.54	2.03	-0.49
A-183	AOI 5	2682598	215354	unconfined	4.1	1	4.26	3.63	0.63
A-22	AOI 5	2680996	216032	unconfined	-2.24	1	1.95	1.83	0.12
A-23	AOI 5	2682143	216385	unconfined	-4.21	1	3.07	3.74	-0.67

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
A-24	AOI 5	2681515	215977	unconfined	-1.44	1	3.15	4.48	-1.33
A-25	AOI 5	2682468	216982	unconfined	0.82	1	4.05	5.67	-1.62
A-26	AOI 5	2682167	216793	unconfined	0.5	1	3.62	5.47	-1.85
A-27	AOI 5	2681846	216592	unconfined	-0.5	1	3.59	3.52	0.07
A-3	AOI 5	2683412	215785	unconfined	-0.34	1	1.23	3.36	-2.13
A-40	AOI 5	2683592	215201	unconfined	-1.98	1	1.64	1.61	0.03
A-41	AOI 5	2683535	215097	unconfined	-2.23	1	1.83	1.59	0.24
A-44	AOI 5	2683121	215462	unconfined	-0.39	1	1.65	3.07	-1.42
A-45	AOI 5	2682742	215239	unconfined	-3.13	1	1.01	3.12	-2.11
A-46	AOI 5	2682464	215347	unconfined	1.56	1	2.58	3.57	-0.99
A-48	AOI 5	2682295	215157	unconfined	-2.87	1	2.04	2.23	-0.19
A-49	AOI 5	2682249	215647	unconfined	-1.2	1	3.74	3.61	0.13
A-5	AOI 5	2682620	215251	unconfined	-5.35	1	0.77	3.28	-2.51
A-6	AOI 5	2682954	215268	unconfined	-1.99	1	2.76	2.82	-0.06
A-7	AOI 5	2683087	215287	unconfined	-1.13	1	1.98	2.54	-0.56
A-9	AOI 5	2683089	215096	unconfined	-2.05	1	2.64	1.86	0.78
ARCO-1	AOI 1	2685973	221361	unconfined	-4.89	1	0.08	0.57	-0.49
ARCO-2	AOI 1	2685882	221258	unconfined	-5.11	1	-0.01	0.93	-0.94
ARCO-3	AOI 1	2685928	221631	unconfined	-7.51	1	-0.33	-1.45	1.12
B-115	AOI 6	2682825	218059	unconfined	5.03	1	5.03	4.77	0.26
B-123	AOI 6	2681458	217146	unconfined	6.25	1	6.25	4.88	1.37
B-124	AOI 6	2681316	216811	unconfined	-4.09	1	3.74	4.54	-0.80
B-125	AOI 6	2681099	216829	unconfined	3.79	1	3.79	4.10	-0.31
B-126	AOI 6	2680974	217022	unconfined	3.6	1	3.60	4.06	-0.46
B-130	AOI 6	2680131	217397	unconfined	-1.89	1	4.48	3.46	1.02
B-131	AOI 6	2680693	216460	unconfined	-2.8	1	4.21	4.23	-0.02
B-132	AOI 6	2681171	217351	unconfined	-3.73	1	2.20	4.03	-1.83
B-133	AOI 6	2681207	217307	unconfined	-2.7	1	2.36	4.16	-1.80
B-134	AOI 6	2681163	217285	unconfined	-2.62	1	1.90	4.11	-2.21
B-135	AOI 6	2681137	217329	unconfined	-2.69	1	1.61	4.06	-2.45
B-136	AOI 6	2681253	217259	unconfined	-0.69	1	4.19	4.49	-0.30
B-137	AOI 6	2681298	217188	unconfined	-0.78	1	3.79	4.59	-0.80
B-138	AOI 6	2681330	217138	unconfined	-0.94	1	5.08	4.61	0.47
B-142	AOI 6	2681209	217178	unconfined	-0.19	1	2.85	4.44	-1.59
B-143	AOI 6	2681159	217208	unconfined	-0.64	1	4.15	4.39	-0.24
B-144	AOI 6	2681235	217134	unconfined	-0.84	1	4.33	4.45	-0.12
B-145	AOI 6	2681362	217086	unconfined	0.16	1	5.41	4.67	0.74

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
B-147	AOI 6	2681125	217146	unconfined	-0.4	1	3.22	4.29	-1.07
B-148	AOI 6	2681077	217444	unconfined	-0.81	1	1.96	4.29	-2.33
B-149	AOI 6	2680999	217436	unconfined	-0.2	1	4.95	4.35	0.60
B-150	AOI 6	2680966	217480	unconfined	-0.17	1	4.69	4.39	0.30
B-151	AOI 6	2680729	217738	unconfined	-0.23	1	4.19	4.28	-0.09
B-152	AOI 6	2680603	217848	unconfined	-0.5	1	4.20	4.25	-0.05
B-153	AOI 6	2680102	217475	unconfined	0.67	1	3.97	2.88	1.09
B-154	AOI 6	2680927	217552	unconfined	0.43	1	5.40	4.38	1.02
B-155	AOI 6	2680975	217400	unconfined	0.54	1	3.31	4.28	-0.97
B-156	AOI 6	2680904	217366	unconfined	0.65	1	3.34	4.20	-0.86
B-158	AOI 6	2679969	217967	unconfined	1.66	1	5.35	3.80	1.55
B-160	AOI 6	2681840	217371	unconfined	2.95	1	4.35	5.36	-1.01
B-161	AOI 6	2681270	216894	unconfined	-0.02	1	3.97	4.59	-0.62
B-163	AOI 6	2681199	217531	unconfined	1.68	1	5.94	4.56	1.38
B-164	AOI 6	2680585	216480	unconfined	-1.14	1	3.75	3.75	0.00
B-165	AOI 6	2680187	217152	unconfined	2.97	1	2.97	1.14	1.83
B-166	AOI 6	2682932	217409	unconfined	0.89	1	4.69	5.86	-1.17
B-167	AOI 6	2683188	217814	unconfined	3.56	1	3.56	5.03	-1.47
B-168	AOI 6	2680070	217495	unconfined	4.05	1	4.05	2.33	1.72
B-169	AOI 6	2680092	217416	unconfined	4.23	1	4.23	1.29	2.94
B-170	AOI 6	2680111	217350	unconfined	-1.71	1	-1.71	1.55	-3.26
B-173	AOI 6	2681021	216651	unconfined	-1.3	1	3.56	4.17	-0.61
B-174	AOI 6	2681059	216388	unconfined	-1.5	1	5.45	4.12	1.33
B-39	AOI 6	2680590	216614	unconfined	-3.46	1	4.30	4.06	0.24
B-43	AOI 6	2680085	217611	unconfined	-1.61	1	3.31	3.90	-0.59
B-45	AOI 6	2680393	218353	unconfined	-4.1	1	4.33	4.23	0.10
B-46	AOI 6	2681909	218131	unconfined	1.32	1	7.10	5.41	1.69
B-92	AOI 6	2681498	216966	unconfined	-3.2	1	4.79	4.83	-0.04
B-95	AOI 6	2680373	217541	unconfined	4.93	1	4.93	4.23	0.70
BF-105	AOI 3	2682998	219443	unconfined	0.61	1	0.61	2.05	-1.44
BF-106	AOI 3	2683176	219737	unconfined	0.19	1	0.19	1.98	-1.79
BF-107	AOI 3	2683307	219941	unconfined	0.55	1	0.55	2.11	-1.56
BF-88	AOI 3	2683465	220156	unconfined	-2.14	1	0.93	2.12	-1.19
BF-99	AOI 3	2683159	219974	unconfined	-4.18	1	0.51	1.89	-1.38
C-104	AOI 7	2679742	219188	unconfined	2.85	1	2.85	1.88	0.97
C-105	AOI 7	2679690	219497	unconfined	5.29	1	5.29	1.66	3.63
C-108	AOI 7	2680856	219819	unconfined	3.88	1	3.88	2.98	0.90

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
C-109	AOI 7	2682312	219231	unconfined	5.58	1	5.58	5.12	0.46
C-110	AOI 7	2682469	219406	unconfined	6.82	1	6.82	5.19	1.63
C-111	AOI 7	2682561	219232	unconfined	6.62	1	6.62	5.38	1.24
C-112	AOI 7	2682431	218697	unconfined	-1.62	1	7.84	5.89	1.95
C-113	AOI 7	2682817	218798	unconfined	7.07	1	7.07	6.19	0.88
C-114	AOI 7	2683001	218348	unconfined	7.17	1	7.17	6.07	1.10
C-127	AOI 7	2680897	220182	unconfined	-3.3	1	1.61	2.76	-1.15
C-129	AOI 7	2681937	220497	unconfined	0.2	1	4.13	3.22	0.91
C-130	AOI 7	2682140	219981	unconfined	0.29	1	5.23	5.07	0.16
C-131	AOI 7	2682329	218971	unconfined	-0.72	1	6.51	5.40	1.11
C-132	AOI 7	2682248	218271	unconfined	-0.91	1	5.73	4.05	1.68
C-133	AOI 7	2681694	218336	unconfined	-0.82	1	6.47	5.17	1.30
C-136	AOI 7	2680991	219217	unconfined	-2.215	1	4.00	2.97	1.03
C-137	AOI 7	2680719	219098	unconfined	-4.285	1	2.01	2.85	-0.84
C-138	AOI 7	2680453	218658	unconfined	-2.52	1	1.78	2.71	-0.93
C-139	AOI 7	2680633	219444	unconfined	-1.53	1	4.49	2.85	1.64
C-140	AOI 7	2679799	218858	unconfined	0.99	1	6.20	2.12	4.08
C-142	AOI 7	2680660	220134	unconfined	0.62	1	2.52	0.48	2.04
C-155	AOI 7	2680525	220082	unconfined	3.23	1	3.23	-0.33	3.56
C-157	AOI 7	2681432	220255	unconfined	-6.67	1	3.24	4.02	-0.78
C-159	AOI 7	2681506	220269	unconfined	-6.56	1	3.16	3.61	-0.45
C-163	AOI 7	2681332	220248	unconfined	2.58	1	2.58	3.97	-1.39
C-164	AOI 7	2681359	220252	unconfined	1.98	1	1.98	3.85	-1.87
C-165	AOI 7	2681386	220255	unconfined	2.4	1	2.40	3.90	-1.50
C-168	AOI 7	2679988	220174	unconfined	3.45	1	3.45	1.69	1.76
C-50	AOI 7	2682341	219619	unconfined	-1.17	1	5.67	5.11	0.56
C-51	AOI 7	2681621	220073	unconfined	-1.1	1	4.36	4.71	-0.35
C-52	AOI 7	2681216	220206	unconfined	-1.32	1	2.40	4.13	-1.73
C-53A	AOI 7	2681031	219940	unconfined	-0.88	1	5.83	4.11	1.72
C-54	AOI 7	2680975	219459	unconfined	-2.51	1	5.69	2.99	2.70
C-55	AOI 7	2680864	218851	unconfined	-3.51	1	4.68	2.89	1.79
C-56	AOI 7	2681367	218776	unconfined	0.4	1	8.19	5.09	3.10
C-57	AOI 7	2681651	219572	unconfined	-1.05	1	5.81	4.97	0.84
C-58	AOI 7	2681692	219017	unconfined	-0.61	1	5.41	5.11	0.30
C-60	AOI 7	2680151	218657	unconfined	-1.98	1	3.83	2.58	1.25
C-61	AOI 7	2679819	219306	unconfined	-0.12	1	4.41	2.49	1.92
C-62	AOI 7	2679892	219890	unconfined	0.35	1	6.51	2.75	3.76

*see notes on last page

Appendix A
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Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
C-63	AOI 7	2680379	219611	unconfined	-3.83	1	1.35	2.84	-1.49
C-64	AOI 7	2680431	220167	unconfined	-1.83	1	-0.22	-11.19	10.97
C-65	AOI 7	2680266	220116	unconfined	-0.53	1	6.18	-4.15	10.33
C-96	AOI 7	2681980	219529	unconfined	-2.18	1	6.90	5.18	1.72
C-97	AOI 7	2680616	220230	unconfined	-2.45	1	-6.31	-8.71	2.40
C-98	AOI 7	2680220	219208	unconfined	-0.66	1	4.47	2.73	1.74
CSX-IW-5	DSCP	2686326	223316	unconfined	-0.56	1	1.37	2.42	-1.05
CSX-MW2	DSCP	2686231	222459	unconfined	16.025	1	0.76	1.65	-0.89
CSX-MW3A	DSCP	2686250	222972	unconfined	15.34	1	1.05	2.01	-0.96
CSX-MW4	DSCP	2686223	222715	unconfined	19.235	1	0.78	1.78	-1.00
CSX-MW5	DSCP	2686326	223321	unconfined	21.415	1	2.87	2.42	0.45
CSX-MW7	DSCP	2686132	222540	unconfined	13.965	1	0.52	1.46	-0.94
CSX-MW8	DSCP	2686196	222613	unconfined	15.28	1	0.71	1.65	-0.94
CSX-MW9	DSCP	2686193	223091	unconfined	18.28	1	1.05	1.96	-0.91
DSCP-MW-1	DSCP	2686587	222951	unconfined	4.335	1	-0.89	2.55	-3.44
DSCP-MW-10	DSCP	2688682	221989	unconfined	1.095	1	1.64	2.64	-1.00
DSCP-MW-11	DSCP	2688509	222483	unconfined	2.46	1	2.35	2.99	-0.64
DSCP-MW-12	DSCP	2688887	222849	unconfined	-7.375	1	2.14	3.40	-1.26
DSCP-MW-13	DSCP	2688362	222878	unconfined	4.5	1	2.75	3.29	-0.54
DSCP-MW-14	DSCP	2687863	222366	unconfined	2.72	1	1.33	2.73	-1.40
DSCP-MW-15	DSCP	2687278	222669	unconfined	5.52	1	1.19	2.75	-1.56
DSCP-MW-16	DSCP	2686924	222962	unconfined	4.455	1	1.71	2.76	-1.05
DSCP-MW-17	DSCP	2687015	223191	unconfined	6.115	1	2.23	2.98	-0.75
DSCP-MW-19	DSCP	2686631	223493	unconfined	7.08	1	3.54	2.95	0.59
DSCP-MW-1A	DSCP	2688112	222563	unconfined	7.555	1	1.70	2.96	-1.26
DSCP-MW-2	DSCP	2686659	222486	unconfined	3.765	1	1.01	2.26	-1.25
DSCP-MW-20	DSCP	2686775	224059	unconfined	9.285	1	0.17	3.89	-3.72
DSCP-MW-21A	DSCP	2687617	223591	unconfined	6.685	1	3.03	3.59	-0.56
DSCP-MW-23A	DSCP	2686572	222722	unconfined	4.3	1	-4.53	2.39	-6.92
DSCP-MW-24	DSCP	2687351	222881	unconfined	7.325	1	1.63	2.94	-1.31
DSCP-MW-27A	DSCP	2687880	222716	unconfined	5.815	1	4.09	3.02	1.07
DSCP-MW-28	DSCP	2686735	222344	unconfined	2.77	1	1.15	2.20	-1.05
DSCP-MW-29	DSCP	2686965	222161	unconfined	3.425	1	1.30	2.19	-0.89
DSCP-MW-2B	DSCP	2687618	223121	unconfined	3.435	1	2.33	3.26	-0.93
DSCP-MW-30	DSCP	2687219	222184	unconfined	2.625	1	0.98	2.33	-1.35
DSCP-MW-32	DSCP	2687645	222120	unconfined	3.44	1	2.03	2.46	-0.43
DSCP-MW-33	DSCP	2687847	222091	unconfined	1.31	1	1.08	2.50	-1.42

*see notes on last page

Appendix A
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Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
DSCP-MW-35A	DSCP	2687607	222354	unconfined	3.14	1	1.43	2.64	-1.21
DSCP-MW-36	DSCP	2688198	221951	unconfined	2.545	1	1.17	2.49	-1.32
DSCP-MW-3A	DSCP	2687182	222473	unconfined	3.56	1	1.05	2.55	-1.50
DSCP-MW-44A	DSCP	2686629	223212	unconfined	2.455	1	1.93	2.72	-0.79
DSCP-MW-45A	DSCP	2686661	223705	unconfined	6.36	1	3.83	3.25	0.58
DSCP-MW-4A	DSCP	2687066	222254	unconfined	5.185	1	1.01	2.32	-1.31
DSCP-MW-5	DSCP	2687276	222313	unconfined	3.9	1	1.37	2.47	-1.10
DSCP-MW-53	DSCP	2688910	223078	unconfined	1.45	1	2.29	3.59	-1.30
DSCP-MW-54	DSCP	2688606	222975	unconfined	3.045	1	2.28	3.44	-1.16
DSCP-MW-59	DSCP	2688866	222696	unconfined	2.2	1	2.16	3.26	-1.10
DSCP-MW-6	DSCP	2687259	222070	unconfined	4.38	1	1.07	2.26	-1.19
DSCP-MW-65	DSCP	2687428	222124	unconfined	-2.03	1	0.81	2.38	-1.57
DSCP-MW-7	DSCP	2688049	221962	unconfined	6.385	1	1.32	2.46	-1.14
DSCP-MW-9	DSCP	2688453	221927	unconfined	2.75	1	1.29	2.54	-1.25
DSCP-RW-10	DSCP	2688044	222360	unconfined	1.24	1	1.65	2.78	-1.13
DSCP-RW-11	DSCP	2687629	222027	unconfined	2.285	1	2.44	2.38	0.06
DSCP-RW-1A	DSCP	2687406	222061	unconfined	1.83	1	0.90	2.32	-1.42
DSCP-RW-2	DSCP	2686840	222240	unconfined	3.655	1	1.32	2.18	-0.86
DSCP-RW-3	DSCP	2687102	222099	unconfined	3.44	1	1.00	2.21	-1.21
DSCP-RW-4	DSCP	2687542	222032	unconfined	2.26	1	1.43	2.35	-0.92
DSCP-RW-5/MW-25	DSCP	2687690	222012	unconfined	5.595	1	1.09	2.39	-1.30
DSCP-RW-6	DSCP	2687840	221992	unconfined	1.34	1	1.07	2.42	-1.35
DSCP-RW-7	DSCP	2687993	221974	unconfined	1.865	1	1.18	2.45	-1.27
DSCP-RW-8	DSCP	2687444	222376	unconfined	1.585	1	1.49	2.59	-1.10
DSCP-RW-9	DSCP	2688233	222374	unconfined	1.4	1	1.62	2.84	-1.22
EPH-MW-39	DSCP	2688284	221752	unconfined	-0.27	1	1.11	2.35	-1.24
EPH-MW-48	DSCP	2687984	221540	unconfined	0.585	1	1.33	1.66	-0.33
EPH-MW-49	DSCP	2687860	221395	unconfined	2.81	1	1.31	1.96	-0.65
EPH-MW-50	DSCP	2687767	221178	unconfined	1.375	1	1.18	2.23	-1.05
EPH-MWS-10	DSCP	2687988	221053	unconfined	5.46	1	3.83	2.47	1.36
EPH-MWS-11	DSCP	2687625	221111	unconfined	5.105	1	1.21	2.25	-1.04
EPH-MWS-5	DSCP	2688545	221597	unconfined	0.455	1	1.32	1.80	-0.48
EPH-PH-5	DSCP	2687579	220875	unconfined	-2.32	1	0.97	2.46	-1.49
EPH-PH-7	DSCP	2688852	221563	unconfined	-1.09	1	3.19	2.26	0.93
MW-1	AOI 4	2684314	220715	unconfined	3.68	1	0.90	2.05	-1.15
MW-26	BELMONT	2685920	224123	unconfined	-7.91	1	3.64	3.34	0.30
MW-27	BELMONT	2685686	224065	unconfined	9.55	1	3.66	3.65	0.01

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
MW-28	BELMONT	2685581	224169	unconfined	9.26	1	3.85	3.93	-0.08
MW-30	BELMONT	2684982	224261	unconfined	4.5	1	4.50	4.60	-0.10
MW-31	BELMONT	2685353	224156	unconfined	11.48	1	4.77	4.20	0.57
MW-32	BELMONT	2685565	224286	unconfined	9.59	1	3.79	4.11	-0.32
MW-33	BELMONT	2685300	224346	unconfined	12.3	1	5.46	4.48	0.98
MW-35	BELMONT	2685572	224473	unconfined	3.34	1	3.56	4.40	-0.84
MW-36	BELMONT	2685830	224431	unconfined	5.25	1	4.16	4.05	0.11
MW-37	BELMONT	2685985	224470	unconfined	5.05	1	4.51	4.20	0.31
MW-38	BELMONT	2686166	224255	unconfined	0.48	1	3.94	3.70	0.24
MW-39	BELMONT	2686158	224193	unconfined	0.49	1	3.93	3.48	0.45
MW-40	BELMONT	2686146	224123	unconfined	3.81	1	3.81	3.13	0.68
MW-41	BELMONT	2686036	224120	unconfined	0.16	1	3.72	3.22	0.50
MW-43	BELMONT	2685063	224183	unconfined	3.48	1	3.94	4.46	-0.52
MW-44	BELMONT	2685403	224419	unconfined	2.32	1	3.60	4.48	-0.88
N-1	AOI 8	2682437	228366	unconfined	18.57	1	9.97	7.46	2.51
N-100	AOI 8	2682716	228210	unconfined	9.99	1	9.29	6.35	2.94
N-101	AOI 8	2683653	227222	unconfined	7.43	1	11.00	10.94	0.06
N-106	AOI 8	2682977	227044	unconfined	7.5	1	15.29	16.38	-1.09
N-107	AOI 8	2683133	226910	unconfined	7.38	1	11.04	13.39	-2.35
N-108	AOI 8	2682983	226849	unconfined	9.97	1	12.01	13.04	-1.03
N-11	AOI 8	2682915	227226	unconfined	14.83	1	11.38	11.16	0.22
N-118	AOI 8	2683077	226461	unconfined	6.49	1	8.70	8.57	0.13
N-129	AOI 8	2683241	225470	unconfined	5.12	1	9.69	9.24	0.45
N-137	AOI 8	2683096	227832	unconfined	5.87	1	8.24	7.64	0.60
N-14	AOI 8	2683665	227011	unconfined	17.14	1	10.88	10.10	0.78
N-140	AOI 8	2683133	227411	unconfined	8.16	1	9.59	9.89	-0.30
N-141	AOI 8	2683308	227396	unconfined	7.535	1	10.45	11.09	-0.64
N-142	AOI 8	2683211	227652	unconfined	6.985	1	8.08	9.28	-1.20
N-143	AOI 8	2683358	227513	unconfined	8.215	1	10.30	10.59	-0.29
N-144	AOI 8	2683293	227623	unconfined	6.77	1	8.40	9.76	-1.36
N-145	AOI 8	2683032	227680	unconfined	7.355	1	8.06	8.27	-0.21
N-15	AOI 8	2684060	226993	unconfined	17.05	1	8.46	8.03	0.43
N-16	AOI 8	2684409	226993	unconfined	18.4	1	9.82	7.70	2.12
N-17	AOI 8	2684410	226993	unconfined	19.05	1	12.70	7.70	5.00
N-18	AOI 8	2684650	226744	unconfined	17.65	1	11.20	7.84	3.36
N-20	AOI 8	2683878	226645	unconfined	22.12	1	10.91	9.05	1.86
N-24	AOI 8	2682554	226437	unconfined	10.03	1	8.55	7.50	1.05

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
N-29	AOI 8	2685039	225835	unconfined	21.6	1	10.03	10.03	0.00
N-37	AOI 8	2681543	226828	lower aquifer	4.26	1	5.65	5.87	-0.22
N-42	AOI 8	2682412	225813	unconfined	4.59	1	7.20	8.12	-0.92
N-47	AOI 8	2683936	225489	unconfined	17.05	1	11.98	9.20	2.78
N-48	AOI 8	2683476	225312	unconfined	15.42	1	9.42	9.43	-0.01
N-49	AOI 8	2683115	225175	unconfined	17.05	1	9.03	9.79	-0.76
N-503	AOI 8	2680566	226576	unconfined	11.46	1	3.51	4.27	-0.76
N-504	AOI 8	2680652	226857	unconfined	11.36	1	3.12	3.80	-0.68
N-51	AOI 8	2682956	225253	unconfined	16.92	1	8.26	9.71	-1.45
N-55	AOI 8	2681474	225122	unconfined	4.39	1	4.58	8.44	-3.86
N-56	AOI 8	2681266	225659	unconfined	4.18	1	4.30	8.74	-4.44
N-57	AOI 8	2680586	226031	unconfined	3.8	1	4.58	7.28	-2.70
N-64	AOI 8	2682309	224842	unconfined	2.5	1	3.97	3.68	0.29
N-67	AOI 8	2682698	226940	unconfined	14.9	1	14.90	14.11	0.79
N-68	AOI 8	2682973	226911	unconfined	14.87	1	14.87	15.28	-0.41
N-72	AOI 8	2680686	226761	unconfined	1.26	1	3.38	6.39	-3.01
N-8	AOI 8	2684092	227375	unconfined	18.53	1	11.48	10.23	1.25
N-82	AOI 8	2684634	225723	unconfined	8.48	1	10.41	9.08	1.33
N-85	AOI 8	2684734	226448	unconfined	8.95	1	11.35	7.14	4.21
N-86	AOI 8	2684119	226463	unconfined	16.3	1	10.73	8.70	2.03
N-87	AOI 8	2683965	226550	unconfined	10.89	1	10.73	9.12	1.61
N-89	AOI 8	2682824	226717	unconfined	9.87	1	9.05	9.85	-0.80
N-93	AOI 8	2683794	226550	unconfined	10.05	1	10.15	8.70	1.45
N-97	AOI 8	2684187	226513	unconfined	9.12	1	9.12	8.34	0.78
N-98	AOI 8	2683479	227658	unconfined	7.46	1	10.91	9.94	0.97
OW-12	BELMONT	2685686	224424	unconfined	15.235	1	4.22	4.17	0.05
OW-13	BELMONT	2685988	224385	unconfined	16.445	1	4.17	3.98	0.19
OW-16	BELMONT	2685739	224420	unconfined	15.82	1	4.06	4.08	-0.02
OW-17	BELMONT	2685587	224388	unconfined	15.15	1	3.63	4.24	-0.61
OW-18	BELMONT	2685520	224437	unconfined	10.75	1	4.32	4.40	-0.08
OW-19	BELMONT	2685717	224415	unconfined	11.22	1	4.73	4.10	0.63
OW-2	BELMONT	2685939	224392	unconfined	16.215	1	4.10	3.99	0.11
OW-20	BELMONT	2685840	224404	unconfined	12.43	1	4.09	3.96	0.13
PGW-MW-1	PGW	2683228	224438	unconfined	8.66	1	8.66	8.60	0.06
PGW-MW-10S	PGW	2685131	225179	unconfined	6.2	1	9.27	9.33	-0.06
PGW-MW-11	PGW	2683813	224768	unconfined	10.55	1	10.55	9.40	1.15
PGW-MW-11S	PGW	2685405	224756	unconfined	4.33	1	8.77	4.91	3.86

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
PGW-MW-12S	PGW	2685295	224521	unconfined	3.36	1	8.90	4.70	4.20
PGW-MW-13	PGW	2683949	224490	unconfined	10.2	1	10.20	8.89	1.31
PGW-MW-15	PGW	2683427	224122	unconfined	8.21	1	8.21	6.20	2.01
PGW-MW-17	PGW	2683385	224541	unconfined	9.47	1	9.47	9.73	-0.26
PGW-MW-18S	PGW	2683206	224683	unconfined	9.41	1	9.41	9.92	-0.51
PGW-MW-1S	PGW	2683457	224135	unconfined	6.3	1	7.76	6.27	1.49
PGW-MW-1S	PGW	2683457	224135	unconfined	6.3	1	7.73	6.27	1.46
PGW-MW-20	AOI 8	2682870	224701	unconfined	9.02	1	9.02	7.62	1.40
PGW-MW-22	PGW	2682953	224875	unconfined	10.03	1	10.03	9.94	0.09
PGW-MW-23	PGW	2684193	224341	unconfined	10.74	1	10.74	5.01	5.73
PGW-MW-25	PGW	2683221	225110	unconfined	10.38	1	10.38	9.93	0.45
PGW-MW-26A	PGW	2684200	225064	unconfined	11.37	1	11.37	9.28	2.09
PGW-MW-2A	PGW	2683341	224285	unconfined	8.12	1	8.12	7.95	0.17
PGW-MW-2S	PGW	2683928	224288	unconfined	8.2	1	9.18	7.37	1.81
PGW-MW-2S	PGW	2683928	224288	unconfined	8.2	1	9.30	7.37	1.93
PGW-MW-3	PGW	2683356	224400	unconfined	10.46	1	10.46	9.13	1.33
PGW-MW-30	PGW	2684088	225511	unconfined	12.87	1	12.87	9.24	3.63
PGW-MW-31	PGW	2683688	225332	unconfined	11.03	1	11.03	9.41	1.62
PGW-MW-33	PGW	2683509	225248	unconfined	11.26	1	11.26	9.61	1.65
PGW-MW-34	PGW	2683317	225168	unconfined	11.68	1	11.68	9.81	1.87
PGW-MW-37	PGW	2683017	225030	unconfined	10.23	1	10.23	10.05	0.18
PGW-MW-39	PGW	2683023	224810	unconfined	9.77	1	9.77	9.94	-0.17
PGW-MW-3S	PGW	2684683	224482	unconfined	8	1	9.59	7.06	2.53
PGW-MW-3S	PGW	2684683	224482	unconfined	8	1	9.57	7.06	2.51
PGW-MW-40A	PGW	2684160	225162	unconfined	11.54	1	11.54	9.32	2.22
PGW-MW-42R	PGW	2684370	225557	unconfined	12.1	1	10.61	9.33	1.28
PGW-MW-42R	PGW	2684370	225557	unconfined	12.1	1	10.69	9.33	1.36
PGW-MW-44	PGW	2684147	225231	unconfined	11.99	1	11.99	9.32	2.67
PGW-MW-45	PGW	2684686	225671	unconfined	11.66	1	11.66	9.57	2.09
PGW-MW-45	PGW	2684686	225671	unconfined	11.66	1	11.32	9.57	1.75
PGW-MW-4S	PGW	2685044	224934	unconfined	2.84	1	9.24	7.81	1.43
PGW-MW-5	AOI 8	2683138	224445	unconfined	8.12	1	8.12	7.20	0.92
PGW-MW-5S	PGW	2685404	225420	unconfined	3.2	1	8.37	7.59	0.78
PGW-MW-6	AOI 8	2682885	224559	unconfined	3.06	1	3.06	3.36	-0.30
PGW-MW-6S	PGW	2685348	224948	unconfined	7.5	1	8.54	5.48	3.06
PGW-MW-7	AOI 8	2682986	224648	unconfined	8.2	1	8.20	8.45	-0.25
PGW-MW-7S	PGW	2685067	224606	unconfined	3.2	1	7.80	4.90	2.90

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
PGW-MW-8	AOI 8	2683074	224544	unconfined	8.2	1	8.20	7.98	0.22
PGW-MW-8S	AOI 2	2684218	224041	unconfined	3.5	1	4.69	4.86	-0.17
PGW-MW-9	AOI 8	2683174	224408	unconfined	8.05	1	8.05	7.16	0.89
PH-MW-40	DSCP	2687731	221480	unconfined	0.065	1	1.33	1.72	-0.39
PH-MW-41	DSCP	2687413	221534	unconfined	3.62	1	1.44	1.34	0.10
PH-MW-42	DSCP	2686769	221821	unconfined	2.08	1	0.89	1.71	-0.82
PH-MW-43	DSCP	2686438	221827	unconfined	6.945	1	0.75	1.34	-0.59
PH-MW-51	DSCP	2687500	221132	unconfined	0.97	1	1.27	2.17	-0.90
PH-MW-55	DSCP	2686505	222267	unconfined	6.165	1	0.88	2.01	-1.13
PH-MW-56	DSCP	2686556	221083	unconfined	1.455	1	0.88	1.78	-0.90
PH-MW-57	DSCP	2686282	220525	unconfined	3.31	1	-0.23	2.13	-2.36
PH-MW-58	DSCP	2686349	221238	unconfined	4.875	1	1.19	1.45	-0.26
PH-MW-60	DSCP	2687960	221802	unconfined	-1.775	1	1.18	2.32	-1.14
PH-MWS-1	DSCP	2686452	221928	unconfined	9.79	1	0.74	1.49	-0.75
PH-MWS-13	DSCP	2686359	221371	unconfined	6.945	1	0.96	1.31	-0.35
PH-MWS-2A	DSCP	2687207	221520	unconfined	0.6	1	1.25	1.33	-0.08
PH-MWS-3	DSCP	2687763	221556	unconfined	-1.45	1	1.36	1.47	-0.11
PH-MWS-4	DSCP	2687804	221600	unconfined	3.58	1	1.23	1.56	-0.33
PH-PH-1	DSCP	2686489	222120	unconfined	7.22	1	0.84	1.89	-1.05
PH-PH-13	DSCP	2687220	221617	unconfined	2.67	1	1.05	1.27	-0.22
PH-PH-14	DSCP	2687012	221567	unconfined	5.04	1	1.15	1.06	0.09
PH-PH-16	DSCP	2687623	221740	unconfined	2.57	1	1.62	2.12	-0.50
PH-PH-17	DSCP	2687678	221881	unconfined	1.175	1	1.10	2.29	-1.19
PH-PH-18	DSCP	2687410	221922	unconfined	1.47	1	1.02	2.22	-1.20
PH-PH-19	DSCP	2687210	221950	unconfined	1.28	1	0.98	2.15	-1.17
PH-PH-2	DSCP	2686821	222025	unconfined	4.855	1	0.93	1.99	-1.06
PH-PH-20	DSCP	2686939	221991	unconfined	2.97	1	0.94	2.03	-1.09
PH-PH-21	DSCP	2686682	222101	unconfined	6.66	1	0.88	1.98	-1.10
PH-PH-22	DSCP	2686409	221643	unconfined	5.46	1	0.89	1.20	-0.31
PH-PH-23	DSCP	2686701	221254	unconfined	1.71	1	1.44	1.70	-0.26
PH-PH-24	DSCP	2687242	221174	unconfined	1.84	1	2.27	2.02	0.25
PH-PH-3	DSCP	2687314	221945	unconfined	5.63	1	1.73	2.20	-0.47
PH-PH-4	DSCP	2687928	221845	unconfined	0.985	1	1.22	2.34	-1.12
PH-PZ-4	DSCP	2687319	221943	unconfined	9.96	1	2.86	2.20	0.66
PH-RW-A	DSCP	2686638	222124	unconfined	4.55	1	2.74	1.98	0.76
PH-RW-A2	DSCP	2686640	222131	unconfined	10.8	1	1.75	1.98	-0.23
PH-RW-B	DSCP	2686815	222035	unconfined	3.87	1	2.42	1.99	0.43

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
PH-RW-B2	DSCP	2686821	222030	unconfined	10.805	1	0.00	1.99	-1.99
PH-RW-C	DSCP	2687070	221975	unconfined	4.065	1	1.93	2.09	-0.16
PH-RW-CA	DSCP	2687084	221963	unconfined	5.025	1	1.89	2.09	-0.20
PH-RW-E	DSCP	2687539	221910	unconfined	1.965	1	1.04	2.26	-1.22
PH-RW-F	DSCP	2687826	221867	unconfined	0.025	1	1.15	2.33	-1.18
PH-RW-G	DSCP	2687154	221567	unconfined	7.55	1	2.65	1.16	1.49
PH-RW-I2	DSCP	2686803	221923	unconfined	10.225	1	1.95	1.87	0.08
PH-RW-N	DSCP	2687810	221599	unconfined	1.735	1	1.25	1.56	-0.31
PH-RW-O	DSCP	2687693	221589	unconfined	0.4	1	2.67	1.45	1.22
PH-RW-P	DSCP	2687599	221597	unconfined	1.15	1	2.91	1.47	1.44
PH-RW-Q	DSCP	2687510	221586	unconfined	-1.75	1	3.60	1.38	2.22
PH-RW-S	DSCP	2687350	221602	unconfined	-1.01	1	2.32	1.38	0.94
PH-RW-U	DSCP	2686879	221846	unconfined	2.615	1	3.33	1.85	1.48
PH-RW-V	DSCP	2686705	221936	unconfined	2.59	1	2.43	1.83	0.60
PH-RW-W	DSCP	2686591	221952	unconfined	2.525	1	2.45	1.82	0.63
PZ-100	AOI 2	2683602	222350	unconfined	1.42	1	1.42	2.37	-0.95
PZ-132A	AOI 6	2680866	216104	unconfined	0.62	1	4.20	1.65	2.55
PZ-2	AOI 5	2681495	215938	unconfined	2.56	1	5.84	4.56	1.28
PZ-201	AOI 8	2683718	225409	unconfined	10.21	1	10.21	9.24	0.97
PZ-202	AOI 8	2683876	225484	unconfined	11.24	1	11.24	9.17	2.07
PZ-203	AOI 8	2684037	225560	unconfined	13.93	1	13.93	9.07	4.86
PZ-204	AOI 8	2684196	225633	unconfined	8.03	1	8.03	8.82	-0.79
PZ-3	AOI 5	2681511	215958	unconfined	2.87	1	3.24	4.50	-1.26
PZ-300	AOI 8	2683295	226640	unconfined	9.39	1	9.39	9.22	0.17
PZ-400	BELMONT	2686131	224096	unconfined	13.855	1	3.68	3.01	0.67
PZ-402	AOI 1	2686061	223552	unconfined	-2.82	1	2.41	2.19	0.22
PZ-403	AOI 1	2685965	222935	unconfined	0.8	1	0.80	1.35	-0.55
PZ-404	AOI 1	2685981	222933	unconfined	5.615	1	-0.58	1.28	-1.86
PZ-501	AOI 8	2680429	225835	unconfined	4.37	1	4.37	3.51	0.86
PZ-502	AOI 8	2680434	225562	unconfined	6.14	1	4.72	3.44	1.28
PZ-503	AOI 8	2680590	225085	unconfined	4.58	1	4.58	2.87	1.71
PZ-504	AOI 8	2680730	224903	unconfined	4.54	1	4.54	3.85	0.69
PZ-505	AOI 8	2681024	224708	unconfined	4.56	1	4.56	3.72	0.84
PZ-507	AOI 8	2682206	224812	unconfined	3.68	1	3.68	3.24	0.44
RW-1	BELMONT	2685680	224407	unconfined	-4.42	1	3.88	4.14	-0.26
RW-100	AOI 2	2683341	222349	unconfined	-3.66	1	1.40	2.39	-0.99
RW-101	AOI 2	2683489	222384	unconfined	-3.63	1	2.14	2.42	-0.28

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
RW-102	AOI 2	2683599	222321	unconfined	-4.76	1	2.21	2.35	-0.14
RW-103	AOI 2	2683770	222358	unconfined	-5.24	1	2.97	2.27	0.70
RW-104	AOI 2	2682960	222446	unconfined	-6.89	1	1.28	2.06	-0.78
RW-105	AOI 2	2682964	222412	unconfined	-2.87	1	-5.77	2.28	-8.05
RW-106	AOI 2	2682946	222348	unconfined	-2.71	1	-0.90	2.26	-3.16
RW-107	AOI 2	2682915	222272	unconfined	1.3	1	1.30	2.26	-0.96
RW-108	AOI 2	2682895	222181	unconfined	-3.66	1	2.21	2.26	-0.05
RW-109	AOI 2	2682883	222084	unconfined	-3.488	1	1.70	2.25	-0.55
RW-110	AOI 1	2685160	222136	unconfined	5.7	1	0.87	1.37	-0.50
RW-111	AOI 1	2685197	222112	unconfined	5.8	1	0.81	1.34	-0.53
RW-112	AOI 1	2685156	222113	unconfined	3.71	1	0.75	1.36	-0.61
RW-113	AOI 2	2682988	222409	unconfined	-8.9	1	-0.94	2.29	-3.23
RW-115	AOI 2	2682980	222371	unconfined	-8.7	1	-1.09	2.28	-3.37
RW-116	AOI 2	2682987	222340	unconfined	-8.11	1	-0.98	2.29	-3.27
RW-117	AOI 2	2682964	222320	unconfined	-9.06	1	-0.68	2.28	-2.96
RW-118	AOI 2	2682999	222302	unconfined	-7.03	1	-0.78	2.31	-3.09
RW-120	AOI 2	2683027	222353	unconfined	0.27	1	-3.58	2.31	-5.89
RW-121	AOI 2	2683050	222376	unconfined	1.3	1	-1.17	2.32	-3.49
RW-123	AOI 2	2682969	222296	unconfined	-9.02	1	-0.63	2.29	-2.92
RW-125	AOI 2	2683040	222428	unconfined	-4.3	1	2.04	2.34	-0.30
RW-126	AOI 2	2682936	222285	unconfined	-9.65	1	-0.22	2.27	-2.49
RW-127	AOI 2	2683036	222383	unconfined	-4.65	1	-5.29	2.31	-7.60
RW-129	AOI 2	2683008	222434	unconfined	-8.55	1	1.11	2.32	-1.21
RW-201	AOI 8	2682704	225060	unconfined	4.11	1	9.06	9.78	-0.72
RW-202	AOI 8	2682881	225065	unconfined	3.54	1	9.03	9.91	-0.88
RW-204	AOI 8	2683190	225163	unconfined	3.84	1	9.18	9.80	-0.62
RW-205	AOI 8	2683343	225251	unconfined	7.8	1	10.25	9.59	0.66
RW-206	AOI 8	2683557	225332	unconfined	7.08	1	9.48	9.37	0.11
RW-21	BELMONT	2685822	224345	unconfined	14.755	1	3.89	3.83	0.06
RW-22	BELMONT	2685892	224304	unconfined	-0.9	1	3.88	3.75	0.13
RW-25	BELMONT	2685725	224365	unconfined	2.24	1	3.91	3.97	-0.06
RW-26	BELMONT	2685474	224410	unconfined	0.6	1	3.68	4.40	-0.72
RW-27	BELMONT	2685423	224396	unconfined	0.74	1	3.42	4.43	-1.01
RW-28	BELMONT	2685357	224378	unconfined	0.1	1	5.10	4.47	0.63
RW-29	BELMONT	2685286	224360	unconfined	0.19	1	3.48	4.51	-1.03
RW-30	BELMONT	2685257	224352	unconfined	0.33	1	3.54	4.52	-0.98
RW-303	AOI 8	2683167	226663	unconfined	10.73	1	10.73	9.57	1.16

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
RW-307	AOI 8	2683080	226604	unconfined	22.82	1	8.45	9.28	-0.83
RW-308	AOI 8	2683240	226623	unconfined	25.27	1	8.81	9.24	-0.43
RW-309	AOI 8	2683373	226602	unconfined	24.81	1	9.51	8.95	0.56
RW-31	BELMONT	2685206	224339	unconfined	0.31	1	3.65	4.55	-0.90
RW-401	AOI 1	2686040	223555	unconfined	-7.99	1	2.81	2.23	0.58
RW-404	AOI 1	2686015	223152	unconfined	-3.81	1	0.85	1.50	-0.65
RW-500	AOI 8	2680478	225305	unconfined	6.79	1	4.67	3.18	1.49
RW-501	AOI 8	2681487	224727	unconfined	7.98	1	3.80	5.13	-1.33
RW-502	AOI 8	2680607	226714	unconfined	11.4	1	3.99	4.74	-0.75
RW-6	BELMONT	2686038	224377	unconfined	16.235	1	4.16	3.98	0.18
RW-600	AOI 2	2683369	223296	unconfined	-5.51	1	4.21	2.80	1.41
RW-601	AOI 2	2683325	223213	unconfined	-2.44	1	2.62	2.68	-0.06
RW-6S	AOI 5	2681520	215947	unconfined	5.22	1	3.42	4.43	-1.01
RW-7	BELMONT	2685894	224363	unconfined	-5.93	1	3.99	3.90	0.09
RW-9	AOI 6	2681446	216562	unconfined	3.71	1	3.71	4.59	-0.88
S-100	AOI 1	2686178	223523	unconfined	0.09	1	3.07	2.35	0.72
S-101	AOI 1	2686296	223163	unconfined	-1.73	1	1.73	2.23	-0.50
S-102	AOI 4	2683874	221407	unconfined	3.13	1	0.86	2.21	-1.35
S-103	AOI 4	2684428	221275	unconfined	6.05	1	1.15	2.00	-0.85
S-104	AOI 4	2684804	221448	unconfined	0.63	1	2.80	1.79	1.01
S-105	AOI 2	2683300	223164	unconfined	4.64	1	2.41	2.63	-0.22
S-107	AOI 2	2683338	223258	unconfined	1.495	1	3.16	2.71	0.45
S-108	AOI 2	2683362	223294	unconfined	-1.04	1	4.61	2.78	1.83
S-108SRTF	AOI 9	2677667	218321	unconfined	-5.93	1	0.25	-1.18	1.43
S-109SRTF	AOI 9	2677084	217894	unconfined	-6.76	1	0.00	-1.88	1.88
S-111SRTF	AOI 9	2677273	217432	unconfined	-8.64	1	-7.59	-2.87	-4.72
S-112SRTF	AOI 9	2677256	216984	unconfined	-8.41	1	-8.60	-3.84	-4.76
S-113SRTF	AOI 9	2676915	216800	unconfined	-9.57	1	-8.65	-4.20	-4.45
S-114SRTF	AOI 9	2676978	216435	unconfined	-10.44	1	-8.57	-5.14	-3.43
S-115SRTF	AOI 9	2676754	216194	unconfined	-9.8	1	-8.75	-5.68	-3.07
S-116SRTF	AOI 9	2676903	215942	unconfined	-11.68	1	-8.84	-6.34	-2.50
S-117	AOI 1	2685492	222352	unconfined	0.6	1	1.16	1.33	-0.17
S-118	AOI 1	2685533	221629	unconfined	-0.41	1	0.41	0.20	0.21
S-118SRTF	AOI 9	2676678	215161	unconfined	-8.98	1	-7.12	-8.28	1.16
S-119	AOI 4	2685393	220753	unconfined	-0.18	1	0.66	1.84	-1.18
S-121SRTF	AOI 9	2677486	215710	unconfined	-8.54	1	-7.16	-6.96	-0.20
S-122SRTF	AOI 9	2677653	216573	unconfined	-7.96	1	-6.68	-4.76	-1.92

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
S-123SRTF	AOI 9	2677861	216790	unconfined	-5.7	1	-8.35	-4.20	-4.15
S-125	AOI 1	2686079	223506	unconfined	3.84	1	2.64	2.11	0.53
S-127	AOI 1	2685644	222203	unconfined	-3.62	1	0.81	0.73	0.08
S-130	AOI 2	2684124	222280	unconfined	2.41	1	3.08	1.86	1.22
S-131	AOI 2	2684100	222307	unconfined	2.91	1	2.63	1.90	0.73
S-132	AOI 2	2684095	222243	unconfined	1.24	1	2.17	1.87	0.30
S-133	AOI 2	2684056	222303	unconfined	1.63	1	2.45	1.91	0.54
S-134	AOI 2	2684441	222209	unconfined	2.61	1	1.68	1.40	0.28
S-135	AOI 2	2684162	222278	unconfined	2.34	1	0.92	1.82	-0.90
S-135SRTF	AOI 9	2676810	216462	unconfined	-13.09	1	-7.72	-5.03	-2.69
S-136	AOI 2	2684135	222257	unconfined	2.95	1	2.08	1.84	0.24
S-136SRTF	AOI 9	2677244	218406	unconfined	-6.45	1	0.32	-0.99	1.31
S-139	AOI 2	2683570	222392	unconfined	0.9	1	2.54	2.41	0.13
S-141	AOI 2	2683427	222387	unconfined	1.965	1	2.00	2.43	-0.43
S-142	AOI 2	2683609	222348	unconfined	-0.19	1	0.45	2.36	-1.91
S-152	AOI 2	2683337	223247	unconfined	-0.9	1	3.25	2.70	0.55
S-154	AOI 2	2683290	223236	unconfined	0.14	1	0.17	2.59	-2.42
S-156	AOI 2	2684180	222281	unconfined	3.18	1	2.16	1.81	0.35
S-157	AOI 2	2684107	222285	unconfined	2.29	1	2.42	1.87	0.55
S-159	AOI 2	2683730	222304	unconfined	6.67	1	2.27	2.26	0.01
S-162	AOI 1	2685202	222131	unconfined	4.925	1	1.14	1.35	-0.21
S-164	AOI 1	2685039	222134	unconfined	2.9	1	1.03	1.30	-0.27
S-166	AOI 2	2684909	222170	unconfined	3.22	1	2.10	1.15	0.95
S-175	AOI 2	2684500	222226	unconfined	5.9	1	2.12	1.34	0.78
S-193	AOI 1	2686254	223959	unconfined	3.48	1	3.69	3.00	0.69
S-196	AOI 1	2686419	224117	unconfined	2.46	1	4.25	3.65	0.60
S-197	AOI 1	2686414	223931	unconfined	2.5	1	4.16	3.29	0.87
S-198	AOI 1	2685879	224076	unconfined	0.74	1	3.56	3.34	0.22
S-199	AOI 1	2685732	224027	unconfined	1.21	1	3.66	3.54	0.12
S-200	AOI 1	2685486	223945	unconfined	1.93	1	3.57	3.79	-0.22
S-201	AOI 1	2685877	223831	unconfined	1.24	1	3.65	2.97	0.68
S-202	AOI 1	2684881	223417	unconfined	2.89	1	4.22	3.64	0.58
S-203	AOI 1	2685245	223217	unconfined	4.39	1	3.63	3.11	0.52
S-206	AOI 1	2684727	223201	unconfined	4.04	1	4.44	3.38	1.06
S-208	AOI 1	2685225	222409	unconfined	-0.42	1	1.45	1.68	-0.23
S-209	AOI 1	2685750	222525	unconfined	-3.56	1	0.86	1.23	-0.37
S-210	AOI 1	2685876	222247	unconfined	-6.86	1	-0.27	0.16	-0.43

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
S-211	AOI 1	2685021	221956	unconfined	-7.28	1	1.15	1.46	-0.31
S-213	AOI 1	2685087	221871	unconfined	-7.39	1	0.64	1.49	-0.85
S-214	AOI 1	2685145	221577	unconfined	-5.77	1	0.63	1.47	-0.84
S-216	AOI 4	2684618	220867	unconfined	-3.93	1	0.95	1.96	-1.01
S-226	AOI 1	2685805	222280	unconfined	-8.14	1	0.13	0.53	-0.40
S-227	AOI 1	2685786	221654	unconfined	-4.72	1	-0.64	-2.22	1.58
S-228	AOI 1	2685779	221657	unconfined	-6.29	1	-0.59	-2.13	1.54
S-231	AOI 1	2685897	222219	unconfined	2.38	1	-0.29	-0.03	-0.26
S-232	AOI 1	2685891	222167	unconfined	0.59	1	-0.28	-0.27	-0.01
S-246A	AOI 2	2682915	222348	unconfined	1.85	1	1.85	1.92	-0.07
S-247	AOI 2	2682921	222381	unconfined	1.18	1	1.18	1.80	-0.62
S-248	AOI 2	2682933	222394	unconfined	1.05	1	1.05	2.15	-1.10
S-249	AOI 2	2682939	222444	unconfined	1.57	1	1.57	1.79	-0.22
S-25	AOI 3	2684275	218447	unconfined	12.06	1	1.15	2.77	-1.62
S-251	AOI 2	2683286	222362	unconfined	5.61	1	0.93	2.39	-1.46
S-252	AOI 2	2683257	222357	unconfined	5.36	1	0.72	2.38	-1.66
S-253	AOI 2	2683301	222420	unconfined	7.11	1	2.25	2.43	-0.18
S-254	AOI 2	2683168	222414	unconfined	6.91	1	1.79	2.39	-0.60
S-256	AOI 1	2685775	221633	unconfined	-5.83	1	-0.16	-2.04	1.88
S-257	AOI 1	2685811	221589	unconfined	-1.33	1	-0.05	-2.38	2.33
S-258	AOI 1	2685820	221665	unconfined	-1.64	1	-0.81	-2.69	1.88
S-259	AOI 1	2685827	221704	unconfined	-2	1	-1.89	-2.88	0.99
S-262	AOI 1	2685590	222045	unconfined	-4.78	1	0.70	0.42	0.28
S-263	AOI 1	2685576	221829	unconfined	-5.34	1	0.49	-0.04	0.53
S-268	AOI 1	2686298	224224	unconfined	25.14	1	4.27	3.76	0.51
S-269	AOI 1	2685044	222590	unconfined	0.63	1	2.21	2.18	0.03
S-270	AOI 1	2685422	222589	unconfined	1.38	1	1.57	1.86	-0.29
S-271	AOI 1	2686090	223898	unconfined	1.45	1	3.47	2.50	0.97
S-273	AOI 1	2686121	223810	unconfined	0.81	1	3.55	2.29	1.26
S-274	AOI 1	2686114	223761	unconfined	0.41	1	3.46	2.32	1.14
S-275	AOI 1	2686107	223710	unconfined	0.05	1	3.28	2.15	1.13
S-276	AOI 1	2686101	223661	unconfined	-0.32	1	2.98	2.05	0.93
S-277	AOI 1	2686071	223444	unconfined	-1.4	1	2.40	2.00	0.40
S-280	AOI 3	2682599	220966	unconfined	6.23	1	2.28	1.91	0.37
S-282	AOI 4	2683960	220827	unconfined	5.99	1	0.80	2.10	-1.30
S-288	AOI 3	2683003	219276	unconfined	7.25	1	8.27	2.15	6.12
S-294	AOI 2	2684673	224162	unconfined	2.62	1	4.60	4.66	-0.06

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
S-295	AOI 2	2684379	223801	unconfined	16.63	1	8.93	10.64	-1.71
S-297	AOI 2	2683613	223495	unconfined	-0.28	1	6.26	6.43	-0.17
S-298	AOI 2	2683859	223263	unconfined	12.98	1	12.12	9.66	2.46
S-299	AOI 2	2683545	222978	unconfined	1.27	1	3.55	2.81	0.74
S-300	AOI 2	2684308	222830	unconfined	1.485	1	4.87	2.82	2.05
S-301	AOI 2	2684442	222551	unconfined	2.99	1	3.47	2.26	1.21
S-302	AOI 2	2683251	222613	unconfined	-0.36	1	2.47	2.53	-0.06
S-303	AOI 2	2683678	222409	unconfined	2.21	1	2.89	2.39	0.50
S-305	AOI 2	2684883	221997	unconfined	-3.29	1	1.15	1.43	-0.28
S-306	AOI 2	2683117	222297	unconfined	-2.42	1	-0.35	2.35	-2.70
S-307	AOI 2	2683508	221764	unconfined	-2.05	1	2.28	2.35	-0.07
S-308	AOI 2	2682915	221383	unconfined	12.89	1	3.94	2.11	1.83
S-309	AOI 2	2683391	221512	unconfined	4.522	1	2.07	2.29	-0.22
S-311	AOI 2	2684448	221518	unconfined	-0.985	1	1.16	1.97	-0.81
S-313	AOI 2	2683327	222420	unconfined	-0.36	1	2.29	2.44	-0.15
S-314	AOI 2	2683250	222411	unconfined	-0.4	1	1.92	2.41	-0.49
S-317	AOI 2	2683227	222440	unconfined	-1.13	1	2.04	2.43	-0.39
S-318	AOI 2	2683216	222516	unconfined	-0.69	1	1.85	2.47	-0.62
S-32	AOI 4	2684136	219917	unconfined	1.15	1	1.15	2.32	-1.17
S-328	AOI 2	2683642	222582	unconfined	3.972	1	3.31	2.56	0.75
S-330	BELMONT	2685219	224246	unconfined	2.79	1	4.05	4.42	-0.37
S-331	BELMONT	2685176	224033	unconfined	6.68	1	3.79	4.21	-0.42
S-332	BELMONT	2685110	224237	unconfined	4.34	1	4.34	4.49	-0.15
S-333	AOI 2	2682920	222372	unconfined	1.41	1	1.41	1.83	-0.42
S-335	AOI 2	2683113	222843	unconfined	0.09	1	0.09	2.22	-2.13
S-336	AOI 2	2683167	222813	unconfined	2.42	1	2.42	2.55	-0.13
S-337	AOI 2	2683260	223172	unconfined	1.9	1	1.90	2.47	-0.57
S-338	AOI 2	2683320	223145	unconfined	2.96	1	2.96	2.67	0.29
S-34	AOI 4	2684177	220357	unconfined	-1.11	1	1.24	2.16	-0.92
S-346	AOI 2	2684760	222200	unconfined	-5.25	1	1.40	1.16	0.24
S-347	AOI 2	2684712	222199	unconfined	-5.24	1	1.22	1.17	0.05
S-348	AOI 2	2683866	222330	unconfined	0.11	1	5.60	2.10	3.50
S-349	AOI 2	2683819	222324	unconfined	-0.73	1	3.71	2.18	1.53
S-350	AOI 2	2684656	224223	unconfined	10	1	4.32	4.71	-0.39
S-351	AOI 2	2684319	224112	unconfined	11.5	1	4.43	4.86	-0.43
S-354	AOI 2	2683499	223705	unconfined	10	1	3.37	4.02	-0.65
S-355	AOI 2	2683594	223590	unconfined	10	1	3.72	4.02	-0.30

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
S-357	AOI 2	2683533	223382	unconfined	0.9	1	7.36	6.52	0.84
S-359	AOI 2	2683809	222117	unconfined	6.5	1	2.76	2.21	0.55
S-360	AOI 2	2684419	221893	unconfined	7.5	1	1.31	1.86	-0.55
S-361	AOI 2	2684109	221779	unconfined	8.5	1	2.66	2.13	0.53
S-363	AOI 2	2684410	221643	unconfined	7.5	1	1.00	1.97	-0.97
S-365	AOI 4	2683839	220855	unconfined	1.61	1	0.46	2.10	-1.64
S-366	AOI 4	2684586	221392	unconfined	2.755	1	0.76	1.92	-1.16
S-367	AOI 4	2684688	221274	unconfined	0.255	1	0.84	1.88	-1.04
S-369	AOI 4	2685726	221204	unconfined	4.905	1	-0.09	1.22	-1.31
S-380	AOI 4	2685674	220596	unconfined	3.395	1	0.88	1.92	-1.04
S-382	AOI 3	2682250	220408	unconfined	-2.4	1	3.88	1.91	1.97
S-384	AOI 3	2683220	220831	unconfined	-1.8	1	0.42	1.98	-1.56
S-395	BELMONT	2685991	224465	unconfined	-7.5	1	4.39	4.19	0.20
S-402	AOI 1	2685116	223884	unconfined	6	1	4.17	4.09	0.08
S-403	AOI 1	2684978	222921	unconfined	-0.9	1	2.89	2.86	0.03
S-405	AOI 1	2685608	223177	unconfined	1.3	1	3.34	2.55	0.79
S-406	AOI 2	2683062	222569	unconfined	2.33	1	2.33	2.42	-0.09
S-41	AOI 1	2685772	221298	unconfined	-4.51	1	-0.09	0.75	-0.84
S-411	AOI 3	2682483	220825	unconfined	2.62	1	0.83	1.88	-1.05
S-413	AOI 3	2683062	220607	unconfined	-4.65	1	0.56	1.89	-1.33
S-414	AOI 3	2682403	220564	unconfined	0.01	1	0.40	1.87	-1.47
S-415	AOI 4	2684132	220822	unconfined	-3.53	1	0.75	2.08	-1.33
S-417	AOI 1	2684867	223781	unconfined	5.7	1	5.11	4.12	0.99
S-419	AOI 1	2685595	222387	unconfined	-6.6	1	0.91	1.22	-0.31
S-420	AOI 2	2682996	222512	unconfined	2.78	1	2.78	2.31	0.47
S-43	AOI 1	2685816	221634	unconfined	-0.54	1	-0.75	-2.53	1.78
S-46	AOI 1	2685283	222077	unconfined	-11.73	1	0.87	1.27	-0.40
S-48	AOI 2	2684871	222221	unconfined	1.48	1	1.48	1.23	0.25
S-50	AOI 1	2685881	222241	unconfined	8.115	1	-0.13	0.13	-0.26
S-51	AOI 1	2685939	222520	unconfined	-1.82	1	0.16	0.86	-0.70
S-53	AOI 2	2684179	222279	unconfined	-2.21	1	2.67	1.81	0.86
S-54	AOI 2	2684412	221766	unconfined	1.26	1	1.26	1.94	-0.68
S-60	AOI 3	2683756	221051	unconfined	0.68	1	0.68	2.13	-1.45
S-61	AOI 2	2683869	221701	unconfined	1.67	1	1.67	2.25	-0.58
S-63	AOI 2	2683223	222269	unconfined	0.95	1	0.54	2.37	-1.83
S-71	AOI 2	2683535	223178	unconfined	-0.5	1	3.82	2.88	0.94
S-72	AOI 2	2683825	223836	unconfined	4.24	1	4.24	4.53	-0.29

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
S-75	BELMONT	2686144	224096	unconfined	3.71	1	3.71	3.05	0.66
S-76	BELMONT	2685601	224035	unconfined	15.61	1	3.78	3.75	0.03
S-77P	AOI 1	2685250	223931	unconfined	13.365	1	4.03	4.03	0.00
S-77SRTF	AOI 9	2678019	217724	unconfined	-6.55	1	-7.89	-2.18	-5.71
S-78	AOI 1	2684757	223423	unconfined	3.43	1	4.62	3.71	0.91
S-78SRTF	AOI 9	2677724	216834	unconfined	-8.36	1	-8.36	-4.14	-4.22
S-79P	AOI 1	2685644	223426	unconfined	10.605	1	3.52	2.89	0.63
S-79SRTF	AOI 9	2677551	215992	unconfined	-7.81	1	-5.35	-6.22	0.87
S-80	AOI 1	2685607	223707	unconfined	7.44	1	3.62	3.31	0.31
S-81SRTF	AOI 9	2677042	216806	unconfined	-8.84	1	-8.33	-4.23	-4.10
S-83	AOI 1	2686061	223399	unconfined	1.13	1	2.41	1.83	0.58
S-83SRTF	AOI 9	2677510	218241	unconfined	-6.73	1	0.05	-1.33	1.38
S-85	AOI 1	2686023	223173	unconfined	0.44	1	0.85	1.53	-0.68
S-86	AOI 1	2685945	223065	unconfined	-6.375	1	0.45	1.61	-1.16
S-88	AOI 1	2686005	223039	unconfined	-1.36	1	-1.19	1.39	-2.58
S-88A	AOI 1	2686013	223107	unconfined	2.185	1	-0.21	1.44	-1.65
S-89	AOI 1	2685989	222922	unconfined	-1.09	1	-0.59	1.22	-1.81
S-91	AOI 2	2684188	222271	unconfined	1.3	1	2.69	1.79	0.90
S-93	AOI 2	2683259	222338	unconfined	-0.57	1	0.94	2.38	-1.44
S-95	AOI 1	2685351	221422	unconfined	-0.89	1	0.59	1.17	-0.58
S-96	AOI 4	2684857	220719	unconfined	0.76	1	0.76	1.94	-1.18
S-99	AOI 1	2686084	222766	unconfined	-2.2	1	0.29	1.43	-1.14
SSEPTA-PH-8	DSCP	2689175	221890	unconfined	7.51	1	0.84	2.01	-1.17
Steen-MW-61	DSCP	2686008	222107	unconfined	3.24	1	-0.28	0.00	-0.28
Steen-MW-62	DSCP	2686037	222328	unconfined	2.09	1	0.49	0.79	-0.30
Steen-MW-64	DSCP	2685953	221694	unconfined	4.29	1	-0.36	-1.39	1.03
Steen-PH-10	DSCP	2686180	222012	unconfined	3.8	1	-3.30	0.81	-4.11
Steen-PH-11	DSCP	2685990	221987	unconfined	3.63	1	-0.67	-0.62	-0.05
Steen-PH-12	DSCP	2686138	222248	unconfined	3.48	1	-1.02	1.11	-2.13
SW-1	AOI 5	2681673	215437	unconfined	7.19	1	2.32	1.57	0.75
SW-2	AOI 5	2681633	215458	unconfined	2.84	1	2.84	1.70	1.14
SW-3	AOI 5	2681565	215492	unconfined	1.98	1	1.98	1.42	0.56
SW-4	AOI 5	2681486	215534	unconfined	7.22	1	2.00	1.39	0.61
SW-5	AOI 5	2681322	215655	unconfined	7.84	1	5.34	2.35	2.99
SWR-1	AOI 5	2681283	215697	unconfined	3.49	1	3.49	2.67	0.82
SWR-2	AOI 5	2681737	215397	unconfined	2.28	1	2.28	1.76	0.52
SWR-3	AOI 5	2681811	215359	unconfined	3.61	1	3.61	1.80	1.81

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
TW-11	BELMONT	2686135	224364	unconfined	16.305	1	4.11	3.98	0.13
TW-3	BELMONT	2685838	224405	unconfined	16.205	1	4.08	3.96	0.12
TW-5	BELMONT	2685994	224416	unconfined	16.17	1	4.55	4.06	0.49
TW-8	BELMONT	2685682	224456	unconfined	15.185	1	3.94	4.25	-0.31
TW-9	BELMONT	2686092	224400	unconfined	16.215	1	4.25	4.05	0.20
U-2	AOI 6	2681798	216694	unconfined	2.8	1	2.80	3.53	-0.73
U-3	AOI 6	2681941	216811	unconfined	3.74	1	3.74	4.44	-0.70
U-4	AOI 6	2682043	216875	unconfined	5.41	1	5.41	5.29	0.12
U-5	AOI 6	2681801	216801	unconfined	2.27	1	2.27	3.60	-1.33
URS-1	AOI 6	2680859	216101	unconfined	4.34	1	4.34	1.37	2.97
URS-2	AOI 6	2681727	216726	unconfined	4.06	1	4.06	3.47	0.59
URS-4	AOI 6	2680671	216277	unconfined	0.85	1	0.85	1.41	-0.56
URS-5	AOI 6	2680401	216794	unconfined	2.84	1	2.84	1.83	1.01
W-1	AOI 10	2682762	223594	unconfined	-1.81	1	0.86	3.80	-2.94
W-10	AOI 10	2681973	222348	unconfined	-1.4	1	3.96	6.32	-2.36
W-11	AOI 10	2682276	222286	unconfined	0.8	1	3.64	4.53	-0.89
W-12	AOI 10	2682078	221939	unconfined	-1.42	1	3.78	3.87	-0.09
W-14	AOI 10	2681747	222310	unconfined	-1.06	1	4.39	6.72	-2.33
W-15	AOI 10	2681624	222775	unconfined	2.3	1	6.37	6.45	-0.08
W-16	AOI 10	2681794	221795	unconfined	-1	1	4.12	3.77	0.35
W-17	AOI 10	2681731	221777	unconfined	-0.93	1	3.87	4.68	-0.81
W-2	AOI 10	2681822	223350	unconfined	0.77	1	4.99	6.38	-1.39
W-20	AOI 10	2680987	222415	unconfined	2.34	1	6.14	7.07	-0.93
W-22	AOI 10	2680429	222466	unconfined	2	1	5.16	5.80	-0.64
W-28	AOI 10	2682420	222857	unconfined	-3.21	1	5.08	5.22	-0.14
W-29	AOI 10	2682149	223225	unconfined	0.09	1	5.11	6.39	-1.28
W-30	AOI 10	2681983	222661	unconfined	-1.42	1	5.03	6.33	-1.30
W-31	AOI 10	2681808	222013	unconfined	-3.574	1	4.59	6.06	-1.47
W-33	AOI 10	2680145	222385	unconfined	2.36	1	5.32	5.26	0.06
W-34	AOI 10	2680919	222425	unconfined	1.78	1	6.30	6.98	-0.68
W-5	AOI 10	2681651	223047	unconfined	-2	1	5.04	6.05	-1.01
W-9	AOI 10	2681893	222543	lower aquifer	0.96	1	-1.17	6.53	-7.70
WP-14	AOI 5	2682199	215243	unconfined	2.06	1	2.06	2.85	-0.79
WP16-3	AOI 5	2682402	216899	unconfined	3.45	1	3.45	5.54	-2.09
WP-8	AOI 5	2682441	215137	unconfined	-6.02	1	1.51	2.41	-0.90
WP9-3	AOI 6	2681300	216733	unconfined	0.4	1	4.12	4.51	-0.39
WP9-4	AOI 6	2681422	216537	unconfined	0.55	1	3.97	4.63	-0.66

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WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
WP9-8	AOI 5	2681391	216377	unconfined	3.085	1	3.89	4.49	-0.60
WP-A	AOI 5	2681387	215594	unconfined	5.19	1	5.19	2.45	2.74
WP-B	AOI 5	2681311	215667	unconfined	3.67	1	3.67	2.46	1.21
WP-C	AOI 5	2681378	215681	unconfined	2.7	1	2.70	4.17	-1.47
WP-D	AOI 5	2681484	215914	unconfined	3.13	1	3.13	4.57	-1.44
WP-E	AOI 5	2681622	215986	unconfined	2.72	1	2.72	3.00	-0.28
WPM-11	AOI 6	2682371	217106	unconfined	5.63	1	5.63	5.44	0.19
WPM-3	AOI 6	2682433	217085	unconfined	4.94	1	4.94	5.55	-0.61
A-15	AOI 5	2682689	216314	unconfined	-5.21	2	3.93	3.51	0.42
A-186	AOI 5	2682888	217107	unconfined	-4.9	2	3.21	3.76	-0.55
B-129	AOI 6	2683018	217874	unconfined	-3.67	2	2.14	4.20	-2.06
B-94	AOI 6	2683137	217610	unconfined	-1.79	2	3.59	4.23	-0.64
BF-100	AOI 3	2683128	219458	unconfined	-5.04	2	0.56	2.08	-1.52
BF-104	AOI 3	2682830	219137	unconfined	-5.8	2	6.49	2.75	3.74
C-150	AOI 7	2680607	220263	unconfined	-5.86	2	-5.86	-7.29	1.43
C-49	AOI 7	2683022	218495	unconfined	-4.66	2	4.61	4.08	0.53
N-102	AOI 8	2683870	227035	unconfined	6.59	2	10.92	8.04	2.88
N-103	AOI 8	2683660	226782	unconfined	5.41	2	11.93	8.48	3.45
N-104	AOI 8	2683420	226914	unconfined	5.96	2	10.82	9.71	1.11
N-105	AOI 8	2683443	226745	unconfined	6.26	2	10.70	9.10	1.60
N-111	AOI 8	2680519	226514	unconfined	-1.4	2	4.02	2.07	1.95
N-113	AOI 8	2681733	226054	unconfined	2.32	2	5.44	5.69	-0.25
N-115	AOI 8	2682246	225824	unconfined	2.43	2	7.54	6.53	1.01
N-122	AOI 8	2683577	226074	unconfined	2.93	2	6.56	6.96	-0.40
N-138	AOI 8	2683256	227757	unconfined	5.29	2	8.27	6.31	1.96
N-139	AOI 8	2683309	227732	unconfined	5	2	8.18	6.48	1.70
N-146	AOI 8	2682830	227726	unconfined	4.89	2	8.72	6.10	2.62
N-2	AOI 8	2682759	228025	unconfined	5.75	2	8.16	6.27	1.89
N-34	AOI 8	2682271	226259	unconfined	3.7	2	6.81	6.59	0.22
N-38	AOI 8	2680805	226899	unconfined	-0.73	2	3.20	3.95	-0.75
N-74	AOI 8	2680701	224898	unconfined	-1.7	2	2.67	1.99	0.68
N-84	AOI 8	2684677	226457	unconfined	5.32	2	11.27	6.91	4.36
N-99	AOI 8	2682855	228875	unconfined	3.26	2	9.68	6.41	3.27
PH-RW-D	DSCP	2687308	221945	unconfined	-10.675	2	2.03	2.17	-0.14
RW-128	AOI 2	2682988	222438	unconfined	-10.2	2	0.12	2.30	-2.18
RW-203	AOI 8	2683032	225154	unconfined	1.57	2	8.56	6.06	2.50
RW-306	AOI 8	2683768	226581	unconfined	4.72	2	10.48	8.09	2.39

*see notes on last page

Appendix A
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Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
RW-403	AOI 1	2686035	223262	unconfined	-8.89	2	2.08	1.83	0.25
RW-405	AOI 1	2685990	222933	unconfined	-6.5	2	-0.66	1.42	-2.08
RW-705	AOI 4	2685080	218913	unconfined	-3.59	2	1.34	2.57	-1.23
RW-707	AOI 4	2685021	218852	unconfined	-4.67	2	0.77	2.56	-1.79
RW-709	AOI 4	2684982	218812	unconfined	-6.48	2	0.81	2.57	-1.76
RW-710	AOI 4	2684962	218790	unconfined	-5.29	2	0.56	2.59	-2.03
RW-711	AOI 4	2684955	218782	unconfined	-6.785	2	0.88	2.59	-1.71
RW-712	AOI 4	2684936	218762	unconfined	-4.82	2	0.83	2.61	-1.78
RW-713	AOI 4	2684924	218748	unconfined	-5.41	2	0.86	2.62	-1.76
RW-714	AOI 4	2684903	218728	unconfined	-5.53	2	0.91	2.64	-1.73
RW-715	AOI 4	2684883	218706	unconfined	-5.64	2	0.88	2.65	-1.77
RW-716	AOI 4	2684864	218684	unconfined	-5.595	2	0.95	2.66	-1.71
RW-717	AOI 4	2684844	218663	unconfined	-5.64	2	1.00	2.67	-1.67
S-120	AOI 4	2685597	220403	unconfined	-3.53	2	1.60	2.07	-0.47
S-120DSRTF	AOI 9,11	2677542	215267	unconfined	-20.65	2	-9.01	-8.33	-0.68
S-122	AOI 4	2685443	219647	unconfined	-2.08	2	1.01	2.51	-1.50
S-123	AOI 4	2684990	219320	unconfined	-0.77	2	0.84	2.54	-1.70
S-124	AOI 4	2685004	218885	unconfined	0.46	2	0.83	2.52	-1.69
S-16	AOI 3	2683817	218965	unconfined	-9.17	2	1.14	2.31	-1.17
S-17	AOI 3	2683786	219271	unconfined	1.17	2	1.17	2.40	-1.23
S-20	AOI 3	2684072	218851	unconfined	-12.2	2	1.10	2.55	-1.45
S-219	AOI 4	2684850	219892	unconfined	0.38	2	1.02	2.35	-1.33
S-220	AOI 4	2684262	219152	unconfined	-4	2	1.05	2.52	-1.47
S-221	AOI 4	2684933	219006	unconfined	-2.48	2	0.75	2.40	-1.65
S-222	AOI 4	2684862	218677	unconfined	-3.61	2	1.11	2.67	-1.56
S-223	AOI 4	2685064	218859	unconfined	-6.02	2	0.94	2.59	-1.65
S-224	AOI 4	2685158	218991	unconfined	-5.47	2	0.91	2.61	-1.70
S-23	AOI 3	2684062	218579	unconfined	-2.55	2	1.16	2.68	-1.52
S-233	AOI 4	2684874	218923	unconfined	-0.87	2	3.82	2.26	1.56
S-234	AOI 4	2684899	218762	unconfined	-1.46	2	0.64	2.61	-1.97
S-235	AOI 4	2684962	218844	unconfined	-2.29	2	0.85	2.53	-1.68
S-236	AOI 4	2684954	219018	unconfined	-4.78	2	0.70	2.41	-1.71
S-237	AOI 4	2684943	218984	unconfined	-5.11	2	0.63	2.37	-1.74
S-238	AOI 4	2685034	218917	unconfined	-2.63	2	0.88	2.52	-1.64
S-239	AOI 4	2684997	218789	unconfined	-1.31	2	0.94	2.60	-1.66
S-240	AOI 4	2684848	218980	unconfined	-1.53	2	0.72	2.44	-1.72
S-241	AOI 4	2684819	219045	unconfined	0.59	2	0.67	2.50	-1.83

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
S-242	AOI 4	2684857	218813	unconfined	0.92	2	0.92	2.56	-1.64
S-243	AOI 4	2684934	218722	unconfined	1.1	2	1.10	2.64	-1.54
S-245	AOI 4	2684999	219051	unconfined	0.96	2	0.96	2.49	-1.53
S-26	AOI 4	2684616	218758	unconfined	1.01	2	1.01	2.65	-1.64
S-278	AOI 4	2684810	218753	unconfined	-3.8	2	1.06	2.63	-1.57
S-279	AOI 4	2684702	219165	unconfined	1.86	2	1.23	2.54	-1.31
S-285	AOI 3	2683687	219690	unconfined	0.2	2	1.34	2.39	-1.05
S-29	AOI 4	2684380	219695	unconfined	-7.17	2	2.41	2.37	0.04
S-291	AOI 3	2683972	218061	unconfined	-3.036	2	4.14	4.07	0.07
S-3	AOI 3	2683570	217784	unconfined	-2.33	2	3.43	3.60	-0.17
S-30	AOI 4	2684380	219703	unconfined	0.9	2	0.90	2.36	-1.46
S-329	AOI 4	2684779	218690	unconfined	-4.3	2	0.74	2.66	-1.92
S-370	AOI 4	2683833	219839	unconfined	-7.94	2	0.73	2.32	-1.59
S-372	AOI 3	2683824	219317	unconfined	1.165	2	0.99	2.40	-1.41
S-38	AOI 4	2685232	219184	unconfined	0.93	2	0.93	2.62	-1.69
S-381	AOI 4	2684590	219563	unconfined	3.095	2	0.70	2.42	-1.72
S-385	AOI 3	2683689	220624	unconfined	-9.3	2	0.81	2.08	-1.27
S-386	AOI 3	2683705	219789	unconfined	-5	2	0.69	2.37	-1.68
S-39	AOI 4	2685582	220133	unconfined	-9.4	2	1.06	2.25	-1.19
S-408	AOI 4	2684259	218600	unconfined	-6.65	2	1.17	2.71	-1.54
S-412	AOI 3	2682923	220115	unconfined	-9.37	2	0.47	1.82	-1.35
S-418	AOI 1	2685854	222337	unconfined	-11	2	3.07	0.69	2.38
S-5	AOI 3	2683838	218242	unconfined	-0.14	2	2.91	3.24	-0.33
S-74D2SRTF	AOI 9	2679122	216095	unconfined	-26.33	2	-4.00	-5.64	1.64
S-82	AOI 1	2686056	223599	unconfined	-10.4	2	3.46	2.30	1.16
C-145	AOI 7	2681007	220222	unconfined	-12.64	3	1.45	1.94	-0.49
C-146	AOI 7	2680640	220255	unconfined	-12.8	3	-4.41	-2.19	-2.22
C-95	AOI 3,7	2682674	219113	unconfined	-15.07	3	6.47	2.76	3.71
DSCP-IW-12	DSCP	2687131	222110	unconfined	-25.28	3	-4.68	2.21	-6.89
N-109	AOI 8	2681605	226649	lower aquifer	3.04	3	6.13	5.53	0.60
N-112	AOI 8	2681664	226328	lower aquifer	1.35	3	5.68	5.38	0.30
N-116	AOI 8	2682617	225844	unconfined	1.49	3	5.35	6.76	-1.41
N-130	AOI 8	2682501	225088	unconfined	-2.93	3	11.14	6.21	4.93
N-59	AOI 8	2680470	225387	unconfined	-2.69	3	1.75	4.27	-2.52
N-61	AOI 8	2680588	225119	unconfined	-2.71	3	4.65	3.66	0.99
N-76	AOI 8	2683610	225362	unconfined	-3.25	3	9.47	6.07	3.40
PGW-MW-21	AOI 8	2682698	224771	unconfined	-5.052	3	9.16	5.43	3.73

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
PH-IW-2	DSCP	2686781	220911	unconfined	-25.15	3	1.23	2.06	-0.83
PH-IW-3	DSCP	2687505	220886	unconfined	-37.05	3	0.07	2.39	-2.32
RW-200	AOI 8	2682439	224925	unconfined	-3.37	3	6.13	5.89	0.24
RW-301	AOI 8	2682907	226707	unconfined	0.45	3	10.14	9.82	0.32
RW-302	AOI 8	2683040	226687	unconfined	0.42	3	10.57	9.74	0.83
RW-304	AOI 8	2683322	226635	unconfined	1.45	3	10.24	9.03	1.21
RW-305	AOI 8	2683458	226615	unconfined	1.39	3	10.23	8.74	1.49
S-10	AOI 3	2683682	218444	unconfined	-14.17	3	1.46	2.01	-0.55
S-12	AOI 3	2683521	218879	unconfined	-13.105	3	1.12	2.05	-0.93
S-153	AOI 2	2683289	223237	unconfined	-11.05	3	2.24	2.51	-0.27
S-396	AOI 1	2685872	223191	unconfined	-16.8	3	1.18	2.10	-0.92
S-52	AOI 1	2685894	222553	unconfined	-13.3	3	0.70	1.18	-0.48
W-23	AOI 10	2680081	222589	unconfined	-9.79	3	5.10	3.75	1.35
W-25	AOI 10	2679601	222643	unconfined	-1.97	3	4.19	2.60	1.59
A-19D	AOI 5,11	2683563	217563	lower aquifer	-44.36	4	-2.05	2.02	-4.07
B-48D	AOI 6,11	2682251	217522	lower aquifer	-41.23	4	-2.04	1.04	-3.08
BF-90D	AOI 3,11	2683040	218957	lower aquifer	-25.15	4	-0.15	1.87	-2.02
DSCP-DW-6	DSCP	2687606	223122	lower aquifer	-40.83	4	0.93	3.42	-2.49
DSCP-IW-1	DSCP	2686539	222709	unconfined	-22.65	4	-3.49	2.70	-6.19
DSCP-IW-13	DSCP	2688517	222412	unconfined	-47.99	4	0.98	2.93	-1.95
N-114	AOI 8	2681511	226225	lower aquifer	-5.03	4	5.72	5.38	0.34
N-127	AOI 8	2682768	225193	unconfined	-4.25	4	9.17	5.29	3.88
N-132	AOI 8	2681685	225634	unconfined	-10.94	4	7.20	5.66	1.54
N-70	AOI 8	2681745	227136	lower aquifer	0.29	4	7.29	5.55	1.74
N-83	AOI 8	2681761	226828	lower aquifer	1.77	4	5.90	5.58	0.32
PH-IW-10	DSCP	2686456	221925	unconfined	-27.44	4	0.80	2.03	-1.23
PH-IW-11	DSCP	2686416	221650	unconfined	-27.93	4	0.74	1.82	-1.08
RW-300	AOI 8	2681810	226710	lower aquifer	-0.17	4	6.35	5.56	0.79
S-110DSRTF	AOI 9	2676987	217259	lower aquifer	-49.73	4	-8.88	-3.26	-5.62
S-115DSRTF	AOI 9	2676755	216206	lower aquifer	-48.3	4	-8.42	-5.77	-2.65
S-119D	AOI 4,11	2685498	220820	lower aquifer	-41.14	4	0.44	2.00	-1.56
S-397	AOI 1	2685305	222831	unconfined	-29.9	4	1.04	2.90	-1.86
S-399	AOI 1	2685166	221521	lower aquifer	-24.7	4	0.72	1.99	-1.27
S-87I	AOI 1	2685940	223065	lower aquifer	-23.46	4	1.07	1.91	-0.84
Steen-IW-07	DSCP	2686043	222338	unconfined	-27.23	4	0.80	1.88	-1.08
B-133D	AOI 6,11	2681722	216723	lower aquifer	-53.9	5	-1.98	-0.47	-1.51
N-19	AOI 8,11	2684651	226737	lower aquifer	-24.54	5	3.28	5.77	-2.49

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							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
N-21	AOI 8,11	2683879	226628	lower aquifer	-21.46	5	5.91	5.63	0.28
N-69	AOI 8	2681822	227392	lower aquifer	-1.14	5	7.99	5.50	2.49
N-9	AOI 8,11	2684097	227375	lower aquifer	-22.3	5	3.63	6.13	-2.50
S-106DSRTF	AOI 9,11	2677610	214778	lower aquifer	-77.13	5	-9.13	-9.79	0.66
S-22	AOI 3	2684081	218842	lower aquifer	-57.59	5	-0.99	1.68	-2.67
S-280D	AOI 3,11	2682596	220955	lower aquifer	-32.58	5	0.20	1.55	-1.35
S-38D2	AOI 4,11	2685229	219163	lower aquifer	-59.16	5	-0.59	2.09	-2.68
S-59D	AOI 4,11	2683843	221368	lower aquifer	-33.24	5	0.73	2.04	-1.31
Steen-IW-09	DSCP	2686190	222018	unconfined	-41.02	5	-2.55	2.53	-5.08
ARCO-1D	AOI 1	2685966	221359	lower aquifer	-44.86	6	0.36	2.46	-2.10
DSCP-DW-1	DSCP	2686539	222715	lower aquifer	-50.55	6	-7.65	3.10	-10.75
DSCP-DW-13	DSCP	2688518	222417	lower aquifer	-79.81	6	0.97	3.17	-2.20
N-73	AOI 8	2680415	225822	lower aquifer	-30.81	6	1.35	1.66	-0.31
N-75	AOI 8	2680694	224909	lower aquifer	-32.35	6	1.38	1.91	-0.53
PGW-MW-12D	PGW	2685290	224520	lower aquifer	-39.93	6	2.13	4.12	-1.99
PGW-MW-1D	PGW	2683465	224134	lower aquifer	-36.43	6	2.32	3.17	-0.85
PGW-MW-1D	PGW	2683465	224134	lower aquifer	-36.43	6	2.41	3.17	-0.76
PH-DW-2	DSCP	2686776	220911	lower aquifer	-74.96	6	0.24	2.42	-2.18
PH-DW-3	DSCP	2687507	220890	lower aquifer	-95.24	6	1.04	2.56	-1.52
S-118DSRTF	AOI 9	2676690	215160	lower aquifer	-68.84	6	-8.89	-8.29	-0.60
S-8	AOI 3,11	2683688	218428	lower aquifer	-58.27	6	-1.01	1.46	-2.47
S-80D	AOI 1,11	2685512	223710	lower aquifer	-39.76	6	1.90	3.59	-1.69
Steen-IW-08	DSCP	2686010	222070	unconfined	-40.96	6	0.79	2.61	-1.82
W-27	AOI 10	2679107	222626	lower aquifer	-3.33	6	-1.97	2.63	-4.60
W-32D	AOI 10	2681222	222055	lower aquifer	-58	6	-0.80	2.64	-3.44
A-21D	AOI 5,11	2681388	215630	lower aquifer	-72.06	7	-5.74	-1.62	-4.12
B-132D	AOI 6,11	2680857	216098	lower aquifer	-69.69	7	-6.14	-1.97	-4.17
B-134D	AOI 6,11	2681037	216764	lower aquifer	-68.55	7	-3.62	-1.12	-2.50
BF-108	AOI 3,11	2683185	219701	lower aquifer	-66.04	7	-0.06	1.59	-1.65
C-129D	AOI 7,11	2681929	220492	lower aquifer	-51.65	7	-1.15	1.25	-2.40
C-134D	AOI 6,7,11	2681165	218306	lower aquifer	-55.65	7	-1.87	0.22	-2.09
C-144D	AOI 7,11	2680337	220108	lower aquifer	-64.36	7	-4.64	0.91	-5.55
CSX-DW-4	DSCP	2686121	222537	lower aquifer	-49.91	7	0.91	2.89	-1.98
CSX-DW-5	DSCP	2686325	223310	lower aquifer	-43.89	7	1.20	3.49	-2.29
DSCP-DW-12	DSCP	2687135	222110	lower aquifer	-79.9	7	-5.21	2.97	-8.18
DSCP-MW-20D	DSCP	2686776	224063	lower aquifer	-58.69	7	1.36	4.06	-2.70
N-38D	AOI 8,11	2680792	226897	lower aquifer	-71.23	7	0.34	2.42	-2.08

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2016 OBSERVED HYDRAULIC HEAD [FT]	MAY 2016 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2016 HYDRAULIC HEAD RESIDUAL [FT]
N-4	AOI 8,11	2683123	227945	lower aquifer	-15.59	7	8.46	6.25	2.21
PGW-MW-2D	PGW	2683918	224286	lower aquifer	-42.84	7	1.55	3.55	-2.00
PGW-MW-2D	PGW	2683918	224286	lower aquifer	-42.84	7	2.65	3.55	-0.90
PGW-MW-3D	PGW	2684691	224483	lower aquifer	-45.27	7	2.22	3.91	-1.69
PGW-MW-3D	PGW	2684691	224483	lower aquifer	-45.27	7	2.67	3.91	-1.24
PH-DW-10	DSCP	2686452	221935	lower aquifer	-76.6	7	0.78	2.74	-1.96
PH-DW-11	DSCP	2686415	221643	lower aquifer	-80.46	7	-0.12	2.66	-2.78
S-13	AOI 3,11	2683522	218892	lower aquifer	-63.46	7	-1.13	1.51	-2.64
S-218D	AOI 4	2684512	220118	lower aquifer	-69.15	7	0.04	2.01	-1.97
S-264D	AOI 1,11	2685762	221289	lower aquifer	-50.81	7	0.52	2.40	-1.88
S-284D	AOI 3,11	2683136	220356	lower aquifer	-60.79	7	0.29	1.67	-1.38
S-294D	AOI 2,11	2684682	224165	lower aquifer	-56.43	7	2.67	3.68	-1.01
S-302D	AOI 2,11	2683248	222607	lower aquifer	-62.45	7	0.62	2.13	-1.51
S-305D	AOI 2,11	2684882	221990	lower aquifer	-56.6	7	0.66	2.38	-1.72
S-388D	AOI 1	2685903	222561	lower aquifer	-53.1	7	0.84	2.86	-2.02
S-389D	AOI 1	2685876	223190	lower aquifer	-52.4	7	1.08	3.29	-2.21
S-390D	AOI 1	2685310	222830	lower aquifer	-62.2	7	1.07	2.93	-1.86
S-392D	AOI 1	2685166	221525	lower aquifer	-49.3	7	0.74	2.33	-1.59
S-393D	BELMONT	2685996	224457	lower aquifer	-64.5	7	2.56	4.22	-1.66
S-394	BELMONT	2685993	224461	lower aquifer	-52.5	7	2.36	4.22	-1.86
S-46D	AOI 1,11	2685274	222026	lower aquifer	-47.87	7	1.18	2.49	-1.31
S-69D	AOI 3,11	2682399	219971	lower aquifer	-47.3	7	-0.25	1.38	-1.63
S-72D	AOI 2,11	2683834	223838	lower aquifer	-61.93	7	2.27	3.12	-0.85
S-74D1SRTF	AOI 9	2679175	216087	lower aquifer	-63.15	7	-8.32	-5.41	-2.91
S-76DSRTF	AOI 9	2678241	216807	lower aquifer	-69.5	7	-8.16	-4.16	-4.00
Steen-DW-07	DSCP	2686045	222330	lower aquifer	-78.62	7	0.77	2.77	-2.00
Steen-DW-08	DSCP	2686004	222074	lower aquifer	-86.23	7	0.78	2.67	-1.89
Steen-DW-09	DSCP	2686195	222017	lower aquifer	-81.39	7	0.80	2.70	-1.90
W-13	AOI 10	2682065	221929	lower aquifer	-56.84	7	-2.01	1.67	-3.68
W-19	AOI 10	2680982	222405	lower aquifer	-66.83	7	-1.59	2.28	-3.87
W-1D	AOI 10	2682756	223584	lower aquifer	-63.63	7	0.63	2.27	-1.64
W-26	AOI 10	2679592	222651	lower aquifer	-12.15	7	-2.90	2.50	-5.40

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
A-10	AOI 5	2682406	215428	unconfined	-1.33	1	2.82	3.66	-0.84
A-11	AOI 5	2682016	215380	unconfined	-3.91	1	2.57	2.93	-0.36
A-118	AOI 5	2683071	217109	unconfined	5.91	1	5.71	5.94	-0.23
A-12	AOI 5	2682183	215379	unconfined	-3.12	1	2.26	3.28	-1.02
A-122	AOI 5	2682278	215930	unconfined	2.54	1	2.43	3.69	-1.26
A-133	AOI 5	2681282	215805	unconfined	0.13	1	5.53	4.54	0.99
A-134	AOI 5	2681409	215810	unconfined	-2.79	1	1.60	4.61	-3.01
A-135	AOI 5	2681633	215823	unconfined	-1.64	1	3.21	2.94	0.27
A-136	AOI 5	2681693	215556	unconfined	-3.48	1	1.76	2.50	-0.74
A-137	AOI 5	2683597	215161	unconfined	-1.71	1	1.66	1.61	0.05
A-142	AOI 5	2683676	214931	unconfined	-2.36	1	0.54	1.34	-0.80
A-143	AOI 5	2683340	215553	unconfined	1.08	1	1.86	2.71	-0.85
A-148	AOI 5	2682641	216806	unconfined	-1.3	1	5.27	5.46	-0.19
A-149	AOI 5	2682443	216327	unconfined	-2.41	1	5.06	5.26	-0.20
A-151	AOI 5	2682129	215824	unconfined	-3.4	1	3.01	3.48	-0.47
A-152	AOI 5	2681987	216073	unconfined	-7.07	1	1.30	3.40	-2.10
A-155	AOI 5	2681449	216208	unconfined	-2.6	1	3.09	4.58	-1.49
A-156	AOI 5	2681355	216058	unconfined	3.1	1	3.74	4.62	-0.88
A-157	AOI 5	2681414	216278	unconfined	1.8	1	3.87	4.47	-0.60
A-158	AOI 5	2681604	216132	unconfined	-0.25	1	2.22	3.06	-0.84
A-163	AOI 5	2681070	215985	unconfined	3.645	1	4.35	3.78	0.57
A-164	AOI 5	2681178	216039	unconfined	3.025	1	3.87	4.13	-0.26
A-166	AOI 5	2681273	215790	unconfined	4.845	1	3.26	4.40	-1.14
A-167	AOI 5	2681257	216200	unconfined	3.755	1	3.85	4.35	-0.50
A-168	AOI 5	2681699	216444	unconfined	3.85	1	4.30	3.28	1.02
A-169	AOI 5	2681150	215953	unconfined	-2.4	1	4.06	4.21	-0.15
A-170	AOI 5	2681811	215867	unconfined	-6.3	1	1.83	3.10	-1.27
A-171	AOI 5	2681590	215555	unconfined	-3.8	1	2.21	2.15	0.06
A-172	AOI 5	2681780	215441	unconfined	-3.8	1	2.42	2.33	0.09
A-174	AOI 5	2683052	217150	unconfined	3.15	1	3.52	5.92	-2.40
A-175	AOI 5	2682663	215245	unconfined	2.5	1	0.54	3.23	-2.69
A-176	AOI 5	2682694	215260	unconfined	2.4	1	0.55	3.27	-2.71
A-178	AOI 5	2682770	215228	unconfined	2.4	1	0.95	3.03	-2.08
A-179	AOI 5	2682824	215290	unconfined	3.75	1	5.08	3.20	1.88
A-181	AOI 5	2682444	215193	unconfined	2.65	1	2.82	2.91	-0.09
A-182	AOI 5	2682580	215083	unconfined	2.5	1	1.99	2.03	-0.04
A-183	AOI 5	2682598	215354	unconfined	4.1	1	4.27	3.63	0.64

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
A-187	AOI 5	2682721	215337	unconfined	3.95	1	3.25	3.52	-0.27
A-189	AOI 5	2683360	217438	unconfined	2.955	1	3.78	5.11	-1.33
A-22	AOI 5	2680996	216032	unconfined	-2.24	1	1.71	1.83	-0.12
A-23	AOI 5	2682143	216385	unconfined	-4.21	1	2.69	3.74	-1.05
A-24	AOI 5	2681515	215977	unconfined	-1.44	1	3.04	4.48	-1.44
A-25	AOI 5	2682468	216982	unconfined	0.82	1	3.99	5.67	-1.68
A-26	AOI 5	2682167	216793	unconfined	0.5	1	3.70	5.47	-1.77
A-27	AOI 5	2681846	216592	unconfined	-0.5	1	3.60	3.52	0.08
A-3	AOI 5	2683412	215785	unconfined	-0.34	1	1.64	3.36	-1.72
A-4	AOI 5	2683520	215001	unconfined	-4.15	1	2.13	1.47	0.66
A-40	AOI 5	2683592	215201	unconfined	-1.98	1	1.90	1.61	0.29
A-41	AOI 5	2683535	215097	unconfined	-2.23	1	1.74	1.59	0.15
A-43	AOI 5	2683120	215588	unconfined	-0.11	1	2.79	3.52	-0.73
A-44	AOI 5	2683121	215462	unconfined	-0.39	1	1.98	3.07	-1.09
A-45	AOI 5	2682742	215239	unconfined	-3.13	1	1.04	3.12	-2.08
A-46	AOI 5	2682464	215347	unconfined	1.56	1	2.36	3.57	-1.21
A-48	AOI 5	2682295	215157	unconfined	-2.87	1	2.03	2.23	-0.20
A-49	AOI 5	2682249	215647	unconfined	-1.2	1	3.74	3.61	0.13
A-5	AOI 5	2682620	215251	unconfined	-5.35	1	0.70	3.28	-2.58
A-6	AOI 5	2682954	215268	unconfined	-1.99	1	3.03	2.82	0.21
A-7	AOI 5	2683087	215287	unconfined	-1.13	1	3.51	2.54	0.97
A-9	AOI 5	2683089	215096	unconfined	-2.05	1	2.24	1.86	0.38
ARCO-1	AOI 1	2685973	221361	unconfined	-4.89	1	-0.27	0.57	-0.84
ARCO-2	AOI 1	2685882	221258	unconfined	-5.11	1	-0.31	0.93	-1.24
ARCO-3	AOI 1	2685928	221631	unconfined	-7.51	1	-0.62	-1.45	0.83
B-115	AOI 6	2682825	218059	unconfined	5.03	1	4.36	4.77	-0.41
B-116	AOI 6	2682925	217899	unconfined	-0.82	1	-0.82	4.82	-5.64
B-117	AOI 6	2682499	217678	unconfined	-1.53	1	-1.53	5.41	-6.94
B-123	AOI 6	2681458	217146	unconfined	6.25	1	5.97	4.88	1.09
B-124	AOI 6	2681316	216811	unconfined	-4.09	1	3.69	4.54	-0.85
B-125	AOI 6	2681099	216829	unconfined	3.79	1	3.64	4.10	-0.46
B-126	AOI 6	2680974	217022	unconfined	3.6	1	3.41	4.06	-0.65
B-130	AOI 6	2680131	217397	unconfined	-1.89	1	4.58	3.46	1.12
B-131	AOI 6	2680693	216460	unconfined	-2.8	1	3.78	4.23	-0.45
B-132	AOI 6	2681171	217351	unconfined	-3.73	1	2.22	4.03	-1.81
B-133	AOI 6	2681207	217307	unconfined	-2.7	1	2.32	4.16	-1.84
B-134	AOI 6	2681163	217285	unconfined	-2.62	1	1.76	4.11	-2.35

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
B-135	AOI 6	2681137	217329	unconfined	-2.69	1	1.47	4.06	-2.59
B-136	AOI 6	2681253	217259	unconfined	-0.69	1	4.26	4.49	-0.23
B-137	AOI 6	2681298	217188	unconfined	-0.78	1	4.43	4.59	-0.16
B-138	AOI 6	2681330	217138	unconfined	-0.94	1	4.86	4.61	0.25
B-142	AOI 6	2681209	217178	unconfined	-0.19	1	2.74	4.44	-1.70
B-143	AOI 6	2681159	217208	unconfined	-0.64	1	3.93	4.39	-0.46
B-144	AOI 6	2681235	217134	unconfined	-0.84	1	4.17	4.45	-0.28
B-145	AOI 6	2681362	217086	unconfined	0.16	1	5.18	4.67	0.51
B-147	AOI 6	2681125	217146	unconfined	-0.4	1	2.65	4.29	-1.64
B-148	AOI 6	2681077	217444	unconfined	-0.81	1	1.74	4.29	-2.55
B-149	AOI 6	2680999	217436	unconfined	-0.2	1	4.58	4.35	0.23
B-150	AOI 6	2680966	217480	unconfined	-0.17	1	2.69	4.39	-1.69
B-151	AOI 6	2680729	217738	unconfined	-0.23	1	3.88	4.28	-0.40
B-152	AOI 6	2680603	217848	unconfined	-0.5	1	3.76	4.25	-0.49
B-153	AOI 6	2680102	217475	unconfined	0.67	1	4.29	2.88	1.41
B-154	AOI 6	2680927	217552	unconfined	0.43	1	5.96	4.38	1.58
B-155	AOI 6	2680975	217400	unconfined	0.54	1	3.44	4.28	-0.84
B-156	AOI 6	2680904	217366	unconfined	0.65	1	3.68	4.20	-0.52
B-157	AOI 6	2680881	217195	unconfined	-1.74	1	3.13	4.07	-0.94
B-158	AOI 6	2679969	217967	unconfined	1.66	1	5.86	3.80	2.06
B-160	AOI 6	2681840	217371	unconfined	2.95	1	4.26	5.36	-1.10
B-161	AOI 6	2681270	216894	unconfined	-0.02	1	3.66	4.59	-0.93
B-163	AOI 6	2681199	217531	unconfined	1.68	1	5.51	4.56	0.95
B-164	AOI 6	2680585	216480	unconfined	-1.14	1	3.32	3.75	-0.43
B-165	AOI 6	2680187	217152	unconfined	2.97	1	3.16	1.14	2.02
B-167	AOI 6	2683188	217814	unconfined	3.56	1	3.18	5.03	-1.85
B-168	AOI 6	2680070	217495	unconfined	4.05	1	4.39	2.33	2.06
B-169	AOI 6	2680092	217416	unconfined	4.23	1	4.38	1.29	3.09
B-170	AOI 6	2680111	217350	unconfined	-1.71	1	-1.66	1.55	-3.21
B-172	AOI 6	2680736	217412	unconfined	2.92	1	2.92	4.04	-1.12
B-173	AOI 6	2681021	216651	unconfined	-1.3	1	3.50	4.17	-0.67
B-174	AOI 6	2681059	216388	unconfined	-1.5	1	5.30	4.12	1.18
B-175	AOI 6	2681336	216863	unconfined	4.10716	1	4.11	4.55	-0.45
B-39	AOI 6	2680590	216614	unconfined	-3.46	1	4.09	4.06	0.03
B-43	AOI 6	2680085	217611	unconfined	-1.61	1	4.49	3.90	0.59
B-45	AOI 6	2680393	218353	unconfined	-4.1	1	4.97	4.23	0.74
B-46	AOI 6	2681909	218131	unconfined	1.32	1	6.59	5.41	1.18

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
B-48	AOI 6	2682248	217529	unconfined	-2.2	1	6.25	5.30	0.95
B-92	AOI 6	2681498	216966	unconfined	-3.2	1	4.63	4.83	-0.20
B-95	AOI 6	2680373	217541	unconfined	4.93	1	4.49	4.23	0.26
BF-103R	AOI 3	2682491	219959	unconfined	3.43	1	0.00	1.84	-1.84
BF-105	AOI 3	2682998	219443	unconfined	0.61	1	0.05	2.05	-2.00
BF-106	AOI 3	2683176	219737	unconfined	0.19	1	-0.03	1.98	-2.01
BF-107	AOI 3	2683307	219941	unconfined	0.55	1	0.10	2.11	-2.01
BF-88	AOI 3	2683465	220156	unconfined	-2.14	1	0.41	2.12	-1.71
BF-99	AOI 3	2683159	219974	unconfined	-4.18	1	0.17	1.89	-1.72
C-104	AOI 7	2679742	219188	unconfined	2.85	1	2.68	1.88	0.80
C-105	AOI 7	2679690	219497	unconfined	5.29	1	5.06	1.66	3.40
C-108	AOI 7	2680856	219819	unconfined	3.88	1	3.83	2.98	0.85
C-109	AOI 7	2682312	219231	unconfined	5.58	1	5.50	5.12	0.38
C-110	AOI 7	2682469	219406	unconfined	6.82	1	6.74	5.19	1.55
C-111	AOI 7	2682561	219232	unconfined	6.62	1	6.59	5.38	1.21
C-113	AOI 7	2682817	218798	unconfined	7.07	1	6.84	6.19	0.65
C-114	AOI 7	2683001	218348	unconfined	7.17	1	6.85	6.07	0.78
C-127	AOI 7	2680897	220182	unconfined	-3.3	1	1.35	2.76	-1.41
C-129	AOI 7	2681937	220497	unconfined	0.2	1	4.11	3.22	0.89
C-130	AOI 7	2682140	219981	unconfined	0.29	1	5.10	5.07	0.03
C-131	AOI 7	2682329	218971	unconfined	-0.72	1	6.52	5.40	1.12
C-132	AOI 7	2682248	218271	unconfined	-0.91	1	5.15	4.05	1.10
C-133	AOI 7	2681694	218336	unconfined	-0.82	1	5.77	5.17	0.60
C-136	AOI 7	2680991	219217	unconfined	-2.215	1	3.85	2.97	0.88
C-137	AOI 7	2680719	219098	unconfined	-4.285	1	2.21	2.85	-0.64
C-138	AOI 7	2680453	218658	unconfined	-2.52	1	2.45	2.71	-0.26
C-139	AOI 7	2680633	219444	unconfined	-1.53	1	4.45	2.85	1.60
C-140	AOI 7	2679799	218858	unconfined	0.99	1	5.87	2.12	3.75
C-142	AOI 7	2680660	220134	unconfined	0.62	1	2.67	0.48	2.19
C-155	AOI 7	2680525	220082	unconfined	3.23	1	3.16	-0.33	3.49
C-156	AOI 7	2681408	220254	unconfined	-6.475	1	3.02	4.07	-1.05
C-157	AOI 7	2681432	220255	unconfined	-6.67	1	3.23	4.02	-0.79
C-159	AOI 7	2681506	220269	unconfined	-6.56	1	3.29	3.61	-0.32
C-163	AOI 7	2681332	220248	unconfined	2.58	1	2.75	3.97	-1.22
C-164	AOI 7	2681359	220252	unconfined	1.98	1	2.61	3.85	-1.24
C-165	AOI 7	2681386	220255	unconfined	2.4	1	2.85	3.90	-1.05
C-168	AOI 7	2679988	220174	unconfined	3.45	1	2.14	1.69	0.46

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
C-171	AOI 7	2679795	219649	unconfined	6.72	1	6.72	2.54	4.18
C-172	AOI 7	2680375	218451	unconfined	2.59	1	2.59	2.65	-0.06
C-50	AOI 7	2682341	219619	unconfined	-1.17	1	5.29	5.11	0.18
C-51	AOI 7	2681621	220073	unconfined	-1.1	1	4.12	4.71	-0.59
C-52	AOI 7	2681216	220206	unconfined	-1.32	1	2.25	4.13	-1.88
C-53A	AOI 7	2681031	219940	unconfined	-0.88	1	5.70	4.11	1.59
C-54	AOI 7	2680975	219459	unconfined	-2.51	1	5.39	2.99	2.40
C-55	AOI 7	2680864	218851	unconfined	-3.51	1	4.31	2.89	1.42
C-56	AOI 7	2681367	218776	unconfined	0.4	1	8.27	5.09	3.18
C-57	AOI 7	2681651	219572	unconfined	-1.05	1	5.66	4.97	0.69
C-58	AOI 7	2681692	219017	unconfined	-0.61	1	5.43	5.11	0.32
C-60	AOI 7	2680151	218657	unconfined	-1.98	1	3.77	2.58	1.19
C-61	AOI 7	2679819	219306	unconfined	-0.12	1	4.58	2.49	2.09
C-62	AOI 7	2679892	219890	unconfined	0.35	1	6.52	2.75	3.77
C-63	AOI 7	2680379	219611	unconfined	-3.83	1	2.38	2.84	-0.46
C-64	AOI 7	2680431	220167	unconfined	-1.83	1	0.27	-11.19	11.47
C-65	AOI 7	2680266	220116	unconfined	-0.53	1	4.20	-4.15	8.35
C-96	AOI 7	2681980	219529	unconfined	-2.18	1	6.75	5.18	1.57
C-97	AOI 7	2680616	220230	unconfined	-2.45	1	-5.05	-8.71	3.66
C-98	AOI 7	2680220	219208	unconfined	-0.66	1	4.73	2.73	2.00
CSX-IW-5	DSCP	2686326	223316	unconfined	-0.56	1	1.20	2.42	-1.22
CSX-MW2	DSCP	2686231	222459	unconfined	16.025	1	0.55	1.65	-1.10
CSX-MW3A	DSCP	2686250	222972	unconfined	15.34	1	0.73	2.01	-1.28
CSX-MW4	DSCP	2686223	222715	unconfined	19.235	1	0.53	1.78	-1.25
CSX-MW5	DSCP	2686326	223321	unconfined	21.415	1	2.68	2.42	0.26
CSX-MW7	DSCP	2686132	222540	unconfined	13.965	1	0.32	1.46	-1.14
CSX-MW8	DSCP	2686196	222613	unconfined	15.28	1	0.38	1.65	-1.27
CSX-MW9	DSCP	2686193	223091	unconfined	18.28	1	0.72	1.96	-1.24
DSCP-MW-1	DSCP	2686587	222951	unconfined	4.335	1	1.20	2.55	-1.35
DSCP-MW-10	DSCP	2688682	221989	unconfined	1.095	1	2.69	2.64	0.05
DSCP-MW-11	DSCP	2688509	222483	unconfined	2.46	1	1.31	2.99	-1.68
DSCP-MW-12	DSCP	2688887	222849	unconfined	-7.375	1	1.58	3.40	-1.82
DSCP-MW-13	DSCP	2688362	222878	unconfined	4.5	1	1.65	3.29	-1.64
DSCP-MW-14	DSCP	2687863	222366	unconfined	2.72	1	0.76	2.73	-1.97
DSCP-MW-15	DSCP	2687278	222669	unconfined	5.52	1	0.78	2.75	-1.97
DSCP-MW-16	DSCP	2686924	222962	unconfined	4.455	1	1.27	2.76	-1.49
DSCP-MW-17	DSCP	2687015	223191	unconfined	6.115	1	1.80	2.98	-1.18

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
DSCP-MW-19	DSCP	2686631	223493	unconfined	7.08	1	3.23	2.95	0.28
DSCP-MW-1A	DSCP	2688112	222563	unconfined	7.555	1	1.19	2.96	-1.77
DSCP-MW-2	DSCP	2686659	222486	unconfined	3.765	1	0.64	2.26	-1.62
DSCP-MW-20	DSCP	2686775	224059	unconfined	9.285	1	3.98	3.89	0.09
DSCP-MW-21A	DSCP	2687617	223591	unconfined	6.685	1	2.59	3.59	-1.00
DSCP-MW-23A	DSCP	2686572	222722	unconfined	4.3	1	0.82	2.39	-1.57
DSCP-MW-24	DSCP	2687351	222881	unconfined	7.325	1	1.16	2.94	-1.78
DSCP-MW-27A	DSCP	2687880	222716	unconfined	5.815	1	1.29	3.02	-1.73
DSCP-MW-28	DSCP	2686735	222344	unconfined	2.77	1	0.92	2.20	-1.28
DSCP-MW-29	DSCP	2686965	222161	unconfined	3.425	1	0.88	2.19	-1.31
DSCP-MW-2B	DSCP	2687618	223121	unconfined	3.435	1	1.85	3.26	-1.41
DSCP-MW-30	DSCP	2687219	222184	unconfined	2.625	1	0.65	2.33	-1.68
DSCP-MW-32	DSCP	2687645	222120	unconfined	3.44	1	1.65	2.46	-0.81
DSCP-MW-33	DSCP	2687847	222091	unconfined	1.31	1	0.62	2.50	-1.88
DSCP-MW-35A	DSCP	2687607	222354	unconfined	3.14	1	1.01	2.64	-1.63
DSCP-MW-36	DSCP	2688198	221951	unconfined	2.545	1	0.75	2.49	-1.74
DSCP-MW-3A	DSCP	2687182	222473	unconfined	3.56	1	2.18	2.55	-0.37
DSCP-MW-44A	DSCP	2686629	223212	unconfined	2.455	1	1.52	2.72	-1.20
DSCP-MW-45A	DSCP	2686661	223705	unconfined	6.36	1	3.52	3.25	0.27
DSCP-MW-4A	DSCP	2687066	222254	unconfined	5.185	1	0.65	2.32	-1.67
DSCP-MW-5	DSCP	2687276	222313	unconfined	3.9	1	1.00	2.47	-1.47
DSCP-MW-53	DSCP	2688910	223078	unconfined	1.45	1	1.85	3.59	-1.74
DSCP-MW-54	DSCP	2688606	222975	unconfined	3.045	1	1.73	3.44	-1.71
DSCP-MW-59	DSCP	2688866	222696	unconfined	2.2	1	1.39	3.26	-1.87
DSCP-MW-6	DSCP	2687259	222070	unconfined	4.38	1	0.66	2.26	-1.60
DSCP-MW-65	DSCP	2687428	222124	unconfined	-2.03	1	0.68	2.38	-1.70
DSCP-MW-7	DSCP	2688049	221962	unconfined	6.385	1	0.87	2.46	-1.59
DSCP-MW-9	DSCP	2688453	221927	unconfined	2.75	1	1.10	2.54	-1.44
DSCP-RW-10	DSCP	2688044	222360	unconfined	1.24	1	1.08	2.78	-1.70
DSCP-RW-11	DSCP	2687629	222027	unconfined	2.285	1	1.02	2.38	-1.36
DSCP-RW-1A	DSCP	2687406	222061	unconfined	1.83	1	0.64	2.32	-1.68
DSCP-RW-2	DSCP	2686840	222240	unconfined	3.655	1	0.93	2.18	-1.25
DSCP-RW-3	DSCP	2687102	222099	unconfined	3.44	1	0.80	2.21	-1.41
DSCP-RW-4	DSCP	2687542	222032	unconfined	2.26	1	0.96	2.35	-1.39
DSCP-RW-5/MW-25	DSCP	2687690	222012	unconfined	5.595	1	0.51	2.39	-1.88
DSCP-RW-6	DSCP	2687840	221992	unconfined	1.34	1	0.42	2.42	-2.00
DSCP-RW-7	DSCP	2687993	221974	unconfined	1.865	1	0.75	2.45	-1.70

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
DSCP-RW-8	DSCP	2687444	222376	unconfined	1.585	1	1.15	2.59	-1.44
DSCP-RW-9	DSCP	2688233	222374	unconfined	1.4	1	0.94	2.84	-1.90
EPH-MW-39	DSCP	2688284	221752	unconfined	-0.27	1	-0.90	2.35	-3.25
EPH-MW-48	DSCP	2687984	221540	unconfined	0.585	1	0.89	1.66	-0.77
EPH-MW-49	DSCP	2687860	221395	unconfined	2.81	1	0.88	1.96	-1.08
EPH-MW-50	DSCP	2687767	221178	unconfined	1.375	1	-0.24	2.23	-2.47
EPH-MWS-10	DSCP	2687988	221053	unconfined	5.46	1	3.78	2.47	1.31
EPH-MWS-11	DSCP	2687625	221111	unconfined	5.105	1	0.83	2.25	-1.42
EPH-MWS-5	DSCP	2688545	221597	unconfined	0.455	1	0.71	1.80	-1.09
EPH-PH-5	DSCP	2687579	220875	unconfined	-2.32	1	0.54	2.46	-1.92
EPH-PH-7	DSCP	2688852	221563	unconfined	-1.09	1	3.18	2.26	0.92
MW-1	AOI 4	2684314	220715	unconfined	3.68	1	0.64	2.05	-1.41
MW-26	BELMONT	2685920	224123	unconfined	-7.91	1	3.43	3.34	0.08
MW-27	BELMONT	2685686	224065	unconfined	9.55	1	3.47	3.65	-0.18
MW-28	BELMONT	2685581	224169	unconfined	9.26	1	3.53	3.93	-0.40
MW-29	BELMONT	2685481	223955	unconfined	9.5	1	3.46	3.81	-0.35
MW-30	BELMONT	2684982	224261	unconfined	4.5	1	4.22	4.60	-0.38
MW-31	BELMONT	2685353	224156	unconfined	11.48	1	4.54	4.20	0.34
MW-32	BELMONT	2685565	224286	unconfined	9.59	1	3.64	4.11	-0.47
MW-33	BELMONT	2685300	224346	unconfined	12.3	1	4.67	4.48	0.19
MW-35	BELMONT	2685572	224473	unconfined	3.34	1	3.26	4.40	-1.14
MW-36	BELMONT	2685830	224431	unconfined	5.25	1	3.93	4.05	-0.12
MW-37	BELMONT	2685985	224470	unconfined	5.05	1	4.27	4.20	0.07
MW-38	BELMONT	2686166	224255	unconfined	0.48	1	3.75	3.70	0.05
MW-39	BELMONT	2686158	224193	unconfined	0.49	1	3.72	3.48	0.24
MW-40	BELMONT	2686146	224123	unconfined	3.81	1	3.58	3.13	0.45
MW-41	BELMONT	2686036	224120	unconfined	0.16	1	3.58	3.22	0.36
MW-43	BELMONT	2685063	224183	unconfined	3.48	1	3.75	4.46	-0.71
MW-44	BELMONT	2685403	224419	unconfined	2.32	1	3.18	4.48	-1.30
MWELL-28	AOI 1	2685865	222299	unconfined	-0.375	1	-0.03	0.40	-0.43
MWELL-29	AOI 1	2685808	222019	unconfined	-1.965	1	-0.75	-0.84	0.09
MWELL-30	AOI 1	2685800	221601	unconfined	4.17	1	-0.64	-2.35	1.71
MWELL-31	AOI 1	2685710	221306	unconfined	5.89	1	-0.29	0.78	-1.07
N-1	AOI 8	2682437	228366	unconfined	18.57	1	10.89	7.46	3.43
N-100	AOI 8	2682716	228210	unconfined	9.99	1	9.10	6.35	2.75
N-101	AOI 8	2683653	227222	unconfined	7.43	1	11.20	10.94	0.26
N-106	AOI 8	2682977	227044	unconfined	7.5	1	14.36	16.38	-2.02

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
N-107	AOI 8	2683133	226910	unconfined	7.38	1	11.11	13.39	-2.28
N-108	AOI 8	2682983	226849	unconfined	9.97	1	12.04	13.04	-1.00
N-11	AOI 8	2682915	227226	unconfined	14.83	1	11.50	11.16	0.34
N-118	AOI 8	2683077	226461	unconfined	6.49	1	8.90	8.57	0.33
N-12	AOI 8	2683394	227099	unconfined	6.08	1	11.24	11.56	-0.32
N-129	AOI 8	2683241	225470	unconfined	5.12	1	9.80	9.24	0.56
N-134	AOI 8	2685262	226063	unconfined	10.79	1	9.74	7.51	2.23
N-137	AOI 8	2683096	227832	unconfined	5.87	1	8.28	7.64	0.64
N-14	AOI 8	2683665	227011	unconfined	17.14	1	10.94	10.10	0.84
N-140	AOI 8	2683133	227411	unconfined	8.16	1	9.80	9.89	-0.09
N-141	AOI 8	2683308	227396	unconfined	7.535	1	10.68	11.09	-0.41
N-142	AOI 8	2683211	227652	unconfined	6.985	1	8.13	9.28	-1.15
N-143	AOI 8	2683358	227513	unconfined	8.215	1	10.60	10.59	0.01
N-144	AOI 8	2683293	227623	unconfined	6.77	1	8.53	9.76	-1.23
N-145	AOI 8	2683032	227680	unconfined	7.355	1	8.06	8.27	-0.21
N-15	AOI 8	2684060	226993	unconfined	17.05	1	8.44	8.03	0.41
N-151	AOI 8	2683620	225640	unconfined	9.76	1	9.95	8.78	1.17
N-16	AOI 8	2684409	226993	unconfined	18.4	1	11.17	7.70	3.47
N-17	AOI 8	2684410	226993	unconfined	19.05	1	11.16	7.70	3.46
N-18	AOI 8	2684650	226744	unconfined	17.65	1	11.03	7.84	3.19
N-20	AOI 8	2683878	226645	unconfined	22.12	1	10.85	9.05	1.80
N-24	AOI 8	2682554	226437	unconfined	10.03	1	8.35	7.50	0.85
N-29	AOI 8	2685039	225835	unconfined	21.6	1	9.82	10.03	-0.21
N-37	AOI 8	2681543	226828	lower aquifer	4.26	1	5.87	5.87	0.00
N-37	AOI 8	2681543	226828	lower aquifer	4.26	1	5.87	5.87	0.00
N-42	AOI 8	2682412	225813	unconfined	4.59	1	7.26	8.12	-0.86
N-47	AOI 8	2683936	225489	unconfined	17.05	1	11.87	9.20	2.67
N-48	AOI 8	2683476	225312	unconfined	15.42	1	9.35	9.43	-0.08
N-49	AOI 8	2683115	225175	unconfined	17.05	1	8.92	9.79	-0.87
N-503	AOI 8	2680566	226576	unconfined	11.46	1	3.79	4.27	-0.48
N-504	AOI 8	2680652	226857	unconfined	11.36	1	3.37	3.80	-0.43
N-51	AOI 8	2682956	225253	unconfined	16.92	1	9.13	9.71	-0.58
N-55	AOI 8	2681474	225122	unconfined	4.39	1	4.65	8.44	-3.79
N-56	AOI 8	2681266	225659	unconfined	4.18	1	4.86	8.74	-3.88
N-57	AOI 8	2680586	226031	unconfined	3.8	1	5.00	7.28	-2.28
N-64	AOI 8	2682309	224842	unconfined	2.5	1	3.79	3.68	0.11
N-67	AOI 8	2682698	226940	unconfined	14.9	1	14.21	14.11	0.10

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
N-68	AOI 8	2682973	226911	unconfined	14.87	1	16.90	15.28	1.62
N-72	AOI 8	2680686	226761	unconfined	1.26	1	3.58	6.39	-2.81
N-8	AOI 8	2684092	227375	unconfined	18.53	1	11.64	10.23	1.41
N-82	AOI 8	2684634	225723	unconfined	8.48	1	9.69	9.08	0.61
N-85	AOI 8	2684734	226448	unconfined	8.95	1	11.16	7.14	4.02
N-86	AOI 8	2684119	226463	unconfined	16.3	1	10.66	8.70	1.96
N-87	AOI 8	2683965	226550	unconfined	10.89	1	10.71	9.12	1.59
N-89	AOI 8	2682824	226717	unconfined	9.87	1	9.10	9.85	-0.75
N-93	AOI 8	2683794	226550	unconfined	10.05	1	10.19	8.70	1.49
N-97	AOI 8	2684187	226513	unconfined	9.12	1	8.98	8.34	0.64
N-98	AOI 8	2683479	227658	unconfined	7.46	1	11.25	9.94	1.31
OW-12	BELMONT	2685686	224424	unconfined	15.235	1	3.94	4.17	-0.23
OW-13	BELMONT	2685988	224385	unconfined	16.445	1	3.94	3.98	-0.04
OW-16	BELMONT	2685739	224420	unconfined	15.82	1	3.86	4.08	-0.22
OW-17	BELMONT	2685587	224388	unconfined	15.15	1	3.40	4.24	-0.84
OW-18	BELMONT	2685520	224437	unconfined	10.75	1	4.05	4.40	-0.35
OW-19	BELMONT	2685717	224415	unconfined	11.22	1	4.61	4.10	0.51
OW-2	BELMONT	2685939	224392	unconfined	16.215	1	3.99	3.99	0.00
OW-20	BELMONT	2685840	224404	unconfined	12.43	1	4.03	3.96	0.07
P-21	AOI 8	2682672	224785	unconfined	8	1	8.00	6.11	1.89
PGW-MW-1	PGW	2683228	224438	unconfined	8.66	1	8.41	8.60	-0.19
PGW-MW-10S	PGW	2685131	225179	unconfined	6.2	1	9.50	9.33	0.17
PGW-MW-11	PGW	2683813	224768	unconfined	10.55	1	10.12	9.40	0.72
PGW-MW-15	PGW	2683427	224122	unconfined	8.21	1	7.98	6.20	1.78
PGW-MW-17	PGW	2683385	224541	unconfined	9.47	1	9.46	9.73	-0.27
PGW-MW-18S	PGW	2683206	224683	unconfined	9.41	1	9.08	9.92	-0.84
PGW-MW-1S	PGW	2683457	224135	unconfined	6.3	1	7.49	6.27	1.22
PGW-MW-20	AOI 8	2682870	224701	unconfined	9.02	1	8.92	7.62	1.30
PGW-MW-22	PGW	2682953	224875	unconfined	10.03	1	9.82	9.94	-0.12
PGW-MW-23	PGW	2684193	224341	unconfined	10.74	1	10.20	5.01	5.19
PGW-MW-24	AOI 8	2682932	225026	unconfined	10.08	1	10.08	9.98	0.10
PGW-MW-2A	PGW	2683341	224285	unconfined	8.12	1	7.86	7.95	-0.09
PGW-MW-2S	PGW	2683928	224288	unconfined	8.2	1	8.90	7.37	1.53
PGW-MW-3	PGW	2683356	224400	unconfined	10.46	1	10.23	9.13	1.10
PGW-MW-34	PGW	2683317	225168	unconfined	11.68	1	10.31	9.81	0.50
PGW-MW-39	PGW	2683023	224810	unconfined	9.77	1	9.56	9.94	-0.38
PGW-MW-3S	PGW	2684683	224482	unconfined	8	1	8.91	7.06	1.85

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
PGW-MW-42R	PGW	2684370	225557	unconfined	12.1	1	10.31	9.33	0.98
PGW-MW-44	PGW	2684147	225231	unconfined	11.99	1	11.57	9.32	2.25
PGW-MW-45	PGW	2684686	225671	unconfined	11.66	1	11.24	9.57	1.67
PGW-MW-5	AOI 8	2683138	224445	unconfined	8.12	1	7.98	7.20	0.78
PGW-MW-5S	PGW	2685404	225420	unconfined	3.2	1	8.10	7.59	0.51
PGW-MW-6	AOI 8	2682885	224559	unconfined	3.06	1	3.88	3.36	0.52
PGW-MW-6S	PGW	2685348	224948	unconfined	7.5	1	7.94	5.48	2.46
PGW-MW-7	AOI 8	2682986	224648	unconfined	8.2	1	8.12	8.45	-0.33
PGW-MW-7S	PGW	2685067	224606	unconfined	3.2	1	5.82	4.90	0.92
PGW-MW-8	AOI 8	2683074	224544	unconfined	8.2	1	7.88	7.98	-0.10
PGW-MW-8S	AOI 2	2684218	224041	unconfined	3.5	1	4.31	4.86	-0.55
PGW-MW-9	AOI 8	2683174	224408	unconfined	8.05	1	7.85	7.16	0.69
PH-MW-40	DSCP	2687731	221480	unconfined	0.065	1	0.86	1.72	-0.86
PH-MW-41	DSCP	2687413	221534	unconfined	3.62	1	0.91	1.34	-0.43
PH-MW-42	DSCP	2686769	221821	unconfined	2.08	1	0.49	1.71	-1.22
PH-MW-43	DSCP	2686438	221827	unconfined	6.945	1	0.29	1.34	-1.05
PH-MW-51	DSCP	2687500	221132	unconfined	0.97	1	0.80	2.17	-1.37
PH-MW-55	DSCP	2686505	222267	unconfined	6.165	1	0.51	2.01	-1.50
PH-MW-56	DSCP	2686556	221083	unconfined	1.455	1	0.43	1.78	-1.35
PH-MW-57	DSCP	2686282	220525	unconfined	3.31	1	-0.53	2.13	-2.66
PH-MW-58	DSCP	2686349	221238	unconfined	4.875	1	0.61	1.45	-0.84
PH-MW-60	DSCP	2687960	221802	unconfined	-1.775	1	0.78	2.32	-1.54
PH-MWS-1	DSCP	2686452	221928	unconfined	9.79	1	0.35	1.49	-1.14
PH-MWS-13	DSCP	2686359	221371	unconfined	6.945	1	0.54	1.31	-0.77
PH-MWS-2A	DSCP	2687207	221520	unconfined	0.6	1	0.79	1.33	-0.54
PH-MWS-3	DSCP	2687763	221556	unconfined	-1.45	1	0.85	1.47	-0.62
PH-MWS-4	DSCP	2687804	221600	unconfined	3.58	1	1.23	1.56	-0.33
PH-MWS-4	DSCP	2687804	221600	unconfined	3.58	1	1.23	1.56	-0.33
PH-PH-1	DSCP	2686489	222120	unconfined	7.22	1	0.51	1.89	-1.38
PH-PH-13	DSCP	2687220	221617	unconfined	2.67	1	0.48	1.27	-0.79
PH-PH-14	DSCP	2687012	221567	unconfined	5.04	1	0.69	1.06	-0.37
PH-PH-16	DSCP	2687623	221740	unconfined	2.57	1	1.19	2.12	-0.93
PH-PH-17	DSCP	2687678	221881	unconfined	1.175	1	0.70	2.29	-1.59
PH-PH-18	DSCP	2687410	221922	unconfined	1.47	1	0.52	2.22	-1.70
PH-PH-19	DSCP	2687210	221950	unconfined	1.28	1	1.03	2.15	-1.12
PH-PH-2	DSCP	2686821	222025	unconfined	4.855	1	0.52	1.99	-1.47
PH-PH-20	DSCP	2686939	221991	unconfined	2.97	1	0.70	2.03	-1.33

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
PH-PH-21	DSCP	2686682	222101	unconfined	6.66	1	0.46	1.98	-1.52
PH-PH-22	DSCP	2686409	221643	unconfined	5.46	1	0.67	1.20	-0.53
PH-PH-23	DSCP	2686701	221254	unconfined	1.71	1	0.94	1.70	-0.76
PH-PH-24	DSCP	2687242	221174	unconfined	1.84	1	1.63	2.02	-0.39
PH-PH-3	DSCP	2687314	221945	unconfined	5.63	1	0.60	2.20	-1.60
PH-PH-4	DSCP	2687928	221845	unconfined	0.985	1	0.77	2.34	-1.57
PH-PZ-4	DSCP	2687319	221943	unconfined	9.96	1	1.03	2.20	-1.17
PH-RW-A	DSCP	2686638	222124	unconfined	4.55	1	2.41	1.98	0.43
PH-RW-A2	DSCP	2686640	222131	unconfined	10.8	1	0.30	1.98	-1.68
PH-RW-B	DSCP	2686815	222035	unconfined	3.87	1	2.02	1.99	0.03
PH-RW-B2	DSCP	2686821	222030	unconfined	10.805	1	1.20	1.99	-0.79
PH-RW-C	DSCP	2687070	221975	unconfined	4.065	1	1.30	2.09	-0.79
PH-RW-CA	DSCP	2687084	221963	unconfined	5.025	1	1.47	2.09	-0.62
PH-RW-E	DSCP	2687539	221910	unconfined	1.965	1	0.61	2.26	-1.65
PH-RW-F	DSCP	2687826	221867	unconfined	0.025	1	0.71	2.33	-1.62
PH-RW-G	DSCP	2687154	221567	unconfined	7.55	1	2.18	1.16	1.02
PH-RW-I2	DSCP	2686803	221923	unconfined	10.225	1	2.20	1.87	0.33
PH-RW-N	DSCP	2687810	221599	unconfined	1.735	1	0.84	1.56	-0.72
PH-RW-O	DSCP	2687693	221589	unconfined	0.4	1	2.20	1.45	0.75
PH-RW-P	DSCP	2687599	221597	unconfined	1.15	1	2.41	1.47	0.94
PH-RW-Q	DSCP	2687510	221586	unconfined	-1.75	1	3.18	1.38	1.80
PH-RW-S	DSCP	2687350	221602	unconfined	-1.01	1	1.86	1.38	0.48
PH-RW-U	DSCP	2686879	221846	unconfined	2.615	1	2.91	1.85	1.06
PH-RW-V	DSCP	2686705	221936	unconfined	2.59	1	1.96	1.83	0.13
PH-RW-W	DSCP	2686591	221952	unconfined	2.525	1	2.03	1.82	0.21
PZ-100	AOI 2	2683602	222350	unconfined	1.42	1	2.97	2.37	0.60
PZ-132A	AOI 6	2680866	216104	unconfined	0.62	1	3.86	1.65	2.21
PZ-2	AOI 5	2681495	215938	unconfined	2.56	1	5.58	4.56	1.02
PZ-201	AOI 8	2683718	225409	unconfined	10.21	1	10.10	9.24	0.86
PZ-202	AOI 8	2683876	225484	unconfined	11.24	1	10.88	9.17	1.71
PZ-203	AOI 8	2684037	225560	unconfined	13.93	1	14.47	9.07	5.40
PZ-204	AOI 8	2684196	225633	unconfined	8.03	1	8.38	8.82	-0.44
PZ-3	AOI 5	2681511	215958	unconfined	2.87	1	3.07	4.50	-1.43
PZ-300	AOI 8	2683295	226640	unconfined	9.39	1	9.42	9.22	0.20
PZ-400	BELMONT	2686131	224096	unconfined	13.855	1	3.45	3.01	0.44
PZ-402	AOI 1	2686061	223552	unconfined	-2.82	1	2.17	2.19	-0.02
PZ-403	AOI 1	2685965	222935	unconfined	0.8	1	0.54	1.35	-0.81

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
PZ-404	AOI 1	2685981	222933	unconfined	5.615	1	-0.87	1.28	-2.15
PZ-500	AOI 8	2680478	225305	unconfined	5.13	1	5.13	3.14	1.99
PZ-501	AOI 8	2680429	225835	unconfined	4.37	1	3.70	3.51	0.19
PZ-502	AOI 8	2680434	225562	unconfined	6.14	1	5.01	3.44	1.57
PZ-503	AOI 8	2680590	225085	unconfined	4.58	1	4.79	2.87	1.92
PZ-504	AOI 8	2680730	224903	unconfined	4.54	1	4.73	3.85	0.88
PZ-505	AOI 8	2681024	224708	unconfined	4.56	1	4.71	3.72	0.99
PZ-507	AOI 8	2682206	224812	unconfined	3.68	1	3.67	3.24	0.43
RW-1	BELMONT	2685680	224407	unconfined	-4.42	1	3.67	4.14	-0.47
RW-100	AOI 2	2683341	222349	unconfined	-3.66	1	2.37	2.39	-0.02
RW-101	AOI 2	2683489	222384	unconfined	-3.63	1	2.75	2.42	0.33
RW-102	AOI 2	2683599	222321	unconfined	-4.76	1	2.57	2.35	0.22
RW-103	AOI 2	2683770	222358	unconfined	-5.24	1	3.01	2.27	0.74
RW-104	AOI 2	2682960	222446	unconfined	-6.89	1	-0.88	2.06	-2.94
RW-105	AOI 2	2682964	222412	unconfined	-2.87	1	0.17	2.28	-2.11
RW-106	AOI 2	2682946	222348	unconfined	-2.71	1	1.72	2.26	-0.54
RW-107	AOI 2	2682915	222272	unconfined	1.3	1	0.40	2.26	-1.86
RW-108	AOI 2	2682895	222181	unconfined	-3.66	1	1.98	2.26	-0.28
RW-110	AOI 1	2685160	222136	unconfined	5.7	1	0.70	1.37	-0.67
RW-111	AOI 1	2685197	222112	unconfined	5.8	1	0.62	1.34	-0.72
RW-112	AOI 1	2685156	222113	unconfined	3.71	1	0.60	1.36	-0.76
RW-113	AOI 2	2682988	222409	unconfined	-8.9	1	1.38	2.29	-0.91
RW-115	AOI 2	2682980	222371	unconfined	-8.7	1	1.59	2.28	-0.69
RW-116	AOI 2	2682987	222340	unconfined	-8.11	1	1.69	2.29	-0.60
RW-117	AOI 2	2682964	222320	unconfined	-9.06	1	1.70	2.28	-0.59
RW-118	AOI 2	2682999	222302	unconfined	-7.03	1	1.85	2.31	-0.46
RW-120	AOI 2	2683027	222353	unconfined	0.27	1	1.70	2.31	-0.61
RW-121	AOI 2	2683050	222376	unconfined	1.3	1	1.76	2.32	-0.56
RW-123	AOI 2	2682969	222296	unconfined	-9.02	1	1.90	2.29	-0.39
RW-125	AOI 2	2683040	222428	unconfined	-4.3	1	1.77	2.34	-0.57
RW-126	AOI 2	2682936	222285	unconfined	-9.65	1	1.66	2.27	-0.61
RW-127	AOI 2	2683036	222383	unconfined	-4.65	1	1.68	2.31	-0.63
RW-129	AOI 2	2683008	222434	unconfined	-8.55	1	1.06	2.32	-1.26
RW-201	AOI 8	2682704	225060	unconfined	4.11	1	9.03	9.78	-0.75
RW-202	AOI 8	2682881	225065	unconfined	3.54	1	9.02	9.91	-0.89
RW-204	AOI 8	2683190	225163	unconfined	3.84	1	9.07	9.80	-0.73
RW-205	AOI 8	2683343	225251	unconfined	7.8	1	10.17	9.59	0.58

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
RW-206	AOI 8	2683557	225332	unconfined	7.08	1	9.32	9.37	-0.05
RW-21	BELMONT	2685822	224345	unconfined	14.755	1	3.69	3.83	-0.14
RW-22	BELMONT	2685892	224304	unconfined	-0.9	1	3.75	3.75	0.00
RW-25	BELMONT	2685725	224365	unconfined	2.24	1	3.74	3.97	-0.23
RW-26	BELMONT	2685474	224410	unconfined	0.6	1	4.04	4.40	-0.36
RW-27	BELMONT	2685423	224396	unconfined	0.74	1	3.11	4.43	-1.32
RW-28	BELMONT	2685357	224378	unconfined	0.1	1	4.59	4.47	0.12
RW-29	BELMONT	2685286	224360	unconfined	0.19	1	3.16	4.51	-1.35
RW-30	BELMONT	2685257	224352	unconfined	0.33	1	3.25	4.52	-1.27
RW-303	AOI 8	2683167	226663	unconfined	10.73	1	10.72	9.57	1.15
RW-307	AOI 8	2683080	226604	unconfined	22.82	1	8.59	9.28	-0.69
RW-308	AOI 8	2683240	226623	unconfined	25.27	1	8.84	9.24	-0.40
RW-309	AOI 8	2683373	226602	unconfined	24.81	1	9.55	8.95	0.60
RW-31	BELMONT	2685206	224339	unconfined	0.31	1	3.23	4.55	-1.32
RW-401	AOI 1	2686040	223555	unconfined	-7.99	1	2.59	2.23	0.36
RW-404	AOI 1	2686015	223152	unconfined	-3.81	1	0.50	1.50	-1.00
RW-500	AOI 8	2680478	225305	unconfined	6.79	1	4.85	3.18	1.67
RW-501	AOI 8	2681487	224727	unconfined	7.98	1	3.77	5.13	-1.36
RW-502	AOI 8	2680607	226714	unconfined	11.4	1	3.93	4.74	-0.81
RW-6	BELMONT	2686038	224377	unconfined	16.235	1	4.09	3.98	0.11
RW-600	AOI 2	2683369	223296	unconfined	-5.51	1	3.77	2.80	0.97
RW-601	AOI 2	2683325	223213	unconfined	-2.44	1	2.63	2.68	-0.05
RW-6S	AOI 5	2681520	215947	unconfined	5.22	1	3.11	4.43	-1.32
RW-7	BELMONT	2685894	224363	unconfined	-5.93	1	3.81	3.90	-0.09
RW-9	AOI 6	2681446	216562	unconfined	3.71	1	3.68	4.59	-0.91
RWBH-2	AOI 5	2682109	215220	unconfined	-0.67	1	1.30	2.48	-1.18
S-100	AOI 1	2686178	223523	unconfined	0.09	1	2.71	2.35	0.36
S-101	AOI 1	2686296	223163	unconfined	-1.73	1	1.45	2.23	-0.78
S-102	AOI 4	2683874	221407	unconfined	3.13	1	2.68	2.21	0.47
S-103	AOI 4	2684428	221275	unconfined	6.05	1	0.92	2.00	-1.08
S-104	AOI 4	2684804	221448	unconfined	0.63	1	1.91	1.79	0.12
S-105	AOI 2	2683300	223164	unconfined	4.64	1	2.03	2.63	-0.60
S-107	AOI 2	2683338	223258	unconfined	1.495	1	2.73	2.71	0.02
S-108	AOI 2	2683362	223294	unconfined	-1.04	1	3.99	2.78	1.21
S-108SRTF	AOI 9	2677667	218321	unconfined	-5.93	1	0.55	-1.18	1.74
S-109SRTF	AOI 9	2677084	217894	unconfined	-6.76	1	0.08	-1.88	1.97
S-111SRTF	AOI 9	2677273	217432	unconfined	-8.64	1	-8.24	-2.87	-5.37

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
S-112SRTF	AOI 9	2677256	216984	unconfined	-8.41	1	-8.71	-3.84	-4.86
S-113SRTF	AOI 9	2676915	216800	unconfined	-9.57	1	-8.79	-4.20	-4.59
S-114SRTF	AOI 9	2676978	216435	unconfined	-10.44	1	-8.76	-5.14	-3.62
S-115SRTF	AOI 9	2676754	216194	unconfined	-9.8	1	-8.92	-5.68	-3.24
S-116SRTF	AOI 9	2676903	215942	unconfined	-11.68	1	-8.91	-6.34	-2.58
S-117	AOI 1	2685492	222352	unconfined	0.6	1	0.82	1.33	-0.51
S-118	AOI 1	2685533	221629	unconfined	-0.41	1	0.06	0.20	-0.14
S-118SRTF	AOI 9	2676678	215161	unconfined	-8.98	1	-7.34	-8.28	0.94
S-119	AOI 4	2685393	220753	unconfined	-0.18	1	-1.60	1.84	-3.44
S-121SRTF	AOI 9	2677486	215710	unconfined	-8.54	1	-7.06	-6.96	-0.10
S-122SRTF	AOI 9	2677653	216573	unconfined	-7.96	1	-6.87	-4.76	-2.11
S-125	AOI 1	2686079	223506	unconfined	3.84	1	2.34	2.11	0.23
S-127	AOI 1	2685644	222203	unconfined	-3.62	1	0.80	0.73	0.07
S-130	AOI 2	2684124	222280	unconfined	2.41	1	3.32	1.86	1.46
S-131	AOI 2	2684100	222307	unconfined	2.91	1	2.76	1.90	0.86
S-132	AOI 2	2684095	222243	unconfined	1.24	1	2.88	1.87	1.01
S-133	AOI 2	2684056	222303	unconfined	1.63	1	2.66	1.91	0.75
S-134	AOI 2	2684441	222209	unconfined	2.61	1	1.34	1.40	-0.06
S-135	AOI 2	2684162	222278	unconfined	2.34	1	0.45	1.82	-1.38
S-135SRTF	AOI 9	2676810	216462	unconfined	-13.09	1	-7.81	-5.03	-2.78
S-136	AOI 2	2684135	222257	unconfined	2.95	1	2.60	1.84	0.76
S-136SRTF	AOI 9	2677244	218406	unconfined	-6.45	1	0.40	-0.99	1.38
S-139	AOI 2	2683570	222392	unconfined	0.9	1	3.04	2.41	0.63
S-141	AOI 2	2683427	222387	unconfined	1.965	1	2.69	2.43	0.27
S-142	AOI 2	2683609	222348	unconfined	-0.19	1	2.04	2.36	-0.32
S-152	AOI 2	2683337	223247	unconfined	-0.9	1	2.21	2.70	-0.49
S-154	AOI 2	2683290	223236	unconfined	0.14	1	2.16	2.59	-0.43
S-156	AOI 2	2684180	222281	unconfined	3.18	1	2.40	1.81	0.59
S-157	AOI 2	2684107	222285	unconfined	2.29	1	2.52	1.87	0.65
S-159	AOI 2	2683730	222304	unconfined	6.67	1	2.64	2.26	0.37
S-162	AOI 1	2685202	222131	unconfined	4.925	1	0.69	1.35	-0.66
S-164	AOI 1	2685039	222134	unconfined	2.9	1	0.81	1.30	-0.49
S-166	AOI 2	2684909	222170	unconfined	3.22	1	1.30	1.15	0.15
S-175	AOI 2	2684500	222226	unconfined	5.9	1	2.01	1.34	0.68
S-193	AOI 1	2686254	223959	unconfined	3.48	1	3.49	3.00	0.49
S-196	AOI 1	2686419	224117	unconfined	2.46	1	4.00	3.65	0.35
S-197	AOI 1	2686414	223931	unconfined	2.5	1	4.05	3.29	0.76

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
S-198	AOI 1	2685879	224076	unconfined	0.74	1	3.41	3.34	0.07
S-199	AOI 1	2685732	224027	unconfined	1.21	1	3.45	3.54	-0.09
S-200	AOI 1	2685486	223945	unconfined	1.93	1	3.43	3.79	-0.36
S-201	AOI 1	2685877	223831	unconfined	1.24	1	3.30	2.97	0.33
S-202	AOI 1	2684881	223417	unconfined	2.89	1	3.52	3.64	-0.12
S-203	AOI 1	2685245	223217	unconfined	4.39	1	3.16	3.11	0.05
S-206	AOI 1	2684727	223201	unconfined	4.04	1	3.60	3.38	0.22
S-208	AOI 1	2685225	222409	unconfined	-0.42	1	1.25	1.68	-0.43
S-209	AOI 1	2685750	222525	unconfined	-3.56	1	0.67	1.23	-0.56
S-210	AOI 1	2685876	222247	unconfined	-6.86	1	-0.46	0.16	-0.62
S-211	AOI 1	2685021	221956	unconfined	-7.28	1	0.96	1.46	-0.50
S-213	AOI 1	2685087	221871	unconfined	-7.39	1	0.47	1.49	-1.02
S-214	AOI 1	2685145	221577	unconfined	-5.77	1	0.34	1.47	-1.13
S-216	AOI 4	2684618	220867	unconfined	-3.93	1	0.64	1.96	-1.32
S-226	AOI 1	2685805	222280	unconfined	-8.14	1	-0.10	0.53	-0.63
S-227	AOI 1	2685786	221654	unconfined	-4.72	1	-0.91	-2.22	1.31
S-228	AOI 1	2685779	221657	unconfined	-6.29	1	-0.85	-2.13	1.28
S-231	AOI 1	2685897	222219	unconfined	2.38	1	-0.42	-0.03	-0.39
S-232	AOI 1	2685891	222167	unconfined	0.59	1	-0.69	-0.27	-0.42
S-246A	AOI 2	2682915	222348	unconfined	1.85	1	0.44	1.92	-1.48
S-247	AOI 2	2682921	222381	unconfined	1.18	1	0.56	1.80	-1.24
S-248	AOI 2	2682933	222394	unconfined	1.05	1	0.51	2.15	-1.64
S-249	AOI 2	2682939	222444	unconfined	1.57	1	-0.58	1.79	-2.37
S-25	AOI 3	2684275	218447	unconfined	12.06	1	0.94	2.77	-1.83
S-251	AOI 2	2683286	222362	unconfined	5.61	1	2.02	2.39	-0.37
S-252	AOI 2	2683257	222357	unconfined	5.36	1	1.98	2.38	-0.40
S-253	AOI 2	2683301	222420	unconfined	7.11	1	2.54	2.43	0.11
S-254	AOI 2	2683168	222414	unconfined	6.91	1	2.03	2.39	-0.36
S-256	AOI 1	2685775	221633	unconfined	-5.83	1	-0.48	-2.04	1.56
S-257	AOI 1	2685811	221589	unconfined	-1.33	1	-0.28	-2.38	2.10
S-258	AOI 1	2685820	221665	unconfined	-1.64	1	-1.27	-2.69	1.42
S-259	AOI 1	2685827	221704	unconfined	-2	1	-1.38	-2.88	1.50
S-260	AOI 1	2685846	221830	unconfined	-3.02	1	-1.63	-2.66	1.03
S-262	AOI 1	2685590	222045	unconfined	-4.78	1	0.53	0.42	0.11
S-263	AOI 1	2685576	221829	unconfined	-5.34	1	0.31	-0.04	0.35
S-268	AOI 1	2686298	224224	unconfined	25.14	1	4.03	3.76	0.27
S-269	AOI 1	2685044	222590	unconfined	0.63	1	2.21	2.18	0.03

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
S-270	AOI 1	2685422	222589	unconfined	1.38	1	1.24	1.86	-0.62
S-271	AOI 1	2686090	223898	unconfined	1.45	1	3.28	2.50	0.78
S-273	AOI 1	2686121	223810	unconfined	0.81	1	3.49	2.29	1.20
S-274	AOI 1	2686114	223761	unconfined	0.41	1	3.25	2.32	0.93
S-275	AOI 1	2686107	223710	unconfined	0.05	1	2.99	2.15	0.84
S-276	AOI 1	2686101	223661	unconfined	-0.32	1	2.83	2.05	0.78
S-277	AOI 1	2686071	223444	unconfined	-1.4	1	2.14	2.00	0.13
S-280	AOI 3	2682599	220966	unconfined	6.23	1	1.26	1.91	-0.65
S-281	AOI 3	2683656	221049	unconfined	-2.63	1	0.29	2.12	-1.83
S-282	AOI 4	2683960	220827	unconfined	5.99	1	-0.19	2.10	-2.29
S-288	AOI 3	2683003	219276	unconfined	7.25	1	4.68	2.15	2.53
S-294	AOI 2	2684673	224162	unconfined	2.62	1	4.08	4.66	-0.58
S-295	AOI 2	2684379	223801	unconfined	16.63	1	9.12	10.64	-1.52
S-297	AOI 2	2683613	223495	unconfined	-0.28	1	5.80	6.43	-0.63
S-298	AOI 2	2683859	223263	unconfined	12.98	1	11.34	9.66	1.69
S-299	AOI 2	2683545	222978	unconfined	1.27	1	3.14	2.81	0.33
S-301	AOI 2	2684442	222551	unconfined	2.99	1	3.25	2.26	0.99
S-302	AOI 2	2683251	222613	unconfined	-0.36	1	2.51	2.53	-0.01
S-303	AOI 2	2683678	222409	unconfined	2.21	1	3.11	2.39	0.72
S-305	AOI 2	2684883	221997	unconfined	-3.29	1	0.94	1.43	-0.49
S-306	AOI 2	2683117	222297	unconfined	-2.42	1	1.82	2.35	-0.53
S-307	AOI 2	2683508	221764	unconfined	-2.05	1	2.31	2.35	-0.04
S-311	AOI 2	2684448	221518	unconfined	-0.985	1	0.95	1.97	-1.03
S-313	AOI 2	2683327	222420	unconfined	-0.36	1	2.70	2.44	0.26
S-314	AOI 2	2683250	222411	unconfined	-0.4	1	2.23	2.41	-0.18
S-317	AOI 2	2683227	222440	unconfined	-1.13	1	2.28	2.43	-0.15
S-318	AOI 2	2683216	222516	unconfined	-0.69	1	1.98	2.47	-0.49
S-32	AOI 4	2684136	219917	unconfined	1.15	1	0.62	2.32	-1.70
S-330	BELMONT	2685219	224246	unconfined	2.79	1	3.73	4.42	-0.69
S-331	BELMONT	2685176	224033	unconfined	6.68	1	3.35	4.21	-0.86
S-332	BELMONT	2685110	224237	unconfined	4.34	1	3.64	4.49	-0.85
S-333	AOI 2	2682920	222372	unconfined	1.41	1	0.56	1.83	-1.27
S-335	AOI 2	2683113	222843	unconfined	0.09	1	1.77	2.22	-0.45
S-336	AOI 2	2683167	222813	unconfined	2.42	1	2.32	2.55	-0.23
S-337	AOI 2	2683260	223172	unconfined	1.9	1	0.80	2.47	-1.67
S-338	AOI 2	2683320	223145	unconfined	2.96	1	2.85	2.67	0.18
S-34	AOI 4	2684177	220357	unconfined	-1.11	1	1.49	2.16	-0.67

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
S-346	AOI 2	2684760	222200	unconfined	-5.25	1	1.09	1.16	-0.06
S-347	AOI 2	2684712	222199	unconfined	-5.24	1	1.09	1.17	-0.07
S-348	AOI 2	2683866	222330	unconfined	0.11	1	4.92	2.10	2.82
S-349	AOI 2	2683819	222324	unconfined	-0.73	1	3.47	2.18	1.29
S-350	AOI 2	2684656	224223	unconfined	10	1	3.99	4.71	-0.72
S-351	AOI 2	2684319	224112	unconfined	11.5	1	4.05	4.86	-0.81
S-354	AOI 2	2683499	223705	unconfined	10	1	3.04	4.02	-0.98
S-355	AOI 2	2683594	223590	unconfined	12.5	1	3.35	4.02	-0.67
S-357	AOI 2	2683533	223382	unconfined	0.9	1	7.95	6.52	1.43
S-359	AOI 2	2683809	222117	unconfined	5.5	1	3.32	2.21	1.11
S-360	AOI 2	2684419	221893	unconfined	7.5	1	1.10	1.86	-0.76
S-361	AOI 2	2684109	221779	unconfined	9.5	1	2.31	2.13	0.18
S-363	AOI 2	2684410	221643	unconfined	7.5	1	0.82	1.97	-1.15
S-365	AOI 4	2683839	220855	unconfined	1.61	1	0.37	2.10	-1.74
S-366	AOI 4	2684586	221392	unconfined	-1.99	1	0.63	1.92	-1.29
S-367	AOI 4	2684688	221274	unconfined	-6.99	1	0.53	1.88	-1.35
S-369	AOI 4	2685726	221204	unconfined	-0.19	1	0.45	1.22	-0.77
S-380	AOI 4	2685674	220596	unconfined	-0.71	1	0.63	1.92	-1.29
S-382	AOI 3	2682250	220408	unconfined	-2.4	1	2.78	1.91	0.87
S-384	AOI 3	2683220	220831	unconfined	-1.8	1	0.20	1.98	-1.78
S-395	BELMONT	2685991	224465	unconfined	-1.25	1	4.21	4.19	0.02
S-396	AOI 1	2685872	223191	unconfined	-7.15	1	0.72	2.02	-1.30
S-402	AOI 1	2685116	223884	unconfined	6	1	3.66	4.09	-0.43
S-405	AOI 1	2685608	223177	unconfined	1.3	1	3.15	2.55	0.60
S-406	AOI 2	2683062	222569	unconfined	2.33	1	2.37	2.42	-0.05
S-41	AOI 1	2685772	221298	unconfined	-4.51	1	-0.37	0.75	-1.12
S-411	AOI 3	2682483	220825	unconfined	2.62	1	0.51	1.88	-1.37
S-413	AOI 3	2683062	220607	unconfined	-4.65	1	0.32	1.89	-1.57
S-414	AOI 3	2682403	220564	unconfined	0.01	1	0.16	1.87	-1.71
S-415	AOI 4	2684132	220822	unconfined	-3.53	1	0.57	2.08	-1.51
S-417	AOI 1	2684867	223781	unconfined	5.7	1	4.78	4.12	0.66
S-419	AOI 1	2685595	222387	unconfined	-6.6	1	0.56	1.22	-0.66
S-420	AOI 2	2682996	222512	unconfined	2.78	1	2.61	2.31	0.30
S-422	AOI 2	2682861	221880	unconfined	-0.84	1	2.45	2.20	0.25
S-423	AOI 2	2683543	223536	unconfined	4.4	1	4.52	3.85	0.67
S-43	AOI 1	2685816	221634	unconfined	-0.54	1	-0.88	-2.53	1.65
S-46	AOI 1	2685283	222077	unconfined	-11.73	1	0.73	1.27	-0.54

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
S-48	AOI 2	2684871	222221	unconfined	1.48	1	1.23	1.23	0.00
S-50	AOI 1	2685881	222241	unconfined	8.115	1	-0.31	0.13	-0.44
S-51	AOI 1	2685939	222520	unconfined	-1.82	1	-0.22	0.86	-1.08
S-53	AOI 2	2684179	222279	unconfined	-2.21	1	2.89	1.81	1.08
S-54	AOI 2	2684412	221766	unconfined	1.26	1	0.99	1.94	-0.95
S-60	AOI 3	2683756	221051	unconfined	0.68	1	0.44	2.13	-1.69
S-61	AOI 2	2683869	221701	unconfined	1.67	1	1.71	2.25	-0.55
S-62	AOI 2	2683630	222319	unconfined	-2.11	1	2.53	2.34	0.19
S-63	AOI 2	2683223	222269	unconfined	0.95	1	1.92	2.37	-0.45
S-71	AOI 2	2683535	223178	unconfined	-0.5	1	3.35	2.88	0.47
S-72	AOI 2	2683825	223836	unconfined	4.24	1	3.97	4.53	-0.56
S-75	BELMONT	2686144	224096	unconfined	3.71	1	3.53	3.05	0.48
S-76	BELMONT	2685601	224035	unconfined	15.61	1	3.37	3.75	-0.38
S-77P	AOI 1	2685250	223931	unconfined	13.365	1	3.57	4.03	-0.46
S-77SRTF	AOI 9	2678019	217724	unconfined	-6.55	1	-8.01	-2.18	-5.83
S-78	AOI 1	2684757	223423	unconfined	3.43	1	3.84	3.71	0.13
S-78SRTF	AOI 9	2677724	216834	unconfined	-8.36	1	-5.61	-4.14	-1.47
S-79P	AOI 1	2685644	223426	unconfined	10.605	1	3.16	2.89	0.27
S-79SRTF	AOI 9	2677551	215992	unconfined	-7.81	1	-5.98	-6.22	0.24
S-80	AOI 1	2685607	223707	unconfined	7.44	1	3.31	3.31	0.00
S-81SRTF	AOI 9	2677042	216806	unconfined	-8.84	1	-8.53	-4.23	-4.30
S-82SRTF	AOI 9	2677316	217918	unconfined	-8.07	1	0.13	-1.91	2.04
S-83	AOI 1	2686061	223399	unconfined	1.13	1	2.03	1.83	0.20
S-83SRTF	AOI 9	2677510	218241	unconfined	-6.73	1	0.36	-1.33	1.69
S-85	AOI 1	2686023	223173	unconfined	0.44	1	0.54	1.53	-0.99
S-86	AOI 1	2685945	223065	unconfined	-6.375	1	0.26	1.61	-1.36
S-88	AOI 1	2686005	223039	unconfined	-1.36	1	-1.42	1.39	-2.81
S-88A	AOI 1	2686013	223107	unconfined	2.185	1	-0.57	1.44	-2.01
S-89	AOI 1	2685989	222922	unconfined	-1.09	1	-0.91	1.22	-2.13
S-91	AOI 2	2684188	222271	unconfined	1.3	1	2.62	1.79	0.83
S-93	AOI 2	2683259	222338	unconfined	-0.57	1	1.98	2.38	-0.40
S-95	AOI 1	2685351	221422	unconfined	-0.89	1	0.28	1.17	-0.89
S-96	AOI 4	2684857	220719	unconfined	0.76	1	0.41	1.94	-1.53
S-99	AOI 1	2686084	222766	unconfined	-2.2	1	-0.08	1.43	-1.51
SSEPTA-PH-8	DSCP	2689175	221890	unconfined	7.51	1	0.08	2.01	-1.93
Steen-MW-61	DSCP	2686008	222107	unconfined	3.24	1	-0.52	0.00	-0.52
Steen-MW-62	DSCP	2686037	222328	unconfined	2.09	1	0.04	0.79	-0.75

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
Steen-MW-64	DSCP	2685953	221694	unconfined	4.29	1	-0.61	-1.39	0.78
Steen-PH-10	DSCP	2686180	222012	unconfined	3.8	1	0.09	0.81	-0.72
Steen-PH-11	DSCP	2685990	221987	unconfined	3.63	1	-0.51	-0.62	0.11
Steen-PH-12	DSCP	2686138	222248	unconfined	3.48	1	0.21	1.11	-0.90
SW-1	AOI 5	2681673	215437	unconfined	7.19	1	1.92	1.57	0.35
SW-2	AOI 5	2681633	215458	unconfined	2.84	1	2.79	1.70	1.09
SW-3	AOI 5	2681565	215492	unconfined	1.98	1	2.26	1.42	0.84
SW-4	AOI 5	2681486	215534	unconfined	7.22	1	2.74	1.39	1.35
SW-5	AOI 5	2681322	215655	unconfined	7.84	1	5.00	2.35	2.65
SWR-1	AOI 5	2681283	215697	unconfined	3.49	1	3.38	2.67	0.71
SWR-2	AOI 5	2681737	215397	unconfined	2.28	1	2.12	1.76	0.36
SWR-3	AOI 5	2681811	215359	unconfined	3.61	1	2.21	1.80	0.41
TW-11	BELMONT	2686135	224364	unconfined	16.305	1	3.91	3.98	-0.07
TW-3	BELMONT	2685838	224405	unconfined	16.205	1	3.88	3.96	-0.08
TW-5	BELMONT	2685994	224416	unconfined	16.17	1	4.10	4.06	0.04
TW-8	BELMONT	2685682	224456	unconfined	15.185	1	3.72	4.25	-0.53
TW-9	BELMONT	2686092	224400	unconfined	16.215	1	4.00	4.05	-0.05
U-1	AOI 6	2681638	216621	unconfined	3.31	1	3.31	3.36	-0.05
U-2	AOI 6	2681798	216694	unconfined	2.8	1	2.64	3.53	-0.89
U-3	AOI 6	2681941	216811	unconfined	3.74	1	3.69	4.44	-0.76
U-4	AOI 6	2682043	216875	unconfined	5.41	1	5.30	5.29	0.01
U-5	AOI 6	2681801	216801	unconfined	2.27	1	1.62	3.60	-1.98
URS-1	AOI 6	2680859	216101	unconfined	4.34	1	4.27	1.37	2.90
URS-2	AOI 6	2681727	216726	unconfined	4.06	1	3.90	3.47	0.43
URS-4	AOI 6	2680671	216277	unconfined	0.85	1	-0.02	1.41	-1.43
URS-5	AOI 6	2680401	216794	unconfined	2.84	1	2.64	1.83	0.81
W-1	AOI 10	2682762	223594	unconfined	-1.81	1	3.38	3.80	-0.42
W-10	AOI 10	2681973	222348	unconfined	-1.4	1	3.98	6.32	-2.34
W-11	AOI 10	2682276	222286	unconfined	0.8	1	3.63	4.53	-0.91
W-12	AOI 10	2682078	221939	unconfined	-1.42	1	3.73	3.87	-0.14
W-14	AOI 10	2681747	222310	unconfined	-1.06	1	4.36	6.72	-2.35
W-15	AOI 10	2681624	222775	unconfined	2.3	1	6.00	6.45	-0.45
W-16	AOI 10	2681794	221795	unconfined	-1	1	4.14	3.77	0.37
W-17	AOI 10	2681731	221777	unconfined	-0.93	1	3.90	4.68	-0.79
W-2	AOI 10	2681822	223350	unconfined	0.77	1	4.25	6.38	-2.13
W-20	AOI 10	2680987	222415	unconfined	2.34	1	6.16	7.07	-0.92
W-22	AOI 10	2680429	222466	unconfined	2	1	5.05	5.80	-0.75

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
W-28	AOI 10	2682420	222857	unconfined	-3.21	1	4.82	5.22	-0.40
W-29	AOI 10	2682149	223225	unconfined	0.09	1	4.40	6.39	-1.99
W-30	AOI 10	2681983	222661	unconfined	-1.42	1	4.63	6.33	-1.70
W-33	AOI 10	2680145	222385	unconfined	2.36	1	5.30	5.26	0.04
W-34	AOI 10	2680919	222425	unconfined	1.78	1	6.11	6.98	-0.87
W-5	AOI 10	2681651	223047	unconfined	-2	1	4.35	6.05	-1.70
W-9	AOI 10	2681893	222543	lower aquifer	0.96	1	-1.07	6.53	-7.60
WP-14	AOI 5	2682199	215243	unconfined	2.06	1	2.00	2.85	-0.85
WP16-3	AOI 5	2682402	216899	unconfined	3.45	1	3.94	5.54	-1.60
WP-8	AOI 5	2682441	215137	unconfined	-6.02	1	1.62	2.41	-0.79
WP9-3	AOI 6	2681300	216733	unconfined	0.4	1	4.36	4.51	-0.15
WP9-4	AOI 6	2681422	216537	unconfined	0.55	1	4.17	4.63	-0.46
WP9-8	AOI 5	2681391	216377	unconfined	3.085	1	3.82	4.49	-0.67
WP-A	AOI 5	2681387	215594	unconfined	5.19	1	4.70	2.45	2.25
WP-B	AOI 5	2681311	215667	unconfined	3.67	1	3.46	2.46	1.00
WP-C	AOI 5	2681378	215681	unconfined	2.7	1	2.44	4.17	-1.73
WP-D	AOI 5	2681484	215914	unconfined	3.13	1	2.90	4.57	-1.67
WP-E	AOI 5	2681622	215986	unconfined	2.72	1	2.67	3.00	-0.33
WPM-11	AOI 6	2682371	217106	unconfined	5.63	1	5.47	5.44	0.03
WPM-3	AOI 6	2682433	217085	unconfined	4.94	1	4.69	5.55	-0.86
A-15	AOI 5	2682689	216314	unconfined	-5.21	2	3.61	3.51	0.10
A-186	AOI 5	2682888	217107	unconfined	-4.9	2	3.00	3.76	-0.76
B-129	AOI 6	2683018	217874	unconfined	-3.67	2	2.19	4.20	-2.02
B-162	AOI 6	2682803	217903	unconfined	-3.57	2	5.10	3.97	1.13
B-94	AOI 6	2683137	217610	unconfined	-1.79	2	3.07	4.23	-1.16
BF-100	AOI 3	2683128	219458	unconfined	-5.04	2	0.09	2.08	-1.99
BF-101	AOI 3	2683565	219687	unconfined	-3.49	2	3.31	2.38	0.93
C-150	AOI 7	2680607	220263	unconfined	-5.86	2	-4.88	-7.29	2.41
C-49	AOI 7	2683022	218495	unconfined	-4.66	2	4.62	4.08	0.54
N-102	AOI 8	2683870	227035	unconfined	6.59	2	10.99	8.04	2.95
N-103	AOI 8	2683660	226782	unconfined	5.41	2	12.01	8.48	3.53
N-104	AOI 8	2683420	226914	unconfined	5.96	2	10.87	9.71	1.16
N-105	AOI 8	2683443	226745	unconfined	6.26	2	10.70	9.10	1.60
N-111	AOI 8	2680519	226514	unconfined	-1.4	2	4.00	2.07	1.93
N-113	AOI 8	2681733	226054	unconfined	2.32	2	5.71	5.69	0.02
N-115	AOI 8	2682246	225824	unconfined	2.43	2	7.52	6.53	0.99
N-122	AOI 8	2683577	226074	unconfined	2.93	2	6.73	6.96	-0.23

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
N-138	AOI 8	2683256	227757	unconfined	5.29	2	8.32	6.31	2.01
N-139	AOI 8	2683309	227732	unconfined	5	2	8.22	6.48	1.74
N-146	AOI 8	2682830	227726	unconfined	4.89	2	8.80	6.10	2.70
N-150	AOI 8	2681575	224612	unconfined	-1.79	2	3.16	1.99	1.17
N-153	AOI 8	2683011	227569	unconfined	5.54	2	8.21	6.76	1.45
N-2	AOI 8	2682759	228025	unconfined	5.75	2	8.19	6.27	1.92
N-34	AOI 8	2682271	226259	unconfined	3.7	2	6.86	6.59	0.27
N-38	AOI 8	2680805	226899	unconfined	-0.73	2	3.24	3.95	-0.71
N-58	AOI 8	2680455	225832	unconfined	-2.29	2	4.75	4.65	0.10
N-74	AOI 8	2680701	224898	unconfined	-1.7	2	2.70	1.99	0.71
N-84	AOI 8	2684677	226457	unconfined	5.32	2	11.10	6.91	4.19
N-99	AOI 8	2682855	228875	unconfined	3.26	2	9.31	6.41	2.90
PH-RW-D	DSCP	2687308	221945	unconfined	-10.675	2	1.11	2.17	-1.06
RW-128	AOI 2	2682988	222438	unconfined	-10.2	2	-0.13	2.30	-2.43
RW-203	AOI 8	2683032	225154	unconfined	1.57	2	8.49	6.06	2.43
RW-306	AOI 8	2683768	226581	unconfined	4.72	2	10.47	8.09	2.38
RW-403	AOI 1	2686035	223262	unconfined	-8.89	2	1.78	1.83	-0.05
RW-405	AOI 1	2685990	222933	unconfined	-6.5	2	-0.97	1.42	-2.39
RW-705	AOI 4	2685080	218913	unconfined	-3.59	2	1.02	2.57	-1.55
RW-707	AOI 4	2685021	218852	unconfined	-4.67	2	0.65	2.56	-1.91
RW-709	AOI 4	2684982	218812	unconfined	-6.48	2	0.25	2.57	-2.32
RW-710	AOI 4	2684962	218790	unconfined	-5.29	2	0.36	2.59	-2.23
RW-711	AOI 4	2684955	218782	unconfined	-6.785	2	0.70	2.59	-1.89
RW-712	AOI 4	2684936	218762	unconfined	-4.82	2	0.66	2.61	-1.95
RW-713	AOI 4	2684924	218748	unconfined	-5.41	2	0.73	2.62	-1.89
RW-714	AOI 4	2684903	218728	unconfined	-5.53	2	0.70	2.64	-1.94
RW-715	AOI 4	2684883	218706	unconfined	-5.64	2	0.74	2.65	-1.91
RW-716	AOI 4	2684864	218684	unconfined	-5.595	2	0.87	2.66	-1.79
RW-717	AOI 4	2684844	218663	unconfined	-5.64	2	0.78	2.67	-1.89
S-120	AOI 4	2685597	220403	unconfined	-3.53	2	0.76	2.07	-1.31
S-120DSRTF	AOI 9,11	2677542	215267	unconfined	-20.65	2	-9.12	-8.33	-0.79
S-122	AOI 4	2685443	219647	unconfined	-2.08	2	0.60	2.51	-1.91
S-123	AOI 4	2684990	219320	unconfined	-0.77	2	0.61	2.54	-1.93
S-124	AOI 4	2685004	218885	unconfined	0.46	2	0.71	2.52	-1.80
S-137SRTF	AOI 9	2679009	215455	unconfined	-29.65	2	-9.93	-10.06	0.13
S-139SRTF	AOI 9	2678435	217571	unconfined	-23.85	2	-8.14	-2.38	-5.76
S-141SRTF	AOI 9	2678317	215107	unconfined	-24.76	2	-9.80	-10.06	0.26

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
S-142SRTF	AOI 9	2677286	214390	unconfined	-30.3	2	-10.04	-10.82	0.78
S-145SRTF	AOI 9	2677312	216695	unconfined	-25.92	2	-8.63	-4.59	-4.04
S-16	AOI 3	2683817	218965	unconfined	-9.17	2	0.99	2.31	-1.32
S-17	AOI 3	2683786	219271	unconfined	1.17	2	1.01	2.40	-1.39
S-20	AOI 3	2684072	218851	unconfined	-12.2	2	0.94	2.55	-1.61
S-219	AOI 4	2684850	219892	unconfined	0.38	2	0.75	2.35	-1.60
S-220	AOI 4	2684262	219152	unconfined	-4	2	0.89	2.52	-1.63
S-221	AOI 4	2684933	219006	unconfined	-2.48	2	0.66	2.40	-1.73
S-222	AOI 4	2684862	218677	unconfined	-3.61	2	0.96	2.67	-1.71
S-223	AOI 4	2685064	218859	unconfined	-6.02	2	0.72	2.59	-1.87
S-224	AOI 4	2685158	218991	unconfined	-5.47	2	0.75	2.61	-1.86
S-23	AOI 3	2684062	218579	unconfined	-2.55	2	0.95	2.68	-1.73
S-233	AOI 4	2684874	218923	unconfined	-0.87	2	3.65	2.26	1.39
S-234	AOI 4	2684899	218762	unconfined	-1.46	2	0.45	2.61	-2.16
S-235	AOI 4	2684962	218844	unconfined	-2.29	2	0.70	2.53	-1.83
S-236	AOI 4	2684954	219018	unconfined	-4.78	2	0.53	2.41	-1.88
S-237	AOI 4	2684943	218984	unconfined	-5.11	2	0.51	2.37	-1.86
S-238	AOI 4	2685034	218917	unconfined	-2.63	2	0.74	2.52	-1.78
S-239	AOI 4	2684997	218789	unconfined	-1.31	2	0.77	2.60	-1.83
S-240	AOI 4	2684848	218980	unconfined	-1.53	2	0.53	2.44	-1.91
S-241	AOI 4	2684819	219045	unconfined	0.59	2	0.63	2.50	-1.86
S-242	AOI 4	2684857	218813	unconfined	0.92	2	0.67	2.56	-1.89
S-243	AOI 4	2684934	218722	unconfined	1.1	2	0.98	2.64	-1.66
S-245	AOI 4	2684999	219051	unconfined	0.96	2	0.81	2.49	-1.68
S-26	AOI 4	2684616	218758	unconfined	1.01	2	0.85	2.65	-1.80
S-278	AOI 4	2684810	218753	unconfined	-3.8	2	0.82	2.63	-1.81
S-279	AOI 4	2684702	219165	unconfined	1.86	2	0.94	2.54	-1.60
S-285	AOI 3	2683687	219690	unconfined	0.2	2	1.15	2.39	-1.24
S-29	AOI 4	2684380	219695	unconfined	-7.17	2	2.00	2.37	-0.36
S-30	AOI 4	2684380	219703	unconfined	0.9	2	0.68	2.36	-1.68
S-329	AOI 4	2684779	218690	unconfined	-4.3	2	0.61	2.66	-2.05
S-370	AOI 4	2683833	219839	unconfined	-7.94	2	0.26	2.32	-2.06
S-372	AOI 3	2683824	219317	unconfined	-5.17	2	0.79	2.40	-1.61
S-373	AOI 4	2684927	219073	unconfined	0.89	2	0.29	2.48	-2.19
S-38	AOI 4	2685232	219184	unconfined	0.93	2	0.69	2.62	-1.93
S-381	AOI 4	2684590	219563	unconfined	-1.31	2	0.50	2.42	-1.92
S-385	AOI 3	2683689	220624	unconfined	-9.3	2	0.64	2.08	-1.44

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
S-386	AOI 3	2683705	219789	unconfined	-5	2	0.50	2.37	-1.87
S-39	AOI 4	2685582	220133	unconfined	-9.4	2	0.75	2.25	-1.50
S-408	AOI 4	2684259	218600	unconfined	-6.65	2	1.03	2.71	-1.68
S-412	AOI 3	2682923	220115	unconfined	-9.37	2	0.20	1.82	-1.62
S-418	AOI 1	2685854	222337	unconfined	-11	2	-0.35	0.69	-1.04
S-5	AOI 3	2683838	218242	unconfined	-0.14	2	3.32	3.24	0.08
S-74D2SRTF	AOI 9	2679122	216095	unconfined	-26.33	2	-3.59	-5.64	2.05
S-82	AOI 1	2686056	223599	unconfined	-10.4	2	3.48	2.30	1.18
C-145	AOI 7	2681007	220222	unconfined	-12.64	3	1.77	1.94	-0.17
C-146	AOI 7	2680640	220255	unconfined	-12.8	3	-3.76	-2.19	-1.57
C-95	AOI 3,7	2682674	219113	unconfined	-15.07	3	6.25	2.76	3.49
DSCP-IW-12	DSCP	2687131	222110	unconfined	-25.28	3	0.58	2.21	-1.63
N-109	AOI 8	2681605	226649	lower aquifer	3.04	3	6.33	5.53	0.80
N-109	AOI 8	2681605	226649	lower aquifer	3.04	3	6.33	5.53	0.80
N-112	AOI 8	2681664	226328	lower aquifer	1.35	3	5.73	5.38	0.35
N-112	AOI 8	2681664	226328	lower aquifer	1.35	3	5.73	5.38	0.35
N-116	AOI 8	2682617	225844	unconfined	1.49	3	5.72	6.76	-1.04
N-130	AOI 8	2682501	225088	unconfined	-2.93	3	11.11	6.21	4.90
N-152	AOI 8	2684912	226052	unconfined	2.09	3	9.94	6.51	3.43
N-59	AOI 8	2680470	225387	unconfined	-2.69	3	5.11	4.27	0.84
N-61	AOI 8	2680588	225119	unconfined	-2.71	3	4.81	3.66	1.15
N-76	AOI 8	2683610	225362	unconfined	-3.25	3	9.24	6.07	3.17
PH-IW-2	DSCP	2686781	220911	unconfined	-25.15	3	0.76	2.06	-1.30
PH-IW-3	DSCP	2687505	220886	unconfined	-37.05	3	0.55	2.39	-1.84
RW-200	AOI 8	2682439	224925	unconfined	-3.37	3	5.95	5.89	0.06
RW-301	AOI 8	2682907	226707	unconfined	0.45	3	10.19	9.82	0.37
RW-302	AOI 8	2683040	226687	unconfined	0.42	3	10.64	9.74	0.90
RW-304	AOI 8	2683322	226635	unconfined	1.45	3	10.27	9.03	1.24
RW-305	AOI 8	2683458	226615	unconfined	1.39	3	10.31	8.74	1.57
S-10	AOI 3	2683682	218444	unconfined	-14.17	3	1.38	2.01	-0.63
S-12	AOI 3	2683521	218879	unconfined	-13.105	3	0.96	2.05	-1.09
S-153	AOI 2	2683289	223237	unconfined	-11.05	3	0.87	2.51	-1.64
S-52	AOI 1	2685894	222553	unconfined	-13.3	3	0.22	1.18	-0.96
W-23	AOI 10	2680081	222589	unconfined	-9.79	3	5.10	3.75	1.35
W-25	AOI 10	2679601	222643	unconfined	-1.97	3	4.02	2.60	1.43
A-19D	AOI 5,11	2683563	217563	lower aquifer	-44.36	4	-2.34	2.02	-4.36
B-48D	AOI 6,11	2682251	217522	lower aquifer	-41.23	4	-2.08	1.04	-3.12

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
BF-90D	AOI 3,11	2683040	218957	lower aquifer	-25.15	4	-0.48	1.87	-2.35
DSCP-DW-6	DSCP	2687606	223122	lower aquifer	-40.83	4	0.56	3.42	-2.86
DSCP-IW-1	DSCP	2686539	222709	unconfined	-22.65	4	0.80	2.70	-1.90
DSCP-IW-13	DSCP	2688517	222412	unconfined	-47.99	4	0.42	2.93	-2.51
N-114	AOI 8	2681511	226225	lower aquifer	-5.03	4	5.38	5.38	0.00
N-114	AOI 8	2681511	226225	lower aquifer	-5.03	4	5.38	5.38	0.00
N-127	AOI 8	2682769	225193	unconfined	-4.25	4	9.10	5.29	3.81
N-132	AOI 8	2681685	225634	unconfined	-10.94	4	7.52	5.66	1.86
N-4	AOI 8,11	2683123	227945	lower aquifer	-15.59	4	8.49	6.25	2.24
N-70	AOI 8	2681745	227136	lower aquifer	0.29	4	7.49	5.55	1.94
N-70	AOI 8	2681745	227136	lower aquifer	0.29	4	7.49	5.55	1.94
N-83	AOI 8	2681761	226828	lower aquifer	1.77	4	6.09	5.58	0.51
N-83	AOI 8	2681761	226828	lower aquifer	1.77	4	6.09	5.58	0.51
PH-IW-10	DSCP	2686456	221925	unconfined	-27.44	4	0.42	2.03	-1.61
PH-IW-11	DSCP	2686416	221650	unconfined	-27.93	4	0.30	1.82	-1.52
RW-300	AOI 8	2681810	226710	lower aquifer	-0.17	4	6.67	5.56	1.11
RW-300	AOI 8	2681810	226710	lower aquifer	-0.17	4	6.67	5.56	1.11
S-110DSRTF	AOI 9	2676987	217259	lower aquifer	-49.73	4	-8.51	-3.26	-5.25
S-115DSRTF	AOI 9	2676755	216206	lower aquifer	-48.3	4	-8.60	-5.77	-2.83
S-119D	AOI 4,11	2685498	220820	lower aquifer	-41.14	4	0.08	2.00	-1.92
S-144SRTF	AOI 9	2677843	217365	unconfined	-49.2	4	-8.31	-3.03	-5.28
S-397	AOI 1	2685305	222831	unconfined	-29.9	4	0.55	2.90	-2.35
S-399	AOI 1	2685166	221521	lower aquifer	-24.7	4	0.34	1.99	-1.65
S-87I	AOI 1	2685940	223065	lower aquifer	-23.46	4	0.62	1.91	-1.29
Steen-IW-07	DSCP	2686043	222338	unconfined	-27.23	4	0.40	1.88	-1.48
B-133D	AOI 6,11	2681722	216723	lower aquifer	-53.9	5	-2.21	-0.47	-1.74
N-148D	AOI 8	2684030	225601	lower aquifer	-30.44	5	1.29	4.74	-3.45
N-19	AOI 8,11	2684651	226737	lower aquifer	-24.54	5	3.01	5.77	-2.76
N-21	AOI 8,11	2683879	226628	lower aquifer	-21.46	5	5.83	5.63	0.20
N-69	AOI 8	2681822	227392	lower aquifer	-1.14	5	8.18	5.50	2.68
N-69	AOI 8	2681822	227392	lower aquifer	-1.14	5	8.18	5.50	2.68
N-9	AOI 8,11	2684097	227375	lower aquifer	-22.3	5	3.30	6.13	-2.83
S-106DSRTF	AOI 9	2677610	214778	lower aquifer	-77.13	5	-9.24	-9.79	0.55
S-143SRTF	AOI 9	2677280	214390	lower aquifer	-60.41	5	-9.39	-10.68	1.29
S-22	AOI 3	2684081	218842	lower aquifer	-57.59	5	-1.21	1.68	-2.89
S-280D	AOI 3,11	2682596	220955	lower aquifer	-32.58	5	0.55	1.55	-1.00
S-38D2	AOI 4,11	2685229	219163	lower aquifer	-59.16	5	-0.87	2.09	-2.96

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WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
S-59D	AOI 4,11	2683843	221368	lower aquifer	-33.24	5	0.60	2.04	-1.44
Steen-IW-09	DSCP	2686190	222018	unconfined	-41.02	5	0.40	2.53	-2.13
ARCO-1D	AOI 1	2685966	221359	lower aquifer	-44.86	6	-0.05	2.46	-2.51
DSCP-DW-1	DSCP	2686539	222715	lower aquifer	-50.55	6	0.57	3.10	-2.53
DSCP-DW-13	DSCP	2688518	222417	lower aquifer	-79.81	6	0.41	3.17	-2.76
FDR-DW-15	DSCP	2687939	219362	lower aquifer	-98.92	6	-1.28	2.31	-3.59
N-73	AOI 8	2680415	225822	lower aquifer	-30.81	6	0.71	1.66	-0.95
N-75	AOI 8	2680694	224909	lower aquifer	-32.35	6	0.36	1.91	-1.55
NOVA-DW-14	DSCP	2688592	219985	lower aquifer	-97.32	6	-1.14	2.53	-3.67
PGW-MW-1D	PGW	2683465	224134	lower aquifer	-36.43	6	1.19	3.17	-1.98
PH-DW-2	DSCP	2686776	220911	lower aquifer	-74.96	6	-0.18	2.42	-2.60
PH-DW-3	DSCP	2687507	220890	lower aquifer	-95.24	6	-0.30	2.56	-2.86
S-118DSRTF	AOI 9	2676690	215160	lower aquifer	-68.84	6	-9.01	-8.29	-0.72
S-8	AOI 3	2683688	218428	lower aquifer	-58.27	6	-1.15	1.46	-2.61
S-80D	AOI 1	2685512	223710	lower aquifer	-39.76	6	1.68	3.59	-1.91
Steen-IW-08	DSCP	2686010	222070	unconfined	-40.96	6	0.50	2.61	-2.11
W-27	AOI 10	2679107	222626	lower aquifer	-3.33	6	-0.27	2.63	-2.90
W-32D	AOI 10	2681222	222055	lower aquifer	-58	6	-1.03	2.64	-3.66
A-21D	AOI 5,11	2681388	215630	lower aquifer	-72.06	7	-5.39	-1.62	-3.77
B-132D	AOI 6,11	2680857	216098	lower aquifer	-69.69	7	-6.24	-1.97	-4.27
B-134D	AOI 6,11	2681037	216764	lower aquifer	-68.55	7	-3.81	-1.12	-2.69
BF-108	AOI 3,11	2683185	219701	lower aquifer	-66.04	7	-0.39	1.59	-1.98
C-129D	AOI 7,11	2681929	220492	lower aquifer	-51.65	7	-1.17	1.25	-2.42
C-134D	AOI 6,7,11	2681165	218306	lower aquifer	-55.65	7	-2.01	0.22	-2.23
C-144D	AOI 7,11	2680337	220108	lower aquifer	-64.36	7	-5.04	0.91	-5.95
CSX-DW-4	DSCP	2686121	222537	lower aquifer	-49.91	7	0.62	2.89	-2.27
CSX-DW-5	DSCP	2686325	223310	lower aquifer	-43.89	7	0.94	3.49	-2.55
DSCP-DW-12	DSCP	2687135	222110	lower aquifer	-79.9	7	0.57	2.97	-2.40
DSCP-MW-20D	DSCP	2686776	224063	lower aquifer	-58.69	7	0.90	4.06	-3.16
N-149D	AOI 8	2681583	224606	lower aquifer	-66.52	7	-1.70	2.30	-4.00
N-38D	AOI 8,11	2680792	226897	lower aquifer	-71.23	7	0.31	2.42	-2.11
N-4	AOI 8,11	2683123	227945	lower aquifer	-15.59	7	8.49	6.25	2.24
PGW-MW-2D	PGW	2683918	224286	lower aquifer	-42.84	7	1.94	3.55	-1.61
PGW-MW-3D	PGW	2684691	224483	lower aquifer	-45.27	7	2.09	3.91	-1.82
PGW-MW-8D	AOI 2	2684089	223962	lower aquifer	-38.89	7	2.32	3.34	-1.02
PGW-MW-9D	AOI 2	2683834	223851	lower aquifer	-38.57	7	1.53	3.13	-1.60
PH-DW-10	DSCP	2686452	221935	lower aquifer	-76.6	7	0.35	2.74	-2.39

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							MAY 2017 OBSERVED HYDRAULIC HEAD [FT]	MAY 2017 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2017 HYDRAULIC HEAD RESIDUAL [FT]
PH-DW-11	DSCP	2686415	221643	lower aquifer	-80.46	7	0.44	2.66	-2.22
S-13	AOI 3,11	2683522	218892	lower aquifer	-63.46	7	-1.38	1.51	-2.89
S-138SRTF	AOI 9	2679003	215451	lower aquifer	-77.23	7	-8.68	-7.48	-1.20
S-218D	AOI 4	2684512	220118	lower aquifer	-69.15	7	0.01	2.01	-2.00
S-264D	AOI 1,11	2685762	221289	lower aquifer	-50.81	7	0.24	2.40	-2.16
S-284D	AOI 3,11	2683136	220356	lower aquifer	-60.79	7	0.19	1.67	-1.48
S-294D	AOI 2,11	2684682	224165	lower aquifer	-56.43	7	2.02	3.68	-1.66
S-302D	AOI 2,11	2683248	222607	lower aquifer	-62.45	7	-0.19	2.13	-2.32
S-305D	AOI 2,11	2684882	221990	lower aquifer	-56.6	7	0.17	2.38	-2.21
S-388D	AOI 1	2685903	222561	lower aquifer	-53.1	7	0.45	2.86	-2.41
S-389D	AOI 1	2685876	223190	lower aquifer	-52.4	7	0.54	3.29	-2.75
S-390D	AOI 1	2685310	222830	lower aquifer	-62.2	7	0.60	2.93	-2.33
S-391D	AOI 1	2684710	223313	lower aquifer	-64.2	7	1.60	3.11	-1.51
S-392D	AOI 1	2685166	221525	lower aquifer	-49.3	7	0.34	2.33	-1.99
S-393D	BELMONT	2685996	224457	lower aquifer	-64.5	7	1.98	4.22	-2.24
S-394	BELMONT	2685993	224461	lower aquifer	-52.5	7	1.92	4.22	-2.30
S-39D	AOI 4	2685551	220138	lower aquifer	-105.1	7	-0.61	2.15	-2.76
S-400	AOI 1	2684704	223296	lower aquifer	-43	7	1.34	3.10	-1.76
S-46D	AOI 1,11	2685274	222026	lower aquifer	-47.87	7	0.67	2.49	-1.82
S-69D	AOI 3,11	2682399	219971	lower aquifer	-47.3	7	-0.53	1.38	-1.91
S-72D	AOI 2	2683834	223838	lower aquifer	-61.93	7	1.42	3.12	-1.70
S-74D1SRTF	AOI 9	2679175	216087	lower aquifer	-63.15	7	-8.47	-5.41	-3.06
S-76DSRTF	AOI 9	2678241	216807	lower aquifer	-69.5	7	-8.43	-4.16	-4.27
Steen-DW-07	DSCP	2686045	222330	lower aquifer	-78.62	7	0.39	2.77	-2.38
Steen-DW-08	DSCP	2686004	222074	lower aquifer	-86.23	7	0.70	2.67	-1.97
Steen-DW-09	DSCP	2686195	222017	lower aquifer	-81.39	7	0.41	2.70	-2.29
W-13	AOI 10	2682065	221929	lower aquifer	-56.84	7	-1.80	1.67	-3.48
W-19	AOI 10	2680982	222405	lower aquifer	-66.83	7	-1.45	2.28	-3.73
W-1D	AOI 10	2682756	223584	lower aquifer	-63.63	7	0.59	2.27	-1.68
W-26	AOI 10	2679592	222651	lower aquifer	-12.15	7	-2.89	2.50	-5.39

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
808	PWD WPCP	2678180	213261	unconfined	-22	1	-9.25	-6.02	-3.23
A-10	AOI 5	2682406	215428	unconfined	-6.33	1	4.46	3.69	0.77
A-11	AOI 5	2682016	215380	unconfined	-8.91	1	2.98	2.95	0.03
A-118	AOI 5	2683071	217109	unconfined	-9.7	1	5.75	6.00	-0.25
A-12	AOI 5	2682183	215379	unconfined	-8.12	1	2.35	3.31	-0.96
A-122	AOI 5	2682278	215930	unconfined	-10.56	1	2.48	3.72	-1.24
A-133	AOI 5	2681282	215805	unconfined	-4.74	1	3.60	4.56	-0.96
A-134	AOI 5	2681409	215810	unconfined	-7.79	1	1.56	4.64	-3.08
A-135	AOI 5	2681633	215823	unconfined	-6.64	1	3.27	2.97	0.30
A-136	AOI 5	2681693	215556	unconfined	-8.48	1	1.56	2.53	-0.97
A-137	AOI 5	2683597	215161	unconfined	-7.71	1	4.40	1.64	2.76
A-139	AOI 5	2683732	215985	unconfined	-8.1	1	4.39	3.59	0.80
A-142	AOI 5	2683676	214931	unconfined	-8.86	1	5.62	1.35	4.27
A-143	AOI 5	2683340	215553	unconfined	-2.92	1	2.18	2.75	-0.57
A-148	AOI 5	2682641	216806	unconfined	-6.3	1	5.55	5.51	0.04
A-149	AOI 5	2682443	216327	unconfined	-8.41	1	5.14	5.30	-0.16
A-151	AOI 5	2682129	215824	unconfined	-9.9	1	2.99	3.52	-0.53
A-155	AOI 5	2681449	216208	unconfined	-9.1	1	3.30	4.62	-1.32
A-156	AOI 5	2681355	216058	unconfined	1.1	1	4.36	4.65	-0.29
A-157	AOI 5	2681414	216278	unconfined	-2.2	1	3.77	4.50	-0.73
A-158	AOI 5	2681604	216132	unconfined	-5.25	1	2.44	3.09	-0.65
A-163	AOI 5	2681070	215985	unconfined	0	1	4.27	3.80	0.47
A-164	AOI 5	2681178	216039	unconfined	0	1	4.01	4.16	-0.15
A-166	AOI 5	2681273	215790	unconfined	0	1	3.17	4.42	-1.25
A-167	AOI 5	2681257	216200	unconfined	0	1	4.77	4.39	0.38
A-168	AOI 5	2681699	216444	unconfined	0	1	3.93	3.32	0.61
A-169	AOI 5	2681150	215953	unconfined	-9.9	1	3.98	4.24	-0.26
A-170	AOI 5	2681811	215867	unconfined	-13.8	1	1.90	3.14	-1.24
A-171	AOI 5	2681590	215555	unconfined	-11.3	1	2.11	2.17	-0.06
A-172	AOI 5	2681780	215441	unconfined	-11.3	1	1.81	2.35	-0.54
A-175	AOI 5	2682663	215245	unconfined	0	1	0.74	3.26	-2.52
A-176	AOI 5	2682694	215260	unconfined	0	1	0.55	3.30	-2.75
A-178	AOI 5	2682770	215228	unconfined	0	1	1.04	3.06	-2.02
A-179	AOI 5	2682824	215290	unconfined	0	1	4.84	3.23	1.61
A-182	AOI 5	2682580	215083	unconfined	0	1	1.96	2.04	-0.08
A-183	AOI 5	2682598	215354	unconfined	0	1	4.56	3.66	0.90
A-187	AOI 5	2682721	215337	unconfined	0	1	3.50	3.55	-0.05

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
A-188	AOI 5	2682745	215335	unconfined	-4.9	1	3.41	3.51	-0.10
A-189	AOI 5	2683360	217438	unconfined	0	1	3.43	5.17	-1.74
A-21	AOI 5	2681388	215630	unconfined	-5.23	1	5.72	3.85	1.87
A-22	AOI 5	2680996	216032	unconfined	-7.24	1	2.15	1.84	0.31
A-23	AOI 5	2682143	216385	unconfined	-9.21	1	2.73	3.78	-1.05
A-24	AOI 5	2681515	215977	unconfined	-6.44	1	3.08	4.52	-1.44
A-25	AOI 5	2682468	216982	unconfined	-4.18	1	4.13	5.72	-1.59
A-26	AOI 5	2682167	216793	unconfined	-4.5	1	3.65	5.52	-1.87
A-27	AOI 5	2681846	216592	unconfined	-5.5	1	3.84	3.56	0.28
A-3	AOI 5	2683412	215785	unconfined	-5.34	1	1.96	3.41	-1.45
A-4	AOI 5	2683520	215001	unconfined	-9.15	1	1.92	1.50	0.42
A-40	AOI 5	2683592	215201	unconfined	-6.98	1	4.66	1.64	3.02
A-41	AOI 5	2683535	215097	unconfined	-7.46	1	1.73	1.62	0.11
A-44	AOI 5	2683121	215462	unconfined	-5.39	1	2.20	3.11	-0.91
A-45	AOI 5	2682742	215239	unconfined	-8.13	1	0.99	3.15	-2.16
A-46	AOI 5	2682464	215347	unconfined	-3.44	1	1.90	3.60	-1.70
A-48	AOI 5	2682295	215157	unconfined	-7.87	1	2.15	2.24	-0.09
A-49	AOI 5	2682249	215647	unconfined	-6.2	1	3.70	3.64	0.06
A-6	AOI 5	2682954	215268	unconfined	-7.99	1	3.82	2.85	0.97
A-7	AOI 5	2683087	215287	unconfined	-6.13	1	2.53	2.57	-0.04
ARCO-1	AOI 1	2685973	221361	unconfined	-14.89	1	0.84	0.72	0.12
ARCO-2	AOI 1	2685882	221258	unconfined	-15.11	1	0.79	1.07	-0.28
ARCO-3	AOI 1	2685928	221631	unconfined	-17.51	1	0.39	-1.29	1.68
B-115	AOI 6	2682825	218059	unconfined	-5	1	4.49	4.84	-0.35
B-123	AOI 6	2681458	217146	unconfined	-5	1	6.06	4.93	1.13
B-124	AOI 6	2681316	216811	unconfined	-9.09	1	3.99	4.58	-0.59
B-125	AOI 6	2681099	216829	unconfined	-5	1	3.83	4.14	-0.31
B-126	AOI 6	2680974	217022	unconfined	-5	1	3.43	4.09	-0.66
B-130	AOI 6	2680131	217397	unconfined	-6.89	1	4.17	3.48	0.69
B-131	AOI 6	2680693	216460	unconfined	-7.8	1	3.47	4.26	-0.79
B-132	AOI 6	2681171	217351	unconfined	-8.73	1	1.94	4.08	-2.14
B-133	AOI 6	2681207	217307	unconfined	-7.7	1	2.43	4.20	-1.77
B-134	AOI 6	2681163	217285	unconfined	-7.62	1	1.63	4.15	-2.52
B-135	AOI 6	2681137	217329	unconfined	-7.69	1	1.23	4.10	-2.87
B-136	AOI 6	2681253	217259	unconfined	-5.69	1	3.69	4.53	-0.84
B-137	AOI 6	2681298	217188	unconfined	-5.78	1	4.11	4.63	-0.52
B-138	AOI 6	2681330	217138	unconfined	-5.94	1	4.80	4.65	0.15

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
B-142	AOI 6	2681209	217178	unconfined	-5.19	1	2.63	4.48	-1.85
B-143	AOI 6	2681159	217208	unconfined	-5.64	1	3.76	4.43	-0.67
B-144	AOI 6	2681235	217134	unconfined	-5.84	1	3.90	4.49	-0.59
B-145	AOI 6	2681362	217086	unconfined	-4.84	1	4.12	4.71	-0.59
B-147	AOI 6	2681125	217146	unconfined	-5.4	1	3.27	4.33	-1.06
B-148	AOI 6	2681077	217444	unconfined	-5.81	1	1.42	4.34	-2.92
B-149	AOI 6	2680999	217436	unconfined	-5.2	1	4.33	4.39	-0.06
B-150	AOI 6	2680966	217480	unconfined	-5.17	1	4.18	4.43	-0.25
B-151	AOI 6	2680729	217738	unconfined	-4.23	1	3.80	4.32	-0.52
B-152	AOI 6	2680603	217848	unconfined	-4.5	1	3.64	4.30	-0.66
B-153	AOI 6	2680102	217475	unconfined	-3.33	1	3.99	2.89	1.10
B-155	AOI 6	2680975	217400	unconfined	-3.46	1	4.03	4.32	-0.29
B-156	AOI 6	2680904	217366	unconfined	-3.35	1	2.30	4.24	-1.94
B-157	AOI 6	2680881	217195	unconfined	-6.74	1	3.30	4.11	-0.81
B-158	AOI 6	2679969	217967	unconfined	-3.34	1	5.94	3.83	2.11
B-160	AOI 6	2681840	217371	unconfined	-1.05	1	4.47	5.41	-0.94
B-161	AOI 6	2681270	216894	unconfined	-5.02	1	3.74	4.63	-0.89
B-163	AOI 6	2681199	217531	unconfined	-2.32	1	5.13	4.61	0.52
B-164	AOI 6	2680585	216480	unconfined	-6.14	1	3.19	3.76	-0.57
B-165	AOI 6	2680187	217152	unconfined	-5	1	2.82	1.14	1.68
B-167	AOI 6	2683188	217814	unconfined	-5	1	1.12	5.09	-3.97
B-168	AOI 6	2680070	217495	unconfined	-5	1	3.64	2.34	1.30
B-169	AOI 6	2680092	217416	unconfined	-5	1	4.43	1.30	3.13
B-172	AOI 6	2680736	217412	unconfined	0	1	1.28	4.08	-2.80
B-173	AOI 6	2681021	216651	unconfined	-6.3	1	3.69	4.20	-0.51
B-174	AOI 6	2681059	216388	unconfined	-6.5	1	4.64	4.15	0.49
B-175	AOI 6	2681336	216863	unconfined	0	1	4.07	4.59	-0.52
B-43	AOI 6	2680085	217611	unconfined	-7.36	1	2.69	3.93	-1.24
B-45	AOI 6	2680393	218353	unconfined	-10.1	1	4.32	4.28	0.04
B-46	AOI 6	2681909	218131	unconfined	-3.68	1	6.74	5.47	1.27
B-47	AOI 6	2681963	217434	unconfined	-5	1	5.31	5.36	-0.05
B-48	AOI 6	2682248	217529	unconfined	-7.2	1	6.00	5.36	0.64
B-92	AOI 6	2681498	216966	unconfined	-8.2	1	4.98	4.87	0.11
B-95	AOI 6	2680373	217541	unconfined	-5	1	4.90	4.27	0.63
BF-103R	AOI 3	2682491	219959	unconfined	-1.57	1	0.94	1.92	-0.98
BF-104	AOI 3	2682830	219137	unconfined	-2.8	1	6.29	4.83	1.46
BF-105	AOI 3	2682998	219443	unconfined	-5	1	0.96	2.15	-1.19

*see notes on last page

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Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
BF-106	AOI 3	2683176	219737	unconfined	-5	1	0.96	2.07	-1.11
BF-107	AOI 3	2683307	219941	unconfined	-5	1	1.07	2.20	-1.13
BF-88	AOI 3	2683465	220156	unconfined	-7.14	1	1.25	2.24	-0.99
BF-90	AOI 3	2683035	218954	unconfined	-5.72	1	5.59	3.61	1.98
BF-99	AOI 3	2683159	219974	unconfined	-9.18	1	1.12	1.98	-0.86
C-104	AOI 7	2679742	219188	unconfined	-5	1	2.65	1.91	0.74
C-105	AOI 7	2679690	219497	unconfined	-5	1	5.11	1.69	3.42
C-108	AOI 7	2680856	219819	unconfined	-5	1	4.43	3.07	1.36
C-109	AOI 7	2682312	219231	unconfined	-5	1	5.55	5.20	0.35
C-110	AOI 7	2682469	219406	unconfined	-5	1	6.75	5.27	1.48
C-111	AOI 7	2682561	219232	unconfined	-5	1	6.85	5.46	1.39
C-113	AOI 7	2682817	218798	unconfined	-5	1	7.04	6.26	0.78
C-114	AOI 7	2683001	218348	unconfined	-5	1	6.93	6.13	0.80
C-127	AOI 7	2680897	220182	unconfined	-8.3	1	1.42	2.92	-1.50
C-129	AOI 7	2681937	220497	unconfined	-4.8	1	4.32	3.25	1.07
C-130	AOI 7	2682140	219981	unconfined	-4.71	1	5.15	5.14	0.01
C-131	AOI 7	2682329	218971	unconfined	-5.72	1	6.71	5.47	1.24
C-132	AOI 7	2682248	218271	unconfined	-5.91	1	6.27	4.11	2.16
C-133	AOI 7	2681694	218336	unconfined	-5.82	1	5.87	5.23	0.64
C-136	AOI 7	2680991	219217	unconfined	-7.22	1	3.93	3.04	0.89
C-137	AOI 7	2680719	219098	unconfined	-9.29	1	1.81	2.92	-1.11
C-138	AOI 7	2680453	218658	unconfined	-7.52	1	2.21	2.77	-0.56
C-139	AOI 7	2680633	219444	unconfined	-6.53	1	4.51	2.93	1.58
C-140	AOI 7	2679799	218858	unconfined	-4.01	1	6.29	2.16	4.13
C-142	AOI 7	2680660	220134	unconfined	-4.38	1	3.29	3.06	0.23
C-143	AOI 7	2680321	220233	unconfined	-7.11	1	-3.86	2.42	-6.28
C-152	AOI 7	2680477	220266	unconfined	-5	1	0.42	2.61	-2.19
C-155	AOI 7	2680525	220082	unconfined	-5	1	2.85	3.07	-0.22
C-156	AOI 7	2681408	220254	unconfined	-16.41	1	5.19	4.12	1.07
C-161	AOI 7	2680460	220266	unconfined	-2.7	1	0.09	2.57	-2.48
C-163	AOI 7	2681332	220248	unconfined	-5	1	3.49	4.03	-0.54
C-164	AOI 7	2681359	220252	unconfined	-5	1	4.56	3.91	0.65
C-165	AOI 7	2681386	220255	unconfined	-5	1	3.84	3.95	-0.11
C-166	AOI 7	2680285	220242	unconfined	-5	1	0.20	1.85	-1.65
C-167	AOI 7	2680256	220239	unconfined	-12.01	1	-2.61	1.80	-4.41
C-171	AOI 7	2679795	219649	unconfined	0	1	7.14	2.60	4.54
C-172	AOI 7	2680375	218451	unconfined	0	1	2.34	2.70	-0.36

*see notes on last page

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
C-50	AOI 7	2682341	219619	unconfined	-6.17	1	5.23	5.18	0.05
C-51	AOI 7	2681621	220073	unconfined	-6.1	1	4.30	4.78	-0.48
C-52	AOI 7	2681216	220206	unconfined	-6.32	1	3.32	4.20	-0.88
C-53A	AOI 7	2681031	219940	unconfined	-6.88	1	5.10	4.20	0.90
C-54	AOI 7	2680975	219459	unconfined	-8.51	1	5.60	3.07	2.53
C-55	AOI 7	2680864	218851	unconfined	-8.51	1	4.23	2.96	1.27
C-56	AOI 7	2681367	218776	unconfined	-4.6	1	8.19	5.15	3.04
C-57	AOI 7	2681651	219572	unconfined	-6.05	1	5.60	5.04	0.56
C-58	AOI 7	2681692	219017	unconfined	-5.61	1	5.48	5.18	0.30
C-60	AOI 7	2680151	218657	unconfined	-6.98	1	3.74	2.64	1.10
C-61	AOI 7	2679819	219306	unconfined	-5.12	1	4.18	2.55	1.63
C-62	AOI 7	2679892	219890	unconfined	-4.65	1	6.62	2.84	3.78
C-63	AOI 7	2680379	219611	unconfined	-8.83	1	2.00	2.92	-0.92
C-64	AOI 7	2680431	220167	unconfined	-6.83	1	-0.54	2.96	-3.50
C-65	AOI 7	2680266	220116	unconfined	-5.53	1	4.54	2.92	1.62
C-96	AOI 7	2681980	219529	unconfined	-7.18	1	6.64	5.25	1.39
C-97	AOI 7	2680616	220230	unconfined	-7.45	1	-3.64	2.91	-6.55
C-98	AOI 7	2680220	219208	unconfined	-5.66	1	4.96	2.80	2.16
CSX-MW4	DSCP	2686223	222715	unconfined	-7.63	1	1.56	2.19	-0.63
CSX-MW5	DSCP	2686326	223321	unconfined	-5.89	1	3.74	3.26	0.48
CSX-MW7	DSCP	2686132	222540	unconfined	-18.2	1	1.30	1.82	-0.52
CSX-MW9	DSCP	2686193	223091	unconfined	-13.54	1	1.85	2.62	-0.77
DSCP-MW-1	DSCP	2686587	222951	unconfined	-13.14	1	2.35	2.95	-0.60
DSCP-MW-10	DSCP	2688682	221989	unconfined	-13.32	1	4.66	2.75	1.91
DSCP-MW-11	DSCP	2688509	222483	unconfined	-11.29	1	4.66	3.13	1.53
DSCP-MW-12	DSCP	2688887	222849	unconfined	-33.28	1	3.13	3.53	-0.40
DSCP-MW-13	DSCP	2688362	222878	unconfined	-10.37	1	3.21	3.46	-0.25
DSCP-MW-14	DSCP	2687863	222366	unconfined	-12.23	1	2.30	2.90	-0.60
DSCP-MW-15	DSCP	2687278	222669	unconfined	-11.54	1	1.16	3.00	-1.84
DSCP-MW-16	DSCP	2686924	222962	unconfined	-10.46	1	2.51	3.11	-0.60
DSCP-MW-17	DSCP	2687015	223191	unconfined	-9.69	1	2.96	3.34	-0.38
DSCP-MW-19	DSCP	2686631	223493	unconfined	-7.97	1	4.12	3.64	0.48
DSCP-MW-1A	DSCP	2688112	222563	unconfined	-6.97	1	3.14	3.13	0.01
DSCP-MW-2	DSCP	2686659	222486	unconfined	-13.3	1	1.71	2.56	-0.85
DSCP-MW-20	DSCP	2686775	224059	unconfined	-6.1	1	4.56	4.60	-0.04
DSCP-MW-21A	DSCP	2687617	223591	unconfined	-7.84	1	3.87	3.85	0.02
DSCP-MW-23A	DSCP	2686572	222722	unconfined	-13.27	1	2.12	2.74	-0.62

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
DSCP-MW-24	DSCP	2687351	222881	unconfined	-5.31	1	2.56	3.21	-0.65
DSCP-MW-27A	DSCP	2687880	222716	unconfined	-12.42	1	2.78	3.22	-0.44
DSCP-MW-28	DSCP	2686735	222344	unconfined	-13.27	1	2.41	2.47	-0.06
DSCP-MW-29	DSCP	2686965	222161	unconfined	-12.16	1	2.30	2.41	-0.11
DSCP-MW-2B	DSCP	2687618	223121	unconfined	-14.47	1	3.21	3.50	-0.29
DSCP-MW-30	DSCP	2687219	222184	unconfined	-14.39	1	1.99	2.54	-0.55
DSCP-MW-32	DSCP	2687645	222120	unconfined	-12.4	1	3.24	2.63	0.61
DSCP-MW-33	DSCP	2687847	222091	unconfined	-14.87	1	2.05	2.66	-0.61
DSCP-MW-35A	DSCP	2687607	222354	unconfined	-10.86	1	2.45	2.83	-0.38
DSCP-MW-36	DSCP	2688198	221951	unconfined	-14.15	1	2.59	2.62	-0.03
DSCP-MW-3A	DSCP	2687182	222473	unconfined	-13.83	1	2.08	2.79	-0.71
DSCP-MW-44A	DSCP	2686629	223212	unconfined	-15.7	1	2.69	3.19	-0.50
DSCP-MW-45A	DSCP	2686661	223705	unconfined	-10.84	1	4.34	4.03	0.31
DSCP-MW-4A	DSCP	2687066	222254	unconfined	-11.84	1	2.06	2.54	-0.48
DSCP-MW-5	DSCP	2687276	222313	unconfined	-9.8	1	2.42	2.68	-0.26
DSCP-MW-53	DSCP	2688910	223078	unconfined	-15.12	1	3.31	3.73	-0.42
DSCP-MW-54	DSCP	2688606	222975	unconfined	-12.87	1	3.24	3.59	-0.35
DSCP-MW-59	DSCP	2688866	222696	unconfined	-11.4	1	3.11	3.39	-0.28
DSCP-MW-6	DSCP	2687259	222070	unconfined	-11.41	1	2.06	2.46	-0.40
DSCP-MW-65	DSCP	2687428	222124	unconfined	-24.24	1	1.86	2.56	-0.70
DSCP-MW-7	DSCP	2688049	221962	unconfined	-5.71	1	3.45	2.59	0.86
DSCP-MW-9	DSCP	2688453	221927	unconfined	-13.57	1	2.83	2.66	0.17
DSCP-RW-10	DSCP	2688044	222360	unconfined	-14.26	1	2.78	2.94	-0.16
DSCP-RW-11	DSCP	2687629	222027	unconfined	-14.71	1	2.44	2.55	-0.11
DSCP-RW-1A	DSCP	2687406	222061	unconfined	-14.17	1	1.80	2.50	-0.70
DSCP-RW-2	DSCP	2686840	222240	unconfined	-11.8	1	1.94	2.42	-0.48
DSCP-RW-3	DSCP	2687102	222099	unconfined	-11.47	1	2.19	2.41	-0.22
DSCP-RW-4	DSCP	2687542	222032	unconfined	-12.99	1	2.46	2.52	-0.06
DSCP-RW-5/MW-25	DSCP	2687690	222012	unconfined	-5.82	1	2.04	2.55	-0.51
DSCP-RW-6	DSCP	2687840	221992	unconfined	-13.96	1	2.19	2.57	-0.38
DSCP-RW-7	DSCP	2687993	221974	unconfined	-13.24	1	2.37	2.59	-0.22
DSCP-RW-8	DSCP	2687444	222376	unconfined	-14.13	1	1.61	2.80	-1.19
DSCP-RW-9	DSCP	2688233	222374	unconfined	-14.2	1	3.05	2.98	0.07
EPH-MW-39	DSCP	2688284	221752	unconfined	-14.87	1	1.76	2.47	-0.71
EPH-MW-48	DSCP	2687984	221540	unconfined	-12.66	1	2.32	1.74	0.58
EPH-MW-49	DSCP	2687860	221395	unconfined	-10.52	1	2.07	2.05	0.02
EPH-MW-50	DSCP	2687767	221178	unconfined	-12.93	1	1.92	2.33	-0.41

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
EPH-MWS-10	DSCP	2687988	221053	unconfined	-4.06	1	3.75	2.56	1.19
EPH-MWS-11	DSCP	2687625	221111	unconfined	-4.43	1	2.02	2.34	-0.32
EPH-MWS-5	DSCP	2688545	221597	unconfined	-13.28	1	1.80	1.87	-0.07
EPH-PH-5	DSCP	2687579	220875	unconfined	-18.67	1	1.67	2.55	-0.88
EPH-PH-7	DSCP	2688852	221563	unconfined	-15.69	1	3.09	2.33	0.76
MW-26	BELMONT	2685920	224123	unconfined	-22.91	1	4.71	4.85	-0.14
MW-27	BELMONT	2685686	224065	unconfined	-0.45	1	4.61	4.86	-0.25
MW-28	BELMONT	2685581	224169	unconfined	-0.74	1	4.49	5.02	-0.53
MW-29	BELMONT	2685481	223955	unconfined	-0.5	1	4.48	4.78	-0.30
MW-30	BELMONT	2684982	224261	unconfined	1.7	1	7.25	5.20	2.05
MW-31	BELMONT	2685353	224156	unconfined	1.48	1	5.48	5.05	0.43
MW-32	BELMONT	2685565	224286	unconfined	-0.41	1	4.25	5.14	-0.89
MW-33	BELMONT	2685300	224346	unconfined	2.3	1	4.83	5.24	-0.41
MW-35	BELMONT	2685572	224473	unconfined	-4.16	1	4.01	5.31	-1.30
MW-36	BELMONT	2685830	224431	unconfined	-2.25	1	5.02	5.23	-0.21
MW-37	BELMONT	2685985	224470	unconfined	-2.45	1	5.24	5.24	0.00
MW-38	BELMONT	2686166	224255	unconfined	-7.02	1	4.70	4.94	-0.24
MW-39	BELMONT	2686158	224193	unconfined	-7.01	1	4.72	4.86	-0.14
MW-40	BELMONT	2686146	224123	unconfined	-5	1	4.73	4.76	-0.03
MW-41	BELMONT	2686036	224120	unconfined	-7.34	1	4.79	4.80	-0.01
MW-44	BELMONT	2685403	224419	unconfined	-5.18	1	3.87	5.29	-1.42
MWELL-28	AOI 1	2685865	222299	unconfined	-20.84	1	1.11	0.69	0.42
MWELL-29	AOI 1	2685808	222019	unconfined	-25.79	1	0.14	-0.62	0.76
MWELL-30	AOI 1	2685800	221601	unconfined	-17.66	1	0.50	-2.20	2.70
MWELL-31	AOI 1	2685710	221306	unconfined	-14.13	1	0.82	0.94	-0.12
N-1	AOI 8	2682437	228366	unconfined	14.57	1	12.02	7.52	4.50
N-100	AOI 8	2682716	228210	unconfined	4.99	1	9.72	6.41	3.31
N-101	AOI 8	2683653	227222	unconfined	2.43	1	11.60	11.06	0.54
N-106	AOI 8	2682977	227044	unconfined	2.5	1	13.91	16.48	-2.57
N-107	AOI 8	2683133	226910	unconfined	2.38	1	11.65	13.50	-1.85
N-108	AOI 8	2682983	226849	unconfined	4.97	1	11.86	13.15	-1.29
N-11	AOI 8	2682915	227226	unconfined	2.33	1	11.86	11.26	0.60
N-118	AOI 8	2683077	226461	unconfined	1.49	1	9.03	8.69	0.34
N-12	AOI 8	2683394	227099	unconfined	0	1	11.71	11.67	0.04
N-129	AOI 8	2683241	225470	unconfined	-2.88	1	10.38	9.38	1.00
N-133	AOI 8	2680751	224967	unconfined	-4.81	1	5.69	7.82	-2.13
N-134	AOI 8	2685262	226063	unconfined	5.79	1	11.08	7.73	3.35

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
N-137	AOI 8	2683096	227832	unconfined	0.87	1	8.85	7.72	1.13
N-14	AOI 8	2683665	227011	unconfined	4.64	1	11.50	10.22	1.28
N-140	AOI 8	2683133	227411	unconfined	0	1	10.31	9.98	0.33
N-141	AOI 8	2683308	227396	unconfined	0	1	11.11	11.18	-0.07
N-142	AOI 8	2683211	227652	unconfined	0	1	8.89	9.37	-0.48
N-143	AOI 8	2683358	227513	unconfined	0	1	10.96	10.68	0.28
N-144	AOI 8	2683293	227623	unconfined	0	1	8.97	9.84	-0.87
N-145	AOI 8	2683032	227680	unconfined	0	1	8.92	8.35	0.57
N-15	AOI 8	2684060	226993	unconfined	4.8	1	9.02	8.16	0.86
N-151	AOI 8	2683620	225640	unconfined	2.26	1	10.95	8.93	2.02
N-16	AOI 8	2684409	226993	unconfined	5	1	11.82	7.84	3.98
N-17	AOI 8	2684410	226993	unconfined	6.3	1	11.83	7.84	3.99
N-18	AOI 8	2684650	226744	unconfined	5.15	1	11.68	7.99	3.69
N-20	AOI 8	2683878	226645	unconfined	19.12	1	11.29	9.19	2.10
N-24	AOI 8	2682554	226437	unconfined	2.03	1	8.33	7.61	0.72
N-29	AOI 8	2685039	225835	unconfined	6.6	1	11.21	10.26	0.95
N-36	AOI 8	2681732	226220	unconfined	-0.27	1	6.66	5.57	1.09
N-37	AOI 8	2681543	226828	lower aquifer	-0.74	1	6.29	5.95	0.34
N-42	AOI 8	2682412	225813	unconfined	-2.91	1	7.44	8.23	-0.79
N-47	AOI 8	2683936	225489	unconfined	4.55	1	12.82	9.37	3.45
N-48	AOI 8	2683476	225312	unconfined	1.92	1	10.43	9.58	0.85
N-49	AOI 8	2683115	225175	unconfined	3.55	1	9.78	9.92	-0.14
N-503	AOI 8	2680566	226576	unconfined	11.46	1	3.91	4.28	-0.37
N-504	AOI 8	2680652	226857	unconfined	11.36	1	3.66	3.81	-0.15
N-51	AOI 8	2682956	225253	unconfined	2.92	1	9.78	9.84	-0.06
N-55	AOI 8	2681474	225122	unconfined	0.59	1	5.25	8.50	-3.25
N-56	AOI 8	2681266	225659	unconfined	-2.32	1	5.59	8.81	-3.22
N-57	AOI 8	2680586	226031	unconfined	-1.2	1	5.45	7.30	-1.85
N-64	AOI 8	2682309	224842	unconfined	-3.5	1	4.08	3.75	0.33
N-67	AOI 8	2682698	226940	unconfined	-2.77	1	13.17	14.21	-1.04
N-68	AOI 8	2682973	226911	unconfined	3.22	1	17.06	15.39	1.67
N-72	AOI 8	2680686	226761	unconfined	-3.74	1	3.76	6.40	-2.64
N-8	AOI 8	2684092	227375	unconfined	1.03	1	12.11	10.35	1.76
N-82	AOI 8	2684634	225723	unconfined	0.98	1	11.68	9.28	2.40
N-85	AOI 8	2684734	226448	unconfined	-1.05	1	11.63	7.31	4.32
N-86	AOI 8	2684119	226463	unconfined	11.3	1	11.00	8.84	2.16
N-87	AOI 8	2683965	226550	unconfined	5.89	1	11.17	9.26	1.91

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Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
N-89	AOI 8	2682824	226717	unconfined	-0.13	1	9.51	9.96	-0.45
N-93	AOI 8	2683794	226550	unconfined	5.05	1	10.37	8.84	1.53
N-97	AOI 8	2684187	226513	unconfined	-5	1	9.29	8.49	0.80
N-98	AOI 8	2683479	227658	unconfined	2.46	1	11.50	10.03	1.47
OW-12	BELMONT	2685686	224424	unconfined	0	1	4.96	5.25	-0.29
OW-13	BELMONT	2685988	224385	unconfined	0	1	4.98	5.14	-0.16
OW-14	BELMONT	2686076	224372	unconfined	-17.59	1	4.83	5.11	-0.28
OW-16	BELMONT	2685739	224420	unconfined	0	1	4.99	5.23	-0.24
OW-17	BELMONT	2685587	224388	unconfined	0	1	4.31	5.24	-0.93
OW-18	BELMONT	2685520	224437	unconfined	0.75	1	4.71	5.29	-0.58
OW-19	BELMONT	2685717	224415	unconfined	1.22	1	5.29	5.24	0.05
OW-2	BELMONT	2685939	224392	unconfined	0	1	5.07	5.16	-0.09
OW-20	BELMONT	2685840	224404	unconfined	2.43	1	5.04	5.20	-0.16
PGW-MW-10S	PGW	2685131	225179	unconfined	1.2	1	10.08	9.71	0.37
PGW-MW-11S	PGW	2685405	224756	unconfined	0	1	9.51	5.54	3.97
PGW-MW-12S	PGW	2685295	224521	unconfined	-1.5	1	9.54	5.38	4.16
PGW-MW-13S	PGW	2685322	225242	unconfined	-0.5	1	9.72	9.05	0.67
PGW-MW-14S	PGW	2685266	224997	unconfined	0	1	9.62	7.86	1.76
PGW-MW-15S	PGW	2685092	224730	unconfined	-4	1	9.81	5.53	4.28
PGW-MW-1S	PGW	2683457	224135	unconfined	-1.2	1	8.13	6.43	1.70
PGW-MW-20	AOI 8	2682870	224701	unconfined	-5	1	9.47	7.72	1.75
PGW-MW-2S	PGW	2683928	224288	unconfined	0.7	1	9.78	7.60	2.18
PGW-MW-3S	PGW	2684683	224482	unconfined	0.5	1	10.30	7.49	2.81
PGW-MW-42R	PGW	2684370	225557	unconfined	4.6	1	11.78	9.52	2.26
PGW-MW-44	PGW	2684147	225231	unconfined	-5	1	13.12	9.52	3.60
PGW-MW-45	PGW	2684686	225671	unconfined	0	1	12.63	9.78	2.85
PGW-MW-4S	PGW	2685044	224934	unconfined	-5	1	10.13	8.26	1.87
PGW-MW-5	AOI 8	2683138	224445	unconfined	-5	1	9.23	7.29	1.94
PGW-MW-5S	PGW	2685404	225420	unconfined	-4.3	1	9.17	7.95	1.22
PGW-MW-6	AOI 8	2682885	224559	unconfined	-5	1	4.24	3.40	0.84
PGW-MW-6S	PGW	2685348	224948	unconfined	0.5	1	9.45	6.05	3.40
PGW-MW-7	AOI 8	2682986	224648	unconfined	-5	1	9.36	8.56	0.80
PGW-MW-7S	PGW	2685067	224606	unconfined	-4.3	1	8.94	5.45	3.49
PGW-MW-8	AOI 8	2683074	224544	unconfined	-5	1	9.70	8.09	1.61
PGW-MW-9	AOI 8	2683174	224408	unconfined	-5	1	8.88	7.26	1.62
PH-MW-40	DSCP	2687731	221480	unconfined	-14.03	1	1.98	1.81	0.17
PH-MW-41	DSCP	2687413	221534	unconfined	-11.92	1	2.16	1.43	0.73

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
PH-MW-43	DSCP	2686438	221827	unconfined	-12.33	1	1.48	1.53	-0.05
PH-MW-51	DSCP	2687500	221132	unconfined	-13.84	1	1.99	2.27	-0.28
PH-MW-55	DSCP	2686505	222267	unconfined	-10.89	1	1.85	2.28	-0.43
PH-MW-56	DSCP	2686556	221083	unconfined	-16.37	1	3.68	1.92	1.76
PH-MW-57	DSCP	2686282	220525	unconfined	-11.98	1	0.45	2.27	-1.82
PH-MW-58	DSCP	2686349	221238	unconfined	-11.84	1	0.61	1.59	-0.98
PH-MW-60	DSCP	2687960	221802	unconfined	-18.93	1	2.33	2.45	-0.12
PH-MWS-1	DSCP	2686452	221928	unconfined	-6.49	1	1.59	1.70	-0.11
PH-MWS-13	DSCP	2686359	221371	unconfined	-7.08	1	1.77	1.46	0.31
PH-MWS-2A	DSCP	2687207	221520	unconfined	-14.65	1	2.06	1.42	0.64
PH-MWS-3	DSCP	2687763	221556	unconfined	-16.04	1	2.06	1.55	0.51
PH-MWS-4	DSCP	2687804	221600	unconfined	-7.57	1	2.42	1.65	0.77
PH-PH-1	DSCP	2686489	222120	unconfined	-10.98	1	1.85	2.14	-0.29
PH-PH-13	DSCP	2687220	221617	unconfined	-12.08	1	-0.99	1.36	-2.35
PH-PH-14	DSCP	2687012	221567	unconfined	-14.83	1	1.88	1.15	0.73
PH-PH-16	DSCP	2687623	221740	unconfined	-13.9	1	2.62	2.26	0.36
PH-PH-17	DSCP	2687678	221881	unconfined	-14.78	1	2.20	2.44	-0.24
PH-PH-18	DSCP	2687410	221922	unconfined	-15.08	1	2.05	2.39	-0.34
PH-PH-19	DSCP	2687210	221950	unconfined	-16.22	1	1.90	2.33	-0.43
PH-PH-2	DSCP	2686821	222025	unconfined	-10.55	1	1.79	2.20	-0.41
PH-PH-20	DSCP	2686939	221991	unconfined	-13.58	1	1.52	2.23	-0.71
PH-PH-21	DSCP	2686682	222101	unconfined	-10.46	1	1.78	2.21	-0.43
PH-PH-22	DSCP	2686409	221643	unconfined	-12.07	1	1.66	1.37	0.29
PH-PH-23	DSCP	2686701	221254	unconfined	-16.1	1	2.14	1.82	0.32
PH-PH-24	DSCP	2687242	221174	unconfined	-15.15	1	2.88	2.13	0.75
PH-PH-3	DSCP	2687314	221945	unconfined	-9.95	1	1.98	2.37	-0.39
PH-PH-4	DSCP	2687928	221845	unconfined	-15.3	1	2.37	2.47	-0.10
PH-PZ-4	DSCP	2687319	221943	unconfined	-1.31	1	2.08	2.37	-0.29
PH-RW-A	DSCP	2686638	222124	unconfined	-11.35	1	3.68	2.22	1.46
PH-RW-A2	DSCP	2686640	222131	unconfined	0	1	2.36	2.22	0.14
PH-RW-B	DSCP	2686815	222035	unconfined	-12.68	1	3.41	2.21	1.20
PH-RW-B2	DSCP	2686821	222030	unconfined	0	1	2.55	2.21	0.34
PH-RW-C	DSCP	2687070	221975	unconfined	-11.9	1	2.93	2.29	0.64
PH-RW-CA	DSCP	2687084	221963	unconfined	-9.19	1	2.83	2.28	0.55
PH-RW-E	DSCP	2687539	221910	unconfined	-14.3	1	2.04	2.42	-0.38
PH-RW-F	DSCP	2687826	221867	unconfined	-16.38	1	2.23	2.47	-0.24
PH-RW-G	DSCP	2687154	221567	unconfined	-14.6	1	3.55	1.25	2.30

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
PH-RW-I2	DSCP	2686803	221923	unconfined	0	1	1.06	2.07	-1.01
PH-RW-N	DSCP	2687810	221599	unconfined	-10.37	1	2.35	1.65	0.70
PH-RW-O	DSCP	2687693	221589	unconfined	-14.9	1	3.49	1.54	1.95
PH-RW-P	DSCP	2687599	221597	unconfined	-16.73	1	3.75	1.56	2.19
PH-RW-Q	DSCP	2687510	221586	unconfined	-18.17	1	4.58	1.47	3.11
PH-RW-S	DSCP	2687350	221602	unconfined	-17.98	1	3.17	1.47	1.70
PH-RW-U	DSCP	2686879	221846	unconfined	-12.61	1	4.21	2.03	2.18
PH-RW-V	DSCP	2686705	221936	unconfined	-14.41	1	3.35	2.04	1.31
PH-RW-W	DSCP	2686591	221952	unconfined	-15.7	1	3.32	2.04	1.28
PZ-100	AOI 2	2683602	222350	unconfined	-5	1	3.36	2.49	0.87
PZ-2	AOI 5	2681495	215938	unconfined	0	1	5.59	4.59	1.00
PZ-201	AOI 8	2683718	225409	unconfined	9.28	1	11.32	9.40	1.92
PZ-202	AOI 8	2683876	225484	unconfined	10.39	1	11.40	9.34	2.06
PZ-203	AOI 8	2684037	225560	unconfined	13.11	1	14.59	9.25	5.34
PZ-204	AOI 8	2684196	225633	unconfined	-5	1	9.20	9.00	0.20
PZ-3	AOI 5	2681511	215958	unconfined	0	1	3.06	4.53	-1.47
PZ-300	AOI 8	2683295	226640	unconfined	-0.23	1	11.46	9.34	2.12
PZ-400	BELMONT	2686131	224096	unconfined	0	1	4.74	4.73	0.01
PZ-402	AOI 1	2686061	223552	unconfined	-8.68	1	4.17	3.76	0.41
PZ-403	AOI 1	2685965	222935	unconfined	-5	1	0.05	1.91	-1.86
PZ-404	AOI 1	2685981	222933	unconfined	-12.84	1	-0.04	1.84	-1.88
PZ-500	AOI 8	2680478	225305	unconfined	0	1	5.32	3.14	2.18
PZ-501	AOI 8	2680429	225835	unconfined	-1	1	5.16	3.51	1.65
PZ-502	AOI 8	2680434	225562	unconfined	6.14	1	5.28	3.44	1.84
PZ-503	AOI 8	2680590	225085	unconfined	-0.31	1	5.22	2.88	2.34
PZ-504	AOI 8	2680730	224903	unconfined	1.63	1	5.15	3.85	1.30
PZ-505	AOI 8	2681024	224708	unconfined	0.46	1	5.20	3.73	1.47
PZ-507	AOI 8	2682206	224812	unconfined	2.68	1	4.19	3.30	0.89
RW-100	AOI 2	2683341	222349	unconfined	-8.66	1	3.12	2.50	0.62
RW-101	AOI 2	2683489	222384	unconfined	-8.63	1	3.10	2.54	0.56
RW-102	AOI 2	2683599	222321	unconfined	-9.76	1	3.52	2.47	1.05
RW-103	AOI 2	2683770	222358	unconfined	-10.24	1	3.37	2.41	0.96
RW-104	AOI 2	2682960	222446	unconfined	-15.89	1	2.40	2.14	0.26
RW-105	AOI 2	2682964	222412	unconfined	-7.87	1	0.76	2.37	-1.61
RW-106	AOI 2	2682946	222348	unconfined	-7.71	1	2.62	2.35	0.27
RW-107	AOI 2	2682915	222272	unconfined	-5	1	1.95	2.35	-0.40
RW-108	AOI 2	2682895	222181	unconfined	-8.66	1	2.60	2.34	0.26

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
RW-109	AOI 2	2682883	222084	unconfined	-10.49	1	3.46	2.34	1.12
RW-110	AOI 1	2685160	222136	unconfined	-4.3	1	1.87	1.60	0.27
RW-112	AOI 1	2685156	222113	unconfined	-6.29	1	1.41	1.58	-0.17
RW-113	AOI 2	2682988	222409	unconfined	-18.9	1	2.27	2.39	-0.12
RW-114	AOI 2	2683023	222392	unconfined	-15.6	1	2.59	2.40	0.19
RW-115	AOI 2	2682980	222371	unconfined	-18.7	1	2.48	2.37	0.11
RW-116	AOI 2	2682987	222340	unconfined	-18.11	1	2.63	2.38	0.25
RW-117	AOI 2	2682964	222320	unconfined	-19.06	1	2.63	2.37	0.26
RW-118	AOI 2	2682999	222302	unconfined	-17.03	1	2.69	2.40	0.29
RW-119	AOI 2	2683013	222332	unconfined	-16.06	1	2.73	2.40	0.33
RW-120	AOI 2	2683027	222353	unconfined	-4.23	1	2.70	2.41	0.29
RW-121	AOI 2	2683050	222376	unconfined	-8.7	1	2.70	2.42	0.28
RW-122	AOI 2	2682978	222265	unconfined	-18.58	1	2.57	2.39	0.18
RW-123	AOI 2	2682969	222296	unconfined	-19.02	1	2.68	2.38	0.30
RW-125	AOI 2	2683040	222428	unconfined	-14.3	1	2.24	2.43	-0.19
RW-126	AOI 2	2682936	222285	unconfined	-19.65	1	2.61	2.36	0.25
RW-127	AOI 2	2683036	222383	unconfined	-14.65	1	2.67	2.41	0.26
RW-129	AOI 2	2683008	222434	unconfined	-18.55	1	1.39	2.42	-1.03
RW-201	AOI 8	2682704	225060	unconfined	-3.39	1	9.61	9.90	-0.29
RW-202	AOI 8	2682881	225065	unconfined	-3.96	1	9.75	10.04	-0.29
RW-204	AOI 8	2683190	225163	unconfined	-3.66	1	10.12	9.94	0.18
RW-205	AOI 8	2683343	225251	unconfined	0.3	1	11.38	9.74	1.64
RW-206	AOI 8	2683557	225332	unconfined	-0.42	1	10.56	9.53	1.03
RW-21	BELMONT	2685822	224345	unconfined	0	1	4.61	5.14	-0.53
RW-22	BELMONT	2685892	224304	unconfined	-13.8	1	4.90	5.08	-0.18
RW-23	BELMONT	2685912	224209	unconfined	-13.72	1	4.93	4.96	-0.03
RW-24	BELMONT	2685772	224272	unconfined	-13.62	1	4.75	5.08	-0.33
RW-25	BELMONT	2685725	224365	unconfined	-10.66	1	4.96	5.18	-0.22
RW-26	BELMONT	2685474	224410	unconfined	-9.4	1	4.68	5.27	-0.59
RW-27	BELMONT	2685423	224396	unconfined	-9.26	1	3.84	5.27	-1.43
RW-28	BELMONT	2685357	224378	unconfined	-9.9	1	4.64	5.26	-0.62
RW-29	BELMONT	2685286	224360	unconfined	-9.81	1	3.87	5.25	-1.38
RW-30	BELMONT	2685257	224352	unconfined	-9.67	1	3.94	5.25	-1.31
RW-303	AOI 8	2683167	226663	unconfined	-6.02	1	11.33	9.68	1.65
RW-307	AOI 8	2683080	226604	unconfined	22.82	1	8.80	9.39	-0.59
RW-308	AOI 8	2683240	226623	unconfined	25.27	1	9.14	9.35	-0.21
RW-309	AOI 8	2683373	226602	unconfined	24.81	1	9.87	9.06	0.81

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
RW-31	BELMONT	2685206	224339	unconfined	-9.69	1	3.90	5.25	-1.35
RW-32	BELMONT	2685150	224324	unconfined	-9.95	1	7.27	5.24	2.03
RW-4	BELMONT	2685789	224388	unconfined	-18.63	1	4.81	5.19	-0.38
RW-401	AOI 1	2686040	223555	unconfined	-25.49	1	-0.87	3.78	-4.65
RW-402	AOI 1	2686055	223415	unconfined	-9.41	1	4.12	3.39	0.73
RW-404	AOI 1	2686015	223152	unconfined	-8.81	1	1.82	2.29	-0.47
RW-500	AOI 8	2680478	225305	unconfined	6.79	1	5.26	3.18	2.08
RW-501	AOI 8	2681487	224727	unconfined	7.98	1	4.86	5.17	-0.31
RW-502	AOI 8	2680607	226714	unconfined	11.4	1	3.97	4.75	-0.78
RW-6	BELMONT	2686038	224377	unconfined	0	1	4.89	5.12	-0.23
RW-600	AOI 2	2683369	223296	unconfined	-15.51	1	6.90	2.90	4.00
RW-6S	AOI 5	2681520	215947	unconfined	5.22	1	3.18	4.47	-1.29
RW-704	AOI 4	2684875	218912	unconfined	-3.87	1	1.22	2.97	-1.75
RW-9	AOI 6	2681446	216562	unconfined	-5	1	4.01	4.63	-0.62
RWBH-1	AOI 5	2682070	215219	unconfined	-6.14	1	1.56	2.30	-0.74
RWBH-2	AOI 5	2682109	215220	unconfined	-3.67	1	2.22	2.49	-0.27
S-100	AOI 1	2686178	223523	unconfined	-9.91	1	4.14	3.67	0.47
S-101	AOI 1	2686296	223163	unconfined	-11.73	1	2.31	2.91	-0.60
S-102	AOI 4	2683874	221407	unconfined	-4.37	1	1.70	2.33	-0.63
S-104	AOI 4	2684804	221448	unconfined	-4.37	1	2.31	1.95	0.36
S-107	AOI 2	2683338	223258	unconfined	-5.51	1	3.43	2.81	0.62
S-108	AOI 2	2683362	223294	unconfined	-8.04	1	5.95	2.88	3.07
S-108SRTF	AOI 9	2677667	218321	unconfined	-10.93	1	-0.50	-1.15	0.65
S-109SRTF	AOI 9	2677084	217894	unconfined	-11.76	1	-0.38	-1.85	1.47
S-111SRTF	AOI 9	2677273	217432	unconfined	-13.64	1	-7.87	-2.84	-5.03
S-112SRTF	AOI 9	2677256	216984	unconfined	-13.41	1	-8.39	-3.82	-4.57
S-113	AOI 3	2683405	220680	unconfined	-11.65	1	1.39	2.10	-0.71
S-113SRTF	AOI 9	2676915	216800	unconfined	-14.57	1	-8.38	-4.18	-4.20
S-114SRTF	AOI 9	2676978	216435	unconfined	-15.44	1	-8.44	-5.12	-3.32
S-115SRTF	AOI 9	2676754	216194	unconfined	-14.8	1	-8.62	-5.67	-2.95
S-116SRTF	AOI 9	2676903	215942	unconfined	-16.68	1	-8.72	-6.32	-2.40
S-117	AOI 1	2685492	222352	unconfined	-9.4	1	1.95	1.63	0.32
S-118SRTF	AOI 9	2676678	215161	unconfined	-13.98	1	-8.04	-8.27	0.23
S-119	AOI 4	2685393	220753	unconfined	-10.18	1	1.57	1.99	-0.42
S-121SRTF	AOI 9	2677486	215710	unconfined	-13.54	1	-6.72	-6.95	0.23
S-122SRTF	AOI 9	2677653	216573	unconfined	-13.96	1	-6.54	-4.74	-1.80
S-125	AOI 1	2686079	223506	unconfined	-6.16	1	4.32	3.64	0.68

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
S-127	AOI 1	2685644	222203	unconfined	-13.62	1	1.50	1.00	0.50
S-131	AOI 2	2684100	222307	unconfined	-7.09	1	5.23	2.05	3.18
S-132	AOI 2	2684095	222243	unconfined	-8.76	1	4.56	2.02	2.54
S-133	AOI 2	2684056	222303	unconfined	-8.37	1	5.27	2.06	3.21
S-134	AOI 2	2684441	222209	unconfined	-7.39	1	4.76	1.58	3.18
S-135	AOI 2	2684162	222278	unconfined	-7.66	1	5.15	1.98	3.17
S-135SRTF	AOI 9	2676810	216462	unconfined	-20.59	1	-7.58	-5.02	-2.56
S-136	AOI 2	2684135	222257	unconfined	-7.05	1	4.48	1.99	2.49
S-139	AOI 2	2683570	222392	unconfined	-9.1	1	3.33	2.53	0.80
S-141	AOI 2	2683427	222387	unconfined	-8.04	1	3.12	2.54	0.58
S-142	AOI 2	2683609	222348	unconfined	-10.19	1	2.43	2.49	-0.06
S-150	AOI 2	2683393	223189	unconfined	-0.09	1	3.42	2.89	0.53
S-152	AOI 2	2683337	223247	unconfined	-10.9	1	3.09	2.81	0.28
S-154	AOI 2	2683290	223236	unconfined	-4.86	1	1.23	2.69	-1.46
S-156	AOI 2	2684180	222281	unconfined	-6.82	1	4.84	1.97	2.87
S-157	AOI 2	2684107	222285	unconfined	-7.71	1	5.27	2.03	3.24
S-159	AOI 2	2683730	222304	unconfined	-0.83	1	3.45	2.39	1.06
S-162	AOI 1	2685202	222131	unconfined	-3.58	1	1.62	1.58	0.04
S-164	AOI 1	2685039	222134	unconfined	-7.1	1	2.11	1.52	0.59
S-166	AOI 2	2684909	222170	unconfined	-6.78	1	2.63	1.36	1.27
S-175	AOI 2	2684500	222226	unconfined	-3.6	1	4.01	1.52	2.49
S-180	AOI 1	2686058	223358	unconfined	-11.5	1	4.16	3.18	0.98
S-181	AOI 1	2686074	223472	unconfined	-11.1	1	4.15	3.56	0.59
S-183	AOI 1	2686096	223635	unconfined	-10.4	1	4.22	3.95	0.27
S-185	AOI 1	2686111	223736	unconfined	-10	1	4.66	4.14	0.52
S-186	AOI 1	2686118	223786	unconfined	-9.6	1	4.64	4.23	0.41
S-187	AOI 1	2686124	223837	unconfined	-9.3	1	4.63	4.31	0.32
S-188	AOI 1	2686125	223886	unconfined	-8.9	1	4.82	4.40	0.42
S-189	AOI 1	2686115	223925	unconfined	-7.5	1	4.61	4.47	0.14
S-190	AOI 1	2686121	223969	unconfined	-6.7	1	4.67	4.54	0.13
S-191	AOI 1	2686127	224012	unconfined	-7	1	4.66	4.60	0.06
S-192	AOI 1	2686135	224055	unconfined	-6.2	1	6.13	4.66	1.47
S-193	AOI 1	2686254	223959	unconfined	-6.52	1	4.64	4.48	0.16
S-194	AOI 1	2686268	223978	unconfined	1.15	1	6.37	4.51	1.86
S-196	AOI 1	2686419	224117	unconfined	-5.04	1	4.85	4.70	0.15
S-197	AOI 1	2686414	223931	unconfined	-5	1	5.23	4.42	0.81
S-198	AOI 1	2685879	224076	unconfined	-6.76	1	4.61	4.80	-0.19

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
S-199	AOI 1	2685732	224027	unconfined	-6.29	1	4.62	4.80	-0.18
S-200	AOI 1	2685486	223945	unconfined	-5.57	1	4.48	4.77	-0.29
S-201	AOI 1	2685877	223831	unconfined	-6.26	1	4.59	4.43	0.16
S-202	AOI 1	2684881	223417	unconfined	-4.61	1	4.39	4.14	0.25
S-203	AOI 1	2685245	223217	unconfined	-3.11	1	4.42	3.70	0.72
S-206	AOI 1	2684727	223201	unconfined	-3.46	1	5.35	3.79	1.56
S-208	AOI 1	2685225	222409	unconfined	-7.92	1	2.37	1.97	0.40
S-209	AOI 1	2685750	222525	unconfined	-11.06	1	1.68	1.61	0.07
S-210	AOI 1	2685876	222247	unconfined	-14.36	1	0.59	0.44	0.15
S-211	AOI 1	2685021	221956	unconfined	-14.78	1	2.23	1.66	0.57
S-213	AOI 1	2685087	221871	unconfined	-14.89	1	1.88	1.68	0.20
S-214	AOI 1	2685145	221577	unconfined	-13.27	1	1.52	1.64	-0.12
S-216	AOI 4	2684618	220867	unconfined	-11.43	1	-3.18	2.10	-5.28
S-225	AOI 4	2684549	221123	unconfined	-15	1	-2.49	2.10	-4.59
S-226	AOI 1	2685805	222280	unconfined	-15.64	1	0.88	0.82	0.06
S-227	AOI 1	2685786	221654	unconfined	-12.22	1	0.13	-2.06	2.19
S-228	AOI 1	2685779	221657	unconfined	-13.79	1	0.21	-1.97	2.18
S-231	AOI 1	2685897	222219	unconfined	-5.32	1	0.48	0.24	0.24
S-232	AOI 1	2685891	222167	unconfined	-8.91	1	0.09	-0.01	0.10
S-246A	AOI 2	2682915	222348	unconfined	-5	1	2.06	1.99	0.07
S-247	AOI 2	2682921	222381	unconfined	-5	1	1.32	1.86	-0.54
S-248	AOI 2	2682933	222394	unconfined	-5	1	1.17	2.24	-1.07
S-249	AOI 2	2682939	222444	unconfined	-5	1	2.04	1.86	0.18
S-25	AOI 3	2684275	218447	unconfined	12.06	1	1.89	2.97	-1.08
S-251	AOI 2	2683286	222362	unconfined	-4.39	1	2.94	2.49	0.45
S-252	AOI 2	2683257	222357	unconfined	-4.64	1	2.83	2.49	0.34
S-253	AOI 2	2683301	222420	unconfined	-2.89	1	2.86	2.54	0.32
S-254	AOI 2	2683168	222414	unconfined	-3.09	1	2.42	2.49	-0.07
S-256	AOI 1	2685775	221633	unconfined	-15.83	1	0.44	-1.88	2.32
S-257	AOI 1	2685811	221589	unconfined	-11.33	1	0.32	-2.23	2.55
S-258	AOI 1	2685820	221665	unconfined	-11.64	1	-0.56	-2.53	1.97
S-259	AOI 1	2685827	221704	unconfined	-12	1	-0.73	-2.72	1.99
S-260	AOI 1	2685846	221830	unconfined	-13.02	1	-0.85	-2.48	1.63
S-262	AOI 1	2685590	222045	unconfined	-12.28	1	1.77	0.64	1.13
S-263	AOI 1	2685576	221829	unconfined	-12.84	1	1.45	0.15	1.30
S-268	AOI 1	2686298	224224	unconfined	15.14	1	4.85	4.87	-0.02
S-269	AOI 1	2685044	222590	unconfined	-9.37	1	3.42	2.50	0.92

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
S-270	AOI 1	2685422	222589	unconfined	-8.62	1	2.37	2.23	0.14
S-271	AOI 1	2686090	223898	unconfined	-8.55	1	4.68	4.43	0.25
S-273	AOI 1	2686121	223810	unconfined	-9.19	1	4.80	4.27	0.53
S-274	AOI 1	2686114	223761	unconfined	-9.59	1	4.74	4.19	0.55
S-275	AOI 1	2686107	223710	unconfined	-9.95	1	4.75	4.09	0.66
S-276	AOI 1	2686101	223661	unconfined	-10.32	1	4.59	4.00	0.59
S-277	AOI 1	2686071	223444	unconfined	-11.4	1	3.98	3.48	0.50
S-280	AOI 3	2682599	220966	unconfined	-1.27	1	2.14	1.98	0.16
S-282	AOI 4	2683960	220827	unconfined	-1.51	1	0.82	2.23	-1.41
S-283	AOI 3	2682503	220304	unconfined	-12.52	1	0.73	1.91	-1.18
S-284	AOI 3	2683135	220364	unconfined	-10.19	1	1.29	1.97	-0.68
S-288	AOI 3	2683003	219276	unconfined	2.25	1	4.46	2.24	2.22
S-294	AOI 2	2684673	224162	unconfined	-4.88	1	9.97	5.14	4.83
S-295	AOI 2	2684379	223801	unconfined	9.13	1	8.87	10.96	-2.09
S-298	AOI 2	2683859	223263	unconfined	5.48	1	11.43	9.81	1.62
S-299	AOI 2	2683545	222978	unconfined	-6.23	1	3.82	2.93	0.89
S-300	AOI 2	2684308	222830	unconfined	-6.01	1	4.45	3.06	1.39
S-301	AOI 2	2684442	222551	unconfined	-6.94	1	3.65	2.47	1.18
S-302	AOI 2	2683251	222613	unconfined	-7.86	1	2.80	2.64	0.16
S-303	AOI 2	2683678	222409	unconfined	-5.29	1	3.45	2.52	0.93
S-305	AOI 2	2684883	221997	unconfined	-10.79	1	2.55	1.62	0.93
S-306	AOI 2	2683117	222297	unconfined	-9.92	1	2.75	2.44	0.31
S-307	AOI 2	2683508	221764	unconfined	-9.55	1	3.35	2.46	0.89
S-308	AOI 2	2682915	221383	unconfined	5.39	1	4.86	2.19	2.67
S-309	AOI 2	2683391	221512	unconfined	-2.98	1	2.83	2.39	0.44
S-311	AOI 2	2684448	221518	unconfined	-8.49	1	4.15	2.12	2.03
S-313	AOI 2	2683327	222420	unconfined	-7.86	1	2.94	2.54	0.40
S-314	AOI 2	2683250	222411	unconfined	-7.9	1	2.58	2.52	0.06
S-317	AOI 2	2683227	222440	unconfined	-8.63	1	2.60	2.53	0.07
S-318	AOI 2	2683216	222516	unconfined	-8.19	1	2.31	2.57	-0.26
S-32	AOI 4	2684136	219917	unconfined	-0.8	1	4.78	2.49	2.29
S-328	AOI 2	2683642	222582	unconfined	-3.53	1	3.19	2.69	0.50
S-330	BELMONT	2685219	224246	unconfined	-4.71	1	4.43	5.16	-0.73
S-331	BELMONT	2685176	224033	unconfined	-3.32	1	5.04	4.94	0.10
S-332	BELMONT	2685110	224237	unconfined	-4.75	1	4.24	5.16	-0.92
S-333	AOI 2	2682920	222372	unconfined	-5	1	1.45	1.89	-0.44
S-335	AOI 2	2683113	222843	unconfined	-5	1	0.40	2.31	-1.91

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
S-336	AOI 2	2683167	222813	unconfined	-5	1	1.66	2.66	-1.00
S-337	AOI 2	2683260	223172	unconfined	-5	1	2.34	2.56	-0.22
S-338	AOI 2	2683320	223145	unconfined	-5	1	3.04	2.77	0.27
S-346	AOI 2	2684760	222200	unconfined	-15.25	1	2.68	1.36	1.32
S-347	AOI 2	2684712	222199	unconfined	-15.24	1	2.64	1.36	1.28
S-348	AOI 2	2683866	222330	unconfined	-9.89	1	6.07	2.24	3.83
S-349	AOI 2	2683819	222324	unconfined	-10.73	1	3.78	2.31	1.47
S-350	AOI 2	2684656	224223	unconfined	0	1	3.63	5.18	-1.55
S-351	AOI 2	2684319	224112	unconfined	0	1	6.29	5.19	1.10
S-354	AOI 2	2683499	223705	unconfined	0	1	3.60	4.17	-0.57
S-355	AOI 2	2683594	223590	unconfined	5	1	3.88	4.18	-0.30
S-357	AOI 2	2683533	223382	unconfined	-7.6	1	9.68	6.64	3.04
S-359	AOI 2	2683809	222117	unconfined	-2	1	4.67	2.34	2.33
S-36	AOI 4	2684276	220366	unconfined	0.41	1	1.63	2.30	-0.67
S-361	AOI 2	2684109	221779	unconfined	2	1	3.96	2.26	1.70
S-366	AOI 4	2684586	221392	unconfined	-9.49	1	4.97	2.07	2.90
S-367	AOI 4	2684688	221274	unconfined	-14.49	1	-2.96	2.03	-4.99
S-368	AOI 4	2684901	221485	unconfined	-12.55	1	2.21	1.88	0.33
S-379	AOI 4	2685666	220887	unconfined	-6.76	1	1.35	1.84	-0.49
S-380	AOI 4	2685674	220596	unconfined	-8.21	1	1.90	2.06	-0.16
S-382	AOI 3	2682250	220408	unconfined	-9.9	1	3.63	1.98	1.65
S-384	AOI 3	2683220	220831	unconfined	-9.3	1	1.19	2.07	-0.88
S-395	BELMONT	2685991	224465	unconfined	-7.5	1	5.12	5.24	-0.12
S-396	AOI 1	2685872	223191	unconfined	-16.8	1	1.91	2.85	-0.94
S-40	AOI 4	2685637	220734	unconfined	-6.33	1	1.45	1.98	-0.53
S-402	AOI 1	2685116	223884	unconfined	-4	1	4.38	4.78	-0.40
S-403	AOI 1	2684978	222921	unconfined	-10.9	1	3.38	3.26	0.12
S-405	AOI 1	2685608	223177	unconfined	-8.7	1	4.12	3.27	0.85
S-406	AOI 2	2683062	222569	unconfined	-5	1	2.66	2.52	0.14
S-407	AOI 3	2683572	220866	unconfined	4.38	1	1.46	2.18	-0.72
S-41	AOI 1	2685772	221298	unconfined	-9.51	1	0.79	0.90	-0.11
S-411	AOI 3	2682483	220825	unconfined	-7.38	1	1.31	1.96	-0.65
S-413	AOI 3	2683062	220607	unconfined	-14.65	1	1.23	1.98	-0.75
S-414	AOI 3	2682403	220564	unconfined	-9.99	1	1.78	1.95	-0.17
S-415	AOI 4	2684132	220822	unconfined	-13.53	1	1.63	2.22	-0.59
S-417	AOI 1	2684867	223781	unconfined	-4.3	1	5.33	4.68	0.65
S-419	AOI 1	2685595	222387	unconfined	-16.6	1	1.59	1.54	0.05

*see notes on last page

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Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
S-420	AOI 2	2682996	222512	unconfined	-5	1	2.64	2.40	0.24
S-422	AOI 2	2682861	221880	unconfined	-10.84	1	3.30	2.28	1.02
S-423	AOI 2	2683543	223536	unconfined	-5.6	1	5.04	4.00	1.04
S-43	AOI 1	2685816	221634	unconfined	-10.54	1	0.02	-2.38	2.40
S-44	AOI 1	2685822	221765	unconfined	-16.79	1	-1.04	-2.63	1.59
S-46	AOI 1	2685283	222077	unconfined	-16.73	1	1.86	1.50	0.36
S-48	AOI 2	2684871	222221	unconfined	-3.7286	1	2.64	1.45	1.19
S-50	AOI 1	2685881	222241	unconfined	-4.77	1	1.34	0.40	0.94
S-51	AOI 1	2685939	222520	unconfined	-11.82	1	0.88	1.23	-0.35
S-53	AOI 2	2684179	222279	unconfined	-7.96	1	5.28	1.97	3.31
S-57	AOI 4	2683745	220383	unconfined	-3.87	1	1.61	2.24	-0.63
S-60	AOI 3	2683756	221051	unconfined	-4.744	1	1.44	2.25	-0.81
S-61	AOI 2	2683869	221701	unconfined	-6.698	1	2.70	2.38	0.32
S-62	AOI 2	2683630	222319	unconfined	-9.11	1	3.40	2.46	0.94
S-63	AOI 2	2683223	222269	unconfined	-4.05	1	2.88	2.48	0.40
S-65	AOI 2	2682948	222452	unconfined	-13.87	1	2.28	1.85	0.43
S-66	AOI 3	2682718	221327	unconfined	-4.25	1	1.40	2.10	-0.70
S-71	AOI 2	2683535	223178	unconfined	-8	1	3.57	3.00	0.57
S-72	AOI 2	2683825	223836	unconfined	0.057	1	4.52	4.73	-0.21
S-74	BELMONT	2686172	224333	unconfined	-6.9	1	4.66	5.04	-0.38
S-75	BELMONT	2686144	224096	unconfined	0.23	1	4.75	4.72	0.03
S-76	BELMONT	2685601	224035	unconfined	5.61	1	4.57	4.85	-0.28
S-77P	AOI 1	2685250	223931	unconfined	-4.1	1	4.31	4.81	-0.50
S-77SRTF	AOI 9	2678019	217724	unconfined	-11.55	1	-7.70	-2.15	-5.55
S-78	AOI 1	2684757	223423	unconfined	-1.57	1	4.73	4.17	0.56
S-78SRTF	AOI 9	2677724	216834	unconfined	-13.36	1	-8.29	-4.12	-4.17
S-79P	AOI 1	2685644	223426	unconfined	-6.67	1	4.38	3.82	0.56
S-79SRTF	AOI 9	2677551	215992	unconfined	-12.81	1	-6.26	-6.20	-0.06
S-80	AOI 1	2685607	223707	unconfined	-0.06	1	4.64	4.36	0.28
S-81SRTF	AOI 9	2677042	216806	unconfined	-13.84	1	-8.17	-4.21	-3.96
S-82SRTF	AOI 9	2677316	217918	unconfined	-13.07	1	-0.39	-1.88	1.49
S-83	AOI 1	2686061	223399	unconfined	-6.37	1	4.20	3.34	0.86
S-83SRTF	AOI 9	2677510	218241	unconfined	-11.73	1	-1.50	-1.30	-0.20
S-85	AOI 1	2686023	223173	unconfined	-7.06	1	1.99	2.35	-0.36
S-86	AOI 1	2685945	223065	unconfined	-12.5	1	1.34	2.30	-0.96
S-88	AOI 1	2686005	223039	unconfined	-9.36	1	-0.72	2.04	-2.76
S-88A	AOI 1	2686013	223107	unconfined	-5.13	1	0.44	2.17	-1.73

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
S-89	AOI 1	2685989	222922	unconfined	-11.09	1	-0.07	1.77	-1.84
S-91	AOI 2	2684188	222271	unconfined	-8.7	1	7.05	1.95	5.10
S-93	AOI 2	2683259	222338	unconfined	-10.57	1	2.90	2.48	0.42
S-95	AOI 1	2685351	221422	unconfined	-8.39	1	1.24	1.33	-0.09
S-96	AOI 4	2684857	220719	unconfined	-5	1	1.67	2.10	-0.43
S-98	AOI 1	2686257	223982	unconfined	-7.81	1	6.22	4.51	1.71
S-99	AOI 1	2686084	222766	unconfined	-12.2	1	0.82	1.88	-1.06
SSEPTA-PH-8	DSCP	2689175	221890	unconfined	0	1	1.52	2.06	-0.54
Steen-MW-61	DSCP	2686008	222107	unconfined	-14.26	1	0.52	0.24	0.28
Steen-MW-62	DSCP	2686037	222328	unconfined	-15.41	1	1.34	1.09	0.25
Steen-MW-64	DSCP	2685953	221694	unconfined	-13.21	1	0.37	-1.22	1.59
Steen-PH-10	DSCP	2686180	222012	unconfined	-13.2	1	1.24	1.04	0.20
Steen-PH-11	DSCP	2685990	221987	unconfined	-13.37	1	0.43	-0.41	0.84
Steen-PH-12	DSCP	2686138	222248	unconfined	-13.52	1	1.63	1.39	0.24
SW-1	AOI 5	2681673	215437	unconfined	7.19	1	2.09	1.58	0.51
SW-2	AOI 5	2681633	215458	unconfined	-9.06	1	2.81	1.71	1.10
SW-3	AOI 5	2681565	215492	unconfined	-8.03	1	2.06	1.42	0.64
SW-4	AOI 5	2681486	215534	unconfined	7.22	1	2.34	1.40	0.94
SW-5	AOI 5	2681322	215655	unconfined	7.84	1	5.01	2.35	2.66
SWR-1	AOI 5	2681283	215697	unconfined	-5	1	3.03	2.67	0.36
SWR-2	AOI 5	2681737	215397	unconfined	-4.94	1	2.56	1.77	0.79
SWR-3	AOI 5	2681811	215359	unconfined	-1.39	1	3.34	1.81	1.53
TW-11	BELMONT	2686135	224364	unconfined	0	1	4.71	5.08	-0.37
TW-3	BELMONT	2685838	224405	unconfined	0	1	4.97	5.20	-0.23
TW-5	BELMONT	2685994	224416	unconfined	0	1	5.20	5.18	0.02
TW-9	BELMONT	2686092	224400	unconfined	0	1	4.84	5.14	-0.30
U-2	AOI 6	2681798	216694	unconfined	-5	1	2.98	3.57	-0.59
U-3	AOI 6	2681941	216811	unconfined	-5	1	4.27	4.49	-0.22
U-4	AOI 6	2682043	216875	unconfined	-5	1	3.68	5.33	-1.65
U-5	AOI 6	2681801	216801	unconfined	-5	1	1.79	3.64	-1.85
UNKNOWN	PWD WPCP	2679017	210821	unconfined	-24	1	-6.51	-0.77	-5.74
URS-1	AOI 6	2680859	216101	unconfined	-5	1	3.59	1.38	2.21
URS-3	AOI 6	2681039	216761	unconfined	-7	1	3.78	4.14	-0.36
URS-4	AOI 6	2680671	216277	unconfined	-5	1	2.12	1.42	0.70
URS-5	AOI 6	2680401	216794	unconfined	-6.06	1	2.79	1.84	0.95
V-MW-1	AOI 8	2683500	227736	unconfined	2.74	1	11.22	9.35	1.87
V-MW-10	AOI 8	2683407	228034	unconfined	2.34	1	9.18	6.66	2.52

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
V-MW-11	AOI 8	2683447	228107	unconfined	2.92	1	9.31	6.67	2.64
V-MW-12	AOI 8	2683544	227991	unconfined	2.38	1	9.63	6.84	2.79
V-MW-16	AOI 8	2683530	228193	unconfined	5.61	1	9.46	6.71	2.75
V-MW-2	AOI 8	2683289	227840	unconfined	3.98	1	8.89	7.93	0.96
V-MW-3	AOI 8	2683267	227930	unconfined	2.89	1	8.99	6.92	2.07
V-MW-4	AOI 8	2683376	228206	unconfined	0.2	1	9.36	6.64	2.72
V-MW-5	AOI 8	2683343	227807	unconfined	2	1	8.91	8.33	0.58
V-MW-6	AOI 8	2683352	227888	unconfined	1.76	1	8.99	7.31	1.68
V-MW-7	AOI 8	2683239	227863	unconfined	1.02	1	8.95	7.64	1.31
V-MW-8	AOI 8	2683326	227957	unconfined	0.92	1	8.94	6.77	2.17
W-1	AOI 10	2682762	223594	unconfined	-9.31	1	3.13	3.83	-0.70
W-10	AOI 10	2681973	222348	unconfined	-5.4	1	2.99	6.37	-3.38
W-11	AOI 10	2682276	222286	unconfined	-4.2	1	2.73	4.57	-1.84
W-12	AOI 10	2682078	221939	unconfined	-4.92	1	3.10	3.90	-0.80
W-14	AOI 10	2681747	222310	unconfined	-4.56	1	3.45	6.77	-3.32
W-15	AOI 10	2681624	222775	unconfined	-2.7	1	4.76	6.50	-1.74
W-16	AOI 10	2681794	221795	unconfined	-4.5	1	3.69	3.80	-0.11
W-17	AOI 10	2681731	221777	unconfined	-4.93	1	3.30	4.72	-1.42
W-2	AOI 10	2681822	223350	unconfined	-4.23	1	4.08	6.42	-2.34
W-20	AOI 10	2680987	222415	unconfined	-1.16	1	5.72	7.12	-1.40
W-22	AOI 10	2680429	222466	unconfined	-2	1	4.53	5.85	-1.32
W-28	AOI 10	2682420	222857	unconfined	-8.21	1	4.44	5.27	-0.83
W-29	AOI 10	2682149	223225	unconfined	-4.91	1	4.22	6.45	-2.23
W-30	AOI 10	2681983	222661	unconfined	-6.42	1	4.30	6.38	-2.08
W-33	AOI 10	2680145	222385	unconfined	-2.64	1	5.00	5.31	-0.31
W-34	AOI 10	2680919	222425	unconfined	-3.22	1	5.46	7.02	-1.56
W-5	AOI 10	2681651	223047	unconfined	-7	1	4.19	6.10	-1.91
W-9	AOI 10	2681893	222543	lower aquifer	-3.04	1	-0.73	6.58	-7.31
WM-1M	PWD WPCP	2678882	211162	unconfined	-33	1	-4.63	-0.79	-3.84
WM-2M	PWD WPCP	2680196	211413	unconfined	-40	1	-3.61	-0.41	-3.20
WM-7M	PWD WPCP	2678343	210303	unconfined	-52	1	-5.61	-1.02	-4.59
WP-14	AOI 5	2682199	215243	unconfined	0.12	1	1.96	2.87	-0.91
WP14-2	AOI 7	2680219	220196	unconfined	-2.37	1	-1.76	2.48	-4.24
WP16-3	AOI 5	2682402	216899	unconfined	-2.93	1	3.49	5.59	-2.10
WP-8	AOI 5	2682441	215137	unconfined	-11.02	1	1.71	2.43	-0.72
WP9-4	AOI 6	2681422	216537	unconfined	-4.2	1	4.17	4.66	-0.49
WP9-8	AOI 5	2681391	216377	unconfined	0	1	3.07	4.52	-1.45

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
WP-A	AOI 5	2681387	215594	unconfined	-3.4	1	4.00	2.46	1.54
WP-B	AOI 5	2681311	215667	unconfined	-1.92	1	3.11	2.46	0.65
WP-C	AOI 5	2681378	215681	unconfined	-6.4747	1	2.23	4.19	-1.96
WP-D	AOI 5	2681484	215914	unconfined	-3.74	1	2.95	4.60	-1.65
WP-E	AOI 5	2681622	215986	unconfined	-2.65	1	2.82	3.03	-0.21
WPM-11	AOI 6	2682371	217106	unconfined	-5	1	2.92	5.48	-2.56
WPM-3	AOI 6	2682433	217085	unconfined	-5	1	4.78	5.60	-0.82
A-15	AOI 5	2682689	216314	unconfined	-10.21	2	4.04	3.55	0.49
A-186	AOI 5	2682888	217107	unconfined	-12.4	2	2.79	3.82	-1.03
B-129	AOI 6	2683018	217874	unconfined	-8.67	2	2.29	4.26	-1.97
B-162	AOI 6	2682803	217903	unconfined	-10.07	2	5.09	4.03	1.06
B-94	AOI 6	2683137	217610	unconfined	-6.79	2	3.71	4.29	-0.58
BF-100	AOI 3	2683128	219458	unconfined	-10.04	2	1.01	2.18	-1.17
BF-101	AOI 3	2683565	219687	unconfined	-8.49	2	3.45	2.50	0.95
C-150	AOI 7	2680607	220263	unconfined	-10	2	-3.45	2.49	-5.94
C-153	AOI 7	2680514	220220	unconfined	-10	2	-3.62	2.62	-6.24
C-154	AOI 7	2680516	220189	unconfined	-13.49	2	-3.43	2.71	-6.14
C-162	AOI 7	2680324	220197	unconfined	-13.53	2	-1.97	2.46	-4.43
C-169	AOI 7	2680431	220267	unconfined	-17.71	2	-0.84	2.25	-3.09
C-49	AOI 7	2683022	218495	unconfined	-9.66	2	5.13	4.14	0.99
MW-BS10	PWD WPCP	2678840	212771	unconfined	-32	2	-7.01	-2.75	-4.26
MW-BS20	PWD WPCP	2678838	212767	unconfined	-32	2	-7.10	-2.74	-4.36
N-102	AOI 8	2683870	227035	unconfined	1.59	2	11.57	8.17	3.40
N-103	AOI 8	2683660	226782	unconfined	0.56	2	12.55	8.61	3.94
N-104	AOI 8	2683420	226914	unconfined	0.96	2	11.42	9.83	1.59
N-105	AOI 8	2683443	226745	unconfined	1.26	2	11.23	9.22	2.01
N-111	AOI 8	2680519	226514	unconfined	-6.4	2	3.99	2.07	1.92
N-113	AOI 8	2681733	226054	unconfined	-2.68	2	6.24	5.79	0.45
N-115	AOI 8	2682246	225824	unconfined	-4.57	2	7.83	6.64	1.19
N-122	AOI 8	2683577	226074	unconfined	-3.07	2	7.44	7.09	0.35
N-138	AOI 8	2683256	227757	unconfined	0.29	2	8.86	6.39	2.47
N-139	AOI 8	2683309	227732	unconfined	0	2	8.82	6.56	2.26
N-146	AOI 8	2682830	227726	unconfined	0	2	9.60	6.17	3.43
N-150	AOI 8	2681575	224612	unconfined	-6.79	2	3.98	2.01	1.97
N-153	AOI 8	2683011	227569	unconfined	-1.96	2	8.94	6.84	2.10
N-2	AOI 8	2682759	228025	unconfined	0	2	8.62	6.34	2.28
N-34	AOI 8	2682271	226259	unconfined	-3.3	2	6.88	6.70	0.18

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
N-38	AOI 8	2680805	226899	unconfined	-8.23	2	3.52	3.96	-0.44
N-58	AOI 8	2680455	225832	unconfined	-9.79	2	5.29	4.66	0.63
N-74	AOI 8	2680701	224898	unconfined	-6.7	2	2.88	1.99	0.89
N-84	AOI 8	2684677	226457	unconfined	0.32	2	11.50	7.08	4.42
N-99	AOI 8	2682855	228875	unconfined	-1.74	2	10.19	6.46	3.73
PH-RW-D	DSCP	2687308	221945	unconfined	-41.5	2	2.40	2.34	0.06
RW-128	AOI 2	2682988	222438	unconfined	-20.2	2	1.02	2.39	-1.37
RW-2	AOI 3	2683712	220837	unconfined	-19.83	2	0.78	2.21	-1.43
RW-203	AOI 8	2683032	225154	unconfined	-5.93	2	9.20	6.20	3.00
RW-306	AOI 8	2683768	226581	unconfined	-2.78	2	10.88	8.22	2.66
RW-403	AOI 1	2686035	223262	unconfined	-26.39	2	3.78	2.78	1.00
RW-405	AOI 1	2685990	222933	unconfined	-11.5	2	-0.16	1.98	-2.14
RW-700	AOI 4	2684982	218992	unconfined	-13.75	2	1.58	2.92	-1.34
RW-701	AOI 4	2684953	218972	unconfined	-12.66	2	1.35	2.92	-1.57
RW-702	AOI 4	2684926	218951	unconfined	-12.76	2	1.69	2.93	-1.24
RW-703	AOI 4	2684902	218926	unconfined	-7.39	2	1.19	2.93	-1.74
RW-705	AOI 4	2685080	218913	unconfined	-16.09	2	1.92	2.95	-1.03
RW-706	AOI 4	2685032	218861	unconfined	-17.69	2	1.77	2.95	-1.18
RW-707	AOI 4	2685021	218852	unconfined	-14.67	2	1.77	2.96	-1.19
RW-708	AOI 4	2685001	218831	unconfined	-16.23	2	0.91	2.96	-2.05
RW-709	AOI 4	2684982	218812	unconfined	-16.48	2	1.14	2.96	-1.82
RW-710	AOI 4	2684962	218790	unconfined	-15.29	2	1.56	2.96	-1.40
RW-711	AOI 4	2684955	218782	unconfined	-19.29	2	1.81	2.96	-1.15
RW-712	AOI 4	2684936	218762	unconfined	-17.32	2	2.35	2.96	-0.61
RW-713	AOI 4	2684924	218748	unconfined	-15.41	2	1.83	2.96	-1.13
RW-714	AOI 4	2684903	218728	unconfined	-15.53	2	1.19	2.96	-1.77
RW-715	AOI 4	2684883	218706	unconfined	-18.14	2	-2.26	2.96	-5.22
RW-716	AOI 4	2684864	218684	unconfined	-18.1	2	1.83	2.96	-1.13
RW-717	AOI 4	2684844	218663	unconfined	-18.14	2	1.87	2.96	-1.09
RW-801	AOI 7	2680575	220246	unconfined	-18.29	2	-3.60	2.54	-6.14
RW-802	AOI 7	2680524	220232	unconfined	-17.9	2	-3.66	2.58	-6.24
RW-803	AOI 7	2680482	220260	unconfined	-17.85	2	-3.02	2.40	-5.42
RW-804	AOI 7	2680432	220257	unconfined	-18.97	2	-3.85	2.37	-6.22
RW-806	AOI 7	2680360	220229	unconfined	-18.18	2	-3.46	2.40	-5.86
RW-807	AOI 7	2680336	220237	unconfined	-18.22	2	-2.96	2.24	-5.20
RW-808	AOI 7	2680285	220230	unconfined	-17.63	2	-4.04	1.90	-5.94
RW-809	AOI 7	2680227	220222	unconfined	-17.11	2	-2.29	1.96	-4.25

*see notes on last page

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WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
RW-810	AOI 7	2680174	220215	unconfined	-17.18	2	-1.44	2.09	-3.53
S-1	AOI 3	2683072	218593	unconfined	-5.16	2	3.25	3.53	-0.28
S-120	AOI 4	2685597	220403	unconfined	-13.53	2	2.05	2.22	-0.17
S-120DSRTF	AOI 9	2677542	215267	unconfined	-25.65	2	-8.86	-8.33	-0.53
S-121	AOI 4	2685120	220222	unconfined	-11.47	2	2.29	2.32	-0.03
S-122	AOI 4	2685443	219647	unconfined	-12.08	2	3.85	2.69	1.16
S-123	AOI 4	2684990	219320	unconfined	-10.77	2	1.99	2.81	-0.82
S-124	AOI 4	2685004	218885	unconfined	-9.54	2	1.84	2.95	-1.11
S-137SRTF	AOI 9	2679009	215455	unconfined	-37.15	2	-9.19	-10.06	0.87
S-139SRTF	AOI 9	2678435	217571	unconfined	-31.35	2	-7.78	-2.36	-5.42
S-141SRTF	AOI 9	2678317	215107	unconfined	-32.26	2	-9.66	-10.06	0.40
S-142SRTF	AOI 9	2677286	214390	unconfined	-40.3	2	-9.94	-10.82	0.88
S-16	AOI 3	2683817	218965	unconfined	-14.17	2	2.04	2.40	-0.36
S-17	AOI 3	2683786	219271	unconfined	-8.15	2	2.12	2.54	-0.42
S-20	AOI 3	2684072	218851	unconfined	-17.2	2	2.02	2.72	-0.70
S-218	AOI 4	2684501	220122	unconfined	-7.54	2	2.11	2.42	-0.31
S-219	AOI 4	2684850	219892	unconfined	-7.12	2	2.16	2.53	-0.37
S-220	AOI 4	2684262	219152	unconfined	-11.5	2	2.08	2.72	-0.64
S-221	AOI 4	2684933	219006	unconfined	-9.98	2	1.98	2.91	-0.93
S-222	AOI 4	2684862	218677	unconfined	-11.11	2	2.00	2.96	-0.96
S-223	AOI 4	2685064	218859	unconfined	-13.52	2	0.92	2.96	-2.04
S-224	AOI 4	2685158	218991	unconfined	-15.47	2	1.92	2.93	-1.01
S-23	AOI 3	2684062	218579	unconfined	-7.55	2	1.98	2.87	-0.89
S-233	AOI 4	2684874	218923	unconfined	-8.37	2	3.67	2.93	0.74
S-234	AOI 4	2684899	218762	unconfined	-8.96	2	1.64	2.96	-1.32
S-235	AOI 4	2684962	218844	unconfined	-9.79	2	2.10	2.95	-0.85
S-236	AOI 4	2684954	219018	unconfined	-12.28	2	1.92	2.91	-0.99
S-237	AOI 4	2684943	218984	unconfined	-12.61	2	1.79	2.92	-1.13
S-238	AOI 4	2685034	218917	unconfined	-10.13	2	1.89	2.94	-1.05
S-239	AOI 4	2684997	218789	unconfined	-8.81	2	-3.83	2.96	-6.79
S-240	AOI 4	2684848	218980	unconfined	-9.03	2	4.52	2.91	1.61
S-241	AOI 4	2684819	219045	unconfined	-6.91	2	1.84	2.89	-1.05
S-242	AOI 4	2684857	218813	unconfined	-5	2	1.88	2.94	-1.06
S-243	AOI 4	2684934	218722	unconfined	-5	2	1.22	2.97	-1.75
S-245	AOI 4	2684999	219051	unconfined	-5	2	2.17	2.91	-0.74
S-26	AOI 4	2684616	218758	unconfined	-3.24	2	1.95	2.92	-0.97
S-278	AOI 4	2684810	218753	unconfined	-11.3	2	1.93	2.95	-1.02

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
S-279	AOI 4	2684702	219165	unconfined	-5.64	2	2.55	2.82	-0.27
S-285	AOI 3	2683687	219690	unconfined	-7.3	2	3.07	2.52	0.55
S-29	AOI 4	2684380	219695	unconfined	-18.17	2	3.04	2.55	0.49
S-329	AOI 4	2684779	218690	unconfined	-16.8	2	1.90	2.95	-1.05
S-370	AOI 4	2683833	219839	unconfined	-15.44	2	1.53	2.46	-0.93
S-371	AOI 4	2684295	219750	unconfined	-10.5	2	3.25	2.52	0.73
S-372	AOI 3	2683824	219317	unconfined	-12.67	2	1.98	2.54	-0.56
S-373	AOI 4	2684927	219073	unconfined	-6.61	2	1.68	2.89	-1.21
S-38	AOI 4	2685232	219184	unconfined	-4.05	2	1.89	2.88	-0.99
S-381	AOI 4	2684590	219563	unconfined	-8.81	2	1.70	2.62	-0.92
S-385	AOI 3	2683689	220624	unconfined	-16.8	2	1.59	2.20	-0.61
S-386	AOI 3	2683705	219789	unconfined	-12.5	2	1.68	2.51	-0.83
S-39	AOI 4	2685582	220133	unconfined	-15.15	2	2.07	2.41	-0.34
S-408	AOI 4	2684259	218600	unconfined	-16.65	2	2.04	2.91	-0.87
S-412	AOI 3	2682923	220115	unconfined	-19.37	2	1.07	1.90	-0.83
S-418	AOI 1	2685854	222337	unconfined	-21	2	0.58	1.00	-0.42
S-5	AOI 3	2683838	218242	unconfined	-2.64	2	2.39	3.29	-0.90
S-74D2SRTF	AOI 9	2679122	216095	unconfined	-31.33	2	-2.97	-5.63	2.66
S-82	AOI 1	2686056	223599	unconfined	-16.4	2	4.27	3.91	0.36
V-MW-9	AOI 8	2683312	228061	unconfined	0.44	2	9.11	6.46	2.65
WM-8M	PWD WPCP	2679684	211208	unconfined	-47	2	-6.07	-0.59	-5.48
C-145	AOI 7	2681007	220222	unconfined	-17.64	3	1.24	2.02	-0.78
C-146	AOI 7	2680640	220255	unconfined	-17.8	3	-3.26	2.05	-5.31
C-147	AOI 7	2680517	220263	unconfined	-17.69	3	-2.93	1.88	-4.81
C-95	AOI 3	2682674	219113	unconfined	-20.07	3	6.30	2.83	3.47
MW-AS	PWD WPCP	2679854	212022	unconfined	-47	3	-5.79	-0.79	-5.00
N-109	AOI 8	2681605	226649	lower aquifer	-4.46	3	6.87	5.62	1.25
N-112	AOI 8	2681664	226328	lower aquifer	-6.15	3	6.24	5.48	0.76
N-116	AOI 8	2682617	225844	unconfined	-3.51	3	5.99	6.87	-0.88
N-130	AOI 8	2682501	225088	unconfined	-17.93	3	11.50	6.32	5.18
N-152	AOI 8	2684912	226052	unconfined	-4.41	3	11.31	6.70	4.61
N-59	AOI 8	2680470	225387	unconfined	-10.19	3	5.30	4.28	1.02
N-61	AOI 8	2680588	225119	unconfined	-10.21	3	5.23	3.67	1.56
RW-200	AOI 8	2682439	224925	unconfined	-8.37	3	6.42	6.00	0.42
RW-301	AOI 8	2682907	226707	unconfined	-7.05	3	10.69	9.93	0.76
RW-302	AOI 8	2683040	226687	unconfined	-7.08	3	11.16	9.85	1.31
RW-304	AOI 8	2683322	226635	unconfined	-6.05	3	10.71	9.15	1.56

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WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL VERIFICATION DATASET[2]		
							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
RW-305	AOI 8	2683458	226615	unconfined	-6.11	3	10.69	8.85	1.84
S-10	AOI 3	2683682	218444	unconfined	-19.17	3	2.07	2.04	0.03
S-12	AOI 3	2683521	218879	unconfined	-17.73	3	1.92	2.10	-0.18
S-153	AOI 2	2683289	223237	unconfined	-16.05	3	2.51	2.60	-0.09
S-52	AOI 1	2685894	222553	unconfined	-20.8	3	1.32	1.56	-0.24
W-23	AOI 10	2680081	222589	unconfined	-14.79	3	4.68	3.80	0.88
W-25	AOI 10	2679601	222643	unconfined	-6.97	3	3.87	2.65	1.22
A-19D	AOI 5	2683563	217563	lower aquifer	-49.36	4	-1.83	2.09	-3.92
B-48D	AOI 6	2682251	217522	lower aquifer	-46.23	4	-1.27	1.09	-2.36
BF-90D	AOI 3	2683040	218957	lower aquifer	-30.15	4	0.50	1.95	-1.45
DSCP-DW-6	DSCP	2687606	223122	lower aquifer	-48.33	4	1.86	3.63	-1.77
MW-AD	PWD WPCP	2679869	212015	lower aquifer	-98	4	-5.84	-2.09	-3.75
N-114	AOI 8	2681511	226225	lower aquifer	-12.53	4	6.45	5.47	0.98
N-127	AOI 8	2682768	225193	unconfined	-21.25	4	9.66	5.41	4.25
N-70	AOI 8	2681745	227136	lower aquifer	-9.71	4	8.05	5.63	2.42
N-77	AOI 8	2682468	226734	unconfined	-13.51	4	11.50	6.66	4.84
N-83	AOI 8	2681761	226828	lower aquifer	-7.73	4	6.54	5.67	0.87
PGW-MW-21	AOI 8	2682698	224771	unconfined	-15	4	9.73	4.64	5.09
RW-300	AOI 8	2681810	226710	lower aquifer	-10.17	4	7.26	5.65	1.61
S-110DSRTF	AOI 9	2676987	217259	lower aquifer	-59.73	4	-8.10	-3.24	-4.86
S-115DSRTF	AOI 9	2676755	216206	lower aquifer	-58.3	4	-8.28	-5.76	-2.52
S-119D	AOI 4	2685498	220820	lower aquifer	-48.64	4	1.28	2.14	-0.86
S-144SRTF	AOI 9	2677843	217365	unconfined	-59.2	4	-7.93	-3.01	-4.92
S-397	AOI 1	2685305	222831	unconfined	-32.4	4	1.55	3.09	-1.54
S-399	AOI 1	2685166	221521	lower aquifer	-27.2	4	1.53	2.13	-0.60
S-87I	AOI 1	2685940	223065	lower aquifer	-30.11	4	1.76	2.49	-0.73
WM-2D	PWD WPCP	2680204	211411	lower aquifer	-105	4	-4.28	-1.62	-2.66
809	PWD WPCP	2678173	213259	lower aquifer	-67.5	5	-7.74	-5.98	-1.76
B-133D	AOI 6	2681722	216723	lower aquifer	-58.9	5	-1.42	-0.43	-0.99
MW-BD	PWD WPCP	2678853	212761	lower aquifer	-98	5	-6.85	-4.77	-2.08
N-148D	AOI 8	2684030	225601	lower aquifer	-35.44	5	3.35	4.87	-1.52
N-19	AOI 8	2684651	226737	lower aquifer	-29.54	5	3.78	5.90	-2.12
N-21	AOI 8	2683879	226628	lower aquifer	-26.46	5	6.12	5.75	0.37
N-30	AOI 8	2685037	225825	lower aquifer	-22.3	5	3.60	5.43	-1.83
N-69	AOI 8	2681822	227392	lower aquifer	-11.14	5	8.81	5.57	3.24
N-9	AOI 8	2684097	227375	lower aquifer	-27.3	5	4.08	6.23	-2.15
S-106DSRTF	AOI 9	2677610	214778	lower aquifer	-81.63	5	-8.92	-9.79	0.87

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
S-143SRTF	AOI 9	2677280	214390	lower aquifer	-65.41	5	-9.18	-10.68	1.50
S-22	AOI 3	2684081	218842	lower aquifer	-62.59	5	-0.17	1.76	-1.93
S-280D	AOI 3	2682596	220955	lower aquifer	-37.58	5	1.07	1.61	-0.54
S-38D2	AOI 4	2685229	219163	lower aquifer	-64.16	5	0.33	2.21	-1.88
S-59D	AOI 4	2683843	221368	lower aquifer	-40.74	5	1.45	2.14	-0.69
WM-1D	PWD WPCP	2678948	211060	lower aquifer	-119	5	-4.43	-2.99	-1.44
ARCO-1D	AOI 1	2685966	221359	lower aquifer	-49.86	6	1.16	2.60	-1.44
DSCP-DW-1	DSCP	2686539	222715	lower aquifer	-58.05	6	1.86	3.28	-1.42
DSCP-DW-13	DSCP	2688518	222417	lower aquifer	-84.81	6	1.88	3.31	-1.43
FDR-DW-15	DSCP	2687939	219362	lower aquifer	-106.42	6	-0.10	2.39	-2.49
N-73	AOI 8	2680415	225822	lower aquifer	-35.81	6	1.80	1.66	0.14
N-75	AOI 8	2680694	224909	lower aquifer	-37.35	6	1.55	1.92	-0.37
NOVA-DW-14	DSCP	2688592	219985	lower aquifer	-104.82	6	-0.08	2.62	-2.70
PGW-MW-12D	PGW	2685290	224520	lower aquifer	-44.93	6	3.02	4.33	-1.31
PGW-MW-1D	PGW	2683465	224134	lower aquifer	-41.43	6	2.17	3.27	-1.10
PGW-MW-42D	PGW	2684364	225540	lower aquifer	-35.31	6	3.37	4.88	-1.51
PH-DW-2	DSCP	2686776	220911	lower aquifer	-82.46	6	1.09	2.54	-1.45
PH-DW-3	DSCP	2687507	220890	lower aquifer	-102.74	6	0.90	2.67	-1.77
S-118DSRTF	AOI 9	2676690	215160	lower aquifer	-78.84	6	-8.75	-8.28	-0.47
S-8	AOI 3	2683688	218428	lower aquifer	-63.02	6	-0.19	1.53	-1.72
S-80D	AOI 1	2685512	223710	lower aquifer	-47.26	6	2.44	3.79	-1.35
W-27	AOI 10	2679107	222626	lower aquifer	-10.83	6	0.93	2.67	-1.74
W-32D	AOI 10	2681222	222055	lower aquifer	-84.5	6	-0.66	2.69	-3.35
A-21D	AOI 5	2681388	215630	lower aquifer	-77.06	7	-5.77	-1.60	-4.17
B-132D	AOI 6	2680857	216098	lower aquifer	-74.69	7	-5.23	-1.94	-3.29
B-134D	AOI 6	2681037	216764	lower aquifer	-73.55	7	-3.21	-1.09	-2.12
BF-108	AOI 3	2683185	219701	lower aquifer	-71.04	7	0.51	1.67	-1.16
C-129D	AOI 7	2681929	220492	lower aquifer	-59.15	7	0.22	1.31	-1.09
C-134D	AOI 6	2681165	218306	lower aquifer	-63.15	7	-1.49	0.28	-1.77
C-144D	AOI 7	2680337	220108	lower aquifer	-71.86	7	-3.48	1.03	-4.51
CSX-DW-4	DSCP	2686121	222537	lower aquifer	-57.41	7	1.72	3.06	-1.34
CSX-DW-5	DSCP	2686325	223310	lower aquifer	-51.39	7	1.88	3.69	-1.81
DSCP-DW-12	DSCP	2687135	222110	lower aquifer	-87.4	7	1.93	3.12	-1.19
DSCP-MW-20D	DSCP	2686776	224063	lower aquifer	-66.19	7	2.11	4.28	-2.17
N-147D	AOI 8	2682707	225675	lower aquifer	-50.78	7	3.03	4.95	-1.92
N-149D	AOI 8	2681583	224606	lower aquifer	-69.02	7	-1.01	2.33	-3.34
N-38D	AOI 8	2680792	226897	lower aquifer	-76.23	7	1.08	2.43	-1.35

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							MAY 2018 OBSERVED HYDRAULIC HEAD [FT]	MAY 2018 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	MAY 2018 HYDRAULIC HEAD RESIDUAL [FT]
N-4	AOI 8	2683123	227945	lower aquifer	-20.59	7	8.92	6.32	2.60
PGW-MW-2D	PGW	2683918	224286	lower aquifer	-47.84	7	2.86	3.68	-0.82
PGW-MW-3D	PGW	2684691	224483	lower aquifer	-50.27	7	3.09	4.08	-0.99
PGW-MW-8D	AOI 2	2684089	223962	lower aquifer	-43.89	7	3.04	3.48	-0.44
PGW-MW-9D	AOI 2	2683834	223851	lower aquifer	-43.57	7	2.87	3.25	-0.38
PH-DW-10	DSCP	2686452	221935	lower aquifer	-84.1	7	1.65	2.89	-1.24
PH-DW-11	DSCP	2686415	221643	lower aquifer	-87.96	7	1.52	2.80	-1.28
S-13	AOI 3	2683522	218892	lower aquifer	-68.46	7	-0.44	1.58	-2.02
S-138SRTF	AOI 9	2679003	215451	lower aquifer	-82.23	7	-8.42	-7.47	-0.95
S-218D	AOI 4	2684512	220118	lower aquifer	-74.15	7	0.88	2.11	-1.23
S-264D	AOI 1	2685762	221289	lower aquifer	-55.81	7	1.48	2.53	-1.05
S-284D	AOI 3	2683136	220356	lower aquifer	-68.29	7	1.11	1.75	-0.64
S-294D	AOI 2	2684682	224165	lower aquifer	-63.93	7	3.12	3.85	-0.73
S-302D	AOI 2	2683248	222607	lower aquifer	-69.95	7	0.36	2.21	-1.85
S-305D	AOI 2	2684882	221990	lower aquifer	-64.1	7	1.54	2.51	-0.97
S-388D	AOI 1	2685903	222561	lower aquifer	-58.1	7	1.62	3.03	-1.41
S-389D	AOI 1	2685876	223190	lower aquifer	-57.4	7	1.70	3.49	-1.79
S-390D	AOI 1	2685310	222830	lower aquifer	-67.2	7	1.68	3.10	-1.42
S-391D	AOI 1	2684710	223313	lower aquifer	-69.2	7	2.26	3.27	-1.01
S-392D	AOI 1	2685165.638	221525.1327	lower aquifer	-54.3	7	1.46	2.460185	-1.000185
S-393D	BELMONT	2685995.78	224456.5533	lower aquifer	-69.5	7	3.1	4.441131	-1.341131
S-39D	AOI 4	2685551.203	220137.6794	lower aquifer	-110.1	7	0.72	2.259424	-1.539424
S-46D	AOI 1	2685273.999	222025.7009	lower aquifer	-55.37	7	1.8	2.635863	-0.835863
S-69D	AOI 3	2682399.255	219970.6981	lower aquifer	-52.3	7	0.43	1.455976	-1.025976
S-74D1SRTF	AOI 9	2679175.325	216087.001	lower aquifer	-67.65	7	-8.29	-5.398283	-2.891717
S-76DSRTF	AOI 9	2678241.018	216806.5474	lower aquifer	-74	7	-8.16	-4.135492	-4.024508
Steen-DW-07	DSCP	2686044.998	222329.8745	lower aquifer	-83.62	7	1.65	2.933509	-1.283509
Steen-DW-08	DSCP	2686003.583	222073.54	lower aquifer	-93.73	7	1.58	2.826617	-1.246617
Steen-DW-09	DSCP	2686195.303	222017.4447	lower aquifer	-88.89	7	1.68	2.855079	-1.175079
W-13	AOI 10	2682064.605	221929.2845	lower aquifer	-61.84	7	-1.57	1.724011	-3.294011
W-19	AOI 10	2680982.428	222405.1065	lower aquifer	-71.83	7	-1.29	2.324419	-3.614419
W-1D	AOI 10	2682756.478	223583.9986	lower aquifer	-68.63	7	-0.82	2.340892	-3.160892
W-26	AOI 10	2679591.711	222651.4265	lower aquifer	-14.65	7	-2.09	2.544224	-4.634224

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
A-10	AOI 5	2682406	215428	unconfined	-6.33	1	4.62	3.66	0.96
A-11	AOI 5	2682016	215380	unconfined	-8.91	1	3.24	2.93	0.31
A-118	AOI 5	2683071	217109	unconfined	-9.7	1	5.71	5.94	-0.23
A-12	AOI 5	2682183	215379	unconfined	-8.12	1	4.21	3.28	0.93
A-122	AOI 5	2682278	215930	unconfined	-10.56	1	3.50	3.69	-0.19
A-133	AOI 5	2681282	215805	unconfined	-4.74	1	3.77	4.54	-0.77
A-134	AOI 5	2681409	215810	unconfined	-7.79	1	1.29	4.61	-3.32
A-135	AOI 5	2681633	215823	unconfined	-6.64	1	3.06	2.94	0.12
A-136	AOI 5	2681693	215556	unconfined	-8.48	1	1.35	2.50	-1.15
A-137	AOI 5	2683597	215161	unconfined	-7.71	1	1.87	1.61	0.26
A-139	AOI 5	2683732	215985	unconfined	-8.1	1	2.31	3.55	-1.24
A-142	AOI 5	2683676	214931	unconfined	-8.86	1	1.00	1.34	-0.34
A-143	AOI 5	2683340	215553	unconfined	-2.92	1	2.07	2.71	-0.64
A-148	AOI 5	2682641	216806	unconfined	-6.3	1	5.34	5.46	-0.12
A-149	AOI 5	2682443	216327	unconfined	-8.41	1	5.18	5.26	-0.08
A-151	AOI 5	2682129	215824	unconfined	-9.9	1	3.04	3.48	-0.44
A-155	AOI 5	2681449	216208	unconfined	-9.1	1	2.87	4.58	-1.71
A-156	AOI 5	2681355	216058	unconfined	1.1	1	4.14	4.62	-0.48
A-157	AOI 5	2681414	216278	unconfined	-2.2	1	3.72	4.47	-0.75
A-158	AOI 5	2681604	216132	unconfined	-5.25	1	2.17	3.06	-0.89
A-163	AOI 5	2681070	215985	unconfined	0	1	4.26	3.78	0.48
A-164	AOI 5	2681178	216039	unconfined	0	1	3.96	4.13	-0.17
A-166	AOI 5	2681273	215790	unconfined	0	1	3.23	4.40	-1.17
A-167	AOI 5	2681257	216200	unconfined	0	1	4.43	4.35	0.08
A-168	AOI 5	2681699	216444	unconfined	0	1	5.19	3.28	1.91
A-169	AOI 5	2681150	215953	unconfined	-9.9	1	4.08	4.21	-0.13
A-170	AOI 5	2681811	215867	unconfined	-13.8	1	2.03	3.10	-1.07
A-171	AOI 5	2681590	215555	unconfined	-11.3	1	1.69	2.15	-0.46
A-172	AOI 5	2681780	215441	unconfined	-11.3	1	2.07	2.33	-0.26
A-175	AOI 5	2682663	215245	unconfined	0	1	0.55	3.23	-2.68
A-176	AOI 5	2682694	215260	unconfined	0	1	0.55	3.27	-2.72
A-179	AOI 5	2682824	215290	unconfined	0	1	4.73	3.20	1.53
A-181	AOI 5	2682444	215193	unconfined	0	1	2.77	2.91	-0.14
A-182	AOI 5	2682580	215083	unconfined	0	1	0.18	2.03	-1.85
A-183	AOI 5	2682598	215354	unconfined	0	1	4.64	3.63	1.01
A-187	AOI 5	2682721	215337	unconfined	0	1	3.19	3.52	-0.33
A-188	AOI 5	2682745	215335	unconfined	-4.9	1	3.08	3.48	-0.40

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
A-189	AOI 5	2683360	217438	unconfined	0	1	4.24	5.11	-0.87
A-21	AOI 5	2681388	215630	unconfined	-5.23	1	5.94	3.83	2.11
A-22	AOI 5	2680996	216032	unconfined	-7.24	1	2.31	1.83	0.48
A-23	AOI 5	2682143	216385	unconfined	-9.21	1	3.10	3.74	-0.64
A-24	AOI 5	2681515	215977	unconfined	-6.44	1	2.80	4.48	-1.68
A-26	AOI 5	2682167	216793	unconfined	-4.5	1	4.35	5.47	-1.12
A-27	AOI 5	2681846	216592	unconfined	-5.5	1	3.41	3.52	-0.11
A-3	AOI 5	2683412	215785	unconfined	-5.34	1	1.89	3.36	-1.47
A-4	AOI 5	2683520	215001	unconfined	-9.15	1	1.94	1.47	0.47
A-40	AOI 5	2683592	215201	unconfined	-6.98	1	1.97	1.61	0.36
A-41	AOI 5	2683535	215097	unconfined	-7.46	1	1.97	1.59	0.38
A-44	AOI 5	2683121	215462	unconfined	-5.39	1	2.11	3.07	-0.96
A-45	AOI 5	2682742	215239	unconfined	-8.13	1	1.02	3.12	-2.10
A-46	AOI 5	2682464	215347	unconfined	-3.44	1	2.45	3.57	-1.12
A-48	AOI 5	2682295	215157	unconfined	-7.87	1	2.07	2.23	-0.16
A-49	AOI 5	2682249	215647	unconfined	-6.2	1	3.85	3.61	0.24
A-6	AOI 5	2682954	215268	unconfined	-7.99	1	3.64	2.82	0.82
A-7	AOI 5	2683087	215287	unconfined	-6.13	1	2.18	2.54	-0.36
ARCO-1	AOI 1	2685973	221361	unconfined	-14.89	1	1.08	0.57	0.51
ARCO-2	AOI 1	2685882	221258	unconfined	-15.11	1	0.96	0.93	0.03
ARCO-3	AOI 1	2685928	221631	unconfined	-17.51	1	0.52	-1.45	1.97
B-115	AOI 6	2682825	218059	unconfined	-5	1	4.82	4.77	0.05
B-116	AOI 6	2682925	217899	unconfined	-4.9	1	3.12	4.82	-1.70
B-117	AOI 6	2682499	217678	unconfined	-4.3	1	1.87	5.41	-3.54
B-123	AOI 6	2681458	217146	unconfined	-5	1	5.98	4.88	1.10
B-124	AOI 6	2681316	216811	unconfined	-9.09	1	3.71	4.54	-0.83
B-125	AOI 6	2681099	216829	unconfined	-5	1	3.92	4.10	-0.18
B-126	AOI 6	2680974	217022	unconfined	-5	1	3.61	4.06	-0.45
B-130	AOI 6	2680131	217397	unconfined	-6.89	1	5.11	3.46	1.65
B-131	AOI 6	2680693	216460	unconfined	-7.8	1	3.62	4.23	-0.61
B-132	AOI 6	2681171	217351	unconfined	-8.73	1	2.22	4.03	-1.81
B-133	AOI 6	2681207	217307	unconfined	-7.7	1	2.33	4.16	-1.83
B-134	AOI 6	2681163	217285	unconfined	-7.62	1	1.92	4.11	-2.19
B-135	AOI 6	2681137	217329	unconfined	-7.69	1	1.59	4.06	-2.47
B-136	AOI 6	2681253	217259	unconfined	-5.69	1	4.70	4.49	0.21
B-137	AOI 6	2681298	217188	unconfined	-5.78	1	3.82	4.59	-0.77
B-138	AOI 6	2681330	217138	unconfined	-5.94	1	4.52	4.61	-0.09

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
B-142	AOI 6	2681209	217178	unconfined	-5.19	1	3.10	4.44	-1.34
B-143	AOI 6	2681159	217208	unconfined	-5.64	1	3.87	4.39	-0.52
B-144	AOI 6	2681235	217134	unconfined	-5.84	1	3.93	4.45	-0.52
B-145	AOI 6	2681362	217086	unconfined	-4.84	1	4.84	4.67	0.17
B-147	AOI 6	2681125	217146	unconfined	-5.4	1	4.02	4.29	-0.27
B-148	AOI 6	2681077	217444	unconfined	-5.81	1	2.02	4.29	-2.27
B-149	AOI 6	2680999	217436	unconfined	-5.2	1	4.75	4.35	0.40
B-150	AOI 6	2680966	217480	unconfined	-5.17	1	4.45	4.39	0.06
B-151	AOI 6	2680729	217738	unconfined	-4.23	1	3.58	4.28	-0.70
B-152	AOI 6	2680603	217848	unconfined	-4.5	1	3.78	4.25	-0.47
B-153	AOI 6	2680102	217475	unconfined	-3.33	1	4.66	2.88	1.78
B-155	AOI 6	2680975	217400	unconfined	-3.46	1	3.15	4.28	-1.13
B-156	AOI 6	2680904	217366	unconfined	-3.35	1	3.16	4.20	-1.04
B-157	AOI 6	2680881	217195	unconfined	-6.74	1	3.25	4.07	-0.82
B-158	AOI 6	2679969	217967	unconfined	-3.34	1	4.73	3.80	0.93
B-160	AOI 6	2681840	217371	unconfined	-1.05	1	4.50	5.36	-0.86
B-161	AOI 6	2681270	216894	unconfined	-5.02	1	3.39	4.59	-1.20
B-163	AOI 6	2681199	217531	unconfined	-2.32	1	5.64	4.56	1.08
B-164	AOI 6	2680585	216480	unconfined	-6.14	1	3.79	3.75	0.04
B-165	AOI 6	2680187	217152	unconfined	-5	1	4.23	1.14	3.09
B-167	AOI 6	2683188	217814	unconfined	-5	1	3.55	5.03	-1.48
B-168	AOI 6	2680070	217495	unconfined	-5	1	5.33	2.33	3.00
B-169	AOI 6	2680092	217416	unconfined	-5	1	5.38	1.29	4.09
B-172	AOI 6	2680736	217412	unconfined	0	1	3.43	4.04	-0.61
B-173	AOI 6	2681021	216651	unconfined	-6.3	1	3.58	4.17	-0.59
B-174	AOI 6	2681059	216388	unconfined	-6.5	1	4.66	4.12	0.54
B-175	AOI 6	2681336	216863	unconfined	0	1	3.64	4.55	-0.91
B-39	AOI 6	2680590	216614	unconfined	-9.46	1	4.40	4.06	0.34
B-43	AOI 6	2680085	217611	unconfined	-7.36	1	4.44	3.90	0.54
B-45	AOI 6	2680393	218353	unconfined	-10.1	1	3.97	4.23	-0.26
B-46	AOI 6	2681909	218131	unconfined	-3.68	1	6.64	5.41	1.23
B-47	AOI 6	2681963	217434	unconfined	-5	1	5.43	5.31	0.12
B-48	AOI 6	2682248	217529	unconfined	-7.2	1	6.50	5.30	1.20
B-92	AOI 6	2681498	216966	unconfined	-8.2	1	5.63	4.83	0.80
B-95	AOI 6	2680373	217541	unconfined	-5	1	5.28	4.23	1.05
BF-103R	AOI 3	2682491	219959	unconfined	-1.57	1	0.86	1.84	-0.98
BF-104	AOI 3	2682830	219137	unconfined	-2.8	1	6.26	4.74	1.52

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
BF-105	AOI 3	2682998	219443	unconfined	-5	1	0.89	2.05	-1.16
BF-106	AOI 3	2683176	219737	unconfined	-5	1	0.85	1.98	-1.13
BF-107	AOI 3	2683307	219941	unconfined	-5	1	1.11	2.11	-1.00
BF-88	AOI 3	2683465	220156	unconfined	-7.14	1	1.33	2.12	-0.79
BF-90	AOI 3	2683035	218954	unconfined	-5.72	1	5.37	3.53	1.84
BF-99	AOI 3	2683159	219974	unconfined	-9.18	1	1.14	1.89	-0.75
C-104	AOI 7	2679742	219188	unconfined	-5	1	3.10	1.88	1.22
C-105	AOI 7	2679690	219497	unconfined	-5	1	4.97	1.66	3.31
C-106	AOI 7	2679710	219756	unconfined	-2.1	1	3.18	1.48	1.70
C-108	AOI 7	2680856	219819	unconfined	-5	1	4.32	2.98	1.34
C-109	AOI 7	2682312	219231	unconfined	-5	1	5.84	5.12	0.72
C-110	AOI 7	2682469	219406	unconfined	-5	1	6.87	5.19	1.68
C-111	AOI 7	2682561	219232	unconfined	-5	1	6.94	5.38	1.56
C-113	AOI 7	2682817	218798	unconfined	-5	1	7.04	6.19	0.85
C-114	AOI 7	2683001	218348	unconfined	-5	1	7.28	6.07	1.21
C-127	AOI 7	2680897	220182	unconfined	-8.3	1	1.65	2.76	-1.11
C-129	AOI 7	2681937	220497	unconfined	-4.8	1	5.51	3.22	2.29
C-130	AOI 7	2682140	219981	unconfined	-4.71	1	5.17	5.07	0.10
C-131	AOI 7	2682329	218971	unconfined	-5.72	1	6.81	5.40	1.41
C-133	AOI 7	2681694	218336	unconfined	-5.82	1	6.23	5.17	1.06
C-136	AOI 7	2680991	219217	unconfined	-7.22	1	4.58	2.97	1.61
C-137	AOI 7	2680719	219098	unconfined	-9.29	1	1.97	2.85	-0.88
C-138	AOI 7	2680453	218658	unconfined	-7.52	1	2.29	2.71	-0.42
C-139	AOI 7	2680633	219444	unconfined	-6.53	1	4.58	2.85	1.73
C-140	AOI 7	2679799	218858	unconfined	-4.01	1	6.00	2.12	3.88
C-142	AOI 7	2680660	220134	unconfined	-4.38	1	3.27	0.48	2.79
C-155	AOI 7	2680525	220082	unconfined	-5	1	2.78	-0.33	3.11
C-156	AOI 7	2681408	220254	unconfined	-16.41	1	3.38	4.07	-0.69
C-157	AOI 7	2681432	220255	unconfined	-17.17	1	5.09	4.02	1.07
C-159	AOI 7	2681506	220269	unconfined	-17.1	1	3.59	3.61	-0.02
C-163	AOI 7	2681332	220248	unconfined	-5	1	3.24	3.97	-0.73
C-164	AOI 7	2681359	220252	unconfined	-5	1	3.20	3.85	-0.65
C-165	AOI 7	2681386	220255	unconfined	-5	1	3.28	3.90	-0.62
C-168	AOI 7	2679988	220174	unconfined	-2.6	1	0.18	1.69	-1.51
C-170	AOI 7	2679856	219923	unconfined	-3.7	1	10.01	2.64	7.37
C-171	AOI 7	2679795	219649	unconfined	0	1	7.22	2.54	4.68
C-172	AOI 7	2680375	218451	unconfined	0	1	2.62	2.65	-0.03

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
C-50	AOI 7	2682341	219619	unconfined	-6.17	1	5.32	5.11	0.21
C-51	AOI 7	2681621	220073	unconfined	-6.1	1	4.34	4.71	-0.37
C-52	AOI 7	2681216	220206	unconfined	-6.32	1	3.01	4.13	-1.12
C-53A	AOI 7	2681031	219940	unconfined	-6.88	1	5.49	4.11	1.38
C-54	AOI 7	2680975	219459	unconfined	-8.51	1	6.24	2.99	3.25
C-55	AOI 7	2680864	218851	unconfined	-8.51	1	4.26	2.89	1.37
C-56	AOI 7	2681367	218776	unconfined	-4.6	1	8.26	5.09	3.17
C-57	AOI 7	2681651	219572	unconfined	-6.05	1	5.94	4.97	0.97
C-58	AOI 7	2681692	219017	unconfined	-5.61	1	6.03	5.11	0.92
C-60	AOI 7	2680151	218657	unconfined	-6.98	1	3.75	2.58	1.17
C-61	AOI 7	2679819	219306	unconfined	-5.12	1	4.67	2.49	2.18
C-62	AOI 7	2679892	219890	unconfined	-4.65	1	6.69	2.75	3.94
C-63	AOI 7	2680379	219611	unconfined	-8.83	1	1.83	2.84	-1.01
C-64	AOI 7	2680431	220167	unconfined	-6.83	1	-0.78	-11.19	10.41
C-65	AOI 7	2680266	220116	unconfined	-5.53	1	5.81	-4.15	9.96
C-96	AOI 7	2681980	219529	unconfined	-7.18	1	6.74	5.18	1.56
C-97	AOI 7	2680616	220230	unconfined	-7.45	1	-2.32	-8.71	6.39
C-98	AOI 7	2680220	219208	unconfined	-5.66	1	5.45	2.73	2.72
DSCP-MW-1	DSCP	2686587	222951	unconfined	-13.14	1	2.62	2.55	0.07
DSCP-MW-10	DSCP	2688682	221989	unconfined	-13.32	1	3.08	2.64	0.44
DSCP-MW-11	DSCP	2688509	222483	unconfined	-11.29	1	3.48	2.99	0.49
DSCP-MW-12	DSCP	2688887	222849	unconfined	-33.28	1	3.39	3.40	-0.01
DSCP-MW-13	DSCP	2688362	222878	unconfined	-10.37	1	3.42	3.29	0.13
DSCP-MW-14	DSCP	2687863	222366	unconfined	-12.23	1	2.43	2.73	-0.30
DSCP-MW-15	DSCP	2687278	222669	unconfined	-11.54	1	2.30	2.75	-0.45
DSCP-MW-16	DSCP	2686924	222962	unconfined	-10.46	1	2.80	2.76	0.04
DSCP-MW-17	DSCP	2687015	223191	unconfined	-9.69	1	3.27	2.98	0.29
DSCP-MW-19	DSCP	2686631	223493	unconfined	-7.97	1	4.33	2.95	1.38
DSCP-MW-1A	DSCP	2688112	222563	unconfined	-6.97	1	3.14	2.96	0.18
DSCP-MW-2	DSCP	2686659	222486	unconfined	-13.3	1	2.13	2.26	-0.13
DSCP-MW-20	DSCP	2686775	224059	unconfined	-6.1	1	4.70	3.89	0.81
DSCP-MW-21A	DSCP	2687617	223591	unconfined	-7.84	1	4.18	3.59	0.59
DSCP-MW-23A	DSCP	2686572	222722	unconfined	-13.27	1	2.32	2.39	-0.07
DSCP-MW-24	DSCP	2687351	222881	unconfined	-5.31	1	2.74	2.94	-0.20
DSCP-MW-27A	DSCP	2687880	222716	unconfined	-12.42	1	2.99	3.02	-0.03
DSCP-MW-28	DSCP	2686735	222344	unconfined	-13.27	1	2.34	2.20	0.14
DSCP-MW-29	DSCP	2686965	222161	unconfined	-12.16	1	2.27	2.19	0.08

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
DSCP-MW-2B	DSCP	2687618	223121	unconfined	-14.47	1	3.51	3.26	0.25
DSCP-MW-30	DSCP	2687219	222184	unconfined	-14.39	1	2.10	2.33	-0.23
DSCP-MW-31	DSCP	2687426	222153	unconfined	-5	1	2.26	2.40	-0.14
DSCP-MW-32	DSCP	2687645	222120	unconfined	-12.4	1	3.45	2.46	0.99
DSCP-MW-33	DSCP	2687847	222091	unconfined	-14.87	1	2.08	2.50	-0.42
DSCP-MW-34	DSCP	2688447	222236	unconfined	-5	1	3.93	2.77	1.16
DSCP-MW-35A	DSCP	2687607	222354	unconfined	-10.86	1	2.66	2.64	0.02
DSCP-MW-36	DSCP	2688198	221951	unconfined	-14.15	1	2.39	2.49	-0.10
DSCP-MW-3A	DSCP	2687182	222473	unconfined	-13.83	1	2.18	2.55	-0.37
DSCP-MW-45A	DSCP	2686661	223705	unconfined	-10.84	1	4.53	3.25	1.28
DSCP-MW-4A	DSCP	2687066	222254	unconfined	-11.84	1	2.12	2.32	-0.20
DSCP-MW-5	DSCP	2687276	222313	unconfined	-9.8	1	2.51	2.47	0.04
DSCP-MW-53	DSCP	2688910	223078	unconfined	-15.12	1	3.65	3.59	0.06
DSCP-MW-54	DSCP	2688606	222975	unconfined	-12.87	1	3.50	3.44	0.06
DSCP-MW-59	DSCP	2688866	222696	unconfined	-11.4	1	3.15	3.26	-0.11
DSCP-MW-6	DSCP	2687259	222070	unconfined	-11.41	1	2.17	2.26	-0.09
DSCP-MW-7	DSCP	2688049	221962	unconfined	-5.71	1	2.46	2.46	0.00
DSCP-MW-9	DSCP	2688453	221927	unconfined	-13.57	1	2.82	2.54	0.28
DSCP-RW-10	DSCP	2688044	222360	unconfined	-14.26	1	2.77	2.78	-0.01
DSCP-RW-11	DSCP	2687629	222027	unconfined	-14.71	1	2.66	2.38	0.28
DSCP-RW-1A	DSCP	2687406	222061	unconfined	-14.17	1	2.30	2.32	-0.02
DSCP-RW-2	DSCP	2686840	222240	unconfined	-11.8	1	2.41	2.18	0.23
DSCP-RW-3	DSCP	2687102	222099	unconfined	-11.47	1	2.30	2.21	0.09
DSCP-RW-4	DSCP	2687542	222032	unconfined	-12.99	1	2.60	2.35	0.25
DSCP-RW-5/MW-25	DSCP	2687690	222012	unconfined	-5.82	1	2.28	2.39	-0.11
DSCP-RW-6	DSCP	2687840	221992	unconfined	-13.96	1	1.69	2.42	-0.73
DSCP-RW-7	DSCP	2687993	221974	unconfined	-13.24	1	2.35	2.45	-0.10
DSCP-RW-8	DSCP	2687444	222376	unconfined	-14.13	1	3.21	2.59	0.62
DSCP-RW-9	DSCP	2688233	222374	unconfined	-14.2	1	2.04	2.84	-0.80
EPH-MW-39	DSCP	2688284	221752	unconfined	-14.87	1	2.32	2.35	-0.03
EPH-MW-48	DSCP	2687984	221540	unconfined	-12.66	1	2.39	1.66	0.73
EPH-MW-49	DSCP	2687860	221395	unconfined	-10.52	1	2.29	1.96	0.33
EPH-MW-50	DSCP	2687767	221178	unconfined	-12.93	1	2.16	2.23	-0.07
EPH-MWS-10	DSCP	2687988	221053	unconfined	-4.06	1	4.20	2.47	1.73
EPH-MWS-11	DSCP	2687625	221111	unconfined	-4.43	1	2.29	2.25	0.04
EPH-MWS-5	DSCP	2688545	221597	unconfined	-13.28	1	1.84	1.80	0.04
EPH-PH-5	DSCP	2687579	220875	unconfined	-18.67	1	1.90	2.46	-0.56

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
EPH-PH-7	DSCP	2688852	221563	unconfined	-15.69	1	2.82	2.26	0.56
MW-26	BELMONT	2685920	224123	unconfined	-22.91	1	5.03	3.34	1.69
MW-27	BELMONT	2685686	224065	unconfined	-0.45	1	4.96	3.65	1.31
MW-28	BELMONT	2685581	224169	unconfined	-0.74	1	5.15	3.93	1.22
MW-29	BELMONT	2685481	223955	unconfined	-0.5	1	4.89	3.81	1.08
MW-30	BELMONT	2684982	224261	unconfined	1.7	1	5.06	4.60	0.46
MW-31	BELMONT	2685353	224156	unconfined	1.48	1	5.46	4.20	1.26
MW-32	BELMONT	2685565	224286	unconfined	-0.41	1	4.81	4.11	0.70
MW-33	BELMONT	2685300	224346	unconfined	2.3	1	5.04	4.48	0.56
MW-35	BELMONT	2685572	224473	unconfined	-4.16	1	5.36	4.40	0.96
MW-36	BELMONT	2685830	224431	unconfined	-2.25	1	5.37	4.05	1.32
MW-37	BELMONT	2685985	224470	unconfined	-2.45	1	5.60	4.20	1.40
MW-38	BELMONT	2686166	224255	unconfined	-7.02	1	4.94	3.70	1.24
MW-39	BELMONT	2686158	224193	unconfined	-7.01	1	5.00	3.48	1.52
MW-40	BELMONT	2686146	224123	unconfined	-5	1	5.02	3.13	1.89
MW-41	BELMONT	2686036	224120	unconfined	-7.34	1	5.05	3.22	1.83
MW-43	BELMONT	2685063	224183	unconfined	-4.02	1	4.99	4.46	0.53
MW-44	BELMONT	2685403	224419	unconfined	-5.18	1	4.46	4.48	-0.02
MWELL-28	AOI 1	2685865	222299	unconfined	-20.84	1	0.88	0.40	0.48
MWELL-29	AOI 1	2685808	222019	unconfined	-25.79	1	0.25	-0.84	1.09
MWELL-30	AOI 1	2685800	221601	unconfined	-17.66	1	0.47	-2.35	2.82
MWELL-31	AOI 1	2685710	221306	unconfined	-14.13	1	0.97	0.78	0.19
N-1	AOI 8	2682437	228366	unconfined	14.57	1	11.72	7.46	4.26
N-100	AOI 8	2682716	228210	unconfined	4.99	1	10.41	6.35	4.06
N-101	AOI 8	2683653	227222	unconfined	2.43	1	11.90	10.94	0.96
N-106	AOI 8	2682977	227044	unconfined	2.5	1	15.29	16.38	-1.09
N-107	AOI 8	2683133	226910	unconfined	2.38	1	12.46	13.39	-0.93
N-11	AOI 8	2682915	227226	unconfined	2.33	1	11.99	11.16	0.83
N-12	AOI 8	2683394	227099	unconfined	0	1	11.85	11.56	0.29
N-129	AOI 8	2683241	225470	unconfined	-2.88	1	10.54	9.24	1.30
N-133	AOI 8	2680751	224967	unconfined	-4.81	1	6.07	7.81	-1.74
N-134	AOI 8	2685262	226063	unconfined	5.79	1	11.52	7.51	4.01
N-137	AOI 8	2683096	227832	unconfined	0.87	1	9.96	7.64	2.32
N-14	AOI 8	2683665	227011	unconfined	4.64	1	12.20	10.10	2.10
N-140	AOI 8	2683133	227411	unconfined	0	1	10.72	9.89	0.83
N-141	AOI 8	2683308	227396	unconfined	0	1	11.35	11.09	0.26
N-142	AOI 8	2683211	227652	unconfined	0	1	9.58	9.28	0.30

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
N-143	AOI 8	2683358	227513	unconfined	0	1	11.22	10.59	0.63
N-144	AOI 8	2683293	227623	unconfined	0	1	9.73	9.76	-0.03
N-145	AOI 8	2683032	227680	unconfined	0	1	9.64	8.27	1.37
N-15	AOI 8	2684060	226993	unconfined	4.8	1	9.32	8.03	1.29
N-151	AOI 8	2683620	225640	unconfined	2.26	1	11.50	8.78	2.72
N-16	AOI 8	2684409	226993	unconfined	5	1	12.13	7.70	4.43
N-17	AOI 8	2684410	226993	unconfined	6.3	1	12.12	7.70	4.42
N-18	AOI 8	2684650	226744	unconfined	5.15	1	11.95	7.84	4.11
N-20	AOI 8	2683878	226645	unconfined	19.12	1	11.54	9.05	2.49
N-24	AOI 8	2682554	226437	unconfined	2.03	1	8.27	7.50	0.77
N-29	AOI 8	2685039	225835	unconfined	6.6	1	11.67	10.03	1.64
N-36	AOI 8	2681732	226220	unconfined	-0.27	1	7.13	5.48	1.65
N-37	AOI 8	2681543	226828	lower aquifer	-0.74	1	6.48	5.87	0.61
N-42	AOI 8	2682412	225813	unconfined	-2.91	1	8.11	8.12	-0.01
N-47	AOI 8	2683936	225489	unconfined	4.55	1	14.07	9.20	4.87
N-48	AOI 8	2683476	225312	unconfined	1.92	1	10.68	9.43	1.25
N-49	AOI 8	2683115	225175	unconfined	3.55	1	10.77	9.79	0.98
N-503	AOI 8	2680566	226576	unconfined	11.46	1	4.10	4.27	-0.17
N-504	AOI 8	2680652	226857	unconfined	11.36	1	4.11	3.80	0.31
N-51	AOI 8	2682956	225253	unconfined	2.92	1	10.08	9.71	0.37
N-55	AOI 8	2681474	225122	unconfined	0.59	1	6.24	8.44	-2.20
N-56	AOI 8	2681266	225659	unconfined	-2.32	1	6.37	8.74	-2.37
N-57	AOI 8	2680586	226031	unconfined	-1.2	1	6.00	7.28	-1.28
N-64	AOI 8	2682309	224842	unconfined	-3.5	1	4.21	3.68	0.53
N-67	AOI 8	2682698	226940	unconfined	-2.77	1	14.81	14.11	0.70
N-68	AOI 8	2682973	226911	unconfined	3.22	1	11.95	15.28	-3.33
N-72	AOI 8	2680686	226761	unconfined	-3.74	1	3.97	6.39	-2.42
N-8	AOI 8	2684092	227375	unconfined	1.03	1	12.46	10.23	2.23
N-82	AOI 8	2684634	225723	unconfined	0.98	1	12.74	9.08	3.66
N-85	AOI 8	2684734	226448	unconfined	-1.05	1	11.84	7.14	4.70
N-86	AOI 8	2684119	226463	unconfined	11.3	1	11.09	8.70	2.39
N-87	AOI 8	2683965	226550	unconfined	5.89	1	11.36	9.12	2.24
N-89	AOI 8	2682824	226717	unconfined	-0.13	1	9.71	9.85	-0.14
N-93	AOI 8	2683794	226550	unconfined	5.05	1	10.42	8.70	1.72
N-97	AOI 8	2684187	226513	unconfined	-5	1	9.45	8.34	1.11
N-98	AOI 8	2683479	227658	unconfined	2.46	1	11.78	9.94	1.84
OW-12	BELMONT	2685686	224424	unconfined	0	1	5.10	4.17	0.93

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
OW-13	BELMONT	2685988	224385	unconfined	0	1	5.31	3.98	1.33
OW-14	BELMONT	2686076	224372	unconfined	-17.59	1	5.13	3.98	1.15
OW-16	BELMONT	2685739	224420	unconfined	0	1	5.32	4.08	1.24
OW-17	BELMONT	2685587	224388	unconfined	0	1	4.73	4.24	0.49
OW-18	BELMONT	2685520	224437	unconfined	0.75	1	5.53	4.40	1.13
OW-19	BELMONT	2685717	224415	unconfined	1.22	1	5.53	4.10	1.43
OW-2	BELMONT	2685939	224392	unconfined	0	1	5.44	3.99	1.45
OW-20	BELMONT	2685840	224404	unconfined	2.43	1	5.36	3.96	1.40
PGW-MW-1	PGW	2683228	224438	unconfined	0	1	9.42	8.60	0.82
PGW-MW-10S	PGW	2685131	225179	unconfined	1.2	1	10.98	9.33	1.65
PGW-MW-11	PGW	2683813	224768	unconfined	0	1	11.71	9.40	2.31
PGW-MW-11S	PGW	2685405	224756	unconfined	0	1	9.98	4.91	5.07
PGW-MW-13	PGW	2683949	224490	unconfined	-5	1	11.05	8.89	2.16
PGW-MW-13S	PGW	2685322	225242	unconfined	-0.5	1	10.19	8.65	1.54
PGW-MW-14S	PGW	2685266	224997	unconfined	0	1	10.21	7.36	2.85
PGW-MW-15	PGW	2683427	224122	unconfined	0	1	8.77	6.20	2.57
PGW-MW-15S	PGW	2685092	224730	unconfined	-4	1	10.29	4.99	5.30
PGW-MW-16	PGW	2683645	224956	unconfined	-5	1	11.64	9.63	2.01
PGW-MW-17	PGW	2683385	224541	unconfined	0	1	10.45	9.73	0.72
PGW-MW-18S	PGW	2683206	224683	unconfined	0	1	10.11	9.92	0.19
PGW-MW-1S	PGW	2683457	224135	unconfined	-1.2	1	8.20	6.27	1.93
PGW-MW-20	AOI 8	2682870	224701	unconfined	-5	1	9.61	7.62	1.99
PGW-MW-22	PGW	2682953	224875	unconfined	0	1	10.78	9.94	0.84
PGW-MW-24	AOI 8	2682932	225026	unconfined	6.66	1	11.39	9.98	1.41
PGW-MW-25	PGW	2683221	225110	unconfined	-5	1	11.13	9.93	1.20
PGW-MW-26A	PGW	2684200	225064	unconfined	-5	1	12.82	9.28	3.54
PGW-MW-2A	PGW	2683341	224285	unconfined	0	1	8.76	7.95	0.81
PGW-MW-2S	PGW	2683928	224288	unconfined	0.7	1	10.03	7.37	2.66
PGW-MW-3	PGW	2683356	224400	unconfined	0	1	11.18	9.13	2.05
PGW-MW-33	PGW	2683509	225248	unconfined	-5	1	12.16	9.61	2.55
PGW-MW-34	PGW	2683317	225168	unconfined	0	1	11.87	9.81	2.06
PGW-MW-37	PGW	2683017	225030	unconfined	-5	1	11.00	10.05	0.95
PGW-MW-39	PGW	2683023	224810	unconfined	0	1	10.48	9.94	0.54
PGW-MW-3S	PGW	2684683	224482	unconfined	0.5	1	10.64	7.06	3.58
PGW-MW-42	PGW	2684361	225555	unconfined	-5	1	4.32	9.32	-5.00
PGW-MW-42R	PGW	2684370	225557	unconfined	4.6	1	11.97	9.33	2.64
PGW-MW-44	PGW	2684147	225231	unconfined	-5	1	13.54	9.32	4.22

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
PGW-MW-45	PGW	2684686	225671	unconfined	0	1	13.31	9.57	3.74
PGW-MW-4S	PGW	2685044	224934	unconfined	-5	1	11.02	7.81	3.21
PGW-MW-5	AOI 8	2683138	224445	unconfined	-5	1	7.79	7.20	0.59
PGW-MW-5S	PGW	2685404	225420	unconfined	-4.3	1	9.78	7.59	2.19
PGW-MW-6	AOI 8	2682885	224559	unconfined	-5	1	-1.17	3.36	-4.53
PGW-MW-6S	PGW	2685348	224948	unconfined	0.5	1	9.91	5.48	4.43
PGW-MW-7	AOI 8	2682986	224648	unconfined	-5	1	8.56	8.45	0.11
PGW-MW-7S	PGW	2685067	224606	unconfined	-4.3	1	9.34	4.90	4.44
PGW-MW-8	AOI 8	2683074	224544	unconfined	-5	1	7.84	7.98	-0.14
PGW-MW-8S	AOI 2	2684218	224041	unconfined	-4	1	5.39	4.86	0.53
PGW-MW-9	AOI 8	2683174	224408	unconfined	-5	1	7.64	7.16	0.48
PH-MW-37	DSCP	2686343	221184	unconfined	-5	1	8.13	1.51	6.62
PH-MW-40	DSCP	2687731	221480	unconfined	-14.03	1	2.26	1.72	0.54
PH-MW-41	DSCP	2687413	221534	unconfined	-11.92	1	2.36	1.34	1.02
PH-MW-42	DSCP	2686769	221821	unconfined	-16.19	1	1.92	1.71	0.21
PH-MW-43	DSCP	2686438	221827	unconfined	-12.33	1	1.78	1.34	0.44
PH-MW-51	DSCP	2687500	221132	unconfined	-13.84	1	2.22	2.17	0.05
PH-MW-55	DSCP	2686505	222267	unconfined	-10.89	1	1.97	2.01	-0.04
PH-MW-56	DSCP	2686556	221083	unconfined	-16.37	1	1.95	1.78	0.17
PH-MW-57	DSCP	2686282	220525	unconfined	-11.98	1	0.94	2.13	-1.19
PH-MW-58	DSCP	2686349	221238	unconfined	-11.84	1	1.85	1.45	0.40
PH-MW-60	DSCP	2687960	221802	unconfined	-18.93	1	2.38	2.32	0.06
PH-MWS-1	DSCP	2686452	221928	unconfined	-6.49	1	1.82	1.49	0.33
PH-MWS-13	DSCP	2686359	221371	unconfined	-7.08	1	1.97	1.31	0.66
PH-MWS-15	DSCP	2686955	220881	unconfined	-5	1	2.32	2.18	0.14
PH-MWS-2A	DSCP	2687207	221520	unconfined	-14.65	1	2.32	1.33	0.99
PH-MWS-3	DSCP	2687763	221556	unconfined	-16.04	1	2.27	1.47	0.80
PH-MWS-4	DSCP	2687804	221600	unconfined	-7.57	1	2.52	1.56	0.96
PH-PH-1	DSCP	2686489	222120	unconfined	-10.98	1	2.03	1.89	0.14
PH-PH-13	DSCP	2687220	221617	unconfined	-12.08	1	1.92	1.27	0.65
PH-PH-14	DSCP	2687012	221567	unconfined	-14.83	1	2.22	1.06	1.16
PH-PH-16	DSCP	2687623	221740	unconfined	-13.9	1	2.74	2.12	0.62
PH-PH-17	DSCP	2687678	221881	unconfined	-14.78	1	2.28	2.29	-0.01
PH-PH-18	DSCP	2687410	221922	unconfined	-15.08	1	2.17	2.22	-0.05
PH-PH-19	DSCP	2687210	221950	unconfined	-16.22	1	2.01	2.15	-0.14
PH-PH-2	DSCP	2686821	222025	unconfined	-10.55	1	1.96	1.99	-0.03
PH-PH-20	DSCP	2686939	221991	unconfined	-13.58	1	1.85	2.03	-0.18

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
PH-PH-21	DSCP	2686682	222101	unconfined	-10.46	1	2.57	1.98	0.59
PH-PH-22	DSCP	2686409	221643	unconfined	-12.07	1	1.95	1.20	0.75
PH-PH-23	DSCP	2686701	221254	unconfined	-16.1	1	2.47	1.70	0.77
PH-PH-24	DSCP	2687242	221174	unconfined	-15.15	1	3.14	2.02	1.12
PH-PH-3	DSCP	2687314	221945	unconfined	-9.95	1	2.21	2.20	0.01
PH-PH-4	DSCP	2687928	221845	unconfined	-15.3	1	2.36	2.34	0.02
PH-PH-6	DSCP	2686307	220879	unconfined	-5	1	11.76	1.86	9.90
PH-PZ-4	DSCP	2687319	221943	unconfined	-1.31	1	2.23	2.20	0.03
PH-RW-A	DSCP	2686638	222124	unconfined	-11.35	1	3.82	1.98	1.84
PH-RW-A2	DSCP	2686640	222131	unconfined	0	1	1.96	1.98	-0.02
PH-RW-B	DSCP	2686815	222035	unconfined	-12.68	1	2.02	1.99	0.03
PH-RW-B2	DSCP	2686821	222030	unconfined	0	1	1.96	1.99	-0.03
PH-RW-C	DSCP	2687070	221975	unconfined	-11.9	1	1.94	2.09	-0.15
PH-RW-CA	DSCP	2687084	221963	unconfined	-9.19	1	1.97	2.09	-0.12
PH-RW-E	DSCP	2687539	221910	unconfined	-14.3	1	2.19	2.26	-0.07
PH-RW-F	DSCP	2687826	221867	unconfined	-16.38	1	2.29	2.33	-0.04
PH-RW-G	DSCP	2687154	221567	unconfined	-14.6	1	2.22	1.16	1.06
PH-RW-H	DSCP	2686848	221570	unconfined	-5	1	2.28	0.92	1.36
PH-RW-I	DSCP	2686802	221928	unconfined	-5	1	2.12	1.88	0.24
PH-RW-I2	DSCP	2686803	221923	unconfined	0	1	2.29	1.87	0.42
PH-RW-M	DSCP	2687433	221597	unconfined	-5	1	2.30	1.40	0.90
PH-RW-N	DSCP	2687810	221599	unconfined	-10.37	1	2.36	1.56	0.80
PH-RW-O	DSCP	2687693	221589	unconfined	-14.9	1	2.26	1.45	0.81
PH-RW-P	DSCP	2687599	221597	unconfined	-16.73	1	2.27	1.47	0.80
PH-RW-Q	DSCP	2687510	221586	unconfined	-18.17	1	2.37	1.38	0.99
PH-RW-S	DSCP	2687350	221602	unconfined	-17.98	1	2.25	1.38	0.87
PH-RW-T	DSCP	2686860	221739	unconfined	-5	1	1.97	1.60	0.37
PH-RW-U	DSCP	2686879	221846	unconfined	-12.61	1	1.91	1.85	0.06
PH-RW-V	DSCP	2686705	221936	unconfined	-14.41	1	1.91	1.83	0.08
PH-RW-V2	DSCP	2686699	221935	unconfined	-5	1	2.17	1.83	0.34
PH-RW-W	DSCP	2686591	221952	unconfined	-15.7	1	1.81	1.82	-0.01
PH-RW-W2	DSCP	2686593	221960	unconfined	-5	1	3.64	1.83	1.81
PZ-100	AOI 2	2683602	222350	unconfined	-5	1	2.54	2.37	0.17
PZ-132A	AOI 6	2680866	216104	unconfined	-1.88	1	3.23	1.65	1.58
PZ-2	AOI 5	2681495	215938	unconfined	0	1	5.26	4.56	0.70
PZ-201	AOI 8	2683718	225409	unconfined	9.28	1	11.58	9.24	2.34
PZ-202	AOI 8	2683876	225484	unconfined	10.39	1	12.88	9.17	3.71

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
PZ-203	AOI 8	2684037	225560	unconfined	13.11	1	14.26	9.07	5.19
PZ-3	AOI 5	2681511	215958	unconfined	0	1	2.78	4.50	-1.72
PZ-300	AOI 8	2683295	226640	unconfined	-0.23	1	11.67	9.22	2.45
PZ-400	BELMONT	2686131	224096	unconfined	0	1	4.98	3.01	1.97
PZ-402	AOI 1	2686061	223552	unconfined	-8.68	1	4.23	2.19	2.04
PZ-403	AOI 1	2685965	222935	unconfined	-5	1	1.46	1.35	0.11
PZ-404	AOI 1	2685981	222933	unconfined	-12.84	1	0.01	1.28	-1.27
PZ-501	AOI 8	2680429	225835	unconfined	-1	1	5.47	3.51	1.96
PZ-502	AOI 8	2680434	225562	unconfined	6.14	1	5.51	3.44	2.07
PZ-503	AOI 8	2680590	225085	unconfined	-0.31	1	5.35	2.87	2.48
PZ-504	AOI 8	2680730	224903	unconfined	1.63	1	5.30	3.85	1.45
PZ-505	AOI 8	2681024	224708	unconfined	0.46	1	5.37	3.72	1.65
PZ-507	AOI 8	2682206	224812	unconfined	2.68	1	4.60	3.24	1.36
RW-1	BELMONT	2685680	224407	unconfined	-19.42	1	5.02	4.14	0.88
RW-100	AOI 2	2683341	222349	unconfined	-8.66	1	3.02	2.39	0.63
RW-101	AOI 2	2683489	222384	unconfined	-8.63	1	2.61	2.42	0.19
RW-102	AOI 2	2683599	222321	unconfined	-9.76	1	2.82	2.35	0.47
RW-103	AOI 2	2683770	222358	unconfined	-10.24	1	2.71	2.27	0.44
RW-104	AOI 2	2682960	222446	unconfined	-15.89	1	-0.32	2.06	-2.38
RW-105	AOI 2	2682964	222412	unconfined	-7.87	1	0.78	2.28	-1.50
RW-106	AOI 2	2682946	222348	unconfined	-7.71	1	2.40	2.26	0.14
RW-107	AOI 2	2682915	222272	unconfined	-5	1	0.37	2.26	-1.89
RW-108	AOI 2	2682895	222181	unconfined	-8.66	1	2.26	2.26	0.00
RW-109	AOI 2	2682883	222084	unconfined	-10.49	1	3.00	2.25	0.75
RW-110	AOI 1	2685160	222136	unconfined	-4.3	1	1.70	1.37	0.33
RW-112	AOI 1	2685156	222113	unconfined	-6.29	1	1.60	1.36	0.24
RW-113	AOI 2	2682988	222409	unconfined	-18.9	1	2.09	2.29	-0.20
RW-114	AOI 2	2683023	222392	unconfined	-15.6	1	2.37	2.31	0.06
RW-115	AOI 2	2682980	222371	unconfined	-18.7	1	2.25	2.28	-0.03
RW-116	AOI 2	2682987	222340	unconfined	-18.11	1	2.39	2.29	0.10
RW-117	AOI 2	2682964	222320	unconfined	-19.06	1	2.36	2.28	0.08
RW-118	AOI 2	2682999	222302	unconfined	-17.03	1	2.50	2.31	0.19
RW-119	AOI 2	2683013	222332	unconfined	-16.06	1	2.48	2.31	0.17
RW-120	AOI 2	2683027	222353	unconfined	-4.23	1	2.52	2.31	0.21
RW-121	AOI 2	2683050	222376	unconfined	-8.7	1	2.45	2.32	0.13
RW-122	AOI 2	2682978	222265	unconfined	-18.58	1	2.40	2.30	0.10
RW-123	AOI 2	2682969	222296	unconfined	-19.02	1	2.42	2.29	0.13

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
RW-125	AOI 2	2683040	222428	unconfined	-14.3	1	2.42	2.34	0.08
RW-126	AOI 2	2682936	222285	unconfined	-19.65	1	-7.67	2.27	-9.94
RW-127	AOI 2	2683036	222383	unconfined	-14.65	1	2.46	2.31	0.15
RW-129	AOI 2	2683008	222434	unconfined	-18.55	1	1.51	2.32	-0.81
RW-201	AOI 8	2682704	225060	unconfined	-3.39	1	9.76	9.78	-0.02
RW-202	AOI 8	2682881	225065	unconfined	-3.96	1	10.56	9.91	0.65
RW-204	AOI 8	2683190	225163	unconfined	-3.66	1	11.61	9.80	1.81
RW-205	AOI 8	2683343	225251	unconfined	0.3	1	11.44	9.59	1.85
RW-206	AOI 8	2683557	225332	unconfined	-0.42	1	10.96	9.37	1.59
RW-21	BELMONT	2685822	224345	unconfined	0	1	4.95	3.83	1.12
RW-22	BELMONT	2685892	224304	unconfined	-13.8	1	5.21	3.75	1.46
RW-24	BELMONT	2685772	224272	unconfined	-13.62	1	5.09	3.64	1.45
RW-25	BELMONT	2685725	224365	unconfined	-10.66	1	5.20	3.97	1.23
RW-26	BELMONT	2685474	224410	unconfined	-9.4	1	4.49	4.40	0.09
RW-27	BELMONT	2685423	224396	unconfined	-9.26	1	4.39	4.43	-0.04
RW-28	BELMONT	2685357	224378	unconfined	-9.9	1	5.06	4.47	0.59
RW-29	BELMONT	2685286	224360	unconfined	-9.81	1	4.48	4.51	-0.03
RW-30	BELMONT	2685257	224352	unconfined	-9.67	1	4.49	4.52	-0.03
RW-303	AOI 8	2683167	226663	unconfined	-6.02	1	11.63	9.57	2.06
RW-307	AOI 8	2683080	226604	unconfined	22.82	1	8.86	9.28	-0.42
RW-308	AOI 8	2683240	226623	unconfined	25.27	1	9.35	9.24	0.11
RW-309	AOI 8	2683373	226602	unconfined	24.81	1	10.03	8.95	1.08
RW-31	BELMONT	2685206	224339	unconfined	-9.69	1	4.46	4.55	-0.09
RW-4	BELMONT	2685789	224388	unconfined	-18.63	1	5.27	3.85	1.42
RW-401	AOI 1	2686040	223555	unconfined	-25.49	1	4.59	2.23	2.36
RW-404	AOI 1	2686015	223152	unconfined	-8.81	1	2.57	1.50	1.07
RW-500	AOI 8	2680478	225305	unconfined	6.79	1	5.56	3.18	2.38
RW-501	AOI 8	2681487	224727	unconfined	7.98	1	5.10	5.13	-0.03
RW-502	AOI 8	2680607	226714	unconfined	11.4	1	4.03	4.74	-0.71
RW-6	BELMONT	2686038	224377	unconfined	0	1	5.23	3.98	1.25
RW-6S	AOI 5	2681520	215947	unconfined	5.22	1	2.88	4.43	-1.55
RW-7	BELMONT	2685894	224363	unconfined	-20.93	1	5.23	3.90	1.33
RW-9	AOI 6	2681446	216562	unconfined	-5	1	3.52	4.59	-1.07
RWBH-1	AOI 5	2682070	215219	unconfined	-6.14	1	2.97	2.28	0.69
RWBH-2	AOI 5	2682109	215220	unconfined	-3.67	1	0.37	2.48	-2.11
S-100	AOI 1	2686178	223523	unconfined	-9.91	1	2.58	2.35	0.23
S-101	AOI 1	2686296	223163	unconfined	-11.73	1	2.61	2.23	0.38

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
S-102	AOI 4	2683874	221407	unconfined	-4.37	1	1.76	2.21	-0.45
S-104	AOI 4	2684804	221448	unconfined	-4.37	1	3.54	1.79	1.75
S-107	AOI 2	2683338	223258	unconfined	-5.51	1	3.00	2.71	0.29
S-108	AOI 2	2683362	223294	unconfined	-8.04	1	4.10	2.78	1.32
S-108SRTF	AOI 9	2677667	218321	unconfined	-10.93	1	-0.76	-1.18	0.42
S-109SRTF	AOI 9	2677084	217894	unconfined	-11.76	1	-0.53	-1.88	1.35
S-111SRTF	AOI 9	2677273	217432	unconfined	-13.64	1	-7.68	-2.87	-4.81
S-112SRTF	AOI 9	2677256	216984	unconfined	-13.41	1	-8.34	-3.84	-4.50
S-113	AOI 3	2683405	220680	unconfined	-11.65	1	1.46	2.00	-0.54
S-113SRTF	AOI 9	2676915	216800	unconfined	-14.57	1	-8.28	-4.20	-4.08
S-114SRTF	AOI 9	2676978	216435	unconfined	-15.44	1	-8.24	-5.14	-3.10
S-115SRTF	AOI 9	2676754	216194	unconfined	-14.8	1	-8.47	-5.68	-2.79
S-116SRTF	AOI 9	2676903	215942	unconfined	-16.68	1	-8.54	-6.34	-2.20
S-117	AOI 1	2685492	222352	unconfined	-9.4	1	2.01	1.33	0.68
S-118	AOI 1	2685533	221629	unconfined	-10.16	1	1.42	0.20	1.22
S-118SRTF	AOI 9	2676678	215161	unconfined	-13.98	1	-7.90	-8.28	0.38
S-119	AOI 4	2685393	220753	unconfined	-10.18	1	1.82	1.84	-0.02
S-121SRTF	AOI 9	2677486	215710	unconfined	-13.54	1	-6.35	-6.96	0.61
S-122SRTF	AOI 9	2677653	216573	unconfined	-13.96	1	-6.38	-4.76	-1.62
S-125	AOI 1	2686079	223506	unconfined	-6.16	1	4.27	2.11	2.16
S-127	AOI 1	2685644	222203	unconfined	-13.62	1	-0.51	0.73	-1.24
S-131	AOI 2	2684100	222307	unconfined	-7.09	1	3.10	1.90	1.20
S-132	AOI 2	2684095	222243	unconfined	-8.76	1	3.10	1.87	1.23
S-133	AOI 2	2684056	222303	unconfined	-8.37	1	3.00	1.91	1.09
S-134	AOI 2	2684441	222209	unconfined	-7.39	1	3.26	1.40	1.86
S-135	AOI 2	2684162	222278	unconfined	-7.66	1	1.09	1.82	-0.73
S-135SRTF	AOI 9	2676810	216462	unconfined	-20.59	1	-7.44	-5.03	-2.41
S-136	AOI 2	2684135	222257	unconfined	-7.05	1	2.95	1.84	1.11
S-139	AOI 2	2683570	222392	unconfined	-9.1	1	2.84	2.41	0.43
S-141	AOI 2	2683427	222387	unconfined	-8.04	1	2.67	2.43	0.24
S-142	AOI 2	2683609	222348	unconfined	-10.19	1	1.62	2.36	-0.74
S-147SRTF	AOI 9	2676674	216718	unconfined	-19.5	1	-8.15	-3.85	-4.30
S-150	AOI 2	2683393	223189	unconfined	-0.09	1	3.43	2.78	0.65
S-152	AOI 2	2683337	223247	unconfined	-10.9	1	2.54	2.70	-0.16
S-154	AOI 2	2683290	223236	unconfined	-4.86	1	-0.58	2.59	-3.17
S-156	AOI 2	2684180	222281	unconfined	-6.82	1	2.83	1.81	1.02
S-157	AOI 2	2684107	222285	unconfined	-7.71	1	3.03	1.87	1.16

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
S-159	AOI 2	2683730	222304	unconfined	-0.83	1	3.25	2.26	0.99
S-162	AOI 1	2685202	222131	unconfined	-3.58	1	1.67	1.35	0.32
S-164	AOI 1	2685039	222134	unconfined	-7.1	1	1.87	1.30	0.57
S-166	AOI 2	2684909	222170	unconfined	-6.78	1	2.57	1.15	1.42
S-175	AOI 2	2684500	222226	unconfined	-3.6	1	3.75	1.34	2.41
S-180	AOI 1	2686058	223358	unconfined	-11.5	1	5.05	1.78	3.27
S-181	AOI 1	2686074	223472	unconfined	-11.1	1	3.89	2.02	1.87
S-183	AOI 1	2686096	223635	unconfined	-10.4	1	4.47	2.04	2.43
S-185	AOI 1	2686111	223736	unconfined	-10	1	4.85	2.24	2.61
S-186	AOI 1	2686118	223786	unconfined	-9.6	1	4.97	2.31	2.66
S-187	AOI 1	2686124	223837	unconfined	-9.3	1	4.57	2.28	2.29
S-188	AOI 1	2686125	223886	unconfined	-8.9	1	4.87	2.32	2.55
S-189	AOI 1	2686115	223925	unconfined	-7.5	1	4.85	2.43	2.42
S-190	AOI 1	2686121	223969	unconfined	-6.7	1	4.87	2.49	2.38
S-191	AOI 1	2686127	224012	unconfined	-7	1	4.87	2.59	2.28
S-192	AOI 1	2686135	224055	unconfined	-6.2	1	5.87	2.82	3.05
S-193	AOI 1	2686254	223959	unconfined	-6.52	1	4.89	3.00	1.89
S-194	AOI 1	2686268	223978	unconfined	1.15	1	5.89	3.08	2.81
S-196	AOI 1	2686419	224117	unconfined	-5.04	1	5.10	3.65	1.45
S-197	AOI 1	2686414	223931	unconfined	-5	1	5.46	3.29	2.17
S-198	AOI 1	2685879	224076	unconfined	-6.76	1	4.91	3.34	1.57
S-199	AOI 1	2685732	224027	unconfined	-6.29	1	4.54	3.54	1.00
S-200	AOI 1	2685486	223945	unconfined	-5.57	1	4.97	3.79	1.18
S-201	AOI 1	2685877	223831	unconfined	-6.26	1	4.90	2.97	1.93
S-202	AOI 1	2684881	223417	unconfined	-4.61	1	4.98	3.64	1.34
S-203	AOI 1	2685245	223217	unconfined	-3.11	1	5.01	3.11	1.90
S-206	AOI 1	2684727	223201	unconfined	-3.46	1	5.08	3.38	1.70
S-208	AOI 1	2685225	222409	unconfined	-7.92	1	2.29	1.68	0.61
S-209	AOI 1	2685750	222525	unconfined	-11.06	1	1.70	1.23	0.47
S-210	AOI 1	2685876	222247	unconfined	-14.36	1	0.48	0.16	0.32
S-211	AOI 1	2685021	221956	unconfined	-14.78	1	2.00	1.46	0.54
S-213	AOI 1	2685087	221871	unconfined	-14.89	1	1.72	1.49	0.23
S-214	AOI 1	2685145	221577	unconfined	-13.27	1	2.16	1.47	0.69
S-216	AOI 4	2684618	220867	unconfined	-11.43	1	2.12	1.96	0.16
S-225	AOI 4	2684549	221123	unconfined	-15	1	-0.59	1.95	-2.54
S-226	AOI 1	2685805	222280	unconfined	-15.64	1	0.91	0.53	0.38
S-227	AOI 1	2685786	221654	unconfined	-12.22	1	0.72	-2.22	2.94

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
S-228	AOI 1	2685779	221657	unconfined	-13.79	1	0.18	-2.13	2.31
S-231	AOI 1	2685897	222219	unconfined	-5.32	1	0.40	-0.03	0.43
S-232	AOI 1	2685891	222167	unconfined	-8.91	1	0.20	-0.27	0.47
S-246A	AOI 2	2682915	222348	unconfined	-5	1	0.85	1.92	-1.07
S-247	AOI 2	2682921	222381	unconfined	-5	1	0.99	1.80	-0.81
S-248	AOI 2	2682933	222394	unconfined	-5	1	0.91	2.15	-1.24
S-249	AOI 2	2682939	222444	unconfined	-5	1	2.22	1.79	0.43
S-251	AOI 2	2683286	222362	unconfined	-4.39	1	2.72	2.39	0.33
S-252	AOI 2	2683257	222357	unconfined	-4.64	1	2.66	2.38	0.28
S-253	AOI 2	2683301	222420	unconfined	-2.89	1	2.88	2.43	0.45
S-254	AOI 2	2683168	222414	unconfined	-3.09	1	2.52	2.39	0.13
S-256	AOI 1	2685775	221633	unconfined	-15.83	1	0.45	-2.04	2.49
S-257	AOI 1	2685811	221589	unconfined	-11.33	1	0.72	-2.38	3.10
S-258	AOI 1	2685820	221665	unconfined	-11.64	1	0.48	-2.69	3.17
S-259	AOI 1	2685827	221704	unconfined	-12	1	-1.30	-2.88	1.58
S-260	AOI 1	2685846	221830	unconfined	-13.02	1	-0.88	-2.66	1.78
S-262	AOI 1	2685590	222045	unconfined	-12.28	1	1.55	0.42	1.13
S-263	AOI 1	2685576	221829	unconfined	-12.84	1	1.33	-0.04	1.37
S-268	AOI 1	2686298	224224	unconfined	15.14	1	5.15	3.76	1.39
S-269	AOI 1	2685044	222590	unconfined	-9.37	1	3.11	2.18	0.93
S-270	AOI 1	2685422	222589	unconfined	-8.62	1	2.85	1.86	0.99
S-271	AOI 1	2686090	223898	unconfined	-8.55	1	4.91	2.50	2.41
S-273	AOI 1	2686121	223810	unconfined	-9.19	1	5.07	2.29	2.78
S-274	AOI 1	2686114	223761	unconfined	-9.59	1	4.89	2.32	2.57
S-275	AOI 1	2686107	223710	unconfined	-9.95	1	4.85	2.15	2.70
S-276	AOI 1	2686101	223661	unconfined	-10.32	1	4.72	2.05	2.67
S-277	AOI 1	2686071	223444	unconfined	-11.4	1	4.79	2.00	2.79
S-280	AOI 3	2682599	220966	unconfined	-1.27	1	2.66	1.91	0.75
S-281	AOI 3	2683656	221049	unconfined	-10.13	1	1.39	2.12	-0.73
S-282	AOI 4	2683960	220827	unconfined	-1.51	1	1.70	2.10	-0.40
S-283	AOI 3	2682503	220304	unconfined	-12.52	1	0.24	1.84	-1.60
S-284	AOI 3	2683135	220364	unconfined	-10.19	1	1.38	1.88	-0.50
S-288	AOI 3	2683003	219276	unconfined	2.25	1	4.44	2.15	2.29
S-294	AOI 2	2684673	224162	unconfined	-4.88	1	5.26	4.66	0.60
S-295	AOI 2	2684379	223801	unconfined	9.13	1	9.19	10.64	-1.45
S-298	AOI 2	2683859	223263	unconfined	5.48	1	11.86	9.66	2.20
S-299	AOI 2	2683545	222978	unconfined	-6.23	1	3.37	2.81	0.56

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
S-300	AOI 2	2684308	222830	unconfined	-6.01	1	4.48	2.82	1.66
S-301	AOI 2	2684442	222551	unconfined	-6.94	1	4.41	2.26	2.15
S-302	AOI 2	2683251	222613	unconfined	-7.86	1	2.84	2.53	0.31
S-303	AOI 2	2683678	222409	unconfined	-5.29	1	3.62	2.39	1.23
S-305	AOI 2	2684883	221997	unconfined	-10.79	1	1.95	1.43	0.52
S-306	AOI 2	2683117	222297	unconfined	-9.92	1	2.49	2.35	0.14
S-307	AOI 2	2683508	221764	unconfined	-9.55	1	3.22	2.35	0.87
S-308	AOI 2	2682915	221383	unconfined	5.39	1	5.17	2.11	3.06
S-309	AOI 2	2683391	221512	unconfined	-2.98	1	2.91	2.29	0.62
S-311	AOI 2	2684448	221518	unconfined	-8.49	1	3.99	1.97	2.02
S-313	AOI 2	2683327	222420	unconfined	-7.86	1	2.96	2.44	0.52
S-314	AOI 2	2683250	222411	unconfined	-7.9	1	2.63	2.41	0.22
S-317	AOI 2	2683227	222440	unconfined	-8.63	1	2.65	2.43	0.22
S-318	AOI 2	2683216	222516	unconfined	-8.19	1	2.36	2.47	-0.11
S-32	AOI 4	2684136	219917	unconfined	-0.8	1	1.86	2.32	-0.46
S-328	AOI 2	2683642	222582	unconfined	-3.53	1	3.44	2.56	0.88
S-330	BELMONT	2685219	224246	unconfined	-4.71	1	5.10	4.42	0.68
S-331	BELMONT	2685176	224033	unconfined	-3.32	1	6.11	4.21	1.90
S-332	BELMONT	2685110	224237	unconfined	-4.75	1	4.81	4.49	0.32
S-333	AOI 2	2682920	222372	unconfined	-5	1	1.01	1.83	-0.82
S-335	AOI 2	2683113	222843	unconfined	-5	1	0.65	2.22	-1.57
S-336	AOI 2	2683167	222813	unconfined	-5	1	2.37	2.55	-0.18
S-337	AOI 2	2683260	223172	unconfined	-5	1	0.51	2.47	-1.96
S-338	AOI 2	2683320	223145	unconfined	-5	1	2.91	2.67	0.24
S-346	AOI 2	2684760	222200	unconfined	-15.25	1	2.41	1.16	1.25
S-347	AOI 2	2684712	222199	unconfined	-15.24	1	2.11	1.17	0.94
S-348	AOI 2	2683866	222330	unconfined	-9.89	1	7.09	2.10	4.99
S-349	AOI 2	2683819	222324	unconfined	-10.73	1	3.96	2.18	1.78
S-350	AOI 2	2684656	224223	unconfined	0	1	5.13	4.71	0.42
S-351	AOI 2	2684319	224112	unconfined	0	1	5.20	4.86	0.34
S-354	AOI 2	2683499	223705	unconfined	0	1	3.78	4.02	-0.24
S-355	AOI 2	2683594	223590	unconfined	5	1	3.72	4.02	-0.30
S-357	AOI 2	2683533	223382	unconfined	-7.6	1	5.24	6.52	-1.28
S-359	AOI 2	2683809	222117	unconfined	-2	1	4.04	2.21	1.83
S-36	AOI 4	2684276	220366	unconfined	0.41	1	1.82	2.15	-0.33
S-360	AOI 2	2684419	221893	unconfined	0	1	5.82	1.86	3.96
S-361	AOI 2	2684109	221779	unconfined	2	1	3.69	2.13	1.56

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
S-366	AOI 4	2684586	221392	unconfined	-9.49	1	2.00	1.92	0.08
S-367	AOI 4	2684688	221274	unconfined	-14.49	1	1.96	1.88	0.08
S-368	AOI 4	2684901	221485	unconfined	-12.55	1	2.46	1.72	0.74
S-379	AOI 4	2685666	220887	unconfined	-6.76	1	1.63	1.69	-0.06
S-380	AOI 4	2685674	220596	unconfined	-8.21	1	2.17	1.92	0.25
S-382	AOI 3	2682250	220408	unconfined	-9.9	1	4.17	1.91	2.26
S-384	AOI 3	2683220	220831	unconfined	-9.3	1	1.24	1.98	-0.74
S-395	BELMONT	2685991	224465	unconfined	-7.5	1	5.49	4.19	1.30
S-396	AOI 1	2685872	223191	unconfined	-16.8	1	1.99	2.02	-0.03
S-40	AOI 4	2685637	220734	unconfined	-6.33	1	1.57	1.83	-0.26
S-402	AOI 1	2685116	223884	unconfined	-4	1	5.02	4.09	0.93
S-403	AOI 1	2684978	222921	unconfined	-10.9	1	3.58	2.86	0.72
S-405	AOI 1	2685608	223177	unconfined	-8.7	1	4.23	2.55	1.68
S-406	AOI 2	2683062	222569	unconfined	-5	1	2.87	2.42	0.45
S-407	AOI 3	2683572	220866	unconfined	4.38	1	1.53	2.07	-0.54
S-41	AOI 1	2685772	221298	unconfined	-9.51	1	0.94	0.75	0.19
S-411	AOI 3	2682483	220825	unconfined	-7.38	1	1.41	1.88	-0.47
S-413	AOI 3	2683062	220607	unconfined	-14.65	1	1.29	1.89	-0.60
S-414	AOI 3	2682403	220564	unconfined	-9.99	1	0.97	1.87	-0.90
S-415	AOI 4	2684132	220822	unconfined	-13.53	1	1.78	2.08	-0.30
S-417	AOI 1	2684867	223781	unconfined	-4.3	1	6.00	4.12	1.88
S-418	AOI 1	2685854	222337	unconfined	-16	1	0.48	0.57	-0.09
S-419	AOI 1	2685595	222387	unconfined	-16.6	1	1.68	1.22	0.46
S-420	AOI 2	2682996	222512	unconfined	-5	1	2.70	2.31	0.39
S-422	AOI 2	2682861	221880	unconfined	-10.84	1	3.15	2.20	0.95
S-423	AOI 2	2683543	223536	unconfined	-5.6	1	4.86	3.85	1.01
S-425	AOI 2	2683425	223467	unconfined	-0.6	1	3.43	3.38	0.05
S-426	AOI 2	2683399	223390	unconfined	0.3	1	5.50	3.02	2.48
S-427	AOI 2	2683387	223311	unconfined	-1	1	5.61	2.86	2.75
S-428	AOI 3	2682724	220250	unconfined	-11.4	1	1.01	1.81	-0.80
S-43	AOI 1	2685816	221634	unconfined	-10.54	1	0.11	-2.53	2.64
S-430	AOI 3	2682288	220761	unconfined	-7.1	1	1.14	2.73	-1.59
S-431	AOI 3	2682232	220624	unconfined	-4	1	1.08	4.64	-3.56
S-432	AOI 3	2682256	220519	unconfined	-5.3	1	0.80	3.01	-2.21
S-44	AOI 1	2685822	221765	unconfined	-16.79	1	-1.19	-2.80	1.61
S-46	AOI 1	2685283	222077	unconfined	-16.73	1	1.70	1.27	0.43
S-50	AOI 1	2685881	222241	unconfined	-4.77	1	1.65	0.13	1.52

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
S-51	AOI 1	2685939	222520	unconfined	-11.82	1	0.86	0.86	0.00
S-53	AOI 2	2684179	222279	unconfined	-7.96	1	3.64	1.81	1.83
S-57	AOI 4	2683745	220383	unconfined	-3.87	1	1.69	2.11	-0.42
S-60	AOI 3	2683756	221051	unconfined	-4.744	1	1.47	2.13	-0.66
S-61	AOI 2	2683869	221701	unconfined	-6.698	1	2.67	2.25	0.42
S-62	AOI 2	2683630	222319	unconfined	-9.11	1	3.15	2.34	0.81
S-63	AOI 2	2683223	222269	unconfined	-4.05	1	2.65	2.37	0.28
S-65	AOI 2	2682948	222452	unconfined	-13.87	1	1.24	1.79	-0.55
S-71	AOI 2	2683535	223178	unconfined	-8	1	3.77	2.88	0.89
S-72	AOI 2	2683825	223836	unconfined	0.057	1	7.81	4.53	3.28
S-74	BELMONT	2686172	224333	unconfined	-6.9	1	4.94	3.92	1.02
S-75	BELMONT	2686144	224096	unconfined	0.23	1	4.99	3.05	1.94
S-76	BELMONT	2685601	224035	unconfined	5.61	1	4.89	3.75	1.14
S-77P	AOI 1	2685250	223931	unconfined	-4.1	1	5.01	4.03	0.98
S-77SRTF	AOI 9	2678019	217724	unconfined	-11.55	1	-7.62	-2.18	-5.44
S-78	AOI 1	2684757	223423	unconfined	-1.57	1	5.28	3.71	1.57
S-78SRTF	AOI 9	2677724	216834	unconfined	-13.36	1	-8.21	-4.14	-4.07
S-79SRTF	AOI 9	2677551	215992	unconfined	-12.81	1	-6.09	-6.22	0.13
S-80	AOI 1	2685607	223707	unconfined	-0.06	1	5.06	3.31	1.75
S-81SRTF	AOI 9	2677042	216806	unconfined	-13.84	1	-8.01	-4.23	-3.78
S-82SRTF	AOI 9	2677316	217918	unconfined	-13.07	1	-0.68	-1.91	1.23
S-83	AOI 1	2686061	223399	unconfined	-6.37	1	3.47	1.83	1.64
S-83SRTF	AOI 9	2677510	218241	unconfined	-11.73	1	-1.93	-1.33	-0.60
S-85	AOI 1	2686023	223173	unconfined	-7.06	1	2.17	1.53	0.64
S-86	AOI 1	2685945	223065	unconfined	-12.5	1	1.45	1.61	-0.16
S-88	AOI 1	2686005	223039	unconfined	-9.36	1	-0.73	1.39	-2.12
S-89	AOI 1	2685989	222922	unconfined	-11.09	1	0.05	1.22	-1.17
S-91	AOI 2	2684188	222271	unconfined	-8.7	1	4.56	1.79	2.77
S-93	AOI 2	2683259	222338	unconfined	-10.57	1	2.67	2.38	0.29
S-95	AOI 1	2685351	221422	unconfined	-8.39	1	1.63	1.17	0.46
S-96	AOI 4	2684857	220719	unconfined	-5	1	1.84	1.94	-0.10
S-98	AOI 1	2686257	223982	unconfined	-7.81	1	6.45	3.06	3.39
S-99	AOI 1	2686084	222766	unconfined	-12.2	1	2.77	1.43	1.34
SSEPTA-PH-8	DSCP	2689175	221890	unconfined	0	1	1.59	2.01	-0.42
Steen-MW-61	DSCP	2686008	222107	unconfined	-14.26	1	0.62	0.00	0.62
Steen-MW-62	DSCP	2686037	222328	unconfined	-15.41	1	1.75	0.79	0.96
Steen-MW-63	DSCP	2686181	222084	unconfined	-5	1	6.85	0.97	5.88

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
Steen-MW-64	DSCP	2685953	221694	unconfined	-13.21	1	0.50	-1.39	1.89
Steen-PH-11	DSCP	2685990	221987	unconfined	-13.37	1	0.58	-0.62	1.20
Steen-PH-12	DSCP	2686138	222248	unconfined	-13.52	1	1.85	1.11	0.74
SW-1	AOI 5	2681673	215437	unconfined	7.19	1	1.99	1.57	0.42
SW-2	AOI 5	2681633	215458	unconfined	-9.06	1	2.65	1.70	0.95
SW-3	AOI 5	2681565	215492	unconfined	-8.03	1	1.60	1.42	0.18
SW-4	AOI 5	2681486	215534	unconfined	7.22	1	2.05	1.39	0.66
SW-5	AOI 5	2681322	215655	unconfined	7.84	1	5.16	2.35	2.81
SWR-1	AOI 5	2681283	215697	unconfined	-5	1	1.29	2.67	-1.38
SWR-2	AOI 5	2681737	215397	unconfined	-4.94	1	2.60	1.76	0.84
SWR-3	AOI 5	2681811	215359	unconfined	-1.39	1	3.09	1.80	1.29
TW-11	BELMONT	2686135	224364	unconfined	0	1	5.00	3.98	1.02
TW-3	BELMONT	2685838	224405	unconfined	0	1	5.30	3.96	1.34
TW-5	BELMONT	2685994	224416	unconfined	0	1	5.59	4.06	1.53
TW-9	BELMONT	2686092	224400	unconfined	0	1	5.14	4.05	1.09
U-2	AOI 6	2681798	216694	unconfined	-5	1	2.14	3.53	-1.39
U-3	AOI 6	2681941	216811	unconfined	-5	1	4.98	4.44	0.54
U-4	AOI 6	2682043	216875	unconfined	-5	1	3.40	5.29	-1.89
U-5	AOI 6	2681801	216801	unconfined	-5	1	0.59	3.60	-3.01
URS-1	AOI 6	2680859	216101	unconfined	-5	1	3.12	1.37	1.75
URS-3	AOI 6	2681039	216761	unconfined	-7	1	3.67	4.10	-0.43
URS-4	AOI 6	2680671	216277	unconfined	-5	1	3.70	1.41	2.29
URS-5	AOI 6	2680401	216794	unconfined	-6.06	1	3.09	1.83	1.26
V-MW-1	AOI 8	2683500	227736	unconfined	2.74	1	11.56	9.27	2.29
V-MW-10	AOI 8	2683407	228034	unconfined	2.34	1	10.01	6.60	3.41
V-MW-11	AOI 8	2683447	228107	unconfined	2.92	1	10.20	6.60	3.60
V-MW-12	AOI 8	2683544	227991	unconfined	2.38	1	10.44	6.77	3.67
V-MW-16	AOI 8	2683530	228193	unconfined	5.61	1	10.37	6.65	3.72
V-MW-2	AOI 8	2683289	227840	unconfined	3.98	1	9.68	7.86	1.82
V-MW-3	AOI 8	2683267	227930	unconfined	2.89	1	9.73	6.85	2.88
V-MW-4	AOI 8	2683376	228206	unconfined	0.2	1	10.36	6.57	3.79
V-MW-5	AOI 8	2683343	227807	unconfined	2	1	9.72	8.25	1.47
V-MW-6	AOI 8	2683352	227888	unconfined	1.76	1	9.82	7.24	2.58
V-MW-7	AOI 8	2683239	227863	unconfined	1.02	1	9.70	7.57	2.13
V-MW-8	AOI 8	2683326	227957	unconfined	0.92	1	9.84	6.70	3.14
W-1	AOI 10	2682762	223594	unconfined	-9.31	1	3.35	3.80	-0.45
W-10	AOI 10	2681973	222348	unconfined	-5.4	1	4.27	6.32	-2.05

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
W-11	AOI 10	2682276	222286	unconfined	-4.2	1	4.13	4.53	-0.40
W-12	AOI 10	2682078	221939	unconfined	-4.92	1	4.00	3.87	0.13
W-14	AOI 10	2681747	222310	unconfined	-4.56	1	4.49	6.72	-2.23
W-15	AOI 10	2681624	222775	unconfined	-2.7	1	6.85	6.45	0.40
W-16	AOI 10	2681794	221795	unconfined	-4.5	1	4.39	3.77	0.62
W-17	AOI 10	2681731	221777	unconfined	-4.93	1	3.97	4.68	-0.71
W-2	AOI 10	2681822	223350	unconfined	-4.23	1	4.55	6.38	-1.83
W-20	AOI 10	2680987	222415	unconfined	-1.16	1	7.49	7.07	0.42
W-22	AOI 10	2680429	222466	unconfined	-2	1	5.22	5.80	-0.58
W-28	AOI 10	2682420	222857	unconfined	-8.21	1	4.89	5.22	-0.33
W-29	AOI 10	2682149	223225	unconfined	-4.91	1	4.75	6.39	-1.64
W-30	AOI 10	2681983	222661	unconfined	-6.42	1	5.16	6.33	-1.17
W-33	AOI 10	2680145	222385	unconfined	-2.64	1	5.26	5.26	0.00
W-34	AOI 10	2680919	222425	unconfined	-3.22	1	6.66	6.98	-0.32
W-5	AOI 10	2681651	223047	unconfined	-7	1	4.67	6.05	-1.38
W-9	AOI 10	2681893	222543	lower aquifer	-3.04	1	-0.36	6.53	-6.89
WP-14	AOI 5	2682199	215243	unconfined	0.12	1	2.56	2.85	-0.29
WP16-3	AOI 5	2682402	216899	unconfined	-2.93	1	3.09	5.54	-2.45
WP-8	AOI 5	2682441	215137	unconfined	-11.02	1	1.86	2.41	-0.55
WP9-4	AOI 6	2681422	216537	unconfined	-4.2	1	3.88	4.63	-0.75
WP9-8	AOI 5	2681391	216377	unconfined	0	1	3.65	4.49	-0.84
WP-A	AOI 5	2681387	215594	unconfined	-3.4	1	4.85	2.45	2.40
WP-B	AOI 5	2681311	215667	unconfined	-1.92	1	4.96	2.46	2.50
WP-D	AOI 5	2681484	215914	unconfined	-3.74	1	2.62	4.57	-1.95
WP-E	AOI 5	2681622	215986	unconfined	-2.65	1	2.66	3.00	-0.34
A-15	AOI 5	2682689	216314	unconfined	-10.21	2	4.75	3.51	1.24
A-186	AOI 5	2682888	217107	unconfined	-12.4	2	3.01	3.76	-0.75
B-129	AOI 6	2683018	217874	unconfined	-8.67	2	2.68	4.20	-1.52
B-94	AOI 6	2683137	217610	unconfined	-6.79	2	3.61	4.23	-0.62
BF-100	AOI 3	2683128	219458	unconfined	-10.04	2	1.21	2.08	-0.87
C-150	AOI 7	2680607	220263	unconfined	-10	2	-2.19	-7.29	5.10
C-154	AOI 7	2680516	220189	unconfined	-13.49	2	-2.19	-15.92	13.73
C-49	AOI 7	2683022	218495	unconfined	-9.66	2	5.00	4.08	0.92
N-102	AOI 8	2683870	227035	unconfined	1.59	2	12.58	8.04	4.54
N-103	AOI 8	2683660	226782	unconfined	0.56	2	11.70	8.48	3.22
N-104	AOI 8	2683420	226914	unconfined	0.96	2	11.74	9.71	2.03
N-105	AOI 8	2683443	226745	unconfined	1.26	2	11.54	9.10	2.44

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
N-111	AOI 8	2680519	226514	unconfined	-6.4	2	4.72	2.07	2.65
N-113	AOI 8	2681733	226054	unconfined	-2.68	2	7.04	5.69	1.35
N-115	AOI 8	2682246	225824	unconfined	-4.57	2	8.20	6.53	1.67
N-122	AOI 8	2683577	226074	unconfined	-3.07	2	8.51	6.96	1.55
N-138	AOI 8	2683256	227757	unconfined	0.29	2	9.68	6.31	3.37
N-139	AOI 8	2683309	227732	unconfined	0	2	9.72	6.48	3.24
N-146	AOI 8	2682830	227726	unconfined	0	2	10.34	6.10	4.24
N-150	AOI 8	2681575	224612	unconfined	-6.79	2	4.29	1.99	2.30
N-153	AOI 8	2683011	227569	unconfined	-1.96	2	9.77	6.76	3.01
N-2	AOI 8	2682759	228025	unconfined	1.2	2	10.72	6.27	4.45
N-34	AOI 8	2682271	226259	unconfined	-3.3	2	8.68	6.59	2.09
N-38	AOI 8	2680805	226899	unconfined	-8.23	2	3.59	3.95	-0.36
N-58	AOI 8	2680455	225832	unconfined	-9.79	2	5.70	4.65	1.05
N-74	AOI 8	2680701	224898	unconfined	-6.7	2	2.79	1.99	0.80
N-84	AOI 8	2684677	226457	unconfined	0.32	2	11.72	6.91	4.81
N-99	AOI 8	2682855	228875	unconfined	-1.74	2	11.11	6.41	4.70
PGW-MW-10A	PGW	2684066	225150	unconfined	-5	2	10.39	5.76	4.63
PGW-MW-30	PGW	2684088	225511	unconfined	-5	2	14.58	6.06	8.52
PGW-MW-31	PGW	2683688	225332	unconfined	-5	2	12.15	6.01	6.14
PGW-MW-40A	PGW	2684160	225162	unconfined	-5	2	12.93	5.76	7.17
PH-RW-D	DSCP	2687308	221945	unconfined	-41.5	2	2.50	2.17	0.33
RW-128	AOI 2	2682988	222438	unconfined	-20.2	2	0.37	2.30	-1.93
RW-2	AOI 3	2683712	220837	unconfined	-19.83	2	0.84	2.09	-1.25
RW-203	AOI 8	2683032	225154	unconfined	-5.93	2	9.01	6.06	2.95
RW-306	AOI 8	2683768	226581	unconfined	-2.78	2	11.08	8.09	2.99
RW-403	AOI 1	2686035	223262	unconfined	-26.39	2	3.73	1.83	1.90
RW-405	AOI 1	2685990	222933	unconfined	-11.5	2	-0.07	1.42	-1.49
RW-705	AOI 4	2685080	218913	unconfined	-16.09	2	0.95	2.57	-1.62
RW-706	AOI 4	2685032	218861	unconfined	-17.69	2	1.73	2.56	-0.83
RW-707	AOI 4	2685021	218852	unconfined	-14.67	2	1.75	2.56	-0.81
RW-708	AOI 4	2685001	218831	unconfined	-16.23	2	1.77	2.57	-0.80
RW-709	AOI 4	2684982	218812	unconfined	-16.48	2	1.85	2.57	-0.72
RW-710	AOI 4	2684962	218790	unconfined	-15.29	2	1.57	2.59	-1.02
RW-711	AOI 4	2684955	218782	unconfined	-19.29	2	2.42	2.59	-0.17
RW-712	AOI 4	2684936	218762	unconfined	-17.32	2	1.73	2.61	-0.88
RW-713	AOI 4	2684924	218748	unconfined	-15.41	2	1.84	2.62	-0.78
RW-714	AOI 4	2684903	218728	unconfined	-15.53	2	1.88	2.64	-0.76

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
RW-715	AOI 4	2684883	218706	unconfined	-18.14	2	1.88	2.65	-0.77
RW-716	AOI 4	2684864	218684	unconfined	-18.1	2	1.93	2.66	-0.73
RW-717	AOI 4	2684844	218663	unconfined	-18.14	2	2.30	2.67	-0.37
S-1	AOI 3	2683072	218593	unconfined	-5.16	2	3.12	3.49	-0.37
S-120	AOI 4	2685597	220403	unconfined	-13.53	2	2.24	2.07	0.17
S-120DSRTF	AOI 9	2677542	215267	unconfined	-25.65	2	-8.73	-8.33	-0.40
S-122	AOI 4	2685443	219647	unconfined	-12.08	2	2.47	2.51	-0.04
S-123	AOI 4	2684990	219320	unconfined	-10.77	2	2.07	2.54	-0.47
S-124	AOI 4	2685004	218885	unconfined	-9.54	2	1.81	2.52	-0.71
S-137SRTF	AOI 9	2679009	215455	unconfined	-37.15	2	-9.96	-10.06	0.10
S-139SRTF	AOI 9	2678435	217571	unconfined	-31.35	2	-7.70	-2.38	-5.32
S-141SRTF	AOI 9	2678317	215107	unconfined	-32.26	2	-9.69	-10.06	0.37
S-142SRTF	AOI 9	2677286	214390	unconfined	-40.3	2	-9.86	-10.82	0.96
S-145SRTF	AOI 9	2677312	216695	unconfined	-33.42	2	-8.08	-4.59	-3.49
S-146SRTF	AOI 9	2676574	215869	unconfined	-26.5	2	-8.57	-6.52	-2.05
S-148SRTF	AOI 9	2676587	216239	unconfined	-21.7	2	-8.36	-5.65	-2.71
S-149SRTF	AOI 9	2676790	216796	unconfined	-21.2	2	-8.08	-4.28	-3.80
S-16	AOI 3	2683817	218965	unconfined	-14.17	2	2.16	2.31	-0.15
S-17	AOI 3	2683786	219271	unconfined	-8.15	2	2.15	2.40	-0.25
S-2	AOI 3	2683361	218077	unconfined	-5.22	2	4.18	2.90	1.28
S-20	AOI 3	2684072	218851	unconfined	-17.2	2	2.10	2.55	-0.45
S-218	AOI 4	2684501	220122	unconfined	-7.54	2	2.56	2.25	0.31
S-219	AOI 4	2684850	219892	unconfined	-7.12	2	2.24	2.35	-0.11
S-220	AOI 4	2684262	219152	unconfined	-11.5	2	2.06	2.52	-0.46
S-222	AOI 4	2684862	218677	unconfined	-11.11	2	3.14	2.67	0.47
S-223	AOI 4	2685064	218859	unconfined	-13.52	2	0.95	2.59	-1.64
S-224	AOI 4	2685158	218991	unconfined	-15.47	2	-0.31	2.61	-2.92
S-23	AOI 3	2684062	218579	unconfined	-7.55	2	2.08	2.68	-0.60
S-233	AOI 4	2684874	218923	unconfined	-8.37	2	4.61	2.26	2.35
S-234	AOI 4	2684899	218762	unconfined	-8.96	2	1.58	2.61	-1.03
S-235	AOI 4	2684962	218844	unconfined	-9.79	2	1.79	2.53	-0.74
S-238	AOI 4	2685034	218917	unconfined	-10.13	2	1.46	2.52	-1.06
S-239	AOI 4	2684997	218789	unconfined	-8.81	2	1.87	2.60	-0.73
S-240	AOI 4	2684848	218980	unconfined	-9.03	2	2.10	2.44	-0.34
S-241	AOI 4	2684819	219045	unconfined	-6.91	2	1.79	2.50	-0.71
S-242	AOI 4	2684857	218813	unconfined	-5	2	1.83	2.56	-0.73
S-243	AOI 4	2684934	218722	unconfined	-5	2	2.31	2.64	-0.33

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
S-245	AOI 4	2684999	219051	unconfined	-5	2	2.00	2.49	-0.49
S-26	AOI 4	2684616	218758	unconfined	-3.24	2	1.92	2.65	-0.73
S-278	AOI 4	2684810	218753	unconfined	-11.3	2	1.87	2.63	-0.76
S-279	AOI 4	2684702	219165	unconfined	-5.64	2	2.35	2.54	-0.19
S-285	AOI 3	2683687	219690	unconfined	-7.3	2	2.84	2.39	0.45
S-29	AOI 4	2684380	219695	unconfined	-18.17	2	0.65	2.37	-1.72
S-290	AOI 3	2683623	219191	unconfined	-10.73	2	2.87	2.37	0.50
S-3	AOI 3	2683570	217784	unconfined	-7.33	2	3.23	3.60	-0.37
S-329	AOI 4	2684779	218690	unconfined	-16.8	2	1.15	2.66	-1.51
S-370	AOI 4	2683833	219839	unconfined	-15.44	2	1.67	2.32	-0.65
S-371	AOI 4	2684295	219750	unconfined	-10.5	2	2.80	2.35	0.45
S-372	AOI 3	2683824	219317	unconfined	-12.67	2	2.13	2.40	-0.27
S-373	AOI 4	2684927	219073	unconfined	-6.61	2	1.48	2.48	-1.00
S-374	AOI 4	2685398	219014	unconfined	-21.8	2	1.95	2.68	-0.73
S-375	AOI 4	2685210	218828	unconfined	-21.5	2	1.87	2.68	-0.81
S-376	AOI 4	2685069	218734	unconfined	-21.5	2	2.25	2.67	-0.42
S-377	AOI 4	2685255	218559	unconfined	-22.5	2	1.82	2.75	-0.93
S-378	AOI 4	2685381	218658	unconfined	-22.9	2	1.88	2.75	-0.87
S-38	AOI 4	2685232	219184	unconfined	-4.05	2	1.98	2.62	-0.64
S-381	AOI 4	2684590	219563	unconfined	-8.81	2	2.10	2.42	-0.32
S-385	AOI 3	2683689	220624	unconfined	-16.8	2	1.60	2.08	-0.48
S-386	AOI 3	2683705	219789	unconfined	-12.5	2	1.68	2.37	-0.69
S-387	AOI 3	2683567	219225	unconfined	-11	2	2.86	2.37	0.49
S-39	AOI 4	2685582	220133	unconfined	-15.15	2	2.28	2.25	0.03
S-408	AOI 4	2684259	218600	unconfined	-16.65	2	2.14	2.71	-0.57
S-408	AOI 4	2684259	218600	unconfined	-16.65	2	2.10	2.71	-0.61
S-412	AOI 3	2682923	220115	unconfined	-19.37	2	1.11	1.82	-0.71
S-5	AOI 3	2683838	218242	unconfined	-2.64	2	2.09	3.24	-1.15
S-74D2SRTF	AOI 9	2679122	216095	unconfined	-31.33	2	-2.48	-5.64	3.16
S-82	AOI 1	2686056	223599	unconfined	-16.4	2	4.92	2.30	2.62
V-MW-9	AOI 8	2683312	228061	unconfined	0.44	2	9.96	6.39	3.57
C-145	AOI 7	2681007	220222	unconfined	-17.64	3	1.56	1.94	-0.38
C-146	AOI 7	2680640	220255	unconfined	-17.8	3	-2.05	-2.19	0.14
C-95	AOI 3	2682674	219113	unconfined	-20.07	3	6.31	2.76	3.55
DSCP-IW-12	DSCP	2687131	222110	unconfined	-30.28	3	1.95	2.21	-0.26
N-109	AOI 8	2681605	226649	lower aquifer	-4.46	3	7.21	5.53	1.68
N-112	AOI 8	2681664	226328	lower aquifer	-6.15	3	5.69	5.38	0.31

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
N-116	AOI 8	2682617	225844	unconfined	-3.51	3	7.19	6.76	0.43
N-130	AOI 8	2682501	225088	unconfined	-17.93	3	11.71	6.21	5.50
N-152	AOI 8	2684912	226052	unconfined	-4.41	3	11.76	6.51	5.25
N-61	AOI 8	2680588	225119	unconfined	-10.21	3	5.44	3.66	1.78
PH-IW-2	DSCP	2686781	220911	unconfined	-32.65	3	2.23	2.06	0.17
PH-IW-3	DSCP	2687505	220886	unconfined	-44.55	3	0.93	2.39	-1.46
RW-200	AOI 8	2682439	224925	unconfined	-8.37	3	6.57	5.89	0.68
RW-301	AOI 8	2682907	226707	unconfined	-7.05	3	10.90	9.82	1.08
RW-302	AOI 8	2683040	226687	unconfined	-7.08	3	11.39	9.74	1.65
RW-304	AOI 8	2683322	226635	unconfined	-6.05	3	11.03	9.03	2.00
RW-305	AOI 8	2683458	226615	unconfined	-6.11	3	10.97	8.74	2.23
S-10	AOI 3	2683682	218444	unconfined	-19.17	3	2.05	2.01	0.04
S-12	AOI 3	2683521	218879	unconfined	-17.73	3	2.03	2.05	-0.02
S-153	AOI 2	2683289	223237	unconfined	-16.05	3	0.11	2.51	-2.40
S-52	AOI 1	2685894	222553	unconfined	-20.8	3	1.37	1.18	0.19
W-23	AOI 10	2680081	222589	unconfined	-14.79	3	5.08	3.75	1.33
W-25	AOI 10	2679601	222643	unconfined	-6.97	3	4.43	2.60	1.83
A-19D	AOI 5	2683563	217563	lower aquifer	-49.36	4	-1.95	2.02	-3.97
B-48D	AOI 6	2682251	217522	lower aquifer	-46.23	4	-1.67	1.04	-2.71
BF-90D	AOI 3	2683040	218957	lower aquifer	-30.15	4	0.36	1.87	-1.51
DSCP-DW-6	DSCP	2687606	223122	lower aquifer	-48.33	4	2.11	3.42	-1.31
DSCP-IW-1	DSCP	2686539	222709	unconfined	-25.15	4	2.28	2.70	-0.42
DSCP-IW-13	DSCP	2688517	222412	unconfined	-55.49	4	4.98	2.93	2.05
N-114	AOI 8	2681511	226225	lower aquifer	-12.53	4	6.96	5.38	1.58
N-127	AOI 8	2682769	225193	unconfined	-21.25	4	9.82	5.29	4.53
N-70	AOI 8	2681745	227136	lower aquifer	-9.71	4	8.43	5.55	2.88
N-77	AOI 8	2682468	226734	unconfined	-13.51	4	11.41	6.56	4.85
N-83	AOI 8	2681761	226828	lower aquifer	-7.73	4	6.79	5.58	1.21
PGW-MW-21	AOI 8	2682698	224771	unconfined	-15	4	8.68	4.54	4.14
PH-IW-10	DSCP	2686456	221925	unconfined	-34.94	4	1.80	2.03	-0.23
PH-IW-11	DSCP	2686416	221650	unconfined	-35.43	4	1.73	1.82	-0.09
RW-300	AOI 8	2681810	226710	lower aquifer	-10.17	4	7.56	5.56	2.00
S-110DSRTF	AOI 9	2676987	217259	lower aquifer	-59.73	4	-7.97	-3.26	-4.71
S-115DSRTF	AOI 9	2676755	216206	lower aquifer	-58.3	4	-8.15	-5.77	-2.38
S-119D	AOI 4	2685498	220820	lower aquifer	-48.64	4	1.41	2.00	-0.59
S-144SRTF	AOI 9	2677843	217365	unconfined	-59.2	4	-7.83	-3.03	-4.80
S-397	AOI 1	2685305	222831	unconfined	-32.4	4	1.60	2.90	-1.30

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
S-399	AOI 1	2685166	221521	lower aquifer	-27.2	4	1.51	1.99	-0.48
S-87I	AOI 1	2685940	223065	lower aquifer	-30.11	4	1.92	1.91	0.01
Steen-IW-07	DSCP	2686043	222338	unconfined	-34.73	4	1.75	1.88	-0.13
B-133D	AOI 6	2681722	216723	lower aquifer	-58.9	5	-1.65	-0.47	-1.18
N-148D	AOI 8	2684030	225601	lower aquifer	-35.44	5	3.94	4.74	-0.80
N-19	AOI 8	2684651	226737	lower aquifer	-29.54	5	4.48	5.77	-1.29
N-21	AOI 8	2683879	226628	lower aquifer	-26.46	5	6.76	5.63	1.13
N-30	AOI 8	2685037	225825	lower aquifer	-22.3	5	4.54	5.26	-0.72
N-69	AOI 8	2681822	227392	lower aquifer	-11.14	5	9.27	5.50	3.77
N-9	AOI 8	2684097	227375	lower aquifer	-27.3	5	-2.65	6.13	-8.78
S-106DSRTF	AOI 9	2677610	214778	lower aquifer	-81.63	5	-9.25	-9.79	0.54
S-143SRTF	AOI 9	2677280	214390	lower aquifer	-65.41	5	-9.09	-10.68	1.59
S-22	AOI 3	2684081	218842	lower aquifer	-62.59	5	-0.29	1.68	-1.97
S-280D	AOI 3	2682596	220955	lower aquifer	-37.58	5	0.48	1.55	-1.07
S-38D2	AOI 4	2685229	219163	lower aquifer	-64.16	5	-0.26	2.09	-2.35
S-59D	AOI 4	2683843	221368	lower aquifer	-40.74	5	1.47	2.04	-0.57
Steen-IW-09	DSCP	2686190	222018	unconfined	-48.52	5	1.76	2.53	-0.77
ARCO-1D	AOI 1	2685966	221359	lower aquifer	-49.86	6	1.26	2.46	-1.20
DSCP-DW-1	DSCP	2686539	222715	lower aquifer	-58.05	6	1.99	3.10	-1.11
DSCP-DW-13	DSCP	2688518	222417	lower aquifer	-84.81	6	1.97	3.17	-1.20
FDR-DW-15	DSCP	2687939	219362	lower aquifer	-106.42	6	-0.10	2.31	-2.41
N-73	AOI 8	2680415	225822	lower aquifer	-35.81	6	1.54	1.66	-0.12
N-75	AOI 8	2680694	224909	lower aquifer	-37.35	6	1.58	1.91	-0.33
NOVA-DW-14	DSCP	2688592	219985	lower aquifer	-104.82	6	0.23	2.53	-2.30
PGW-MW-1D	PGW	2683465	224134	lower aquifer	-41.43	6	2.52	3.17	-0.65
PGW-MW-42D	PGW	2684364	225540	lower aquifer	-35.31	6	3.13	4.73	-1.60
PH-DW-2	DSCP	2686776	220911	lower aquifer	-82.46	6	1.09	2.42	-1.33
PH-DW-3	DSCP	2687507	220890	lower aquifer	-102.74	6	2.14	2.56	-0.42
S-118DSRTF	AOI 9	2676690	215160	lower aquifer	-78.84	6	-8.59	-8.29	-0.30
S-150SRTF	AOI 9	2675847	214743	lower aquifer	-66.3	6	-9.28	-8.70	-0.58
S-8	AOI 3	2683688	218428	lower aquifer	-63.02	6	-0.55	1.46	-2.01
S-80D	AOI 1	2685512	223710	lower aquifer	-47.26	6	2.80	3.59	-0.79
Steen-IW-08	DSCP	2686010	222070	unconfined	-48.46	6	1.72	2.61	-0.89
W-27	AOI 10	2679107	222626	lower aquifer	-10.83	6	1.18	2.63	-1.45
W-32D	AOI 10	2681222	222055	lower aquifer	-84.5	6	-0.05	2.64	-2.69
A-21D	AOI 5	2681388	215630	lower aquifer	-77.06	7	-4.37	-1.62	-2.75
B-132D	AOI 6	2680857	216098	lower aquifer	-74.69	7	-5.76	-1.97	-3.79

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							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
B-134D	AOI 6	2681037	216764	lower aquifer	-73.55	7	-3.54	-1.12	-2.42
BF-108	AOI 3	2683185	219701	lower aquifer	-71.04	7	0.37	1.59	-1.22
C-129D	AOI 7	2681929	220492	lower aquifer	-59.15	7	-0.22	1.25	-1.47
C-134D	AOI 6	2681165	218306	lower aquifer	-63.15	7	-1.60	0.22	-1.82
C-134D	AOI 6	2681165	218306	lower aquifer	-63.15	7	-1.60	0.22	-1.82
C-144D	AOI 7	2680337	220108	lower aquifer	-71.86	7	-3.76	0.91	-4.67
DSCP-DW-12	DSCP	2687135	222110	lower aquifer	-87.4	7	2.01	2.97	-0.96
DSCP-MW-20D	DSCP	2686776	224063	lower aquifer	-66.19	7	2.33	4.06	-1.73
N-147D	AOI 8	2682707	225675	lower aquifer	-50.78	7	3.62	4.85	-1.23
N-149D	AOI 8	2681583	224606	lower aquifer	-69.02	7	-1.06	2.30	-3.36
N-33	AOI 8	2682934	226174	lower aquifer	-63	7	4.54	5.27	-0.73
N-38D	AOI 8	2680792	226897	lower aquifer	-76.23	7	0.82	2.42	-1.60
N-4	AOI 8	2683123	227945	lower aquifer	-20.59	7	9.76	6.25	3.51
PGW-MW-2D	PGW	2683918	224286	lower aquifer	-47.84	7	2.74	3.55	-0.81
PGW-MW-3D	PGW	2684691	224483	lower aquifer	-50.27	7	2.85	3.91	-1.06
PGW-MW-8D	AOI 2	2684089	223962	lower aquifer	-43.89	7	2.31	3.34	-1.03
PGW-MW-9D	AOI 2	2683834	223851	lower aquifer	-43.57	7	2.40	3.13	-0.73
PH-DW-10	DSCP	2686452	221935	lower aquifer	-84.1	7	1.80	2.74	-0.94
PH-DW-11	DSCP	2686415	221643	lower aquifer	-87.96	7	1.76	2.66	-0.90
S-13	AOI 3	2683522	218892	lower aquifer	-68.46	7	-0.56	1.51	-2.07
S-138SRTF	AOI 9	2679003	215451	lower aquifer	-82.23	7	-8.52	-7.48	-1.04
S-218D	AOI 4	2684512	220118	lower aquifer	-74.15	7	2.29	2.01	0.28
S-264D	AOI 1	2685762	221289	lower aquifer	-55.81	7	1.50	2.40	-0.90
S-284D	AOI 3	2683136	220356	lower aquifer	-68.29	7	0.95	1.67	-0.72
S-294D	AOI 2	2684682	224165	lower aquifer	-63.93	7	2.92	3.68	-0.76
S-302D	AOI 2	2683248	222607	lower aquifer	-69.95	7	1.50	2.13	-0.63
S-302D	AOI 2	2683248	222607	lower aquifer	-69.95	7	0.60	2.13	-1.53
S-305D	AOI 2	2684882	221990	lower aquifer	-64.1	7	1.25	2.38	-1.13
S-388D	AOI 1	2685903	222561	lower aquifer	-58.1	7	1.71	2.86	-1.15
S-389D	AOI 1	2685876	223190	lower aquifer	-57.4	7	1.96	3.29	-1.33
S-38D	AOI 4	2685231	219174	lower aquifer	-114.12	7	0.34	1.98	-1.64
S-390D	AOI 1	2685310	222830	lower aquifer	-67.2	7	1.72	2.93	-1.21
S-391D	AOI 1	2684710	223313	lower aquifer	-69.2	7	2.64	3.11	-0.47
S-392D	AOI 1	2685166	221525	lower aquifer	-54.3	7	1.50	2.33	-0.83
S-393D	BELMONT	2685996	224457	lower aquifer	-69.5	7	3.22	4.22	-1.00
S-39D	AOI 4	2685551	220138	lower aquifer	-110.1	7	0.76	2.15	-1.39
S-46D	AOI 1	2685274	222026	lower aquifer	-55.37	7	2.02	2.49	-0.47

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							JUNE 2019 OBSERVED HYDRAULIC HEAD [FT]	JUNE 2019 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	JUNE 2019 HYDRAULIC HEAD RESIDUAL [FT]
S-69D	AOI 3	2682399	219971	lower aquifer	-52.3	7	0.10	1.38	-1.28
S-74D1SRTF	AOI 9	2679175	216087	lower aquifer	-67.65	7	-8.21	-5.41	-2.80
S-76DSRTF	AOI 9	2678241	216807	lower aquifer	-74	7	-7.96	-4.16	-3.80
Steen-DW-07	DSCP	2686045	222330	lower aquifer	-83.62	7	1.76	2.77	-1.01
Steen-DW-08	DSCP	2686004	222074	lower aquifer	-93.73	7	1.69	2.67	-0.98
Steen-DW-09	DSCP	2686195	222017	lower aquifer	-88.89	7	1.79	2.70	-0.91
W-13	AOI 10	2682065	221929	lower aquifer	-61.84	7	-1.22	1.67	-2.89
W-19	AOI 10	2680982	222405	lower aquifer	-71.83	7	-0.85	2.28	-3.13
W-1D	AOI 10	2682756	223584	lower aquifer	-68.63	7	1.34	2.27	-0.93
W-26	AOI 10	2679592	222651	lower aquifer	-14.65	7	-1.95	2.50	-4.45

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
A-1	AOI 5	2683608	215289	unconfined	-9.19	1	2.08	1.70	0.38
A-10	AOI 5	2682406	215428	unconfined	-6.33	1	4.85	3.72	1.13
A-11	AOI 5	2682016	215380	unconfined	-8.91	1	2.69	2.97	-0.28
A-118	AOI 5	2683071	217109	unconfined	-9.7	1	5.72	6.04	-0.32
A-12	AOI 5	2682183	215379	unconfined	-8.12	1	2.36	3.33	-0.97
A-122	AOI 5	2682278	215930	unconfined	-10.56	1	2.55	3.75	-1.20
A-133	AOI 5	2681282	215805	unconfined	-4.74	1	3.93	4.58	-0.65
A-134	AOI 5	2681409	215810	unconfined	-7.79	1	1.49	4.66	-3.17
A-135	AOI 5	2681633	215823	unconfined	-6.64	1	3.17	3.00	0.17
A-136	AOI 5	2681693	215556	unconfined	-8.48	1	1.52	2.54	-1.02
A-137	AOI 5	2683623	215145	unconfined	-7.71	1	1.75	1.68	0.07
A-139	AOI 5	2683732	215985	unconfined	-8.1	1	3.08	3.63	-0.55
A-140	AOI 5	2683699	215637	unconfined	-9.68	1	6.43	2.15	4.28
A-142	AOI 5	2683675	214931	unconfined	-8.86	1	2.84	1.36	1.48
A-143	AOI 5	2683340	215553	unconfined	-2.92	1	2.65	2.78	-0.13
A-148	AOI 5	2682641	216806	unconfined	-6.3	1	5.41	5.54	-0.13
A-149	AOI 5	2682443	216327	unconfined	-8.41	1	4.92	5.33	-0.41
A-151	AOI 5	2682129	215824	unconfined	-9.9	1	3.15	3.54	-0.39
A-155	AOI 5	2681449	216208	unconfined	-9.1	1	3.32	4.64	-1.32
A-156	AOI 5	2681355	216058	unconfined	1.1	1	4.44	4.67	-0.23
A-157	AOI 5	2681414	216278	unconfined	-2.2	1	5.20	4.52	0.68
A-158	AOI 5	2681604	216132	unconfined	-5.25	1	1.07	3.12	-2.05
A-163	AOI 5	2681070	215985	unconfined	0	1	4.55	3.81	0.74
A-164	AOI 5	2681178	216039	unconfined	0	1	4.35	4.18	0.17
A-166	AOI 5	2681273	215790	unconfined	0	1	3.22	4.44	-1.22
A-167	AOI 5	2681257	216200	unconfined	0	1	4.19	4.41	-0.22
A-168	AOI 5	2681699	216444	unconfined	0	1	4.12	3.34	0.78
A-169	AOI 5	2681150	215953	unconfined	-9.9	1	4.36	4.25	0.11
A-170	AOI 5	2681811	215866	unconfined	-13.8	1	2.14	3.16	-1.02
A-171	AOI 5	2681590	215555	unconfined	-11.3	1	1.94	2.18	-0.24
A-172	AOI 5	2681780	215441	unconfined	-11.3	1	1.72	2.36	-0.64
A-176	AOI 5	2682694	215260	unconfined	0	1	0.86	3.32	-2.46
A-177	AOI 5	2682775	215250	unconfined	-11.47	1	1.26	3.18	-1.92
A-179	AOI 5	2682824	215290	unconfined	0	1	4.75	3.26	1.49
A-183	AOI 5	2682598	215354	unconfined	0	1	4.57	3.69	0.88
A-187	AOI 5	2682721	215337	unconfined	0	1	3.84	3.57	0.27
A-189	AOI 5	2683360	217438	unconfined	0	1	3.62	5.21	-1.59

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
A-21	AOI 5	2681388	215630	unconfined	-5.23	1	5.88	3.85	2.03
A-22	AOI 5	2680996	216032	unconfined	-7.24	1	1.77	1.85	-0.08
A-23	AOI 5	2682143	216385	unconfined	-9.21	1	2.65	3.81	-1.16
A-24	AOI 5	2681515	215977	unconfined	-6.44	1	2.82	4.54	-1.72
A-26	AOI 5	2682167	216793	unconfined	-4.5	1	3.67	5.55	-1.88
A-27	AOI 5	2681846	216592	unconfined	-5.5	1	4.22	3.59	0.63
A-3	AOI 5	2683412	215785	unconfined	-5.34	1	2.63	3.44	-0.81
A-4	AOI 5	2683520	215001	unconfined	-9.15	1	1.98	1.52	0.46
A-40	AOI 5	2683595	215149	unconfined	-6.98	1	1.76	1.67	0.09
A-41	AOI 5	2683535	215097	unconfined	-7.46	1	1.75	1.65	0.10
A-44	AOI 5	2683121	215462	unconfined	-5.39	1	2.59	3.14	-0.55
A-45	AOI 5	2682740	215249	unconfined	-8.13	1	0.97	3.22	-2.25
A-46	AOI 5	2682464	215347	unconfined	-3.44	1	2.35	3.62	-1.27
A-48	AOI 5	2682295	215157	unconfined	-7.87	1	1.03	2.25	-1.22
A-49	AOI 5	2682249	215647	unconfined	-6.2	1	3.97	3.67	0.30
A-6	AOI 5	2682954	215268	unconfined	-7.99	1	3.46	2.88	0.58
A-7	AOI 5	2683111	215298	unconfined	-6.13	1	2.44	2.58	-0.14
ARCO-1	AOI 1	2685973	221361	unconfined	-14.89	1	0.92	0.87	0.05
ARCO-2	AOI 1	2685882	221258	unconfined	-15.11	1	0.89	1.24	-0.35
ARCO-3	AOI 1	2685928	221631	unconfined	-17.51	1	0.40	-1.12	1.52
B-115	AOI 6	2682825	218059	unconfined	-5	1	4.77	4.88	-0.11
B-116	AOI 6	2682925	217899	unconfined	-4.9	1	2.88	4.93	-2.05
B-117	AOI 6	2682499	217678	unconfined	-4.3	1	4.23	5.50	-1.27
B-123	AOI 6	2681458	217146	unconfined	-5	1	6.56	4.95	1.61
B-124	AOI 6	2681316	216811	unconfined	-9.09	1	4.20	4.61	-0.41
B-125	AOI 6	2681099	216829	unconfined	-5	1	3.93	4.16	-0.23
B-126	AOI 6	2680974	217022	unconfined	-5	1	3.36	4.12	-0.76
B-130	AOI 6	2680131	217397	unconfined	-6.89	1	4.59	3.49	1.10
B-131	AOI 6	2680693	216460	unconfined	-7.8	1	3.62	4.27	-0.65
B-132	AOI 6	2681171	217351	unconfined	-8.73	1	1.44	4.10	-2.66
B-133	AOI 6	2681207	217307	unconfined	-7.7	1	2.29	4.23	-1.94
B-134	AOI 6	2681163	217285	unconfined	-7.62	1	1.58	4.18	-2.60
B-135	AOI 6	2681137	217329	unconfined	-7.69	1	1.22	4.13	-2.91
B-136	AOI 6	2681253	217259	unconfined	-5.69	1	4.94	4.56	0.38
B-137	AOI 6	2681298	217188	unconfined	-5.78	1	4.38	4.65	-0.27
B-138	AOI 6	2681330	217138	unconfined	-5.94	1	5.00	4.68	0.32
B-142	AOI 6	2681209	217178	unconfined	-5.19	1	2.69	4.50	-1.81

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
B-143	AOI 6	2681159	217208	unconfined	-5.64	1	4.00	4.46	-0.46
B-144	AOI 6	2681235	217134	unconfined	-5.84	1	4.11	4.51	-0.40
B-145	AOI 6	2681362	217086	unconfined	-4.84	1	5.35	4.74	0.61
B-147	AOI 6	2681125	217146	unconfined	-5.4	1	3.89	4.36	-0.47
B-148	AOI 6	2681077	217444	unconfined	-5.81	1	1.52	4.36	-2.84
B-149	AOI 6	2680999	217436	unconfined	-5.2	1	4.55	4.42	0.13
B-150	AOI 6	2680966	217480	unconfined	-5.17	1	4.42	4.45	-0.03
B-151	AOI 6	2680729	217738	unconfined	-4.23	1	4.17	4.35	-0.18
B-152	AOI 6	2680603	217848	unconfined	-4.5	1	1.53	4.32	-2.79
B-153	AOI 6	2680102	217475	unconfined	-3.33	1	4.12	2.90	1.22
B-155	AOI 6	2680975	217400	unconfined	-3.46	1	2.93	4.34	-1.41
B-156	AOI 6	2680904	217366	unconfined	-3.35	1	2.91	4.27	-1.36
B-158	AOI 6	2679969	217967	unconfined	-3.34	1	6.61	3.84	2.77
B-160	AOI 6	2681840	217371	unconfined	-1.05	1	4.90	5.44	-0.54
B-161	AOI 6	2681270	216894	unconfined	-5.02	1	3.80	4.66	-0.86
B-163	AOI 6	2681199	217531	unconfined	-2.32	1	4.65	4.64	0.01
B-164	AOI 6	2680585	216480	unconfined	-6.14	1	3.13	3.77	-0.64
B-165	AOI 6	2680187	217152	unconfined	-5	1	3.28	1.14	2.14
B-166	AOI 6	2682932	217409	unconfined	-4.11	1	4.37	5.95	-1.58
B-168	AOI 6	2680070	217495	unconfined	-5	1	4.63	2.34	2.29
B-169	AOI 6	2680092	217416	unconfined	-5	1	4.86	1.30	3.56
B-170	AOI 6	2680107	217350	unconfined	-5.2	1	5.38	1.45	3.93
B-172	AOI 6	2680736	217412	unconfined	0	1	3.23	4.10	-0.87
B-173	AOI 6	2681021	216651	unconfined	-6.3	1	3.75	4.23	-0.48
B-174	AOI 6	2681059	216388	unconfined	-6.5	1	5.02	4.17	0.85
B-175	AOI 6	2681336	216863	unconfined	0	1	4.30	4.62	-0.32
B-177	AOI 6	2680952	217497	unconfined	-11.02	1	4.19	4.50	-0.31
B-178	AOI 6	2680933	217532	unconfined	-6.21	1	4.46	4.49	-0.03
B-39	AOI 6	2680696	216615	unconfined	-9.46	1	3.40	4.07	-0.67
B-43	AOI 6	2680085	217611	unconfined	-7.36	1	4.40	3.95	0.45
B-45	AOI 6	2680393	218353	unconfined	-10.1	1	5.09	4.31	0.78
B-46	AOI 6	2681909	218131	unconfined	-3.68	1	6.67	5.51	1.16
B-47	AOI 6	2681963	217434	unconfined	-5	1	5.99	5.39	0.60
B-92	AOI 6	2681498	216966	unconfined	-8.2	1	4.63	4.90	-0.27
B-95	AOI 6	2680373	217541	unconfined	-5	1	4.62	4.29	0.33
BF-103R	AOI 3	2682491	219959	unconfined	-1.57	1	1.19	2.01	-0.82
BF-104	AOI 3	2682830	219137	unconfined	-2.8	1	7.01	4.90	2.11

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
BF-105	AOI 3	2682998	219443	unconfined	-5	1	1.46	2.23	-0.77
BF-106	AOI 3	2683176	219737	unconfined	-5	1	1.37	2.16	-0.79
BF-107	AOI 3	2683307	219941	unconfined	-5	1	1.39	2.30	-0.91
BF-88	AOI 3	2683465	220156	unconfined	-7.14	1	1.59	2.37	-0.78
BF-90	AOI 3	2683035	218954	unconfined	-5.72	1	5.98	3.69	2.29
BF-99	AOI 3	2683159	219974	unconfined	-9.18	1	1.38	2.08	-0.70
C-104	AOI 7	2679742	219188	unconfined	-5	1	2.78	1.93	0.85
C-105	AOI 7	2679690	219497	unconfined	-5	1	4.78	1.70	3.08
C-108	AOI 7	2680856	219819	unconfined	-5	1	3.81	3.10	0.71
C-109	AOI 7	2682312	219231	unconfined	-5	1	5.96	5.25	0.71
C-110	AOI 7	2682469	219406	unconfined	-5	1	6.75	5.33	1.42
C-111	AOI 7	2682561	219232	unconfined	-5	1	6.86	5.52	1.34
C-112	AOI 7	2682431	218697	unconfined	-1.62	1	8.06	6.01	2.05
C-113	AOI 7	2682817	218798	unconfined	-5	1	6.85	6.32	0.53
C-114	AOI 7	2683001	218348	unconfined	-5	1	6.92	6.18	0.74
C-127	AOI 7	2680897	220182	unconfined	-8.3	1	1.28	2.94	-1.66
C-129	AOI 7	2681937	220497	unconfined	-4.8	1	4.55	3.28	1.27
C-130	AOI 7	2682140	219981	unconfined	-4.71	1	6.35	5.20	1.15
C-131	AOI 7	2682329	218971	unconfined	-5.72	1	6.49	5.52	0.97
C-133	AOI 7	2681694	218336	unconfined	-5.82	1	6.41	5.26	1.15
C-136	AOI 7	2680991	219217	unconfined	-7.22	1	4.25	3.07	1.18
C-138	AOI 7	2680453	218658	unconfined	-7.52	1	2.54	2.80	-0.26
C-139	AOI 7	2680633	219444	unconfined	-6.53	1	4.51	2.96	1.55
C-140	AOI 7	2679799	218858	unconfined	-4.01	1	5.97	2.18	3.79
C-142	AOI 7	2680660	220134	unconfined	-4.38	1	2.38	3.09	-0.71
C-152	AOI 7	2680477	220266	unconfined	-5	1	-1.19	2.63	-3.82
C-155	AOI 7	2680525	220082	unconfined	-5	1	3.30	3.09	0.21
C-156	AOI 7	2681408	220254	unconfined	-16.41	1	2.97	4.14	-1.17
C-157	AOI 7	2681432	220255	unconfined	-17.17	1	3.01	4.09	-1.08
C-159	AOI 7	2681506	220269	unconfined	-17.1	1	3.12	3.68	-0.56
C-161	AOI 7	2680460	220266	unconfined	-2.7	1	-1.21	2.59	-3.80
C-163	AOI 7	2681332	220248	unconfined	-5	1	2.85	4.05	-1.20
C-164	AOI 7	2681359	220252	unconfined	-5	1	2.86	3.93	-1.07
C-165	AOI 7	2681386	220255	unconfined	-5	1	2.91	3.98	-1.07
C-168	AOI 7	2679988	220174	unconfined	-2.6	1	0.92	2.27	-1.35
C-170	AOI 7	2679843	219975	unconfined	-3.7	1	9.72	2.55	7.17
C-171	AOI 7	2679795	219649	unconfined	0	1	6.24	2.62	3.62

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
C-172	AOI 7	2680375	218451	unconfined	0	1	3.51	2.73	0.78
C-50	AOI 7	2682341	219619	unconfined	-6.17	1	5.51	5.24	0.27
C-51	AOI 7	2681621	220073	unconfined	-6.1	1	4.70	4.82	-0.12
C-52	AOI 7	2681216	220206	unconfined	-6.32	1	2.00	4.23	-2.23
C-53A	AOI 7	2681031	219940	unconfined	-6.88	1	4.68	4.23	0.45
C-54	AOI 7	2680975	219459	unconfined	-8.51	1	5.46	3.10	2.36
C-55	AOI 7	2680864	218851	unconfined	-8.51	1	4.87	2.99	1.88
C-56	AOI 7	2681367	218776	unconfined	-4.6	1	8.36	5.19	3.17
C-57	AOI 7	2681651	219572	unconfined	-6.05	1	5.86	5.08	0.78
C-58	AOI 7	2681692	219017	unconfined	-5.61	1	5.61	5.22	0.39
C-60	AOI 7	2680151	218657	unconfined	-6.98	1	4.61	2.66	1.95
C-61	AOI 7	2679819	219306	unconfined	-5.12	1	4.90	2.57	2.33
C-62	AOI 7	2679892	219890	unconfined	-4.65	1	6.07	2.86	3.21
C-63	AOI 7	2680379	219611	unconfined	-8.83	1	1.31	2.95	-1.64
C-64	AOI 7	2680431	220167	unconfined	-6.83	1	-0.26	2.98	-3.24
C-65	AOI 7	2680266	220116	unconfined	-5.53	1	3.82	2.95	0.87
C-96	AOI 7	2681980	219529	unconfined	-7.18	1	6.68	5.30	1.38
C-98	AOI 7	2680220	219208	unconfined	-5.66	1	4.80	2.83	1.97
MW-26	BELMONT	2685920	224123	unconfined	-22.91	1	4.59	4.99	-0.40
MW-27	BELMONT	2685686	224065	unconfined	-0.45	1	4.59	5.02	-0.43
MW-28	BELMONT	2685581	224169	unconfined	-0.74	1	4.90	5.17	-0.27
MW-29	BELMONT	2685481	223955	unconfined	-0.5	1	4.73	4.97	-0.24
MW-30	BELMONT	2684982	224261	unconfined	1.7	1	4.70	5.37	-0.67
MW-31	BELMONT	2685353	224156	unconfined	1.48	1	5.56	5.22	0.34
MW-32	BELMONT	2685565	224286	unconfined	-0.41	1	4.50	5.29	-0.79
MW-33	BELMONT	2685300	224346	unconfined	2.3	1	4.87	5.39	-0.52
MW-35	BELMONT	2685572	224472	unconfined	-4.16	1	4.12	5.44	-1.32
MW-36	BELMONT	2685830	224431	unconfined	-2.25	1	5.26	5.36	-0.10
MW-37	BELMONT	2685985	224470	unconfined	-2.45	1	5.09	5.37	-0.28
MW-38	BELMONT	2686166	224255	unconfined	-7.02	1	4.50	5.06	-0.56
MW-39	BELMONT	2686158	224193	unconfined	-7.01	1	4.55	4.98	-0.43
MW-40	BELMONT	2686146	224123	unconfined	-5	1	4.55	4.89	-0.34
MW-41	BELMONT	2686036	224120	unconfined	-7.34	1	4.62	4.93	-0.31
MW-43	BELMONT	2685063	224183	unconfined	-4.02	1	4.69	5.30	-0.61
MW-44	BELMONT	2685403	224419	unconfined	-5.18	1	4.18	5.43	-1.25
MWELL-28	AOI 1	2685865	222299	unconfined	-20.84	1	0.96	0.94	0.02
MWELL-29	AOI 1	2685808	222019	unconfined	-25.79	1	0.23	-0.38	0.61

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
MWELL-30	AOI 1	2685800	221601	unconfined	-17.66	1	0.33	-2.02	2.35
MWELL-31	AOI 1	2685710	221306	unconfined	-14.13	1	0.77	1.12	-0.35
N-100	AOI 8	2682716	228210	unconfined	4.99	1	9.86	6.45	3.41
N-107	AOI 8	2683133	226910	unconfined	2.38	1	11.62	13.56	-1.94
N-11	AOI 8	2682915	227226	unconfined	2.33	1	11.63	11.31	0.32
N-12	AOI 8	2683394	227099	unconfined	0	1	11.49	11.73	-0.24
N-129	AOI 8	2683241	225470	unconfined	-2.88	1	10.26	9.45	0.81
N-133	AOI 8	2680751	224967	unconfined	-4.81	1	6.70	7.83	-1.13
N-137	AOI 8	2683096	227832	unconfined	0.87	1	9.18	7.76	1.42
N-14	AOI 8	2683665	227011	unconfined	4.64	1	11.64	10.28	1.36
N-140	AOI 8	2683133	227411	unconfined	0	1	10.33	10.03	0.30
N-142	AOI 8	2683211	227652	unconfined	0	1	9.07	9.41	-0.34
N-144	AOI 8	2683293	227623	unconfined	0	1	9.27	9.89	-0.62
N-151	AOI 8	2683619	225640	unconfined	2.26	1	11.18	9.01	2.17
N-159	AOI 8	2683542	225496	unconfined	-1.53	1	9.81	9.40	0.41
N-160	AOI 8	2683047	227800	unconfined	4.07	1	8.69	7.83	0.86
N-161	AOI 8	2683202	227791	unconfined	4	1	8.88	8.35	0.53
N-162	AOI 8	2683378	227695	unconfined	3.05	1	10.36	9.56	0.80
N-18	AOI 8	2684650	226744	unconfined	5.15	1	11.74	8.06	3.68
N-20	AOI 8	2683878	226645	unconfined	19.12	1	11.26	9.25	2.01
N-29	AOI 8	2685039	225835	unconfined	6.6	1	11.32	10.34	0.98
N-37	AOI 8	2681543	226828	lower aquifer	-0.74	1	6.42	6.00	0.42
N-42	AOI 8	2682412	225813	unconfined	-2.91	1	8.44	8.30	0.14
N-47	AOI 8	2683936	225489	unconfined	4.55	1	12.73	9.45	3.28
N-48	AOI 8	2683476	225312	unconfined	1.92	1	10.60	9.66	0.94
N-49	AOI 8	2683115	225175	unconfined	3.55	1	9.20	10.00	-0.80
N-503	AOI 8	2680566	226576	unconfined	11.46	1	3.78	4.28	-0.50
N-504	AOI 8	2680652	226857	unconfined	11.36	1	3.82	3.81	0.01
N-51	AOI 8	2682956	225253	unconfined	2.92	1	9.06	9.91	-0.85
N-55	AOI 8	2681474	225122	unconfined	0.59	1	6.19	8.55	-2.36
N-56	AOI 8	2681266	225659	unconfined	-2.32	1	9.75	8.86	0.89
N-57	AOI 8	2680586	226031	unconfined	-1.2	1	6.91	7.31	-0.40
N-72	AOI 8	2680686	226761	unconfined	-3.74	1	4.17	6.41	-2.24
N-8	AOI 8	2684092	227375	unconfined	1.03	1	12.17	10.40	1.77
N-82	AOI 8	2684634	225723	unconfined	0.98	1	11.97	9.36	2.61
N-85	AOI 8	2684734	226448	unconfined	-1.05	1	11.75	7.38	4.37
N-86	AOI 8	2684119	226463	unconfined	11.3	1	11.09	8.91	2.18

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
N-93	AOI 8	2683794	226550	unconfined	5.05	1	10.34	8.90	1.44
N-97	AOI 8	2684187	226513	unconfined	-5	1	9.50	8.56	0.94
N-98	AOI 8	2683479	227658	unconfined	2.46	1	11.59	10.07	1.52
OW-12	BELMONT	2685686	224424	unconfined	0	1	4.92	5.38	-0.46
OW-13	BELMONT	2685988	224385	unconfined	0	1	4.83	5.27	-0.44
OW-14	BELMONT	2686076	224372	unconfined	-17.59	1	4.65	5.23	-0.58
OW-16	BELMONT	2685739	224420	unconfined	0	1	4.90	5.37	-0.47
OW-17	BELMONT	2685587	224388	unconfined	0	1	4.38	5.38	-1.00
OW-18	BELMONT	2685520	224437	unconfined	0.75	1	5.04	5.43	-0.39
OW-19	BELMONT	2685717	224415	unconfined	1.22	1	6.44	5.37	1.07
OW-2	BELMONT	2685939	224392	unconfined	0	1	4.88	5.29	-0.41
OW-20	BELMONT	2685840	224404	unconfined	2.43	1	4.92	5.33	-0.41
PGW-MW-1	PGW	2683228	224438	unconfined	0	1	8.93	8.79	0.14
PGW-MW-10S	PGW	2685131	225179	unconfined	1.2	1	10.01	9.82	0.19
PGW-MW-11	PGW	2683813	224768	unconfined	0	1	10.91	9.69	1.22
PGW-MW-13	PGW	2683949	224490	unconfined	-5	1	10.50	9.22	1.28
PGW-MW-13S	PGW	2685322	225242	unconfined	-0.5	1	9.65	9.15	0.50
PGW-MW-15	PGW	2683427	224122	unconfined	0	1	8.73	6.45	2.28
PGW-MW-15S	PGW	2685092	224730	unconfined	-4	1	9.75	5.66	4.09
PGW-MW-16	PGW	2683645	224956	unconfined	-5	1	10.91	9.89	1.02
PGW-MW-17	PGW	2683385	224541	unconfined	0	1	9.41	9.97	-0.56
PGW-MW-18S	PGW	2683206	224683	unconfined	0	1	9.59	10.14	-0.55
PGW-MW-1S	PGW	2683457	224135	unconfined	-1.2	1	7.61	6.54	1.07
PGW-MW-20	AOI 8	2682864	224699	unconfined	-5	1	8.50	7.64	0.86
PGW-MW-22	PGW	2682953	224875	unconfined	0	1	10.13	10.14	-0.01
PGW-MW-23	PGW	2684193	224341	unconfined	-6	1	11.11	5.44	5.67
PGW-MW-24	AOI 8	2682932	225026	unconfined	6.66	1	10.40	10.19	0.21
PGW-MW-25	PGW	2683221	225110	unconfined	-5	1	10.43	10.15	0.28
PGW-MW-26A	PGW	2684200	225064	unconfined	-5	1	12.03	9.60	2.43
PGW-MW-2A	PGW	2683341	224285	unconfined	0	1	8.44	8.16	0.28
PGW-MW-2S	PGW	2683928	224288	unconfined	0.7	1	9.71	7.72	1.99
PGW-MW-3	PGW	2683356	224400	unconfined	0	1	10.72	9.36	1.36
PGW-MW-33	PGW	2683509	225248	unconfined	-5	1	10.90	9.85	1.05
PGW-MW-34	PGW	2683317	225168	unconfined	0	1	10.68	10.04	0.64
PGW-MW-37	PGW	2683017	225030	unconfined	-5	1	10.22	10.26	-0.04
PGW-MW-39	PGW	2683023	224810	unconfined	0	1	9.98	10.15	-0.17
PGW-MW-3S	PGW	2684683	224482	unconfined	0.5	1	10.13	7.64	2.49

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
PGW-MW-42R	PGW	2684370	225557	unconfined	4.6	1	11.74	9.61	2.13
PGW-MW-44	PGW	2684147	225231	unconfined	-5	1	12.71	9.62	3.09
PGW-MW-45	PGW	2684686	225671	unconfined	0	1	12.87	9.86	3.01
PGW-MW-5	AOI 8	2683135	224441	unconfined	-5	1	7.42	7.19	0.23
PGW-MW-6	AOI 8	2682880	224558	lower aquifer	-5	1	1.47	3.02	-1.55
PGW-MW-7	AOI 8	2682984	224648	unconfined	-5	1	7.55	8.59	-1.04
PGW-MW-7S	PGW	2685067	224606	unconfined	-4.3	1	9.27	5.59	3.68
PGW-MW-8	AOI 8	2683074	224544	unconfined	-5	1	7.35	8.13	-0.78
PGW-MW-8S	AOI 2	2684218	224041	unconfined	-4	1	5.13	5.31	-0.18
PGW-MW-9	AOI 8	2683168	224403	unconfined	-5	1	7.12	7.11	0.01
PZ-100	AOI 2	2683602	222350	unconfined	-5	1	1.67	3.06	-1.39
PZ-2	AOI 5	2681495	215938	unconfined	0	1	5.21	4.62	0.59
PZ-201	AOI 8	2683718	225409	unconfined	9.28	1	10.47	9.48	0.99
PZ-202	AOI 8	2683876	225484	unconfined	10.39	1	12.25	9.42	2.83
PZ-203	AOI 8	2684037	225560	unconfined	13.11	1	14.45	9.33	5.12
PZ-3	AOI 5	2681511	215958	unconfined	0	1	2.77	4.55	-1.78
PZ-400	BELMONT	2686131	224096	unconfined	0	1	4.55	4.86	-0.31
PZ-402	AOI 1	2686061	223552	unconfined	-8.68	1	4.01	3.92	0.09
PZ-403	AOI 1	2685965	222935	unconfined	-5	1	-1.32	2.11	-3.43
PZ-404	AOI 1	2685981	222933	unconfined	-12.84	1	-0.12	2.03	-2.15
PZ-501	AOI 8	2680429	225835	unconfined	-1	1	6.16	3.51	2.65
PZ-502	AOI 8	2680434	225562	unconfined	6.14	1	4.43	3.44	0.99
PZ-503	AOI 8	2680590	225085	unconfined	-0.31	1	5.90	2.88	3.02
PZ-504	AOI 8	2680730	224903	unconfined	1.63	1	5.80	3.86	1.94
PZ-505	AOI 8	2681024	224708	unconfined	0.46	1	5.76	3.73	2.03
RW-1	BELMONT	2685680	224407	unconfined	-19.42	1	4.67	5.37	-0.70
RW-100	AOI 2	2683341	222349	unconfined	-8.66	1	1.91	2.92	-1.01
RW-101	AOI 2	2683489	222384	unconfined	-8.63	1	1.84	3.03	-1.19
RW-102	AOI 2	2683599	222321	unconfined	-9.76	1	2.26	3.03	-0.77
RW-103	AOI 2	2683770	222358	unconfined	-10.24	1	2.17	3.12	-0.95
RW-104	AOI 2	2682960	222446	unconfined	-15.89	1	3.32	2.43	0.89
RW-105	AOI 2	2682964	222412	unconfined	-7.87	1	0.15	2.71	-2.56
RW-106	AOI 2	2682946	222348	unconfined	-7.71	1	1.32	2.68	-1.36
RW-107	AOI 2	2682915	222272	unconfined	-5	1	1.25	2.66	-1.41
RW-108	AOI 2	2682895	222181	unconfined	-8.66	1	2.36	2.64	-0.28
RW-109	AOI 2	2682883	222084	unconfined	-10.49	1	2.40	2.62	-0.22
RW-110	AOI 1	2685160	222136	unconfined	-4.3	1	1.12	2.34	-1.22

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
RW-112	AOI 1	2685156	222113	unconfined	-6.29	1	1.43	2.32	-0.89
RW-113	AOI 2	2682988	222409	unconfined	-18.9	1	1.07	2.73	-1.66
RW-114	AOI 2	2683023	222392	unconfined	-15.6	1	1.26	2.75	-1.49
RW-115	AOI 2	2682980	222371	unconfined	-18.7	1	1.21	2.71	-1.50
RW-116	AOI 2	2682987	222340	unconfined	-18.11	1	1.32	2.72	-1.40
RW-117	AOI 2	2682964	222320	unconfined	-19.06	1	1.39	2.70	-1.31
RW-118	AOI 2	2682999	222302	unconfined	-17.03	1	1.43	2.73	-1.30
RW-119	AOI 2	2683013	222332	unconfined	-16.06	1	1.36	2.74	-1.38
RW-120	AOI 2	2683027	222353	unconfined	-4.23	1	1.31	2.75	-1.44
RW-121	AOI 2	2683050	222376	unconfined	-8.7	1	1.31	2.76	-1.45
RW-122	AOI 2	2682978	222265	unconfined	-18.58	1	1.41	2.72	-1.31
RW-123	AOI 2	2682969	222296	unconfined	-19.02	1	1.47	2.71	-1.24
RW-125	AOI 2	2683040	222428	unconfined	-14.3	1	1.56	2.79	-1.23
RW-126	AOI 2	2682936	222285	unconfined	-19.65	1	1.81	2.68	-0.87
RW-127	AOI 2	2683036	222383	unconfined	-14.65	1	1.32	2.75	-1.43
RW-129	AOI 2	2683008	222434	unconfined	-18.55	1	1.00	2.76	-1.76
RW-201	AOI 8	2682704	225060	unconfined	-3.39	1	9.39	9.97	-0.58
RW-202	AOI 8	2682881	225065	unconfined	-3.96	1	8.19	10.11	-1.92
RW-204	AOI 8	2683190	225163	unconfined	-3.66	1	9.24	10.02	-0.78
RW-205	AOI 8	2683343	225251	unconfined	0.3	1	10.57	9.82	0.75
RW-21	BELMONT	2685822	224345	unconfined	0	1	4.48	5.27	-0.79
RW-23	BELMONT	2685912	224209	unconfined	-15.25	1	4.60	5.10	-0.50
RW-233	AOI 8	2684339	225731	unconfined	-2.46	1	12.19	8.48	3.71
RW-24	BELMONT	2685772	224272	unconfined	-13.62	1	4.53	5.21	-0.68
RW-26	BELMONT	2685474	224410	unconfined	-9.4	1	4.56	5.41	-0.85
RW-27	BELMONT	2685423	224396	unconfined	-9.26	1	4.15	5.41	-1.26
RW-29	BELMONT	2685286	224360	unconfined	-9.81	1	4.19	5.41	-1.22
RW-30	BELMONT	2685257	224352	unconfined	-9.67	1	4.33	5.40	-1.07
RW-31	BELMONT	2685206	224339	unconfined	-9.69	1	4.35	5.40	-1.05
RW-4	BELMONT	2685789	224388	unconfined	-18.63	1	4.88	5.33	-0.45
RW-401	AOI 1	2686040	223555	unconfined	-25.49	1	4.27	3.94	0.33
RW-404	AOI 1	2686015	223152	unconfined	-8.81	1	1.71	2.46	-0.75
RW-500	AOI 8	2680478	225305	unconfined	6.79	1	5.91	3.18	2.73
RW-501	AOI 8	2681487	224727	unconfined	7.98	1	5.54	5.19	0.35
RW-502	AOI 8	2680607	226714	unconfined	11.4	1	3.82	4.75	-0.93
RW-6	BELMONT	2686038	224377	unconfined	0	1	4.77	5.25	-0.48
RW-6S	AOI 5	2681520	215947	unconfined	5.22	1	2.92	4.49	-1.57

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
RW-7	BELMONT	2685894	224363	unconfined	-20.93	1	4.77	5.27	-0.50
RW-704	AOI 4	2684875	218912	unconfined	-3.869	1	2.15	3.06	-0.91
RW-9	AOI 6	2681446	216562	unconfined	-5	1	4.21	4.65	-0.44
RWBH-1	AOI 5	2682070	215219	unconfined	-6.14	1	2.56	2.31	0.25
RWBH-2	AOI 5	2682109	215220	unconfined	-3.67	1	2.30	2.50	-0.20
S-100	AOI 1	2686178	223523	unconfined	-9.91	1	3.44	3.81	-0.37
S-101	AOI 1	2686296	223163	unconfined	-11.73	1	2.48	3.05	-0.57
S-102	AOI 4	2683874	221407	unconfined	-4.37	1	1.61	2.72	-1.11
S-104	AOI 4	2684804	221448	unconfined	-4.37	1	3.64	2.39	1.25
S-107	AOI 2	2683338	223258	unconfined	-5.51	1	3.15	3.10	0.05
S-108	AOI 2	2683362	223294	unconfined	-8.04	1	3.46	3.15	0.31
S-108SRTF	AOI 9	2677667	218321	unconfined	-10.93	1	0.06	-1.14	1.20
S-109SRTF	AOI 9	2677084	217894	unconfined	-11.76	1	0.03	-1.84	1.87
S-111SRTF	AOI 9	2677273	217432	unconfined	-13.64	1	-7.68	-2.83	-4.85
S-112SRTF	AOI 9	2677256	216984	unconfined	-13.41	1	-8.43	-3.82	-4.61
S-113	AOI 3	2683405	220680	unconfined	-11.65	1	1.47	2.28	-0.81
S-113SRTF	AOI 9	2676915	216800	unconfined	-14.57	1	-8.29	-4.18	-4.11
S-114SRTF	AOI 9	2676978	216435	unconfined	-15.44	1	-8.38	-5.12	-3.26
S-115SRTF	AOI 9	2676754	216194	unconfined	-14.8	1	-8.59	-5.66	-2.93
S-116SRTF	AOI 9	2676903	215942	unconfined	-16.68	1	-8.65	-6.32	-2.33
S-117	AOI 1	2685492	222352	unconfined	-9.4	1	1.72	2.08	-0.36
S-118SRTF	AOI 9	2676678	215161	unconfined	-13.98	1	-6.22	-8.27	2.05
S-119	AOI 4	2685393	220753	unconfined	-10.18	1	1.45	2.17	-0.72
S-121SRTF	AOI 9	2677486	215710	unconfined	-13.54	1	-5.36	-6.94	1.58
S-122SRTF	AOI 9	2677653	216573	unconfined	-13.96	1	-6.33	-4.74	-1.59
S-125	AOI 1	2686079	223506	unconfined	-6.16	1	5.20	3.80	1.40
S-127	AOI 1	2685644	222203	unconfined	-13.62	1	1.35	1.35	0.00
S-131	AOI 2	2684100	222307	unconfined	-7.09	1	1.97	3.13	-1.16
S-132	AOI 2	2684095	222243	unconfined	-8.76	1	2.56	3.07	-0.51
S-133	AOI 2	2684056	222303	unconfined	-8.37	1	2.35	3.13	-0.78
S-134	AOI 2	2684441	222209	unconfined	-7.39	1	3.62	3.02	0.60
S-135	AOI 2	2684162	222278	unconfined	-7.66	1	1.21	3.11	-1.90
S-135SRTF	AOI 9	2676810	216462	unconfined	-20.59	1	-7.55	-5.01	-2.54
S-136	AOI 2	2684135	222257	unconfined	-7.05	1	2.50	3.09	-0.59
S-139	AOI 2	2683570	222392	unconfined	-9.1	1	2.15	3.08	-0.93
S-141	AOI 2	2683427	222387	unconfined	-8.04	1	1.76	3.00	-1.24
S-142	AOI 2	2683609	222348	unconfined	-10.19	1	0.53	3.06	-2.53

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
S-147SRTF	AOI 9	2676674	216718	unconfined	-19.5	1	-8.05	-3.82	-4.23
S-150	AOI 2	2683393	223189	unconfined	-0.09	1	3.46	3.21	0.25
S-152	AOI 2	2683337	223247	unconfined	-10.9	1	3.16	3.10	0.06
S-154	AOI 2	2683290	223236	unconfined	-4.86	1	2.06	2.97	-0.91
S-156	AOI 2	2684180	222281	unconfined	-6.82	1	2.46	3.11	-0.65
S-157	AOI 2	2684107	222285	unconfined	-7.71	1	2.54	3.11	-0.57
S-159	AOI 2	2683730	222304	unconfined	-0.83	1	2.29	3.07	-0.78
S-162	AOI 1	2685202	222131	unconfined	-3.58	1	1.31	2.27	-0.96
S-164	AOI 1	2685039	222134	unconfined	-7.1	1	1.71	2.51	-0.80
S-166	AOI 2	2684909	222170	unconfined	-6.78	1	3.67	2.72	0.95
S-175	AOI 2	2684500	222226	unconfined	-3.6	1	3.16	3.02	0.14
S-180	AOI 1	2686058	223358	unconfined	-11.5	1	5.76	3.34	2.42
S-185	AOI 1	2686111	223736	unconfined	-10	1	6.45	4.28	2.17
S-186	AOI 1	2686118	223786	unconfined	-9.6	1	4.95	4.37	0.58
S-187	AOI 1	2686124	223837	unconfined	-9.3	1	4.85	4.45	0.40
S-188	AOI 1	2686125	223886	unconfined	-8.9	1	4.71	4.53	0.18
S-189	AOI 1	2686115	223925	unconfined	-7.5	1	4.46	4.60	-0.14
S-190	AOI 1	2686121	223969	unconfined	-6.7	1	4.51	4.67	-0.16
S-191	AOI 1	2686127	224012	unconfined	-7	1	4.52	4.73	-0.21
S-193	AOI 1	2686254	223959	unconfined	-6.52	1	4.70	4.60	0.10
S-194	AOI 1	2686268	223978	unconfined	1.15	1	6.18	4.63	1.55
S-196	AOI 1	2686419	224117	unconfined	-5.04	1	4.75	4.82	-0.07
S-197	AOI 1	2686414	223931	unconfined	-5	1	5.71	4.54	1.17
S-198	AOI 1	2685879	224076	unconfined	-6.76	1	4.50	4.94	-0.44
S-199	AOI 1	2685732	224027	unconfined	-6.29	1	4.61	4.96	-0.35
S-200	AOI 1	2685486	223945	unconfined	-5.57	1	4.61	4.96	-0.35
S-201	AOI 1	2685877	223831	unconfined	-6.26	1	4.55	4.59	-0.04
S-202	AOI 1	2684881	223417	unconfined	-4.61	1	4.41	4.48	-0.07
S-203	AOI 1	2685245	223217	unconfined	-3.11	1	4.21	4.04	0.17
S-206	AOI 1	2684727	223201	unconfined	-3.46	1	4.48	4.22	0.26
S-208	AOI 1	2685225	222409	unconfined	-7.92	1	2.11	2.63	-0.52
S-209	AOI 1	2685750	222525	unconfined	-11.06	1	1.45	1.89	-0.44
S-210	AOI 1	2685876	222247	unconfined	-14.36	1	0.37	0.68	-0.31
S-211	AOI 1	2685021	221956	unconfined	-14.78	1	1.91	2.46	-0.55
S-213	AOI 1	2685087	221871	unconfined	-14.89	1	1.84	2.31	-0.47
S-214	AOI 1	2685145	221577	unconfined	-13.27	1	1.50	2.04	-0.54
S-216	AOI 4	2684618	220867	unconfined	-11.43	1	1.78	2.35	-0.57

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
S-226	AOI 1	2685805	222280	unconfined	-15.64	1	0.76	1.09	-0.33
S-227	AOI 1	2685786	221654	unconfined	-12.22	1	-0.03	-1.86	1.83
S-228	AOI 1	2685779	221657	unconfined	-13.79	1	-0.07	-1.77	1.70
S-231	AOI 1	2685897	222219	unconfined	-5.32	1	0.28	0.47	-0.19
S-232	AOI 1	2685891	222167	unconfined	-8.91	1	0.34	0.21	0.13
S-246A	AOI 2	2682915	222348	unconfined	-5	1	0.99	2.24	-1.25
S-247	AOI 2	2682921	222381	unconfined	-5	1	0.91	2.09	-1.18
S-248	AOI 2	2682933	222394	unconfined	-5	1	0.81	2.54	-1.73
S-249	AOI 2	2682939	222444	unconfined	-5	1	2.00	2.08	-0.08
S-251	AOI 2	2683286	222362	unconfined	-4.39	1	1.61	2.90	-1.29
S-252	AOI 2	2683257	222357	unconfined	-4.64	1	1.62	2.88	-1.26
S-253	AOI 2	2683301	222420	unconfined	-2.89	1	1.89	2.95	-1.06
S-254	AOI 2	2683168	222414	unconfined	-3.09	1	1.36	2.87	-1.51
S-256	AOI 1	2685775	221633	unconfined	-15.83	1	0.19	-1.69	1.88
S-257	AOI 1	2685811	221589	unconfined	-11.33	1	0.34	-2.04	2.38
S-258	AOI 1	2685820	221665	unconfined	-11.64	1	-0.50	-2.35	1.85
S-259	AOI 1	2685827	221704	unconfined	-12	1	-1.46	-2.53	1.07
S-260	AOI 1	2685846	221830	unconfined	-13.02	1	-0.87	-2.29	1.42
S-262	AOI 1	2685590	222045	unconfined	-12.28	1	1.42	1.00	0.42
S-263	AOI 1	2685576	221829	unconfined	-12.84	1	0.86	0.46	0.40
S-268	AOI 1	2686298	224224	unconfined	15.14	1	4.75	4.99	-0.24
S-269	AOI 1	2685044	222590	unconfined	-9.37	1	2.83	3.21	-0.38
S-270	AOI 1	2685422	222589	unconfined	-8.62	1	2.39	2.68	-0.29
S-271	AOI 1	2686090	223898	unconfined	-8.55	1	4.59	4.57	0.02
S-273	AOI 1	2686121	223810	unconfined	-9.19	1	5.39	4.41	0.98
S-274	AOI 1	2686114	223761	unconfined	-9.59	1	4.64	4.33	0.31
S-275	AOI 1	2686107	223710	unconfined	-9.95	1	4.60	4.24	0.36
S-276	AOI 1	2686101	223661	unconfined	-10.32	1	3.20	4.14	-0.94
S-277	AOI 1	2686071	223444	unconfined	-11.4	1	3.96	3.63	0.33
S-280	AOI 3	2682599	220966	unconfined	-1.27	1	2.32	2.11	0.21
S-281	AOI 3	2683656	221049	unconfined	-10.13	1	1.41	2.51	-1.10
S-282	AOI 4	2683960	220827	unconfined	-1.51	1	1.41	2.47	-1.06
S-283	AOI 3	2682503	220304	unconfined	-12.52	1	0.63	2.01	-1.38
S-284	AOI 3	2683135	220364	unconfined	-10.19	1	2.09	2.09	0.00
S-288	AOI 3	2683003	219276	unconfined	2.25	1	8.45	2.33	6.12
S-292	AOI 2	2683562	223718	unconfined	9.386	1	9.40	4.41	4.99
S-294	AOI 2	2684673	224162	unconfined	-4.88	1	5.02	5.32	-0.30

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
S-295	AOI 2	2684379	223801	unconfined	9.13	1	12.26	11.17	1.09
S-298	AOI 2	2683859	223263	unconfined	5.48	1	10.30	10.11	0.19
S-299	AOI 2	2683545	222978	unconfined	-6.23	1	2.79	3.37	-0.58
S-300	AOI 2	2684308	222830	unconfined	-6.01	1	1.45	3.73	-2.28
S-301	AOI 2	2684442	222551	unconfined	-6.94	1	3.76	3.41	0.35
S-302	AOI 2	2683251	222613	unconfined	-7.86	1	2.04	3.05	-1.01
S-303	AOI 2	2683678	222409	unconfined	-5.29	1	2.92	3.14	-0.22
S-305	AOI 2	2684883	221997	unconfined	-10.79	1	2.05	2.65	-0.60
S-306	AOI 2	2683117	222297	unconfined	-9.92	1	1.40	2.80	-1.40
S-307	AOI 2	2683508	221764	unconfined	-9.55	1	2.47	2.86	-0.39
S-308	AOI 2	2682916	221383	unconfined	5.39	1	5.35	2.38	2.97
S-309	AOI 2	2683391	221512	unconfined	-2.98	1	2.25	2.69	-0.44
S-311	AOI 2	2684448	221518	unconfined	-8.49	1	3.91	2.64	1.27
S-313	AOI 2	2683327	222420	unconfined	-7.86	1	1.97	2.97	-1.00
S-314	AOI 2	2683250	222411	unconfined	-7.9	1	1.65	2.92	-1.27
S-317	AOI 2	2683227	222440	unconfined	-8.63	1	1.70	2.93	-1.23
S-318	AOI 2	2683216	222516	unconfined	-8.19	1	1.45	2.97	-1.52
S-32	AOI 4	2684136	219917	unconfined	-0.8	1	1.70	2.62	-0.92
S-328	AOI 2	2683642	222582	unconfined	-3.53	1	2.48	3.25	-0.77
S-330	BELMONT	2685219	224246	unconfined	-4.71	1	4.79	5.33	-0.54
S-331	BELMONT	2685176	224033	unconfined	-3.32	1	6.53	5.14	1.39
S-332	BELMONT	2685110	224237	unconfined	-4.75	1	4.48	5.33	-0.85
S-333	AOI 2	2682920	222372	unconfined	-5	1	0.92	2.12	-1.20
S-335	AOI 2	2683113	222843	unconfined	-5	1	1.06	2.61	-1.55
S-336	AOI 2	2683167	222813	unconfined	-5	1	2.30	3.04	-0.74
S-337	AOI 2	2683260	223172	unconfined	-5	1	2.61	2.84	-0.23
S-338	AOI 2	2683320	223145	unconfined	-5	1	2.88	3.09	-0.21
S-346	AOI 2	2684760	222200	unconfined	-15.25	1	2.13	2.88	-0.75
S-347	AOI 2	2684712	222199	unconfined	-15.24	1	1.73	2.91	-1.18
S-348	AOI 2	2683866	222330	unconfined	-9.89	1	4.37	3.13	1.24
S-349	AOI 2	2683819	222324	unconfined	-10.73	1	2.87	3.11	-0.24
S-350	AOI 2	2684656	224223	unconfined	0	1	4.89	5.35	-0.46
S-351	AOI 2	2684319	224112	unconfined	0	1	4.82	5.34	-0.52
S-354	AOI 2	2683499	223705	unconfined	0	1	3.71	4.30	-0.59
S-355	AOI 2	2683594	223590	unconfined	5	1	3.94	4.32	-0.38
S-357	AOI 2	2683540	223357	unconfined	-7.6	1	5.72	7.85	-2.13
S-359	AOI 2	2683809	222117	unconfined	-2	1	3.07	3.04	0.03

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
S-36	AOI 4	2684276	220366	unconfined	0.41	1	1.63	2.48	-0.85
S-360	AOI 2	2684419	221893	unconfined	0	1	5.42	2.87	2.55
S-361	AOI 2	2684109	221779	unconfined	2	1	3.81	2.91	0.90
S-365	AOI 4	2683839	220855	unconfined	-11.78	1	1.48	2.48	-1.00
S-366	AOI 4	2684586	221392	unconfined	-9.49	1	1.60	2.51	-0.91
S-367	AOI 4	2684688	221274	unconfined	-14.49	1	1.67	2.39	-0.72
S-368	AOI 4	2684901	221485	unconfined	-12.55	1	1.94	2.32	-0.38
S-369	AOI 4	2685726	221204	unconfined	-10.193	1	0.61	1.55	-0.94
S-379	AOI 4	2685666	220887	unconfined	-6.76	1	1.40	2.01	-0.61
S-380	AOI 4	2685674	220596	unconfined	-8.21	1	2.02	2.22	-0.20
S-382	AOI 3	2682250	220408	unconfined	-9.9	1	3.39	2.08	1.31
S-383	AOI 3	2683142	220109	unconfined	-3.8	1	1.57	2.06	-0.49
S-384	AOI 3	2683220	220831	unconfined	-9.3	1	1.31	2.24	-0.93
S-395	BELMONT	2685991	224465	unconfined	-7.5	1	4.97	5.36	-0.39
S-396	AOI 1	2685872	223191	unconfined	-16.8	1	1.95	3.05	-1.10
S-40	AOI 4	2685637	220734	unconfined	-6.33	1	1.40	2.14	-0.74
S-402	AOI 1	2685116	223884	unconfined	-4	1	4.93	5.00	-0.07
S-403	AOI 1	2684978	222921	unconfined	-10.9	1	3.32	3.78	-0.46
S-405	AOI 1	2685608	223177	unconfined	-8.7	1	4.17	3.54	0.63
S-406	AOI 2	2683062	222569	unconfined	-5	1	2.02	2.89	-0.87
S-407	AOI 3	2683572	220866	unconfined	4.38	1	1.58	2.40	-0.82
S-41	AOI 1	2685772	221298	unconfined	-9.51	1	0.61	1.08	-0.47
S-411	AOI 3	2682483	220824	unconfined	-7.38	1	1.48	2.07	-0.59
S-413	AOI 3	2683062	220607	unconfined	-14.65	1	1.41	2.12	-0.71
S-414	AOI 3	2682403	220564	unconfined	-9.99	1	1.09	2.05	-0.96
S-415	AOI 4	2684132	220822	unconfined	-13.53	1	1.31	2.47	-1.16
S-417	AOI 1	2684867	223781	unconfined	-4.3	1	5.53	4.93	0.60
S-418	AOI 1	2685854	222337	unconfined	-16	1	0.45	1.13	-0.68
S-420	AOI 2	2682996	222512	unconfined	-5	1	2.61	2.74	-0.13
S-422	AOI 2	2682861	221880	unconfined	-10.84	1	2.58	2.52	0.06
S-423	AOI 2	2683543	223536	unconfined	-5.6	1	5.10	4.14	0.96
S-425	AOI 2	2683434	223471	unconfined	-0.6	1	3.20	3.72	-0.52
S-426	AOI 2	2683416	223382	unconfined	0.3	1	5.25	3.39	1.86
S-427	AOI 2	2683386	223305	unconfined	-1	1	5.51	3.22	2.29
S-428	AOI 3	2682724	220250	unconfined	-11.4	1	1.19	1.99	-0.80
S-429	AOI 3	2682258	220522	unconfined	-7.6	1	1.38	3.10	-1.72
S-43	AOI 1	2685816	221634	unconfined	-10.54	1	-2.28	-2.19	-0.09

*see notes on last page

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
S-430	AOI 3	2682288	220761	unconfined	-7.1	1	1.51	2.90	-1.39
S-431	AOI 3	2682232	220624	unconfined	-4	1	1.52	4.80	-3.28
S-432	AOI 3	2682256	220519	unconfined	-5.3	1	1.31	3.18	-1.87
S-433	AOI 3	2682192	220032	unconfined	-10.8	1	1.11	5.18	-4.07
S-434	AOI 3	2682610	219597	unconfined	-9.1	1	1.31	4.10	-2.79
S-435	AOI 3	2682591	219886	unconfined	-9.8	1	1.28	2.01	-0.73
S-436	AOI 3	2682814	219691	unconfined	-8.3	1	1.34	2.07	-0.73
S-437	AOI 3	2682425	220471	unconfined	-8.5	1	1.17	2.04	-0.87
S-438	AOI 3	2682240	220484	unconfined	-5.8	1	1.31	3.88	-2.57
S-439	AOI 3	2682531	220607	unconfined	-10	1	-0.10	2.04	-2.14
S-44	AOI 1	2685822	221765	unconfined	-16.79	1	-1.40	-2.43	1.03
S-452	BELMONT	2685341	224063	unconfined	-7.15	1	4.48	5.13	-0.65
S-453	BELMONT	2685445	224101	unconfined	0.7	1	4.50	5.14	-0.64
S-455	BELMONT	2685739	224211	unconfined	-8.76	1	4.55	5.16	-0.61
S-457	BELMONT	2685621	224073	unconfined	-10.35	1	4.46	5.06	-0.60
S-458	BELMONT	2686080	224498	unconfined	-7.22	1	4.97	5.37	-0.40
S-46	AOI 1	2685283	222077	unconfined	-16.73	1	1.46	2.09	-0.63
S-461	BELMONT	2686060	224288	unconfined	-16.71	1	4.57	5.14	-0.57
S-463	BELMONT	2685867	224426	unconfined	-10.15	1	4.83	5.34	-0.51
S-464	BELMONT	2685951	224417	unconfined	-10.03	1	4.85	5.31	-0.46
S-467	BELMONT	2685044	224061	unconfined	-3.41	1	4.69	5.19	-0.50
S-468	BELMONT	2685073	224146	unconfined	-2.74	1	4.30	5.26	-0.96
S-469	BELMONT	2686174	224362	unconfined	-10.94	1	4.50	5.19	-0.69
S-472	AOI 2	2684845	224193	unconfined	-3.47	1	4.58	5.33	-0.75
S-50	AOI 1	2685881	222241	unconfined	-4.77	1	0.32	0.64	-0.32
S-51	AOI 1	2685939	222520	unconfined	-11.82	1	0.70	1.44	-0.74
S-53	AOI 2	2684179	222279	unconfined	-7.96	1	3.02	3.11	-0.09
S-57	AOI 4	2683745	220383	unconfined	-3.87	1	1.64	2.42	-0.78
S-60	AOI 3	2683756	221051	unconfined	-4.744	1	1.43	2.53	-1.10
S-61	AOI 2	2683869	221701	unconfined	-6.698	1	2.33	2.90	-0.57
S-63	AOI 2	2683223	222269	unconfined	-4.05	1	1.49	2.86	-1.37
S-65	AOI 2	2682948	222452	unconfined	-13.87	1	2.46	2.07	0.39
S-71	AOI 2	2683535	223178	unconfined	-8	1	3.25	3.36	-0.11
S-72	AOI 2	2683825	223836	unconfined	0.057	1	4.67	4.85	-0.18
S-74	BELMONT	2686172	224333	unconfined	-6.9	1	4.50	5.16	-0.66
S-75	BELMONT	2686144	224096	unconfined	0.23	1	4.55	4.85	-0.30
S-76	BELMONT	2685601	224035	unconfined	5.61	1	4.58	5.02	-0.44

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WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
S-77P	AOI 1	2685250	223931	unconfined	-4.1	1	4.66	5.02	-0.36
S-77SRTF	AOI 9	2678019	217724	unconfined	-11.55	1	-7.45	-2.14	-5.31
S-78	AOI 1	2684757	223423	unconfined	-1.57	1	4.71	4.51	0.20
S-78SRTF	AOI 9	2677724	216834	unconfined	-13.36	1	-8.05	-4.11	-3.94
S-79SRTF	AOI 9	2677551	215992	unconfined	-12.81	1	-4.39	-6.20	1.81
S-80	AOI 1	2685607	223707	unconfined	-0.06	1	4.70	4.56	0.14
S-81SRTF	AOI 9	2677042	216806	unconfined	-13.84	1	-8.09	-4.20	-3.89
S-82SRTF	AOI 9	2677316	217918	unconfined	-13.07	1	-0.30	-1.87	1.57
S-83	AOI 1	2686061	223399	unconfined	-6.37	1	3.81	3.50	0.31
S-83SRTF	AOI 9	2677510	218241	unconfined	-11.73	1	-0.25	-1.29	1.04
S-85	AOI 1	2686023	223173	unconfined	-7.06	1	1.84	2.52	-0.68
S-86	AOI 1	2685945	223065	unconfined	-12.5	1	1.20	2.49	-1.29
S-88	AOI 1	2686005	223039	unconfined	-9.36	1	-0.32	2.22	-2.54
S-89	AOI 1	2685989	222922	unconfined	-11.09	1	-0.15	1.96	-2.11
S-91	AOI 2	2684188	222271	unconfined	-8.7	1	3.07	3.10	-0.03
S-93	AOI 2	2683259	222338	unconfined	-10.57	1	1.60	2.88	-1.28
S-95	AOI 1	2685351	221422	unconfined	-8.39	1	1.45	1.61	-0.16
S-96	AOI 4	2684857	220719	unconfined	-5	1	3.48	2.32	1.16
S-98	AOI 1	2686257	223982	unconfined	-7.81	1	6.15	4.64	1.51
S-99	AOI 1	2686084	222766	unconfined	-12.2	1	0.98	2.05	-1.07
SW-1	AOI 5	2681673	215437	unconfined	7.19	1	1.55	1.58	-0.03
SW-2	AOI 5	2681633	215458	unconfined	-9.06	1	2.30	1.72	0.58
SW-3	AOI 5	2681565	215492	unconfined	-8.03	1	1.93	1.43	0.50
SW-4	AOI 5	2681486	215534	unconfined	7.22	1	2.39	1.40	0.99
SW-5	AOI 5	2681322	215655	unconfined	7.84	1	4.94	2.36	2.58
SWR-1	AOI 5	2681283	215697	unconfined	-5	1	2.93	2.68	0.25
SWR-2	AOI 5	2681737	215397	unconfined	-4.94	1	1.94	1.78	0.16
SWR-3	AOI 5	2681811	215359	unconfined	-1.39	1	2.45	1.81	0.64
TW-11	BELMONT	2686135	224364	unconfined	0	1	4.53	5.20	-0.67
TW-3	BELMONT	2685838	224405	unconfined	0	1	4.87	5.33	-0.46
TW-5	BELMONT	2685994	224416	unconfined	0	1	5.03	5.30	-0.27
TW-8	BELMONT	2685682	224456	unconfined	-4.63	1	4.68	5.41	-0.73
TW-9	BELMONT	2686092	224400	unconfined	0	1	4.72	5.26	-0.54
U-2	AOI 6	2681798	216694	unconfined	-5	1	2.61	3.59	-0.98
U-3	AOI 6	2681941	216811	unconfined	-5	1	4.15	4.51	-0.36
U-4	AOI 6	2682043	216875	unconfined	-5	1	4.82	5.36	-0.54
U-5	AOI 6	2681801	216801	unconfined	-5	1	0.70	3.67	-2.97

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Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
URS-1	AOI 6	2680859	216101	unconfined	-5	1	4.27	1.38	2.89
URS-3	AOI 6	2681039	216761	unconfined	-7	1	3.92	4.16	-0.24
URS-4	AOI 6	2680671	216277	unconfined	-5	1	4.04	1.42	2.62
URS-5	AOI 6	2680401	216794	unconfined	-6.06	1	2.91	1.84	1.07
V-MW-1	AOI 8	2683500	227736	unconfined	2.74	1	11.30	9.40	1.90
V-MW-10	AOI 8	2683407	228034	unconfined	2.34	1	9.55	6.70	2.85
V-MW-11	AOI 8	2683447	228107	unconfined	2.92	1	9.71	6.70	3.01
V-MW-12	AOI 8	2683544	227991	unconfined	2.38	1	10.07	6.88	3.19
V-MW-16	AOI 8	2683530	228193	unconfined	5.61	1	10.04	6.75	3.29
V-MW-2	AOI 8	2683289	227840	unconfined	3.98	1	9.10	7.97	1.13
V-MW-3	AOI 8	2683267	227930	unconfined	2.89	1	8.22	6.96	1.26
V-MW-4	AOI 8	2683376	228206	unconfined	0.2	1	9.96	6.67	3.29
V-MW-5	AOI 8	2683343	227807	unconfined	2	1	9.30	8.37	0.93
V-MW-6	AOI 8	2683352	227888	unconfined	1.76	1	9.30	7.35	1.95
V-MW-7	AOI 8	2683239	227863	unconfined	1.02	1	9.17	7.68	1.49
V-MW-8	AOI 8	2683326	227957	unconfined	0.92	1	9.38	6.81	2.57
W-1	AOI 10	2682762	223594	unconfined	-9.31	1	2.93	3.86	-0.93
W-10	AOI 10	2681973	222348	unconfined	-5.4	1	3.45	6.42	-2.97
W-11	AOI 10	2682276	222286	unconfined	-4.2	1	3.05	4.61	-1.56
W-12	AOI 10	2682078	221939	unconfined	-4.92	1	2.92	3.93	-1.01
W-14	AOI 10	2681747	222310	unconfined	-4.56	1	4.32	6.82	-2.50
W-15	AOI 10	2681624	222775	unconfined	-2.7	1	6.49	6.55	-0.06
W-16	AOI 10	2681794	221795	unconfined	-4.5	1	3.90	3.83	0.07
W-17	AOI 10	2681731	221777	unconfined	-4.93	1	3.65	4.75	-1.10
W-2	AOI 10	2681822	223350	unconfined	-4.23	1	4.60	6.47	-1.87
W-20	AOI 10	2680987	222415	unconfined	-1.16	1	6.38	7.16	-0.78
W-22	AOI 10	2680429	222466	unconfined	-2	1	5.53	5.88	-0.35
W-28	AOI 10	2682420	222857	unconfined	-8.21	1	5.06	5.32	-0.26
W-29	AOI 10	2682149	223225	unconfined	-4.91	1	4.73	6.50	-1.77
W-30	AOI 10	2681983	222661	unconfined	-6.42	1	4.95	6.43	-1.48
W-31	AOI 10	2681808	222013	unconfined	-9.574	1	4.53	6.15	-1.62
W-33	AOI 10	2680145	222385	unconfined	-2.64	1	5.95	5.33	0.62
W-34	AOI 10	2680919	222425	unconfined	-3.22	1	6.86	7.06	-0.20
W-5	AOI 10	2681651	223047	unconfined	-7	1	4.81	6.15	-1.34
W-8	AOI 10	2681884	222549	unconfined	-5.777	1	5.06	6.65	-1.59
W-9	AOI 10	2681893	222543	lower aquifer	-3.04	1	-0.94	6.63	-7.57
WP-14	AOI 5	2682199	215243	unconfined	0.12	1	1.88	2.89	-1.01

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WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
WP14-2	AOI 7	2680219	220196	unconfined	-2.37	1	-0.86	2.50	-3.36
WP16-3	AOI 5	2682402	216899	unconfined	-2.93	1	3.27	5.62	-2.35
WP-8	AOI 5	2682441	215137	unconfined	-11.02	1	1.36	2.44	-1.08
WP9-4	AOI 6	2681422	216537	unconfined	-4.2	1	4.27	4.69	-0.42
WP9-8	AOI 5	2681391	216377	unconfined	0	1	4.68	4.55	0.13
WP-A	AOI 5	2681387	215594	unconfined	-3.4	1	5.73	2.46	3.27
WP-B	AOI 5	2681311	215667	unconfined	-1.92	1	2.95	2.47	0.48
WP-D	AOI 5	2681484	215914	unconfined	-3.74	1	2.69	4.62	-1.93
WP-E	AOI 5	2681622	215986	unconfined	-2.65	1	2.47	3.05	-0.58
WPM-3	AOI 6	2682433	217085	unconfined	-7.036	1	4.85	5.64	-0.79
A-15	AOI 5	2682689	216314	unconfined	-10.21	2	4.49	3.58	0.91
B-129	AOI 6	2683018	217874	unconfined	-8.67	2	2.21	4.31	-2.10
B-162	AOI 6	2682803	217903	unconfined	-10.07	2	5.12	4.08	1.04
B-94	AOI 6	2683137	217610	unconfined	-6.79	2	3.02	4.34	-1.32
BF-100	AOI 3	2683128	219458	unconfined	-10.04	2	1.37	2.26	-0.89
C-150	AOI 7	2680607	220263	unconfined	-10	2	-7.34	2.51	-9.85
C-151	AOI 7	2680490	220255	unconfined	-15.79	2	-6.02	2.45	-8.47
C-153	AOI 7	2680514	220220	unconfined	-10	2	-7.38	2.64	-10.02
C-154	AOI 7	2680516	220189	unconfined	-13.49	2	-4.01	2.73	-6.74
C-162	AOI 7	2680324	220197	unconfined	-13.53	2	-1.63	2.47	-4.10
C-166	AOI 7	2680285	220242	unconfined	-15.74	2	0.57	1.66	-1.09
C-169	AOI 7	2680431	220267	unconfined	-17.71	2	0.92	2.27	-1.35
C-49	AOI 7	2683022	218495	unconfined	-9.66	2	4.52	4.19	0.33
N-102	AOI 8	2683870	227035	unconfined	1.59	2	11.58	8.23	3.35
N-103	AOI 8	2683660	226782	unconfined	0.56	2	11.35	8.67	2.68
N-104	AOI 8	2683420	226914	unconfined	0.96	2	11.44	9.89	1.55
N-113	AOI 8	2681733	226054	unconfined	-2.68	2	7.21	5.85	1.36
N-115	AOI 8	2682246	225824	unconfined	-4.57	2	8.38	6.70	1.68
N-138	AOI 8	2683256	227757	unconfined	0.29	2	9.17	6.43	2.74
N-139	AOI 8	2683309	227732	unconfined	0	2	9.13	6.61	2.52
N-146	AOI 8	2682830	227726	unconfined	0	2	9.56	6.22	3.34
N-150	AOI 8	2681575	224612	unconfined	-6.79	2	4.76	2.02	2.74
N-153	AOI 8	2683011	227569	unconfined	-1.96	2	9.16	6.89	2.27
N-58	AOI 8	2680455	225832	unconfined	-9.79	2	5.87	4.66	1.21
N-74	AOI 8	2680701	224898	unconfined	-6.7	2	3.06	2.01	1.05
N-84	AOI 8	2684677	226457	unconfined	0.32	2	11.68	7.15	4.53
PGW-MW-10A	PGW	2684066	225150	unconfined	-5	2	9.57	6.05	3.52

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
PGW-MW-30	PGW	2684088	225511	unconfined	-5	2	13.90	6.32	7.58
PGW-MW-31	PGW	2683688	225332	unconfined	-5	2	10.95	6.26	4.69
PGW-MW-40A	PGW	2684160	225162	unconfined	-5	2	11.93	6.05	5.88
RW-128	AOI 2	2682988	222438	unconfined	-20.2	2	0.93	2.73	-1.80
RW-2	AOI 3	2683712	220837	unconfined	-19.83	2	0.77	2.45	-1.68
RW-203	AOI 8	2683032	225154	unconfined	-5.93	2	8.73	6.27	2.46
RW-306	AOI 8	2683768	226581	unconfined	-2.78	2	10.83	8.28	2.55
RW-403	AOI 1	2686035	223262	unconfined	-26.39	2	3.52	2.95	0.57
RW-405	AOI 1	2685990	222933	unconfined	-11.5	2	-0.27	2.16	-2.43
RW-700	AOI 4	2684982	218992	unconfined	-13.752	2	2.18	3.02	-0.84
RW-701	AOI 4	2684953	218972	unconfined	-12.662	2	2.28	3.02	-0.74
RW-702	AOI 4	2684926	218951	unconfined	-12.76	2	2.17	3.02	-0.85
RW-703	AOI 4	2684902	218926	unconfined	-7.387	2	2.60	3.02	-0.42
RW-705	AOI 4	2685080	218913	unconfined	-16.09	2	2.67	3.04	-0.37
RW-706	AOI 4	2685032	218861	unconfined	-17.69	2	2.15	3.05	-0.90
RW-707	AOI 4	2685021	218852	unconfined	-14.67	2	2.18	3.05	-0.87
RW-708	AOI 4	2685001	218831	unconfined	-16.23	2	2.19	3.05	-0.86
RW-709	AOI 4	2684982	218812	unconfined	-16.48	2	2.19	3.05	-0.86
RW-710	AOI 4	2684962	218790	unconfined	-15.29	2	1.92	3.05	-1.13
RW-711	AOI 4	2684955	218782	unconfined	-19.29	2	2.23	3.05	-0.82
RW-712	AOI 4	2684936	218762	unconfined	-17.32	2	2.15	3.05	-0.90
RW-713	AOI 4	2684924	218748	unconfined	-15.41	2	2.20	3.05	-0.85
RW-714	AOI 4	2684903	218728	unconfined	-15.53	2	2.24	3.05	-0.81
RW-715	AOI 4	2684883	218706	unconfined	-18.14	2	2.22	3.05	-0.83
RW-716	AOI 4	2684864	218684	unconfined	-18.1	2	2.27	3.05	-0.78
RW-717	AOI 4	2684844	218663	unconfined	-18.14	2	2.30	3.05	-0.75
RW-809	AOI 7	2680227	220222	unconfined	-17.11	2	-2.83	1.97	-4.80
RW-810	AOI 7	2680174	220215	unconfined	-17.18	2	-1.23	2.10	-3.33
S-1	AOI 3	2683072	218593	unconfined	-5.16	2	4.15	3.57	0.58
S-11	AOI 3	2683575	218661	unconfined	-2.576	2	2.96	2.31	0.65
S-120	AOI 4	2685597	220403	unconfined	-13.53	2	2.14	2.37	-0.23
S-120DSRTF	AOI 9	2677542	215267	unconfined	-25.65	2	-8.76	-8.33	-0.43
S-121	AOI 4	2685120	220222	unconfined	-11.47	2	2.02	2.48	-0.46
S-122	AOI 4	2685443	219647	unconfined	-12.08	2	2.26	2.80	-0.54
S-123	AOI 4	2684990	219320	unconfined	-10.77	2	2.17	2.92	-0.75
S-124	AOI 4	2685004	218885	unconfined	-9.54	2	2.18	3.04	-0.86
S-137SRTF	AOI 9	2679009	215455	unconfined	-37.15	2	-9.02	-10.06	1.04

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
S-139SRTF	AOI 9	2678435	217571	unconfined	-31.35	2	-7.48	-2.34	-5.14
S-141SRTF	AOI 9	2678317	215107	unconfined	-32.26	2	-9.51	-10.06	0.55
S-142SRTF	AOI 9	2677286	214390	unconfined	-40.3	2	-9.80	-10.82	1.02
S-145SRTF	AOI 9	2677312	216695	unconfined	-33.42	2	-8.23	-4.57	-3.66
S-146SRTF	AOI 9	2676574	215869	unconfined	-26.5	2	-8.46	-6.51	-1.95
S-148SRTF	AOI 9	2676587	216239	unconfined	-21.7	2	-8.28	-5.63	-2.65
S-149SRTF	AOI 9	2676790	216796	unconfined	-21.2	2	-8.02	-4.25	-3.77
S-16	AOI 3	2683817	218965	unconfined	-14.17	2	2.35	2.46	-0.11
S-17	AOI 3	2683785	219271	unconfined	-8.15	2	2.16	2.62	-0.46
S-2	AOI 3	2683361	218077	unconfined	-5.22	2	3.24	2.96	0.28
S-20	AOI 3	2684072	218851	unconfined	-17.2	2	2.28	2.80	-0.52
S-218	AOI 4	2684501	220122	unconfined	-7.54	2	2.03	2.57	-0.54
S-219	AOI 4	2684850	219892	unconfined	-7.12	2	2.20	2.66	-0.46
S-220	AOI 4	2684262	219152	unconfined	-11.5	2	2.06	2.81	-0.75
S-221	AOI 4	2684933	219006	unconfined	-9.98	2	2.22	3.01	-0.79
S-222	AOI 4	2684862	218677	unconfined	-11.11	2	2.46	3.05	-0.59
S-223	AOI 4	2685064	218859	unconfined	-13.52	2	2.30	3.05	-0.75
S-224	AOI 4	2685158	218991	unconfined	-15.47	2	2.29	3.03	-0.74
S-23	AOI 3	2684062	218579	unconfined	-7.55	2	2.33	2.95	-0.62
S-233	AOI 4	2684874	218923	unconfined	-8.37	2	5.40	3.02	2.38
S-234	AOI 4	2684899	218762	unconfined	-8.96	2	2.01	3.04	-1.03
S-235	AOI 4	2684962	218844	unconfined	-9.79	2	2.17	3.04	-0.87
S-238	AOI 4	2685034	218917	unconfined	-10.13	2	2.23	3.04	-0.81
S-239	AOI 4	2684997	218789	unconfined	-8.81	2	2.29	3.05	-0.76
S-240	AOI 4	2684848	218980	unconfined	-9.03	2	2.08	3.00	-0.92
S-241	AOI 4	2684819	219045	unconfined	-6.91	2	2.08	2.98	-0.90
S-242	AOI 4	2684857	218813	unconfined	-5	2	2.29	3.03	-0.74
S-243	AOI 4	2684934	218722	unconfined	-5	2	2.44	3.05	-0.61
S-245	AOI 4	2684999	219051	unconfined	-5	2	2.40	3.01	-0.61
S-246	AOI 4	2685018	219005	unconfined	-15.665	2	2.78	3.02	-0.24
S-26	AOI 4	2684616	218758	unconfined	-3.24	2	2.25	3.01	-0.76
S-278	AOI 4	2684810	218753	unconfined	-11.3	2	2.22	3.03	-0.81
S-279	AOI 4	2684702	219165	unconfined	-5.64	2	2.18	2.93	-0.75
S-285	AOI 3	2683687	219690	unconfined	-7.3	2	2.60	2.63	-0.03
S-29	AOI 4	2684380	219695	unconfined	-18.17	2	2.89	2.67	0.22
S-290	AOI 3	2683623	219191	unconfined	-10.73	2	3.30	2.56	0.74
S-3	AOI 3	2683570	217784	unconfined	-7.33	2	4.29	3.69	0.60

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
S-329	AOI 4	2684779	218690	unconfined	-16.8	2	2.06	3.04	-0.98
S-370	AOI 4	2683833	219839	unconfined	-15.44	2	1.61	2.59	-0.98
S-371	AOI 4	2684295	219750	unconfined	-10.5	2	4.09	2.65	1.44
S-372	AOI 3	2683824	219317	unconfined	-12.67	2	2.13	2.63	-0.50
S-374	AOI 4	2685398	219014	unconfined	-21.8	2	2.20	3.01	-0.81
S-375	AOI 4	2685211	218828	unconfined	-21.5	2	2.18	3.05	-0.87
S-376	AOI 4	2685069	218734	unconfined	-21.5	2	2.18	3.06	-0.88
S-378	AOI 4	2685381	218658	unconfined	-22.9	2	2.22	3.03	-0.81
S-38	AOI 4	2685232	219184	unconfined	-4.05	2	2.21	2.98	-0.77
S-381	AOI 4	2684590	219563	unconfined	-8.81	2	1.92	2.74	-0.82
S-385	AOI 3	2683689	220624	unconfined	-16.8	2	1.49	2.40	-0.91
S-386	AOI 3	2683705	219789	unconfined	-12.5	2	1.34	2.62	-1.28
S-387	AOI 3	2683567	219225	unconfined	-11	2	3.14	2.56	0.58
S-39	AOI 4	2685582	220133	unconfined	-15.15	2	2.18	2.54	-0.36
S-408	AOI 4	2684259	218600	unconfined	-16.65	2	2.40	2.99	-0.59
S-412	AOI 3	2682923	220115	unconfined	-19.37	2	1.35	2.00	-0.65
S-440	AOI 4	2684591	218487	unconfined	-16.77	2	2.38	3.06	-0.68
S-448	AOI 4	2685365	218464	unconfined	-13.35	2	2.41	3.02	-0.61
S-456	BELMONT	2685266	224309	unconfined	-14.59	2	3.90	5.37	-1.47
S-465	BELMONT	2685936	224570	unconfined	-29.5	2	5.32	5.47	-0.15
S-5	AOI 3	2683838	218242	unconfined	-2.64	2	2.43	3.32	-0.89
S-74D2SRTF	AOI 9	2679122	216095	unconfined	-31.33	2	-2.04	-5.62	3.58
S-82	AOI 1	2686056	223599	unconfined	-16.4	2	4.50	4.06	0.44
V-MW-9	AOI 8	2683312	228061	unconfined	0.44	2	9.54	6.49	3.05
C-145	AOI 7	2681007	220222	unconfined	-17.64	3	1.38	2.04	-0.66
C-146	AOI 7	2680640	220255	unconfined	-17.8	3	-4.73	2.08	-6.81
C-147	AOI 7	2680517	220263	unconfined	-17.69	3	-3.83	1.90	-5.73
C-174	AOI 7	2682342	219609	unconfined	-16.89	3	0.69	2.57	-1.88
C-95	AOI 3	2682674	219113	unconfined	-20.07	3	6.64	2.89	3.75
N-109	AOI 8	2681605	226649	lower aquifer	-4.46	3	7.29	5.67	1.62
N-116	AOI 8	2682617	225844	unconfined	-3.51	3	7.47	6.94	0.53
N-130	AOI 8	2682501	225088	unconfined	-17.93	3	11.45	6.39	5.06
N-152	AOI 8	2684912	226052	unconfined	-4.41	3	11.47	6.78	4.69
N-157	AOI 8	2683283	227743	lower aquifer	-4.2	3	9.09	6.53	2.56
N-158	AOI 8	2684043	225616	unconfined	-6.47	3	11.23	6.41	4.82
N-61	AOI 8	2680588	225119	unconfined	-10.21	3	6.04	3.67	2.37
RW-200	AOI 8	2682439	224925	unconfined	-8.37	3	6.67	6.07	0.60

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							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
S-10	AOI 3	2683682	218444	unconfined	-19.17	3	2.32	2.07	0.25
S-12	AOI 3	2683521	218879	unconfined	-17.73	3	2.28	2.14	0.14
S-153	AOI 2	2683289	223237	unconfined	-16.05	3	3.24	2.87	0.37
S-441	AOI 4	2684942	218647	unconfined	-30.3	3	2.23	3.04	-0.81
S-442	AOI 4	2685250	218837	unconfined	-33.05	3	2.22	2.99	-0.77
S-443	AOI 4	2685093	218799	unconfined	-34.76	3	2.19	3.00	-0.81
S-444	AOI 4	2685451	218994	unconfined	-34.83	3	2.21	2.95	-0.74
S-445	AOI 4	2685478	219178	unconfined	-33.8	3	2.20	2.91	-0.71
S-446	AOI 4	2685468	219489	unconfined	-29.12	3	2.21	2.83	-0.62
S-447	AOI 4	2685200	219068	unconfined	-29.82	3	2.20	2.95	-0.75
S-52	AOI 1	2685894	222553	unconfined	-20.8	3	1.18	1.79	-0.61
W-23	AOI 10	2680081	222589	unconfined	-14.79	3	5.54	3.82	1.72
W-25	AOI 10	2679601	222643	unconfined	-6.97	3	4.37	2.67	1.70
A-19D	AOI 5	2683563	217563	lower aquifer	-49.36	4	-1.52	2.13	-3.65
B-48D	AOI 6	2682251	217522	lower aquifer	-46.23	4	-0.93	1.13	-2.06
BF-90D	AOI 3	2683040	218957	lower aquifer	-30.15	4	0.70	2.01	-1.31
N-114	AOI 8	2681511	226225	lower aquifer	-12.53	4	8.06	5.53	2.53
N-127	AOI 8	2682769	225193	unconfined	-21.25	4	9.28	5.48	3.80
N-70	AOI 8	2681745	227136	lower aquifer	-9.71	4	8.36	5.68	2.68
N-83	AOI 8	2681761	226828	lower aquifer	-7.73	4	6.84	5.72	1.12
PGW-MW-21	AOI 8	2682698	224771	unconfined	-15	4	8.28	4.70	3.58
RW-300	AOI 8	2681810	226710	lower aquifer	-10.17	4	7.23	5.70	1.53
S-110DSRTF	AOI 9	2676987	217259	lower aquifer	-59.73	4	-8.05	-3.23	-4.82
S-115DSRTF	AOI 9	2676755	216206	lower aquifer	-58.3	4	-8.23	-5.75	-2.48
S-119D	AOI 4	2685498	220820	lower aquifer	-48.64	4	1.31	2.30	-0.99
S-144SRTF	AOI 9	2677843	217365	unconfined	-59.2	4	-7.67	-3.00	-4.67
S-397	AOI 1	2685305	222831	unconfined	-32.4	4	1.62	3.27	-1.65
S-399	AOI 1	2685166	221521	lower aquifer	-27.2	4	1.53	2.38	-0.85
S-87I	AOI 1	2685940	223065	lower aquifer	-30.11	4	1.67	2.67	-1.00
B-133D	AOI 6	2681722	216723	lower aquifer	-58.9	5	-1.05	-0.40	-0.65
B-176	AOI 6	2680248	217068	lower aquifer	-57.13	5	-5.64	-1.46	-4.18
N-148D	AOI 8	2684030	225601	lower aquifer	-35.44	5	3.01	4.95	-1.94
N-163	AOI 8	2682715	228202	lower aquifer	-12.84	5	8.28	6.16	2.12
N-164	AOI 8	2682438	228315	lower aquifer	-5.95	5	9.57	5.99	3.58
N-19	AOI 8	2684651	226737	lower aquifer	-29.54	5	4.05	5.97	-1.92
N-21	AOI 8	2683879	226628	lower aquifer	-26.46	5	5.84	5.81	0.03
N-30	AOI 8	2685037	225825	lower aquifer	-22.3	5	4.08	5.51	-1.43

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
N-69	AOI 8	2681822	227392	lower aquifer	-11.14	5	9.34	5.61	3.73
N-9	AOI 8	2684097	227375	lower aquifer	-27.3	5	4.34	6.28	-1.94
S-106DSRTF	AOI 9	2677610	214778	lower aquifer	-81.63	5	-8.88	-9.79	0.91
S-143SRTF	AOI 9	2677280	214390	lower aquifer	-65.41	5	-9.02	-10.68	1.66
S-22	AOI 3	2684081	218842	lower aquifer	-62.59	5	-0.18	1.84	-2.02
S-280D	AOI 3	2682596	220955	lower aquifer	-37.58	5	1.41	1.69	-0.28
S-38D2	AOI 4	2685229	219163	lower aquifer	-64.16	5	0.54	2.29	-1.75
S-59D	AOI 4	2683843	221368	lower aquifer	-40.74	5	1.71	2.30	-0.59
ARCO-1D	AOI 1	2685966	221359	lower aquifer	-49.86	6	1.29	2.74	-1.45
N-73	AOI 8	2680415	225822	lower aquifer	-35.81	6	1.43	1.66	-0.23
N-75	AOI 8	2680694	224909	lower aquifer	-37.35	6	1.27	1.93	-0.66
PGW-MW-1D	PGW	2683465	224134	lower aquifer	-41.43	6	2.40	3.36	-0.96
PGW-MW-42D	PGW	2684364	225540	lower aquifer	-35.31	6	3.24	4.96	-1.72
S-118DSRTF	AOI 9	2676690	215160	lower aquifer	-78.84	6	-8.63	-8.28	-0.35
S-150SRTF	AOI 9	2675847	214743	lower aquifer	-66.3	6	-9.23	-8.69	-0.54
S-449	AOI 4	2685360	218463	lower aquifer	-72.72	6	0.15	2.09	-1.94
S-459	BELMONT	2685957	224128	lower aquifer	-41.93	6	3.05	4.33	-1.28
S-460	BELMONT	2685650	224323	lower aquifer	-43.38	6	2.96	4.39	-1.43
S-8	AOI 3	2683688	218428	lower aquifer	-63.02	6	-0.18	1.60	-1.78
S-80D	AOI 1	2685512	223710	lower aquifer	-47.26	6	3.08	3.92	-0.84
W-27	AOI 10	2679107	222626	lower aquifer	-10.83	6	2.23	2.70	-0.47
W-32D	AOI 10	2681222	222055	lower aquifer	-84.5	6	-1.16	2.73	-3.89
A-21D	AOI 5	2681388	215630	lower aquifer	-77.06	7	-4.21	-1.58	-2.63
B-132D	AOI 6	2680857	216098	lower aquifer	-74.69	7	-4.81	-1.92	-2.89
B-134D	AOI 6	2681037	216764	lower aquifer	-73.55	7	-2.64	-1.07	-1.57
BF-108	AOI 3	2683185	219701	lower aquifer	-71.04	7	0.57	1.75	-1.18
C-129D	AOI 7	2681929	220492	lower aquifer	-59.15	7	0.86	1.36	-0.50
C-134D	AOI 6	2681165	218306	lower aquifer	-63.15	7	-0.67	0.31	-0.98
C-144D	AOI 7	2680337	220108	lower aquifer	-71.86	7	-3.71	1.05	-4.76
N-147D	AOI 8	2682707	225675	lower aquifer	-50.78	7	3.72	5.02	-1.30
N-149D	AOI 8	2681583	224606	lower aquifer	-69.02	7	1.27	2.36	-1.09
N-38D	AOI 8	2680792	226897	lower aquifer	-76.23	7	0.43	2.43	-2.00
N-4	AOI 8	2683123	227945	lower aquifer	-20.59	7	9.28	6.36	2.92
PGW-MW-2D	PGW	2683918	224286	lower aquifer	-47.84	7	2.66	3.78	-1.12
PGW-MW-3D	PGW	2684691	224483	lower aquifer	-50.27	7	2.78	4.19	-1.41
PGW-MW-8D	AOI 2	2684089	223962	lower aquifer	-43.89	7	3.30	3.59	-0.29
PGW-MW-9D	AOI 2	2683834	223851	lower aquifer	-43.57	7	3.27	3.36	-0.09

*see notes on last page

Appendix A
2014 - 2019, 2021 Field Gauging and GWF Model Data
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC

WELL ID	AOI	EASTING	NORTHING	HYDROSTRATIGRAPHIC UNIT	ESTIMATED SCREEN MIDPOINT ELEVATION [FT NAVD88]	GWF MODEL LAYER[1]	GWF MODEL CALIBRATION DATASET[2]		
							APRIL 2021 OBSERVED HYDRAULIC HEAD [FT]	APRIL 2021 GWF MODEL SIMULATED HYDRAULIC HEAD [FT]	APRIL 2021 HYDRAULIC HEAD RESIDUAL [FT]
S-13	AOI 3	2683522	218892	lower aquifer	-68.46	7	-0.17	1.65	-1.82
S-138SRTF	AOI 9	2679003	215451	lower aquifer	-82.23	7	-8.23	-7.47	-0.76
S-218D	AOI 4	2684512	220118	lower aquifer	-74.15	7	0.99	2.23	-1.24
S-264D	AOI 1	2685762	221289	lower aquifer	-55.81	7	1.51	2.68	-1.17
S-284D	AOI 3	2683137	220356	lower aquifer	-68.29	7	1.04	1.85	-0.81
S-294D	AOI 2	2684682	224165	lower aquifer	-63.93	7	3.36	3.96	-0.60
S-302D	AOI 2	2683248	222607	lower aquifer	-69.95	7	1.45	2.33	-0.88
S-305D	AOI 2	2684882	221990	lower aquifer	-64.1	7	1.45	2.75	-1.30
S-388D	AOI 1	2685903	222561	lower aquifer	-58.1	7	1.56	3.18	-1.62
S-389D	AOI 1	2685876	223190	lower aquifer	-57.4	7	1.78	3.62	-1.84
S-390D	AOI 1	2685310	222830	lower aquifer	-67.2	7	1.63	3.27	-1.64
S-391D	AOI 1	2684710	223313	lower aquifer	-69.2	7	3.07	3.42	-0.35
S-392D	AOI 1	2685166	221525	lower aquifer	-54.3	7	1.55	2.64	-1.09
S-393D	BELMONT	2685996	224457	lower aquifer	-69.5	7	3.25	4.54	-1.29
S-39D	AOI 4	2685551	220138	lower aquifer	-110.1	7	-1.14	2.37	-3.51
S-454	BELMONT	2685492	224109	lower aquifer	-64.05	7	3.15	4.20	-1.05
S-462	BELMONT	2685957	224310	lower aquifer	-60.82	7	3.25	4.44	-1.19
S-466	BELMONT	2685410	224346	lower aquifer	-55.83	7	3.03	4.33	-1.30
S-46D	AOI 1	2685274	222026	lower aquifer	-55.37	7	1.91	2.84	-0.93
S-470	AOI 1	2686108	223862	lower aquifer	-54.96	7	1.97	4.17	-2.20
S-69D	AOI 3	2682399	219971	lower aquifer	-52.3	7	0.47	1.52	-1.05
S-74D1SRTF	AOI 9	2679163	216088	lower aquifer	-67.65	7	-7.97	-5.41	-2.56
S-76DSRTF	AOI 9	2678241	216807	lower aquifer	-74	7	-7.83	-4.13	-3.70
W-13	AOI 10	2682065	221929	lower aquifer	-61.84	7	-1.69	1.79	-3.48
W-19	AOI 10	2680982	222405	lower aquifer	-71.83	7	-1.30	2.36	-3.66
W-1D	AOI 10	2682756	223584	lower aquifer	-68.63	7	0.75	2.41	-1.66
W-26	AOI 10	2679592	222651	lower aquifer	-14.65	7	-2.27	2.57	-4.84

*see notes on last page

Notes:

FT = feet

FT NAVD88= feet relative to the North American Vertical Datum of 1988

GWF = Groundwater Flow

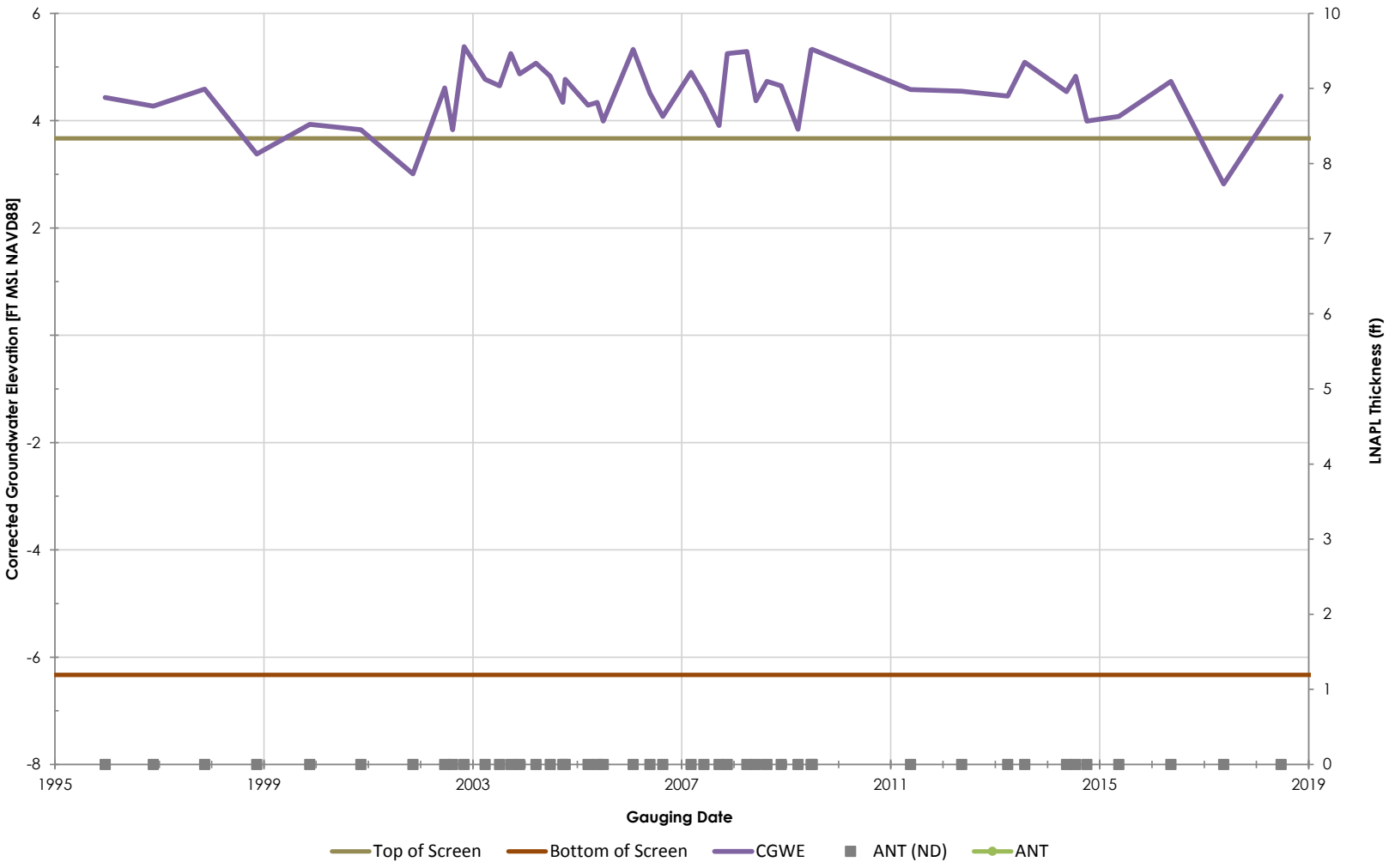
1. GWF Model layers were established using midscreen elevations.
2. Calibration/verification datasets use a filtered subset of available data collected for each year's event. The only exception is the omission of a select few well targets located along the 3 Separator Remediation System during times of active recovery.

*see notes on last page

APPENDIX B
WELL HYDROGRAPHS

Sitewide Fate and Transport Remedial Investigation Report
Part 1 – Groundwater Flow Model
Former Philadelphia Refinery
Philadelphia, Pennsylvania
Philadelphia Refinery Operations,
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue, Philadelphia, Pennsylvania

Stantec



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

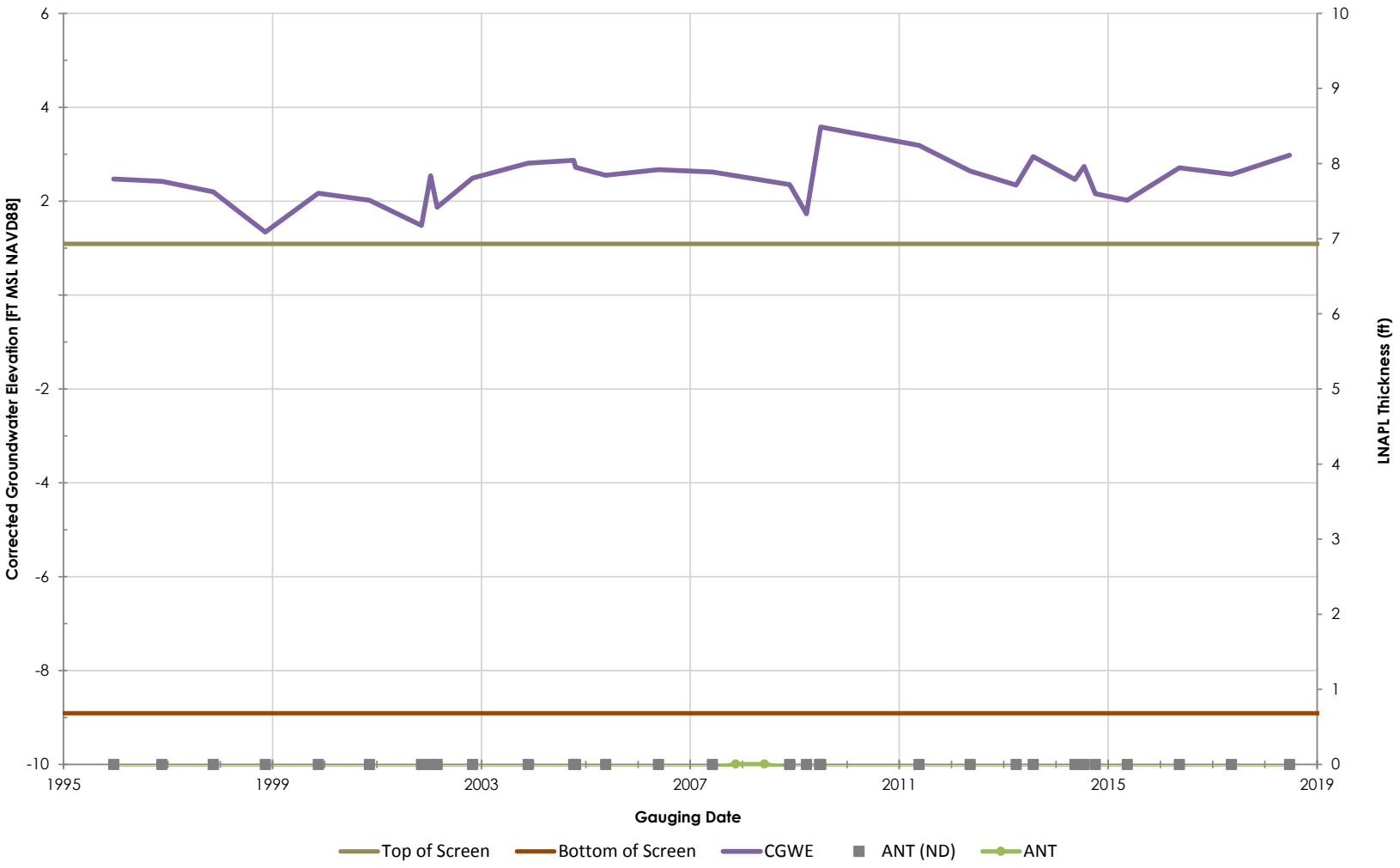
Stantec

Figure/Well No.

A-10

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

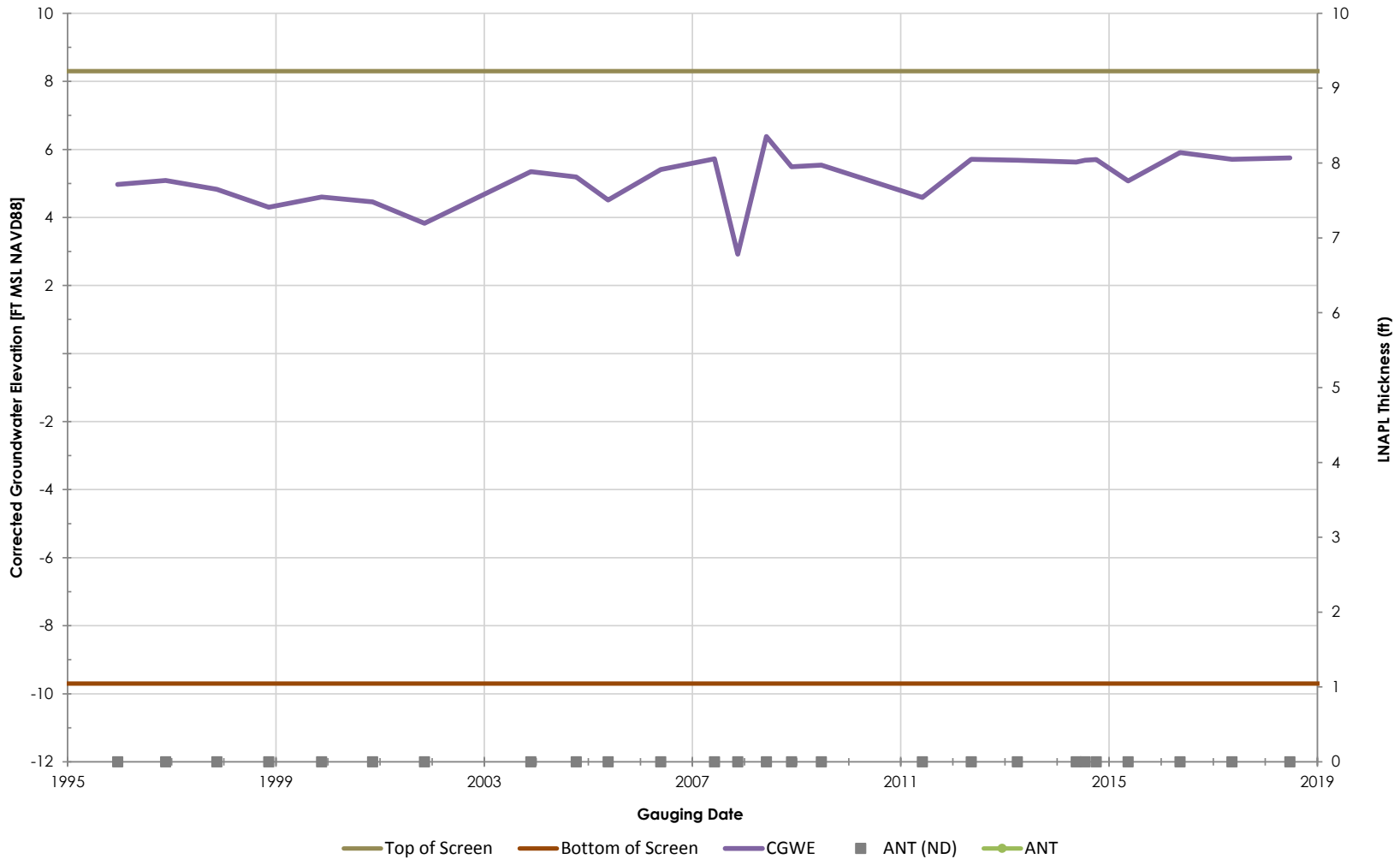
Stantec

Figure/Well No.

A-11

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

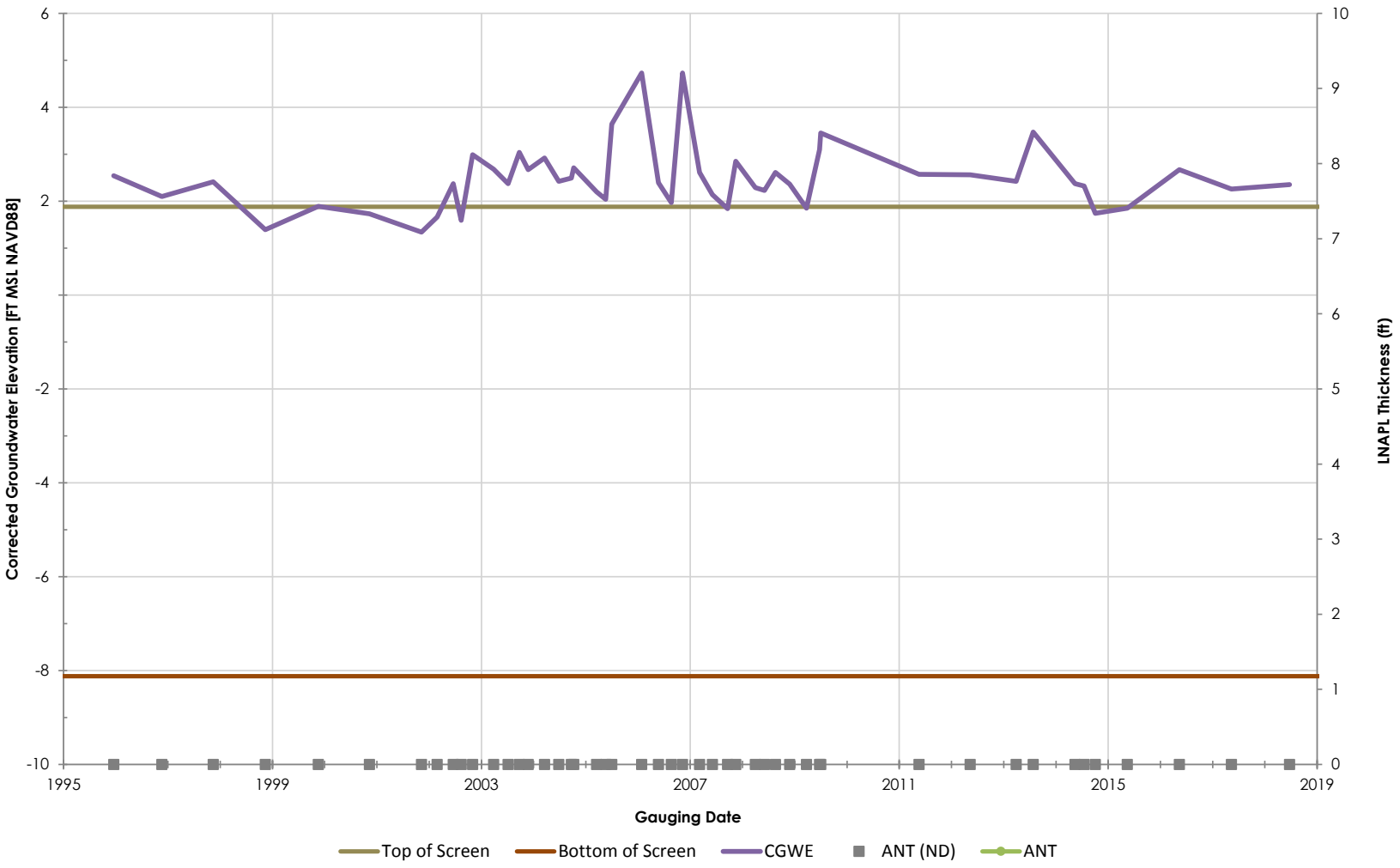
Stantec

Figure/Well No.

A-118

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

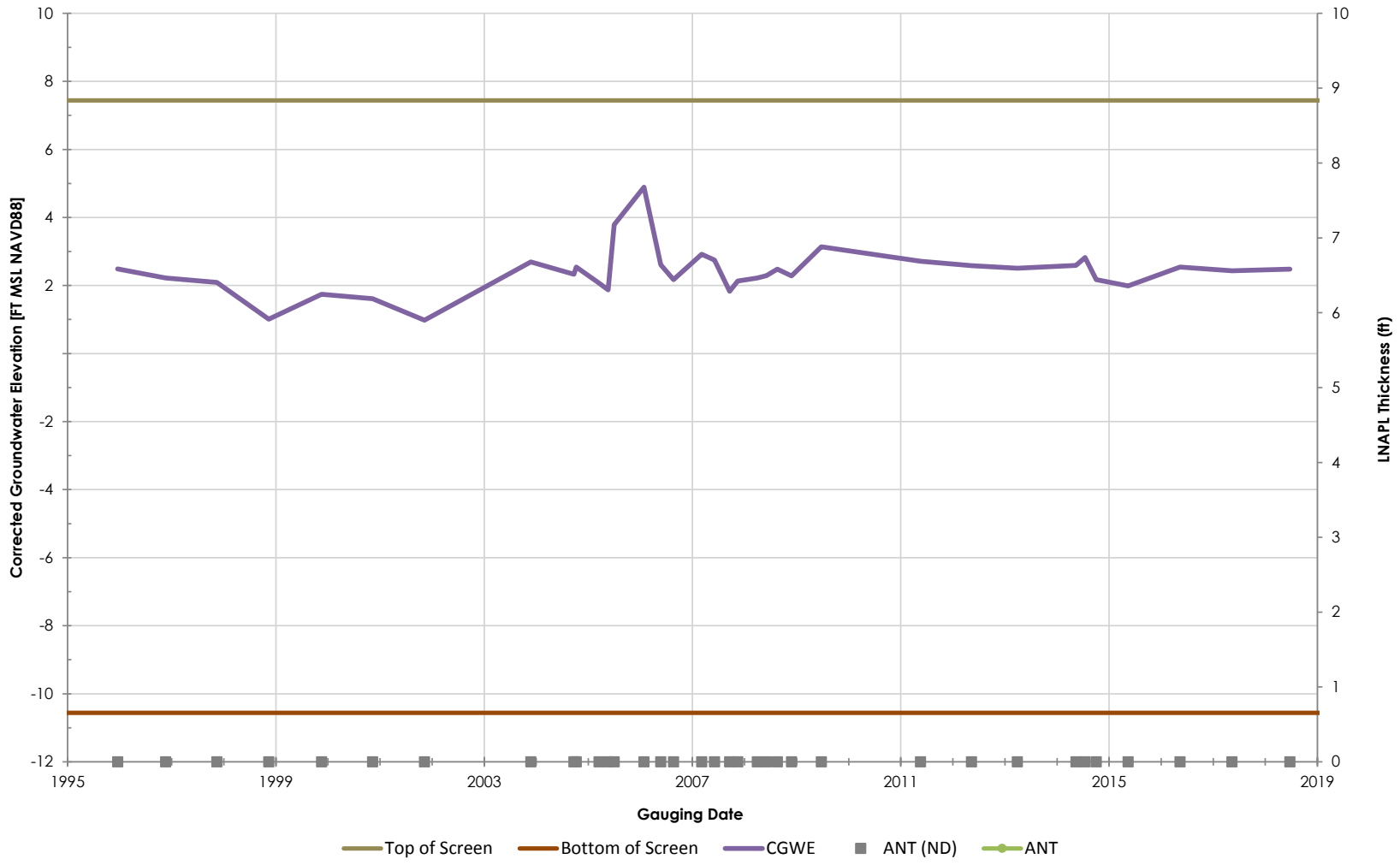
Stantec

Figure/Well No.

A-12

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

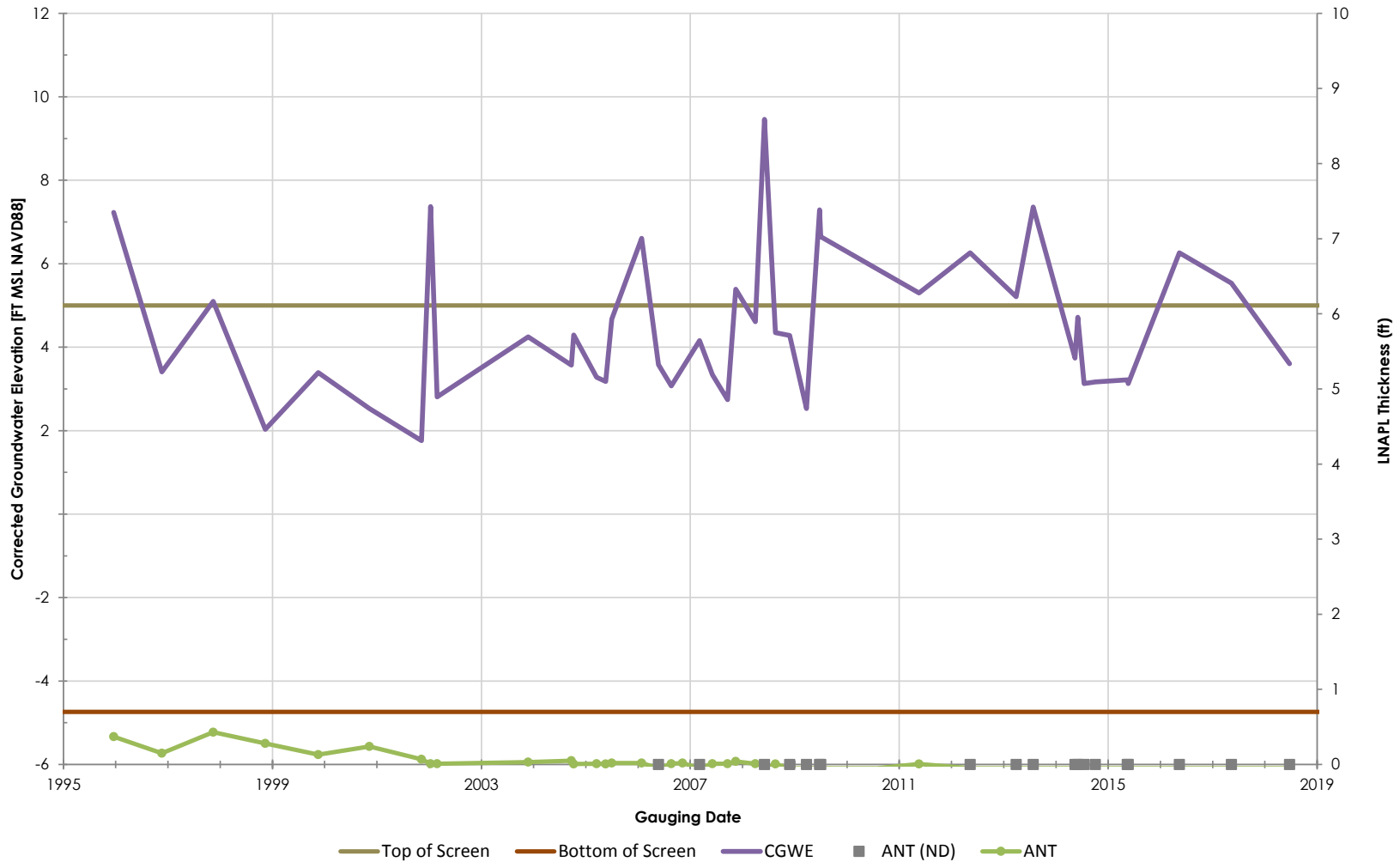
Stantec

Figure/Well No.

A-122

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

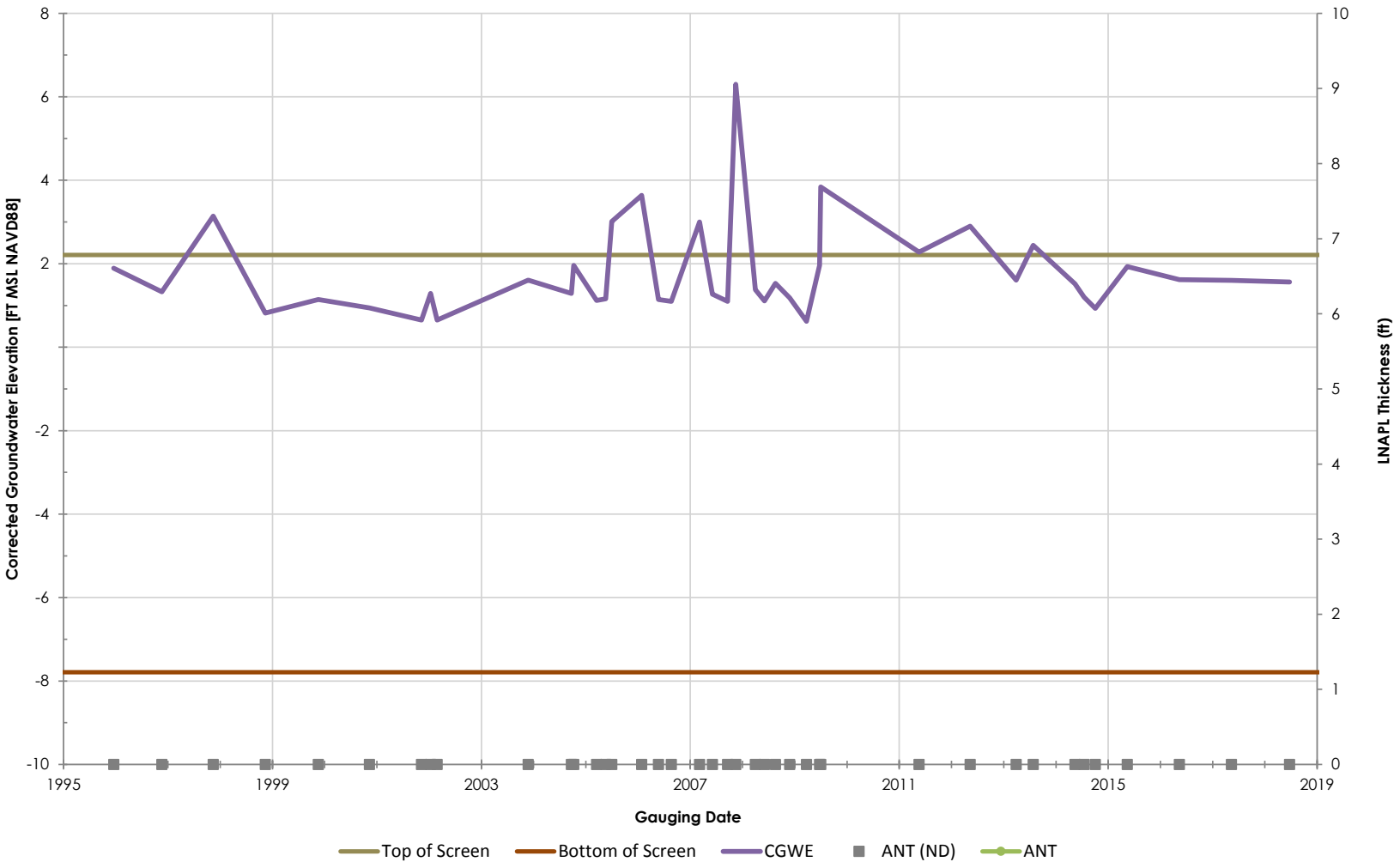
Stantec

Figure/Well No.

A-133

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

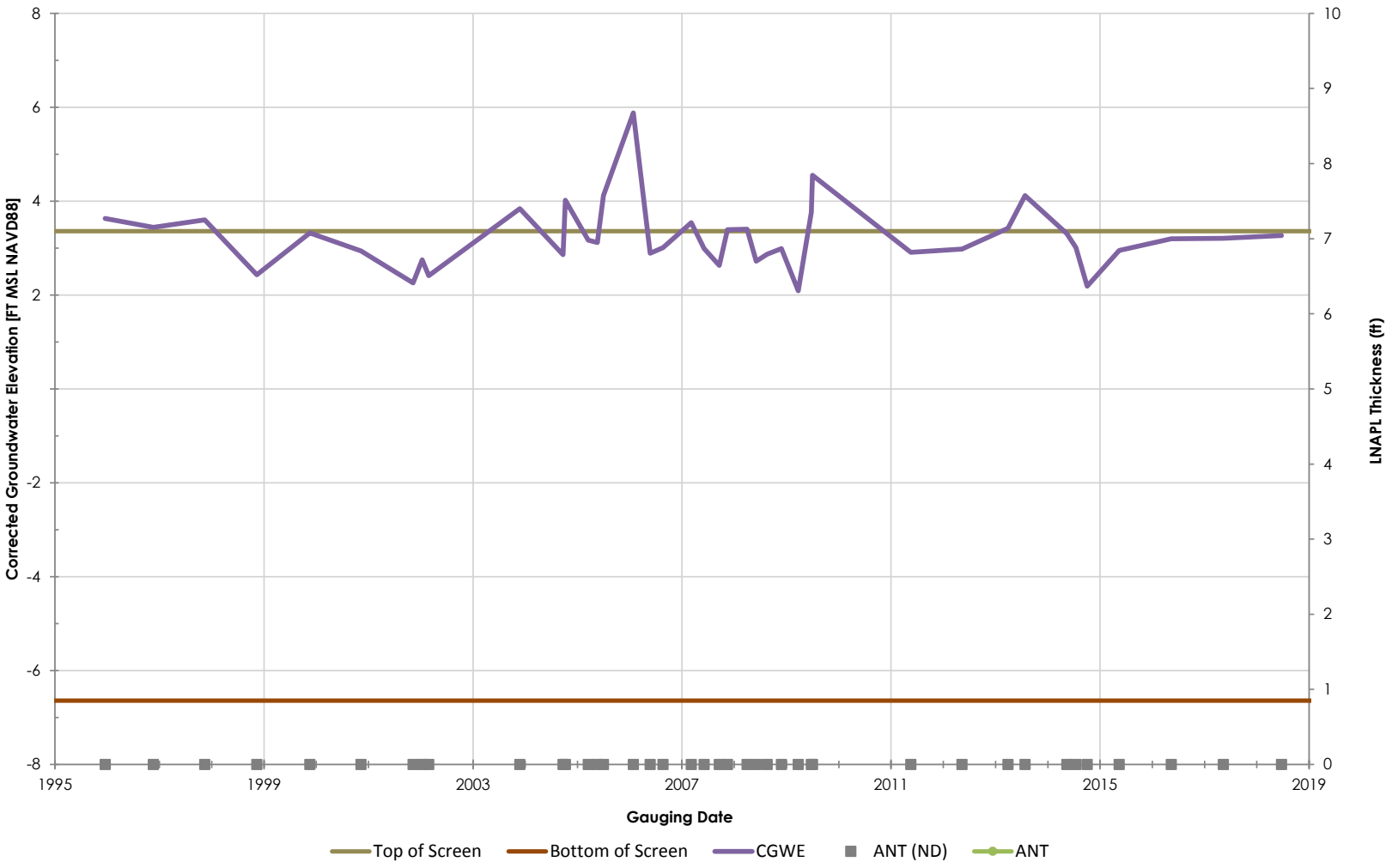
Stantec

Figure/Well No.

A-134

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

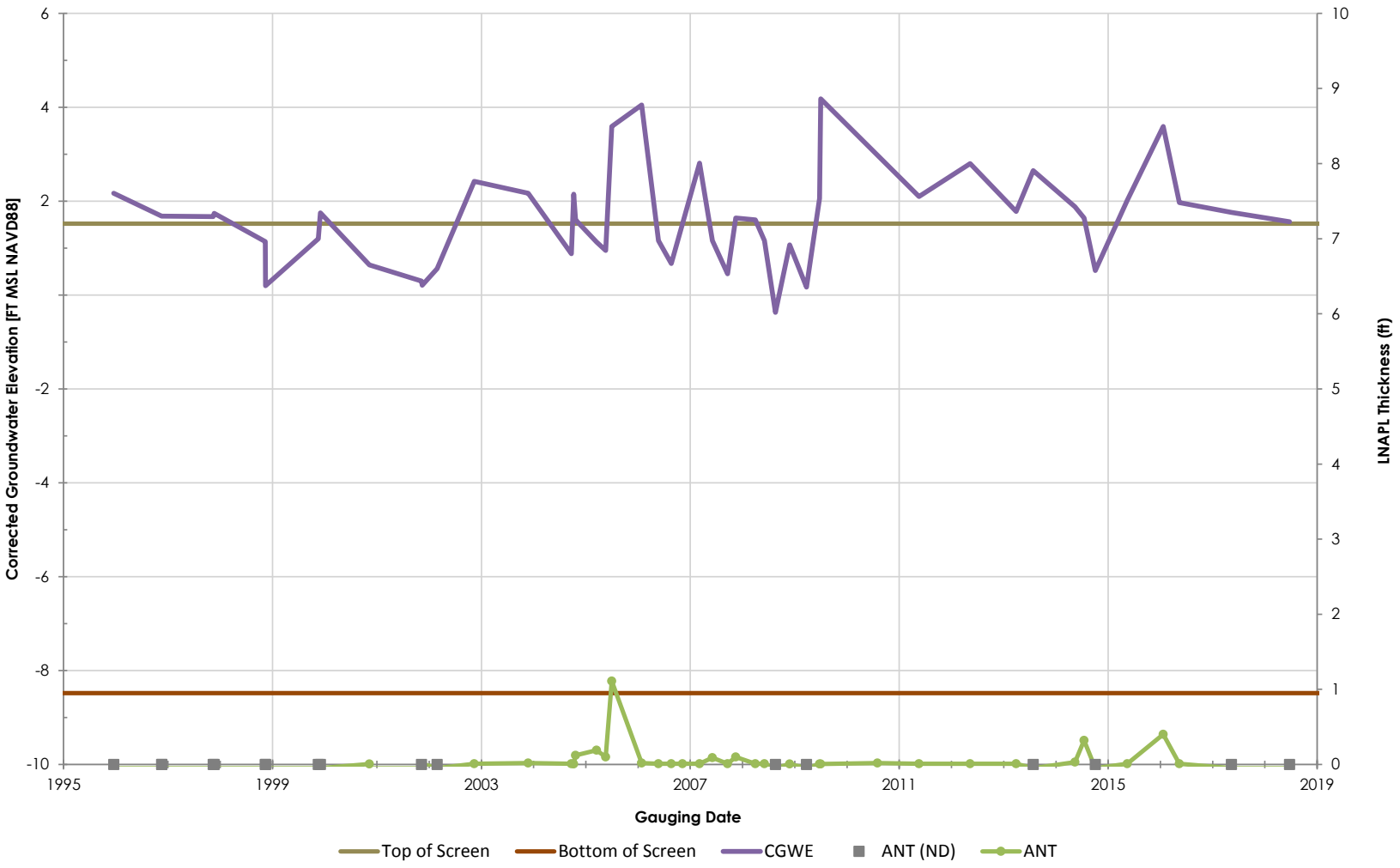
Stantec

Figure/Well No.

A-135

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



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Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

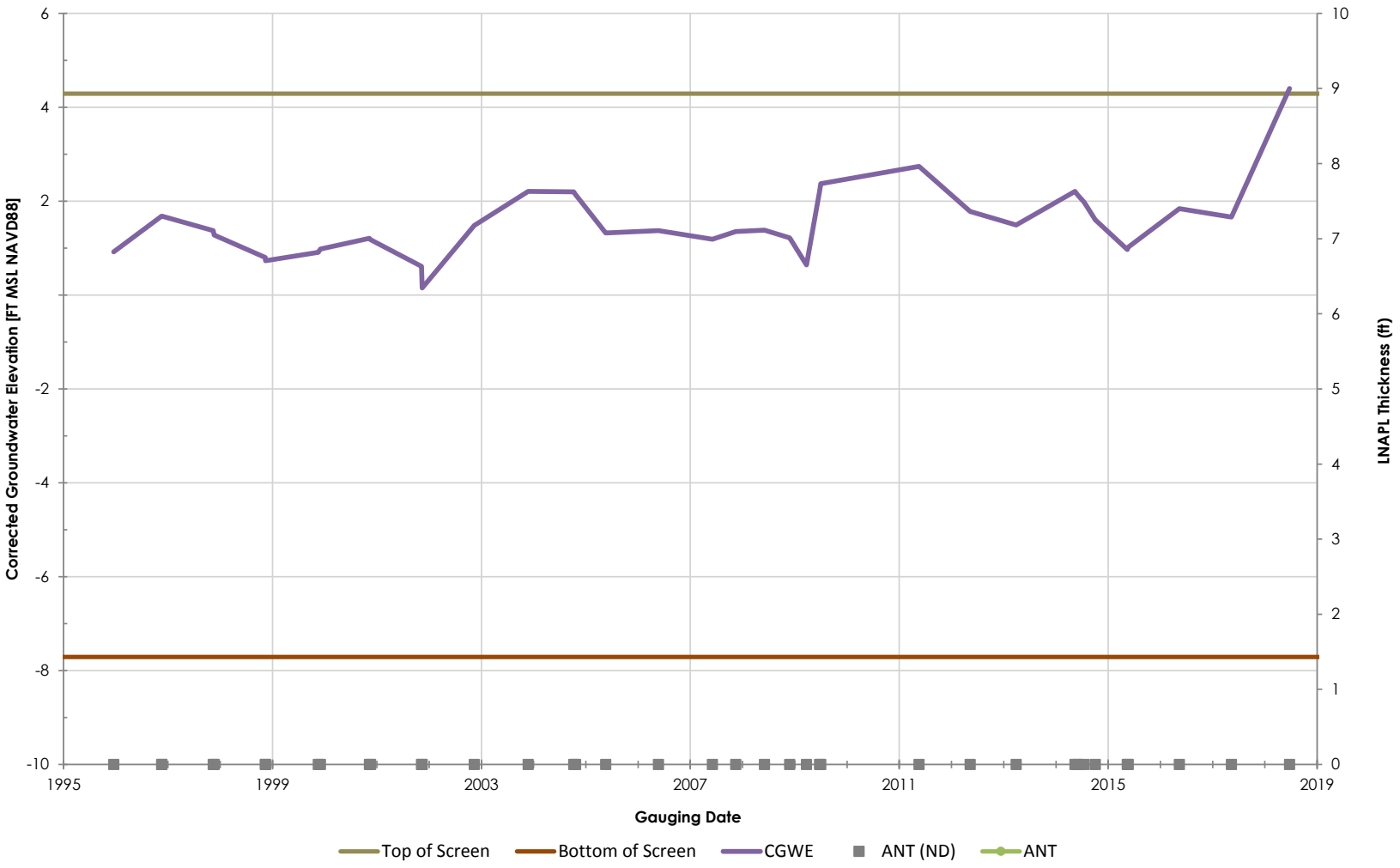
Stantec

Figure/Well No.

A-136

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

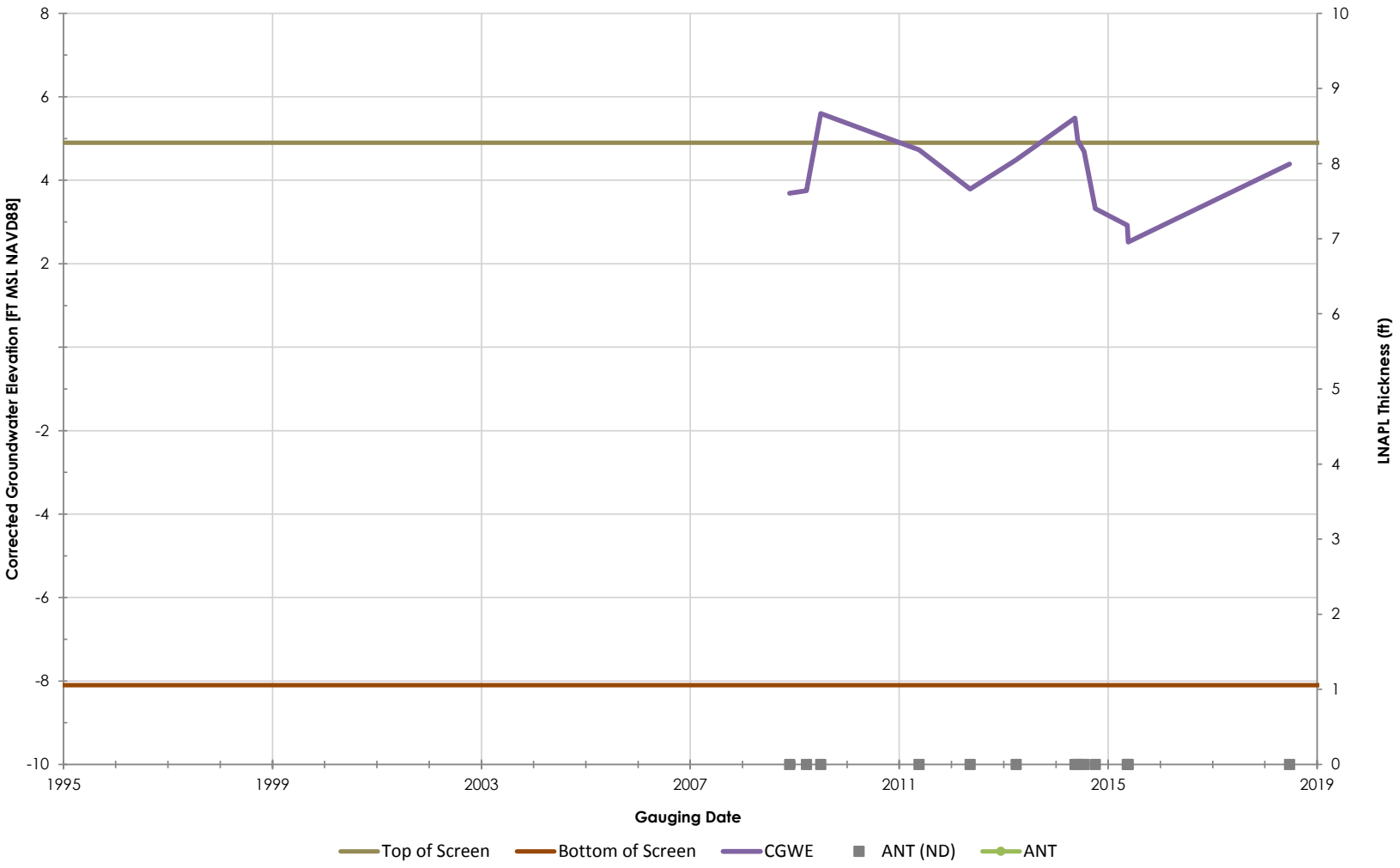
Stantec

Figure/Well No.

A-137

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

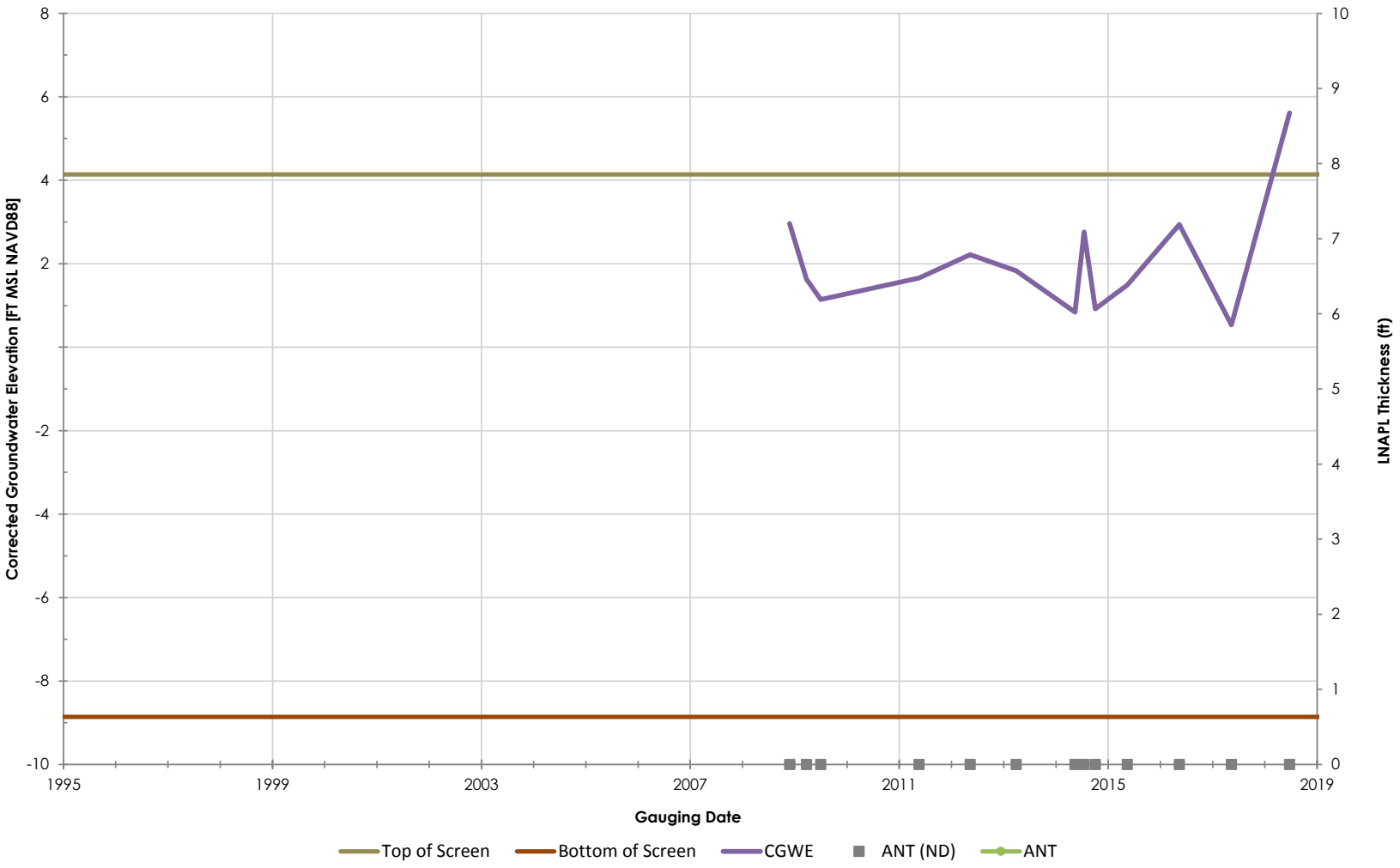
Stantec

Figure/Well No.

A-139

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

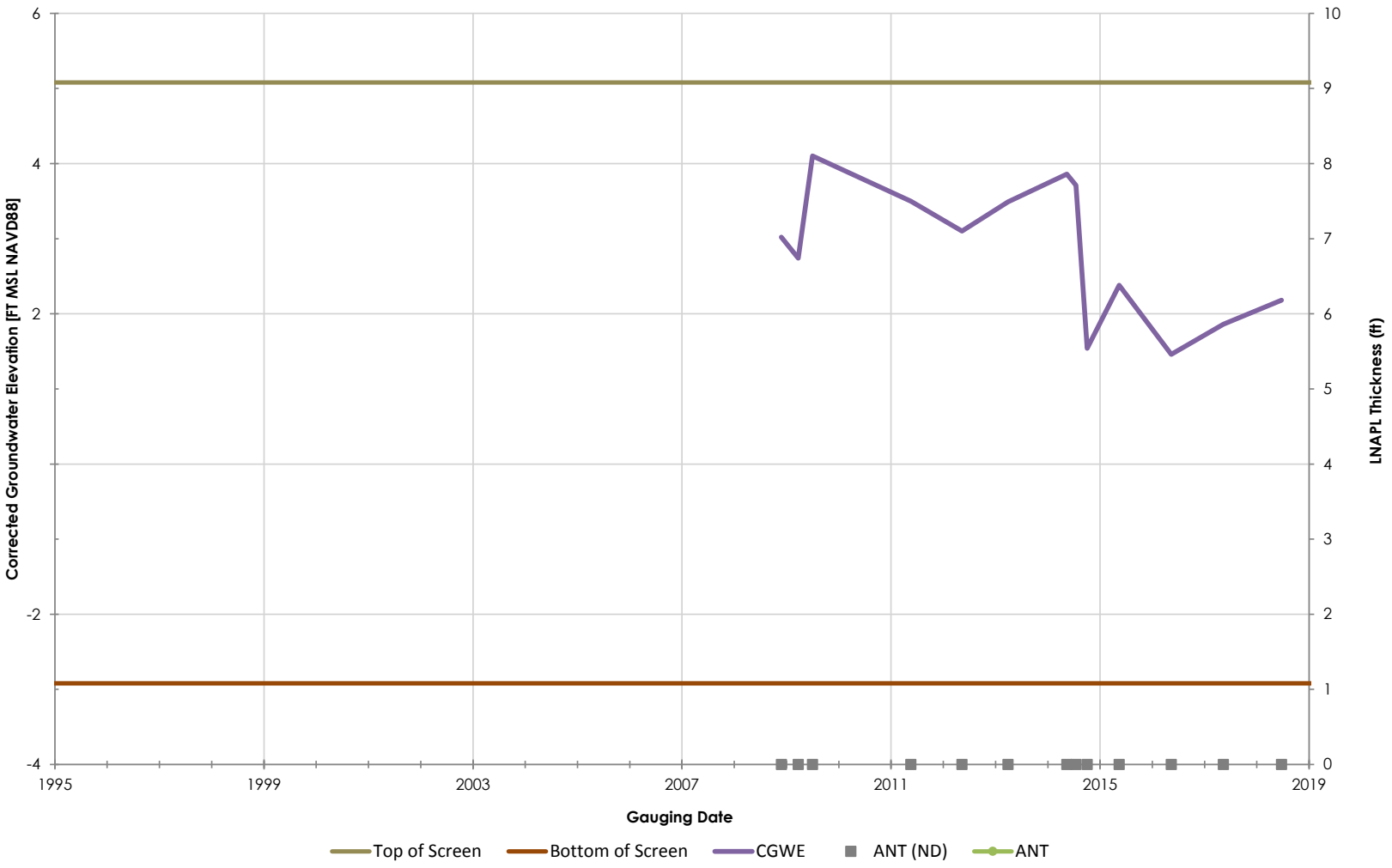
Stantec

Figure/Well No.

A-142

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

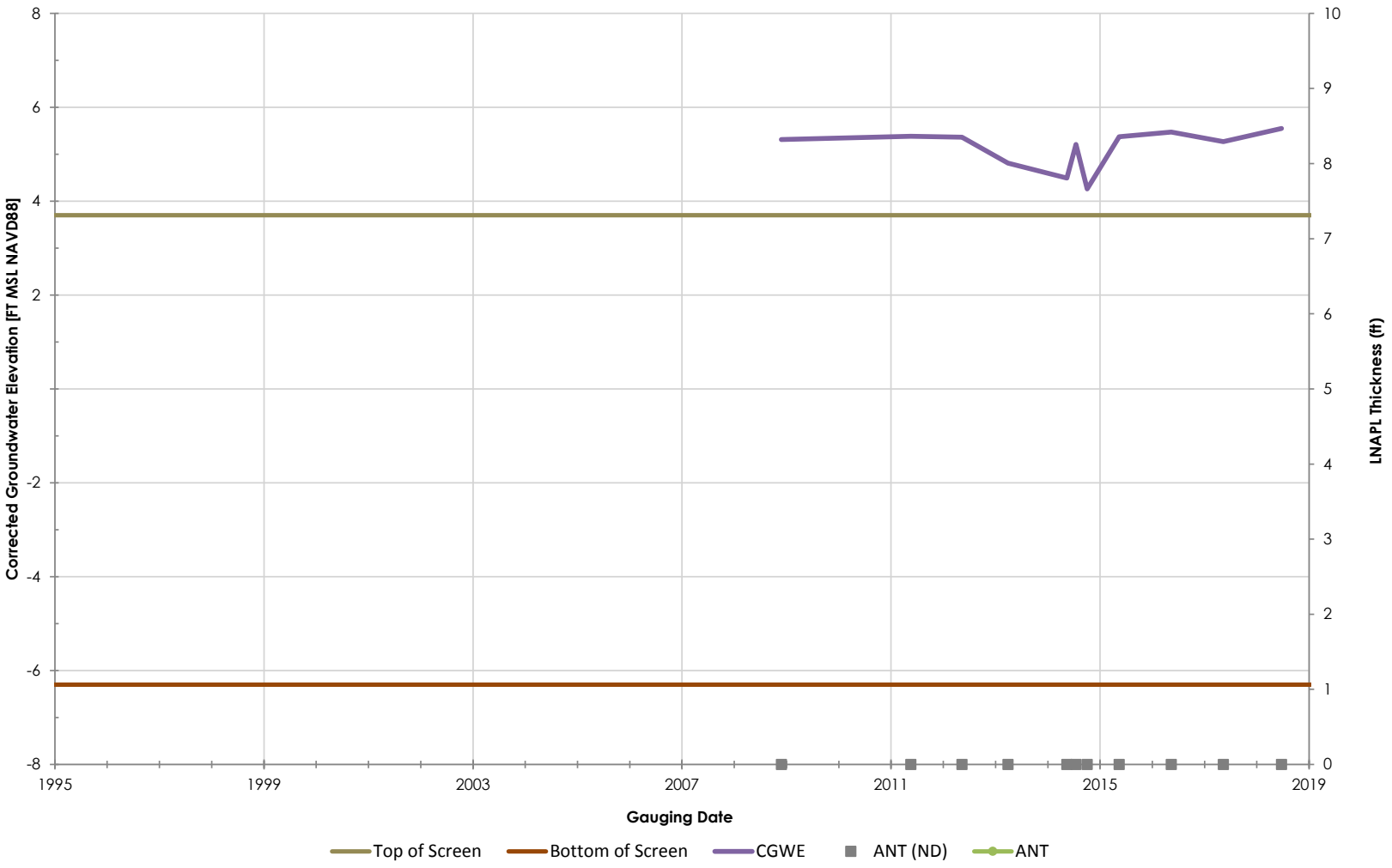
Stantec

Figure/Well No.

A-143

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

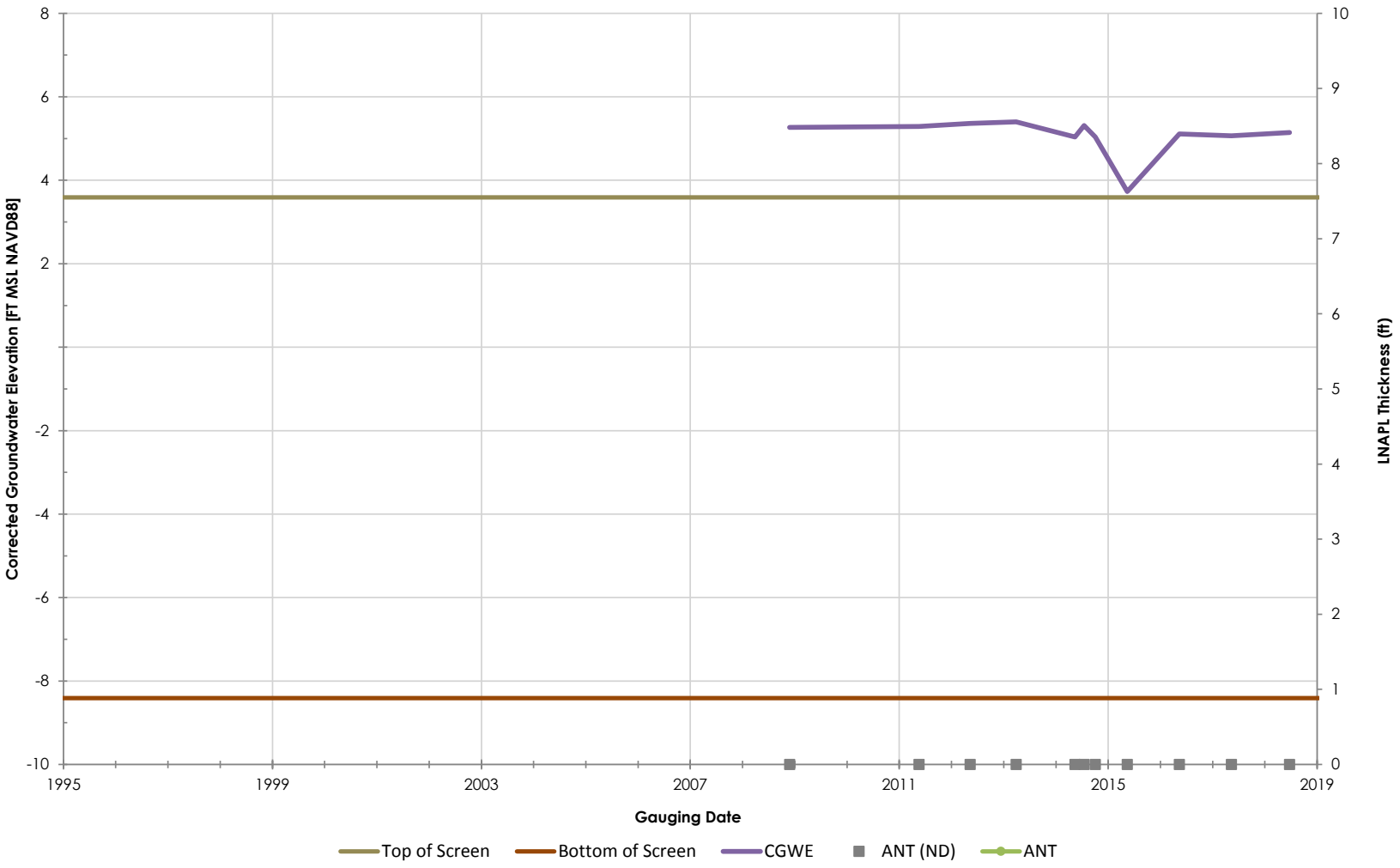
Stantec

Figure/Well No.

A-148

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

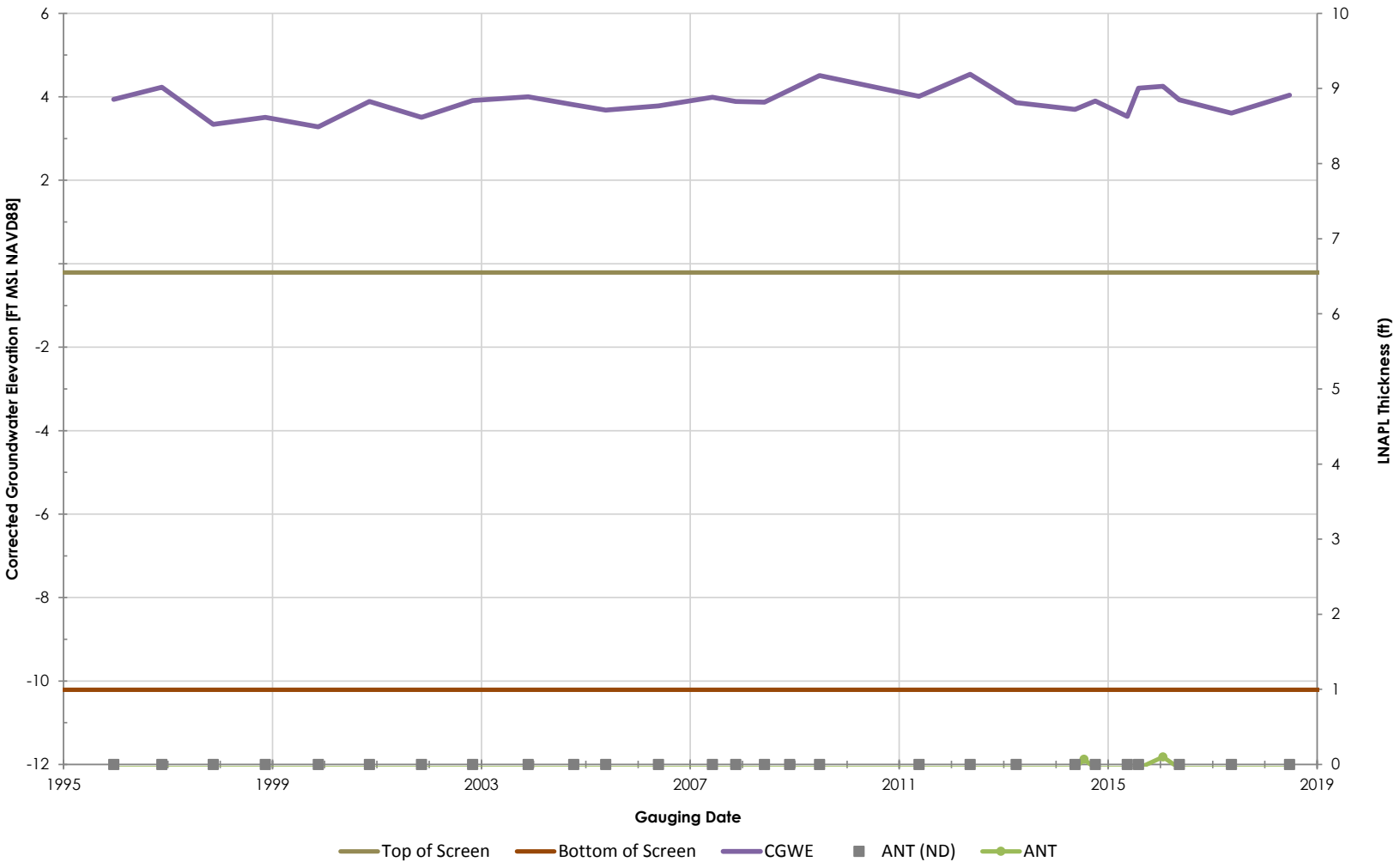
Stantec

Figure/Well No.

A-149

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

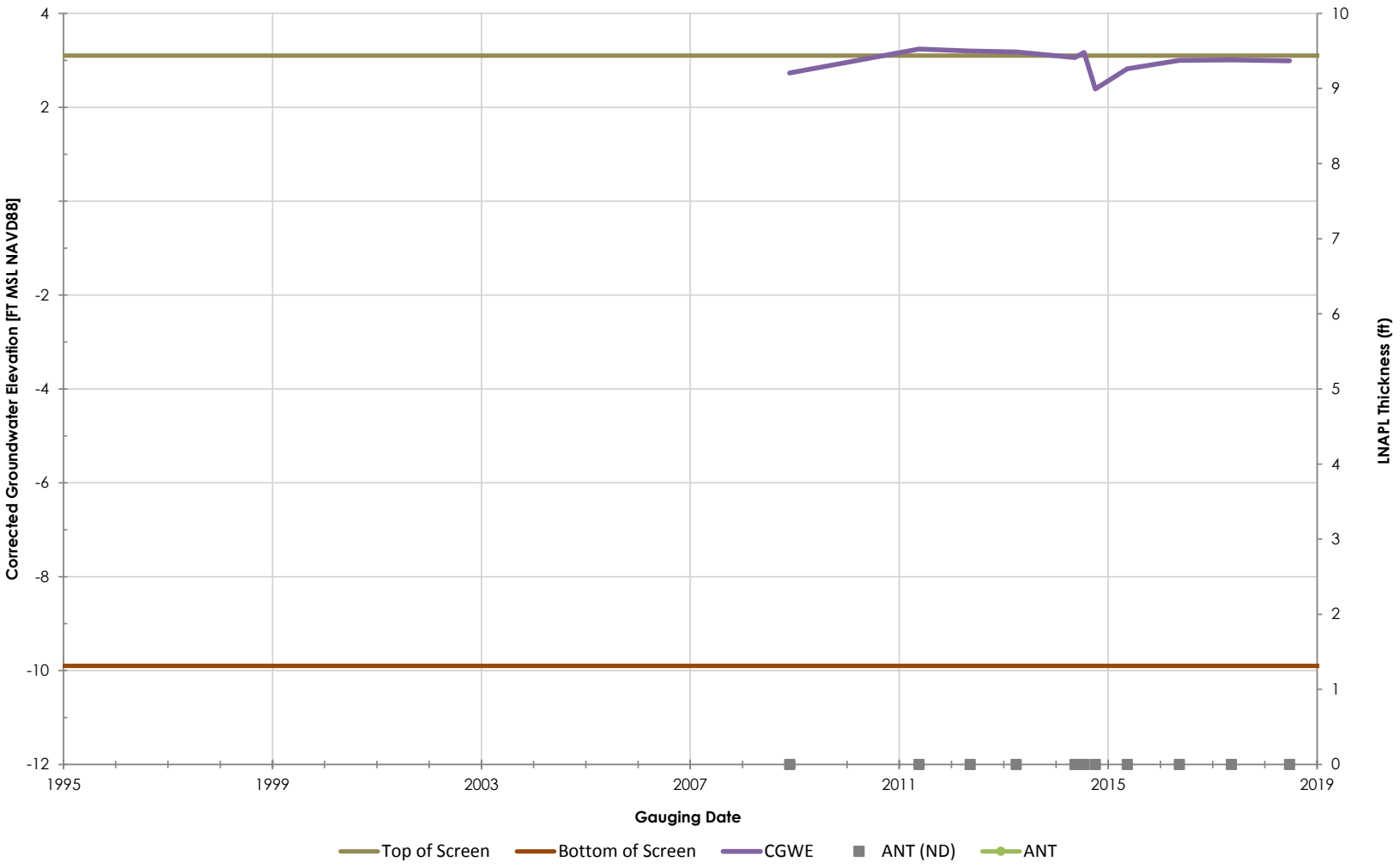
Stantec

Figure/Well No.

A-15

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

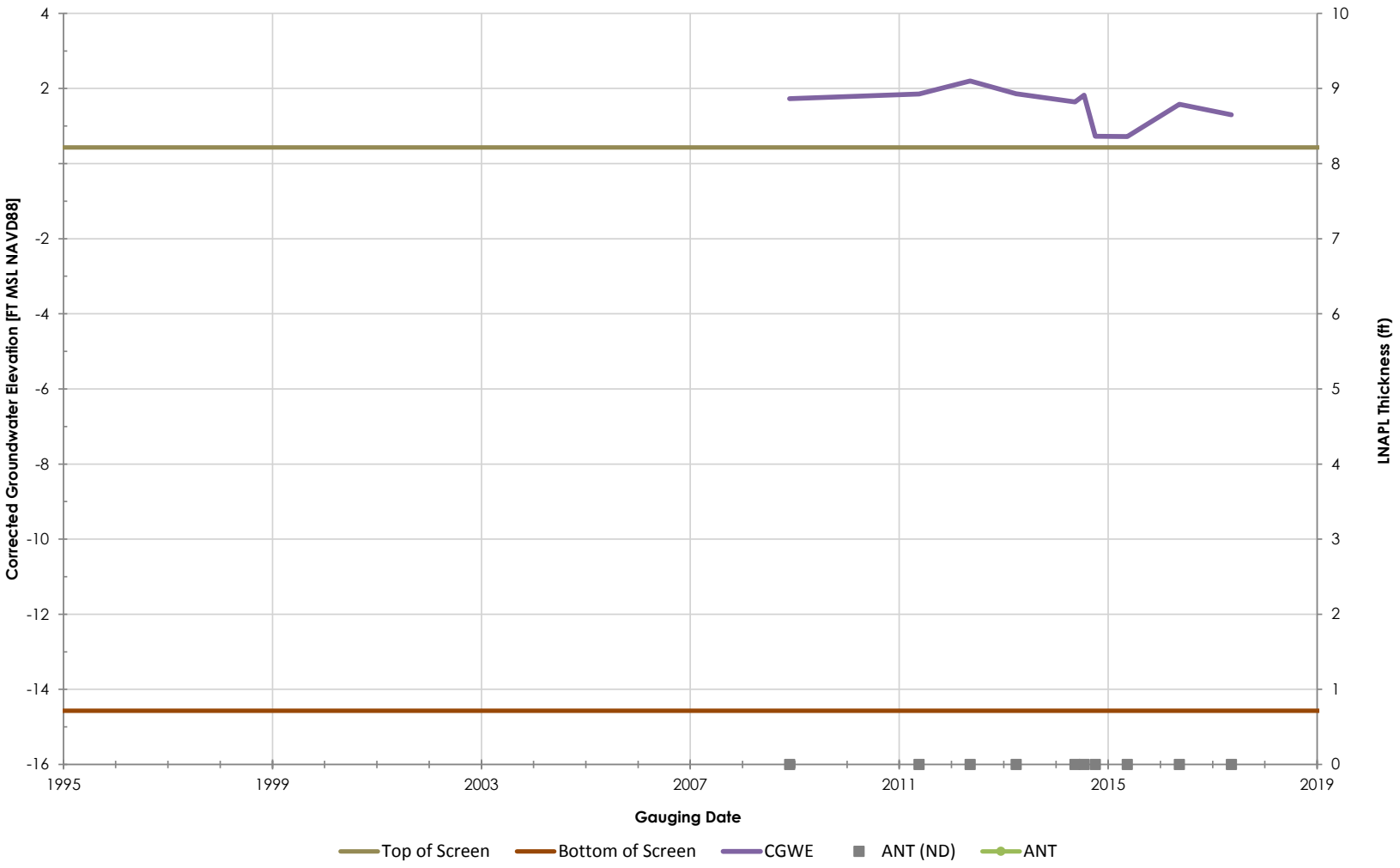
Stantec

Figure/Well No.

A-151

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

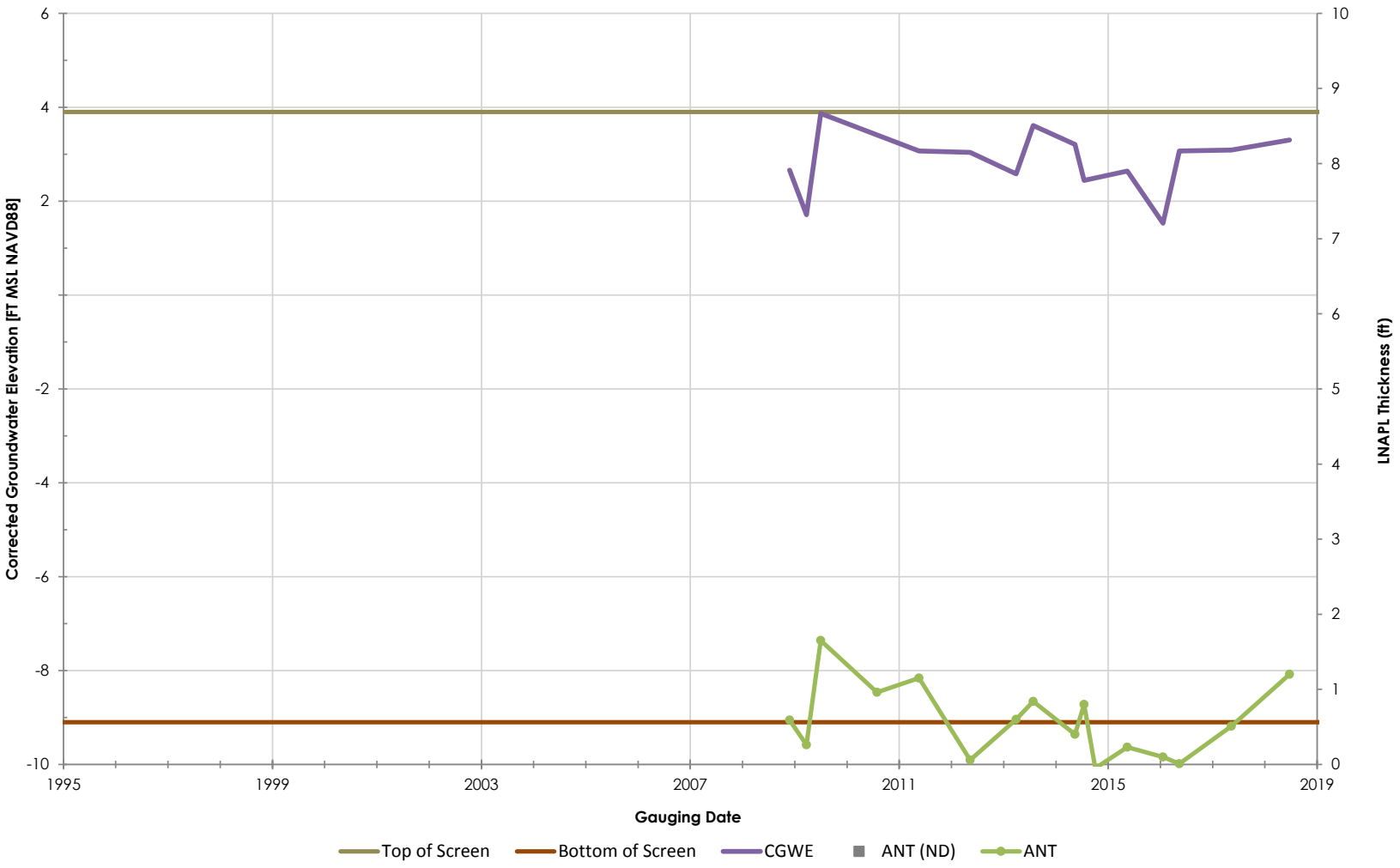
Stantec

Figure/Well No.

A-152

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

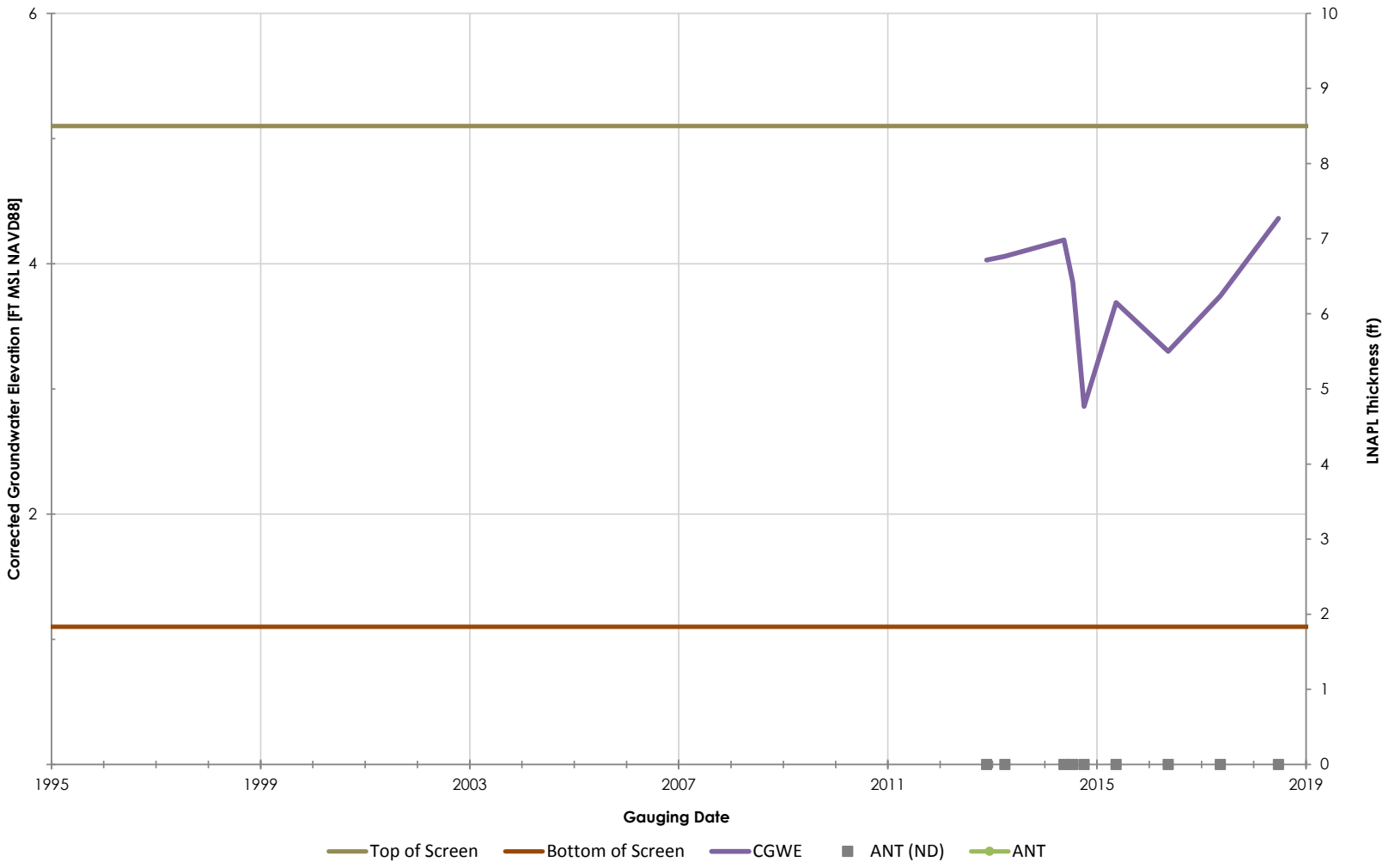
Stantec

Figure/Well No.

A-155

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

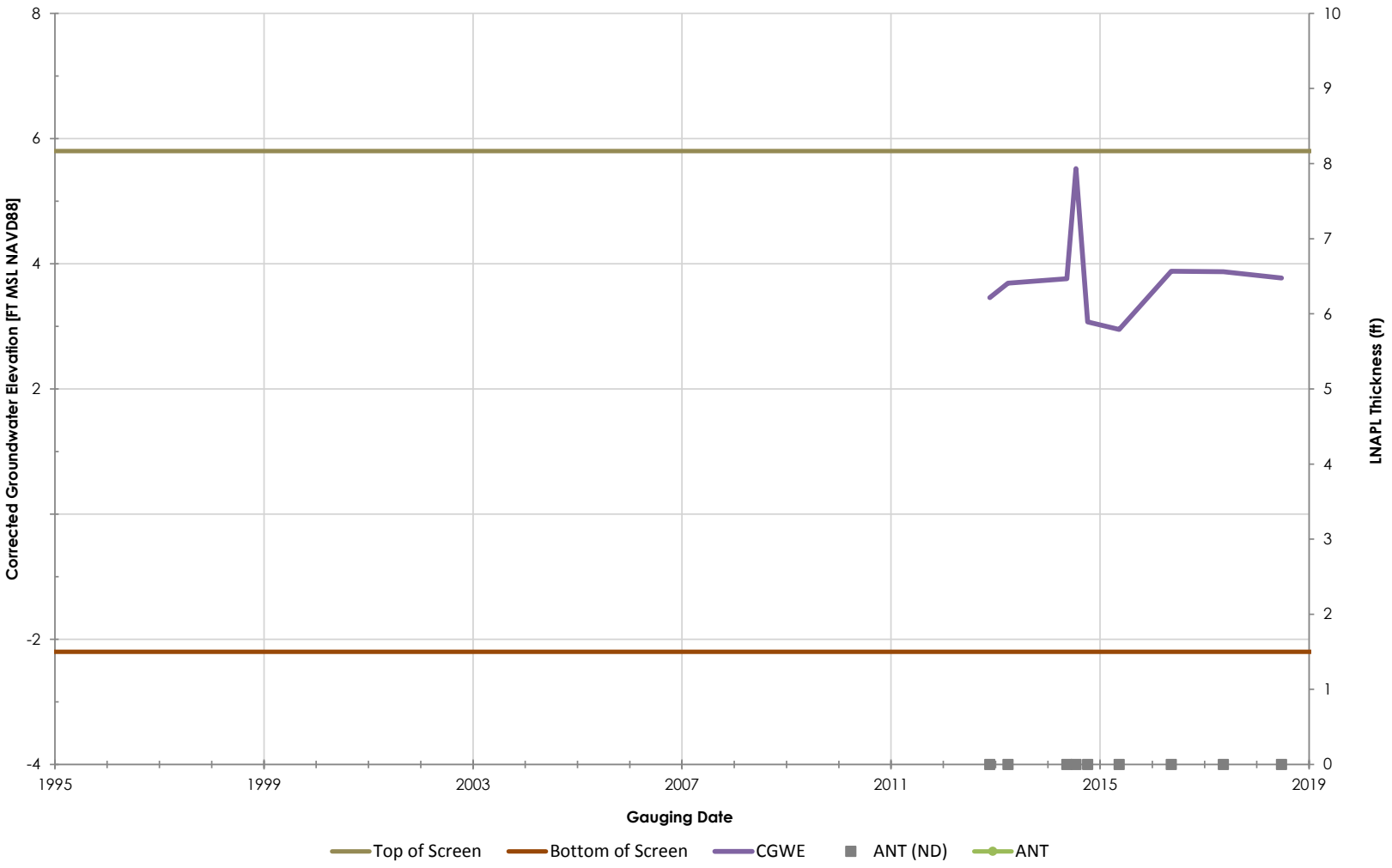
Stantec

Figure/Well No.

A-156

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

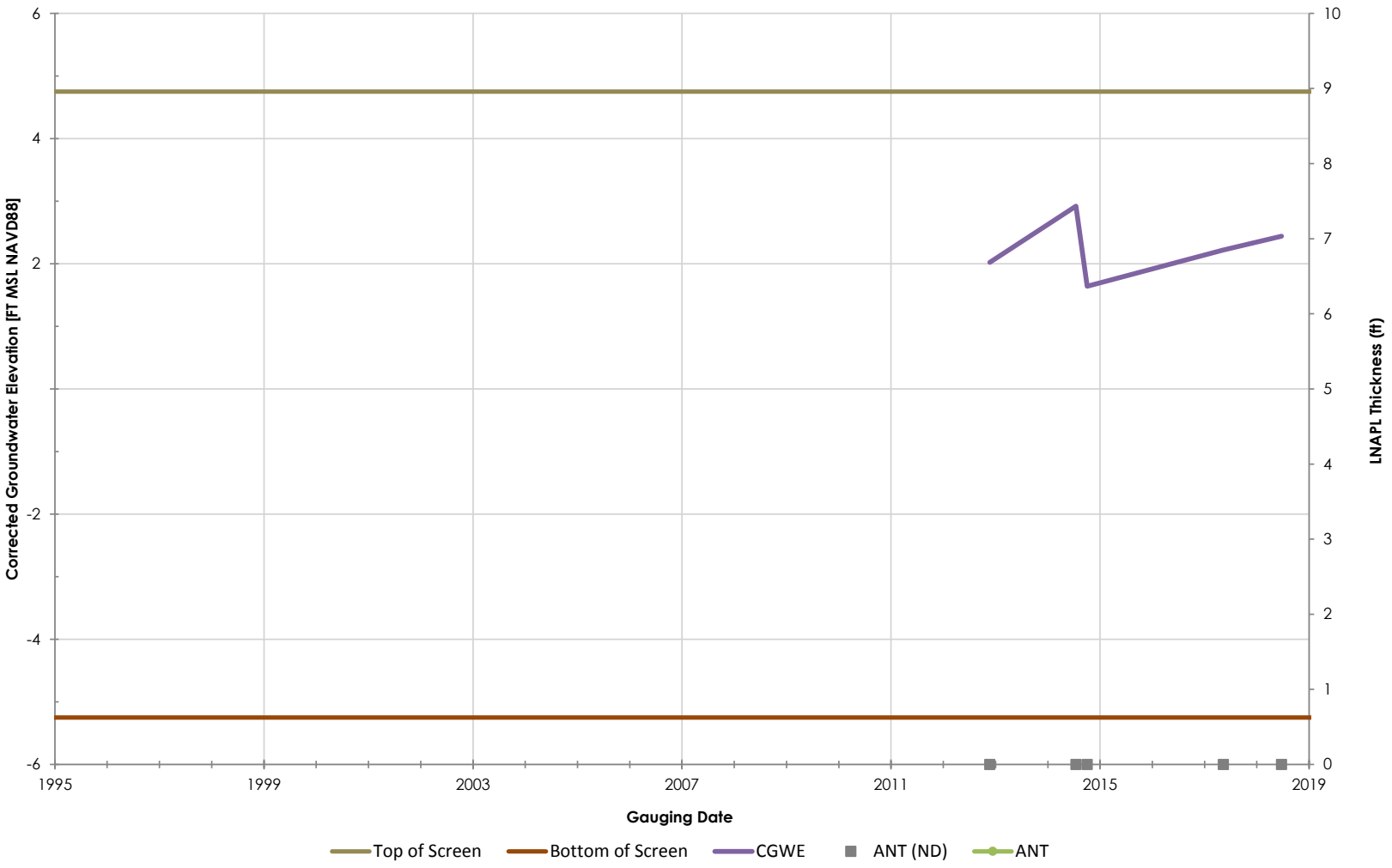
Stantec

Figure/Well No.

A-157

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

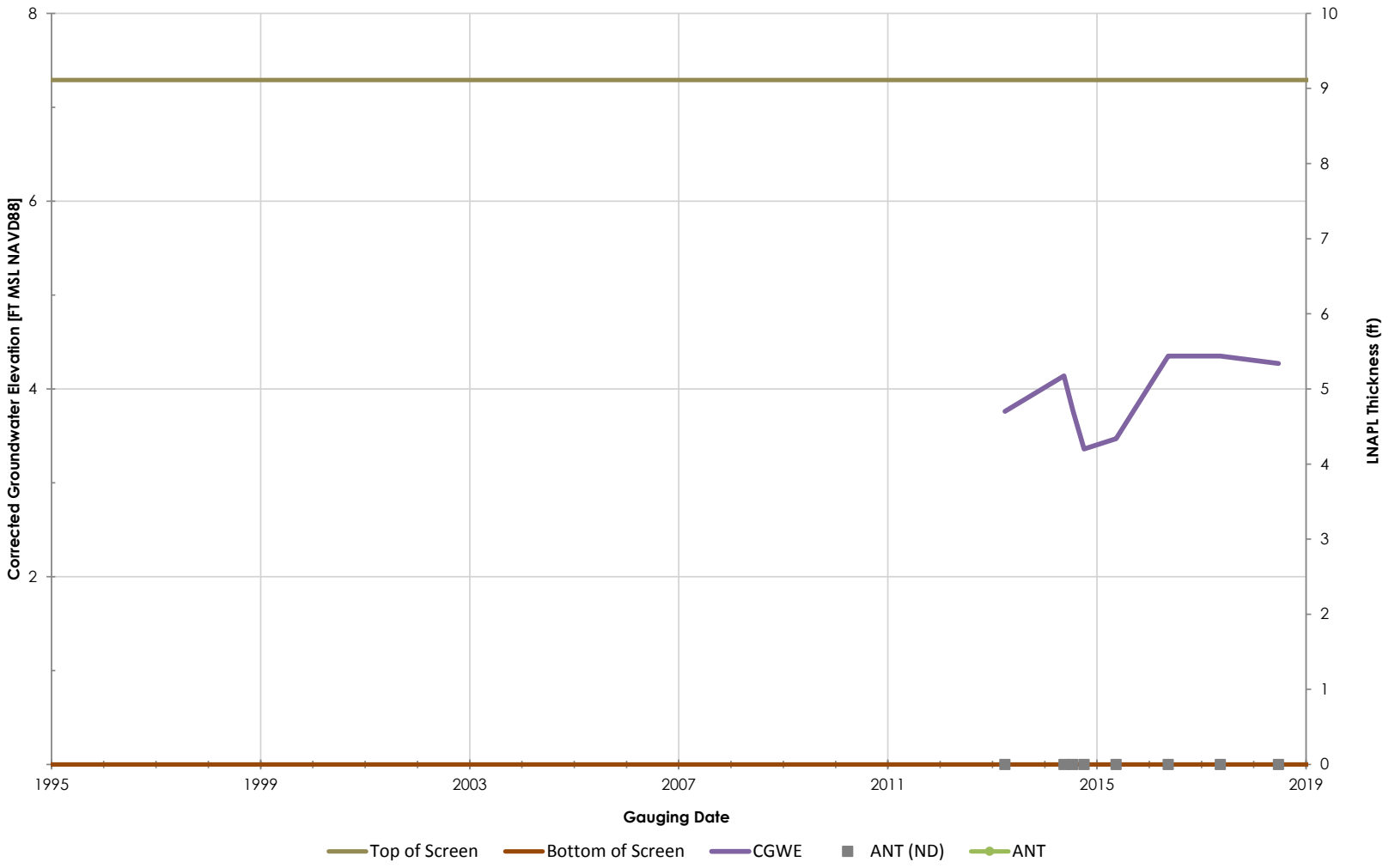
Stantec

Figure/Well No.

A-158

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

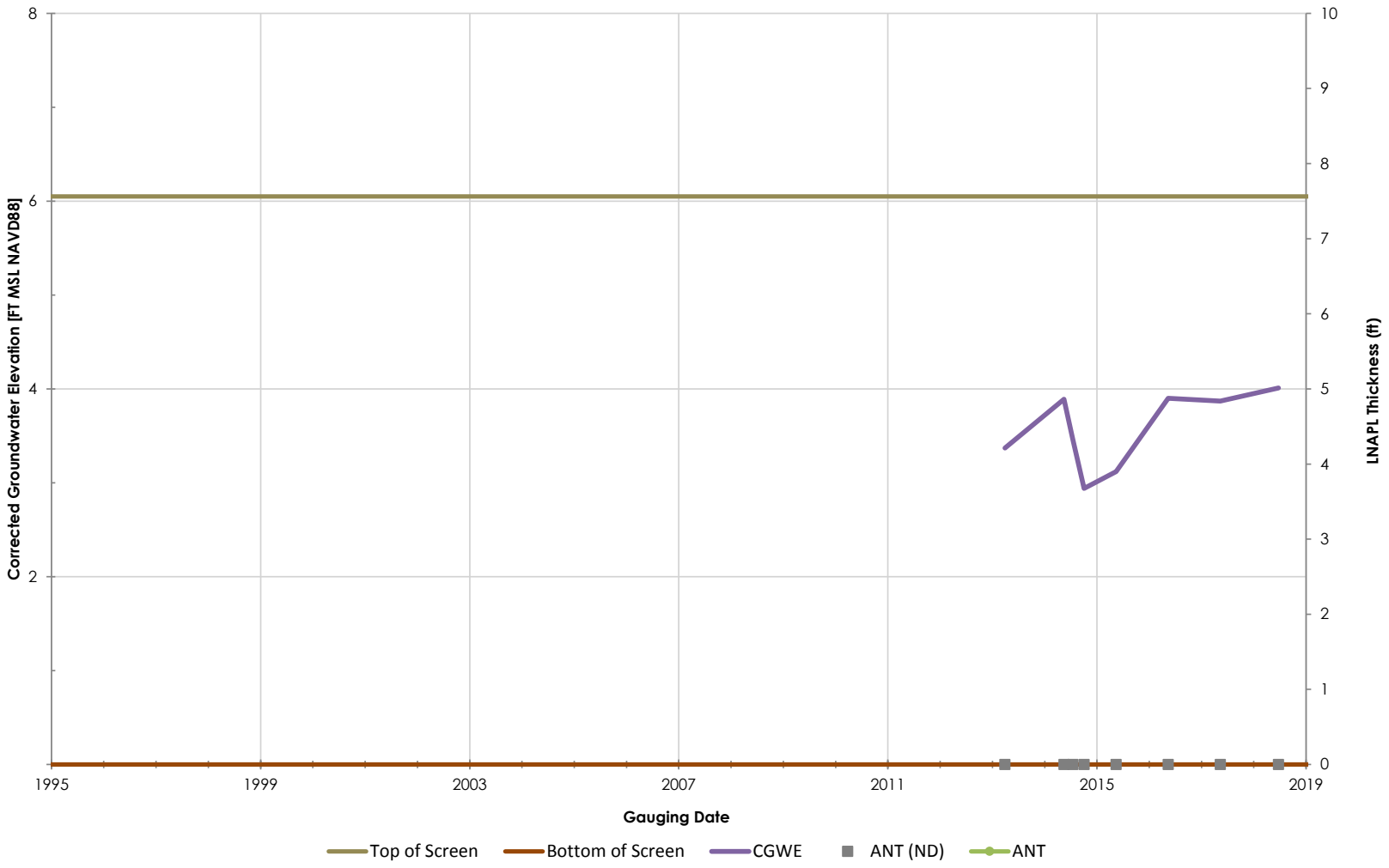
Stantec

Figure/Well No.

A-163

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

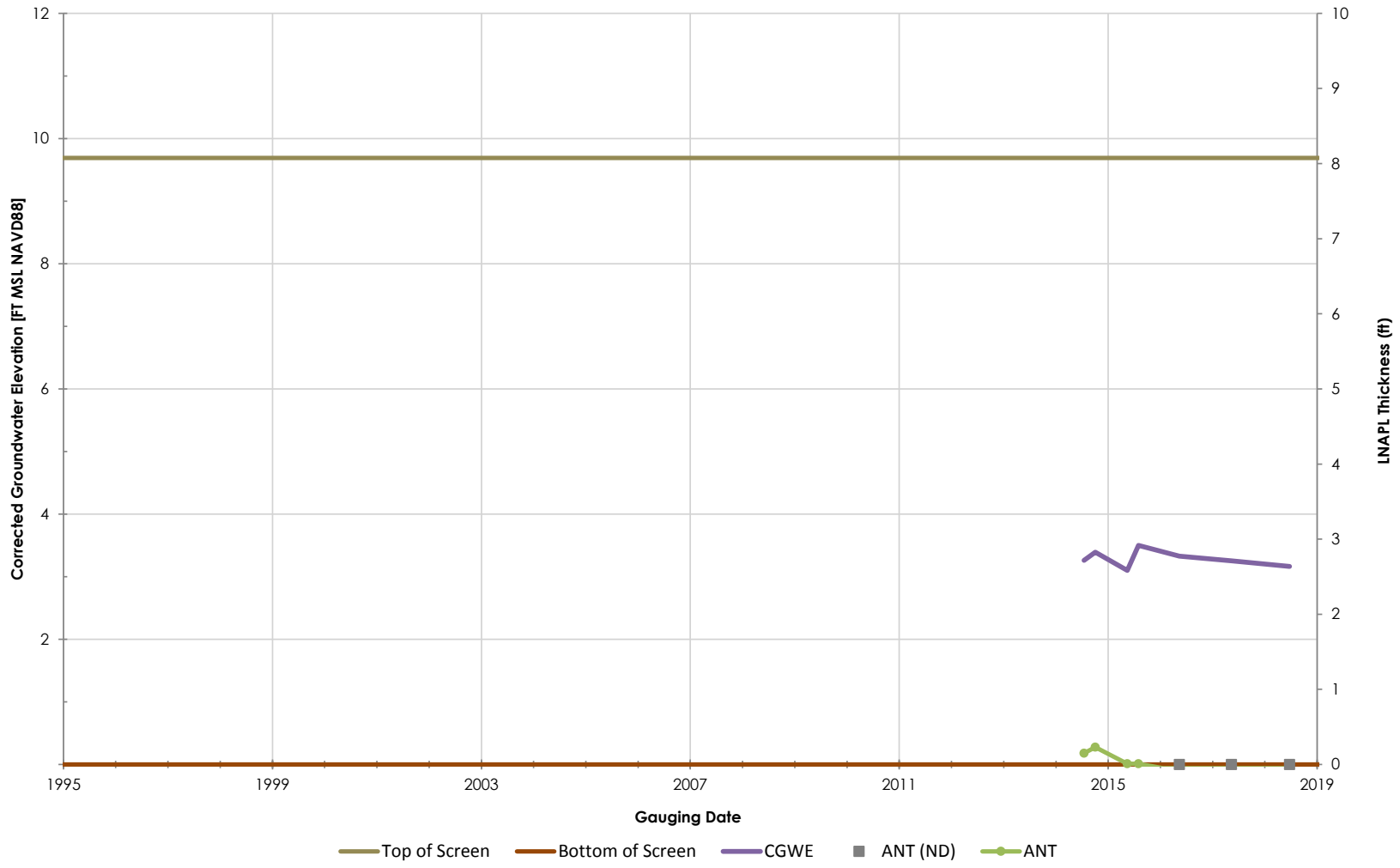
Stantec

Figure/Well No.

A-164

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

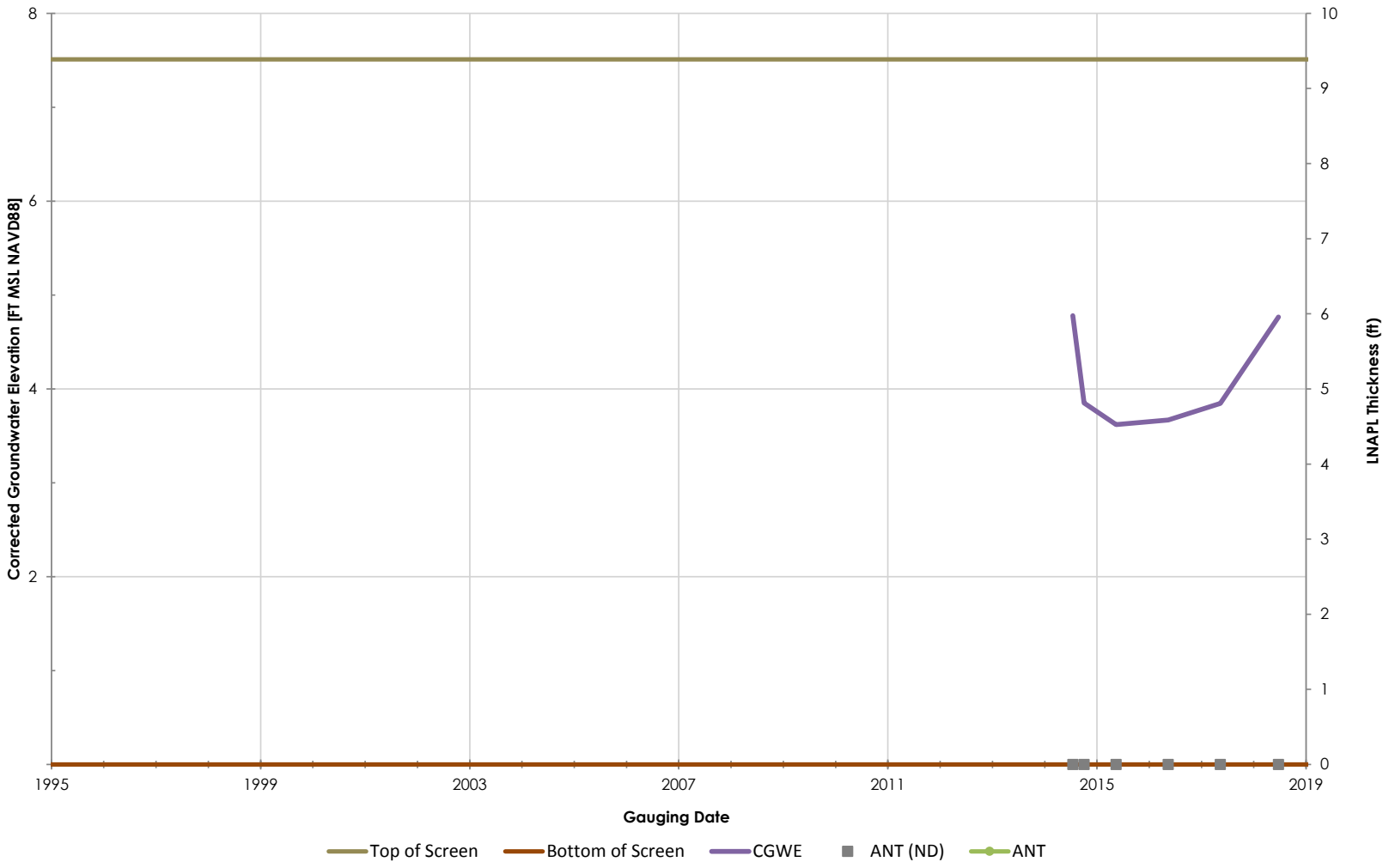
Stantec

Figure/Well No.

A-166

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

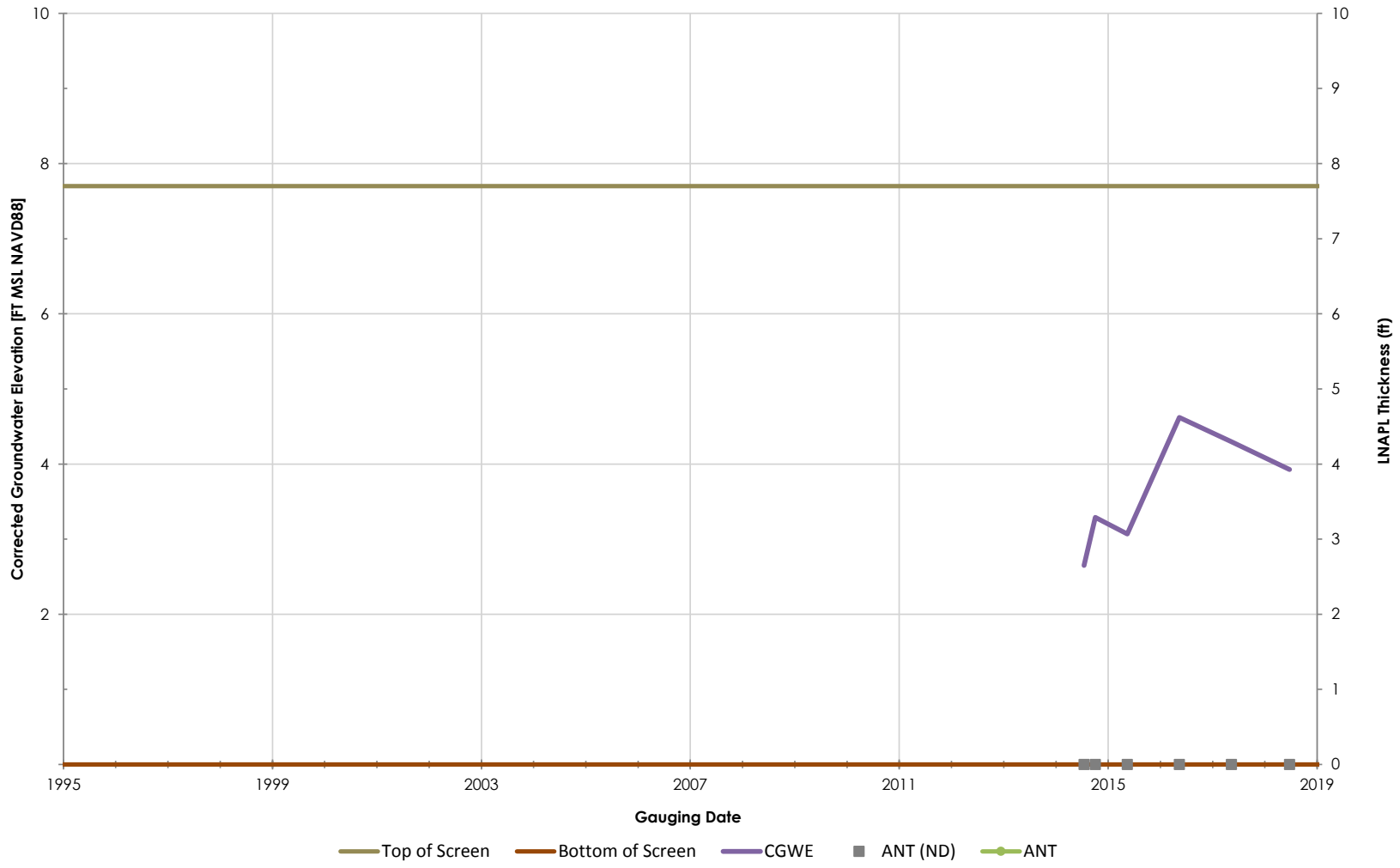
Stantec

Figure/Well No.

A-167

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



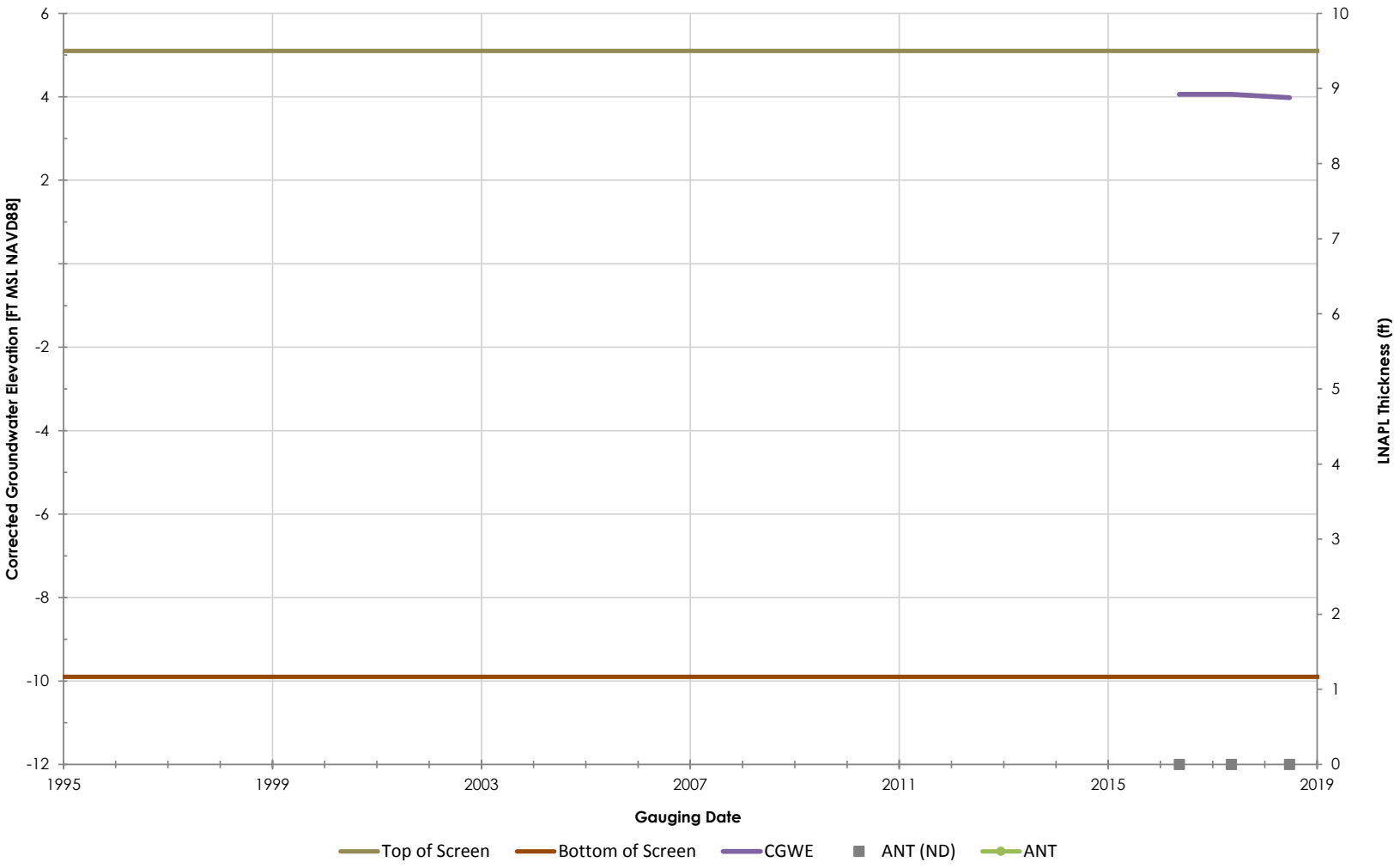
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

A-168

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

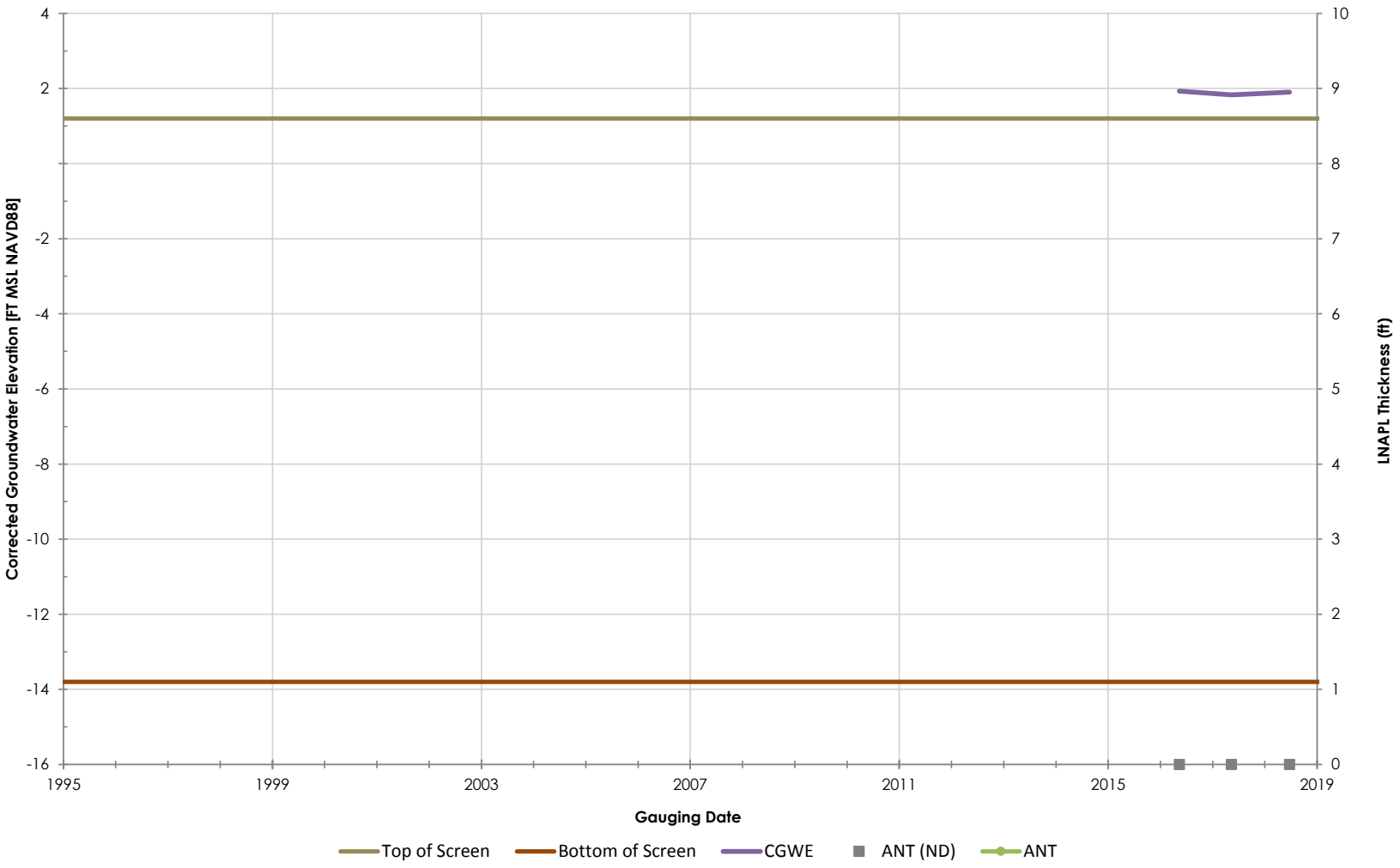
Stantec

Figure/Well No.

A-169

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



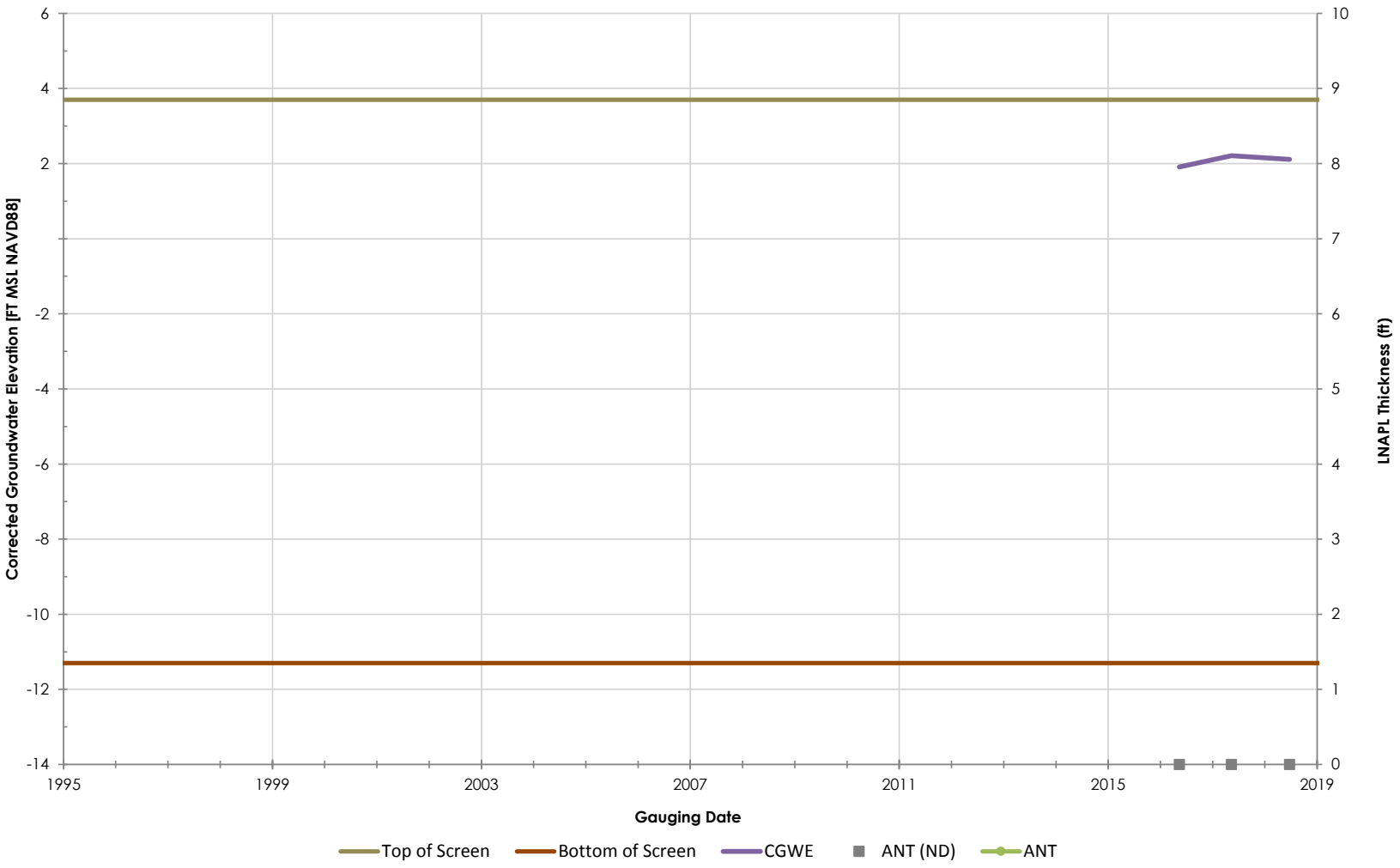
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

A-170

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

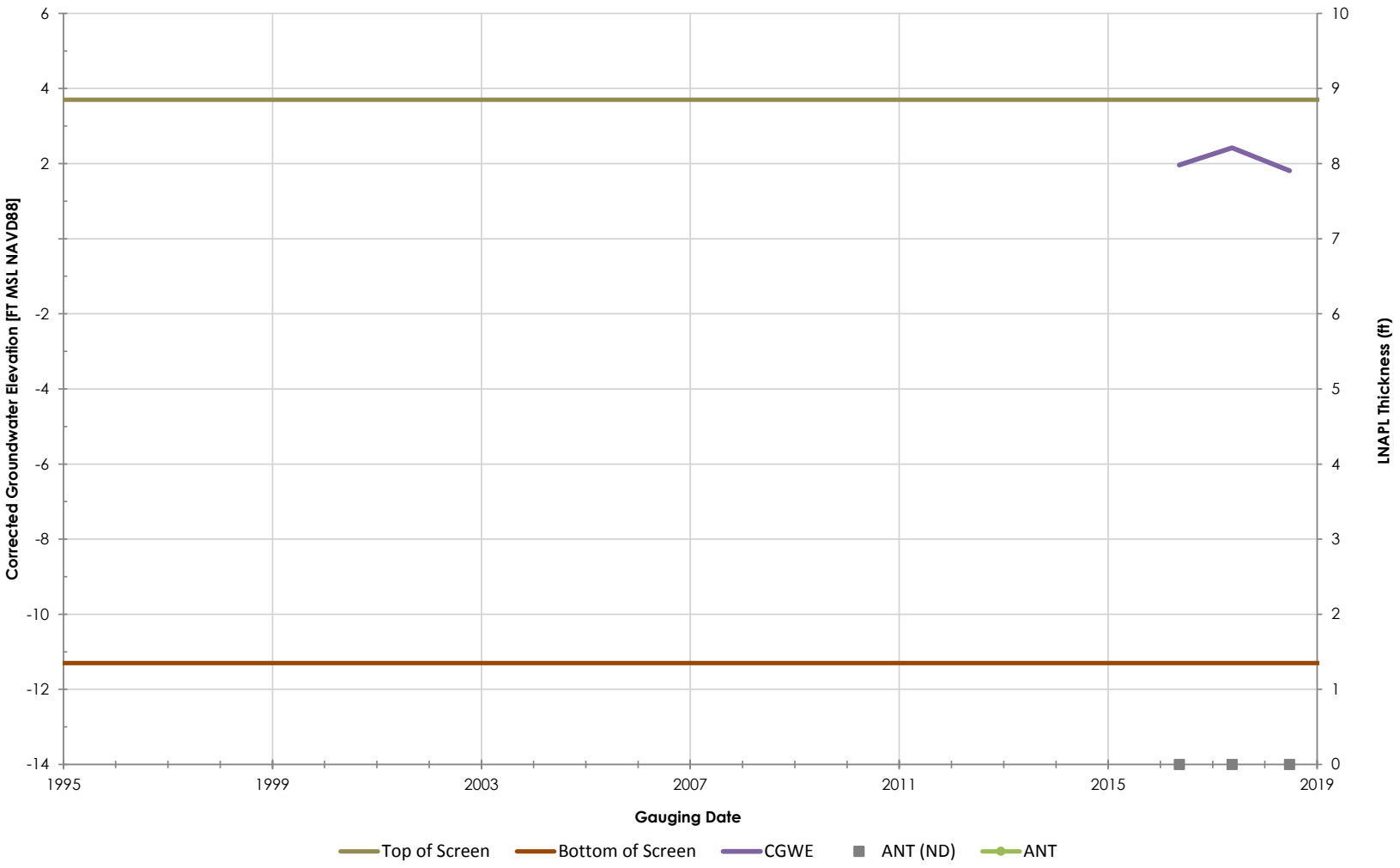
Stantec

Figure/Well No.

A-171

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

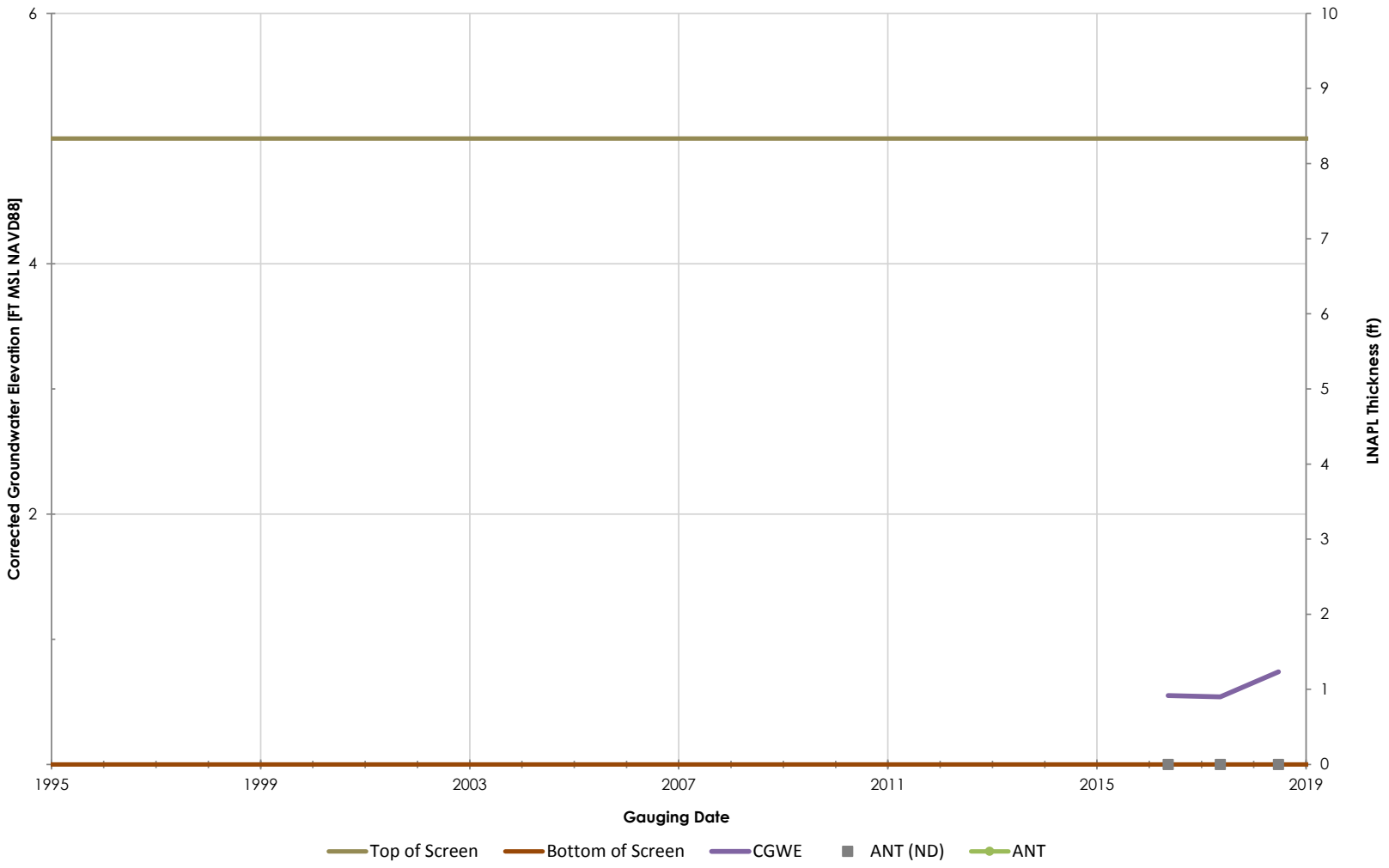
Stantec

Figure/Well No.

A-172

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

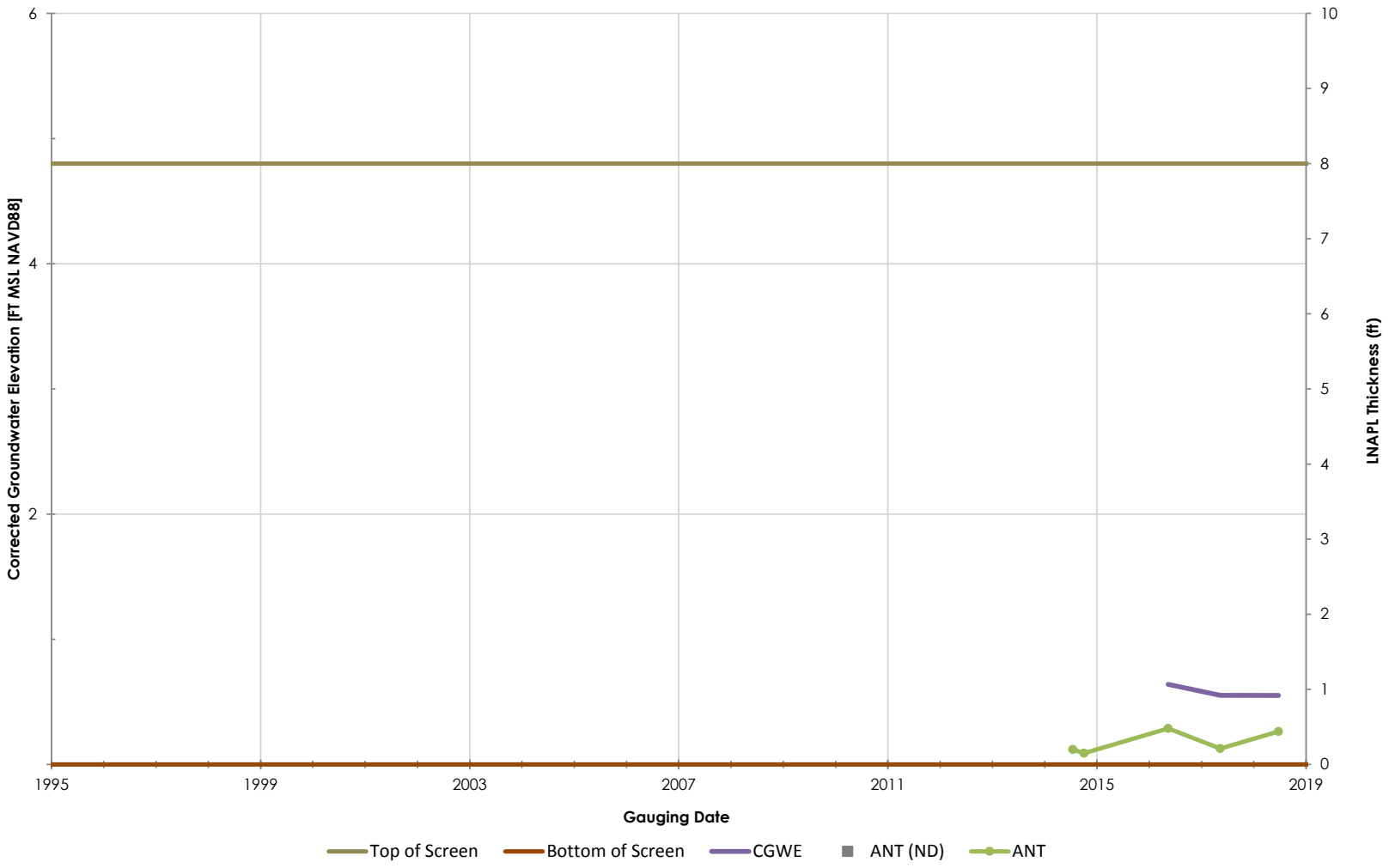
Stantec

Figure/Well No.

A-175

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

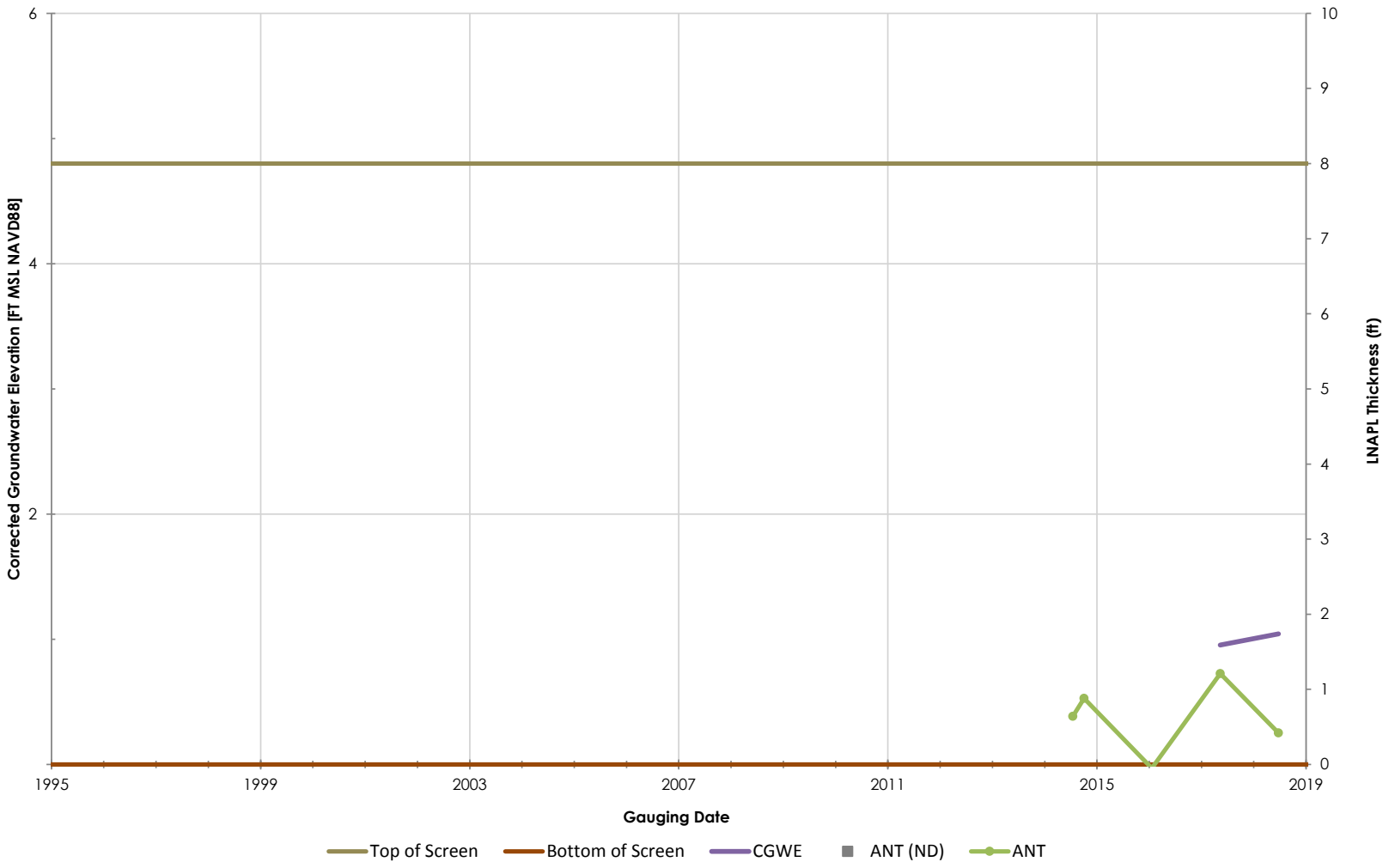
Stantec

Figure/Well No.

A-176

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

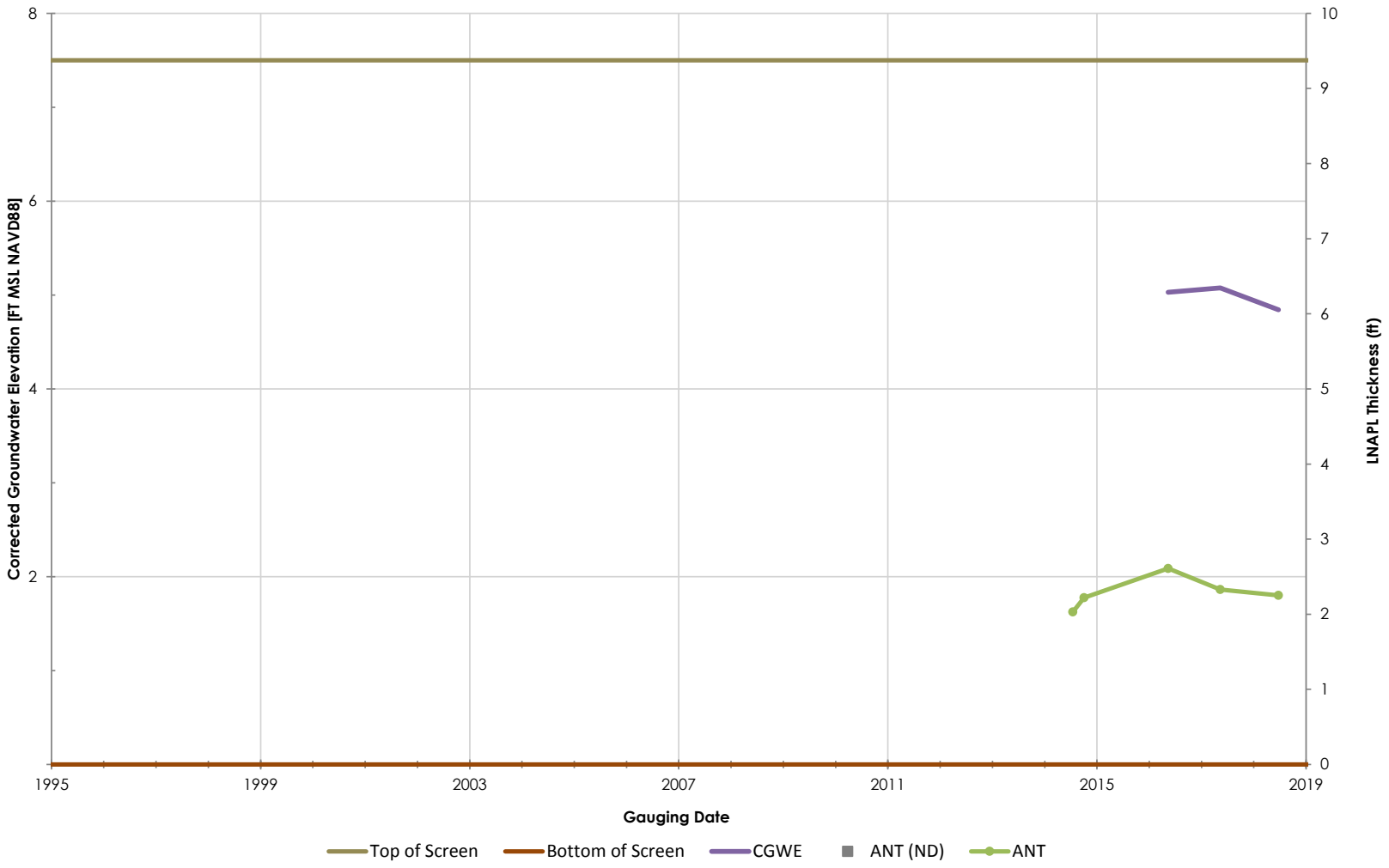
Stantec

Figure/Well No.

A-178

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

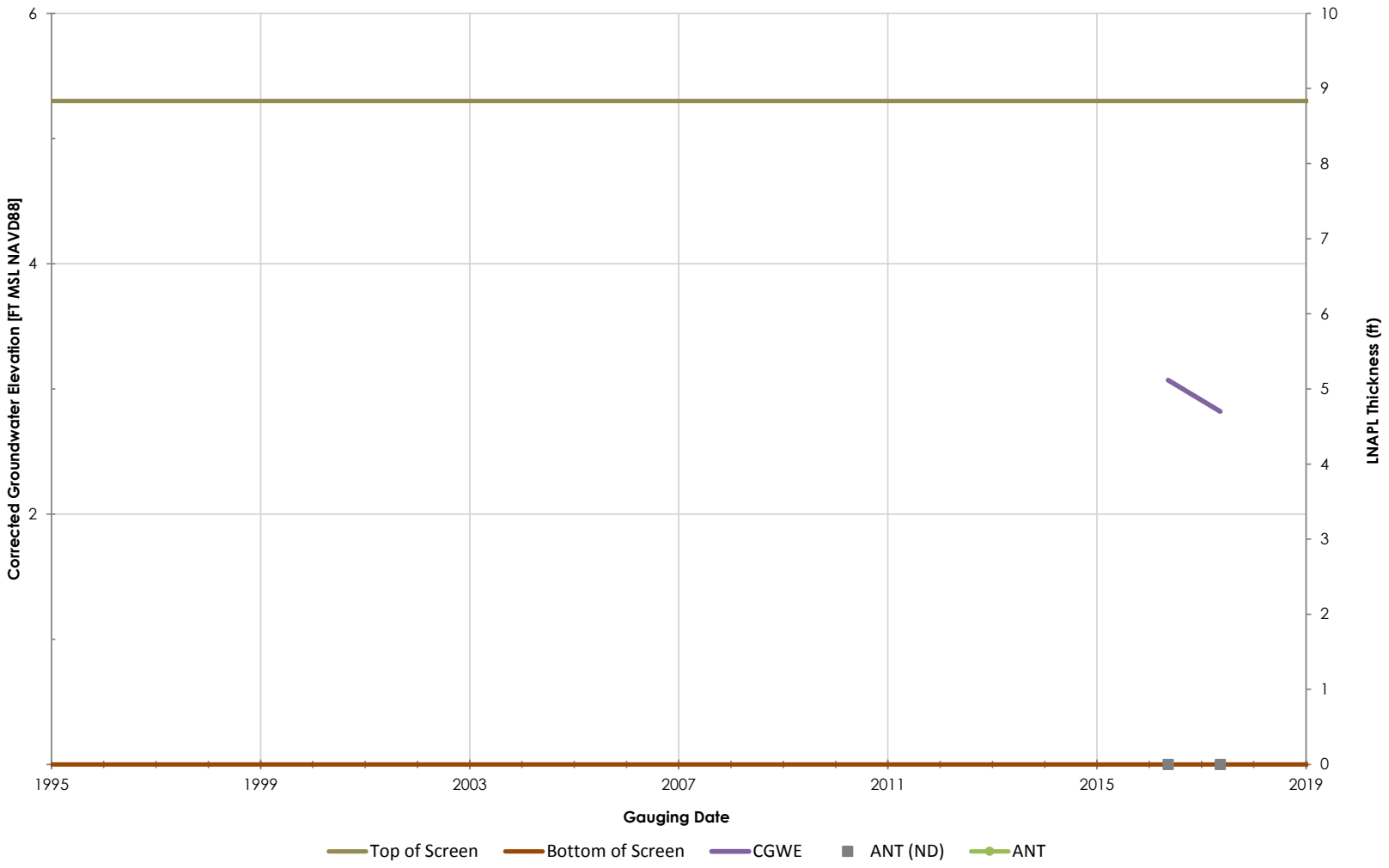
Stantec

Figure/Well No.

A-179

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

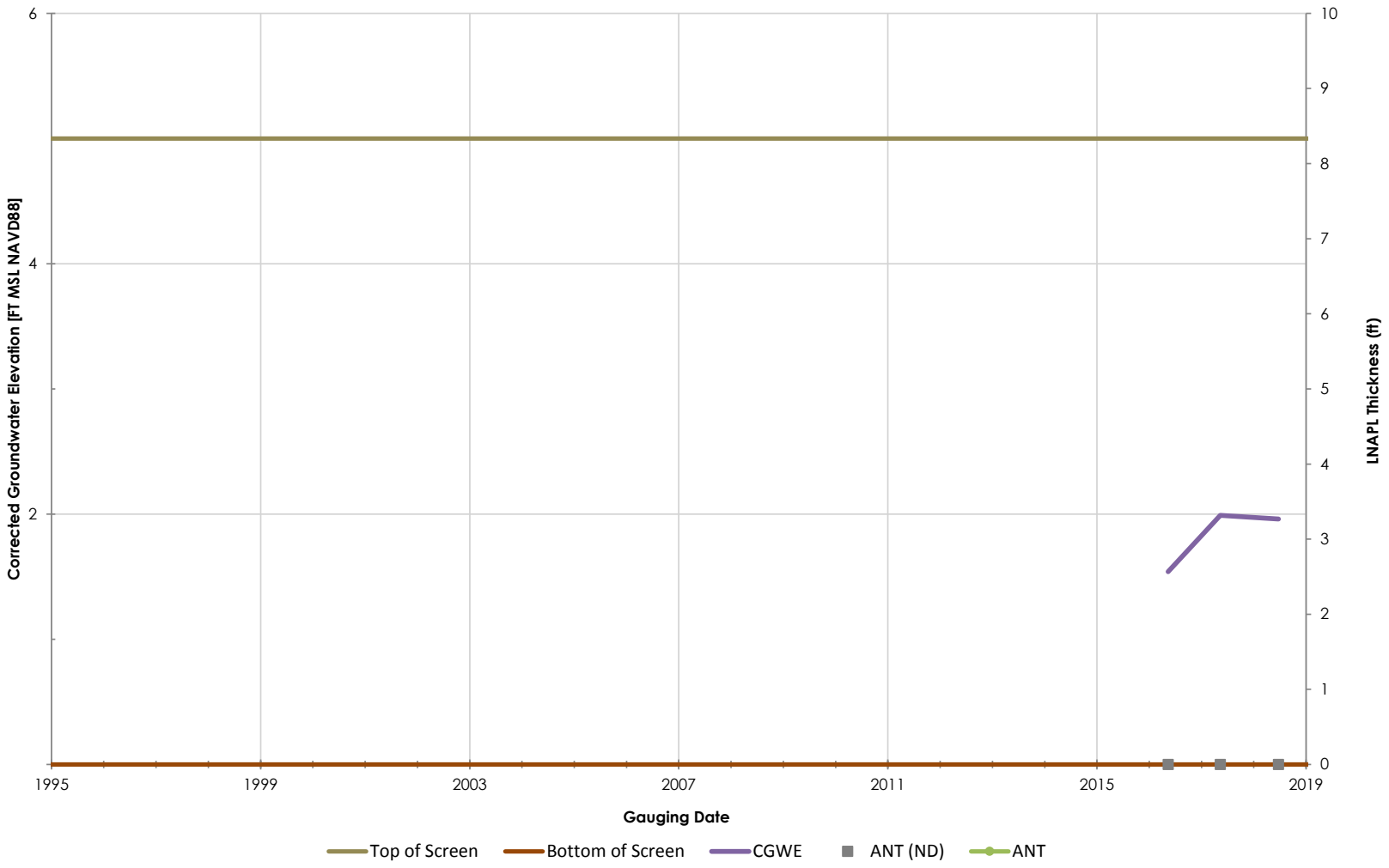
Stantec

Figure/Well No.

A-181

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

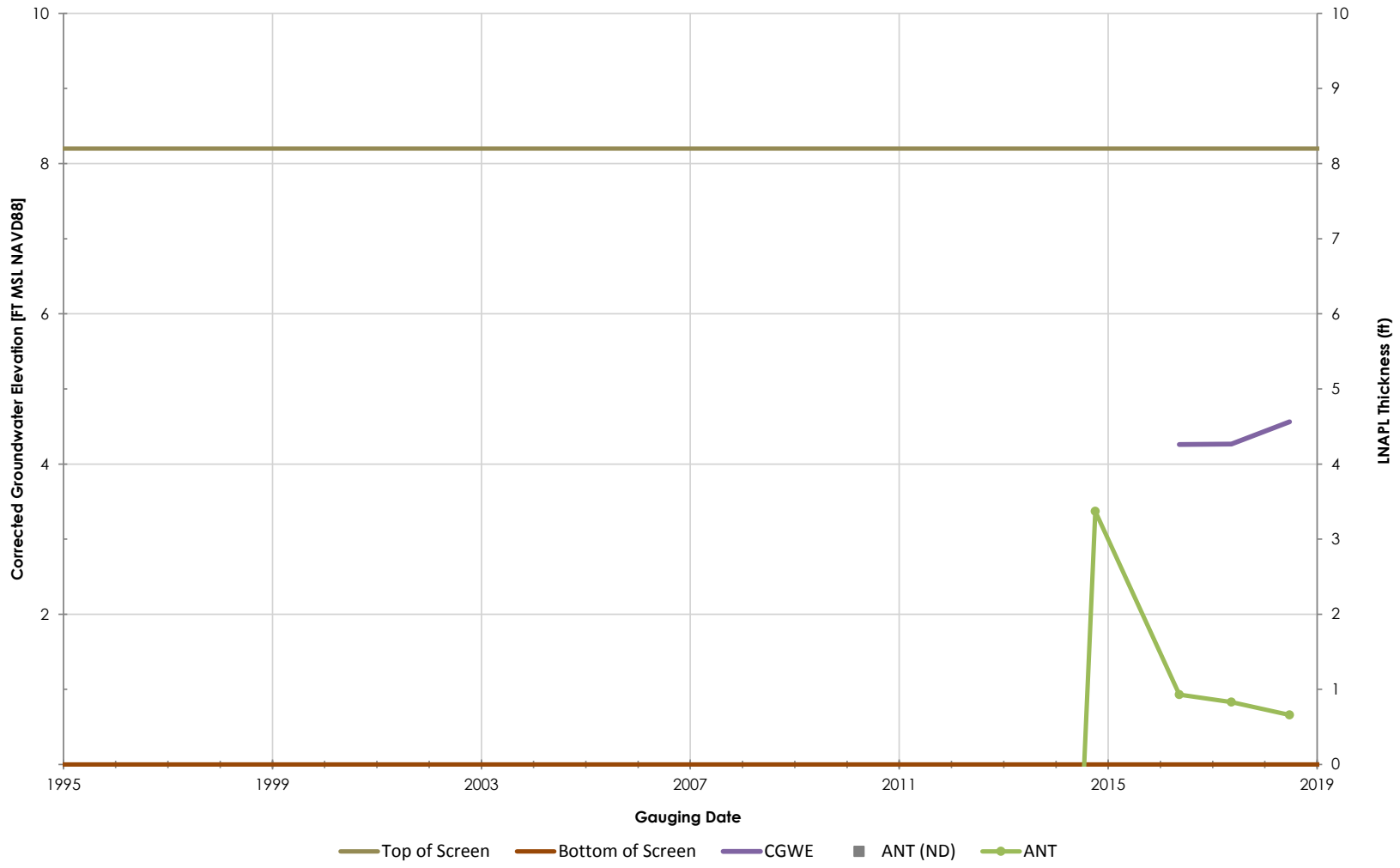
Stantec

Figure/Well No.

A-182

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

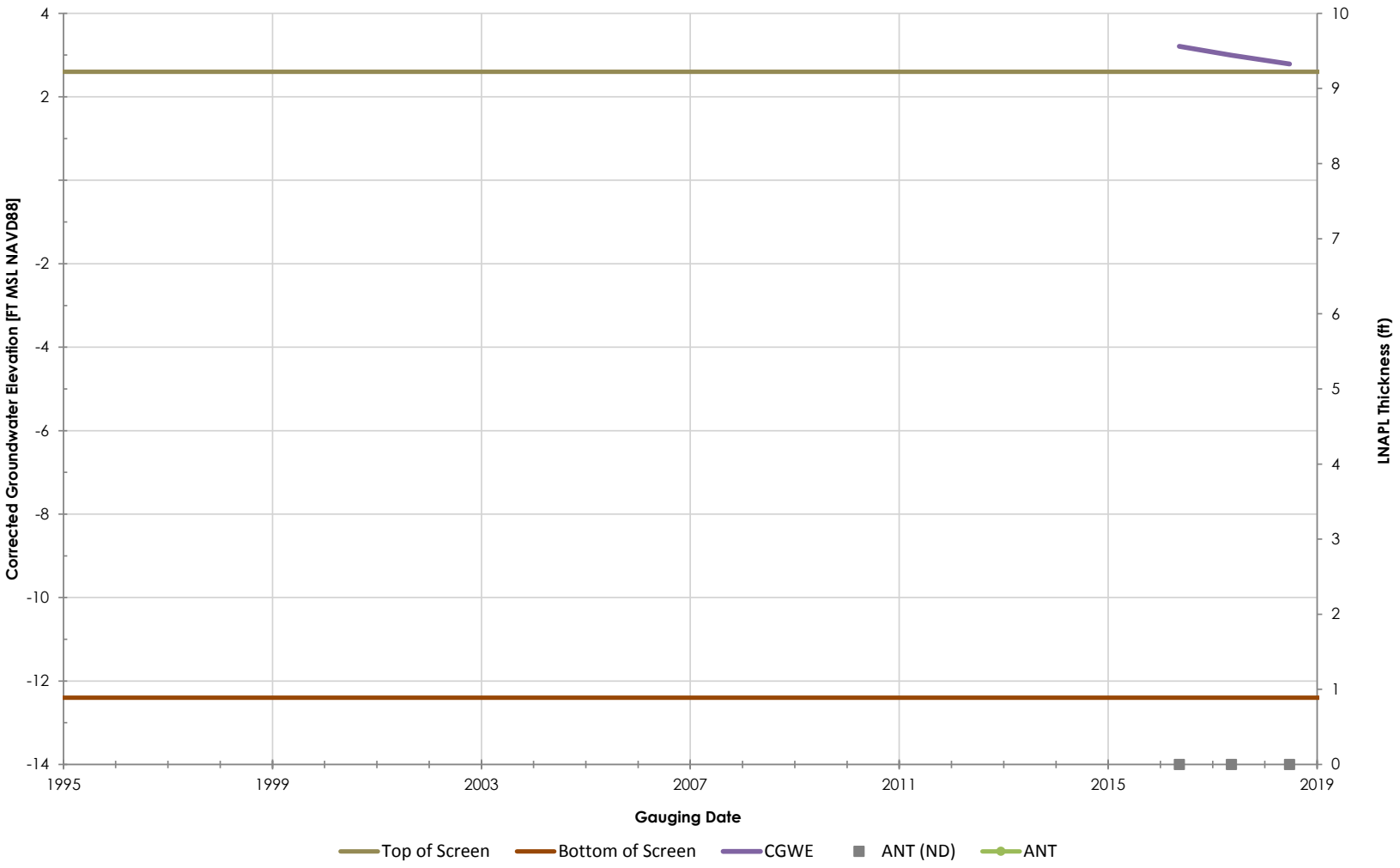
Stantec

Figure/Well No.

A-183

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

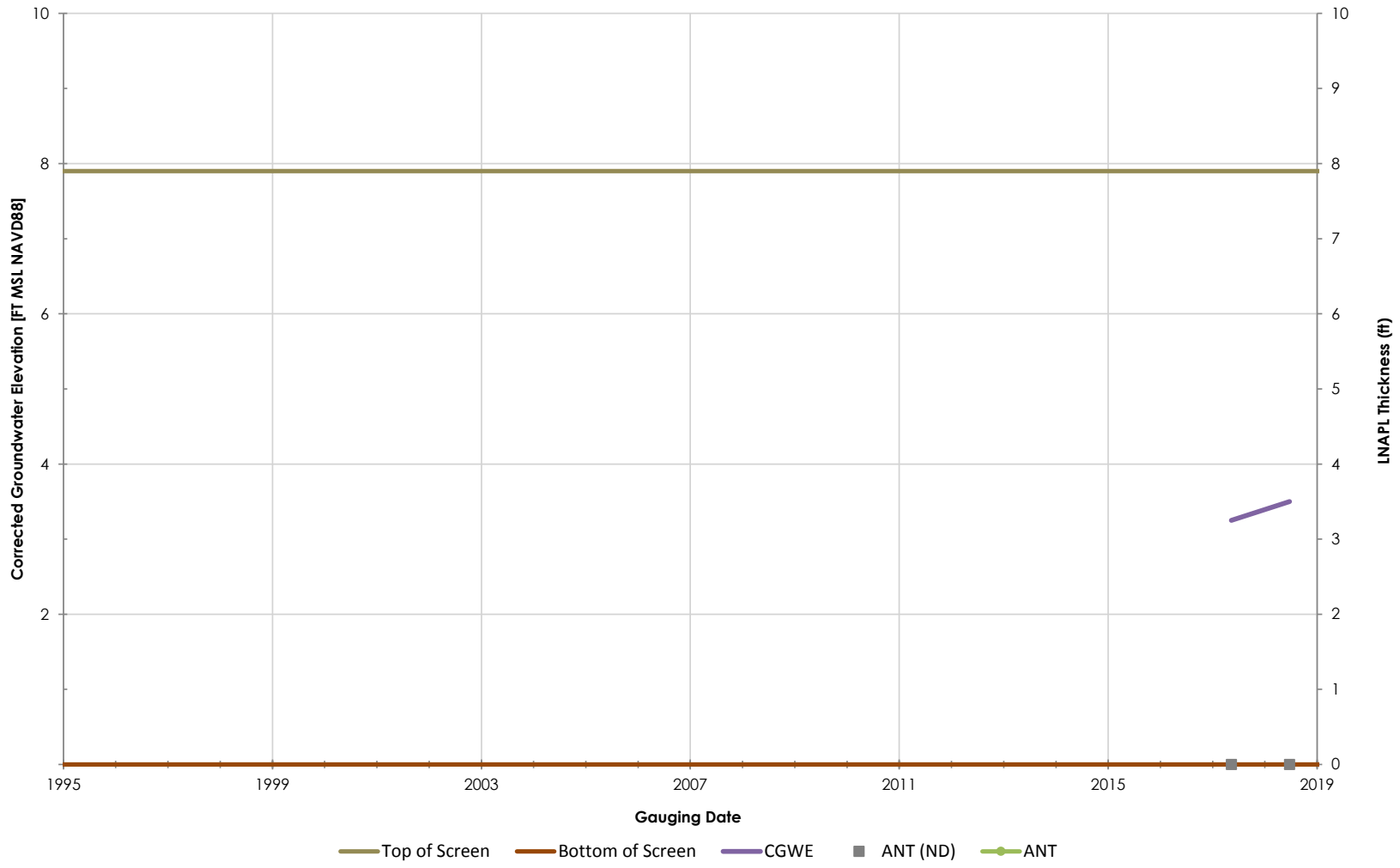
Stantec

Figure/Well No.

A-186

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



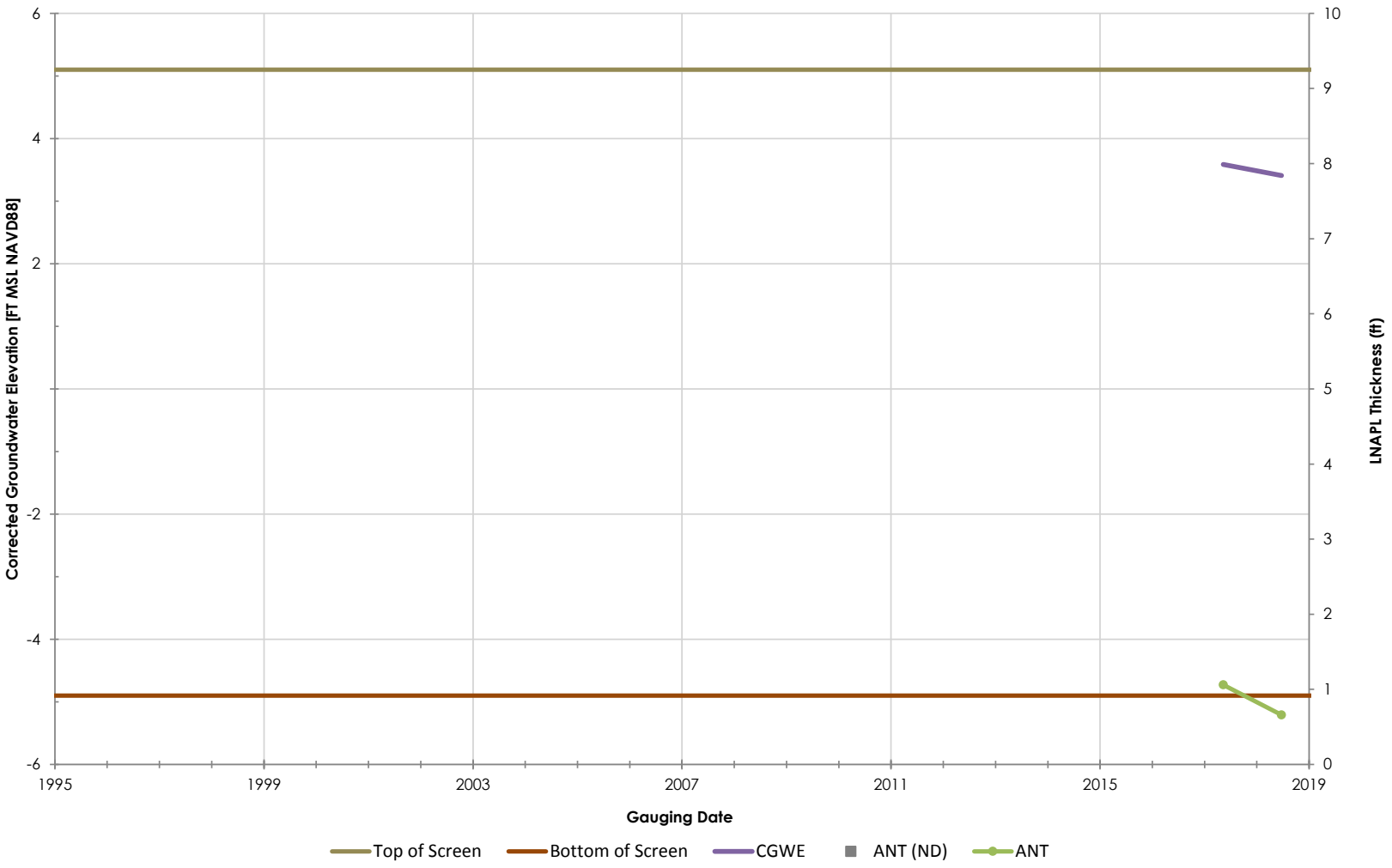
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

A-187

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

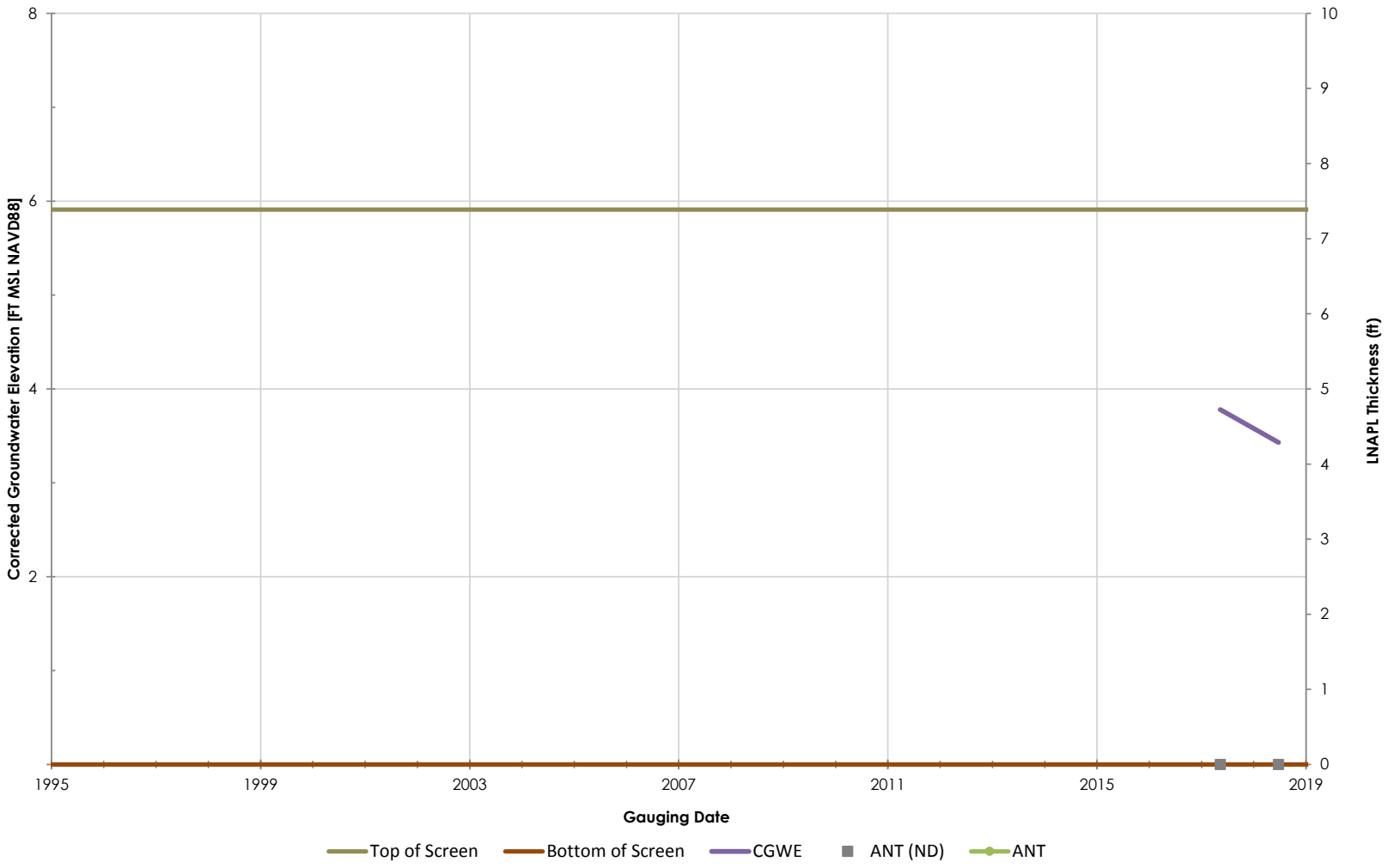
Stantec

Figure/Well No.

A-188

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

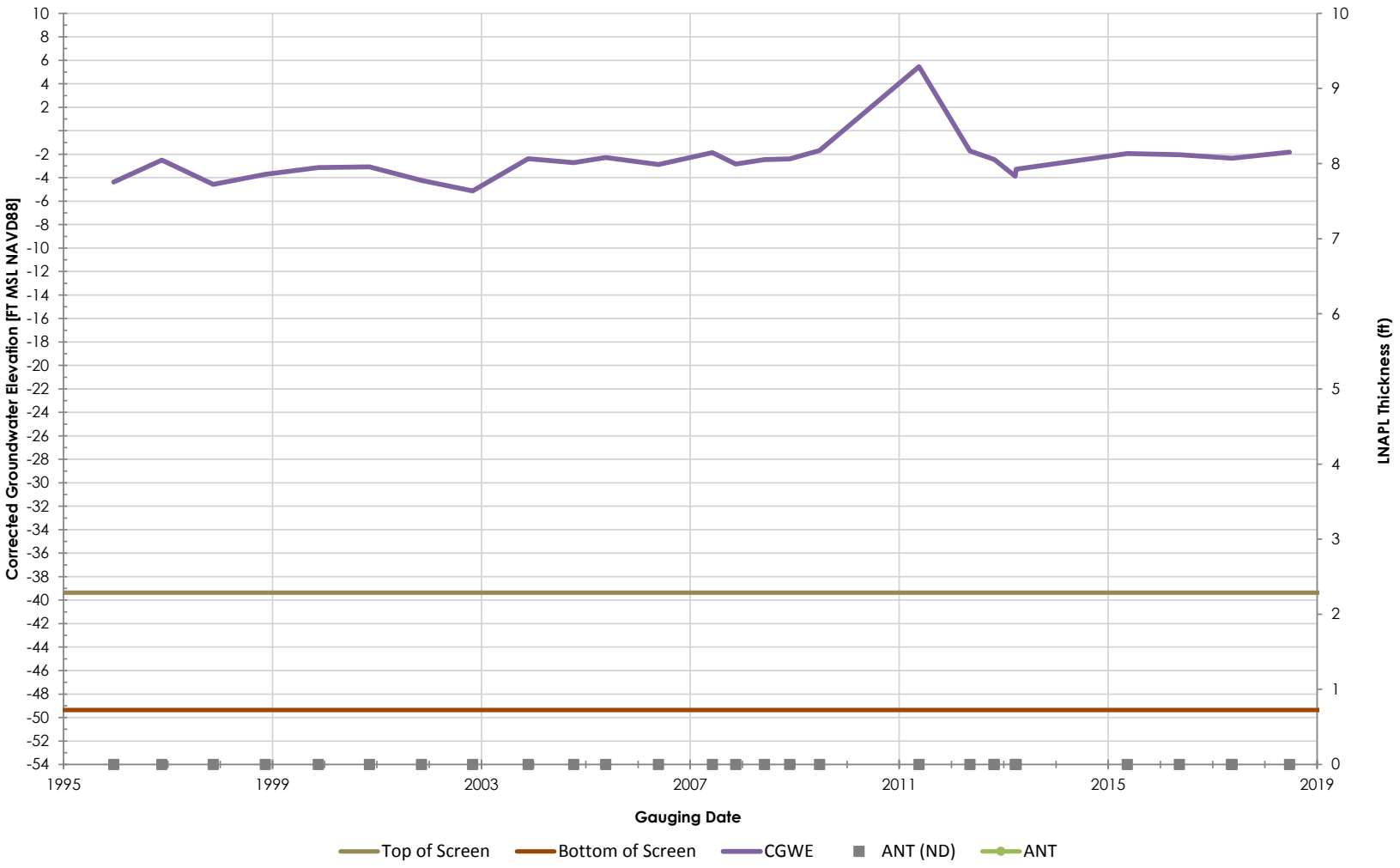
Stantec

Figure/Well No.

A-189

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

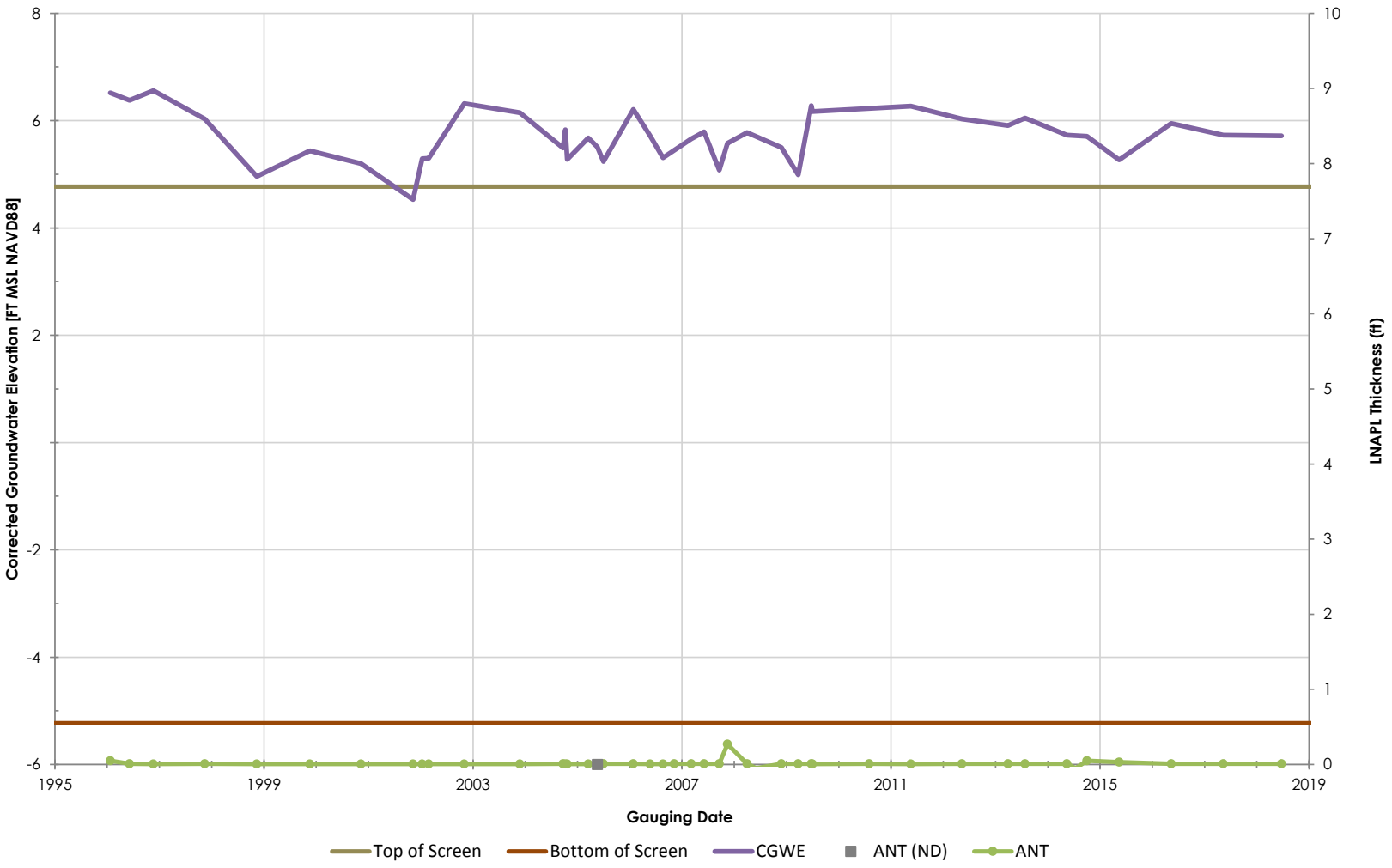
Stantec

Figure/Well No.

A-19D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

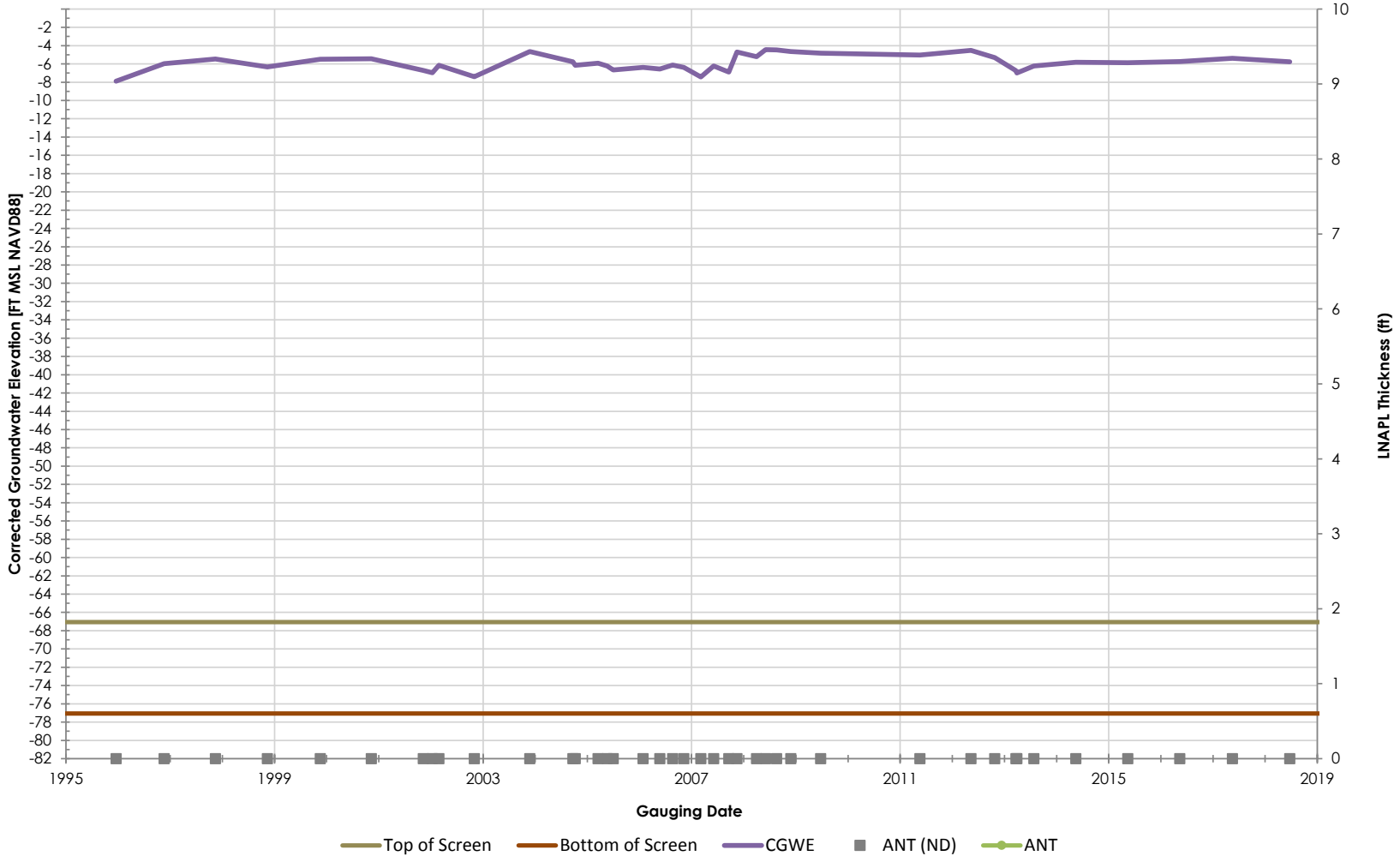
Stantec

Figure/Well No.

A-21

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

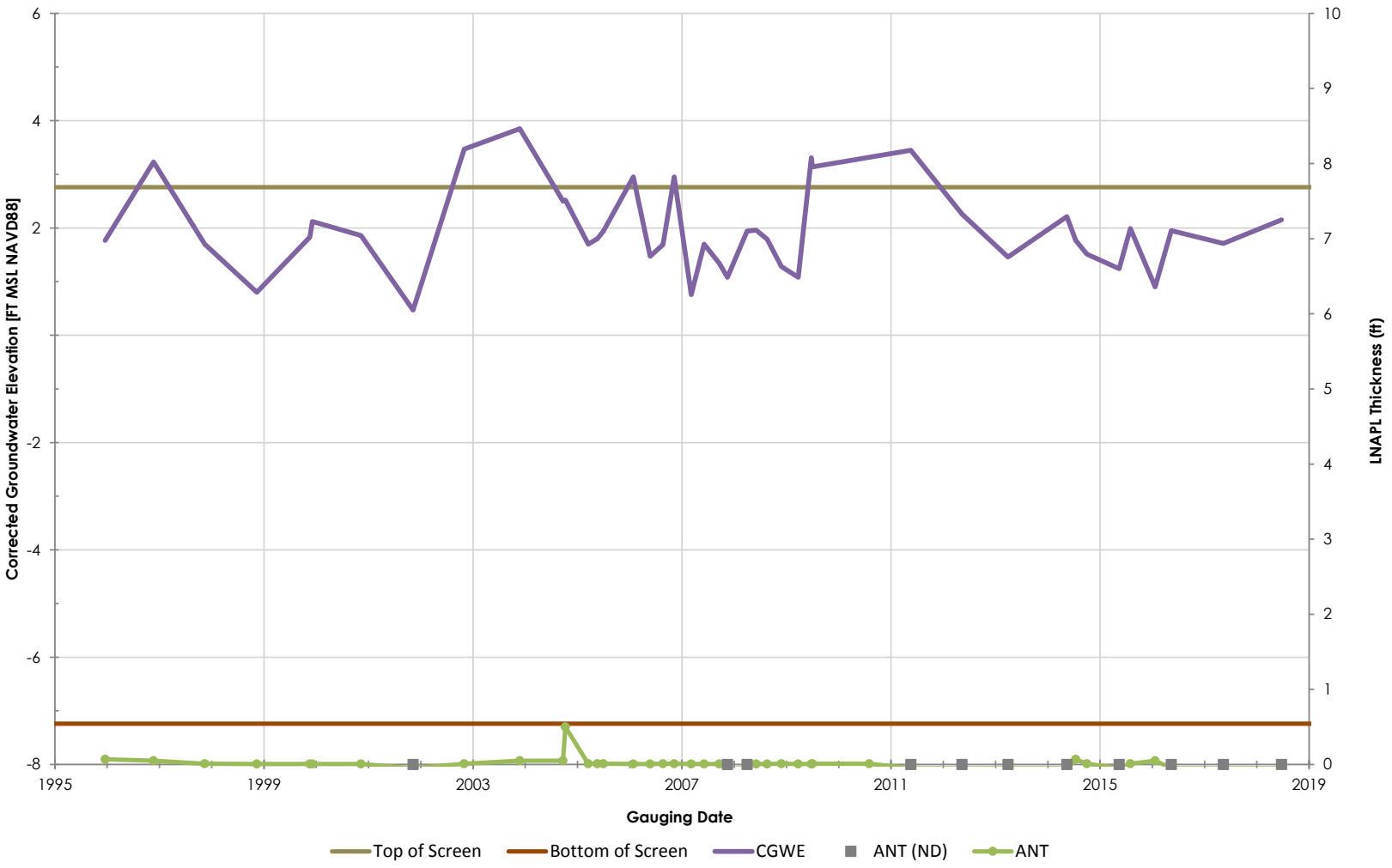
Stantec

Figure/Well No.

A-21D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

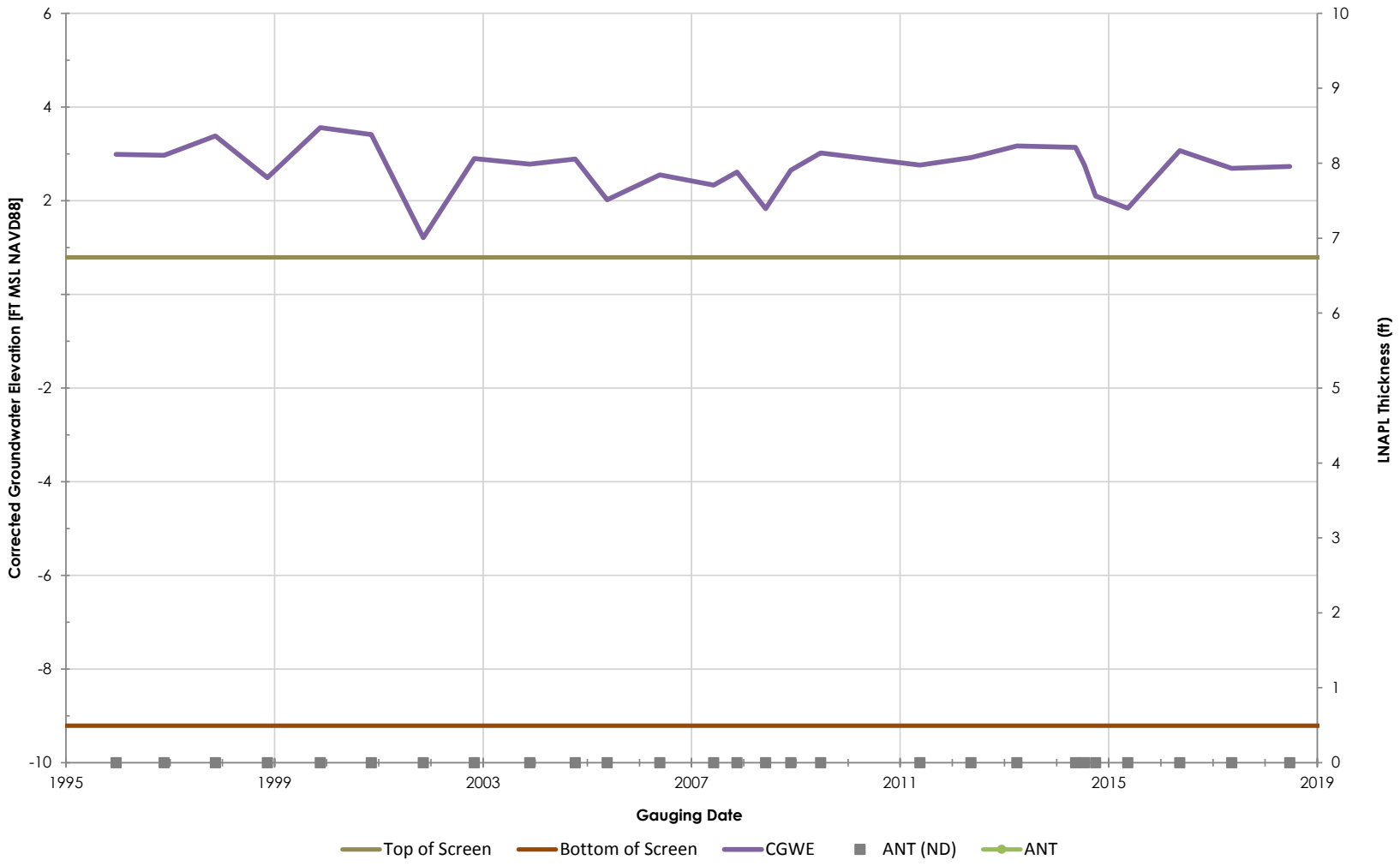
Stantec

Figure/Well No.

A-22

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

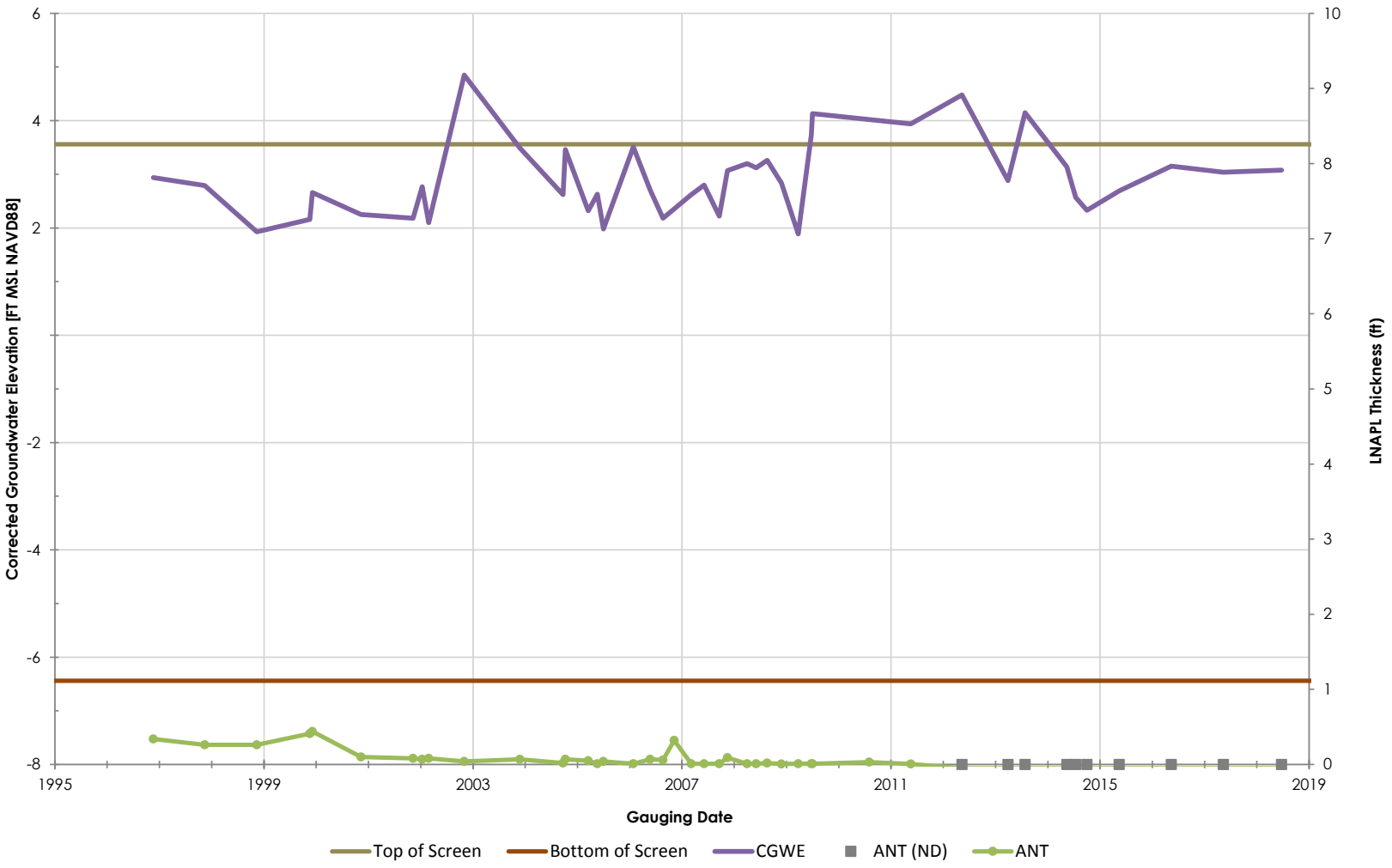
Stantec

Figure/Well No.

A-23

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

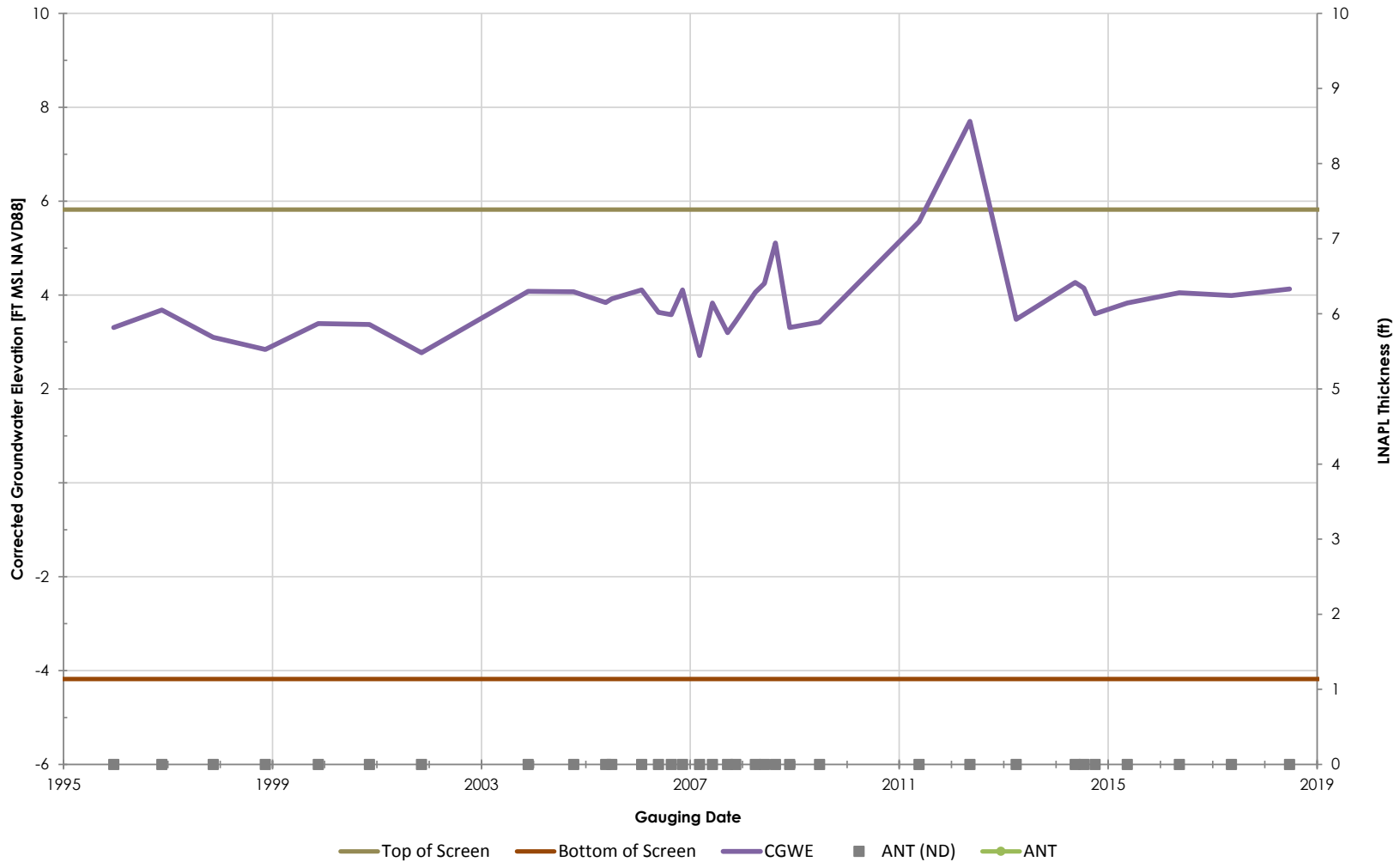
Stantec

Figure/Well No.

A-24

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

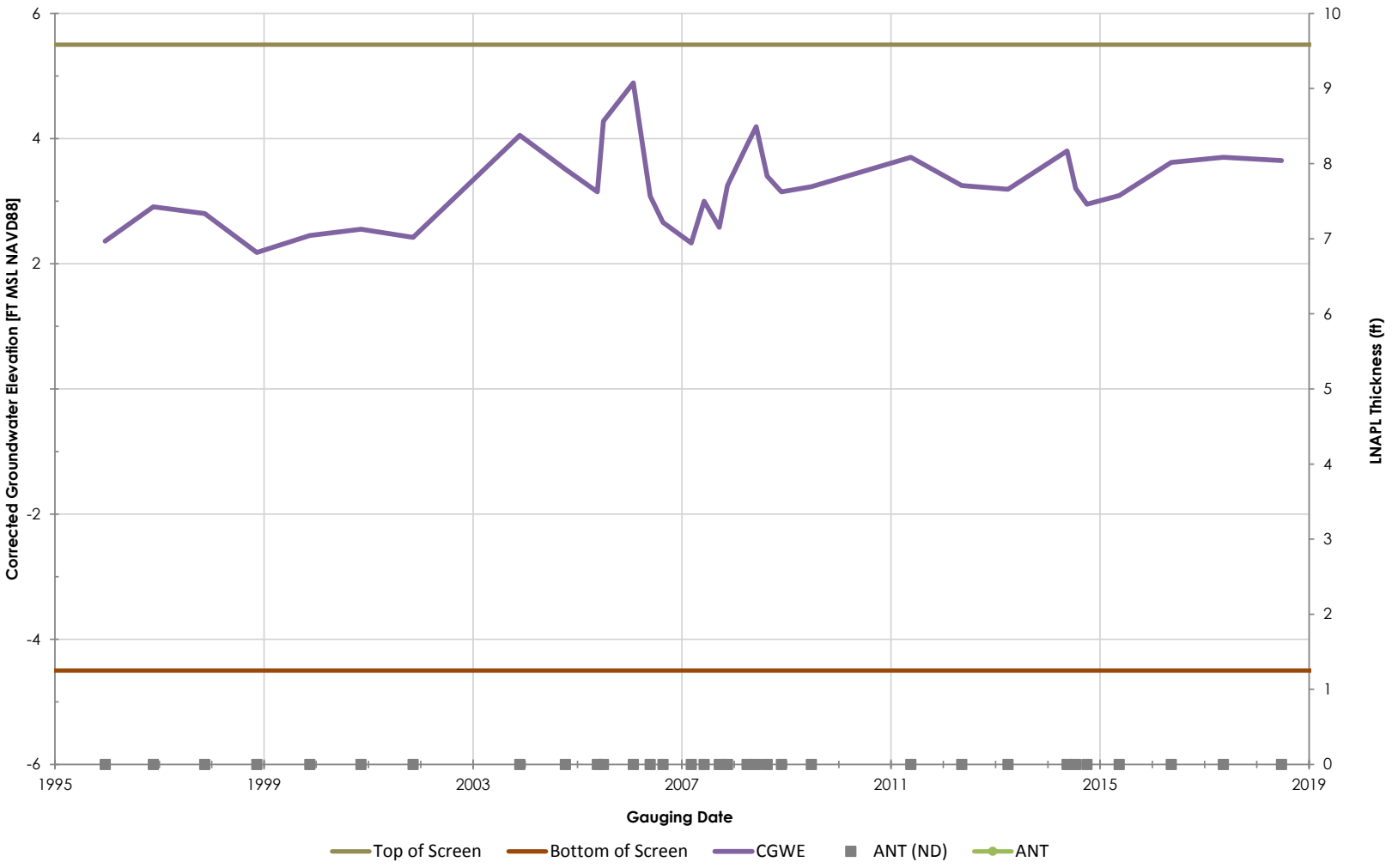
Stantec

Figure/Well No.

A-25

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

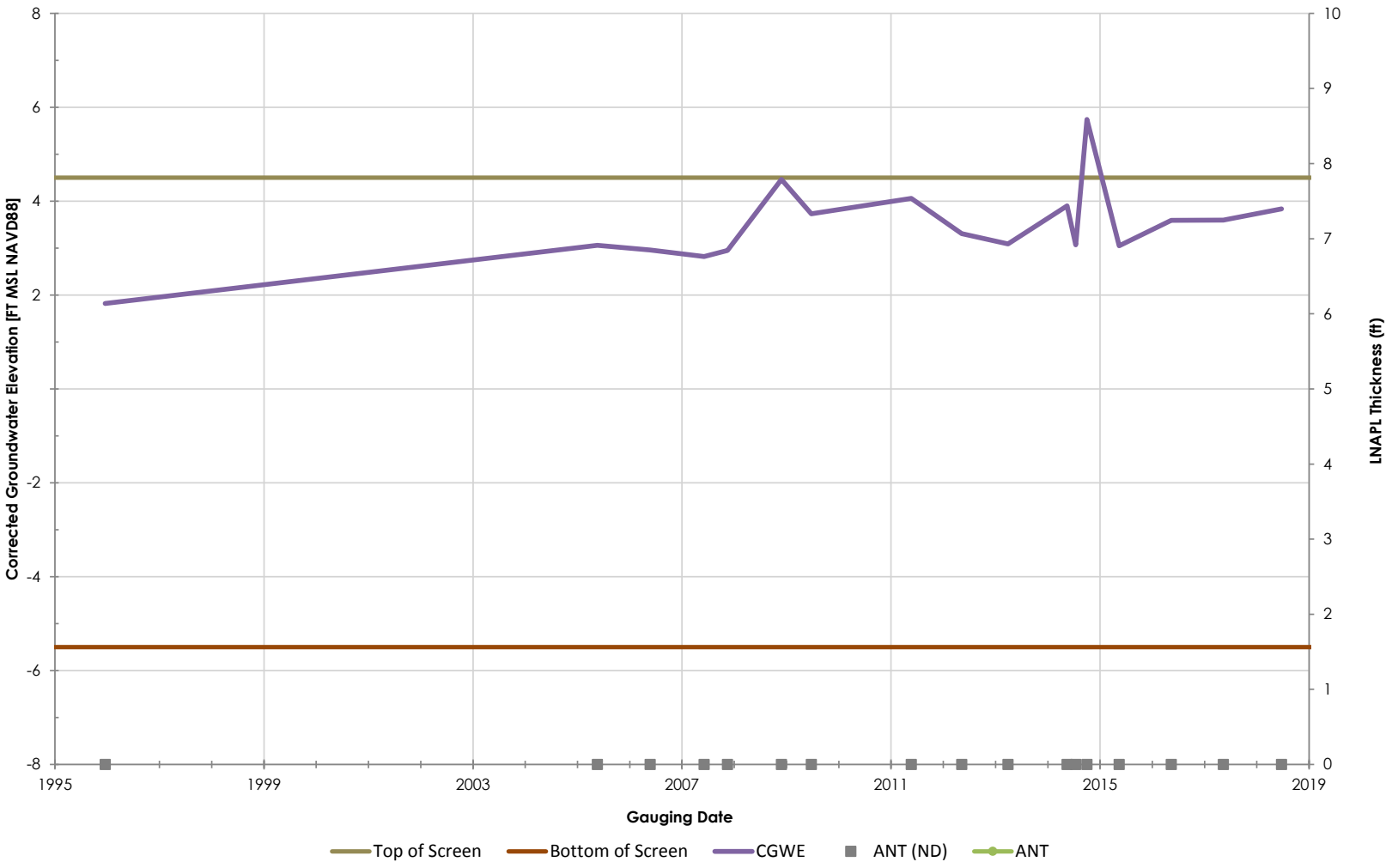
Stantec

Figure/Well No.

A-26

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

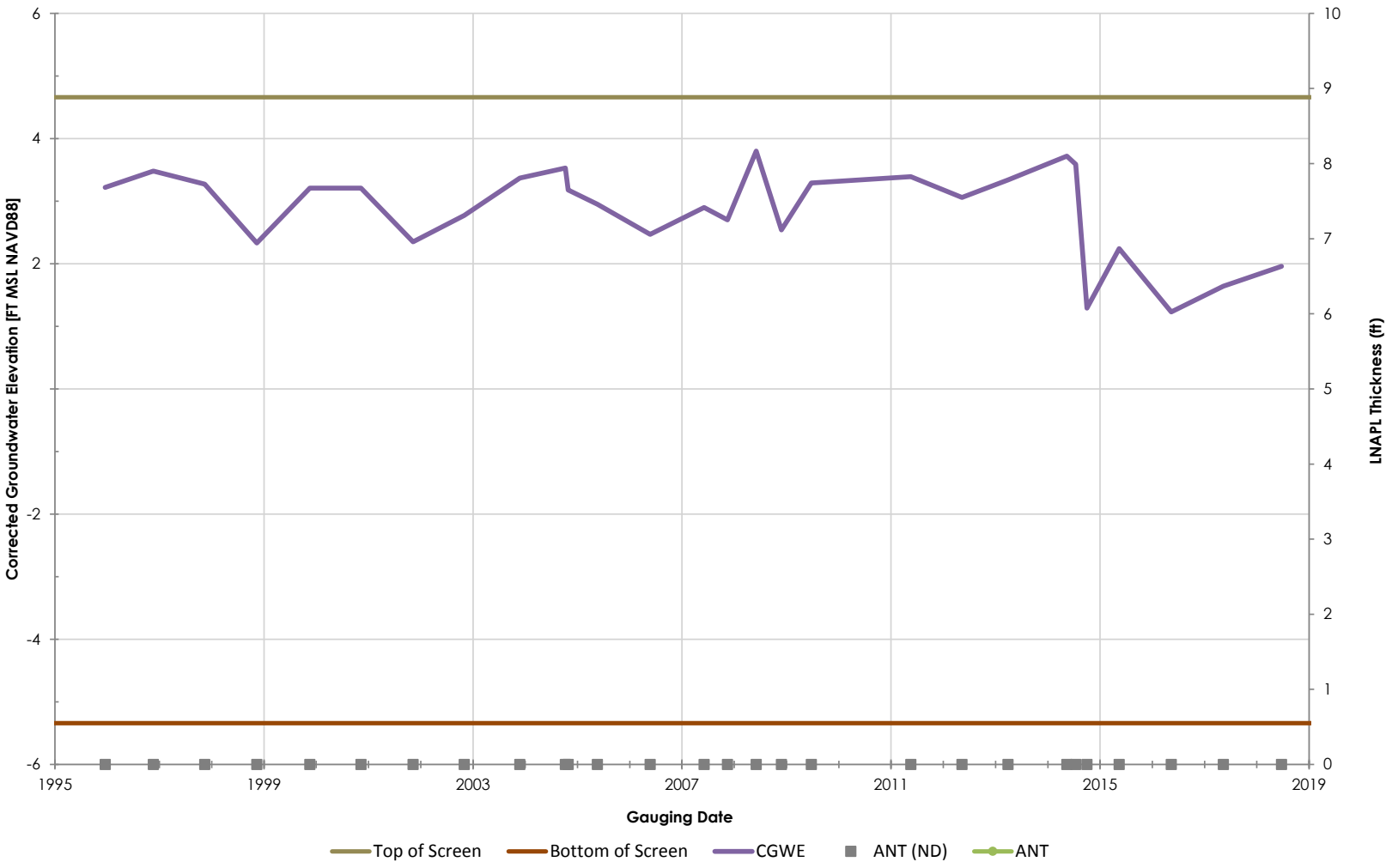
Stantec

Figure/Well No.

A-27

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

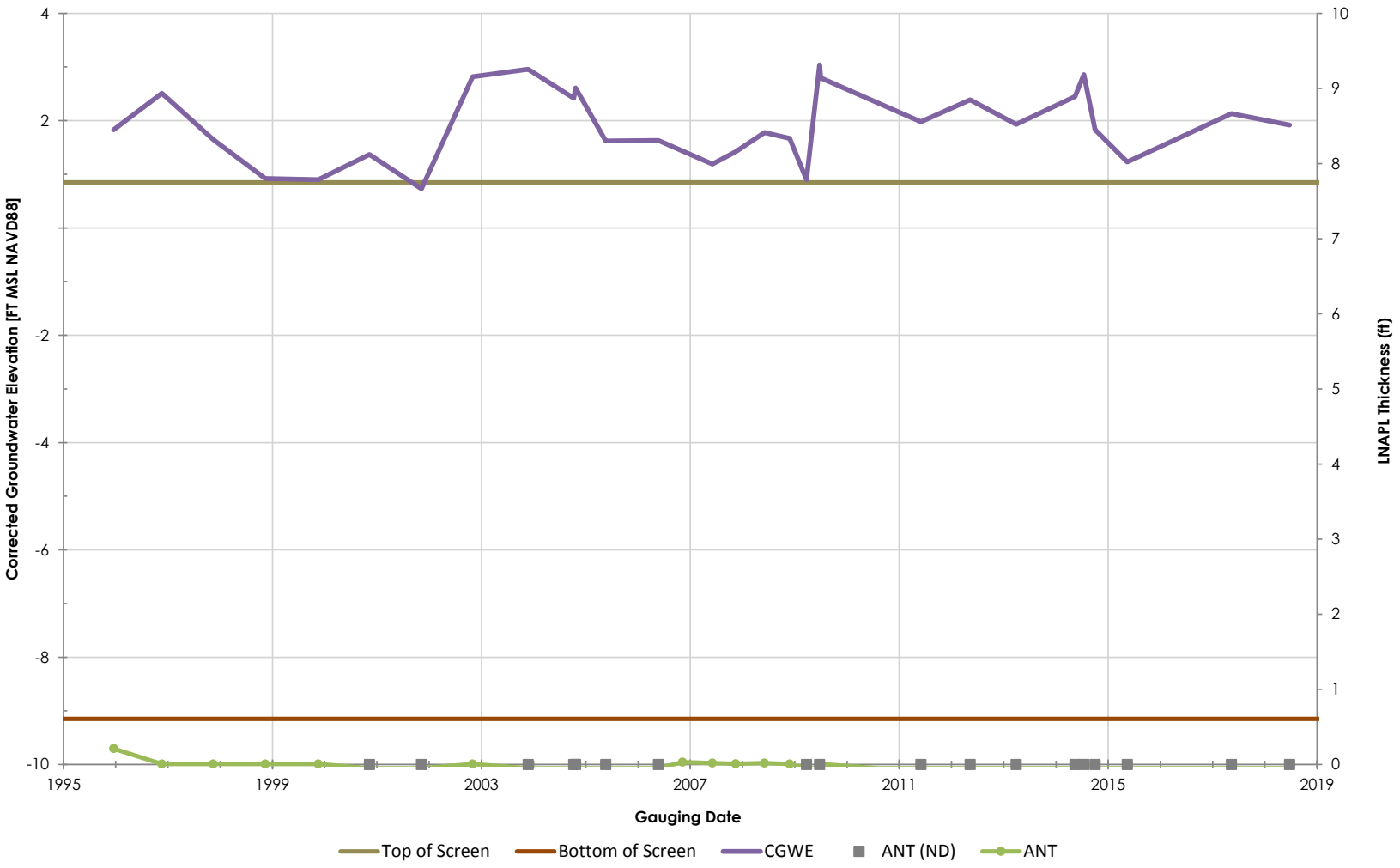
Stantec

Figure/Well No.

A-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

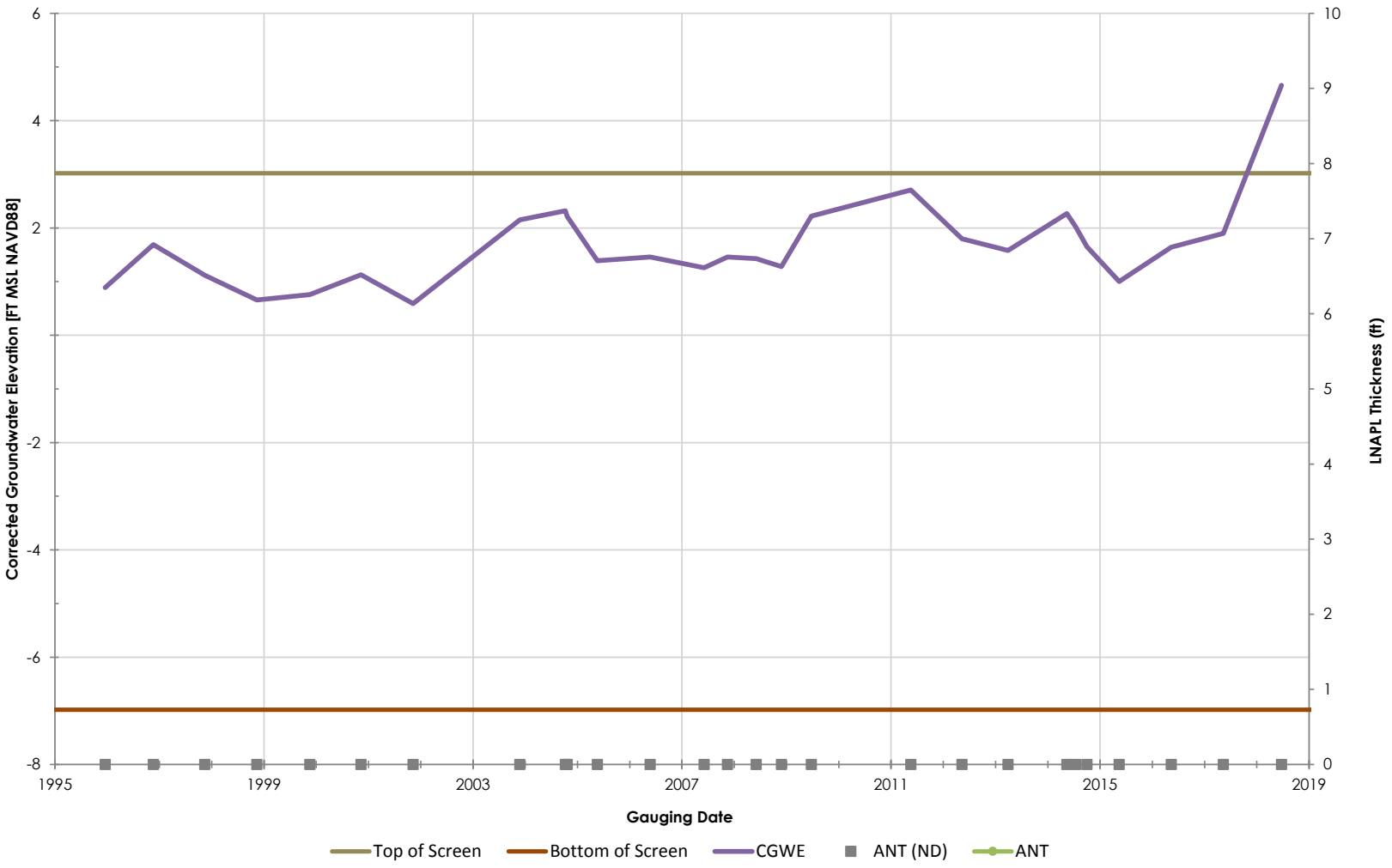
Stantec

Figure/Well No.

A-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

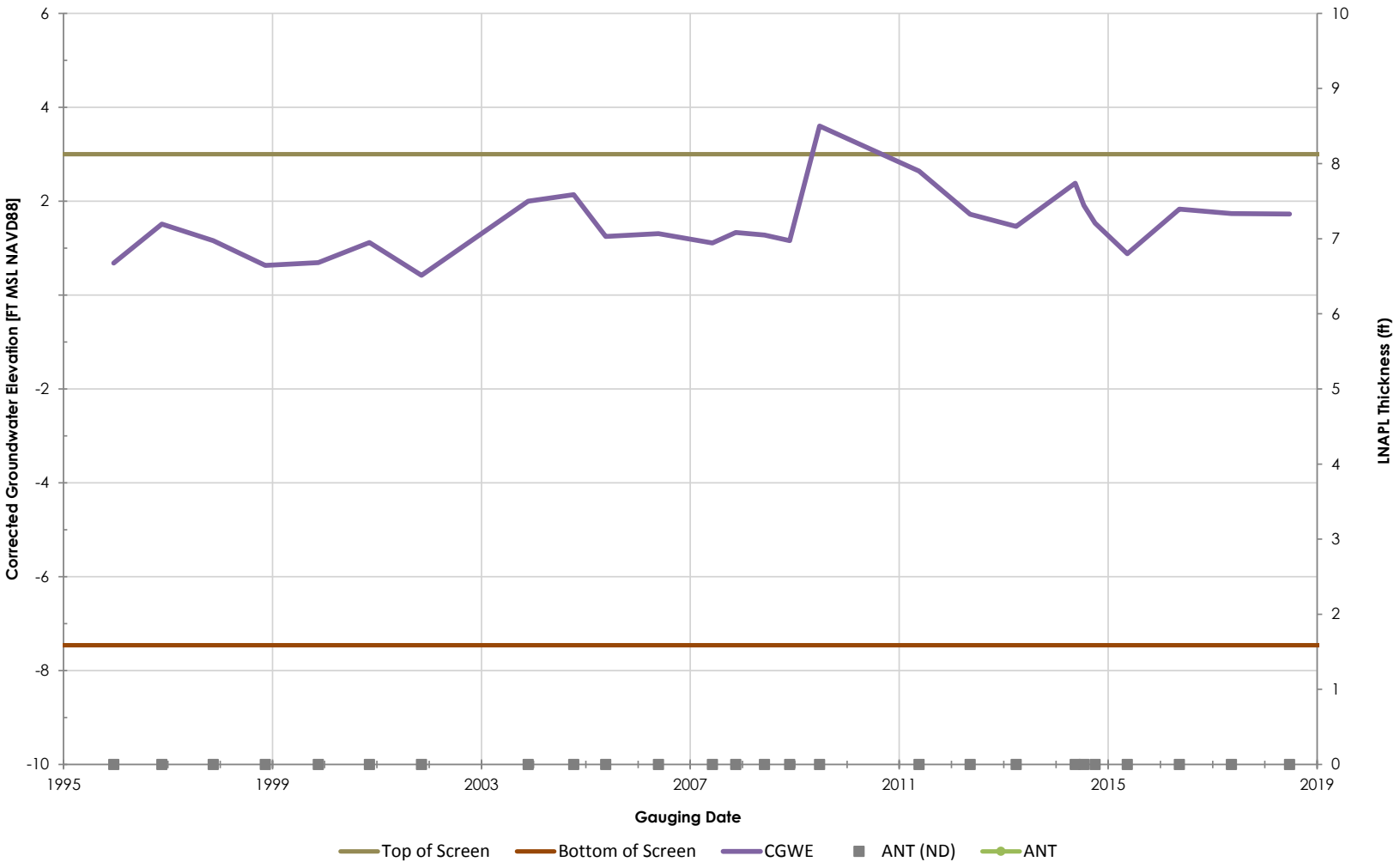
Stantec

Figure/Well No.

A-40

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

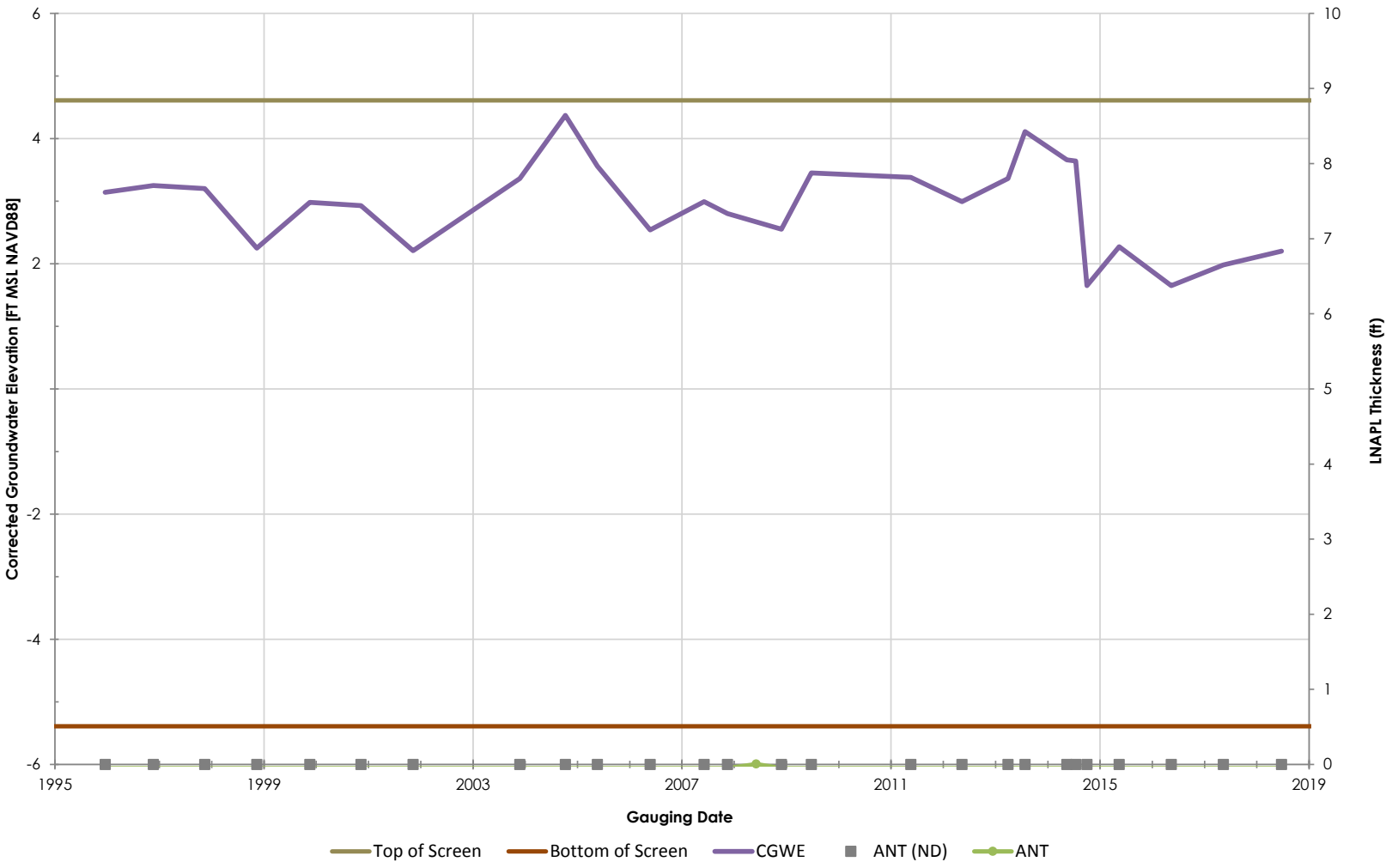
Stantec

Figure/Well No.

A-41

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

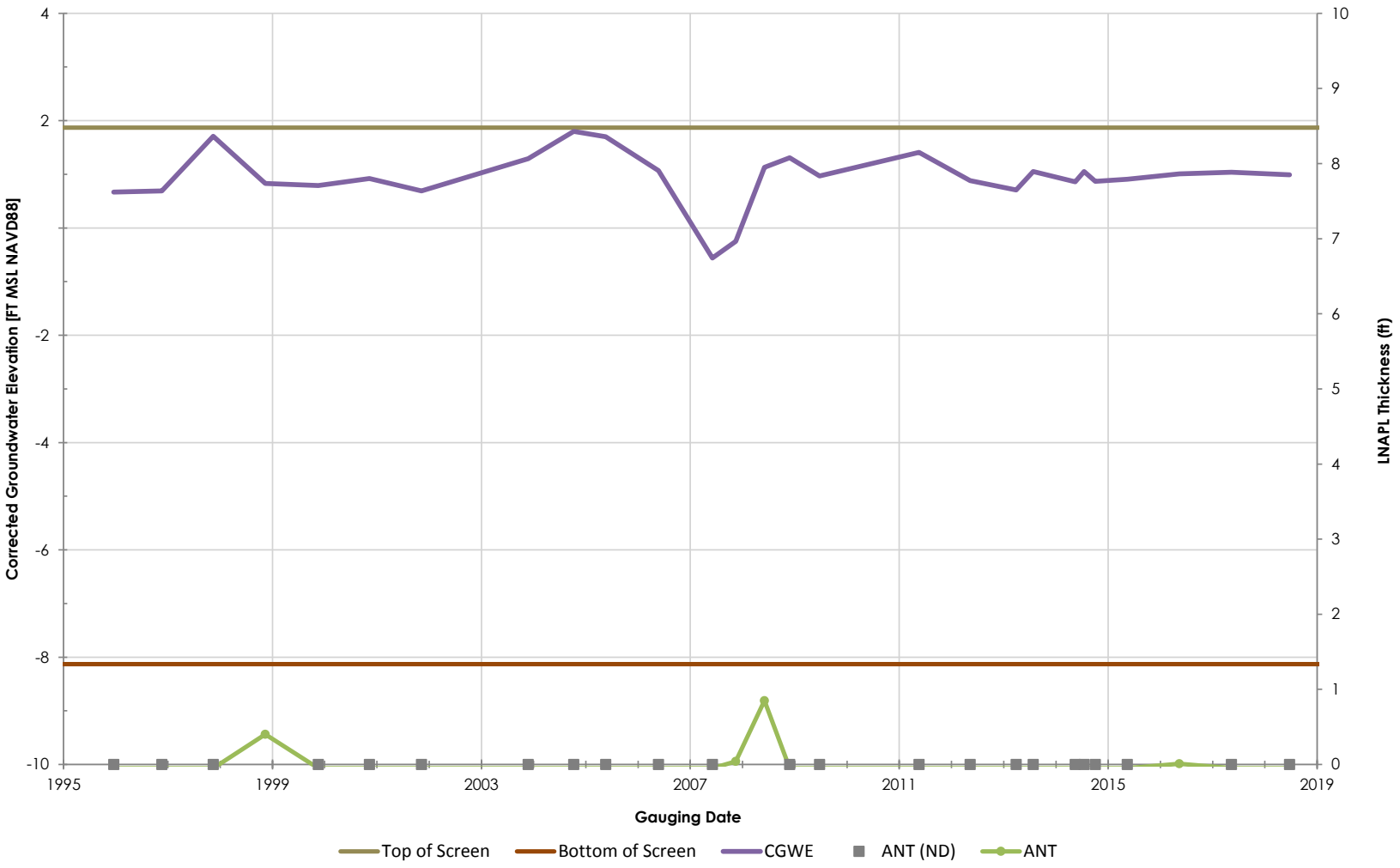
Stantec

Figure/Well No.

A-44

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

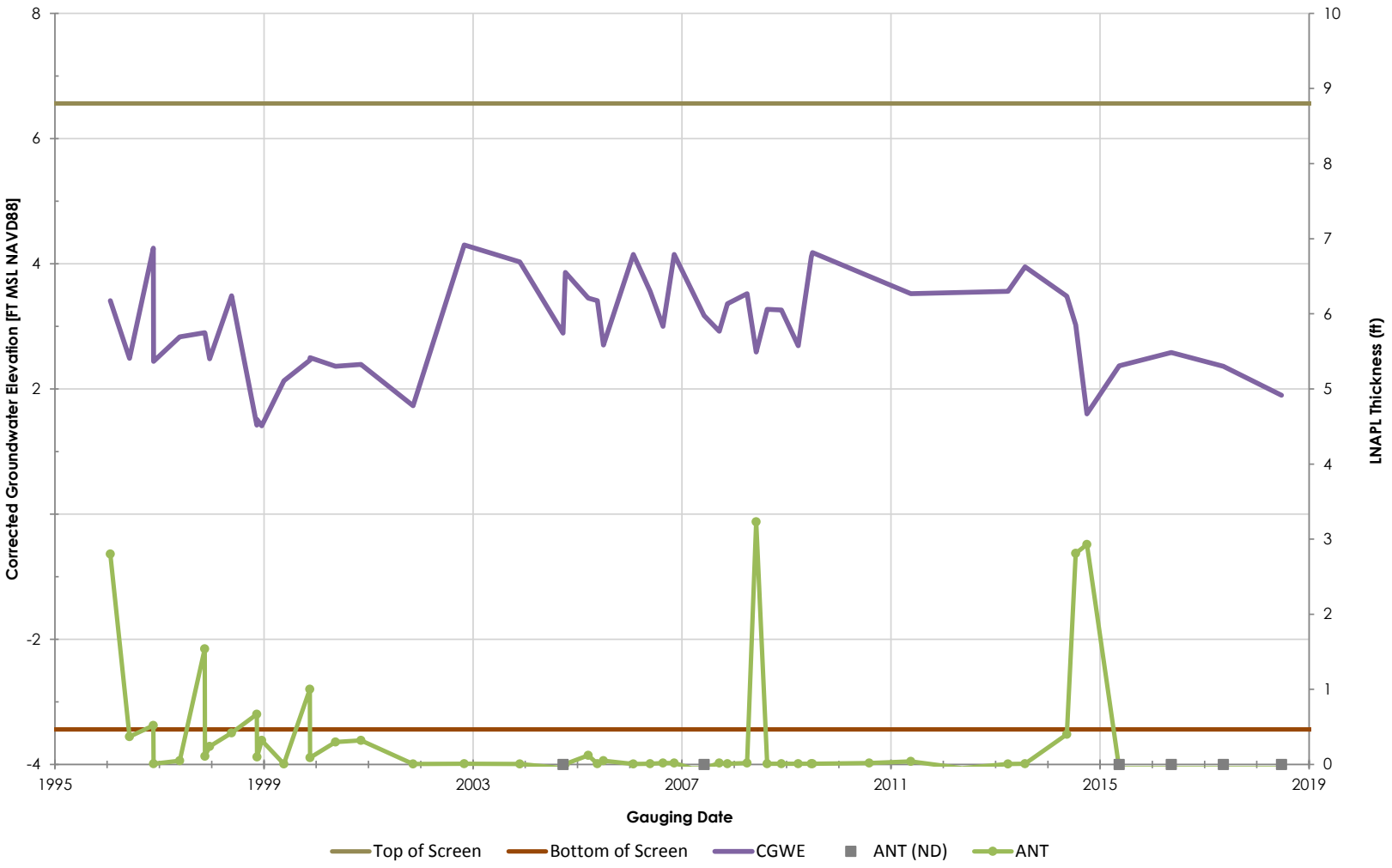
Stantec

Figure/Well No.

A-45

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

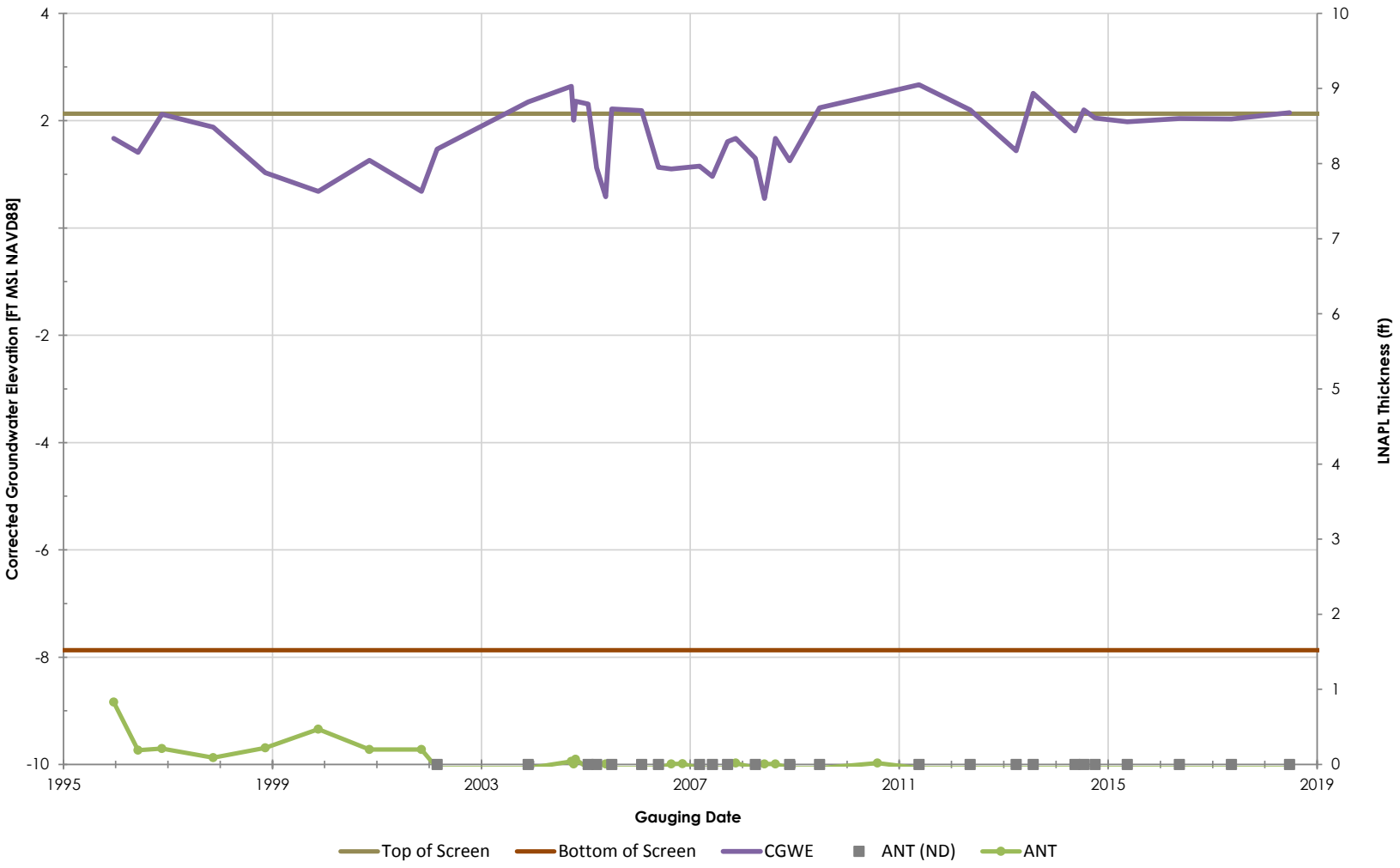
Stantec

Figure/Well No.

A-46

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

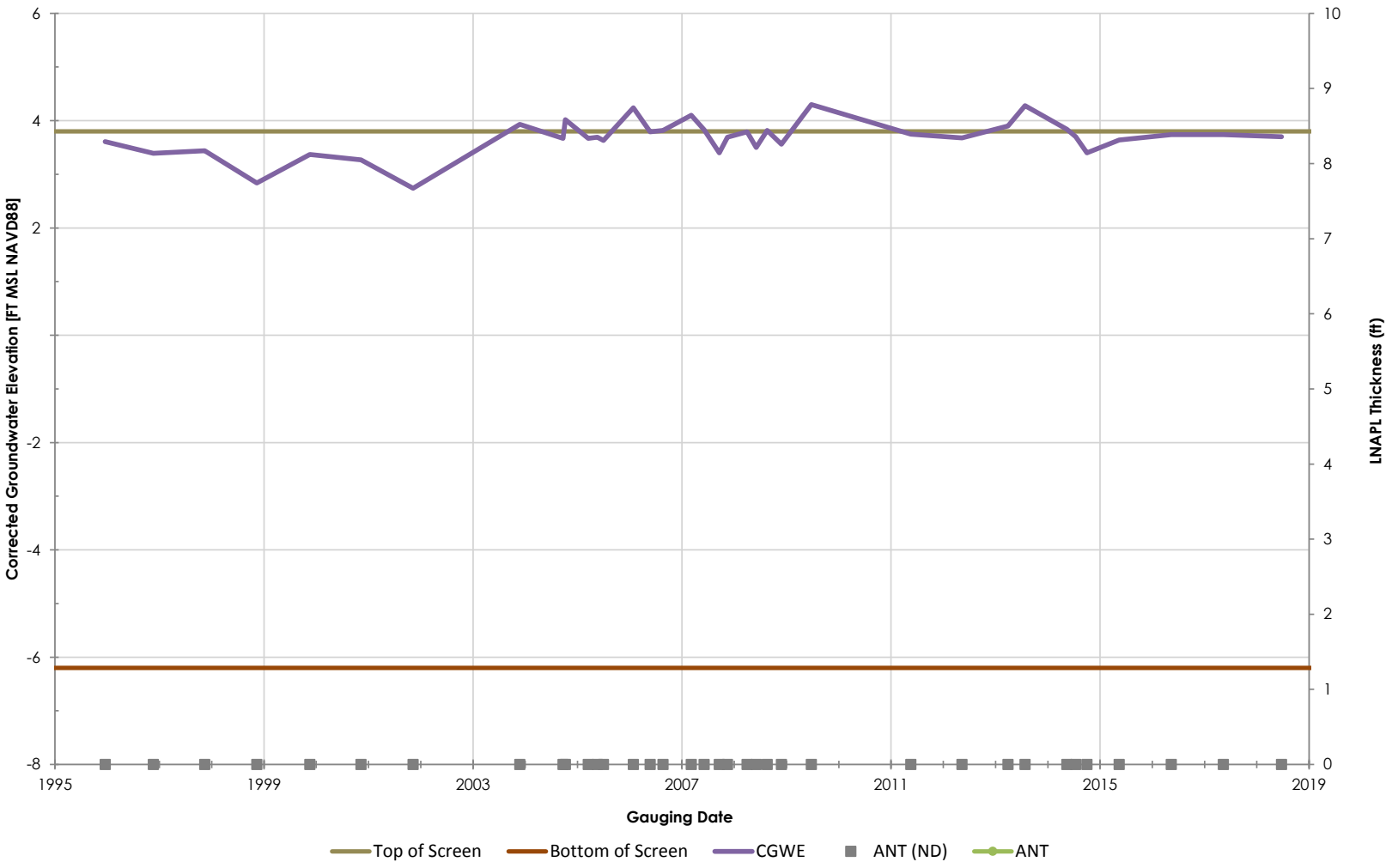
Stantec

Figure/Well No.

A-48

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

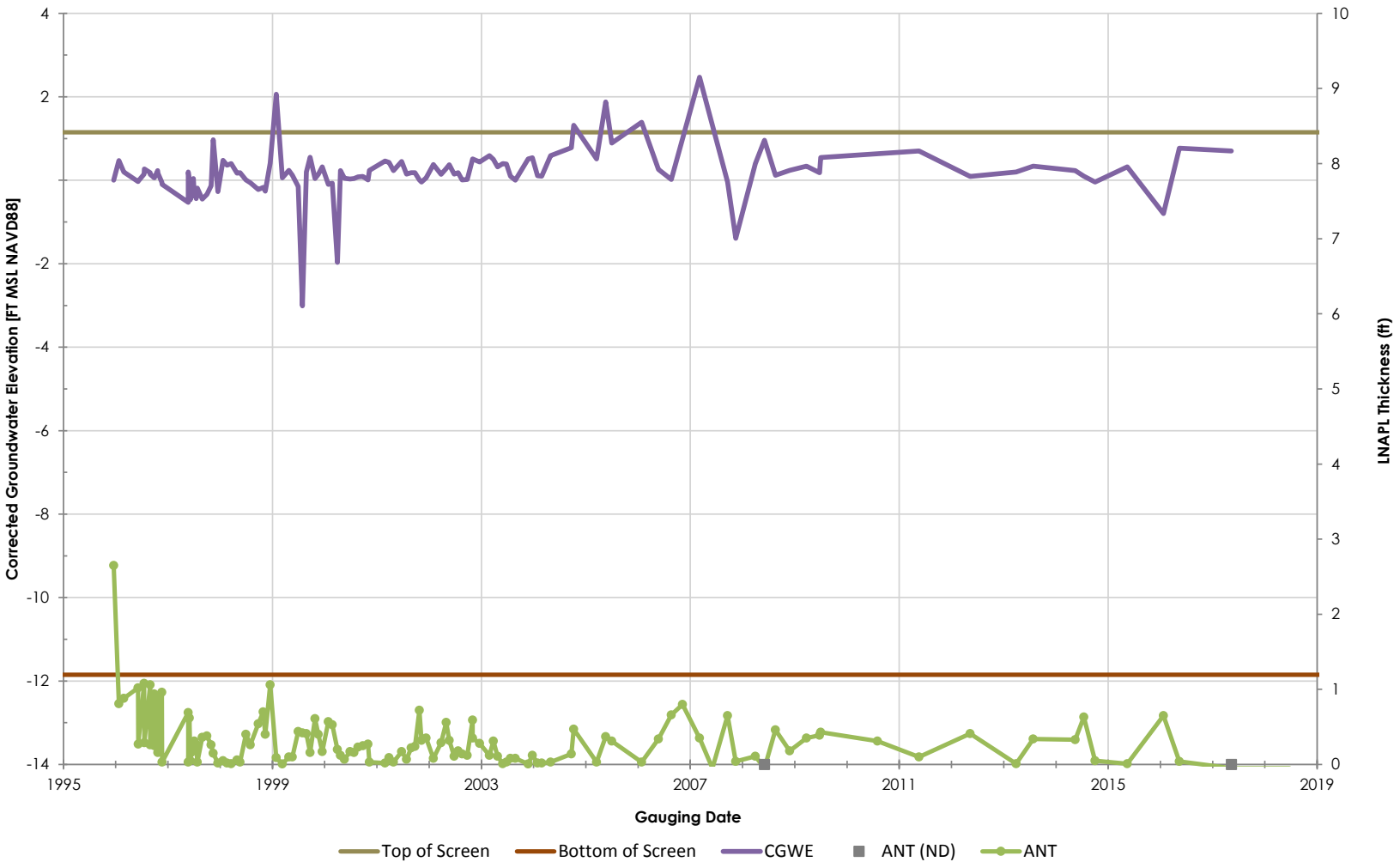
Stantec

Figure/Well No.

A-49

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

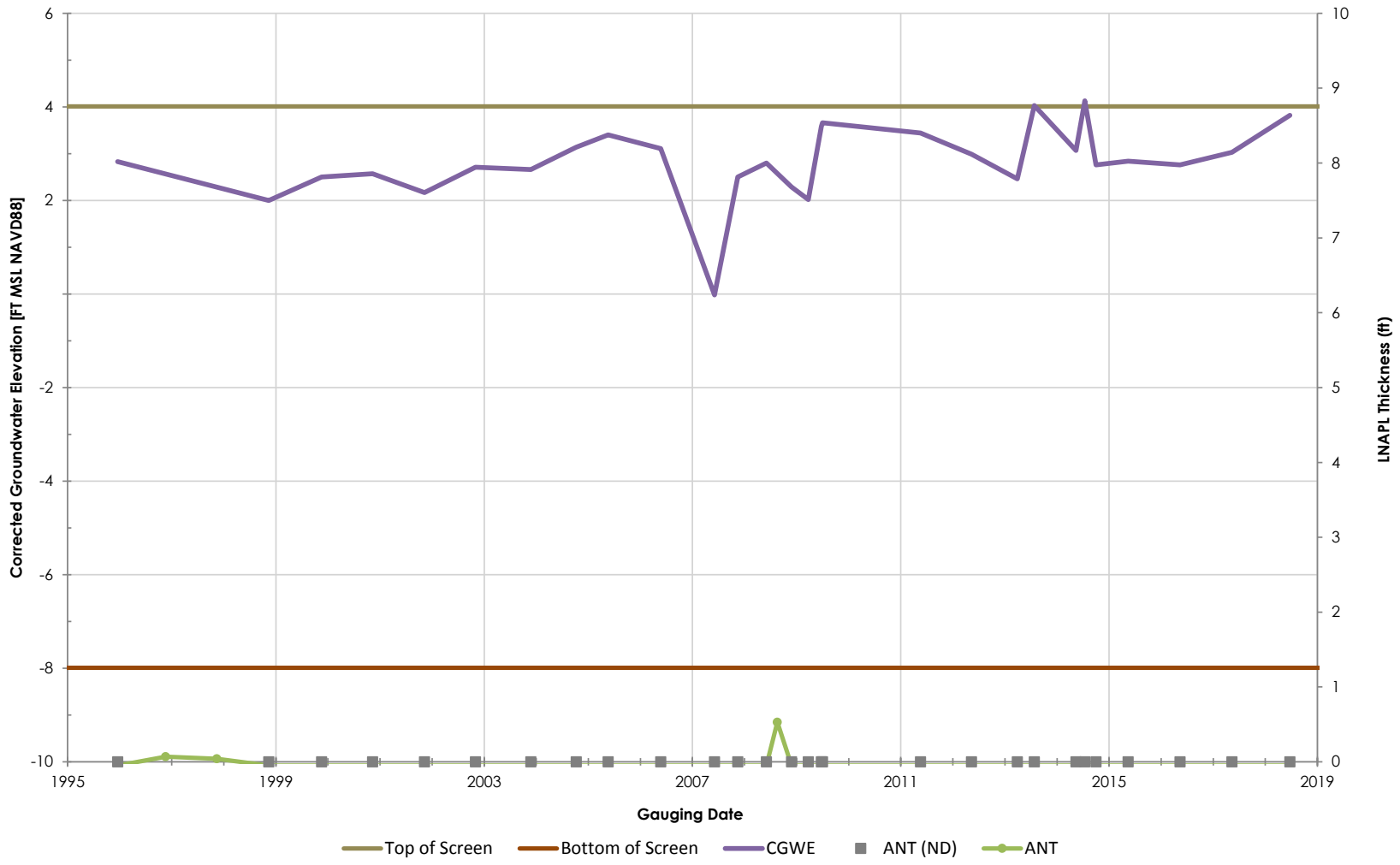
Stantec

Figure/Well No.

A-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

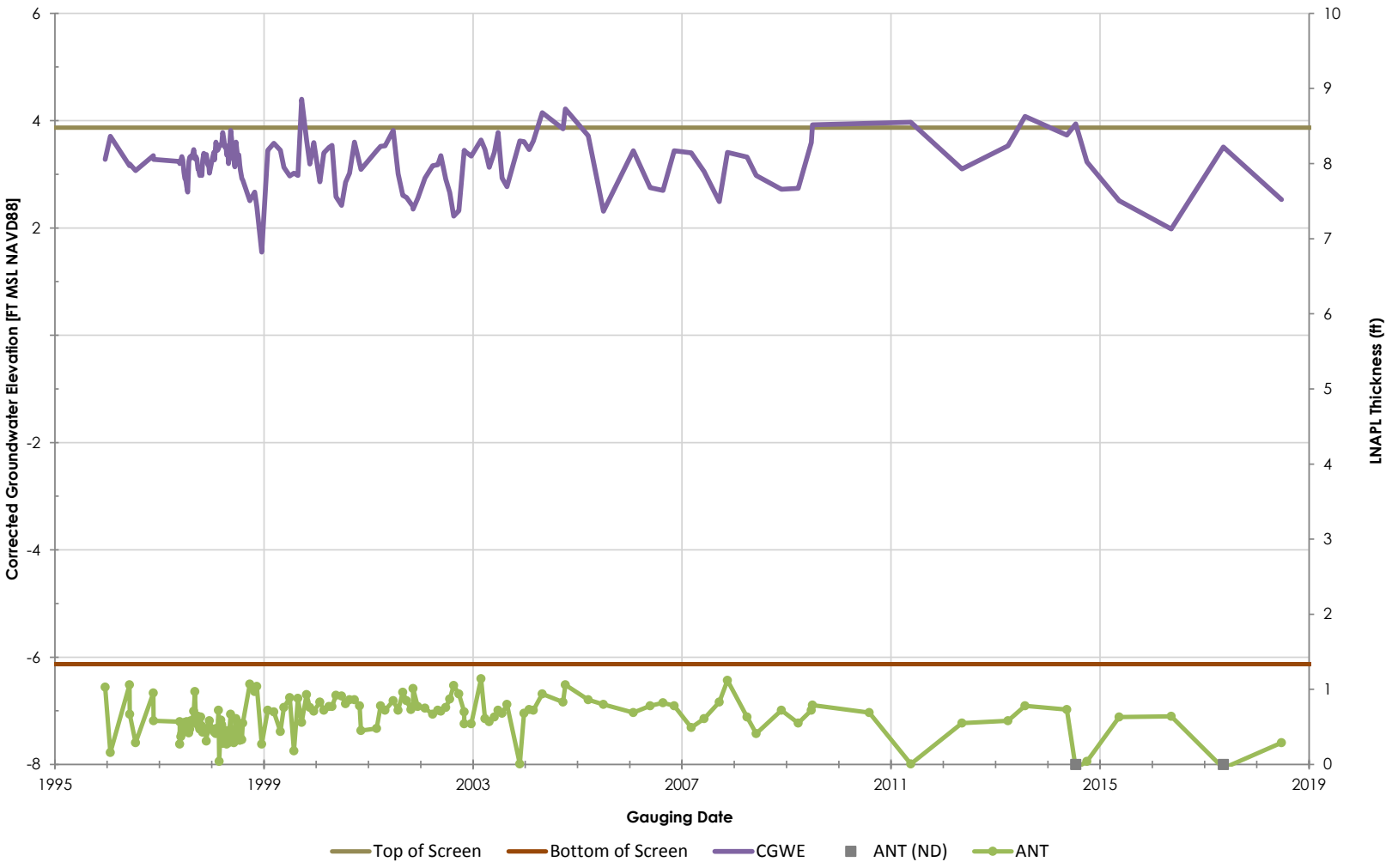
Stantec

Figure/Well No.

A-6

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

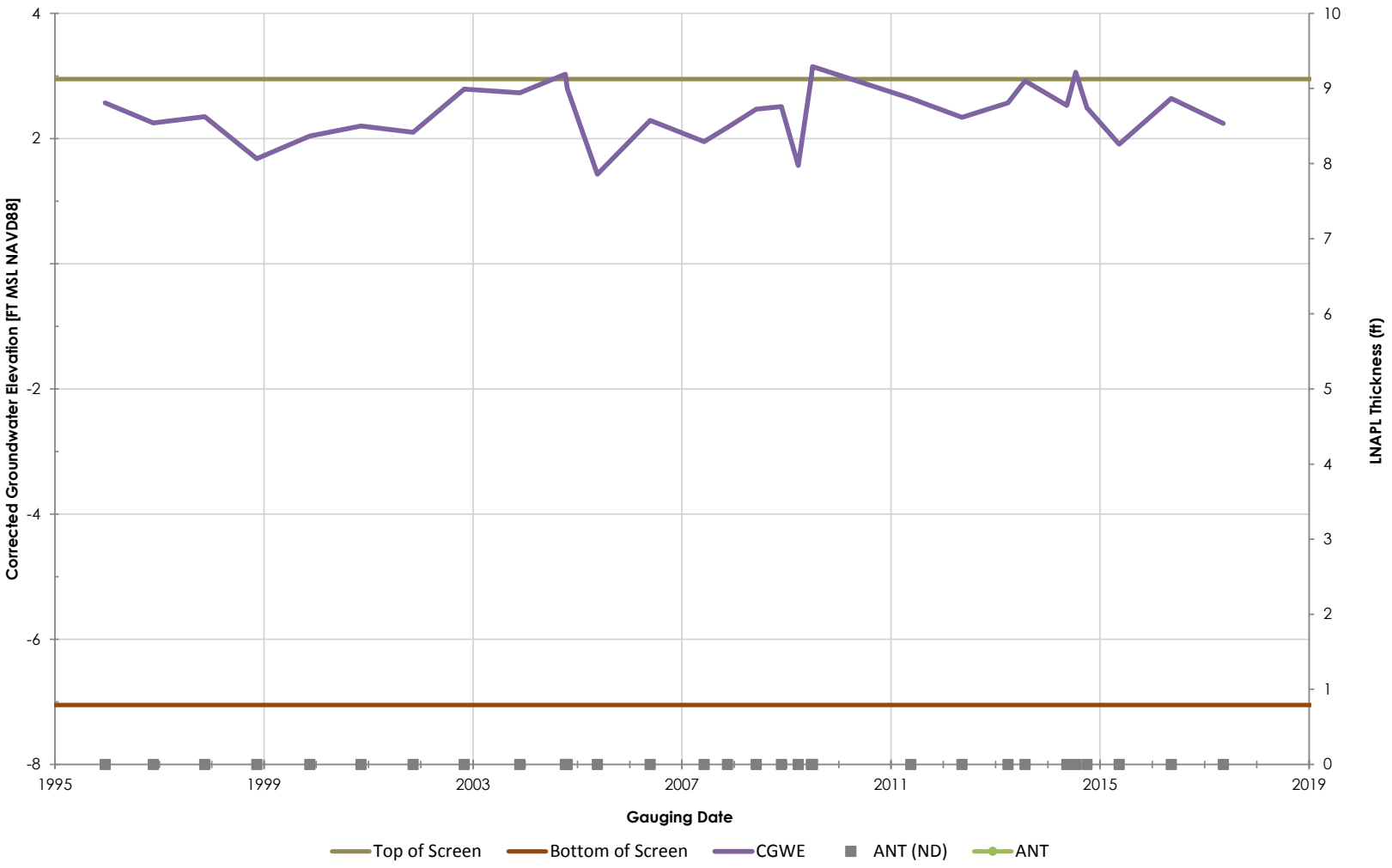
Stantec

Figure/Well No.

A-7

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

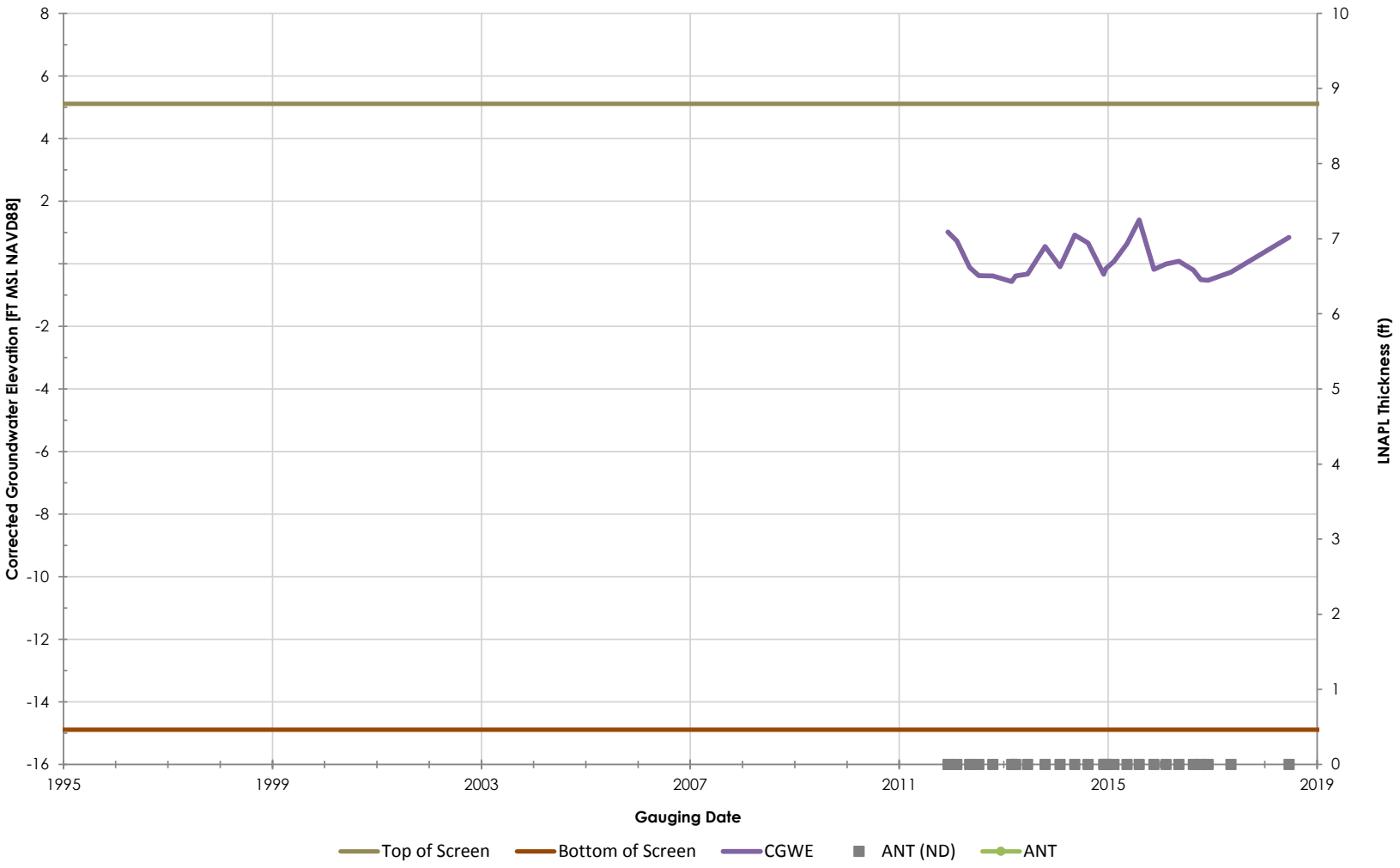
Stantec

Figure/Well No.

A-9

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

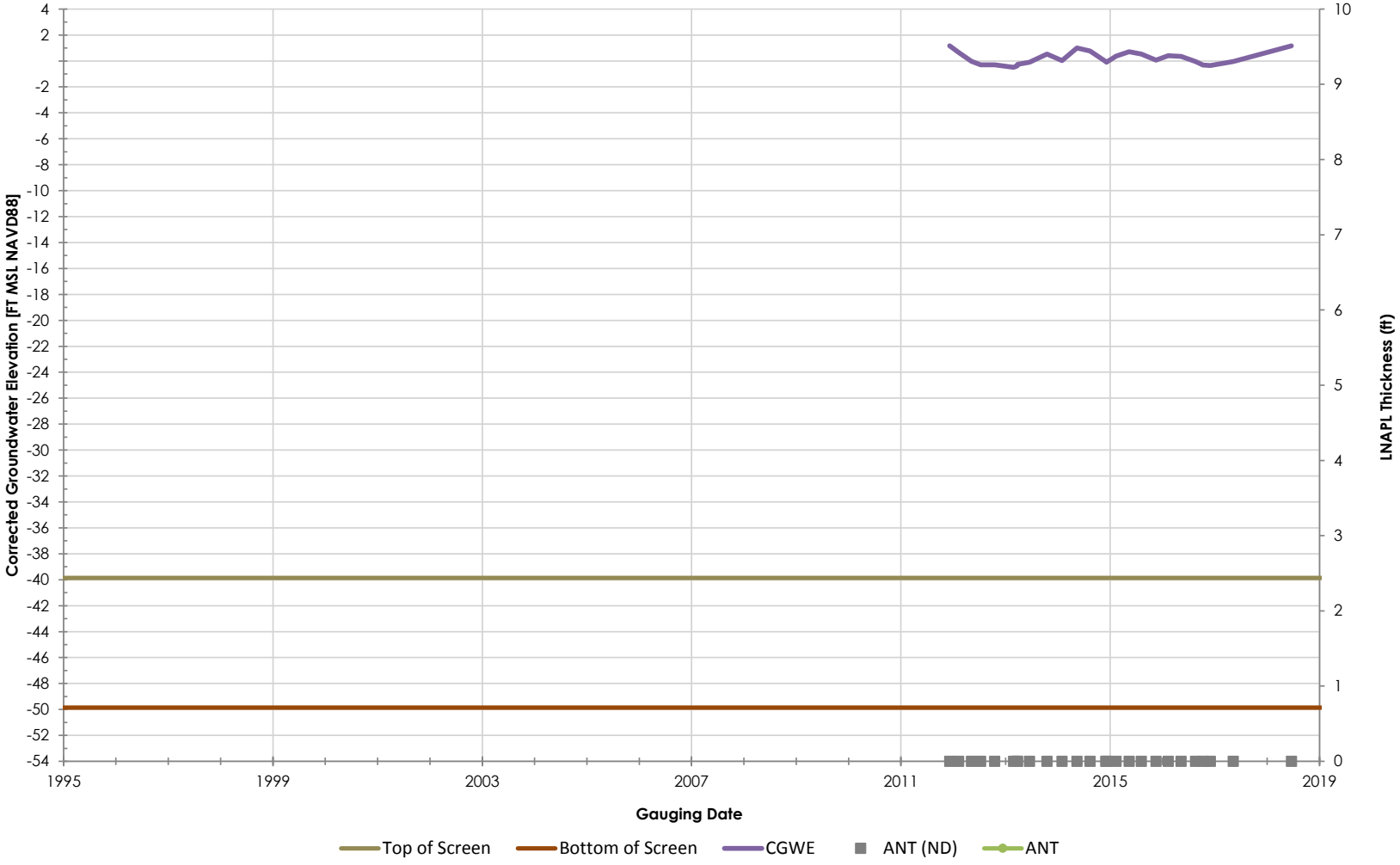
Stantec

Figure/Well No.

ARCO-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



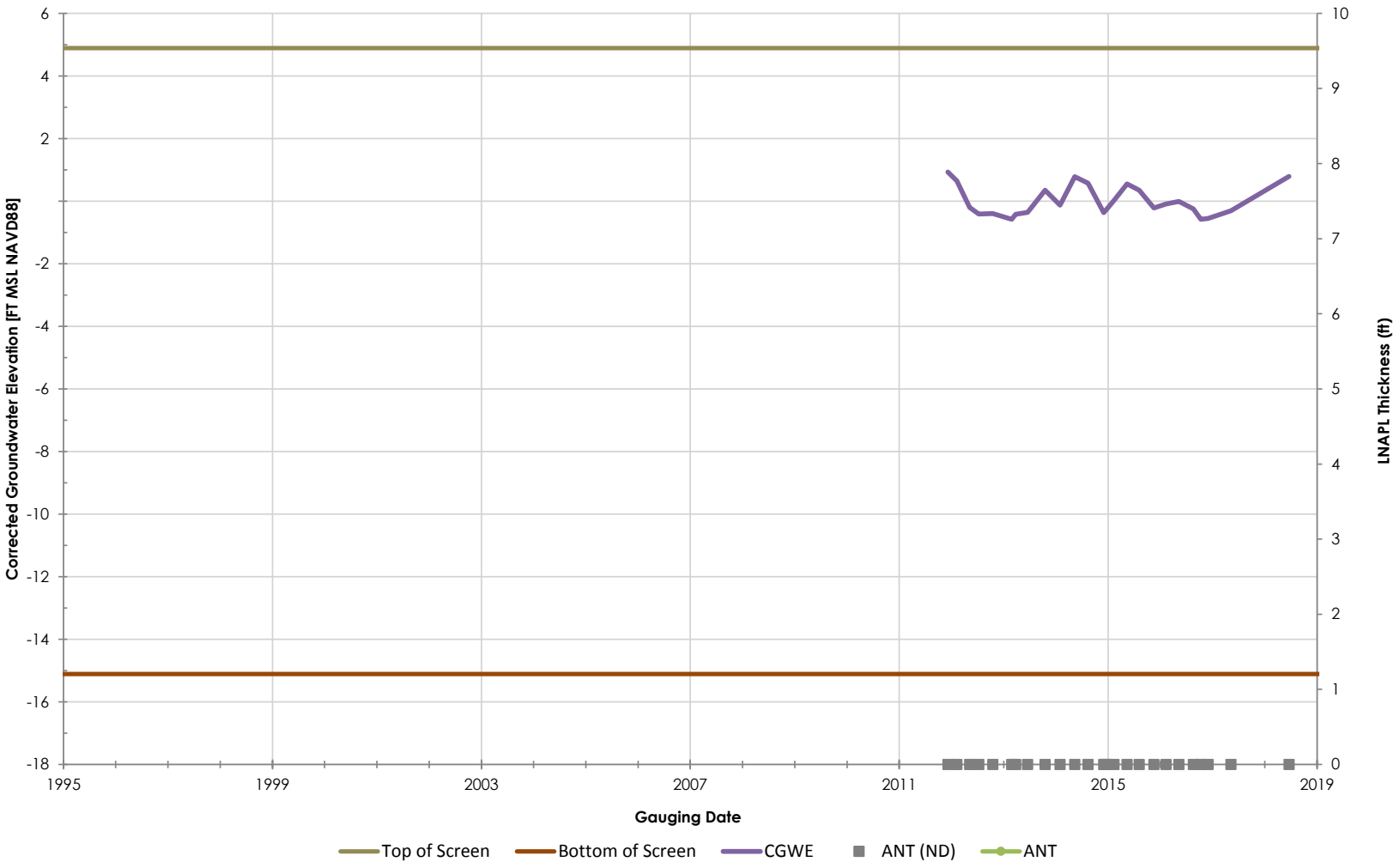
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

ARCO-1D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

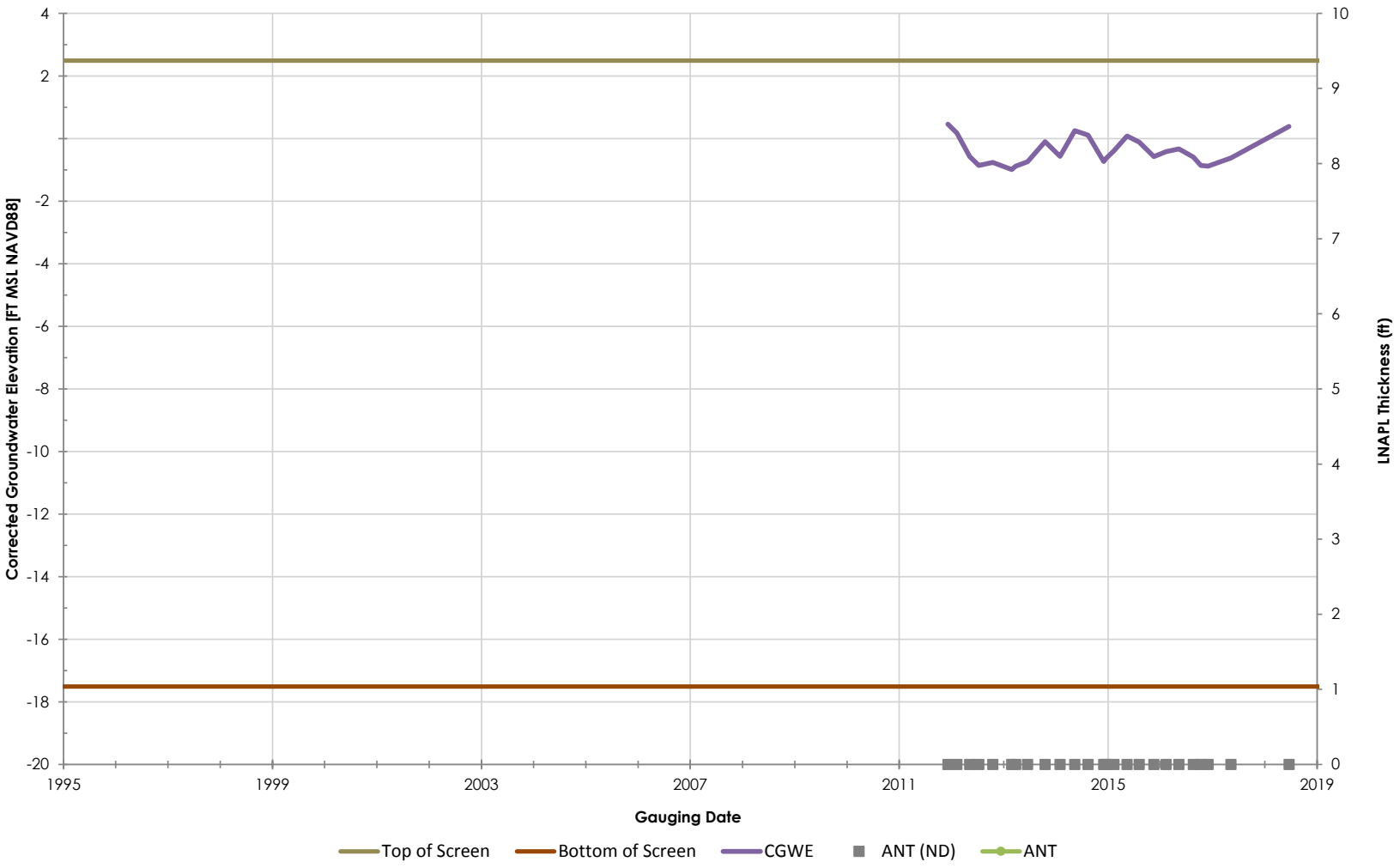
Stantec

Figure/Well No.

ARCO-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

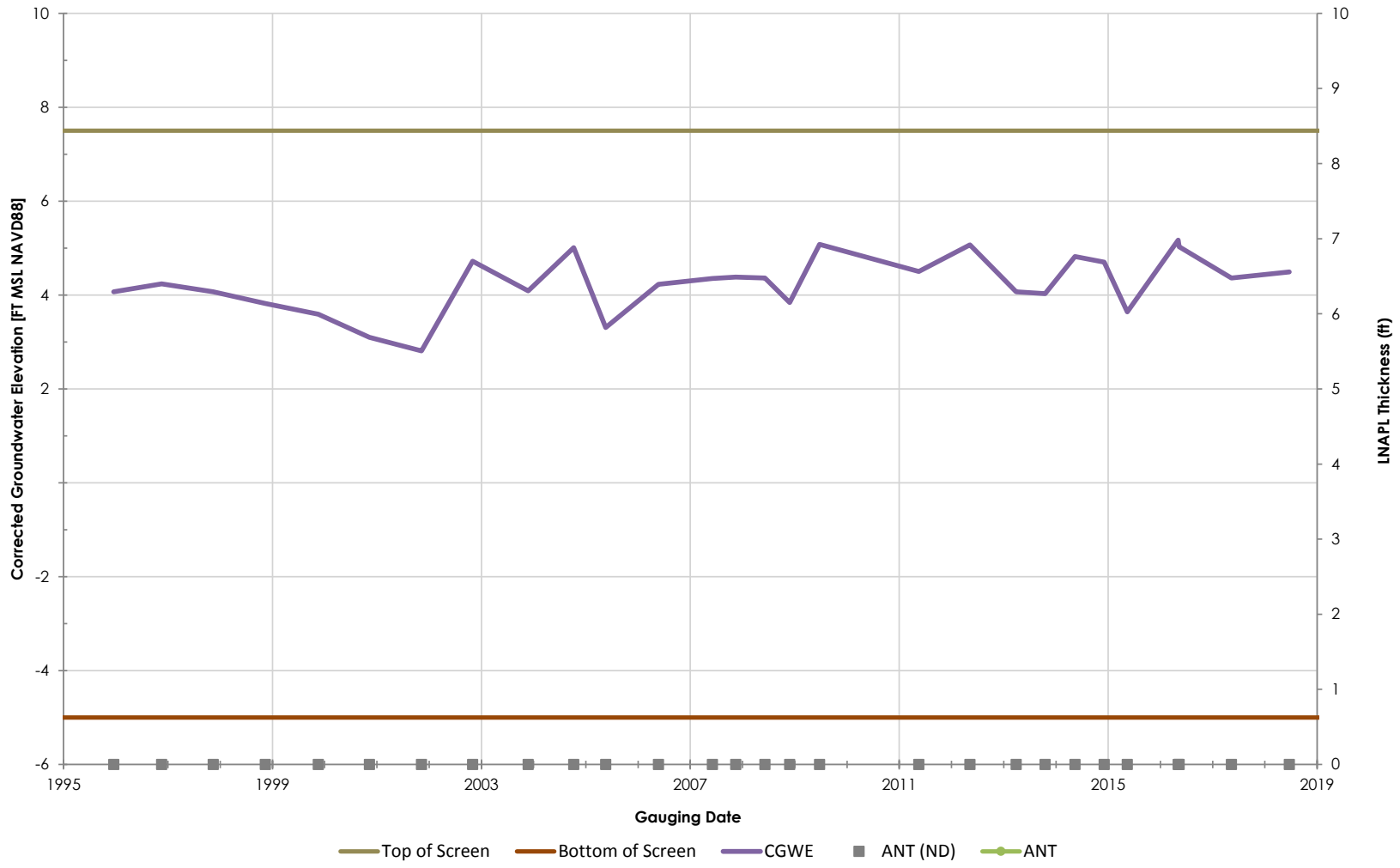
Stantec

Figure/Well No.

ARCO-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

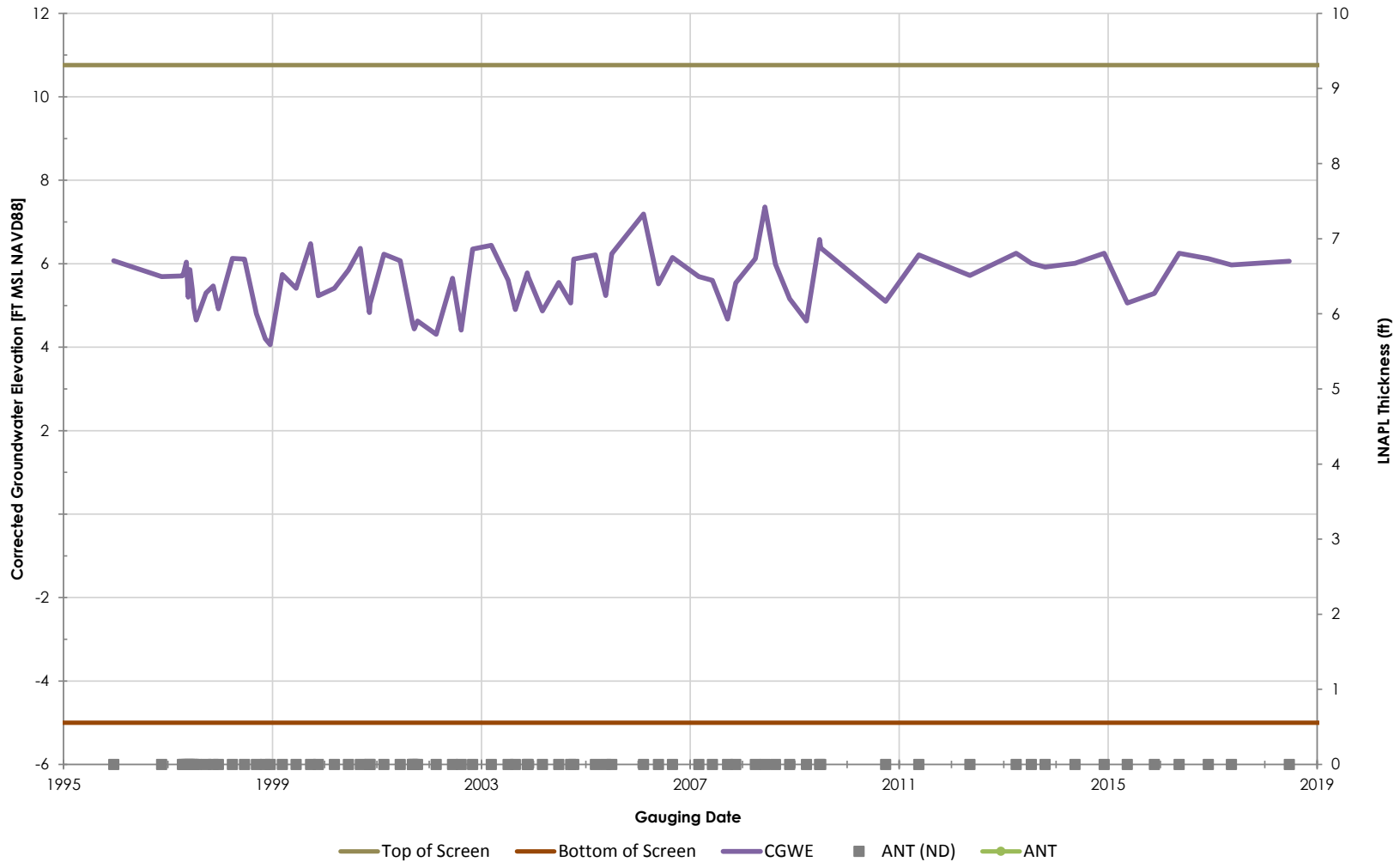
Stantec

Figure/Well No.

B-115

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

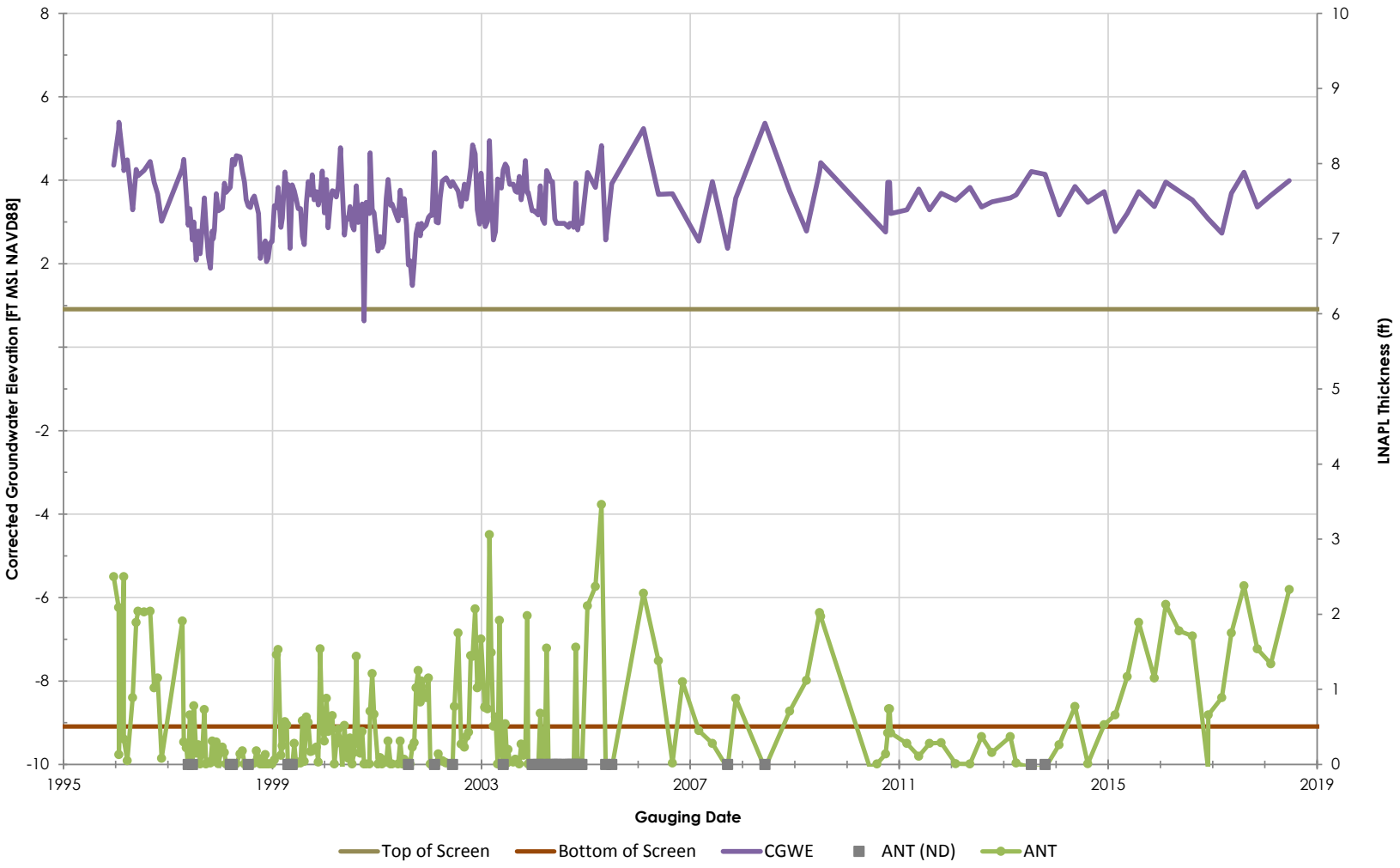
Stantec

Figure/Well No.

B-123

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

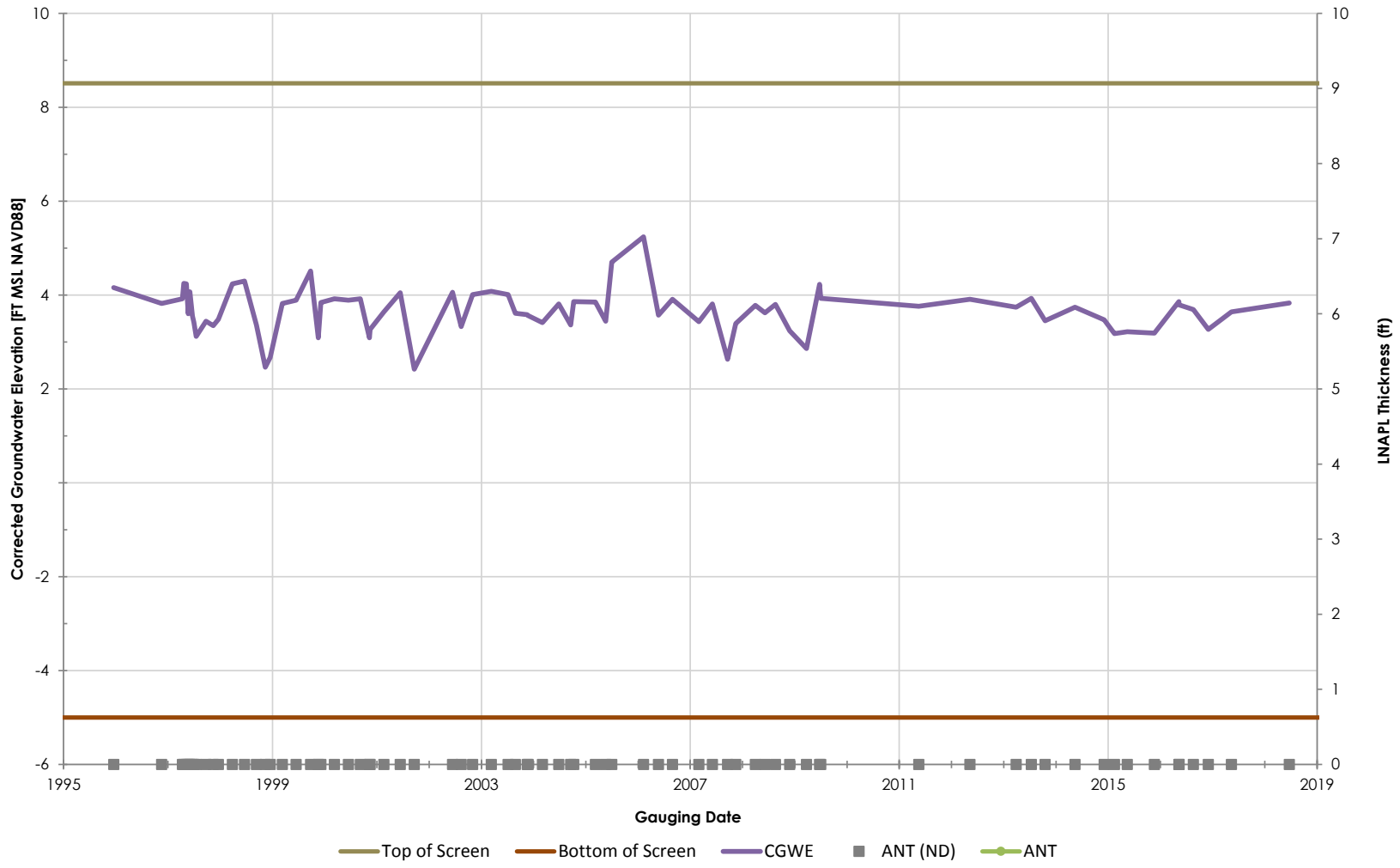
Stantec

Figure/Well No.

B-124

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Stantec

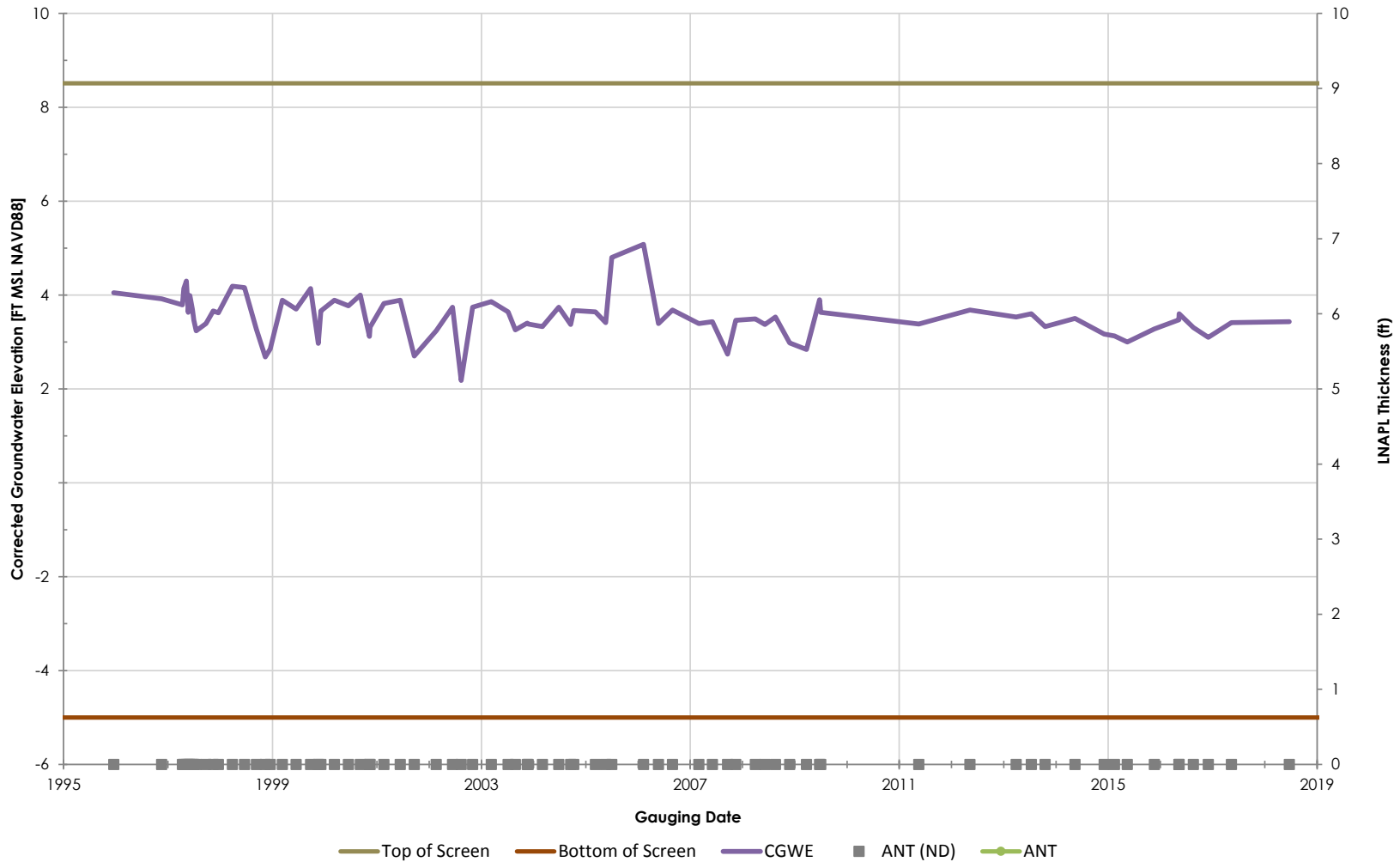
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

B-125

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

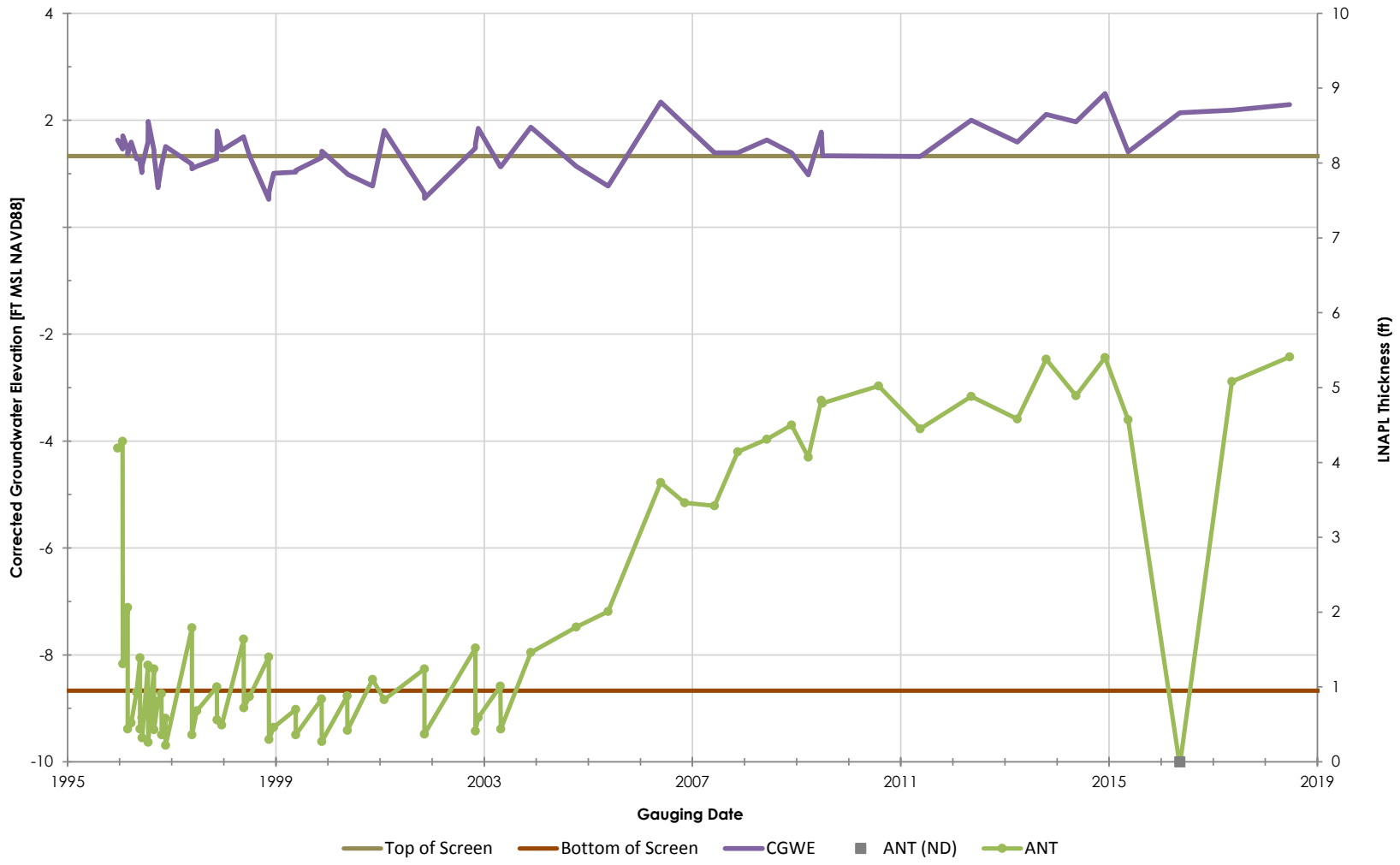
Stantec

Figure/Well No.

B-126

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

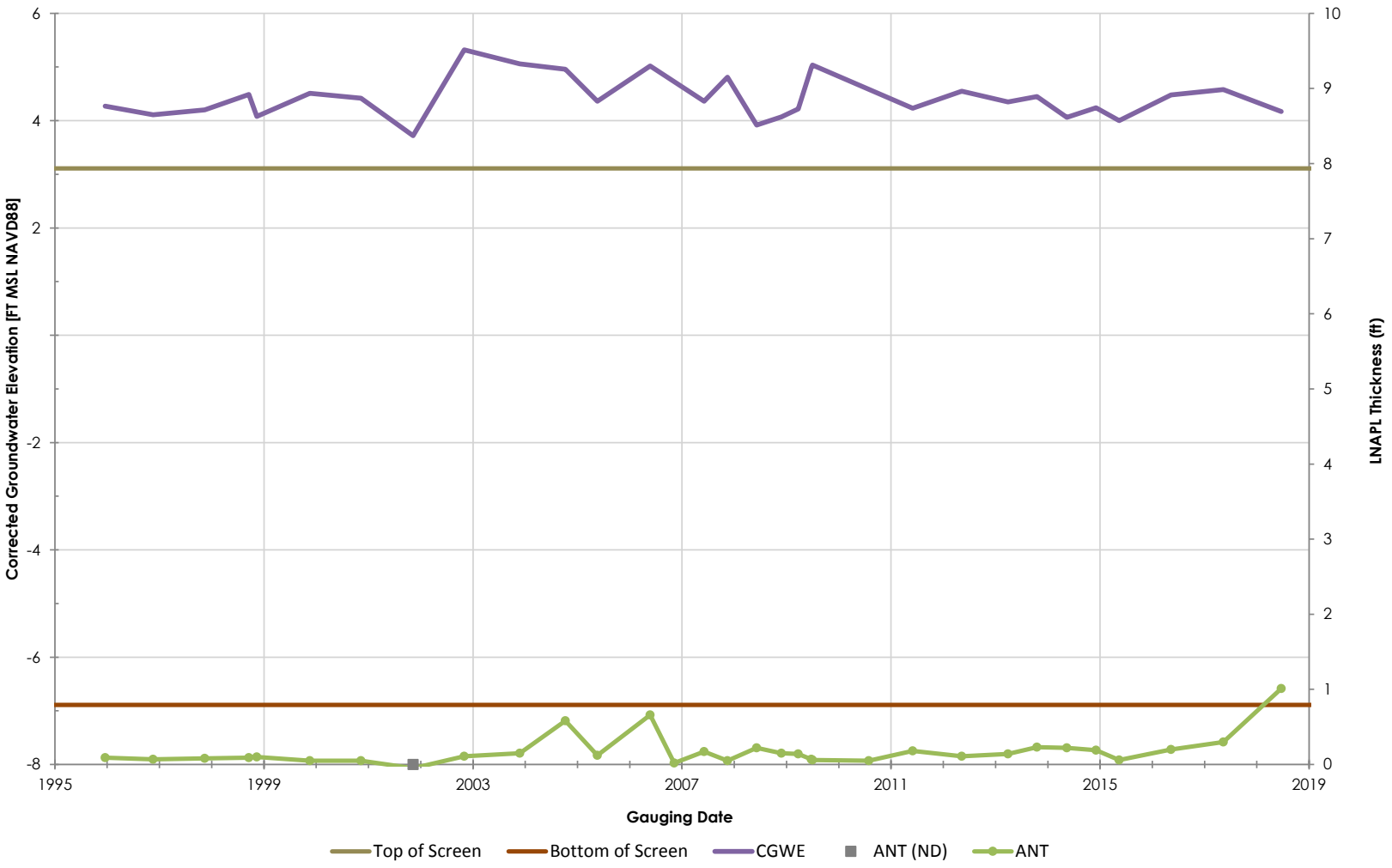
Stantec

Figure/Well No.

B-129

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

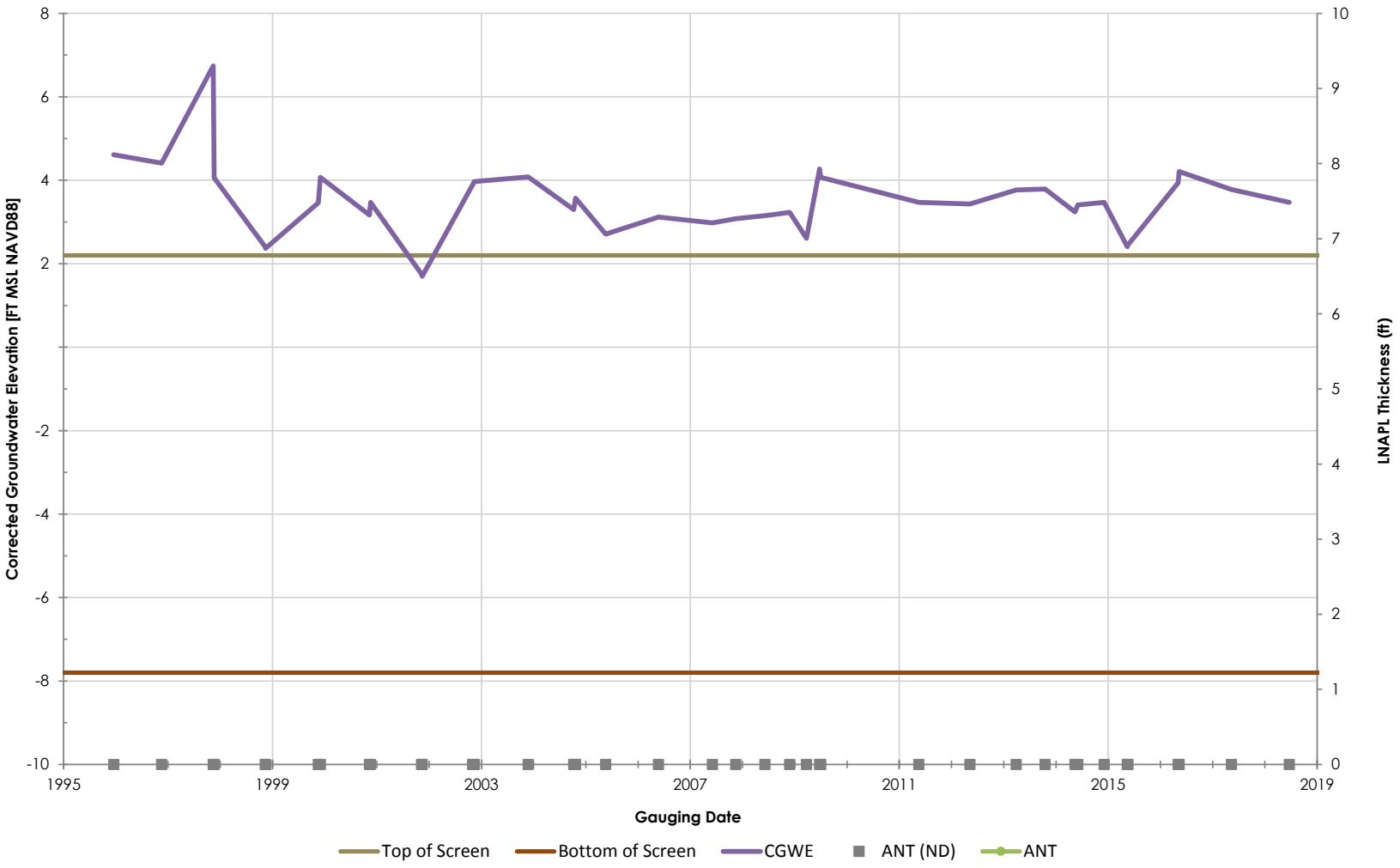
Stantec

Figure/Well No.

B-130

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

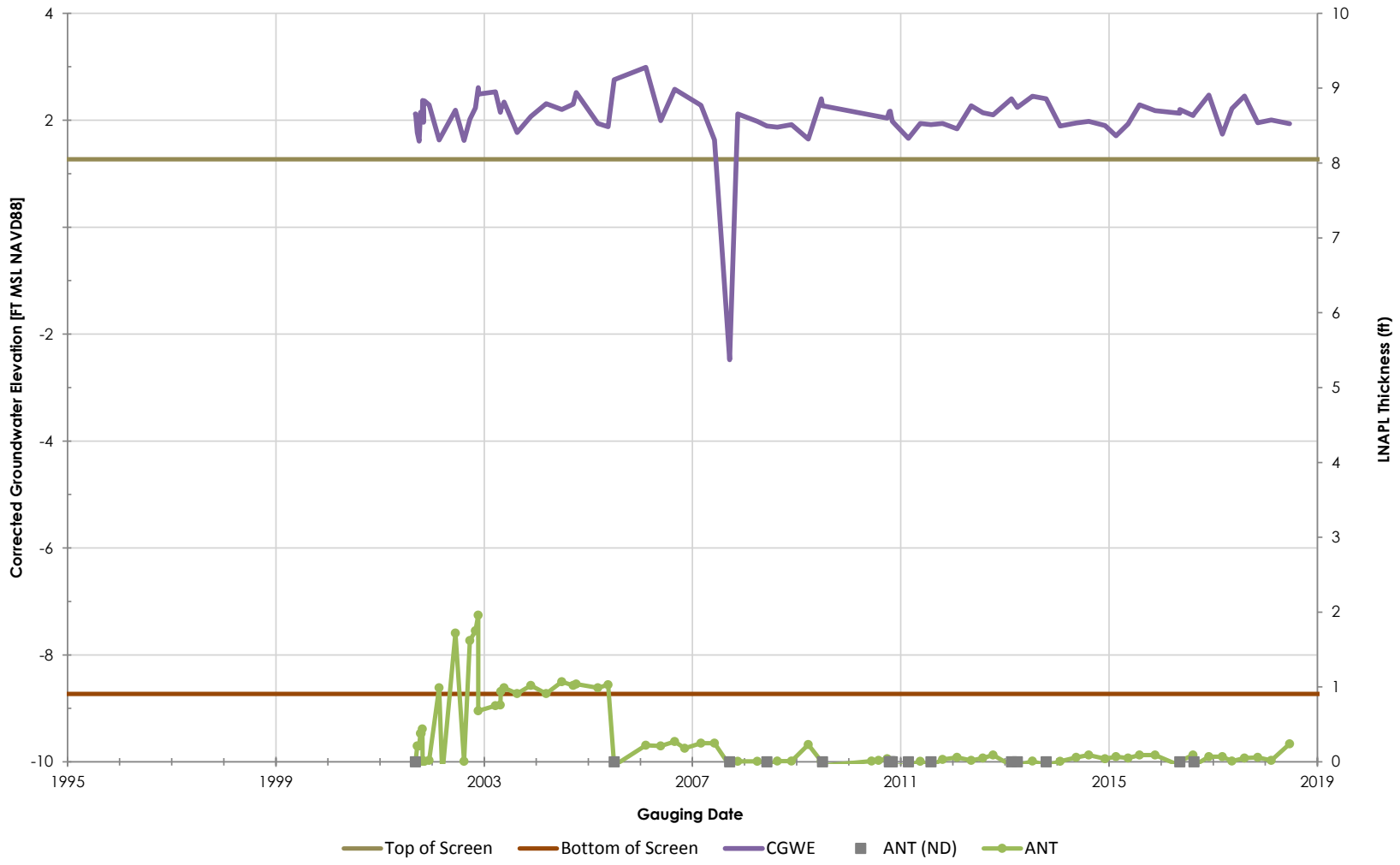
Stantec

Figure/Well No.

B-131

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

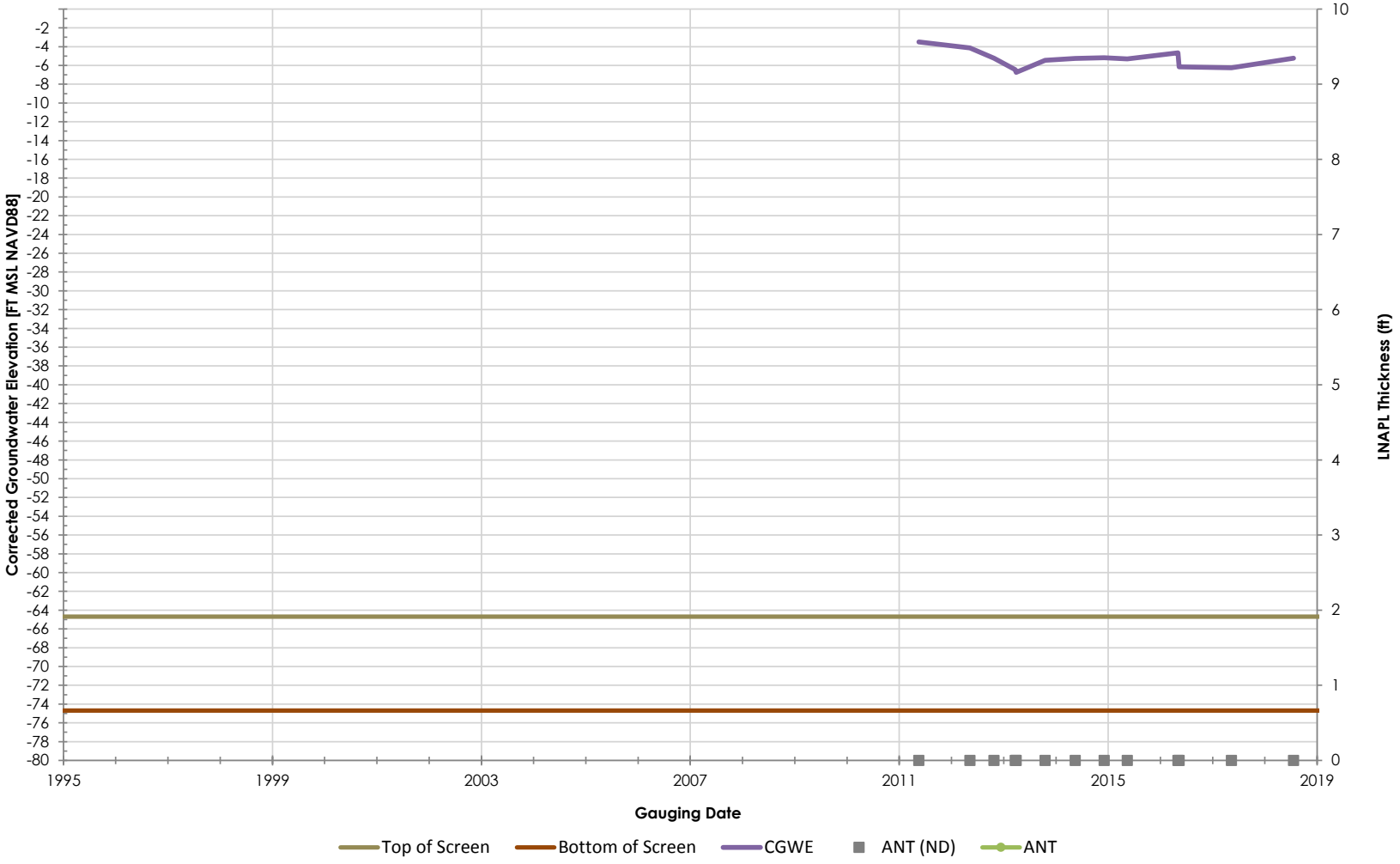
Stantec

Figure/Well No.

B-132

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

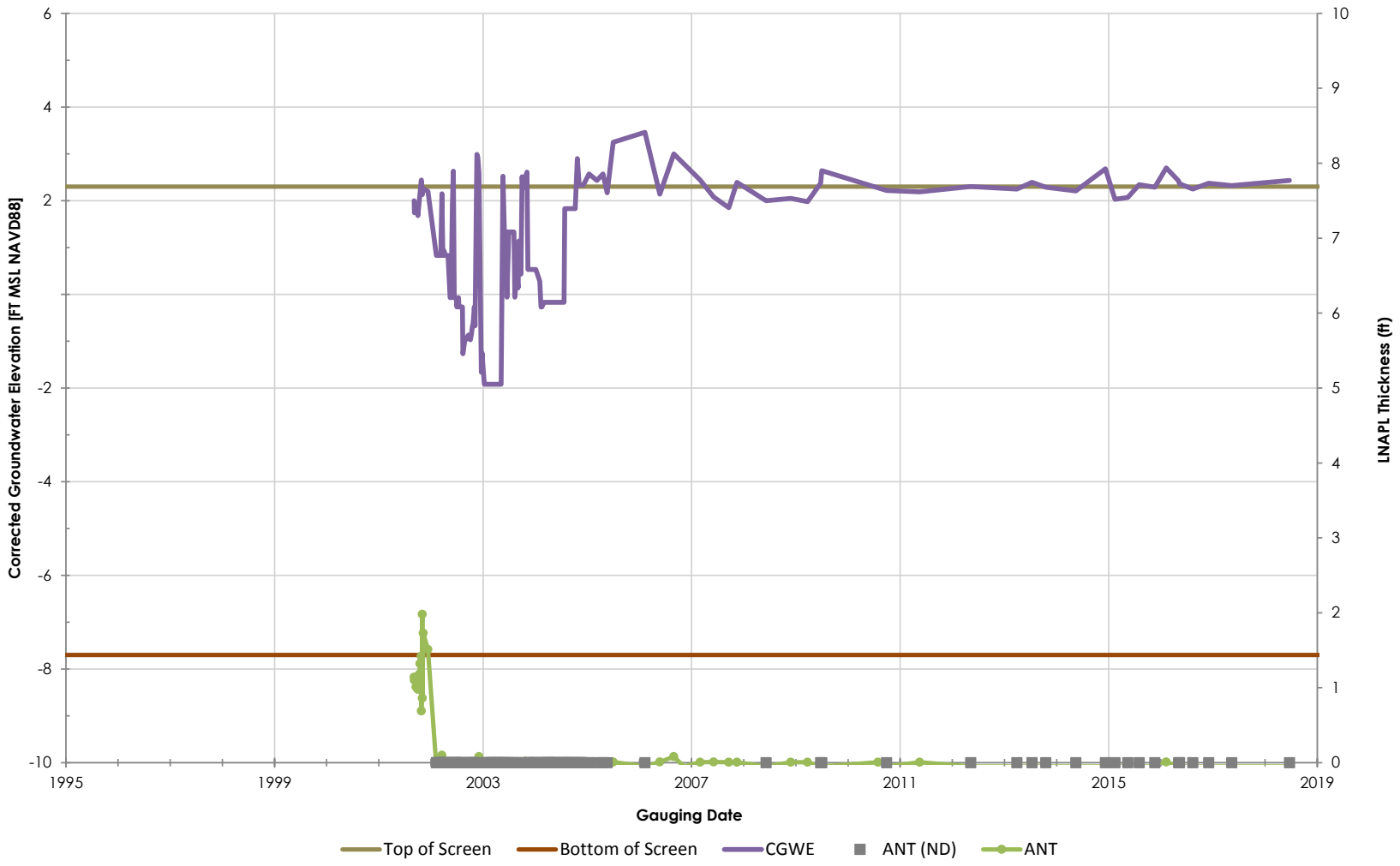
Stantec

Figure/Well No.

B-132D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

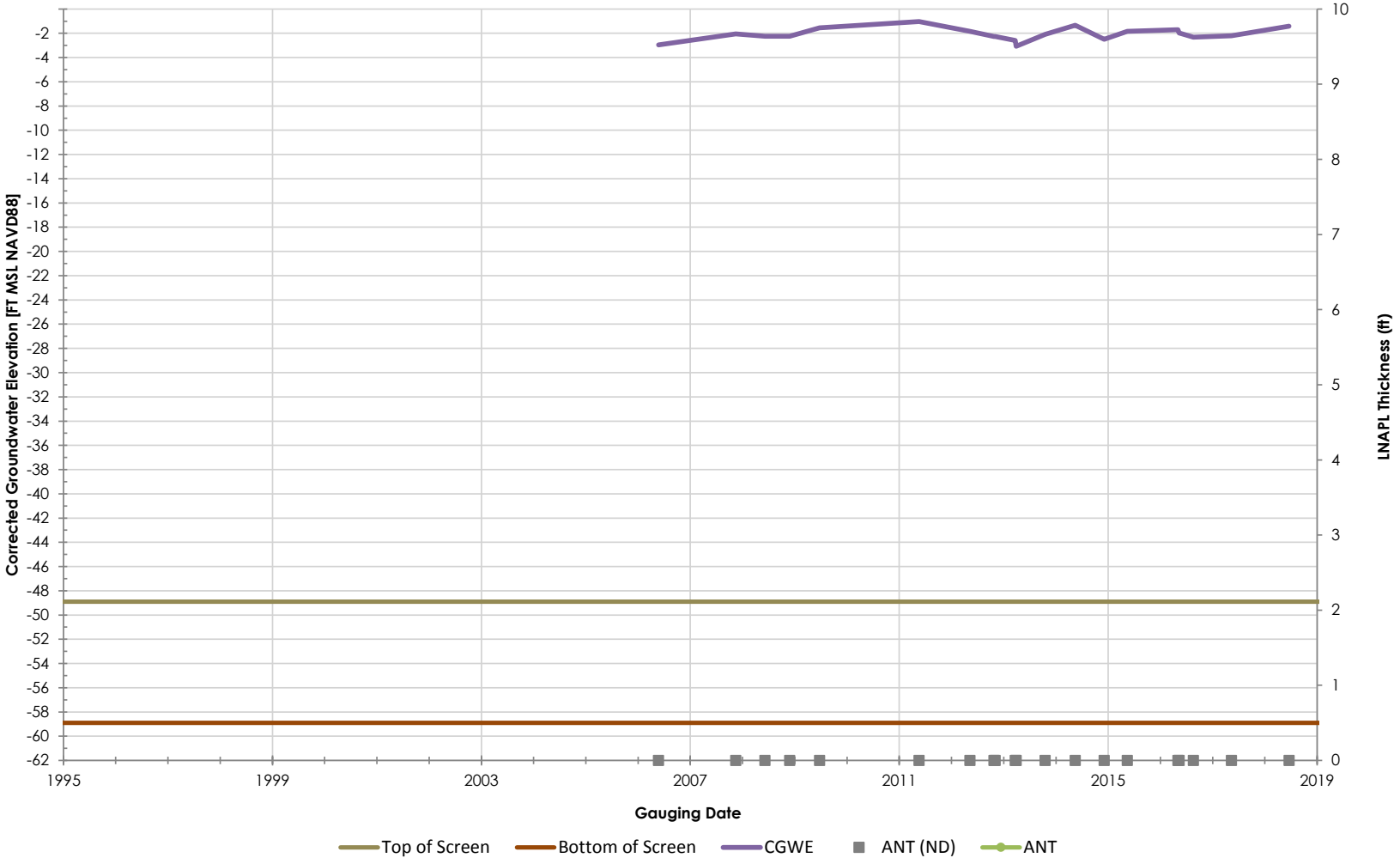
Stantec

Figure/Well No.

B-133

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

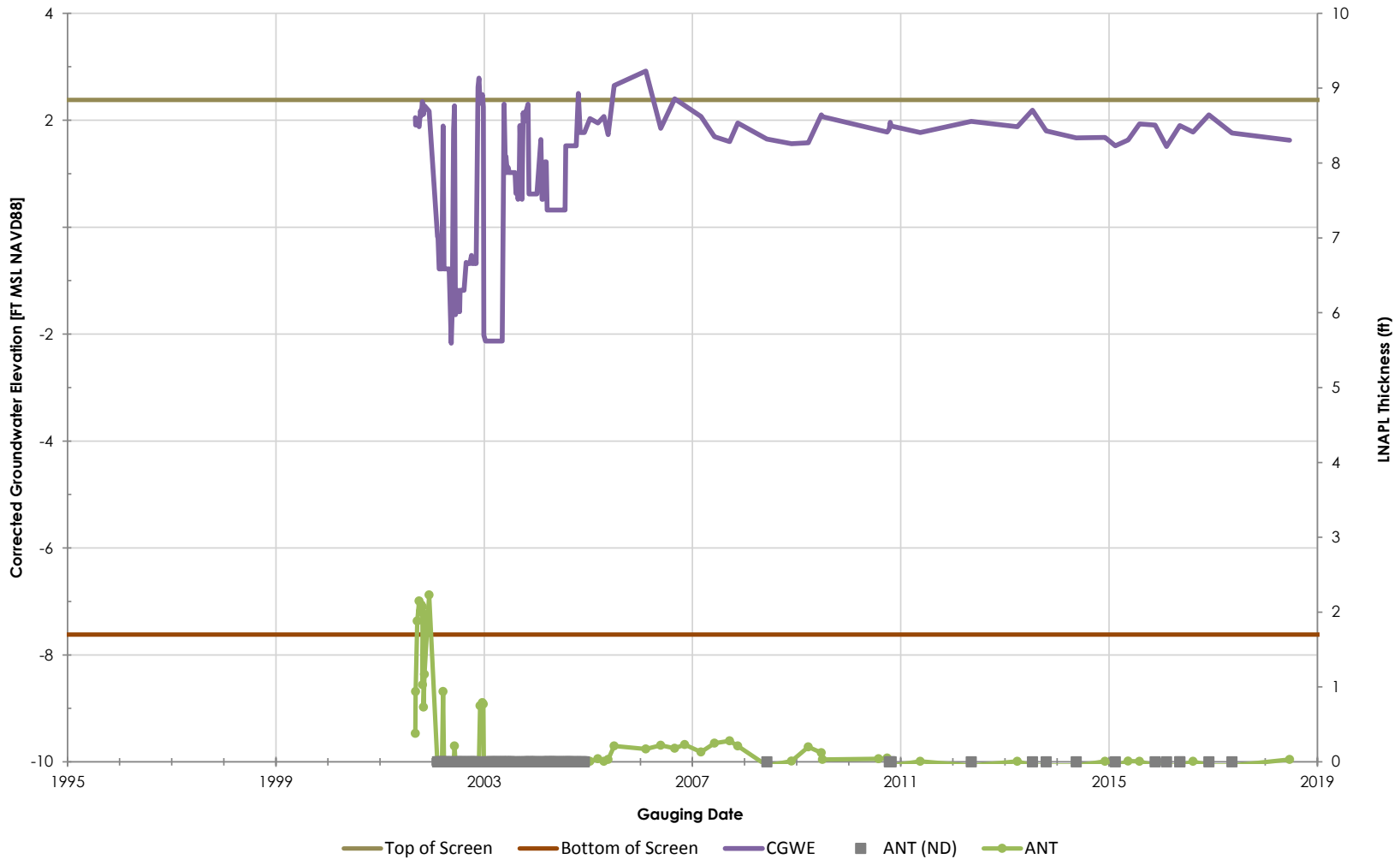
Stantec

Figure/Well No.

B-133D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

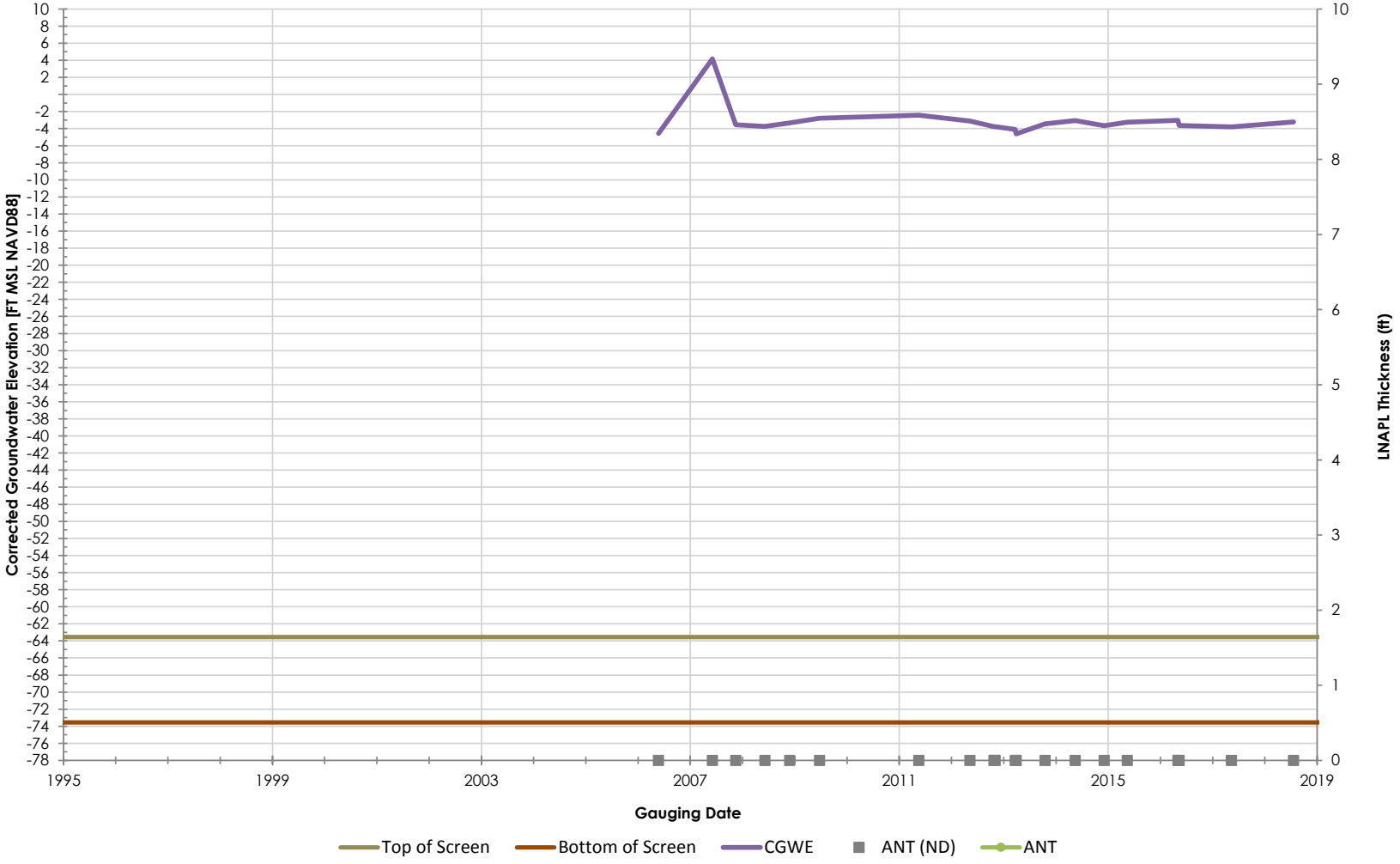
Stantec

Figure/Well No.

B-134

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

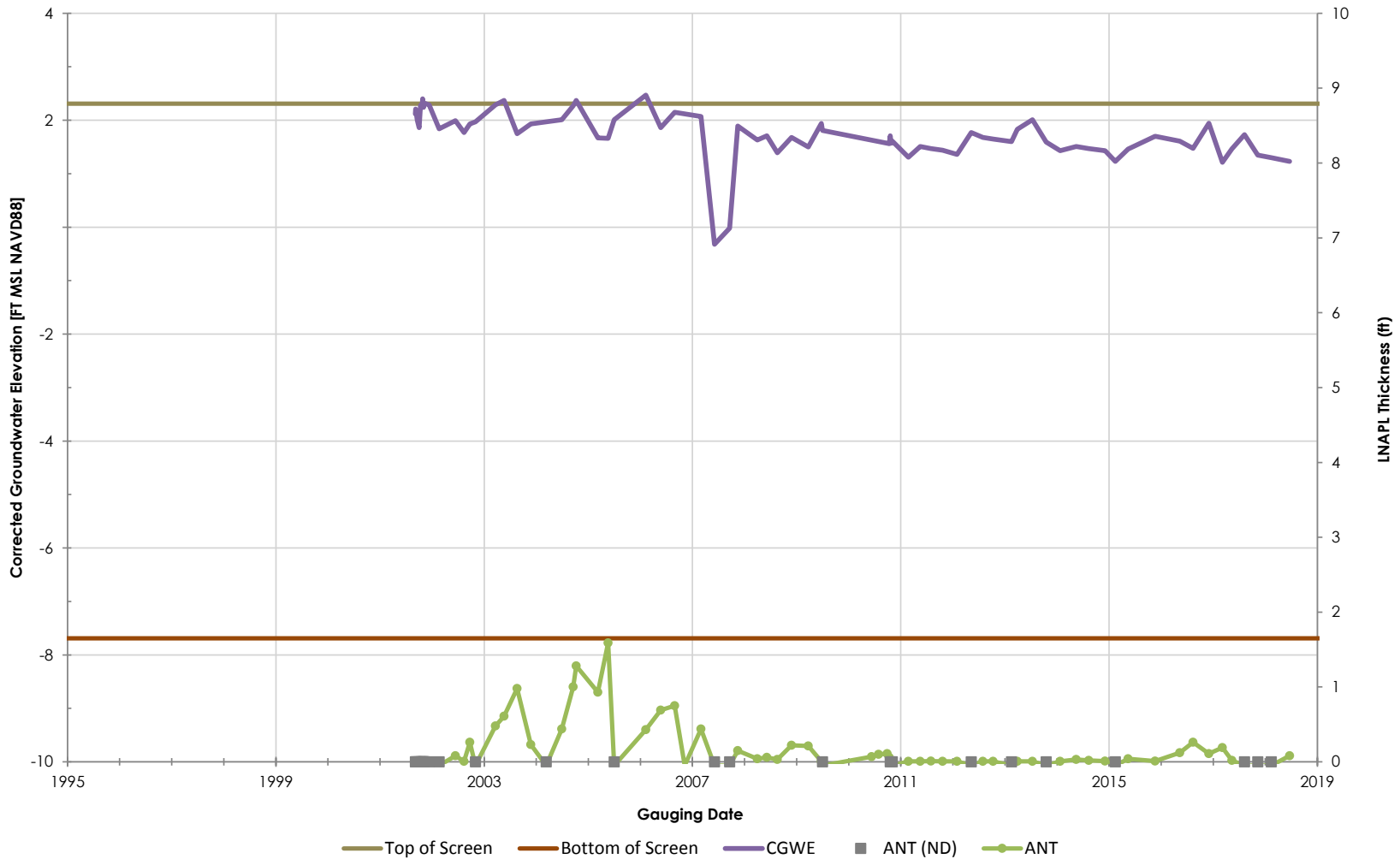
Stantec

Figure/Well No.

B-134D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

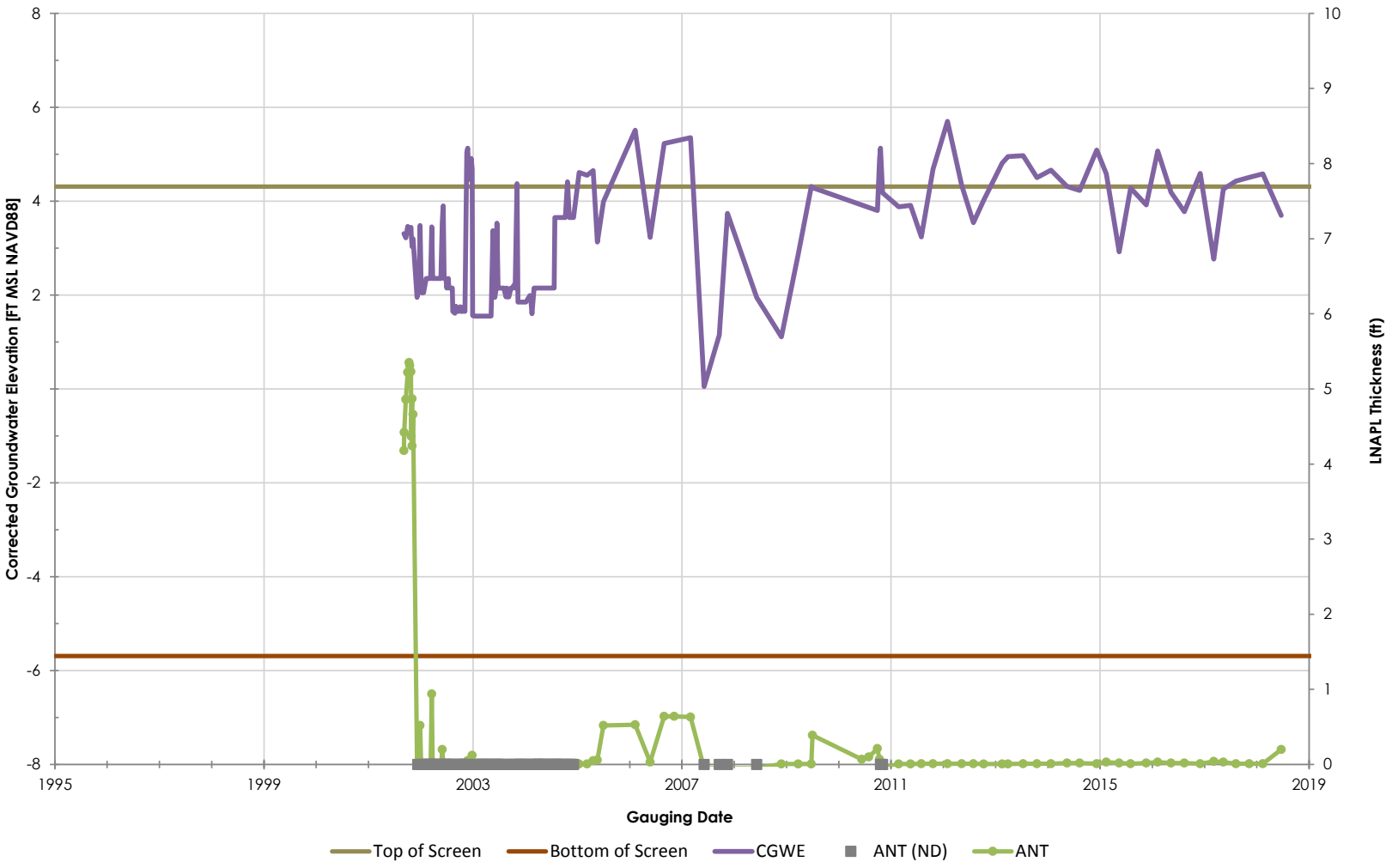
Stantec

Figure/Well No.

B-135

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

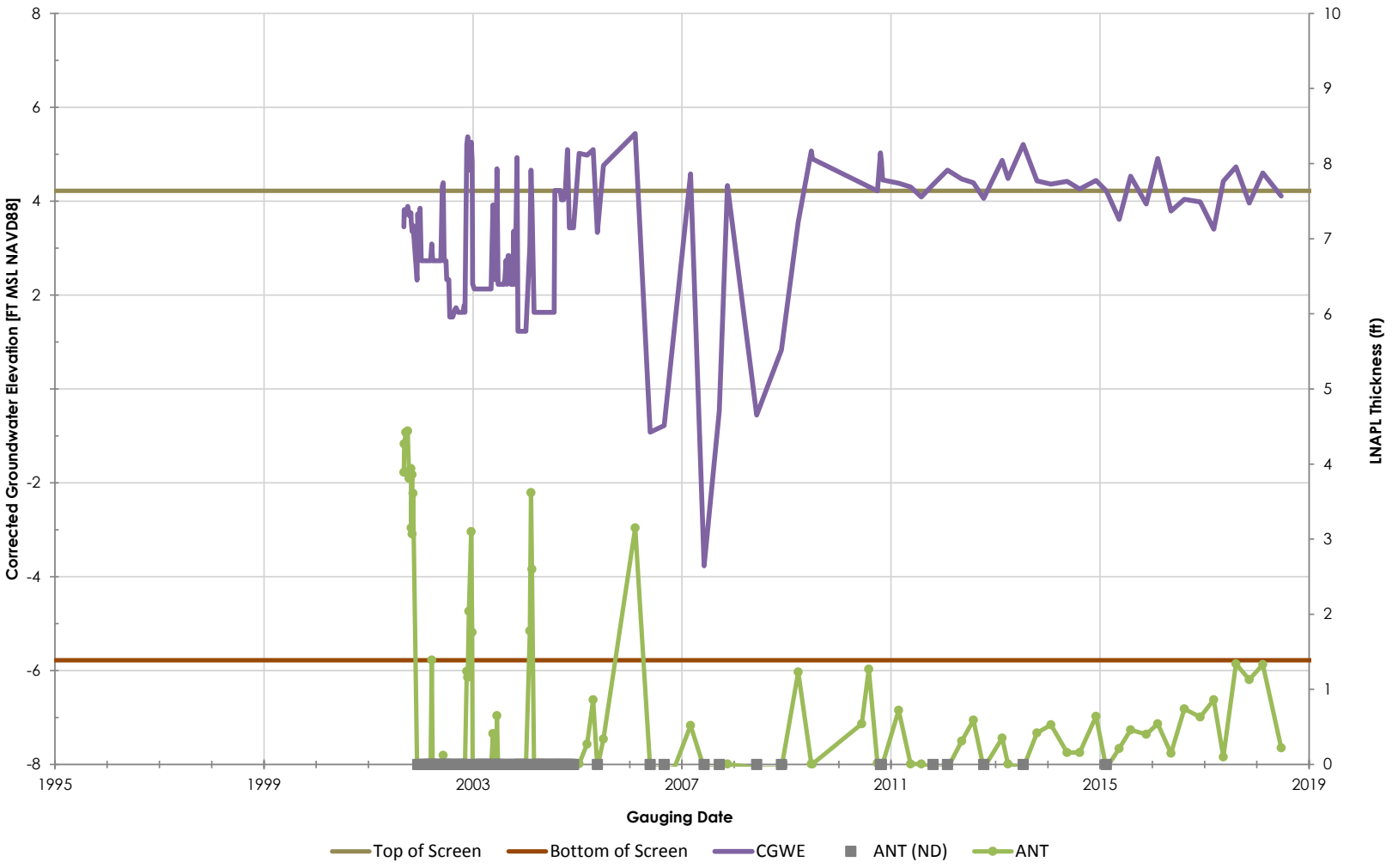
Stantec

Figure/Well No.

B-136

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

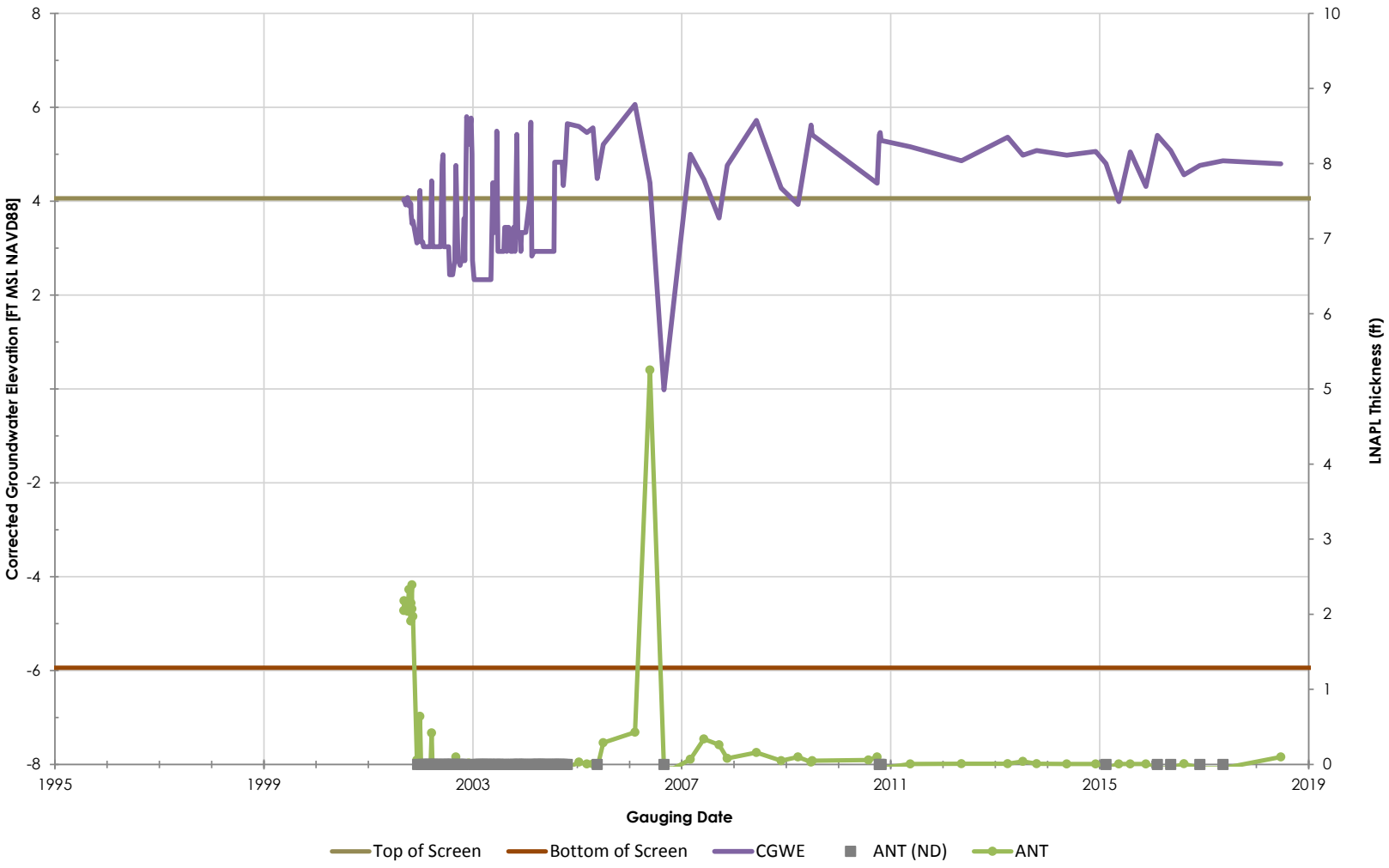
Stantec

Figure/Well No.

B-137

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

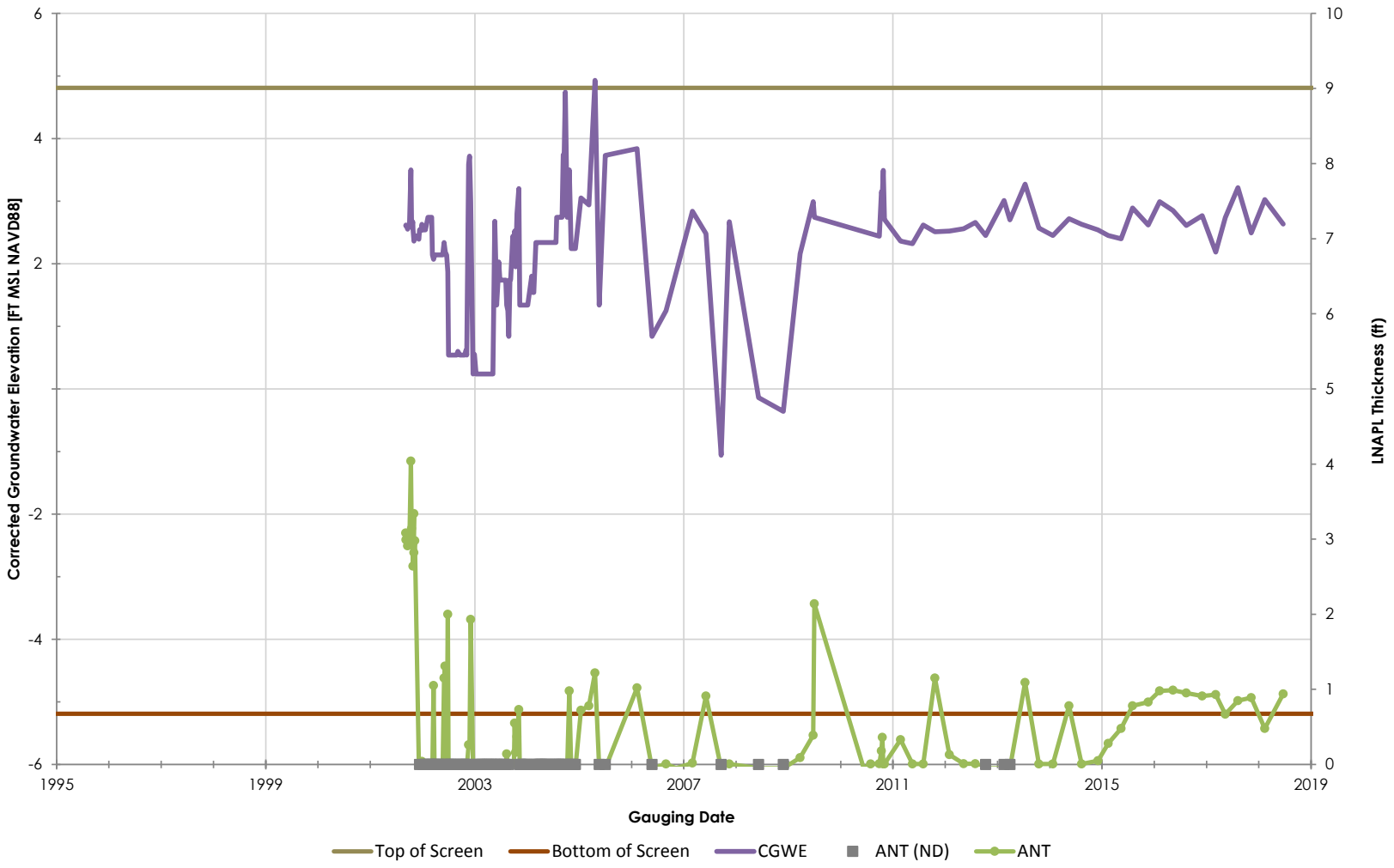
Stantec

Figure/Well No.

B-138

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

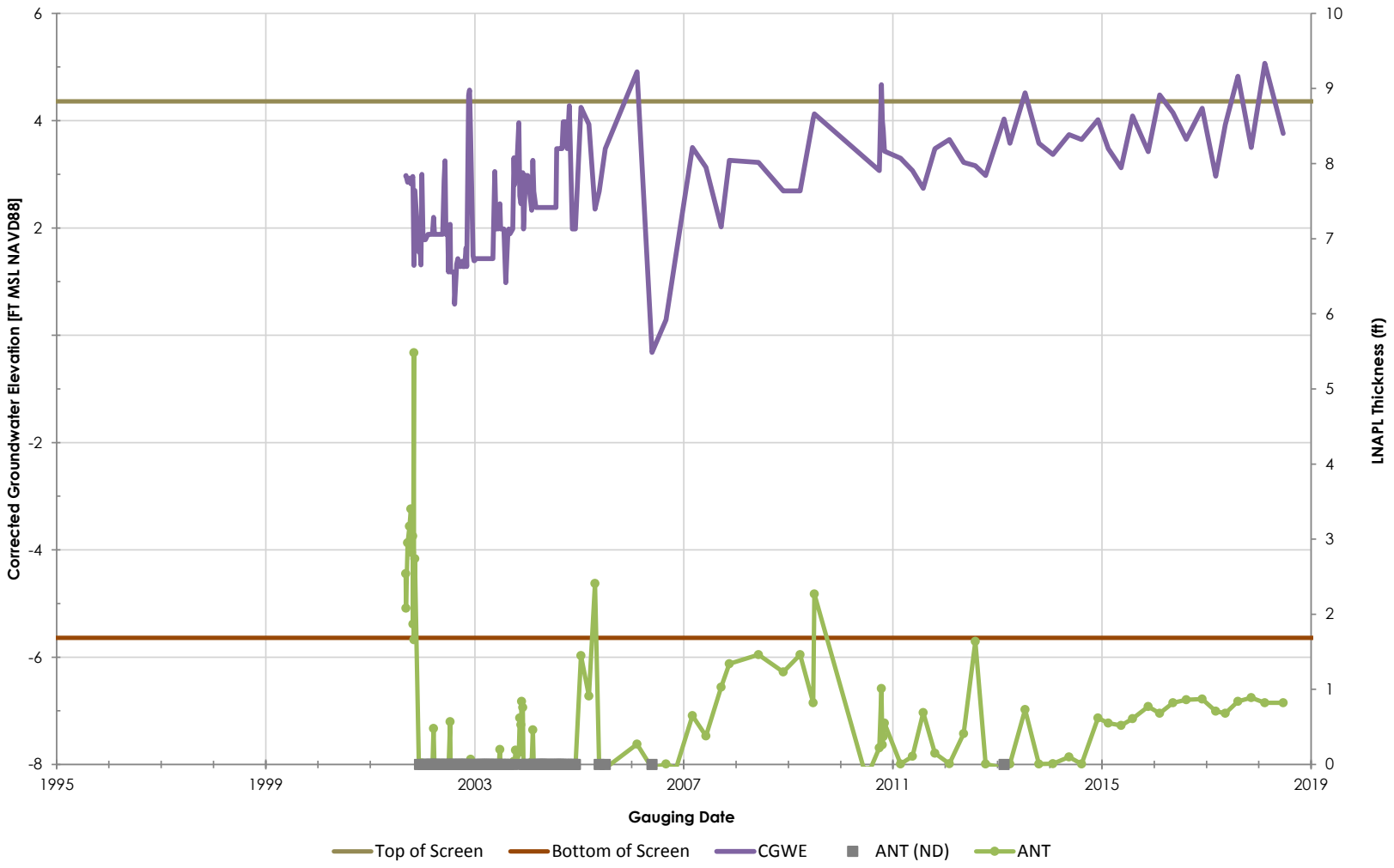
Stantec

Figure/Well No.

B-142

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

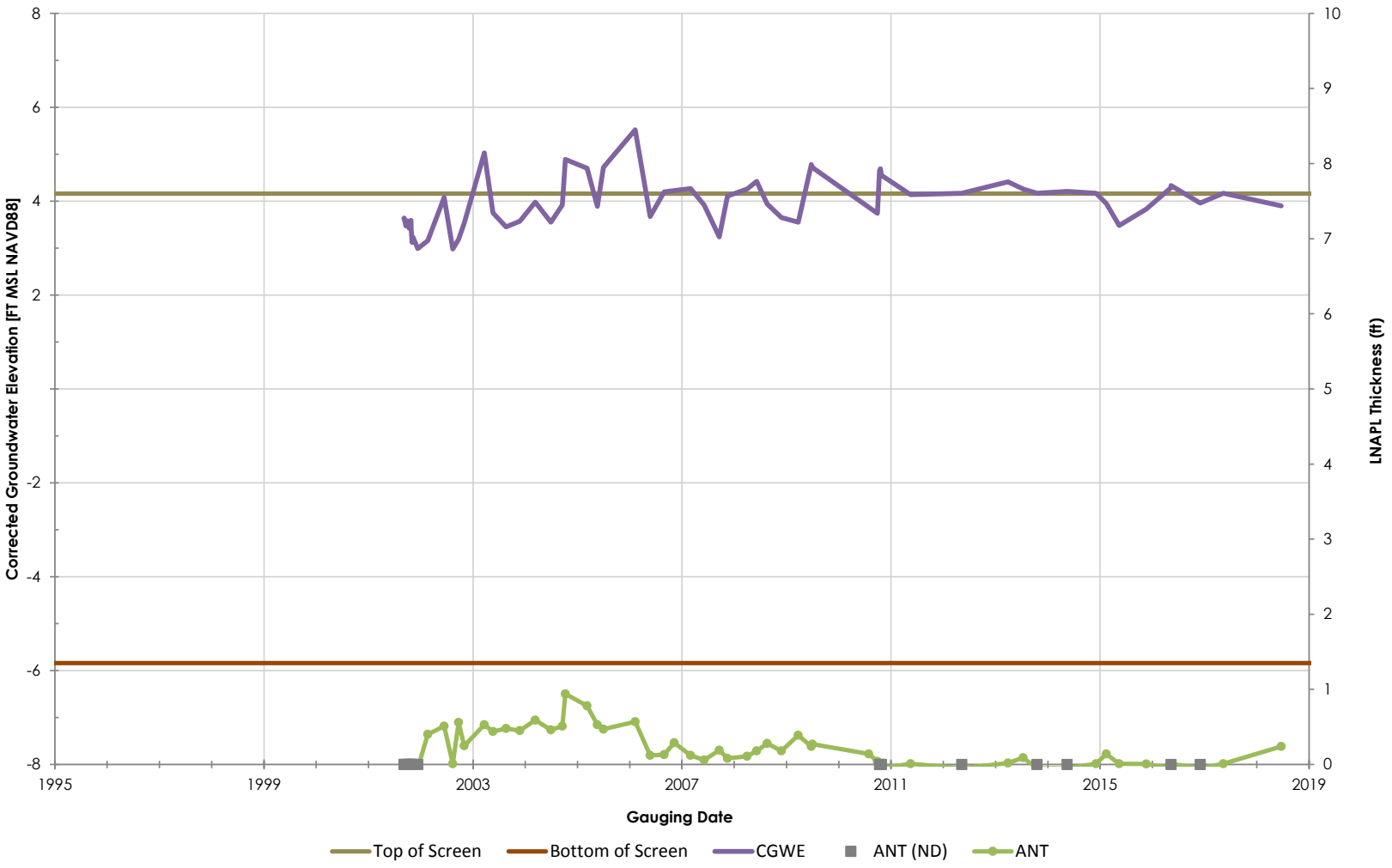
Stantec

Figure/Well No.

B-143

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

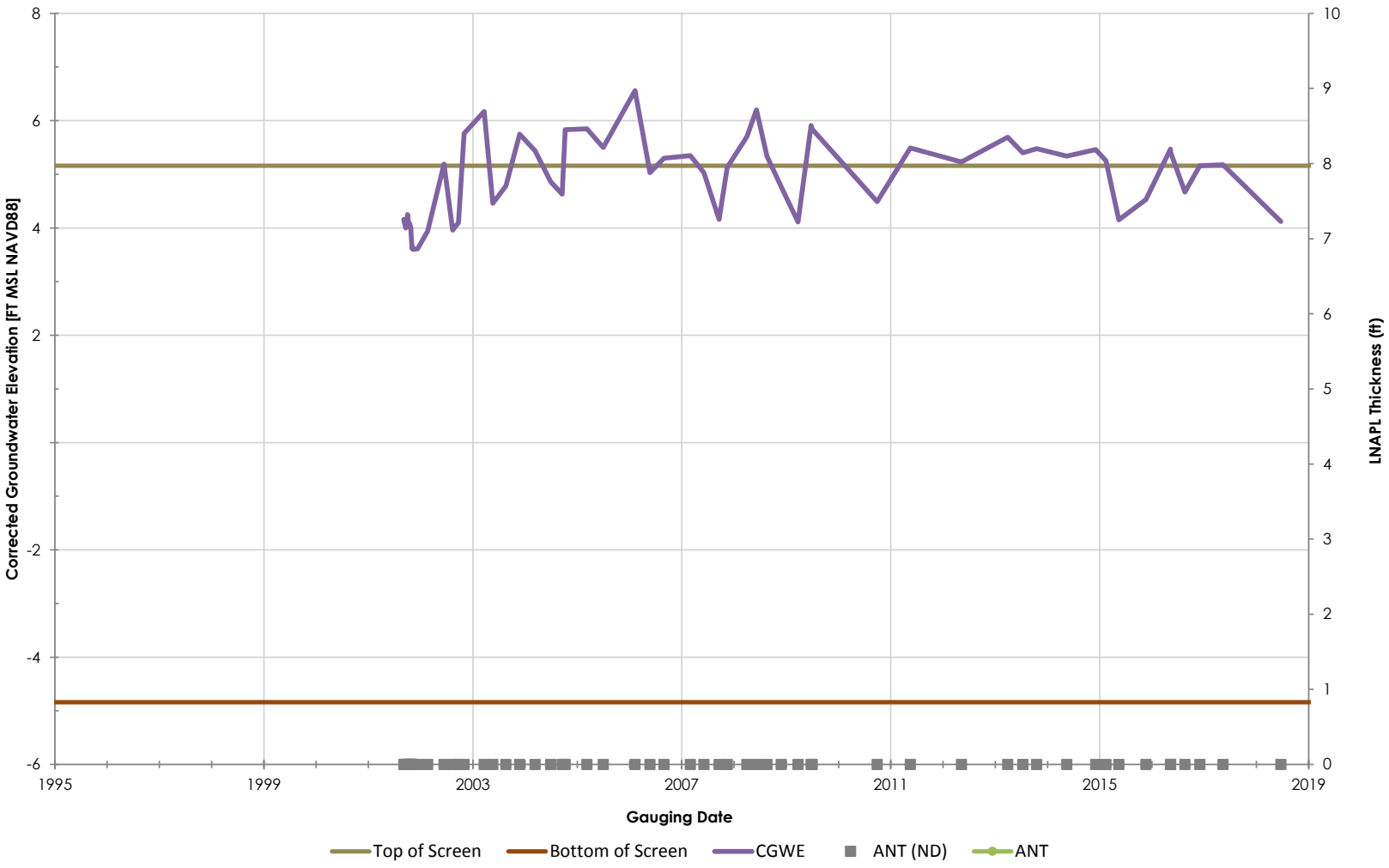
Stantec

Figure/Well No.

B-144

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

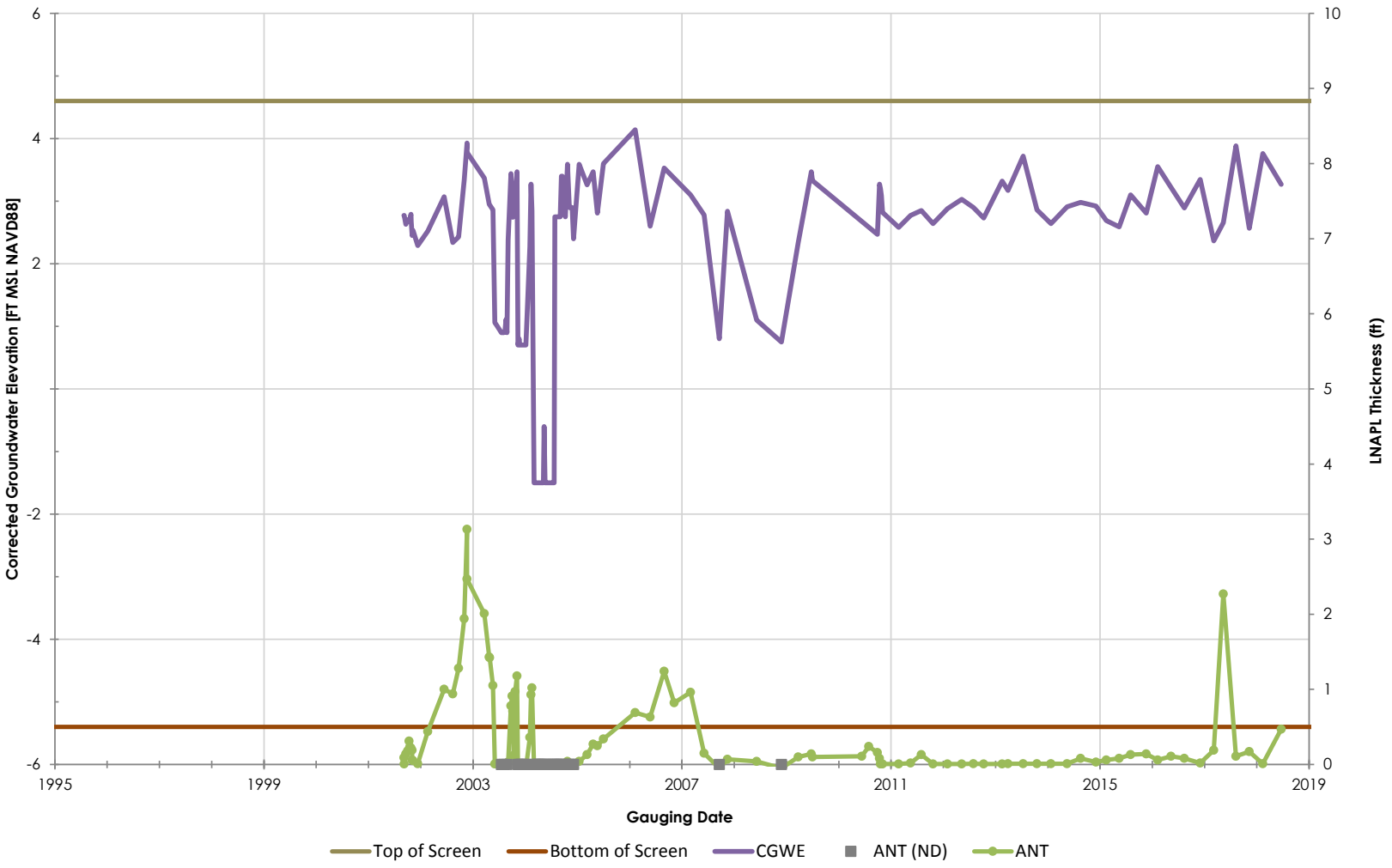
Stantec

Figure/Well No.

B-145

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

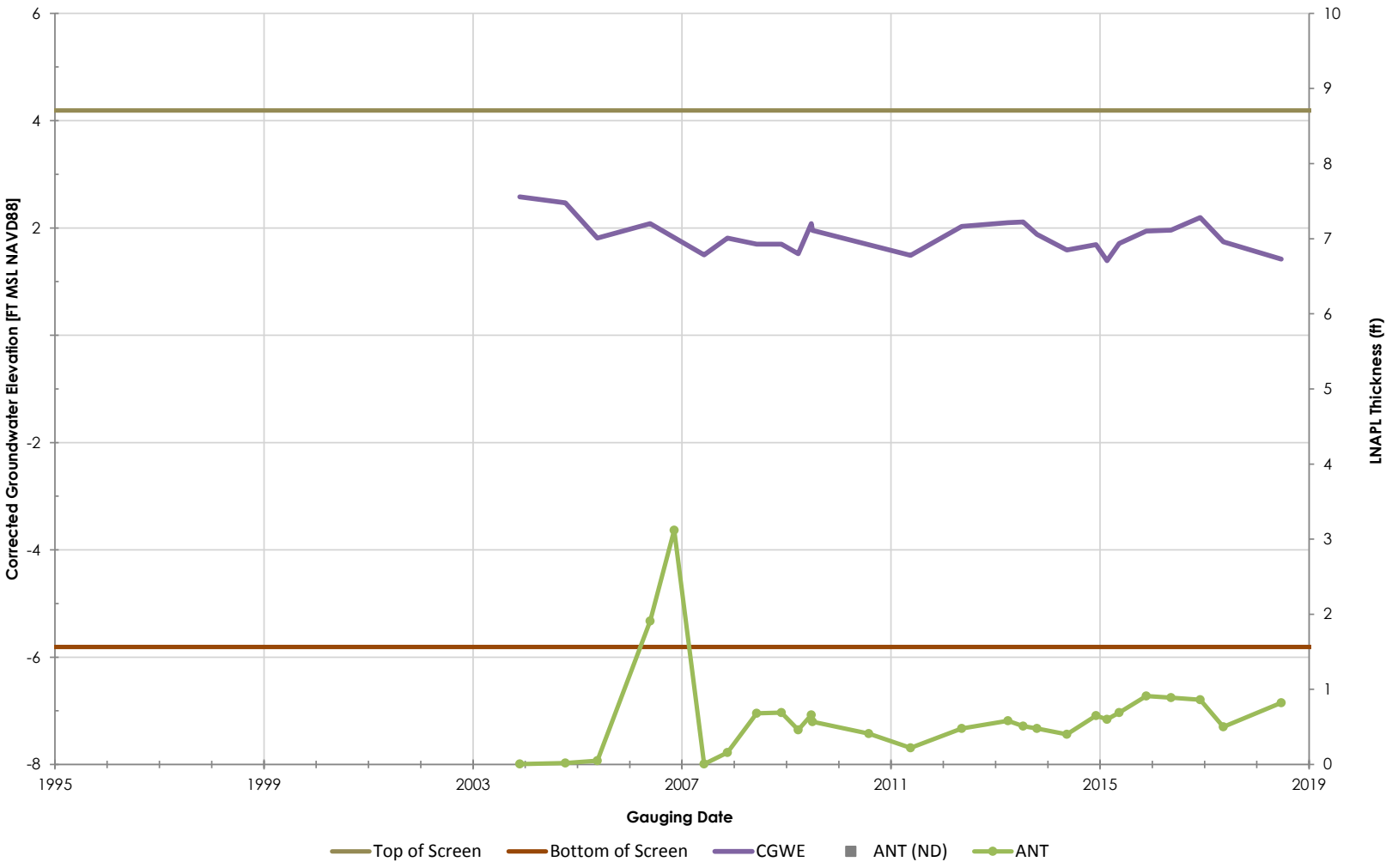
Stantec

Figure/Well No.

B-147

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

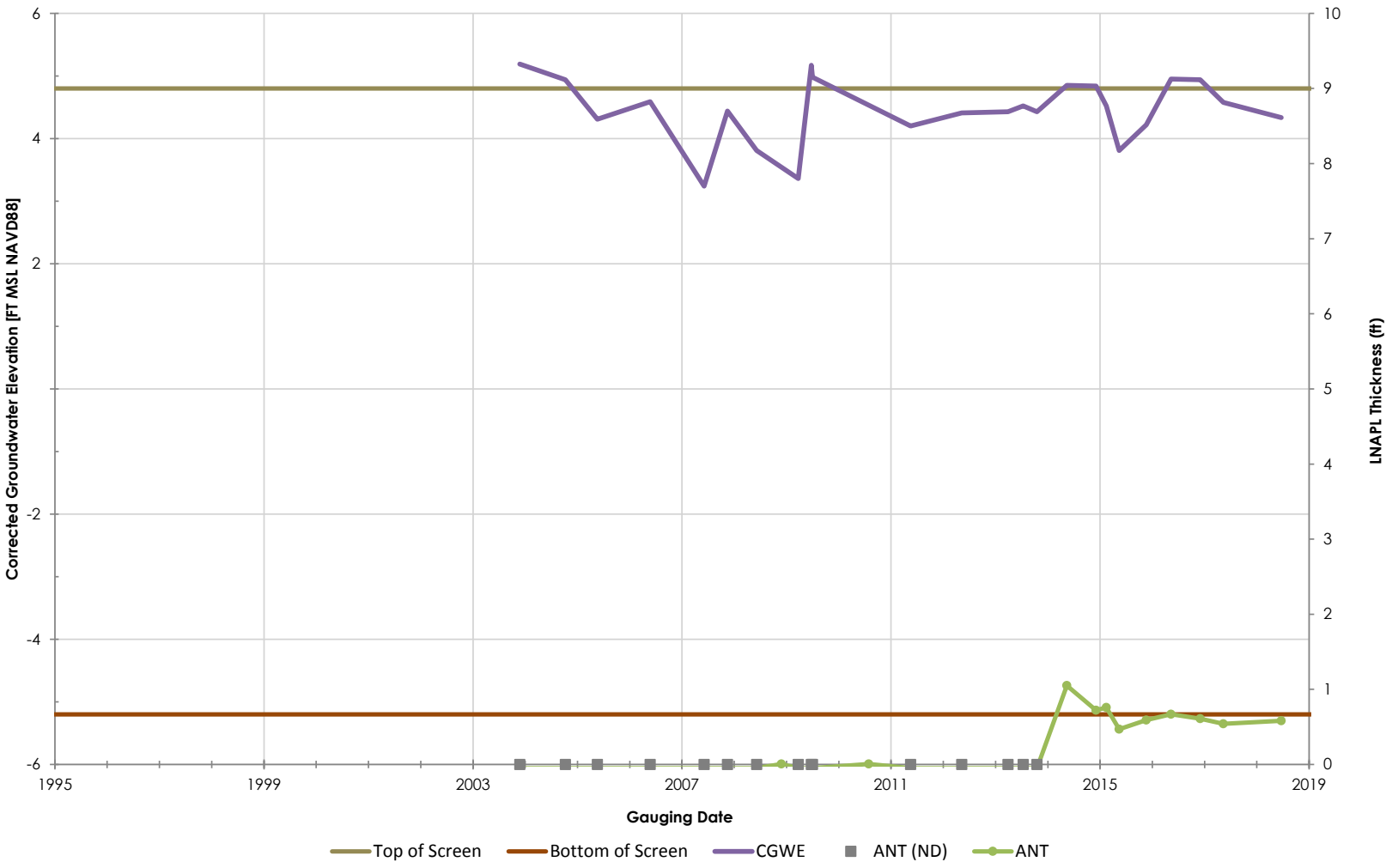
Stantec

Figure/Well No.

B-148

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

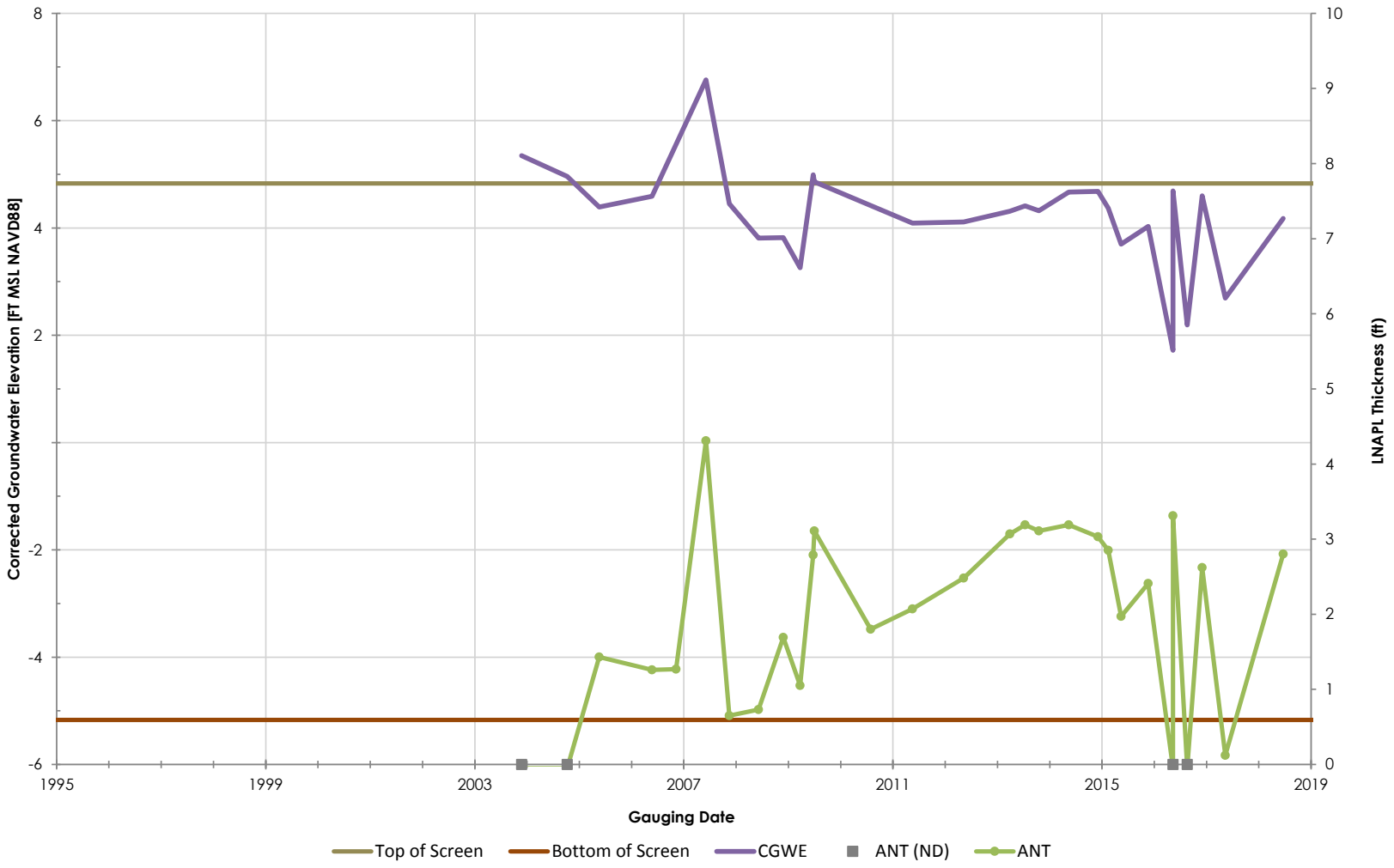
Stantec

Figure/Well No.

B-149

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

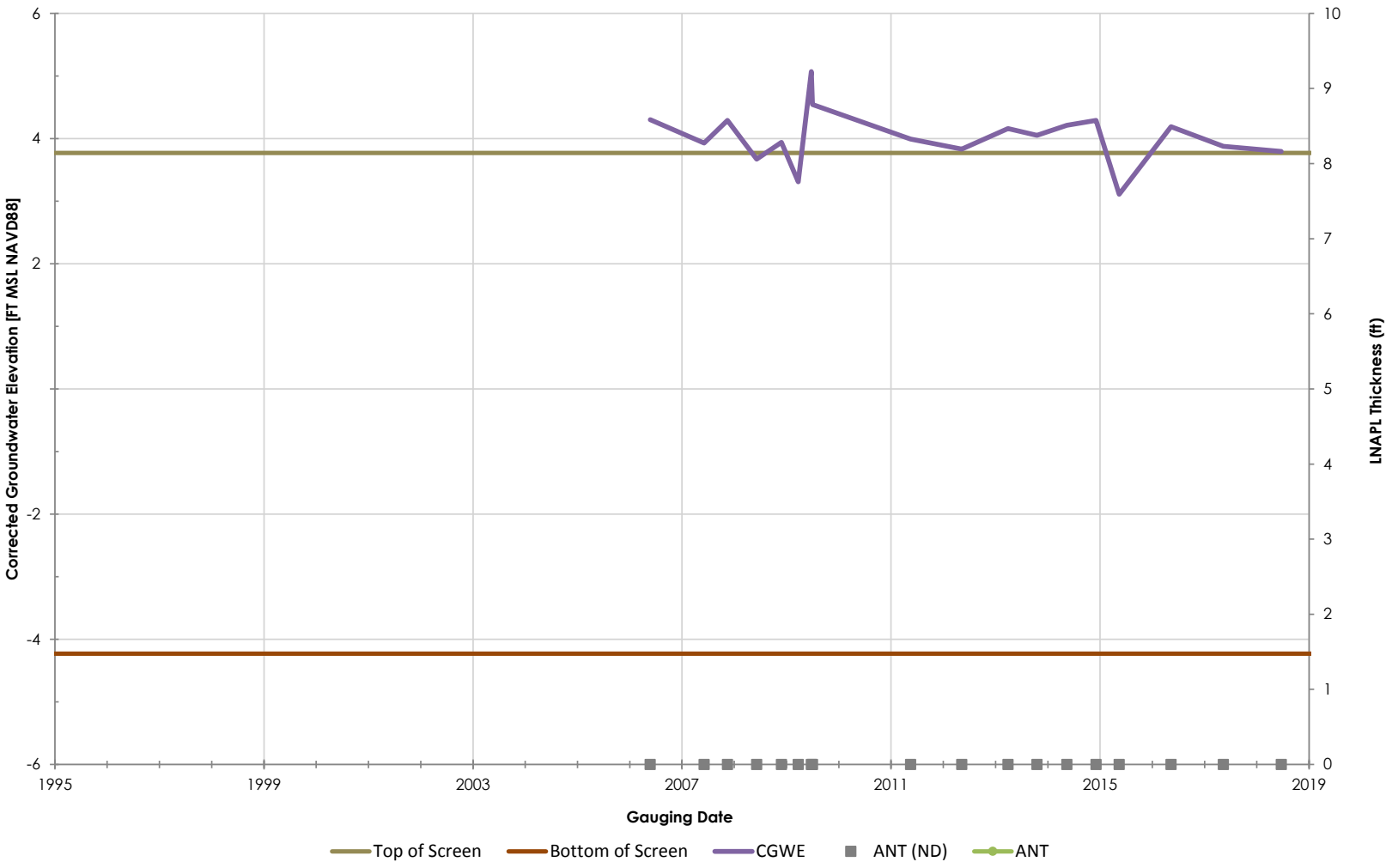
Stantec

Figure/Well No.

B-150

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

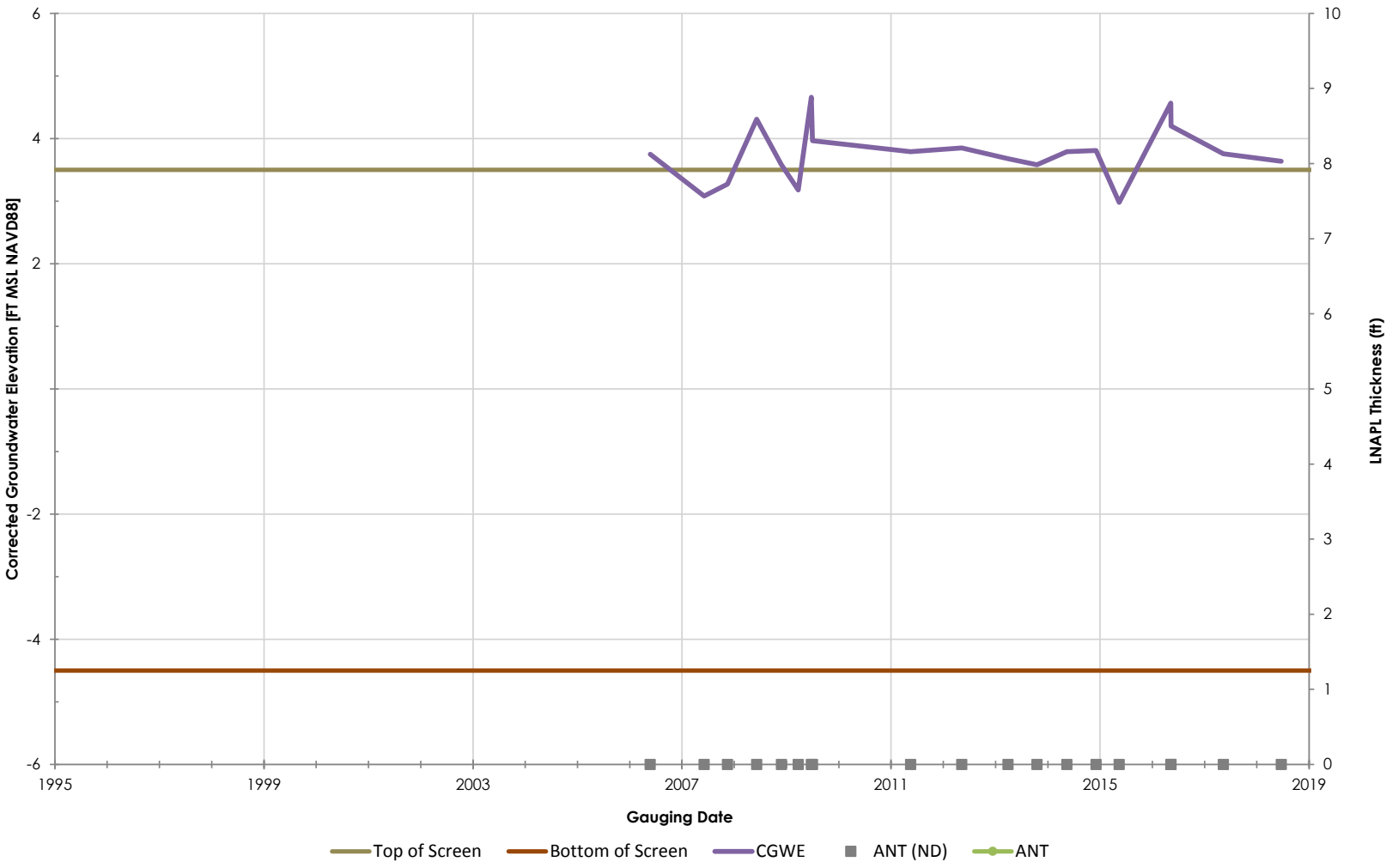
Stantec

Figure/Well No.

B-151

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

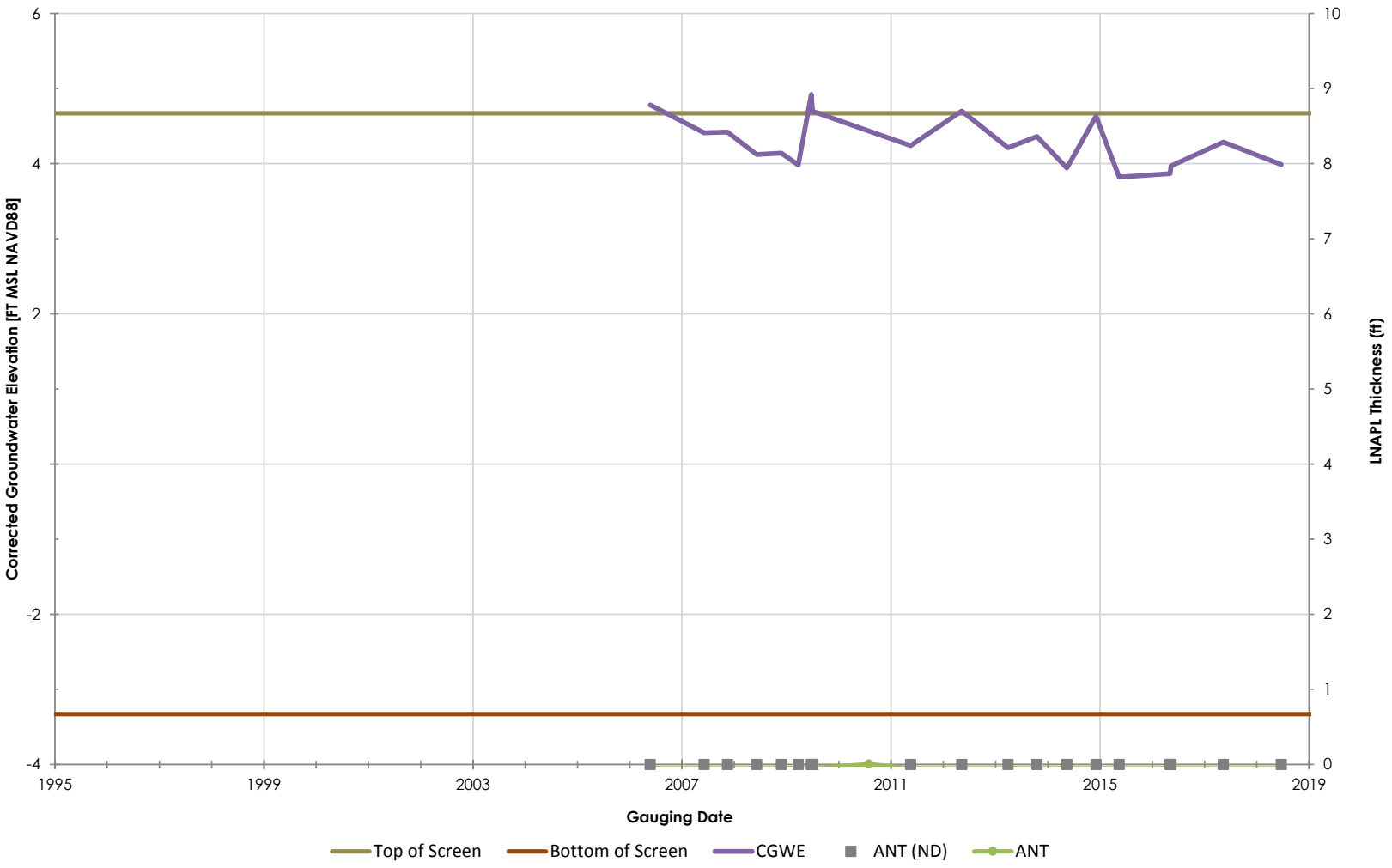
Stantec

Figure/Well No.

B-152

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

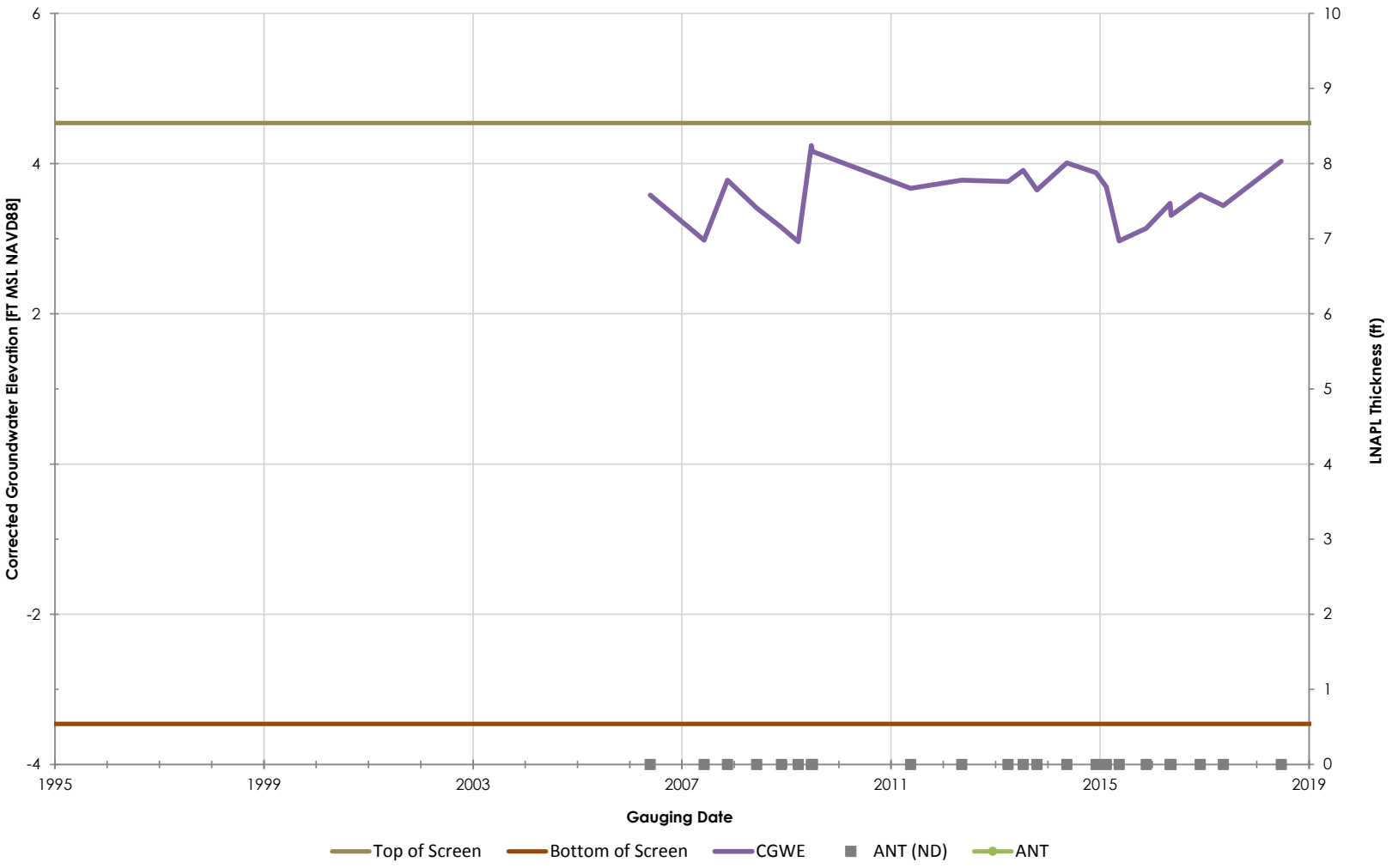
Stantec

Figure/Well No.

B-153

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

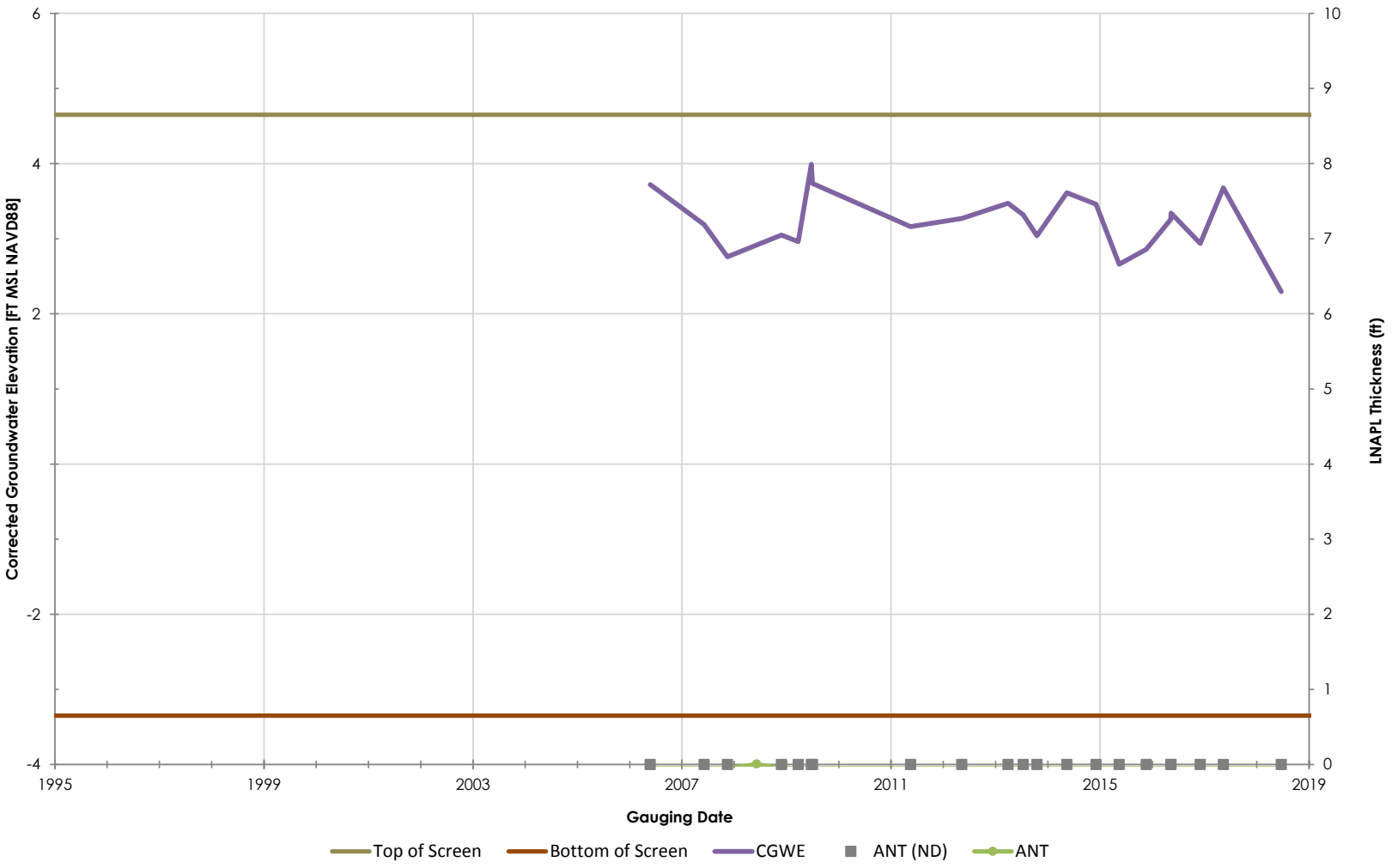
Stantec

Figure/Well No.

B-155

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

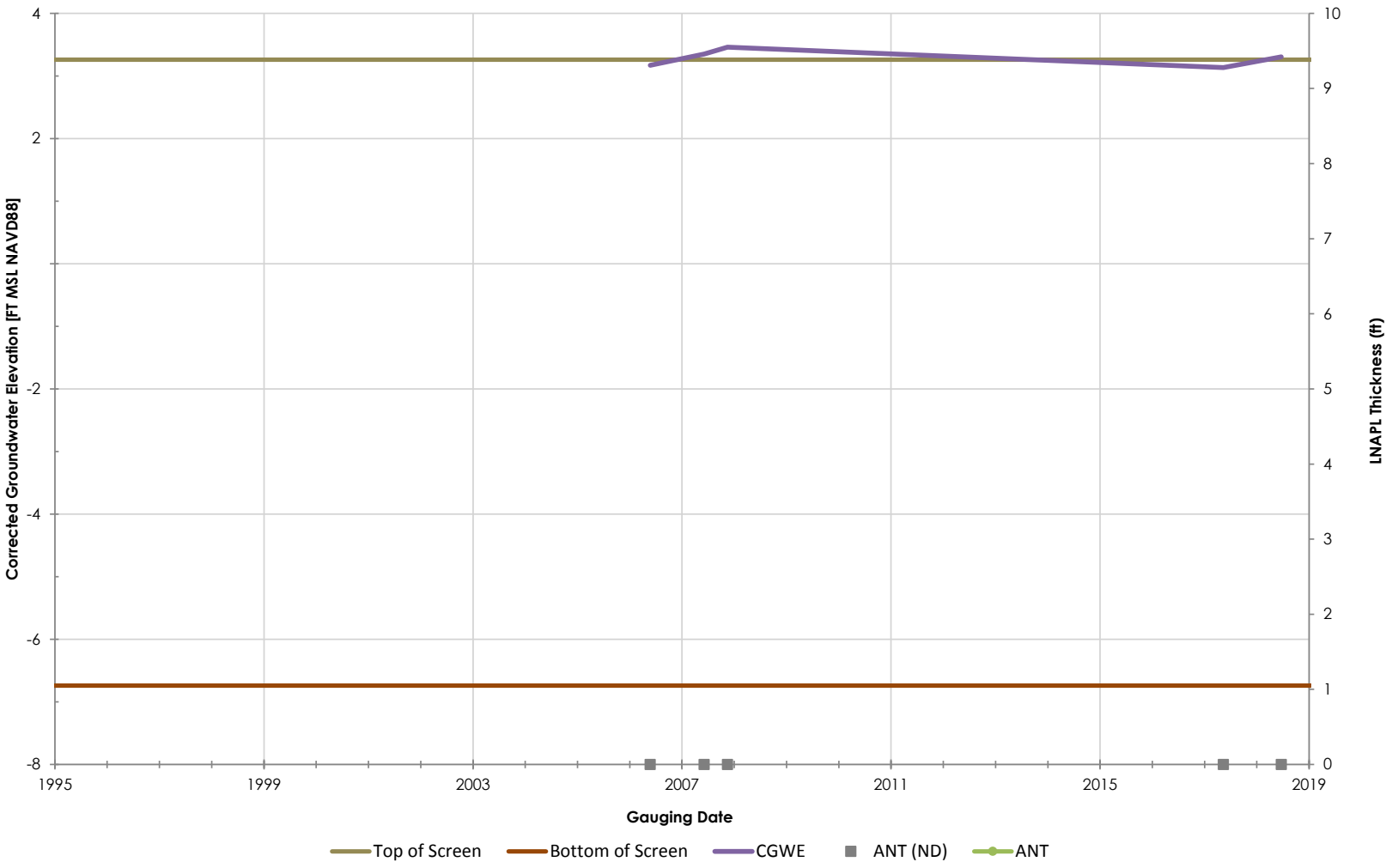
Stantec

Figure/Well No.

B-156

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

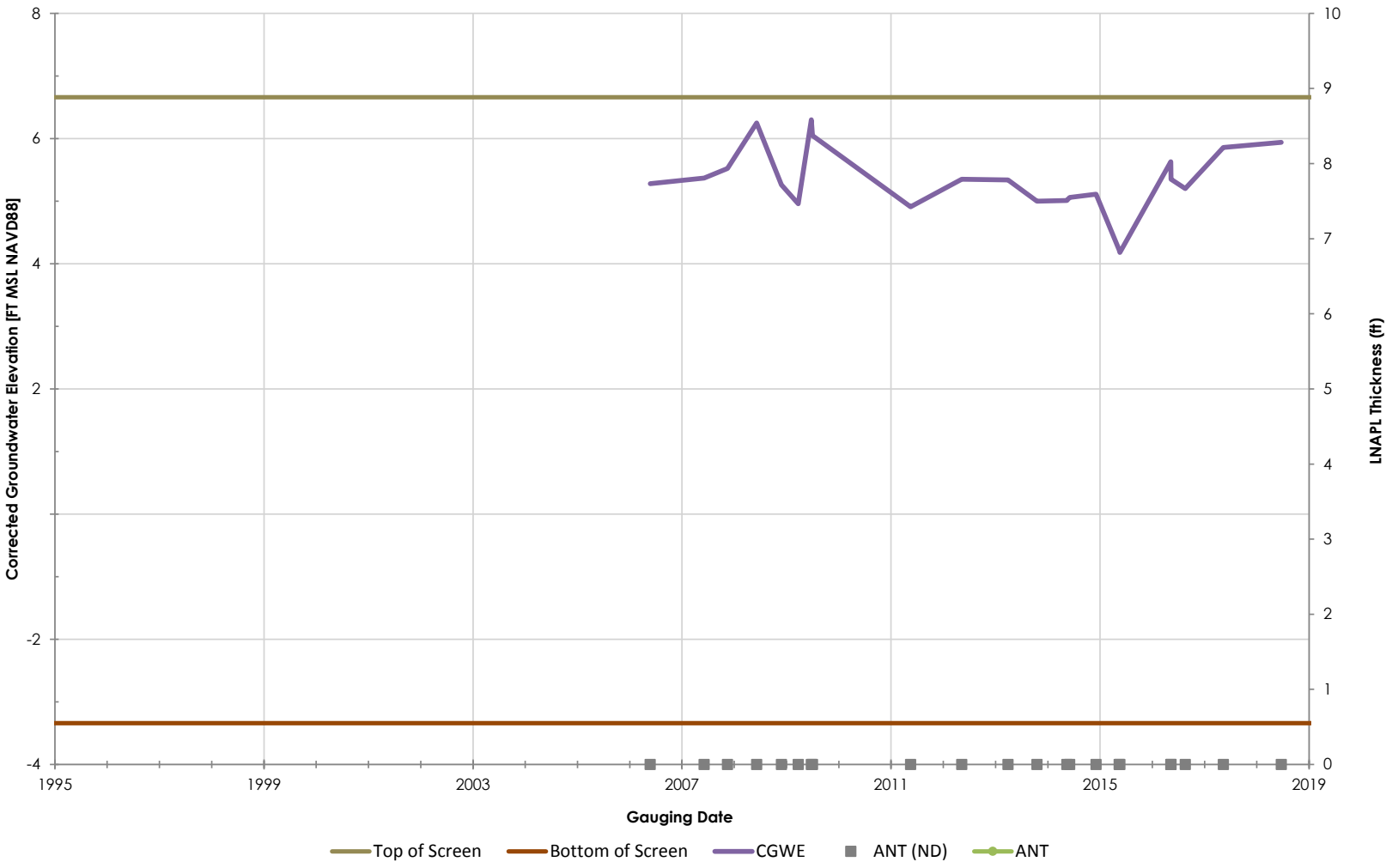
Stantec

Figure/Well No.

B-157

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

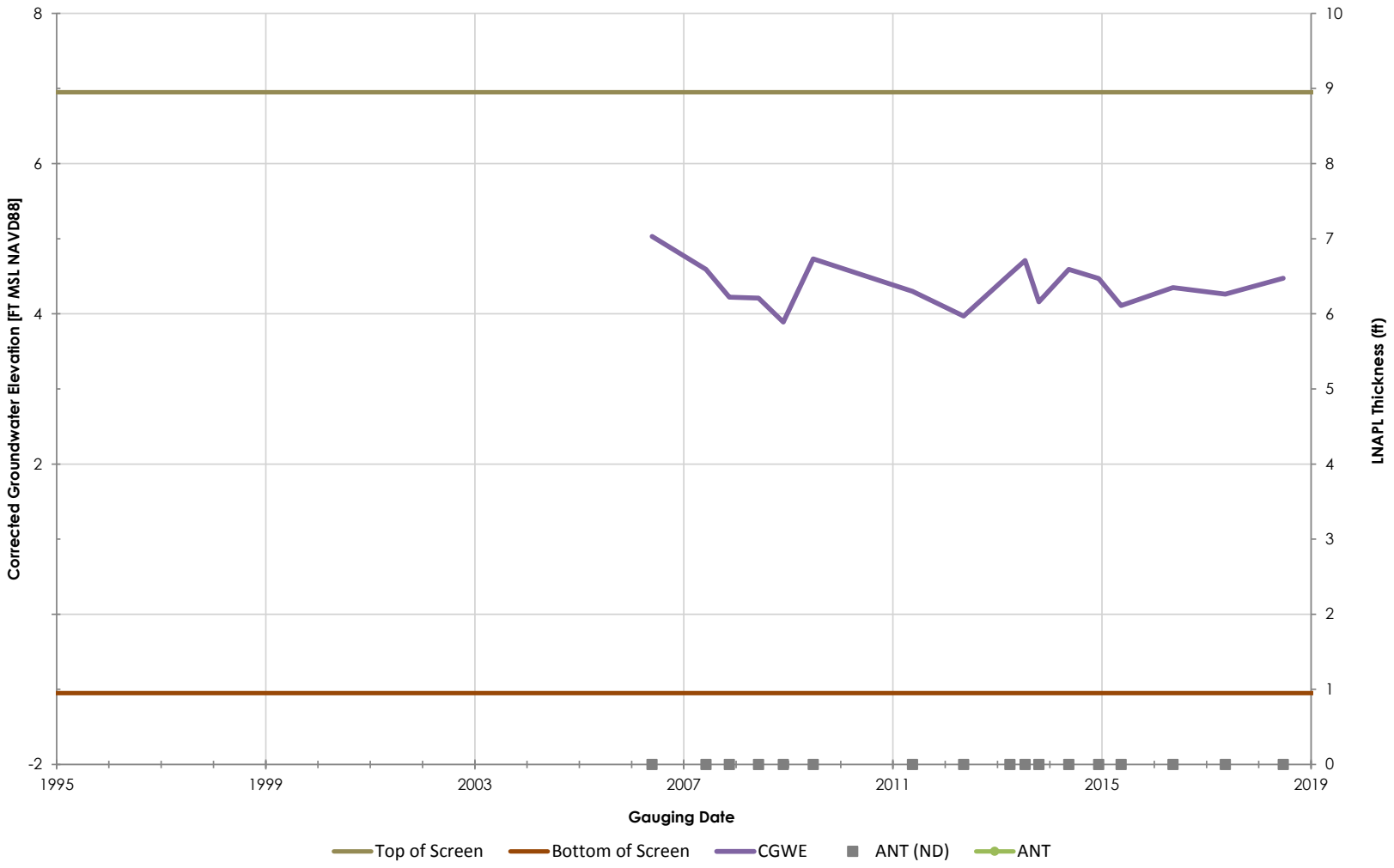
Stantec

Figure/Well No.

B-158

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

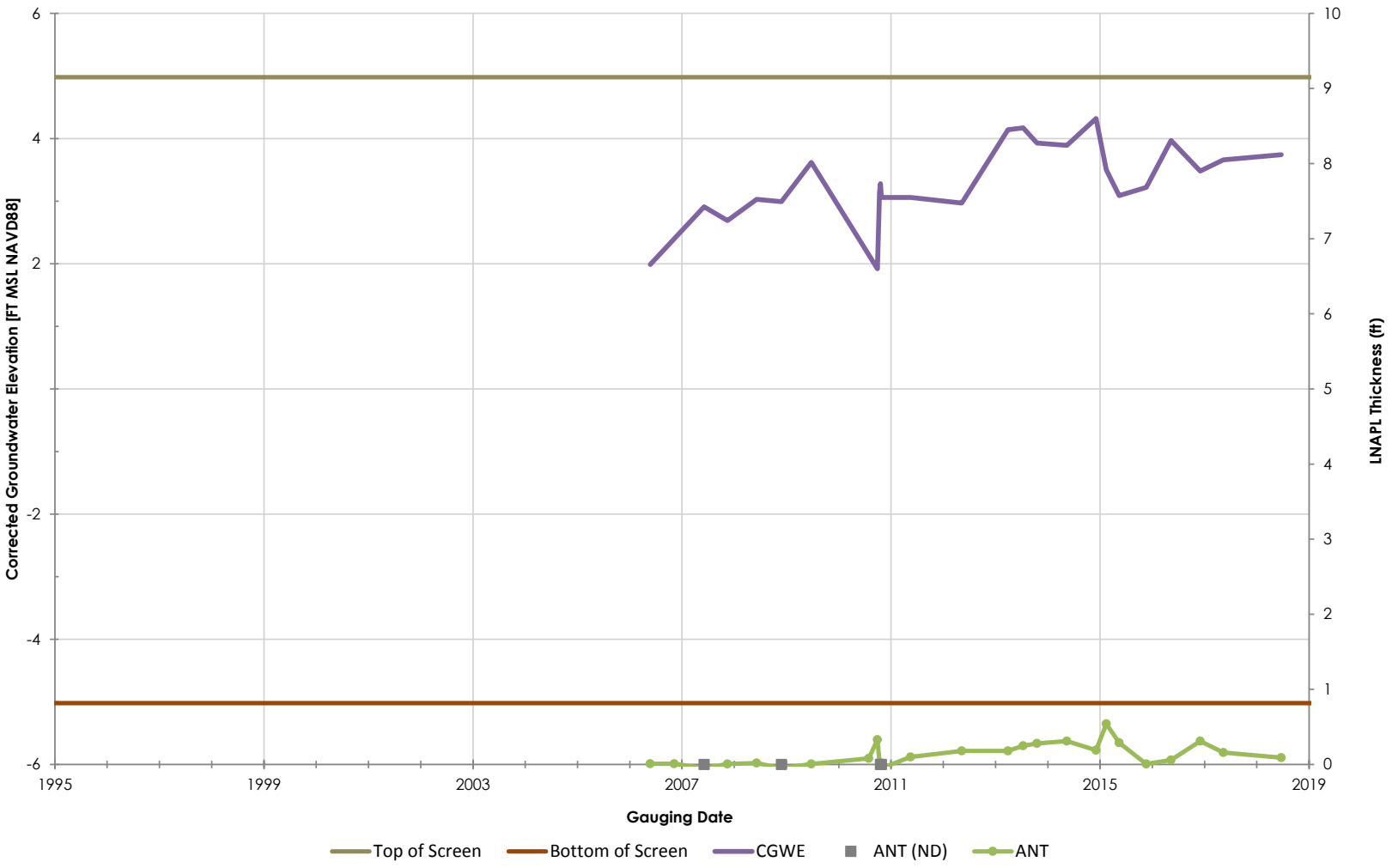
Stantec

Figure/Well No.

B-160

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

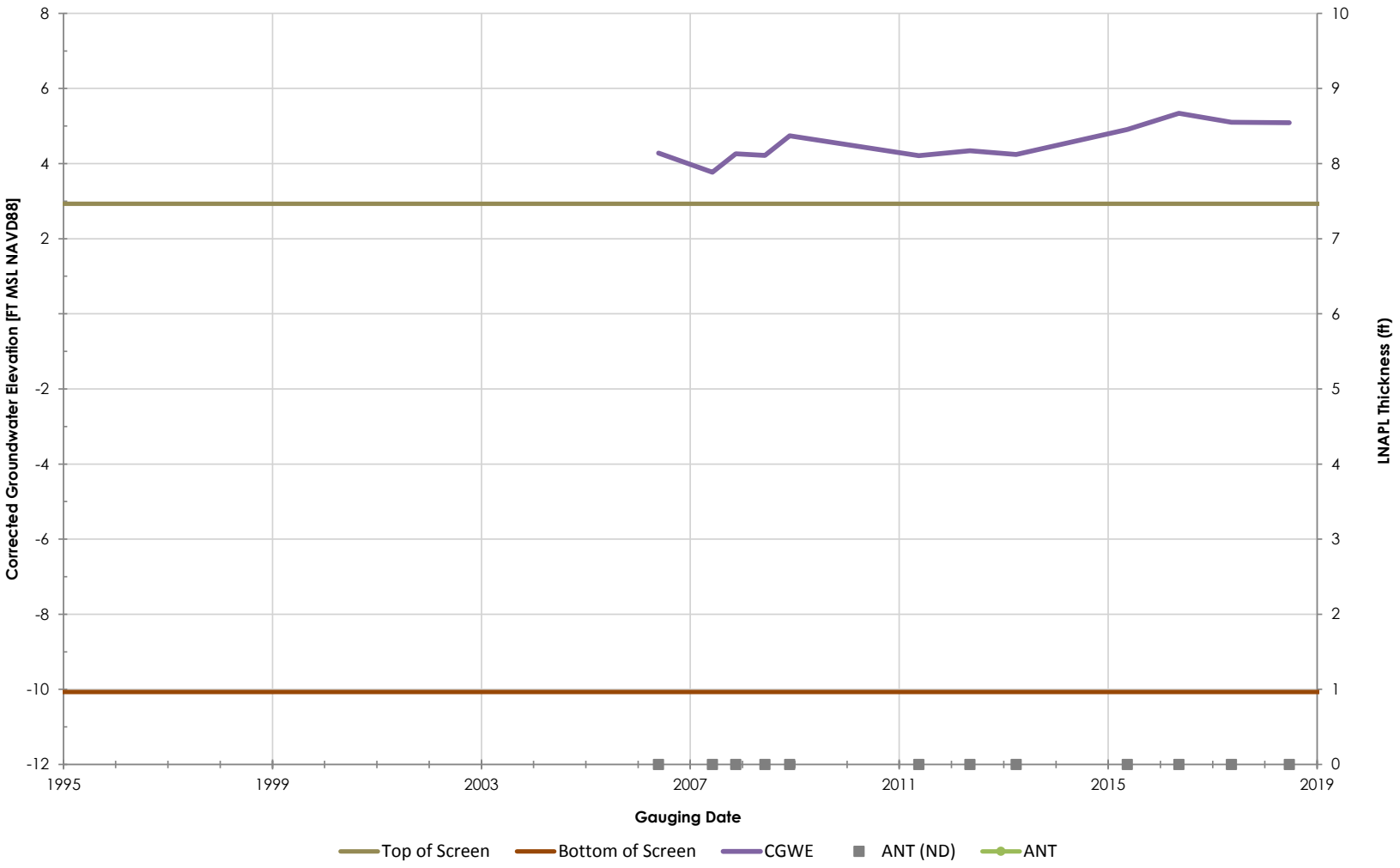
Stantec

Figure/Well No.

B-161

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

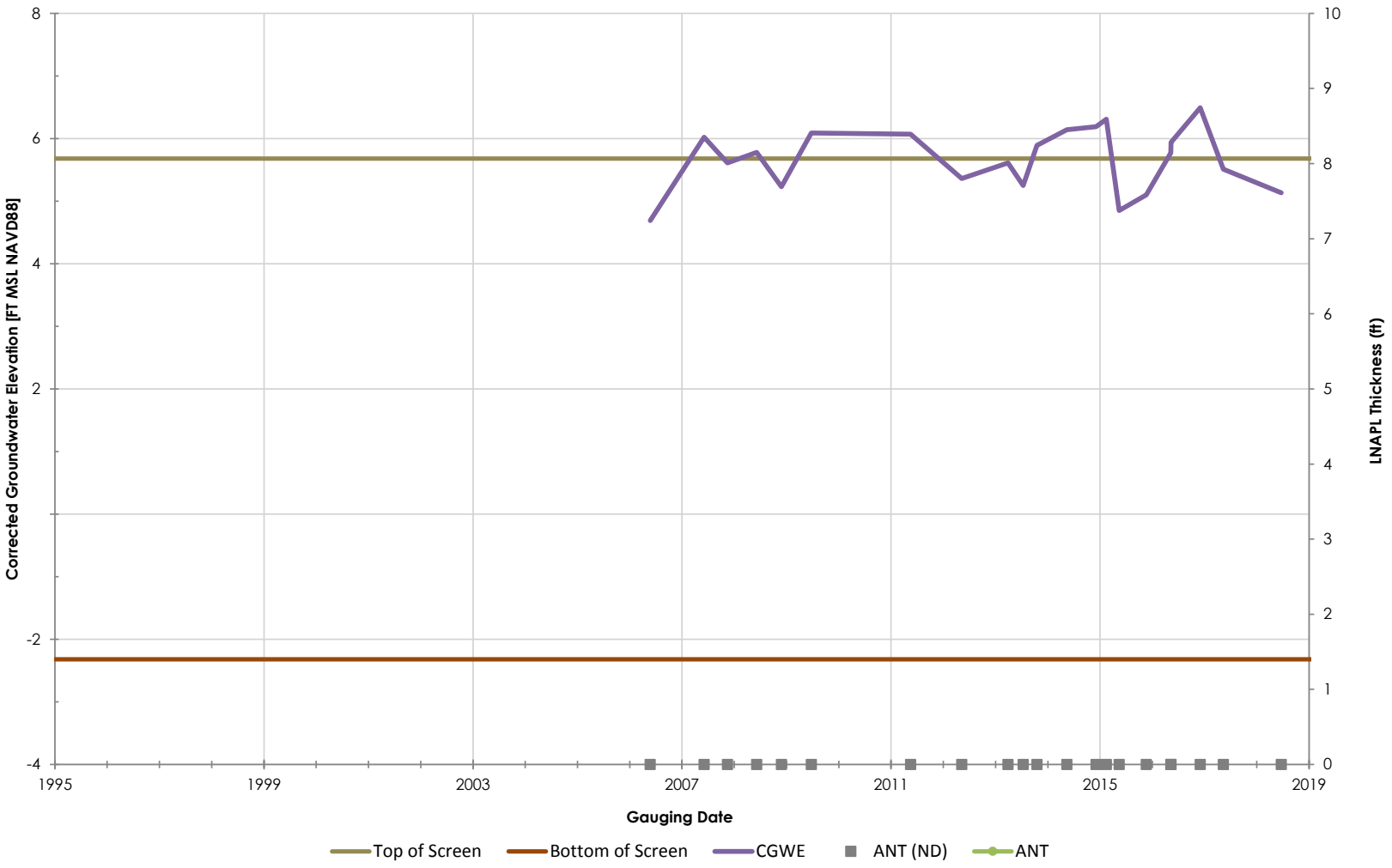
Stantec

Figure/Well No.

B-162

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

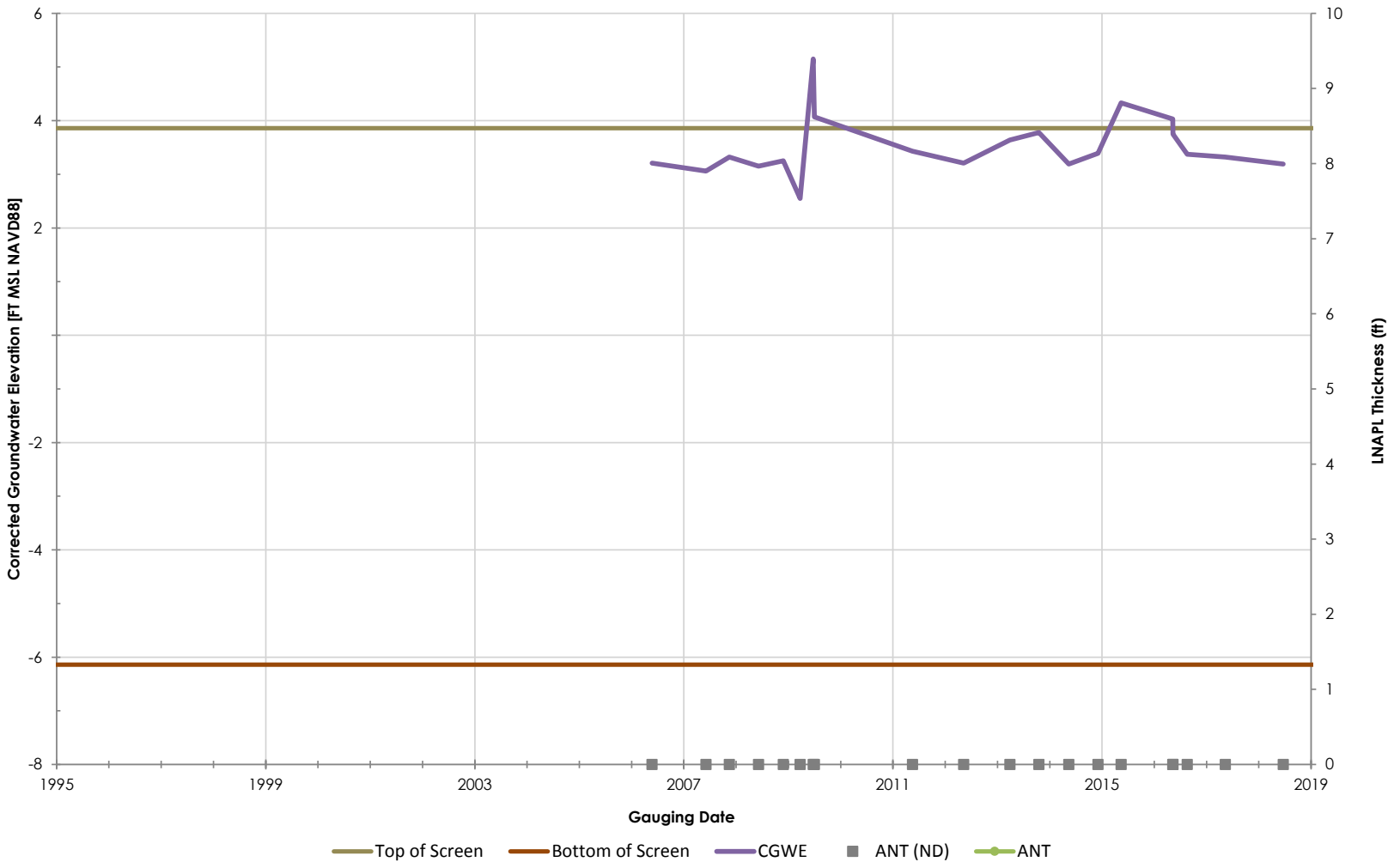
Stantec

Figure/Well No.

B-163

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

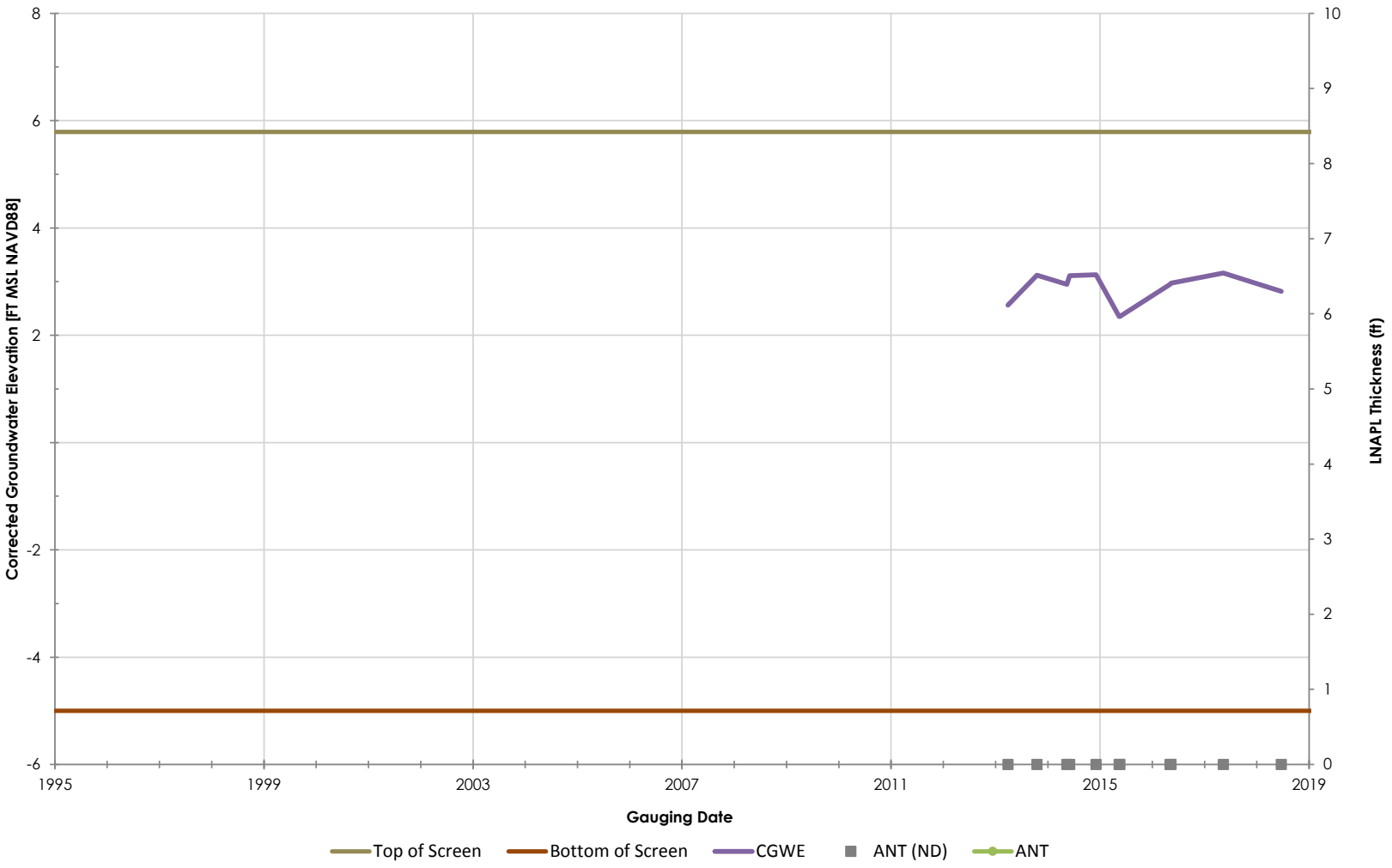
Stantec

Figure/Well No.

B-164

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

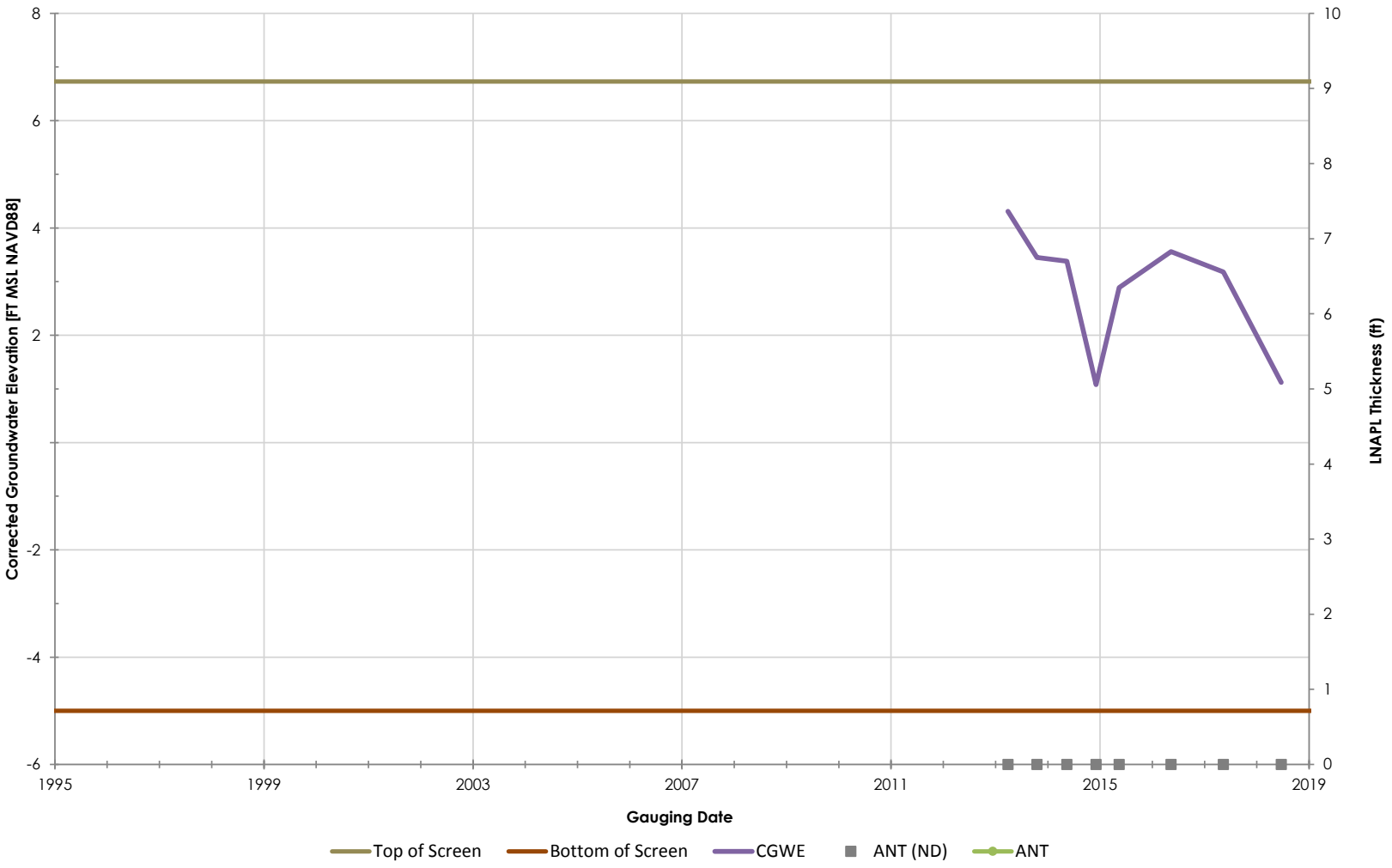
Stantec

Figure/Well No.

B-165

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

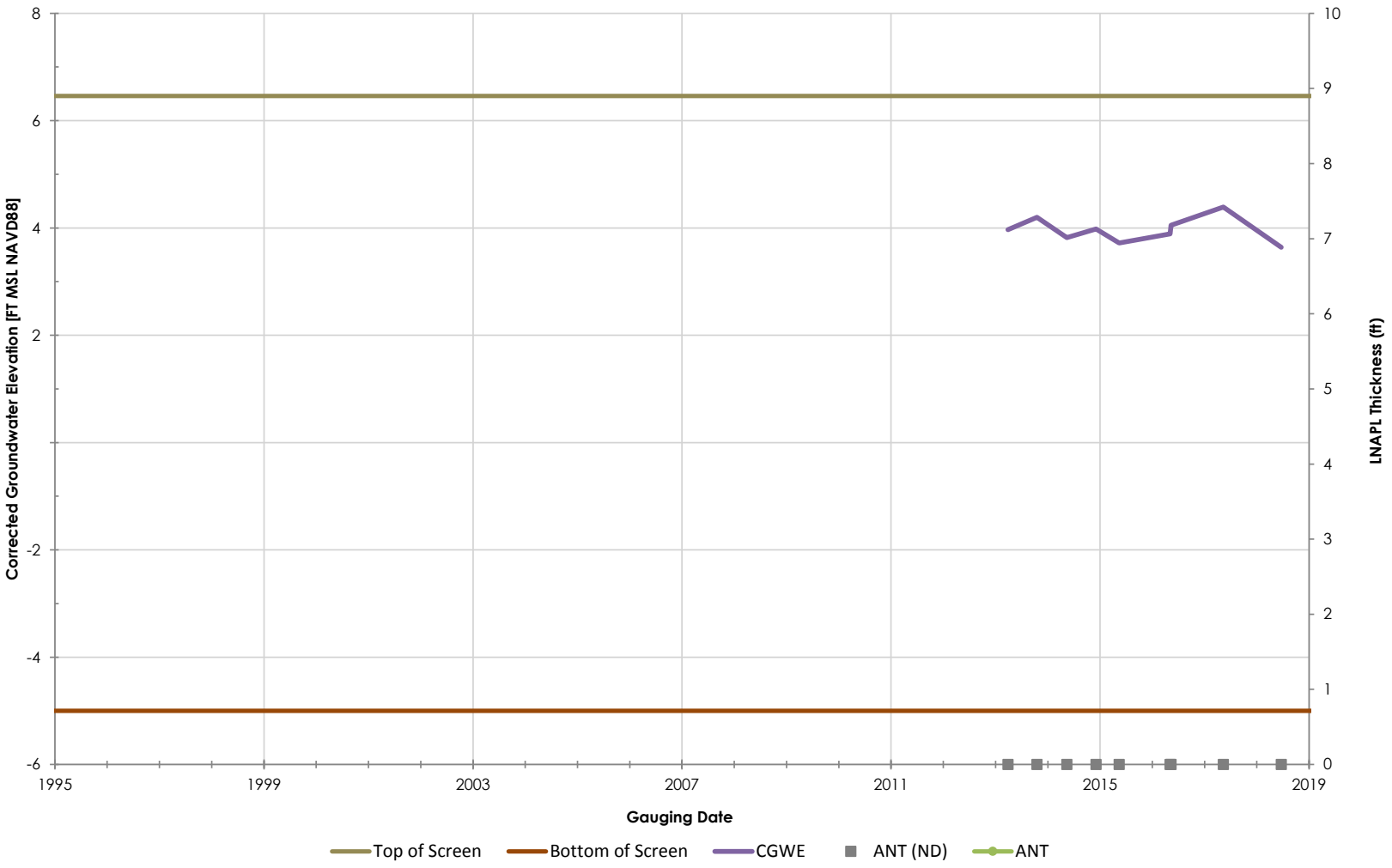
Stantec

Figure/Well No.

B-167

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

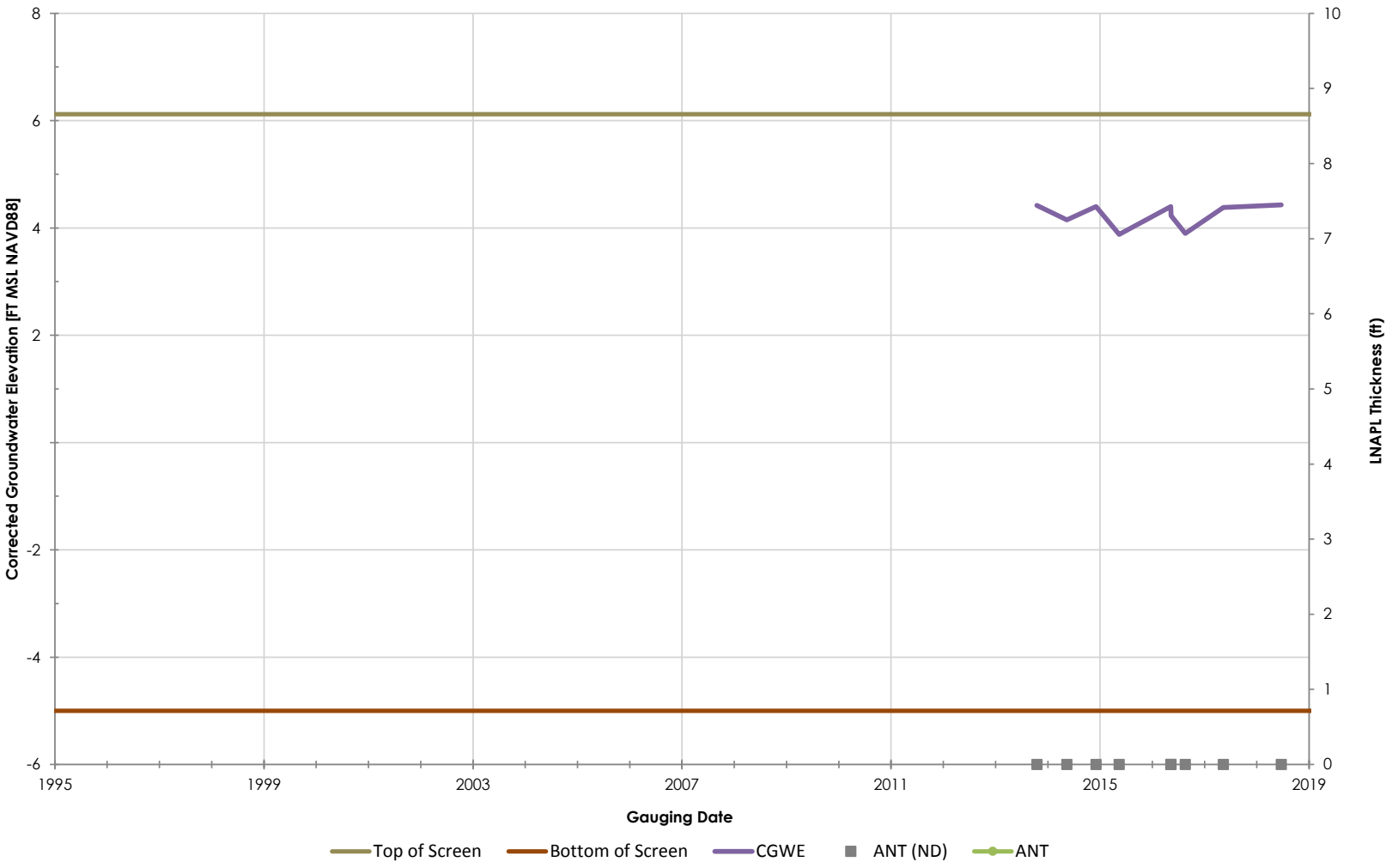
Stantec

Figure/Well No.

B-168

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

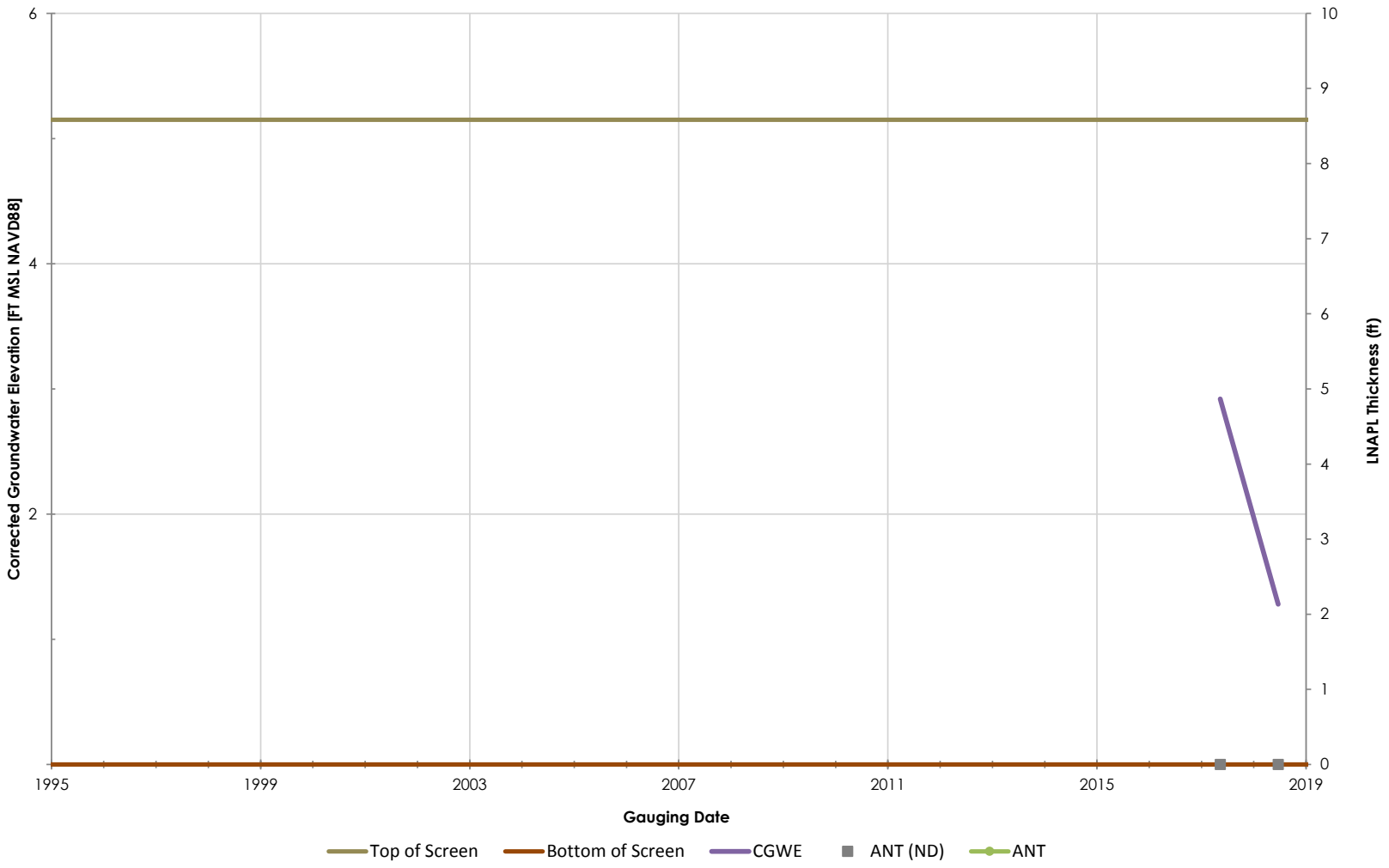
Stantec

Figure/Well No.

B-169

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

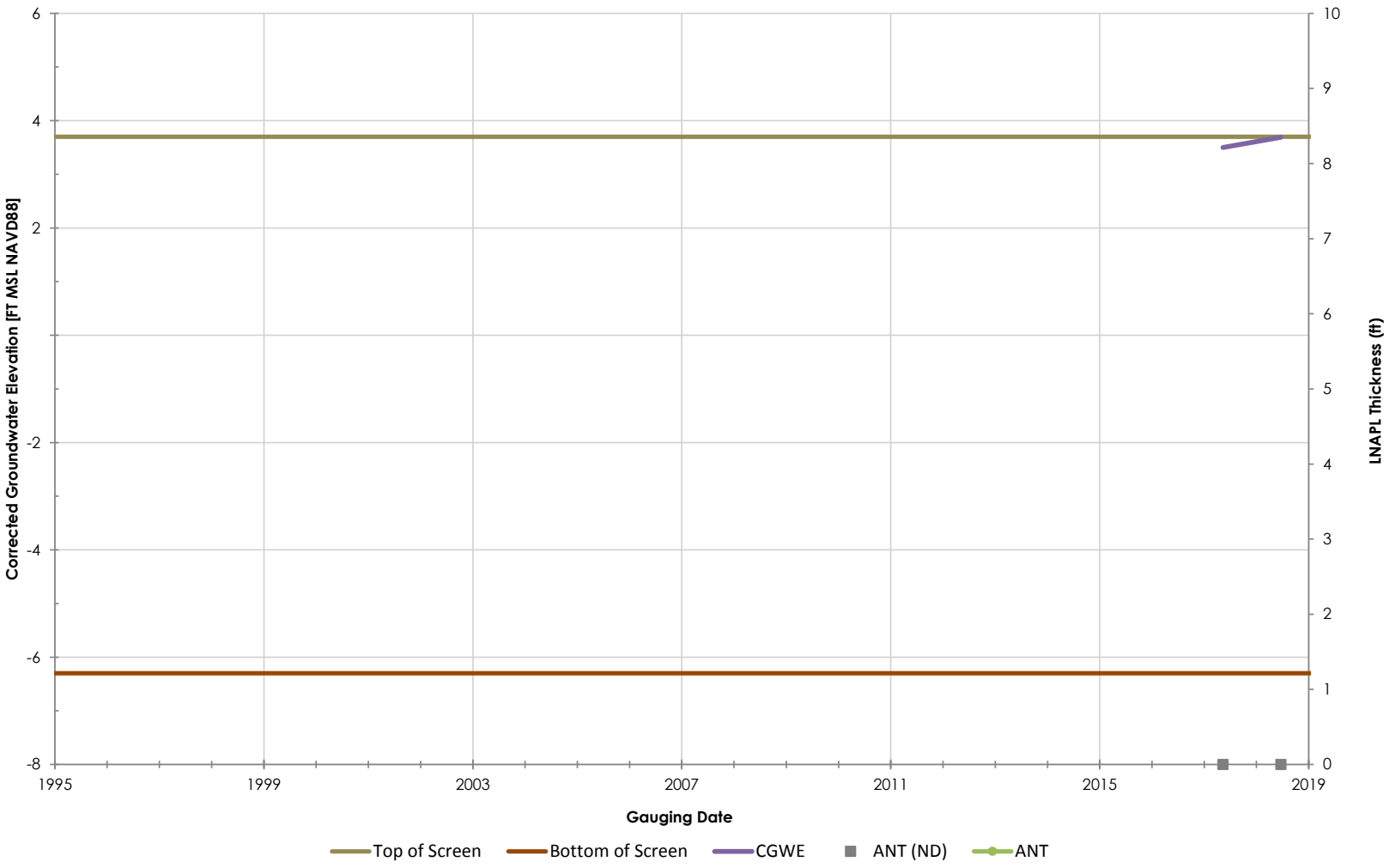
Stantec

Figure/Well No.

B-172

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

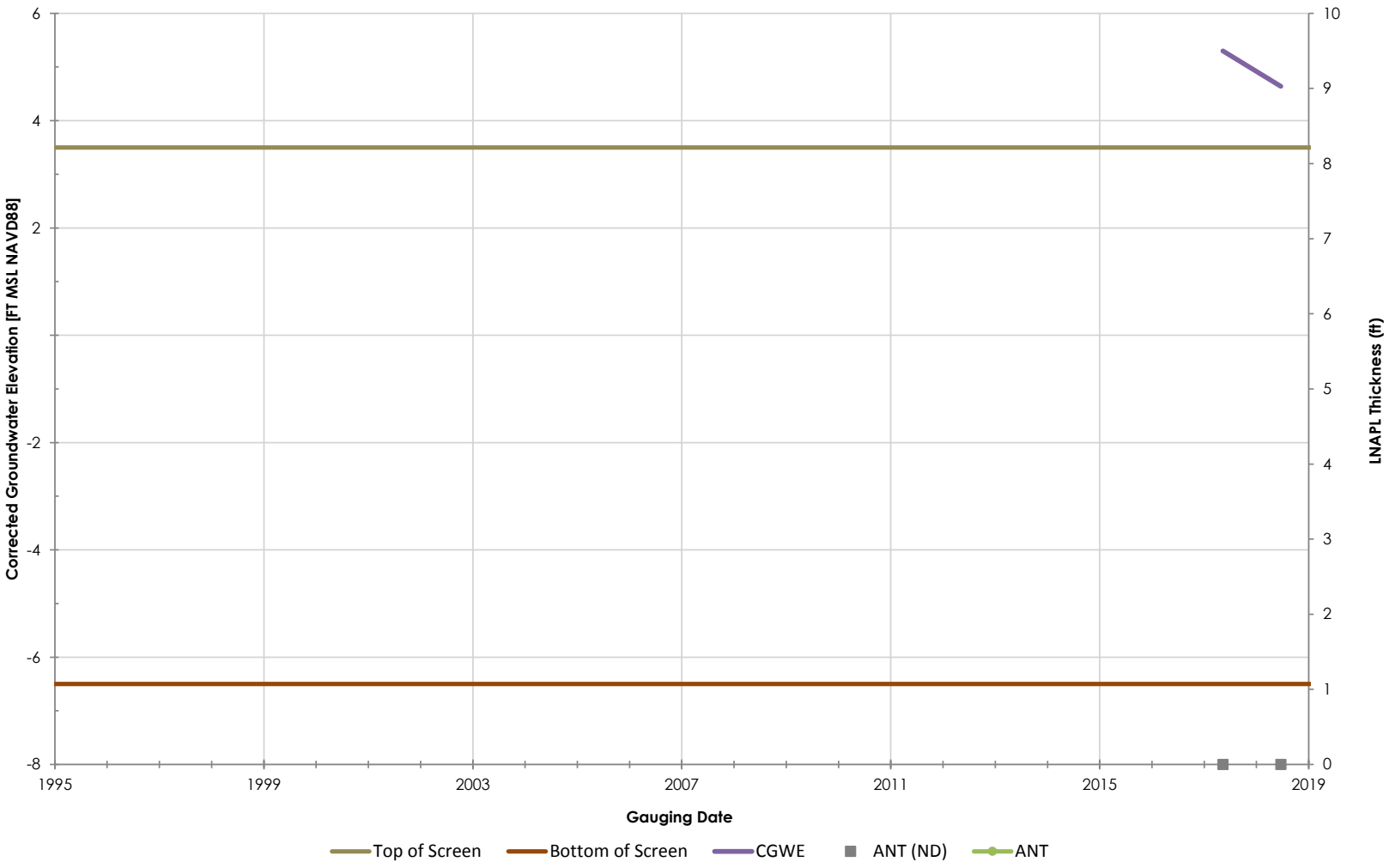
Stantec

Figure/Well No.

B-173

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

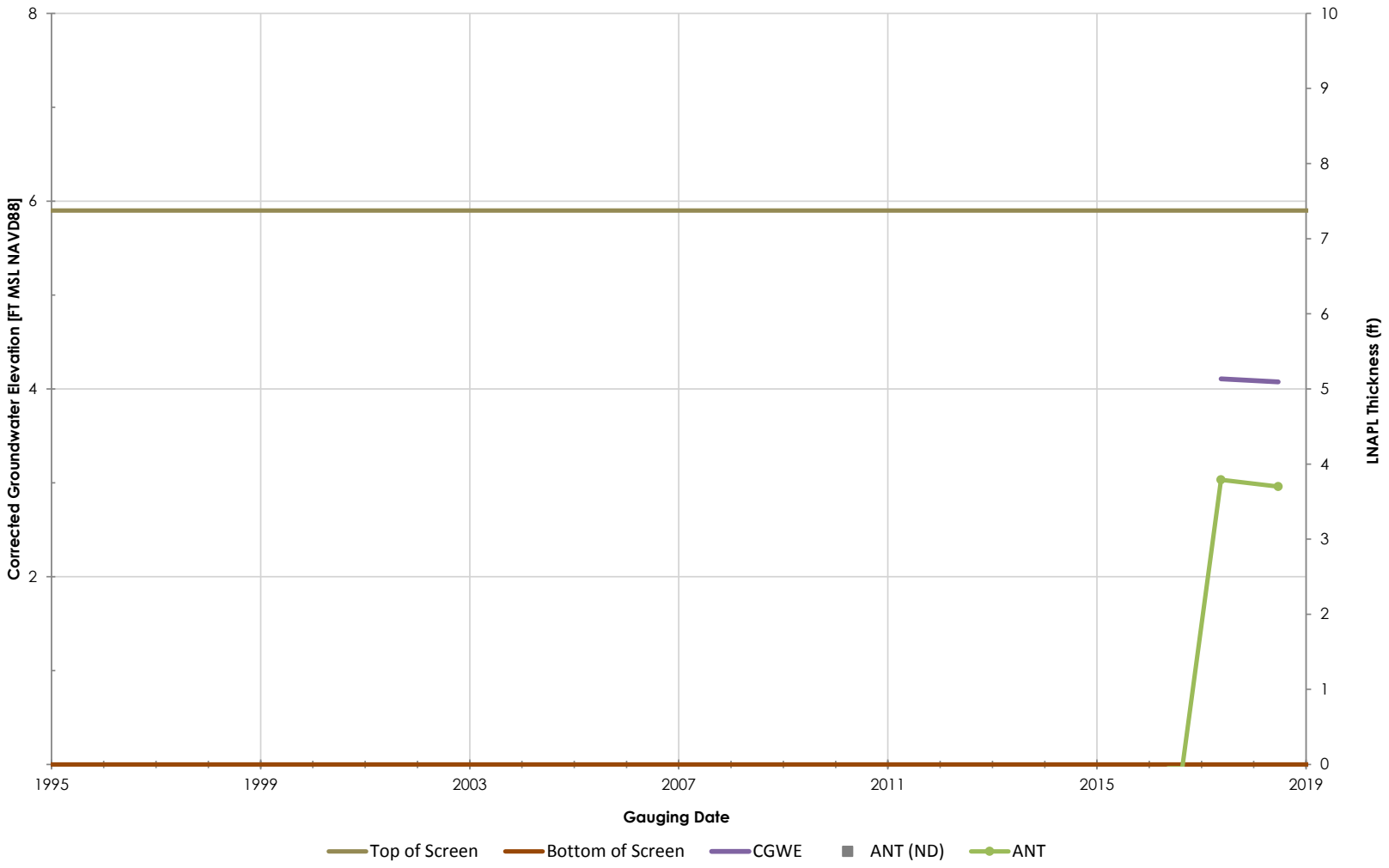
Stantec

Figure/Well No.

B-174

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

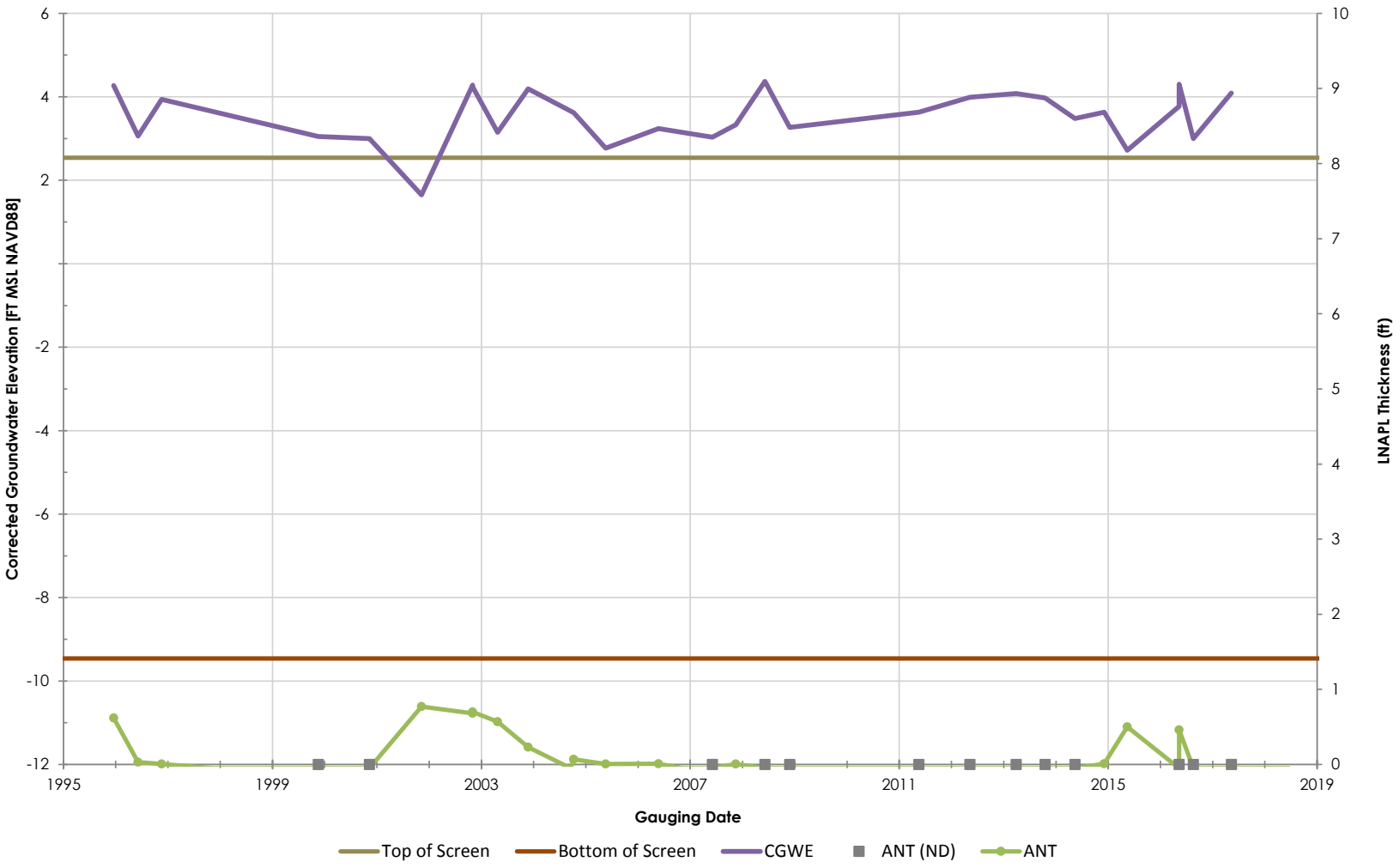
Stantec

Figure/Well No.

B-175

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

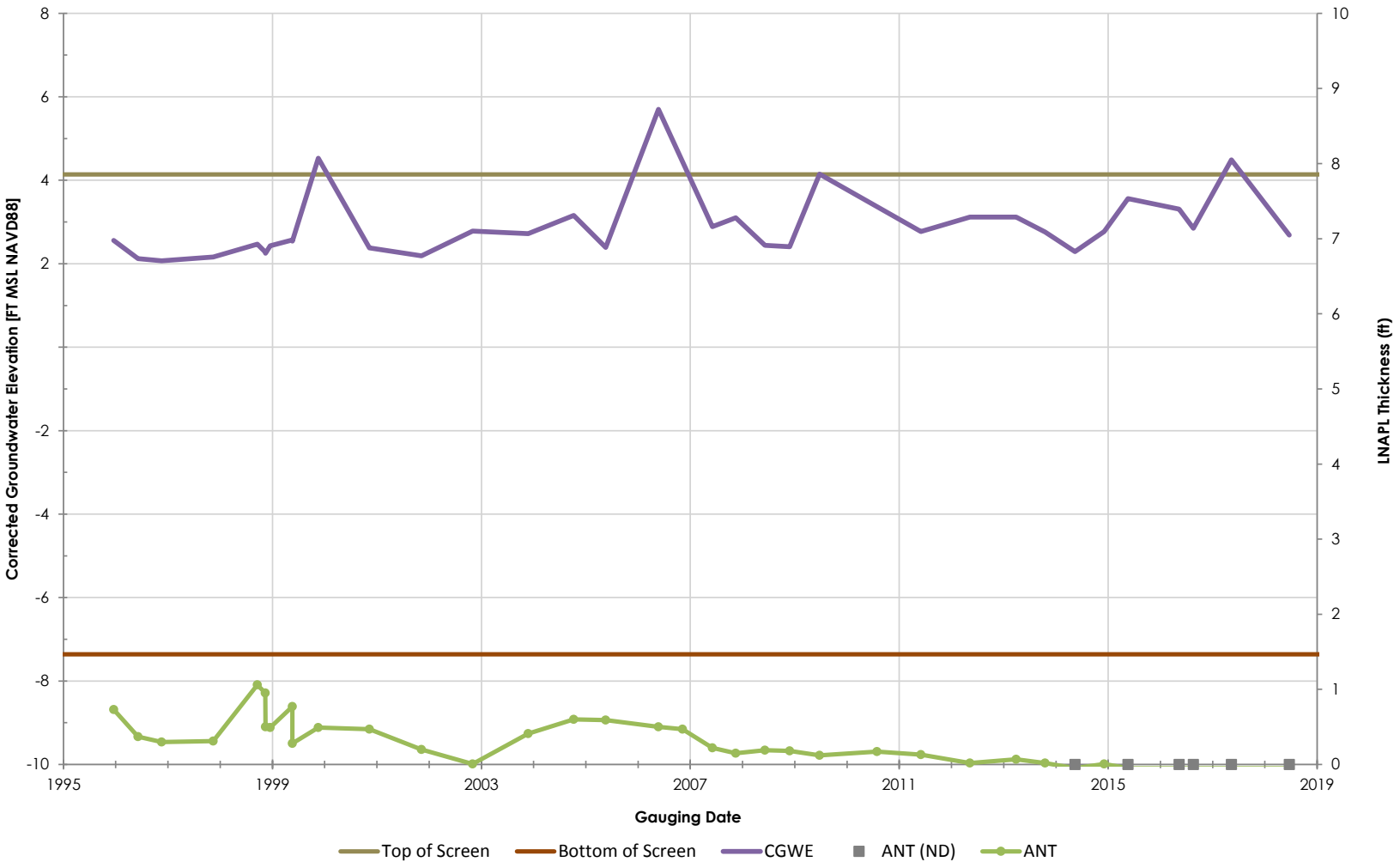
Stantec

Figure/Well No.

B-39

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

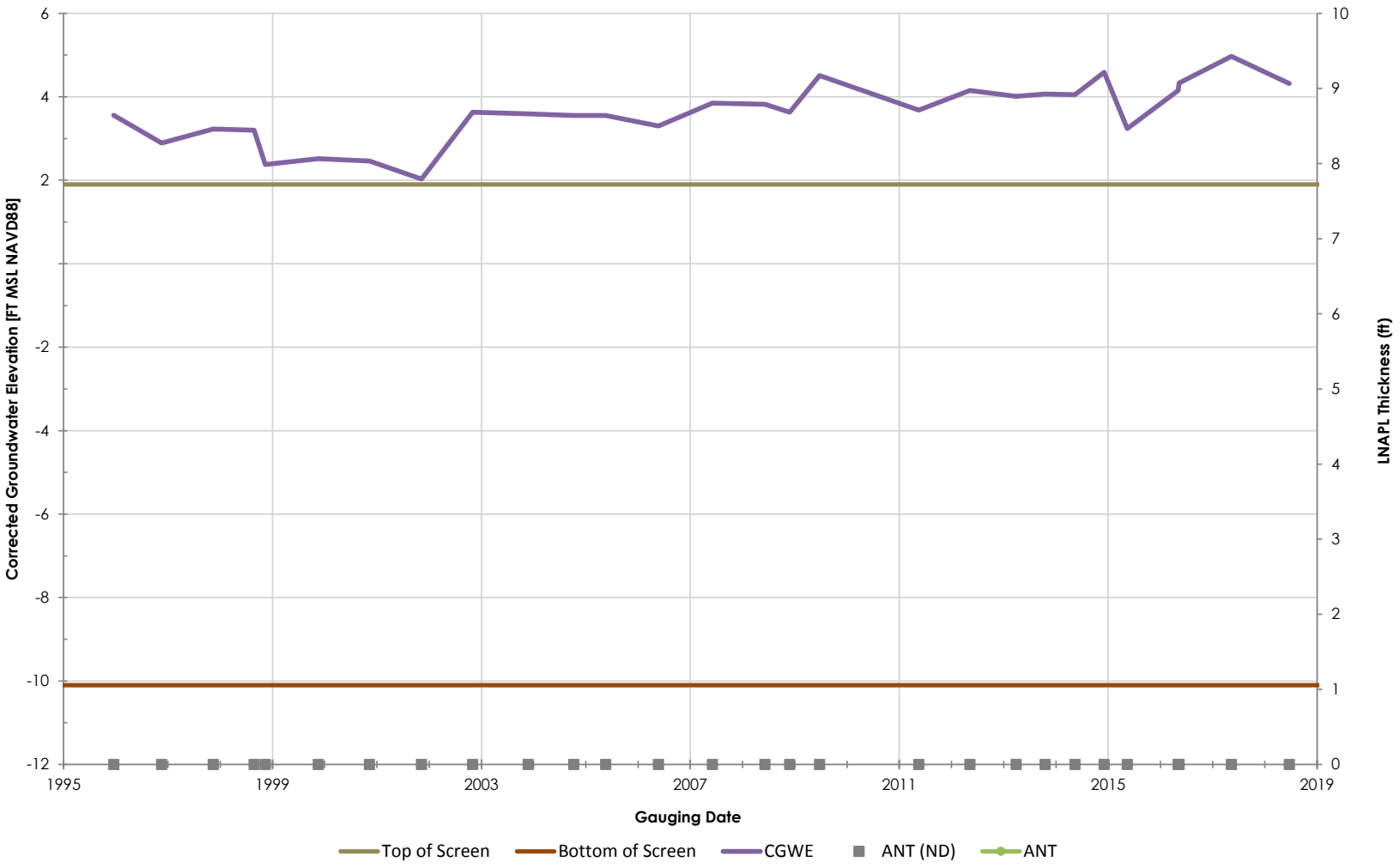
Stantec

Figure/Well No.

B-43

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

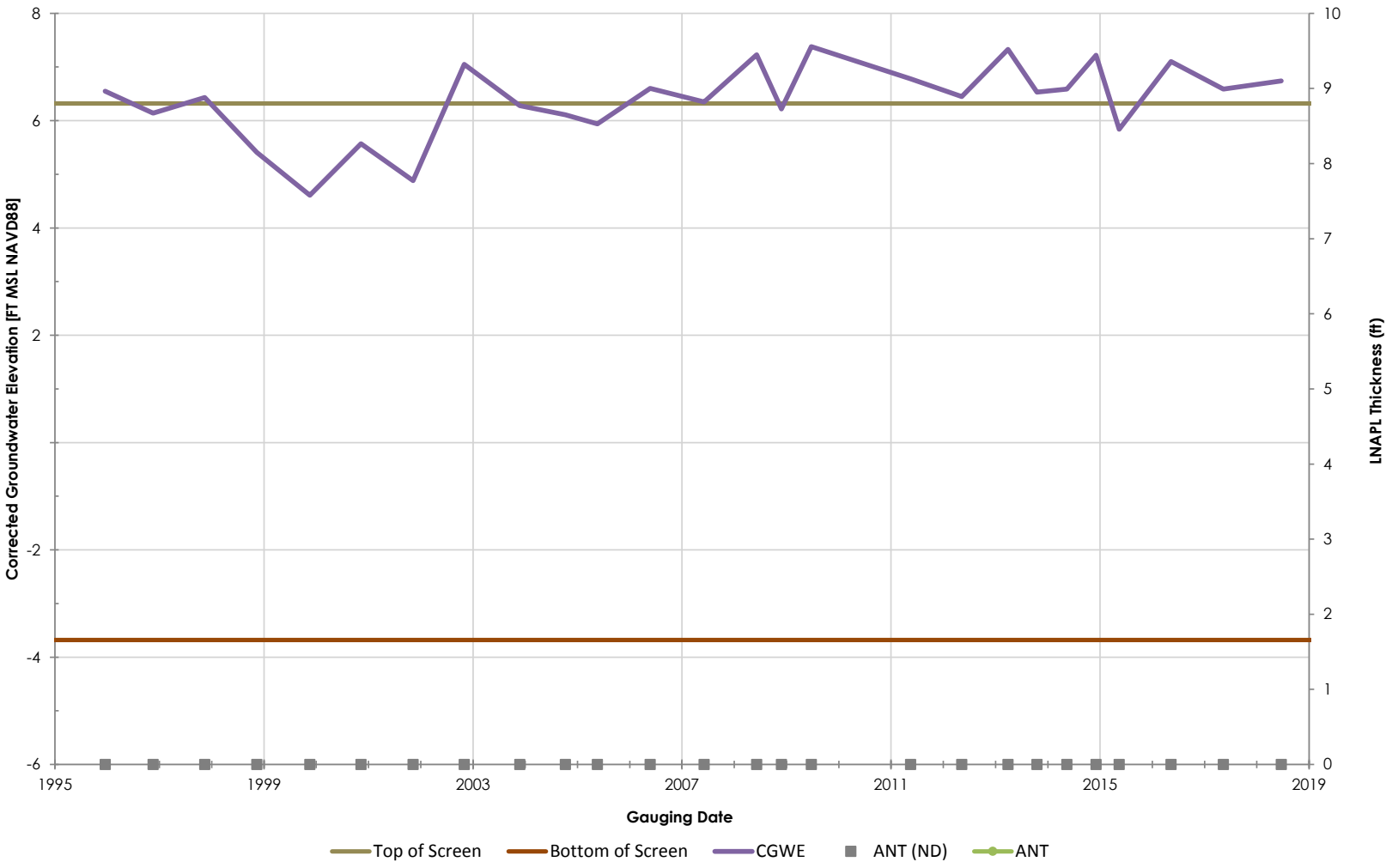
Stantec

Figure/Well No.

B-45

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Stantec

Figure/Well No.

B-46

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

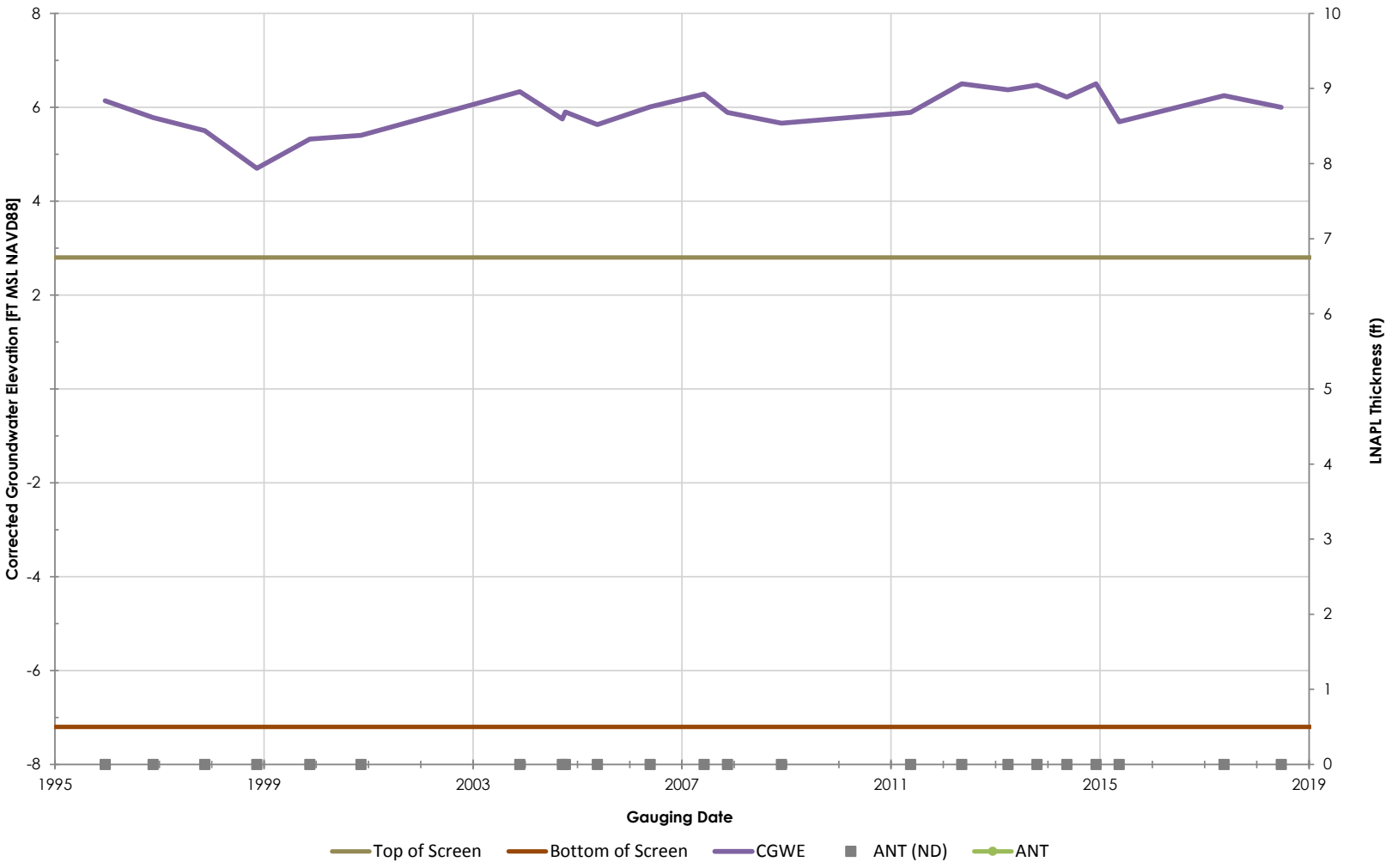
Stantec

Figure/Well No.

B-47

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

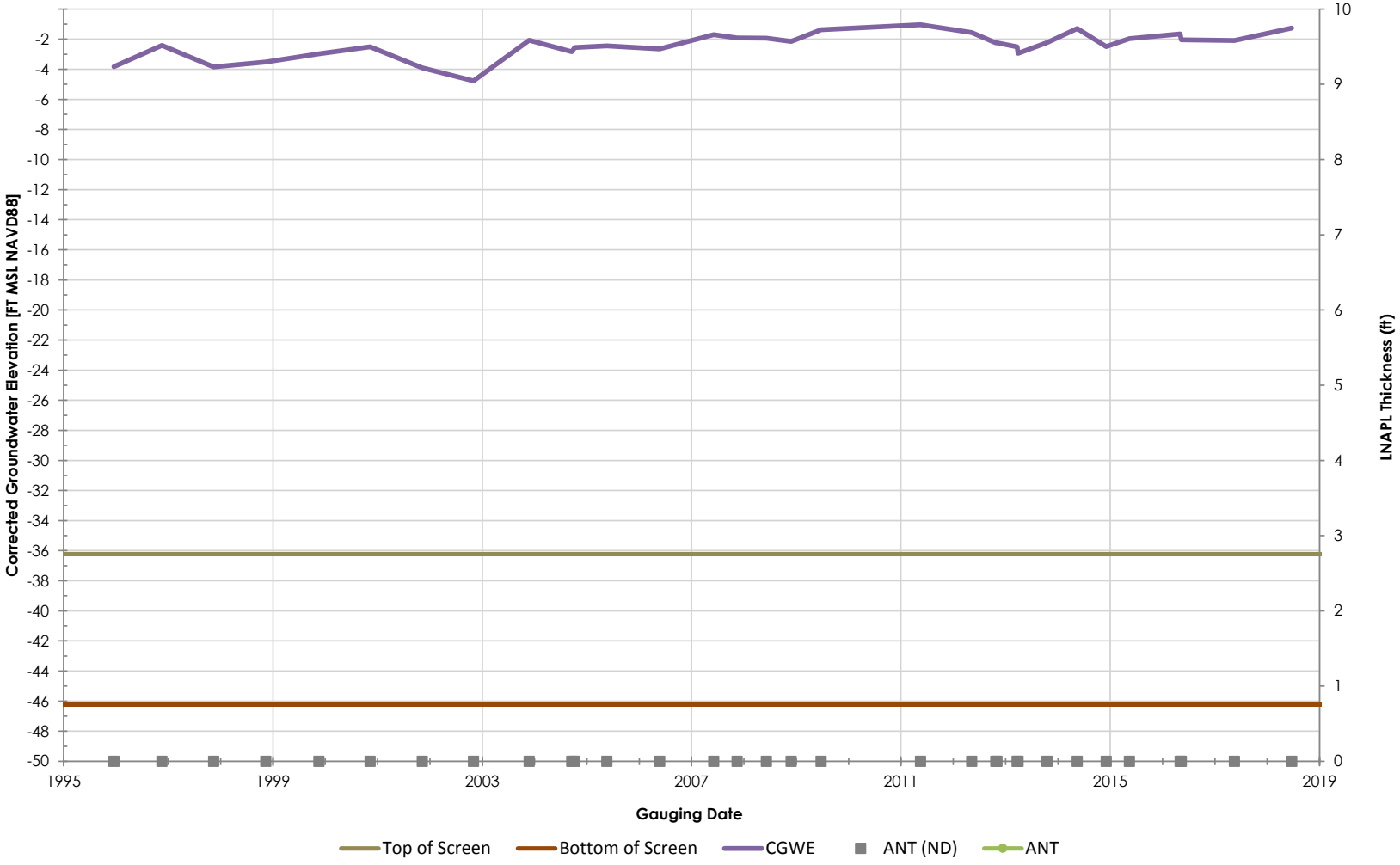
Stantec

Figure/Well No.

B-48

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

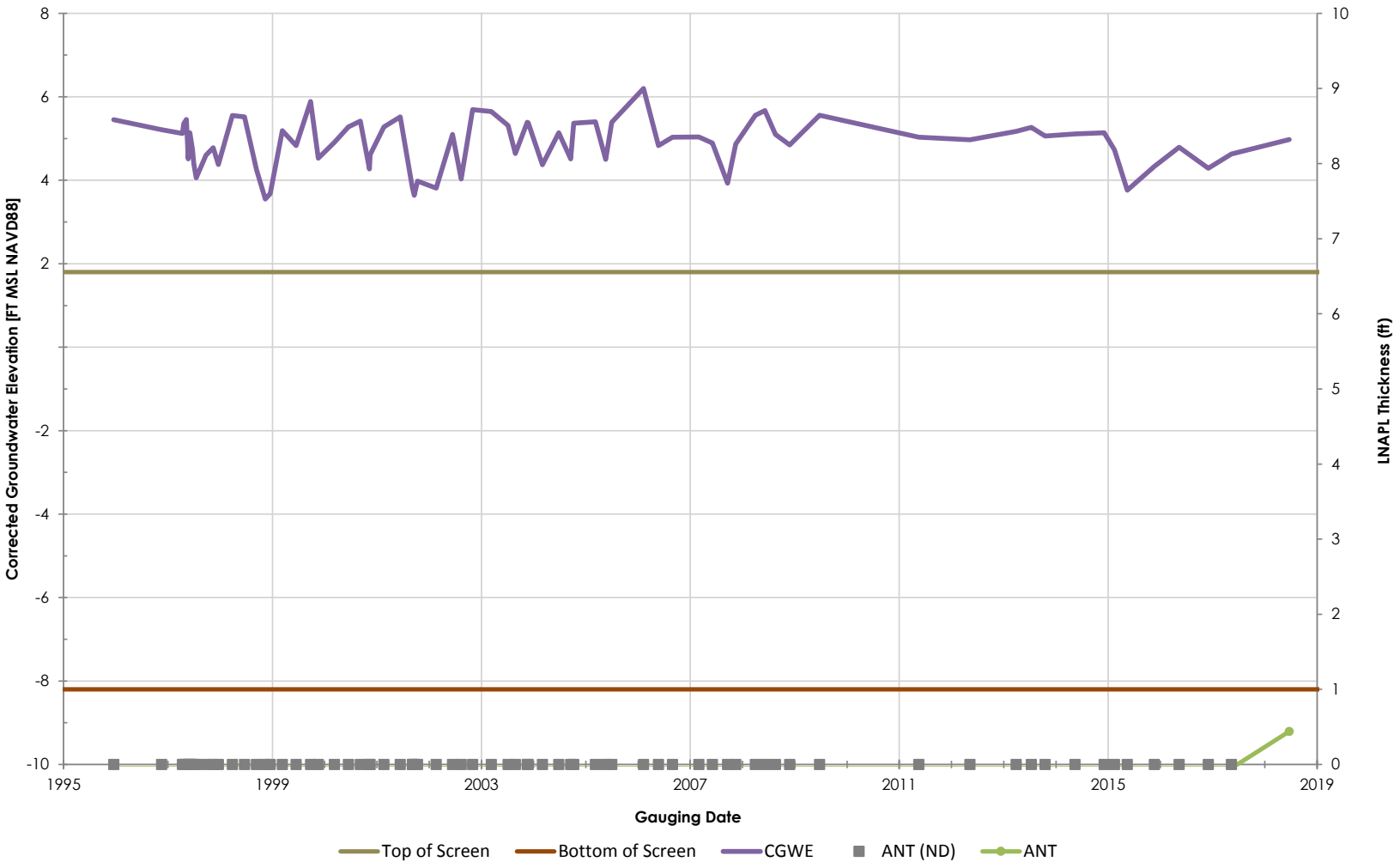
Stantec

Figure/Well No.

B-48D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

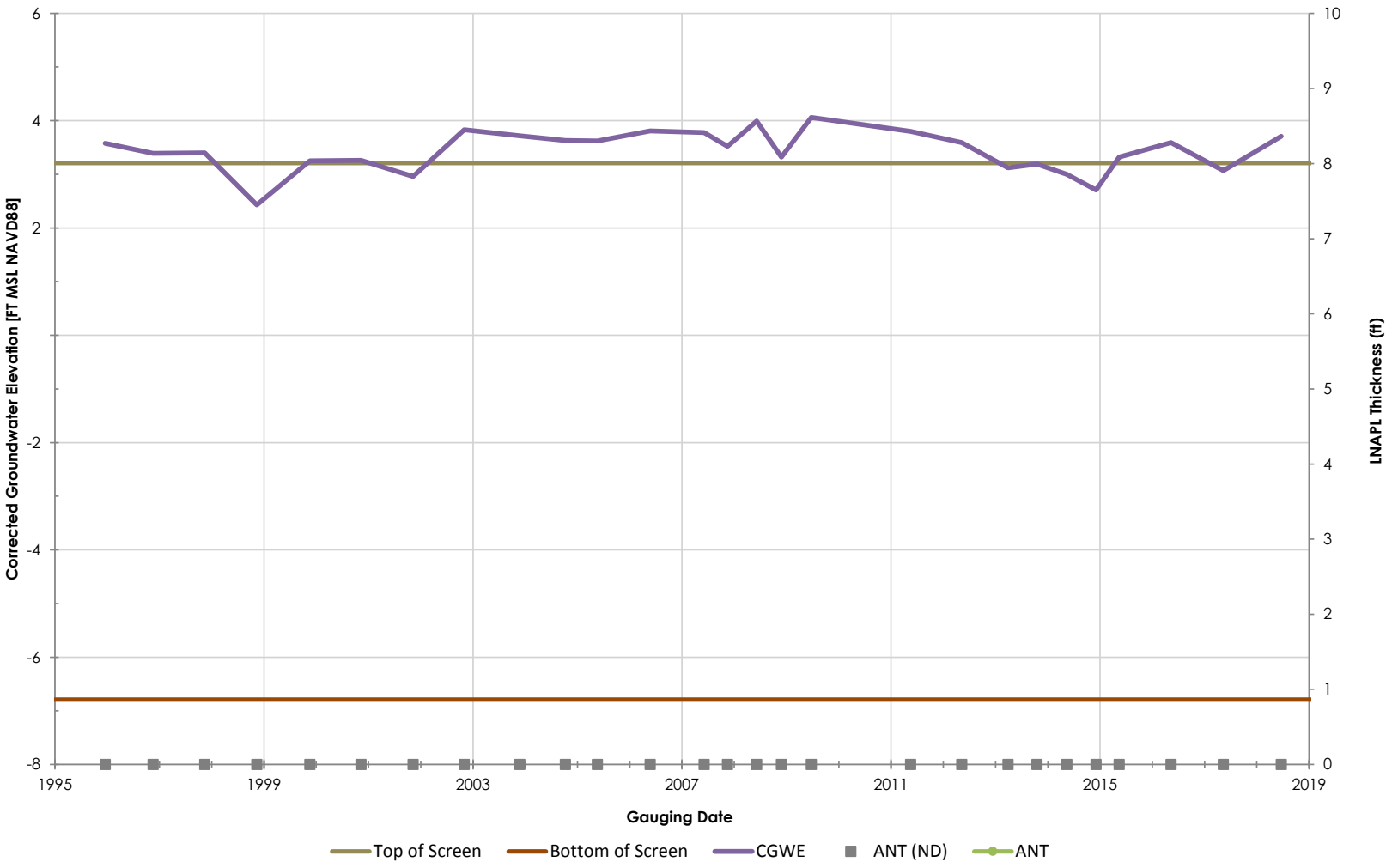
Stantec

Figure/Well No.

B-92

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

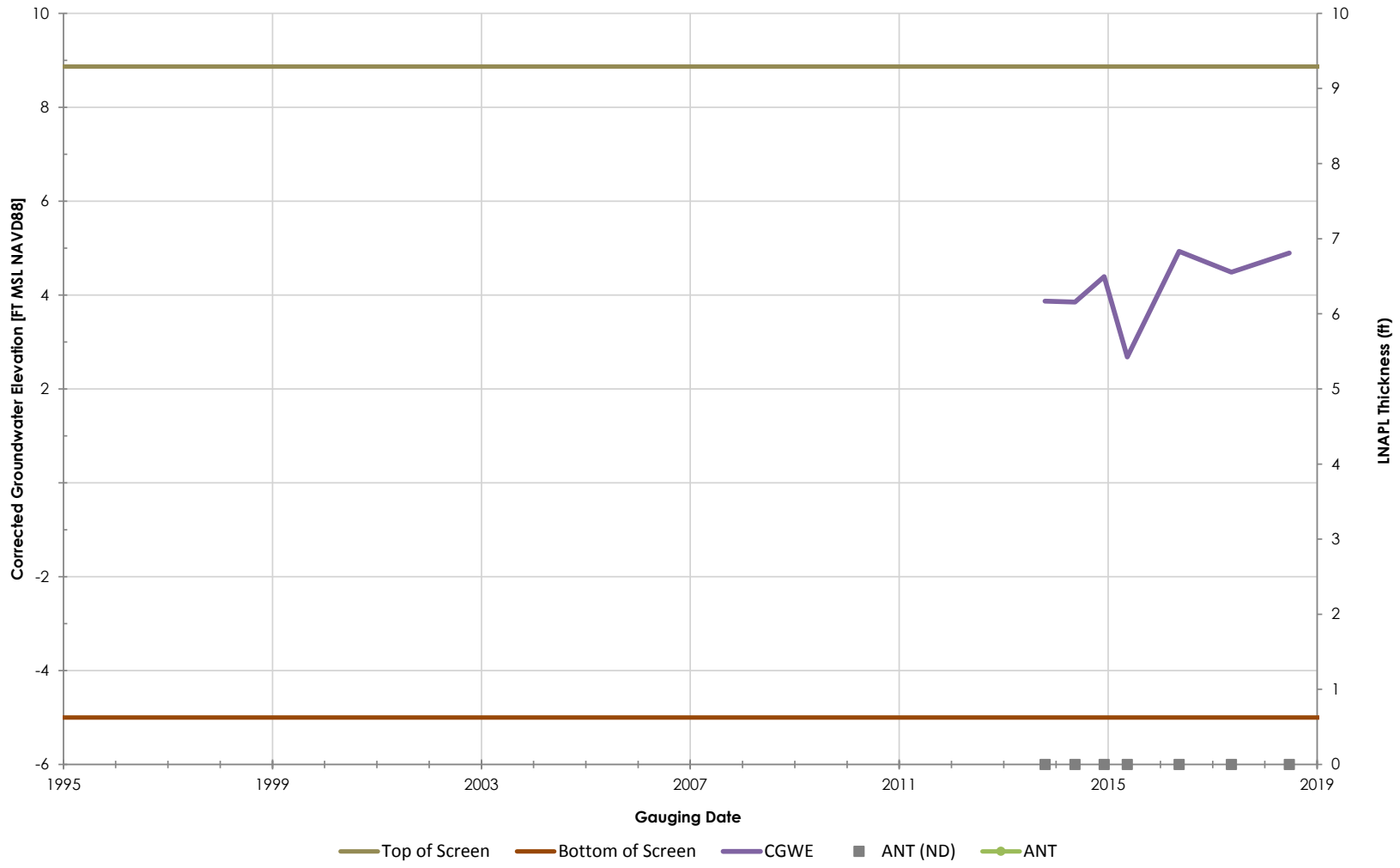
Stantec

Figure/Well No.

B-94

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

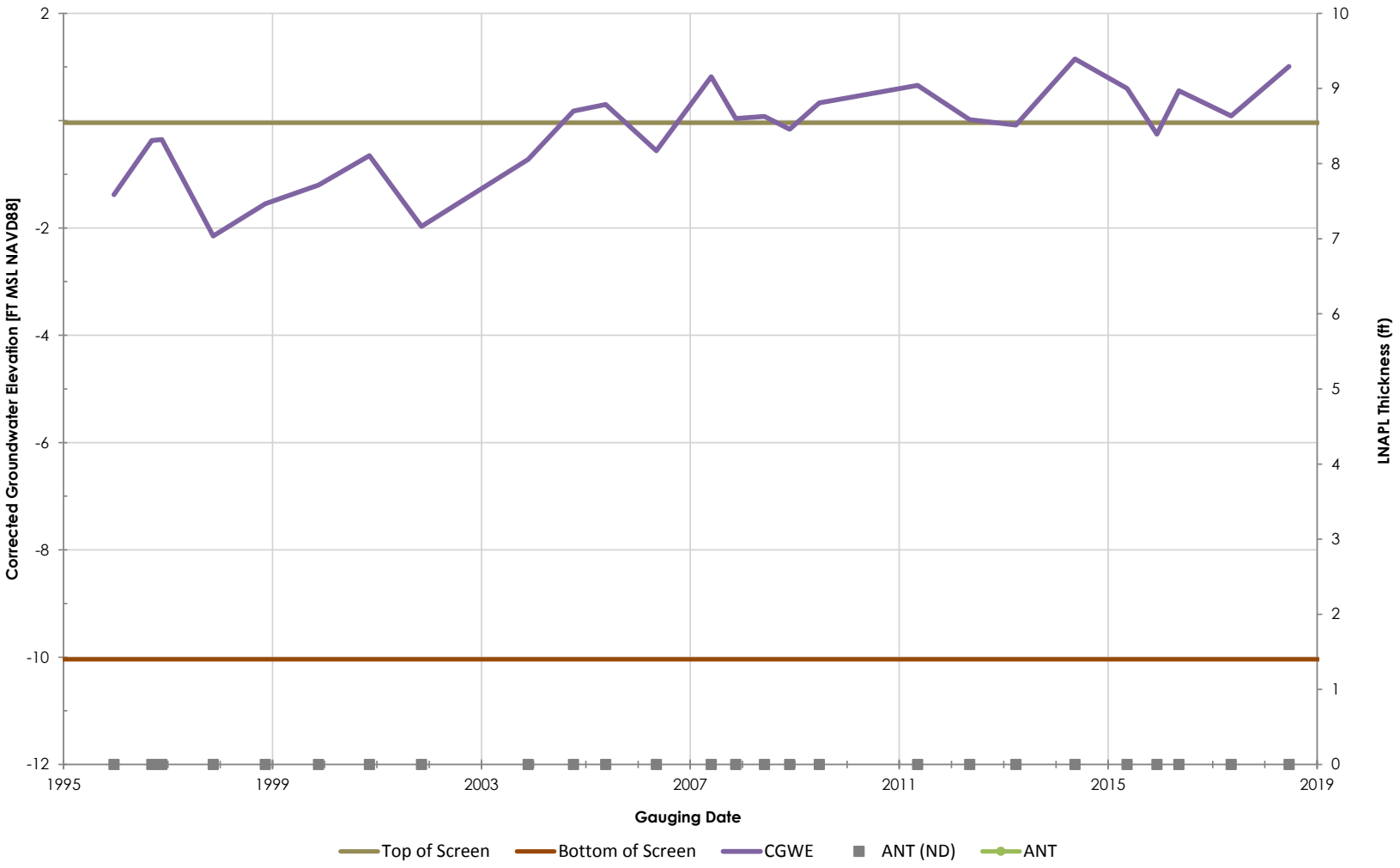
Stantec

Figure/Well No.

B-95

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

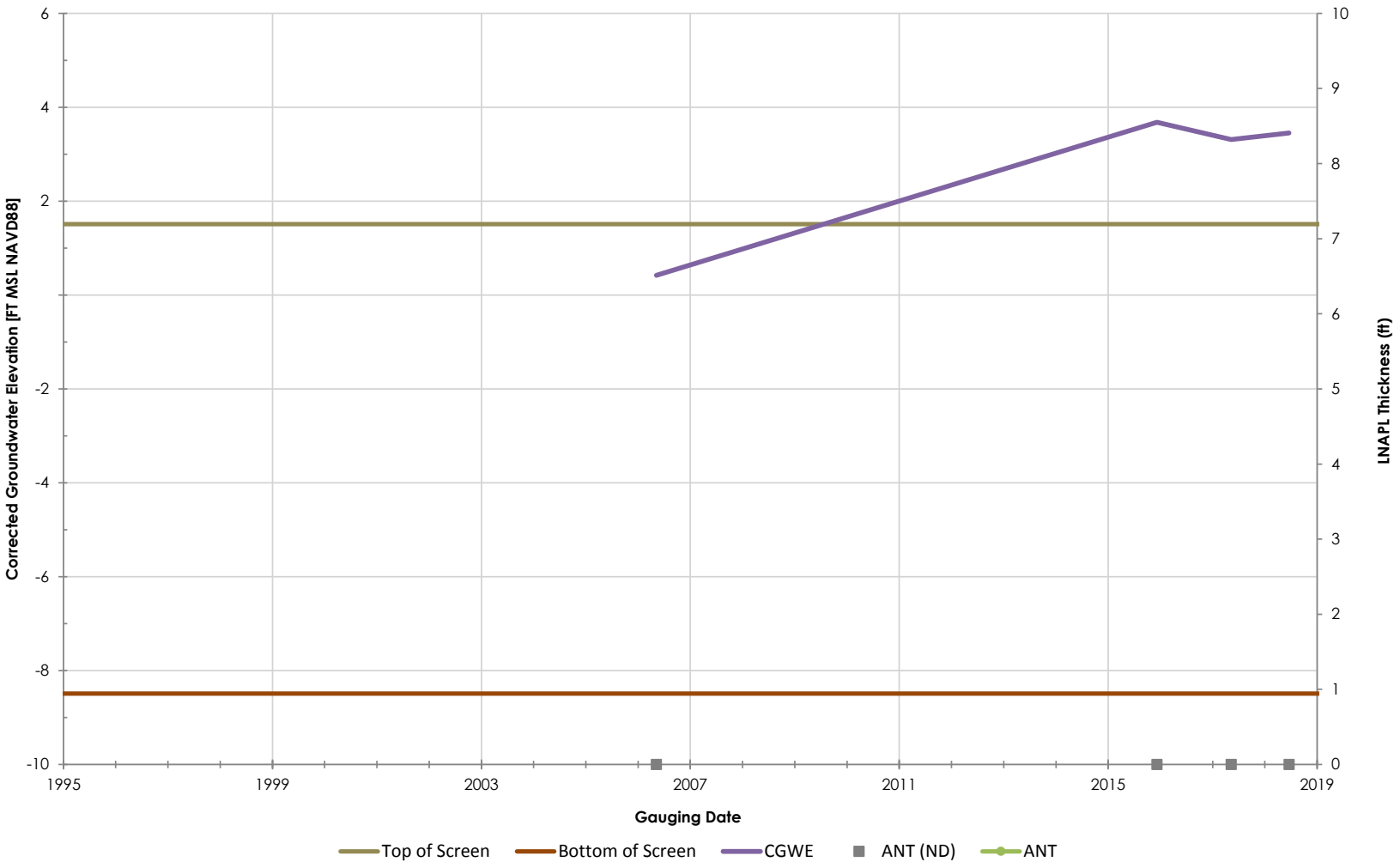
Stantec

Figure/Well No.

BF-100

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

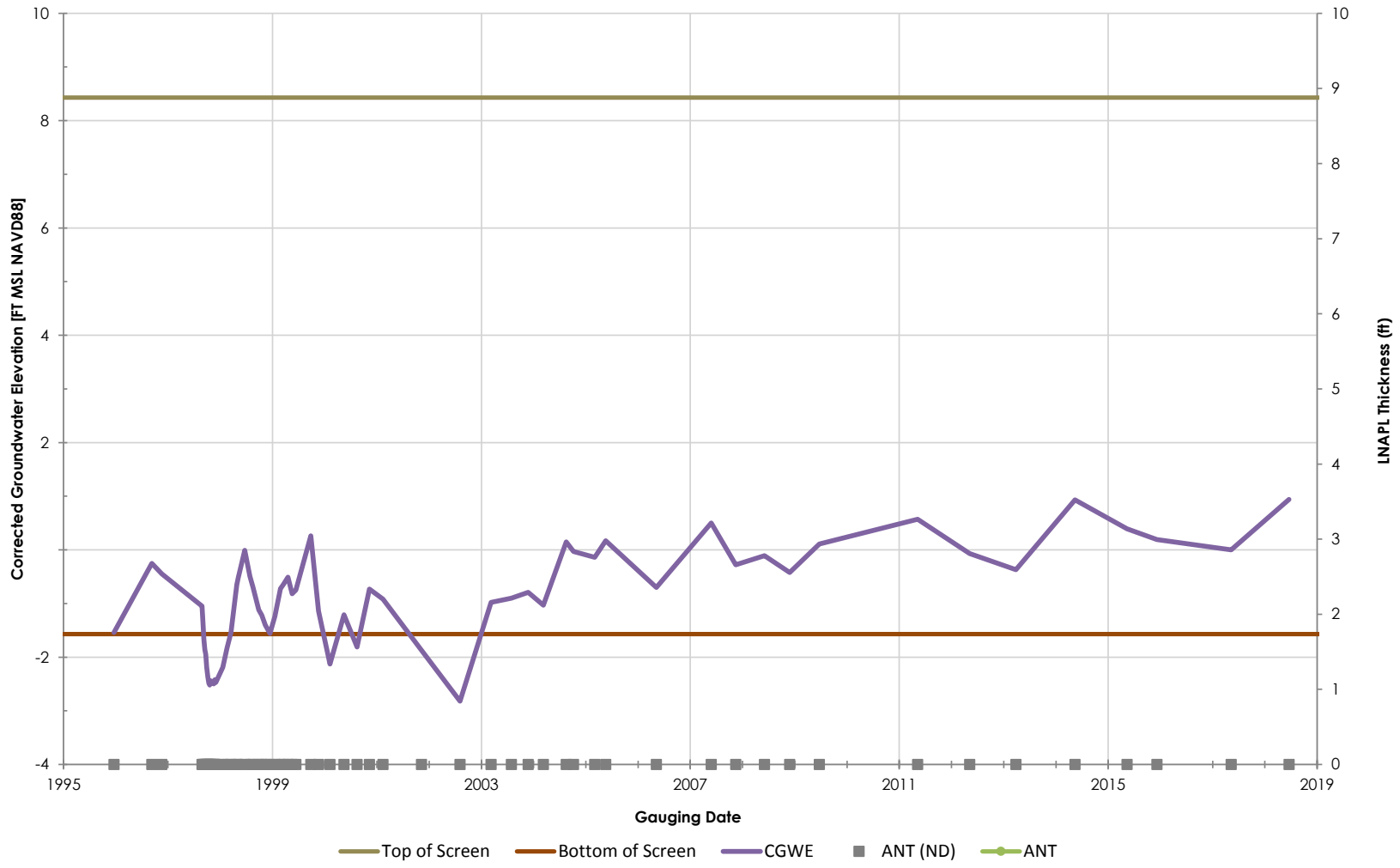
Stantec

Figure/Well No.

BF-101

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

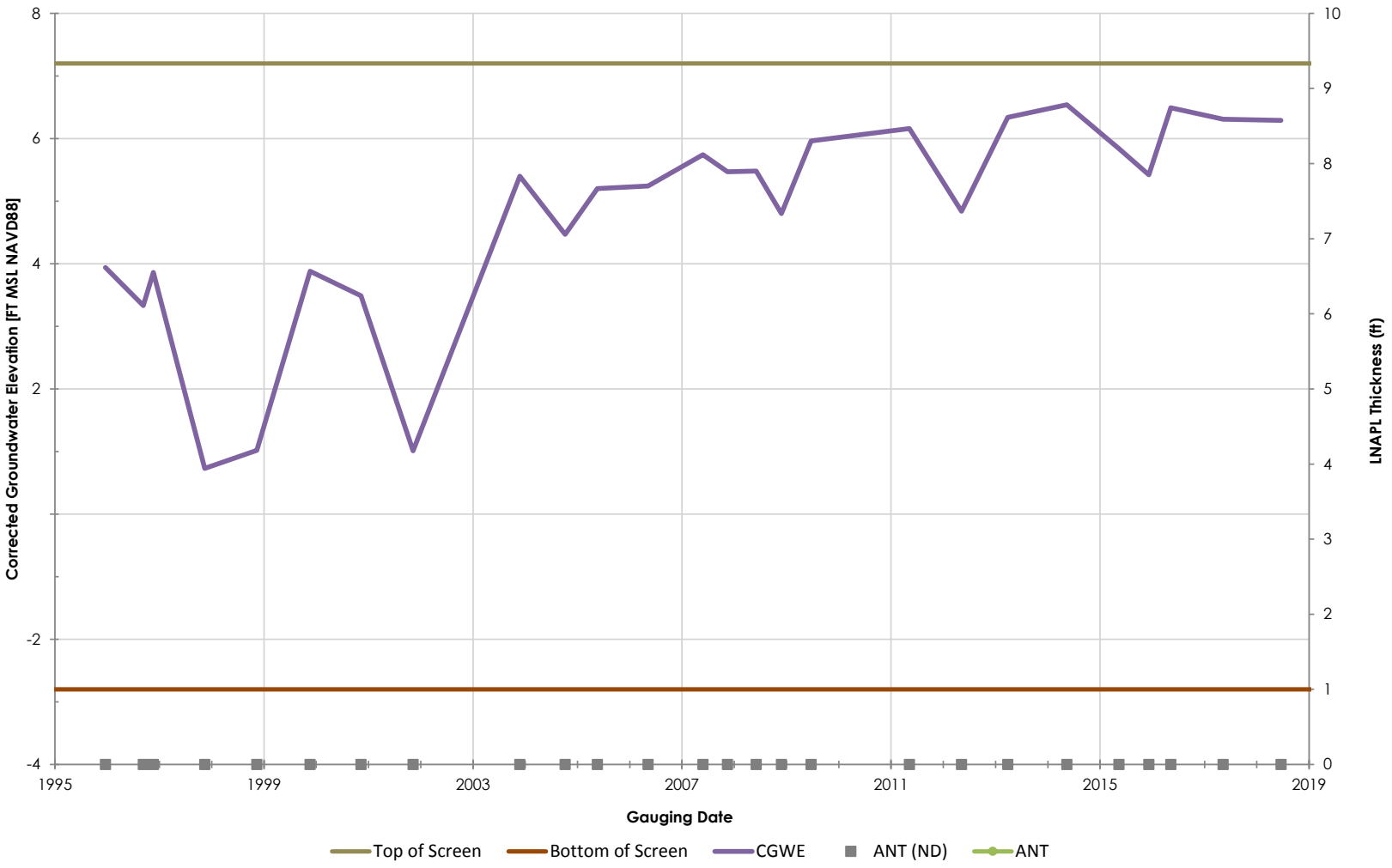
Stantec

Figure/Well No.

BF-103R

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

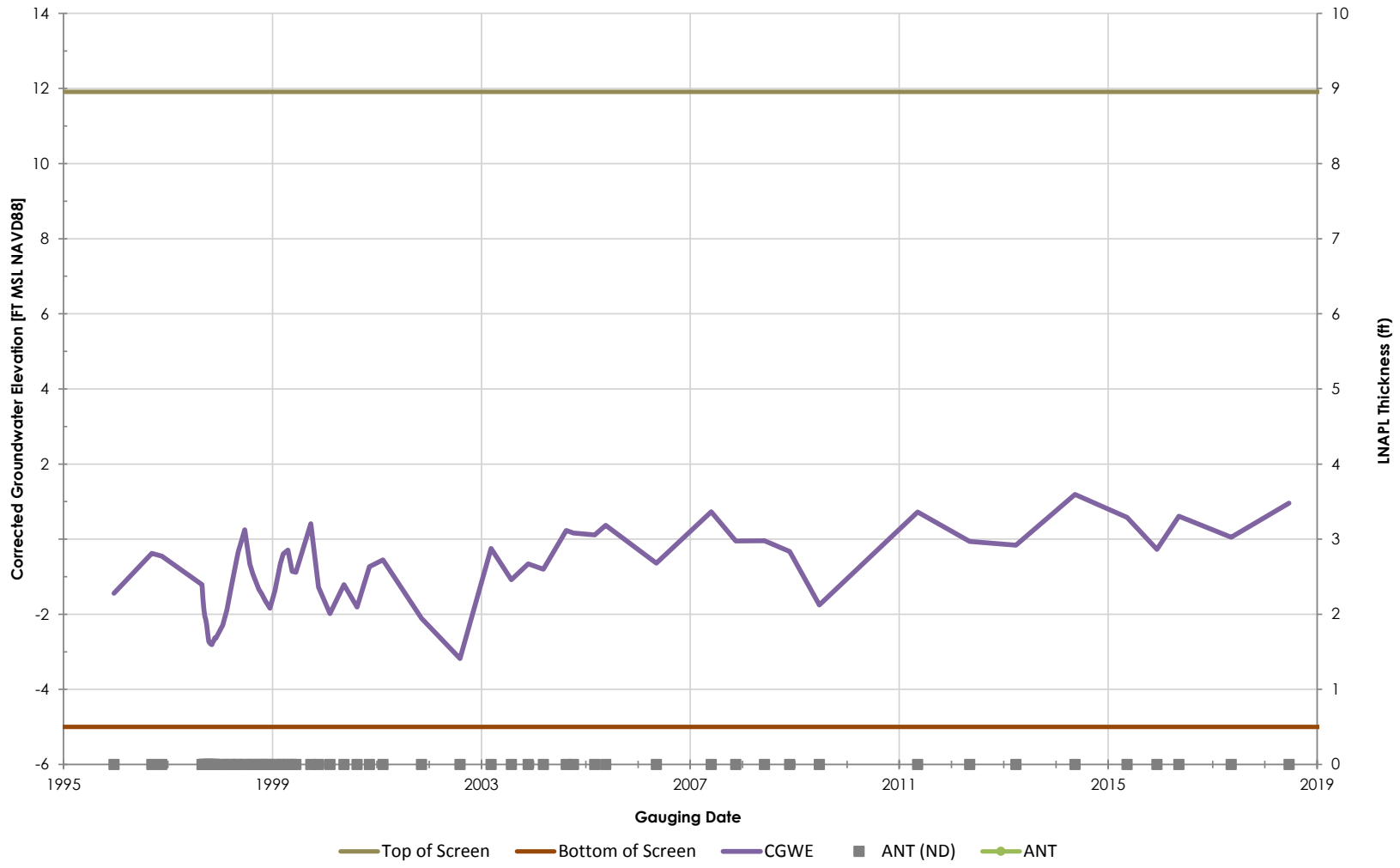
Stantec

Figure/Well No.

BF-104

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

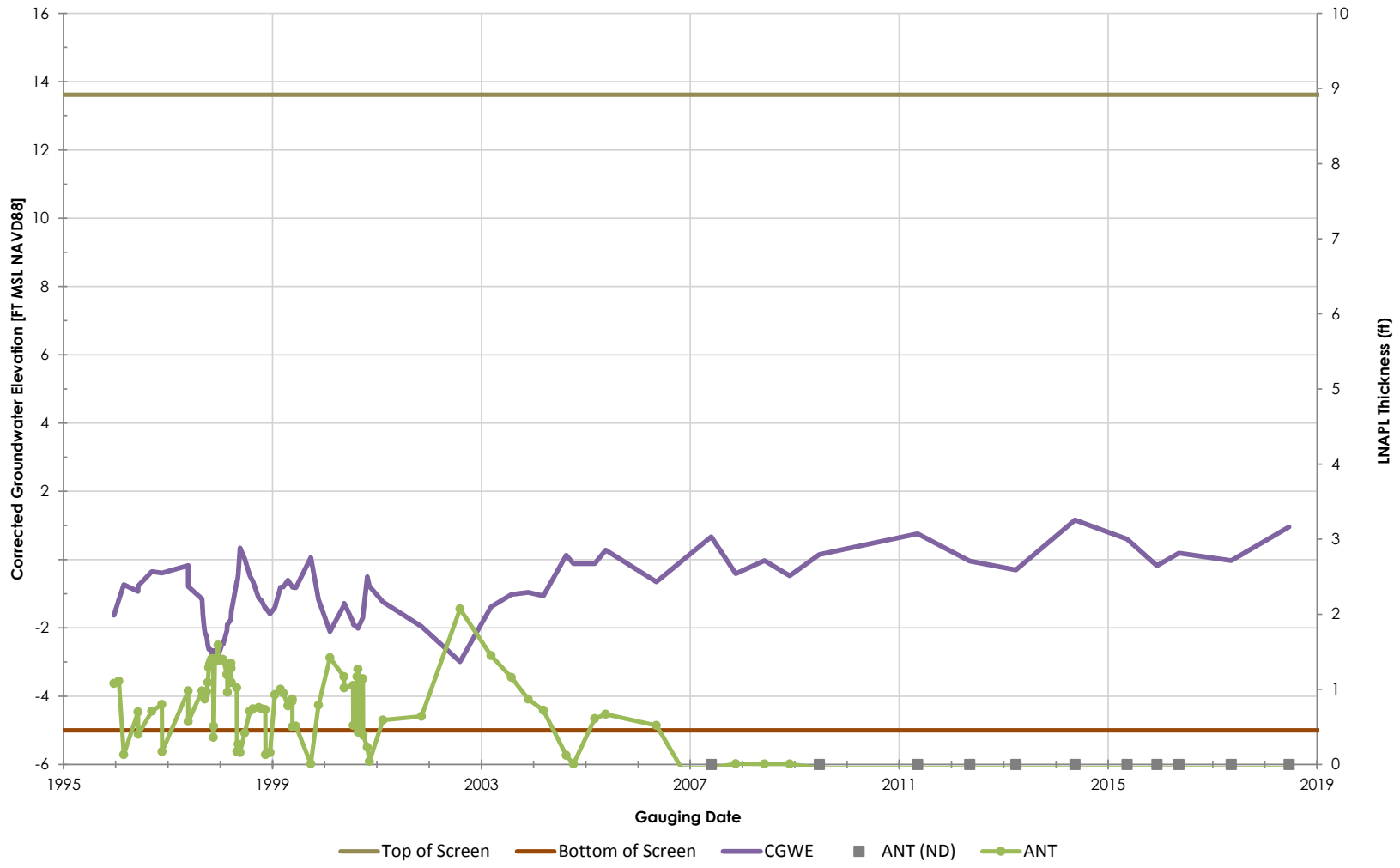
Stantec

Figure/Well No.

BF-105

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

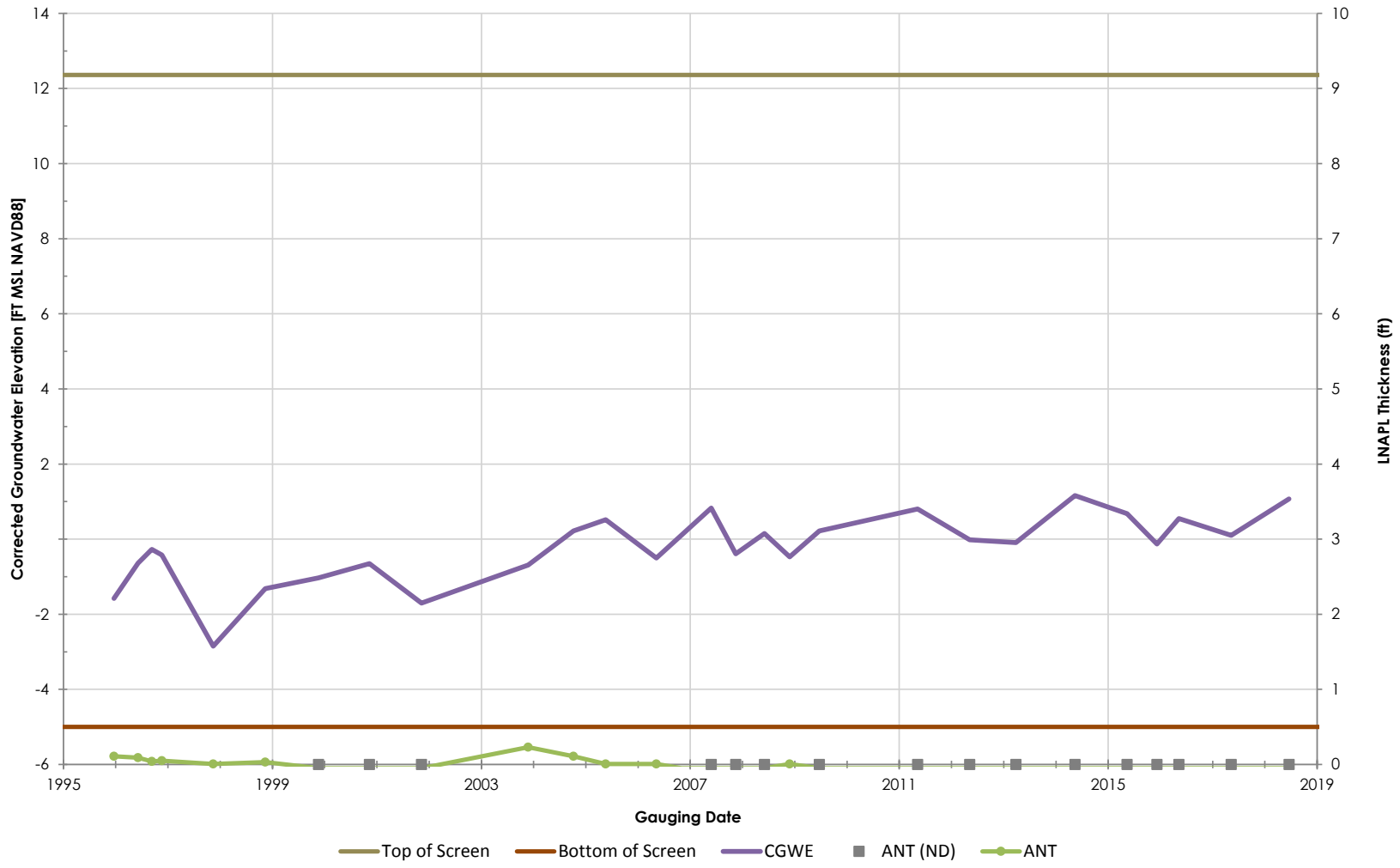
Stantec

Figure/Well No.

BF-106

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

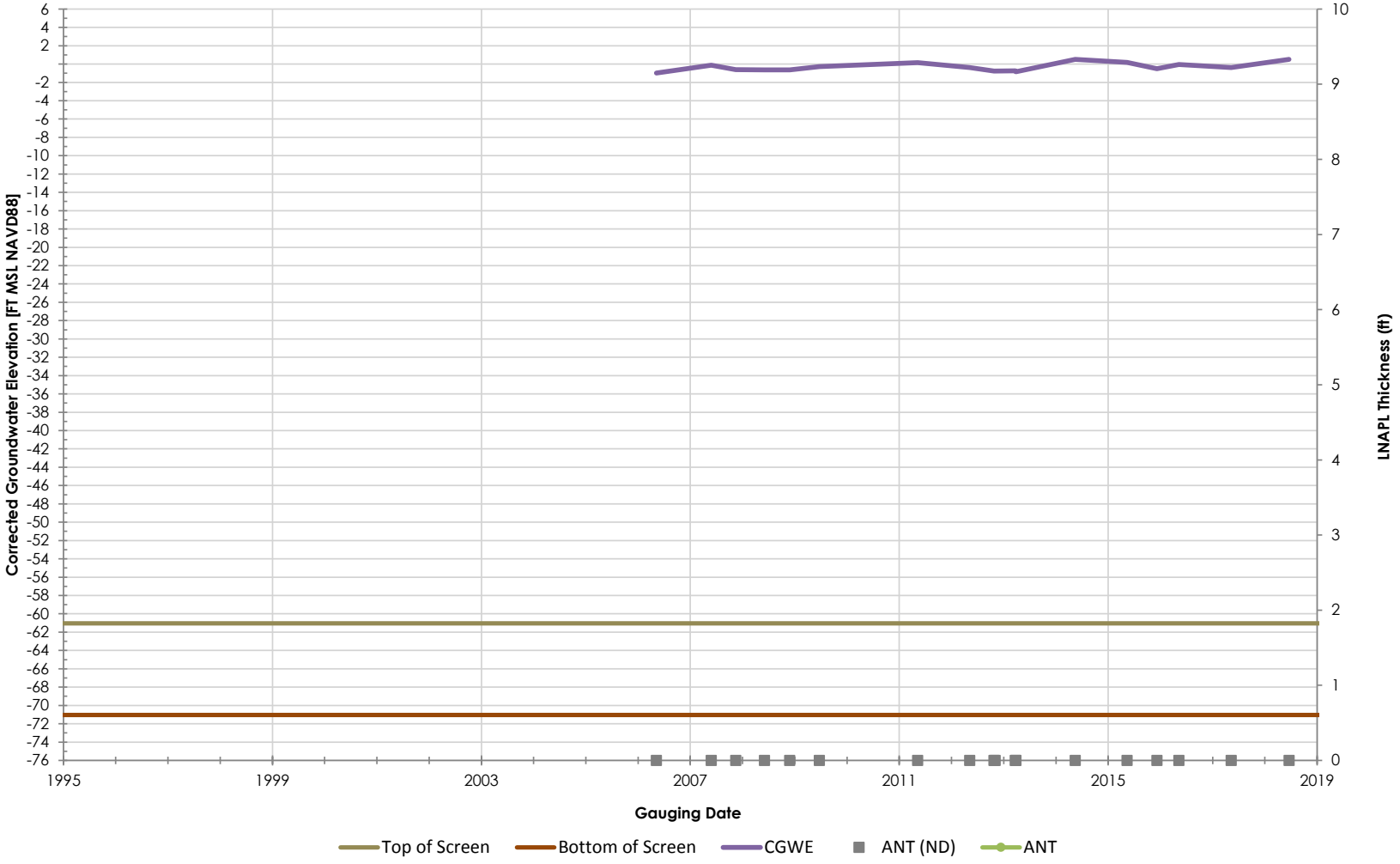
Stantec

Figure/Well No.

BF-107

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

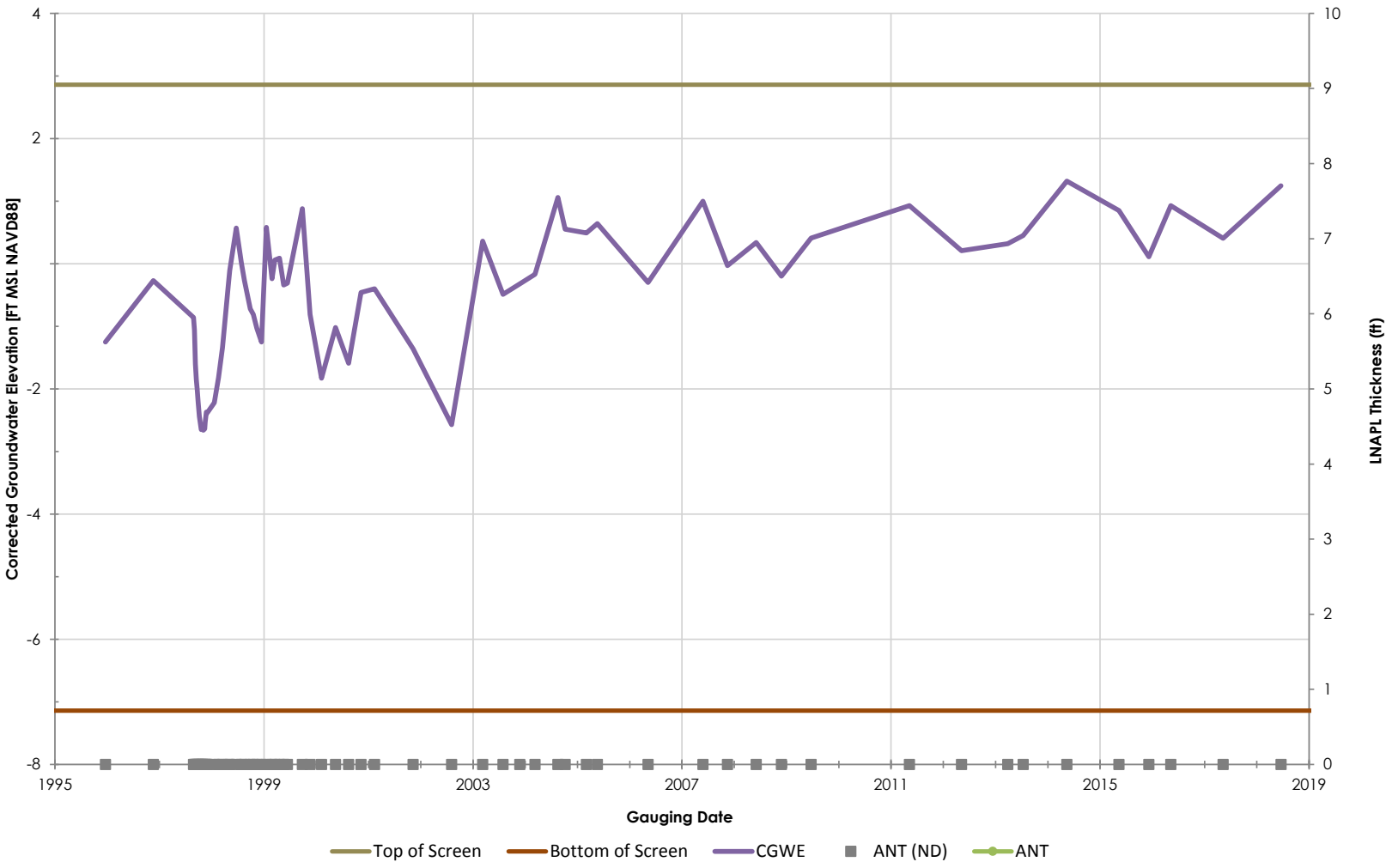
Stantec

Figure/Well No.

BF-108

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

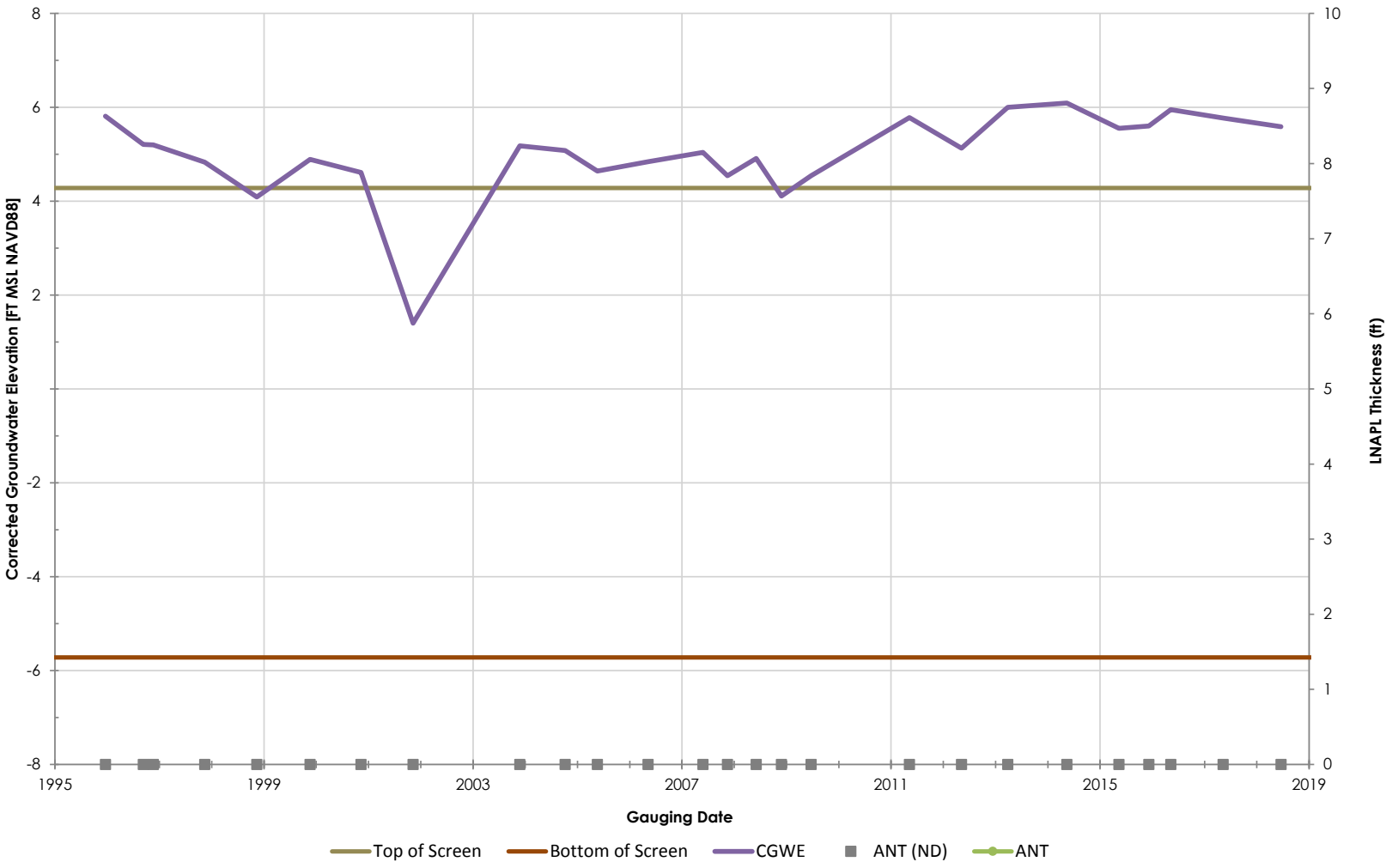
Stantec

Figure/Well No.

BF-88

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

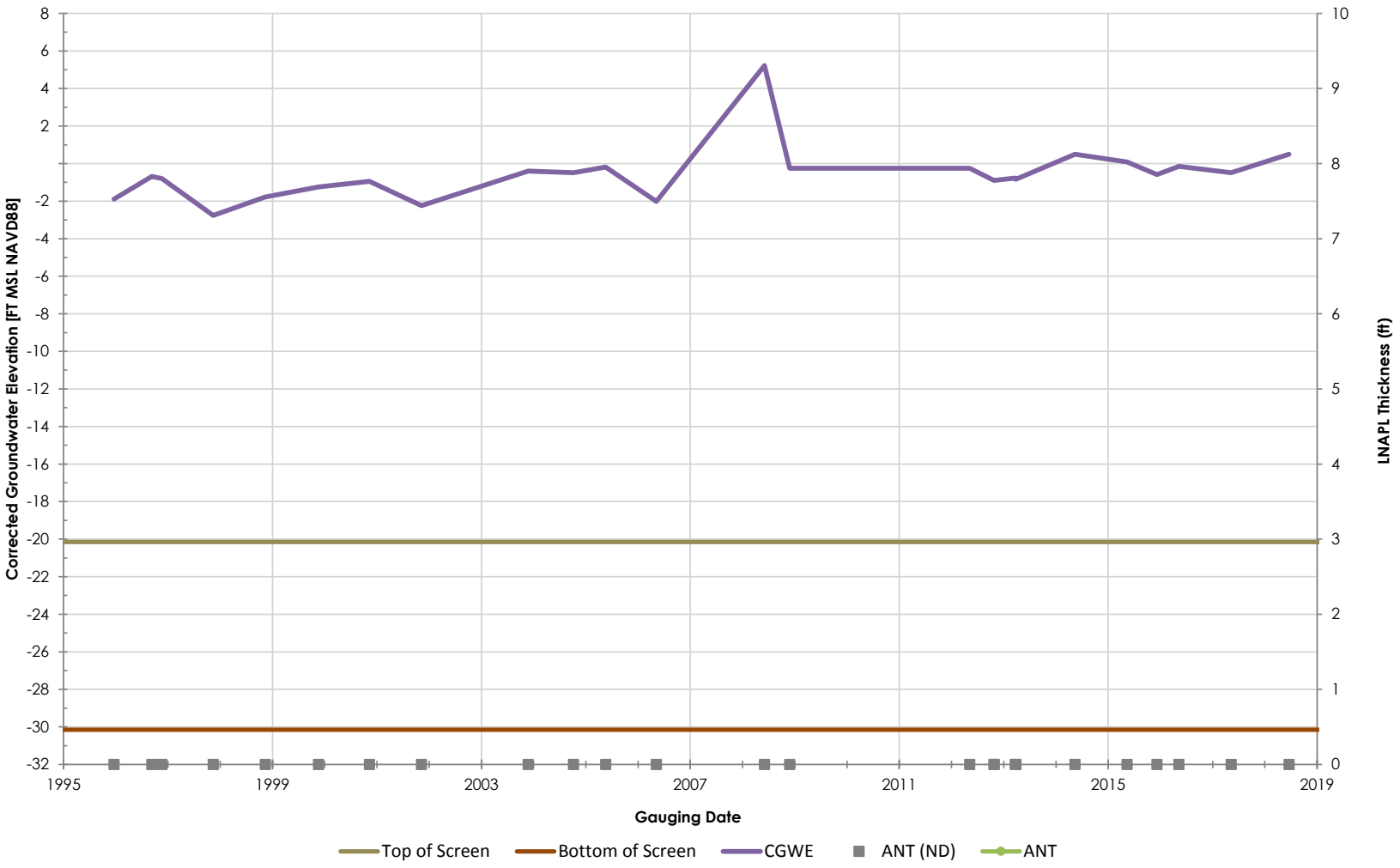
Stantec

Figure/Well No.

BF-90

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

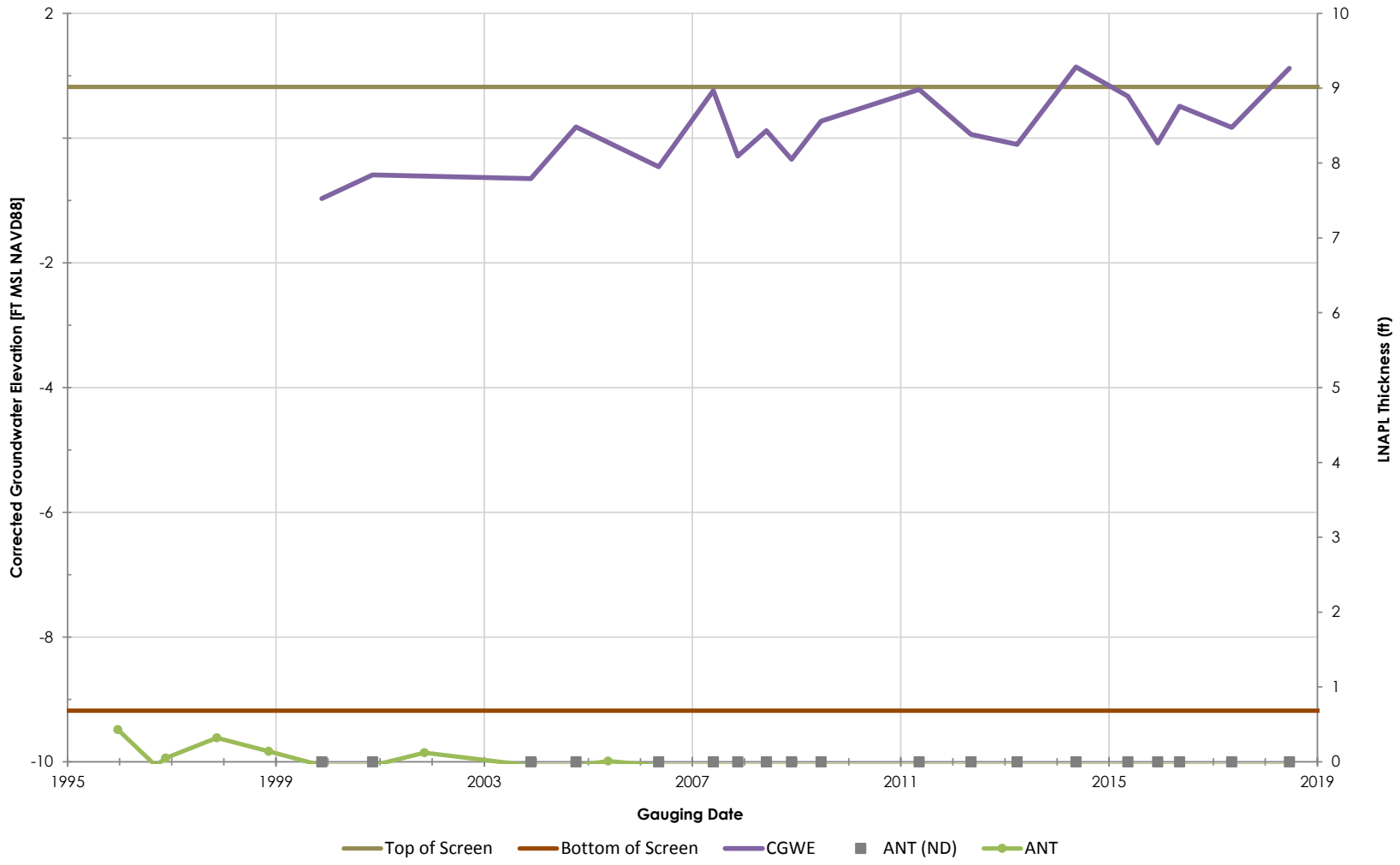
Stantec

Figure/Well No.

BF-90D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

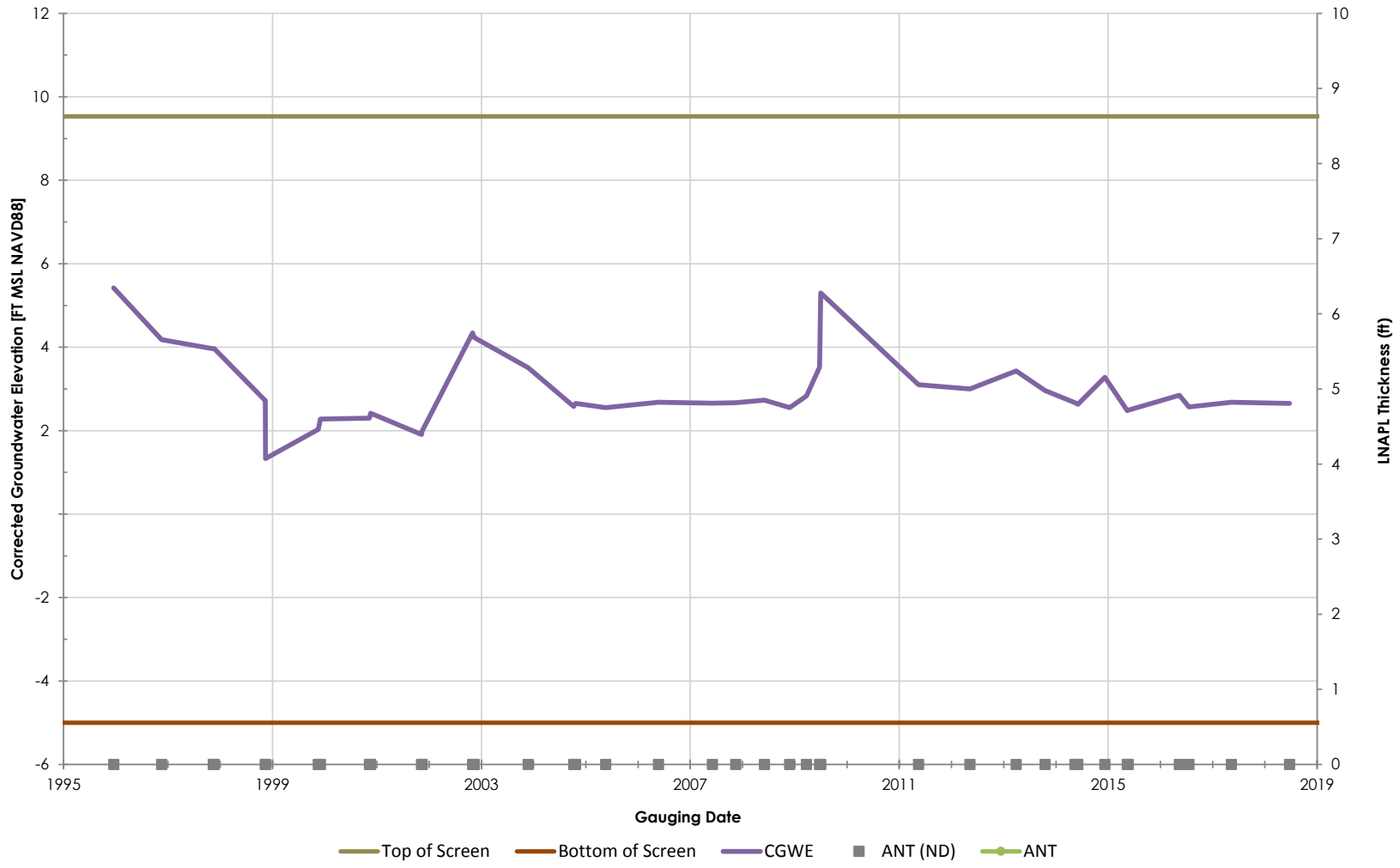
Stantec

Figure/Well No.

BF-99

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

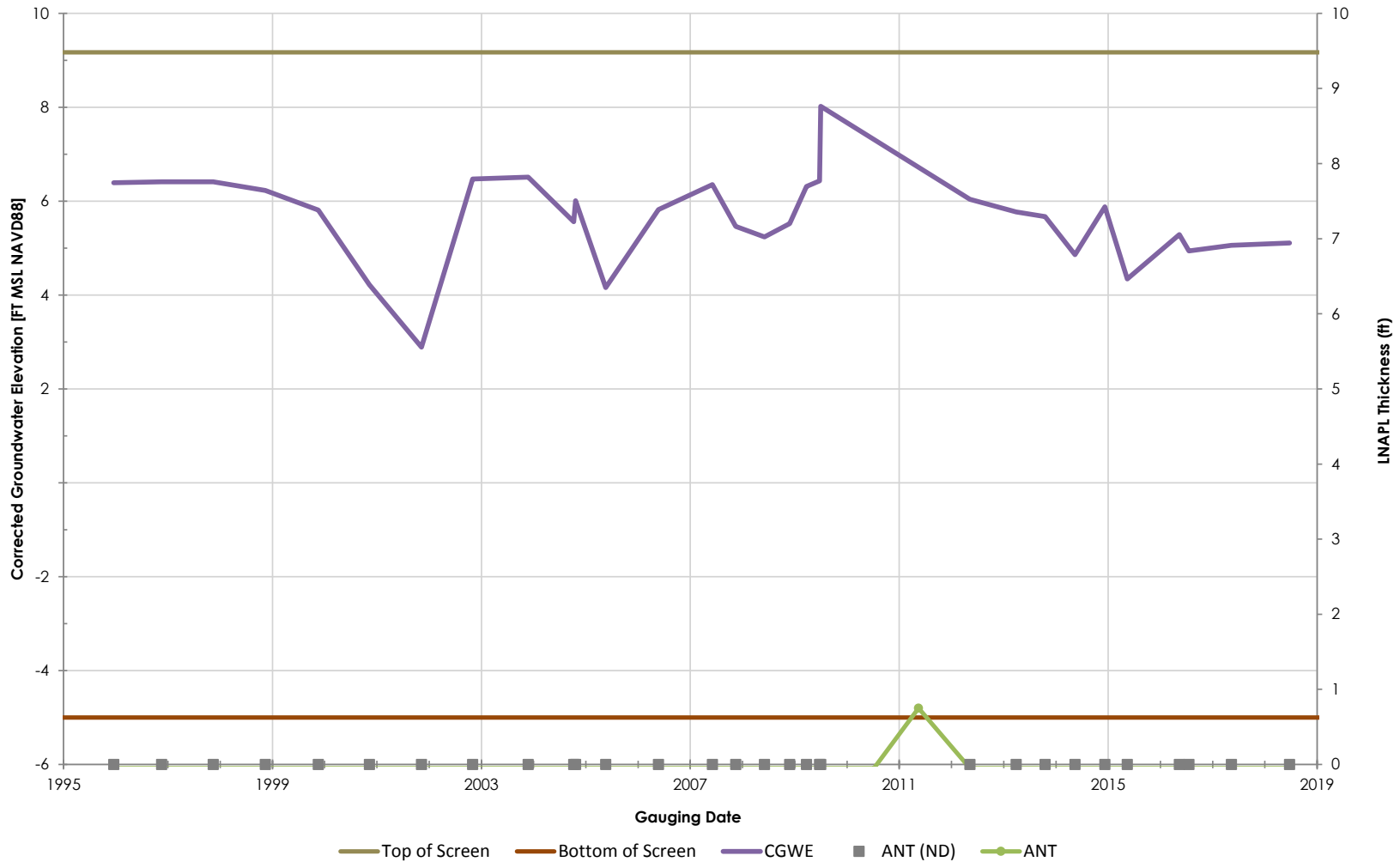
Stantec

Figure/Well No.

C-104

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

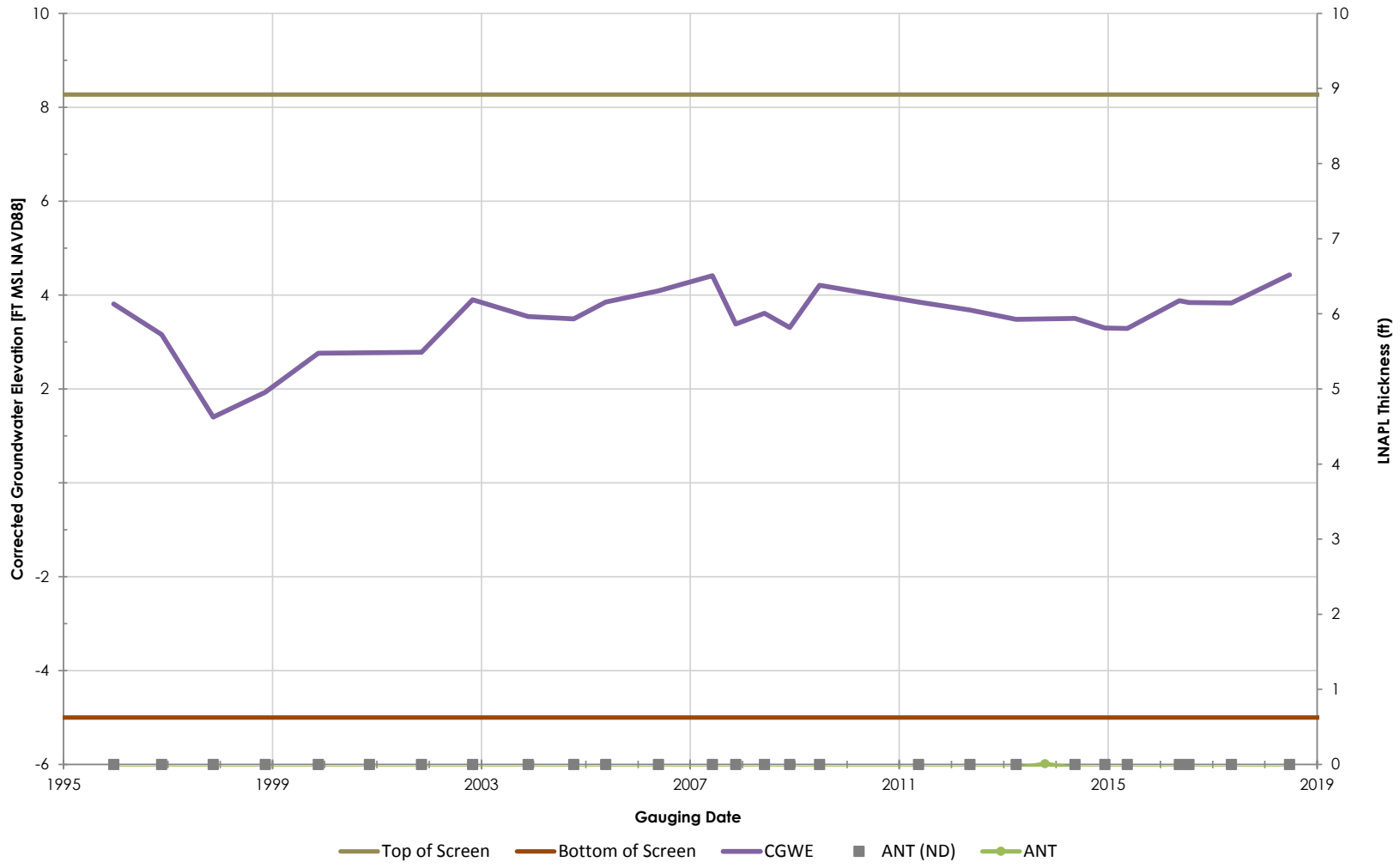
Stantec

Figure/Well No.

C-105

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

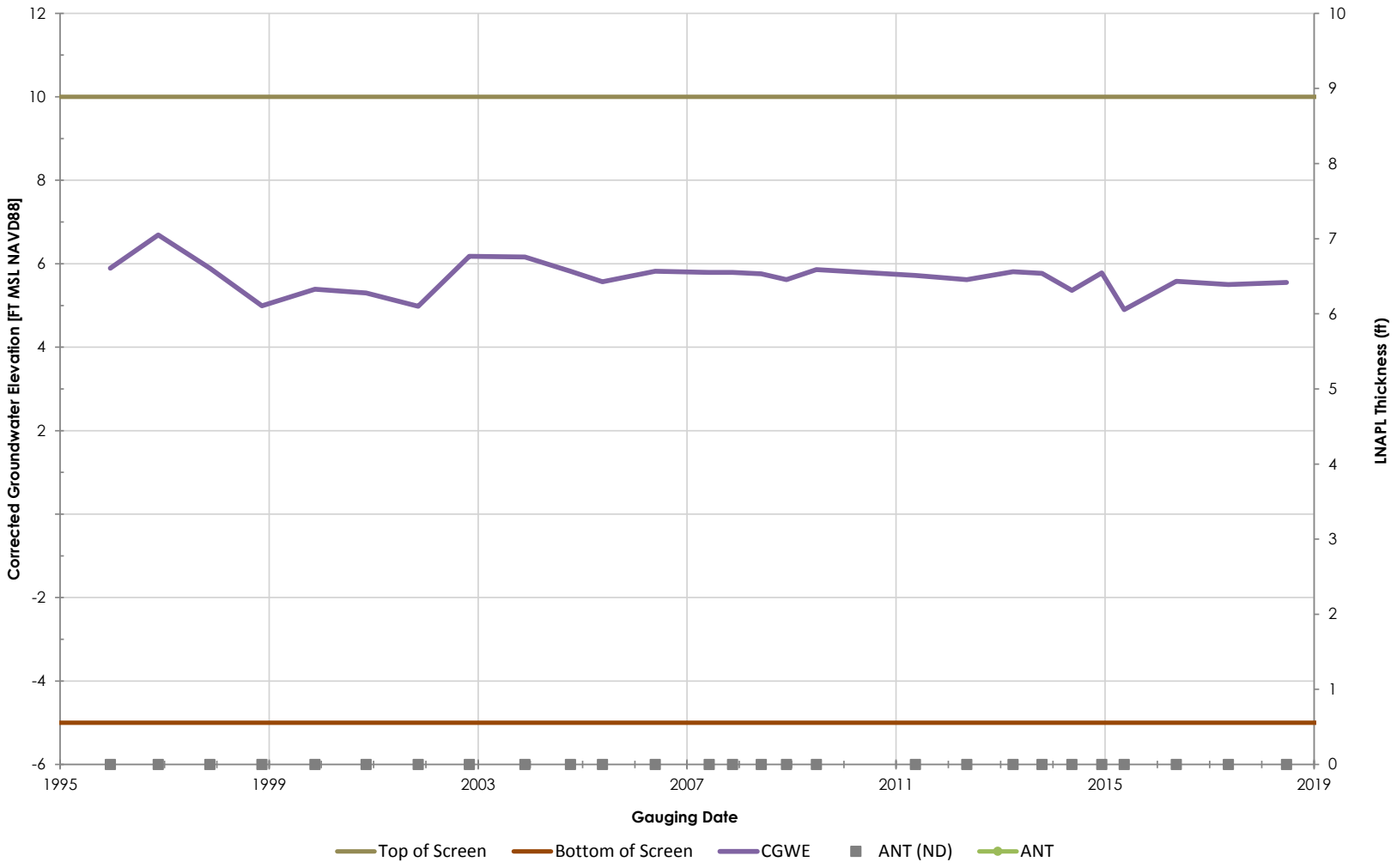
Stantec

Figure/Well No.

C-108

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

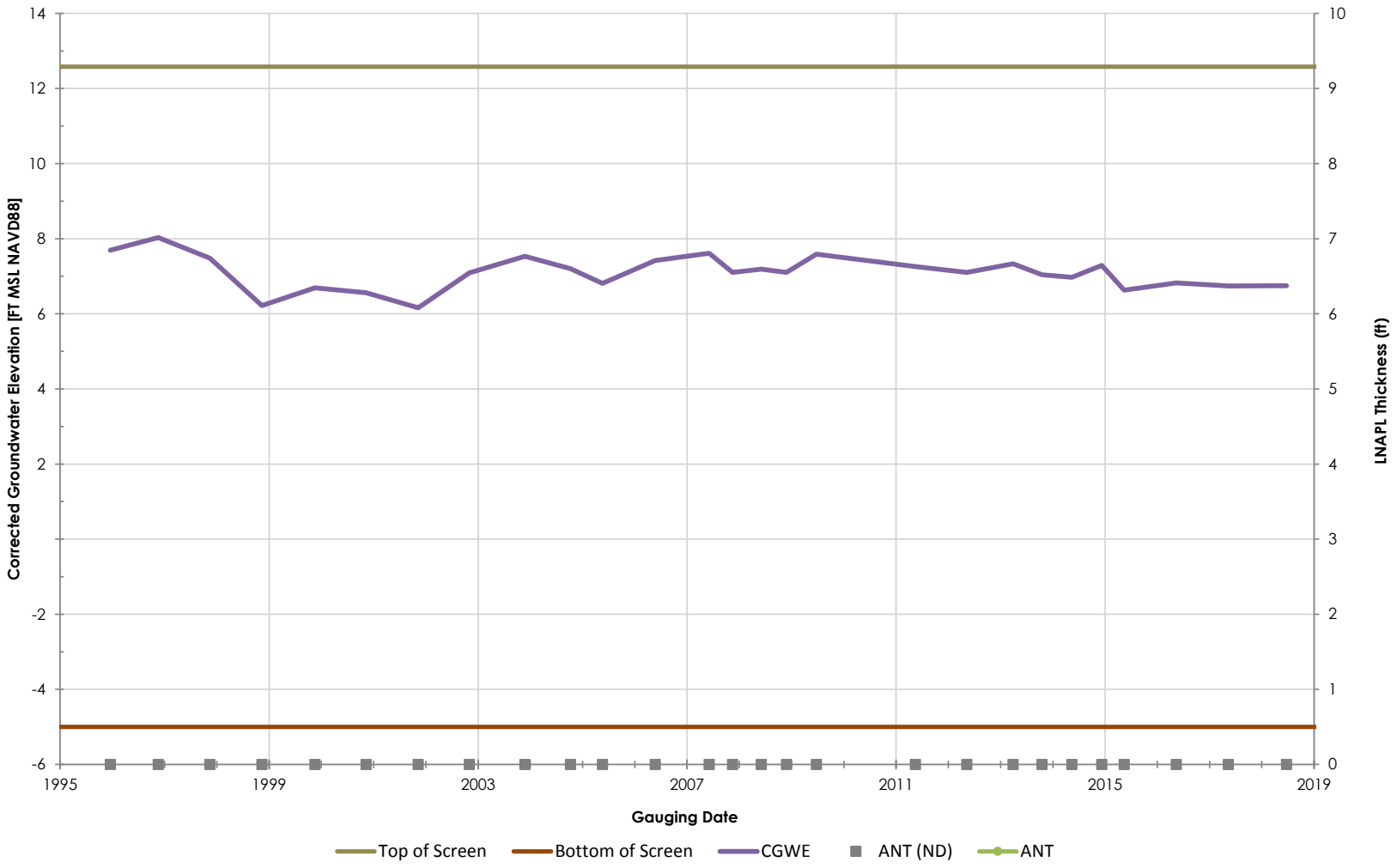
Stantec

Figure/Well No.

C-109

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

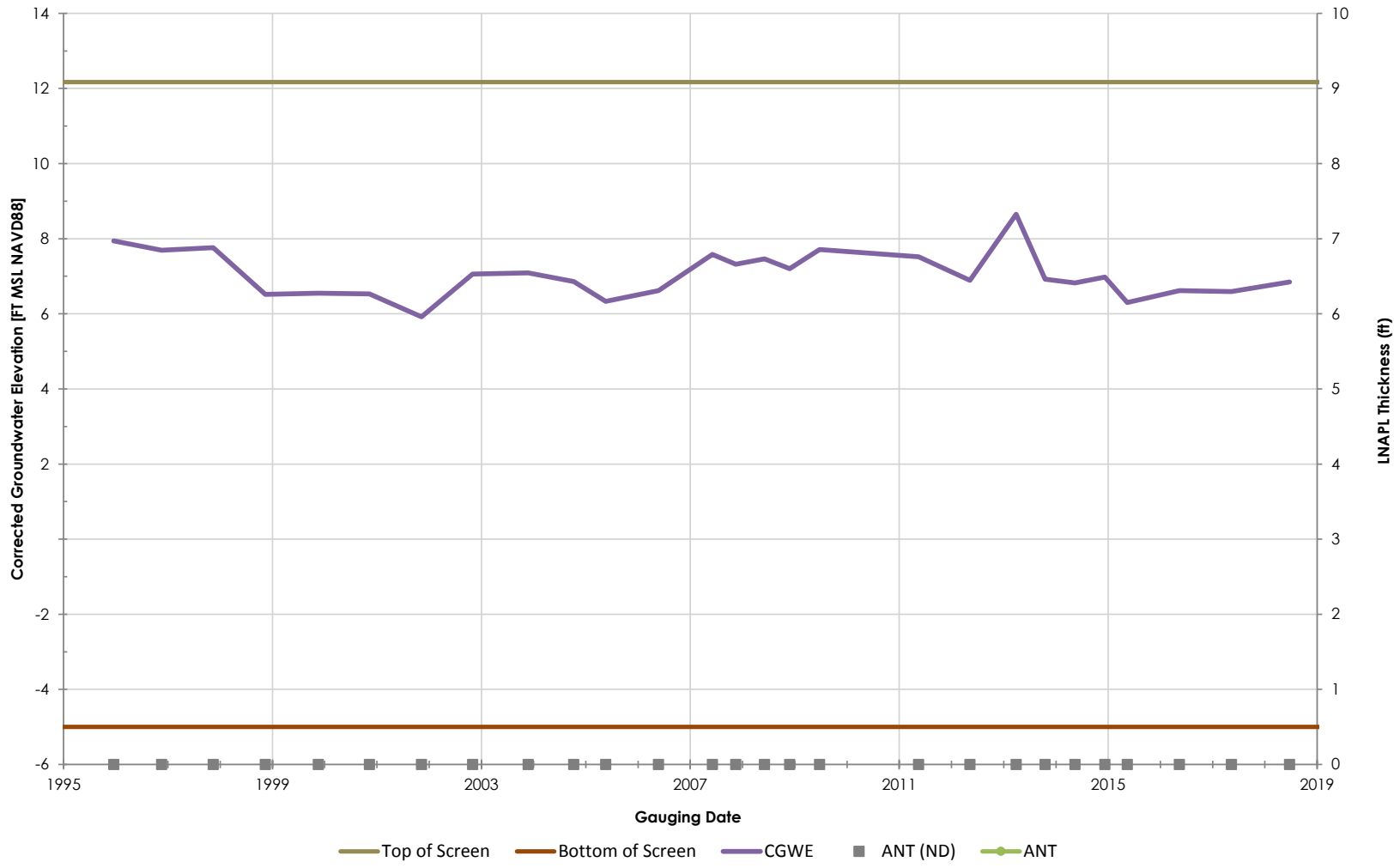
Stantec

Figure/Well No.

C-110

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

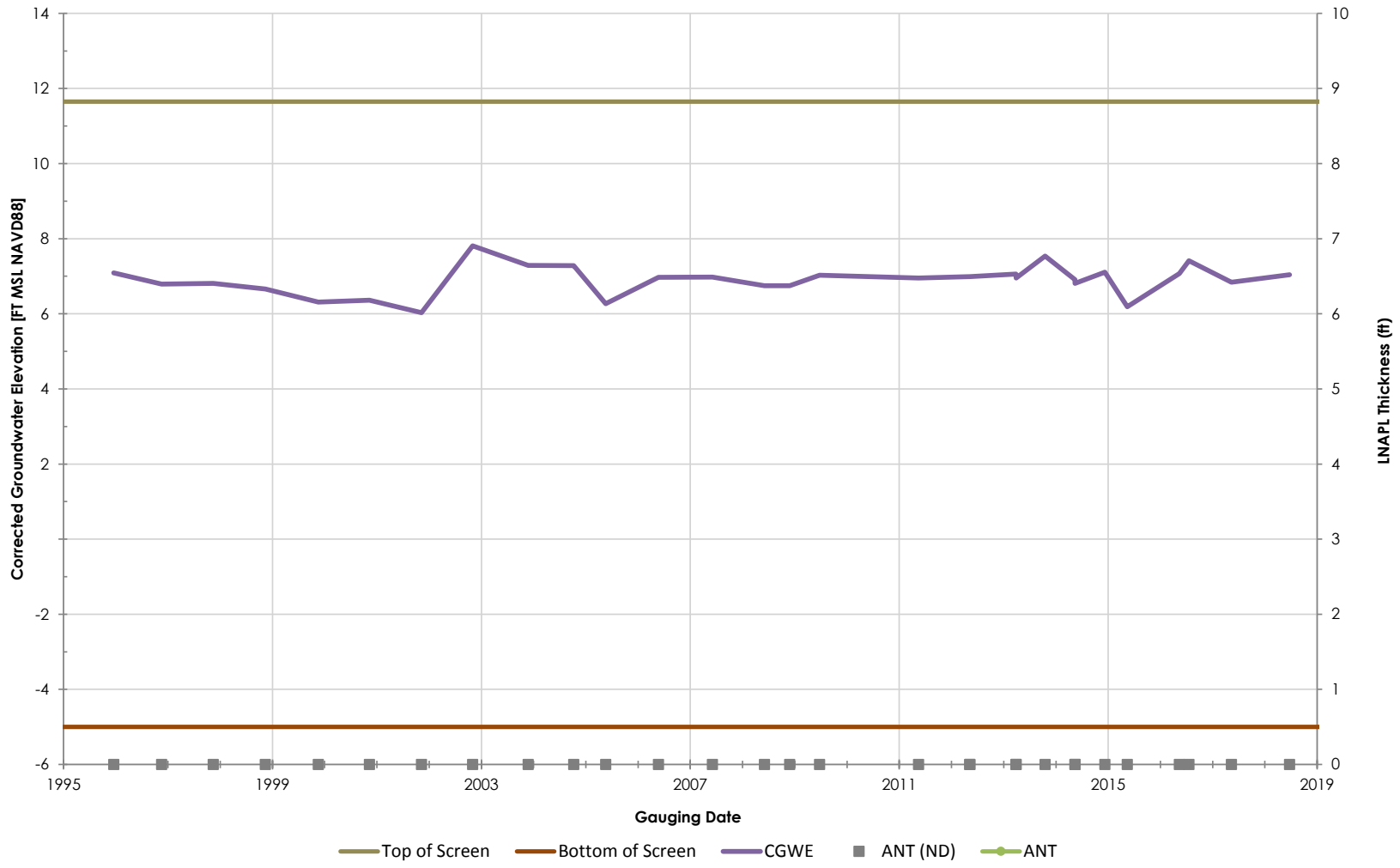
Stantec

Figure/Well No.

C-111

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

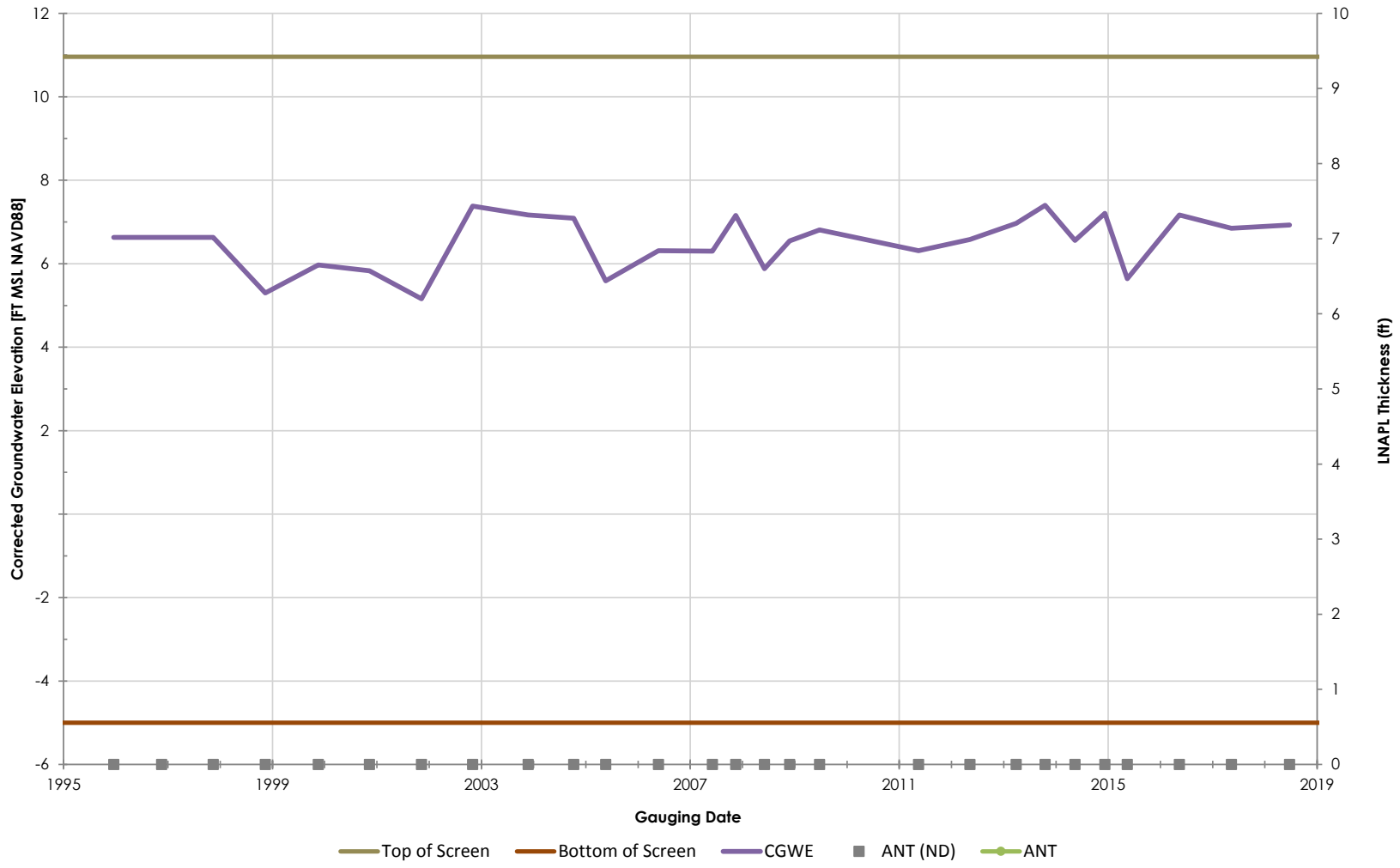
Stantec

Figure/Well No.

C-113

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

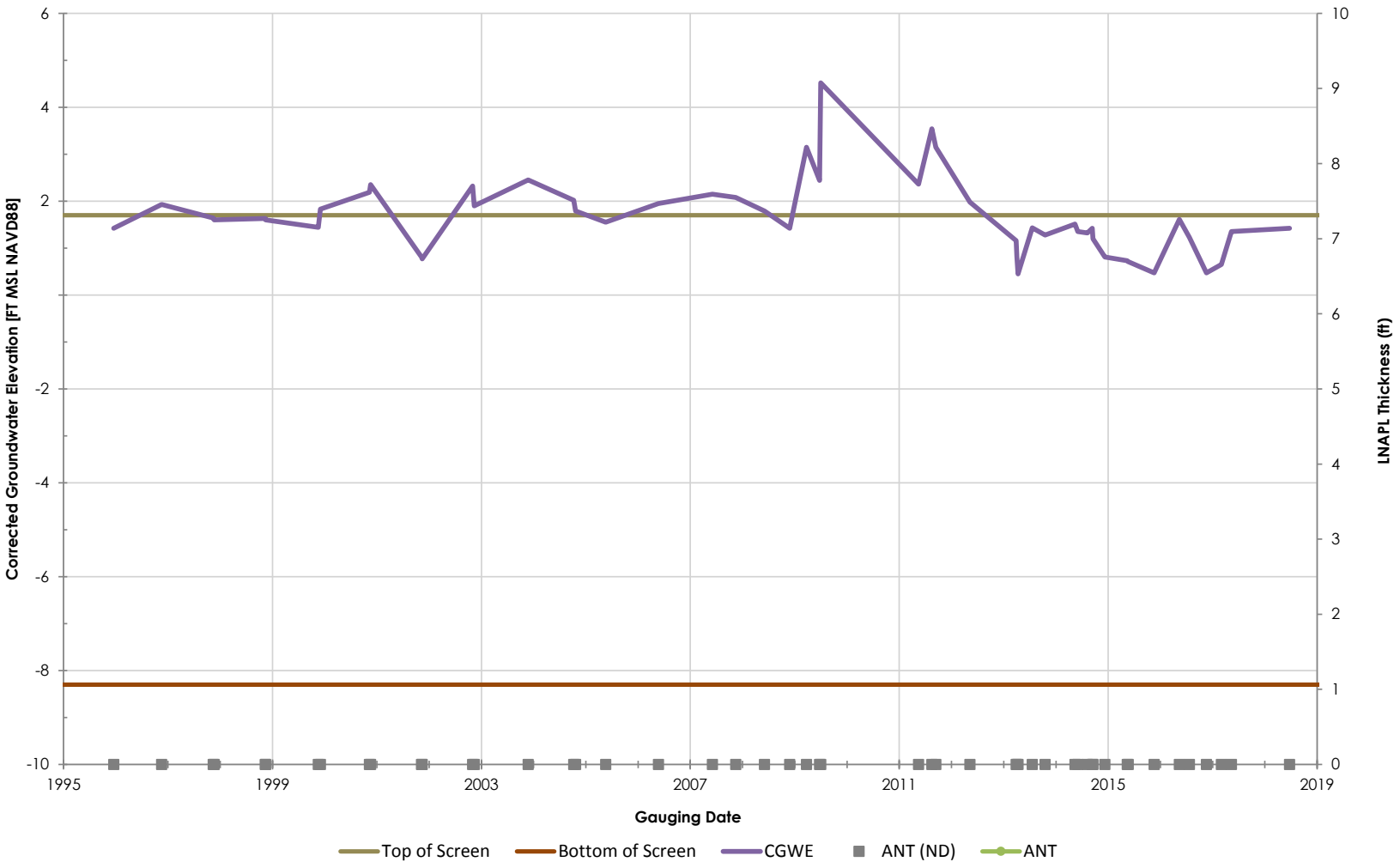
Stantec

Figure/Well No.

C-114

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

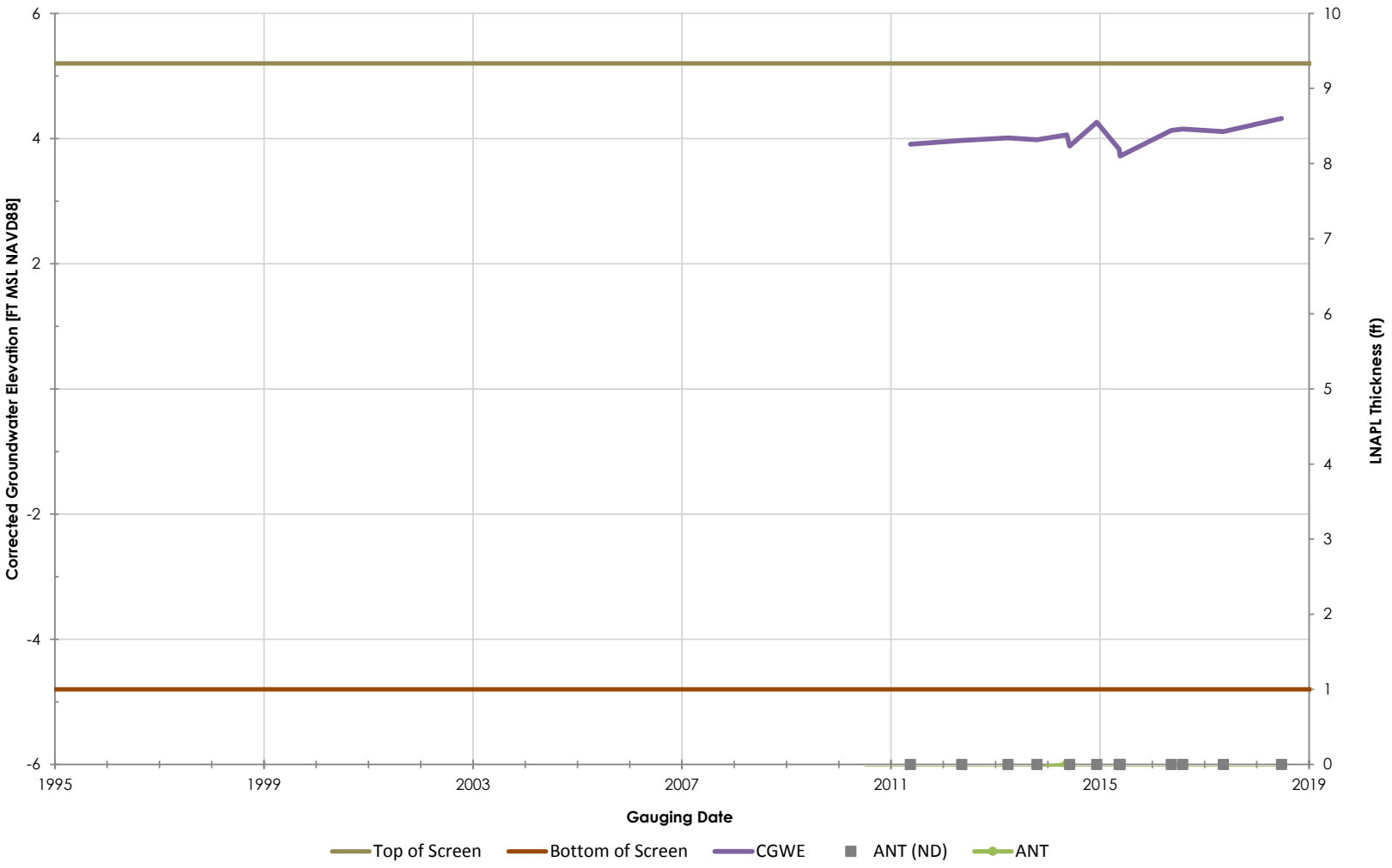
Stantec

Figure/Well No.

C-127

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

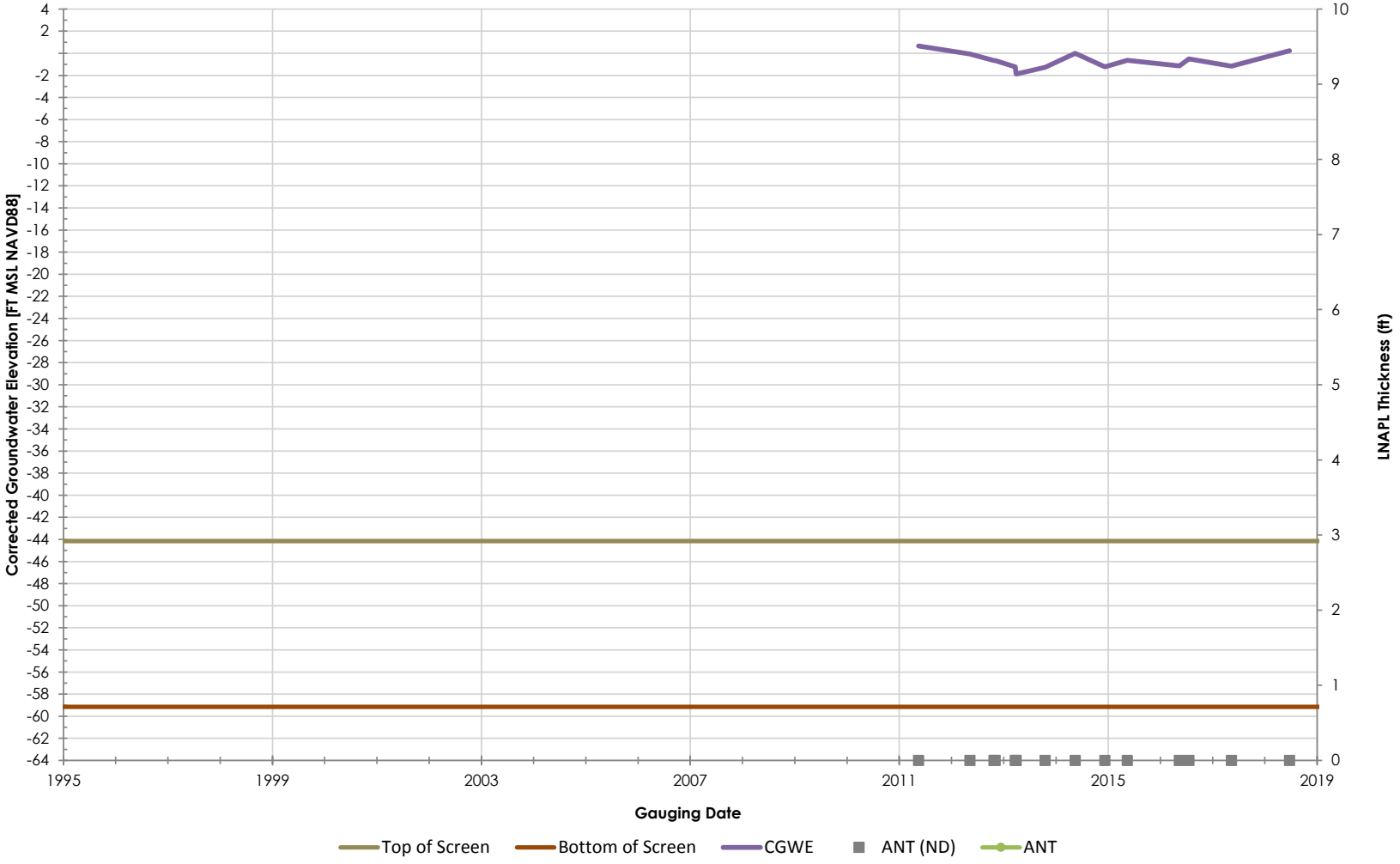
Stantec

Figure/Well No.

C-129

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

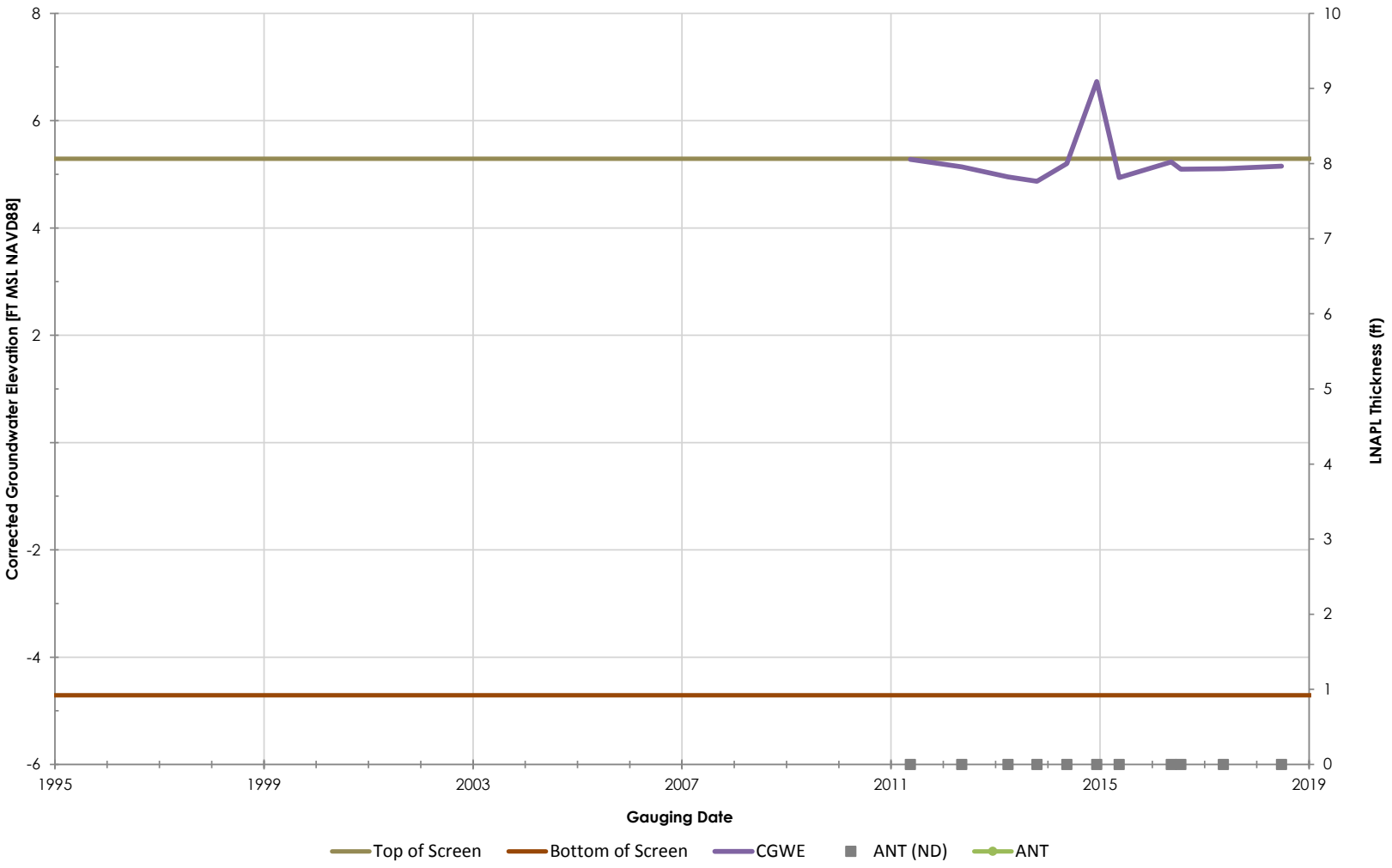
Stantec

Figure/Well No.

C-129D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

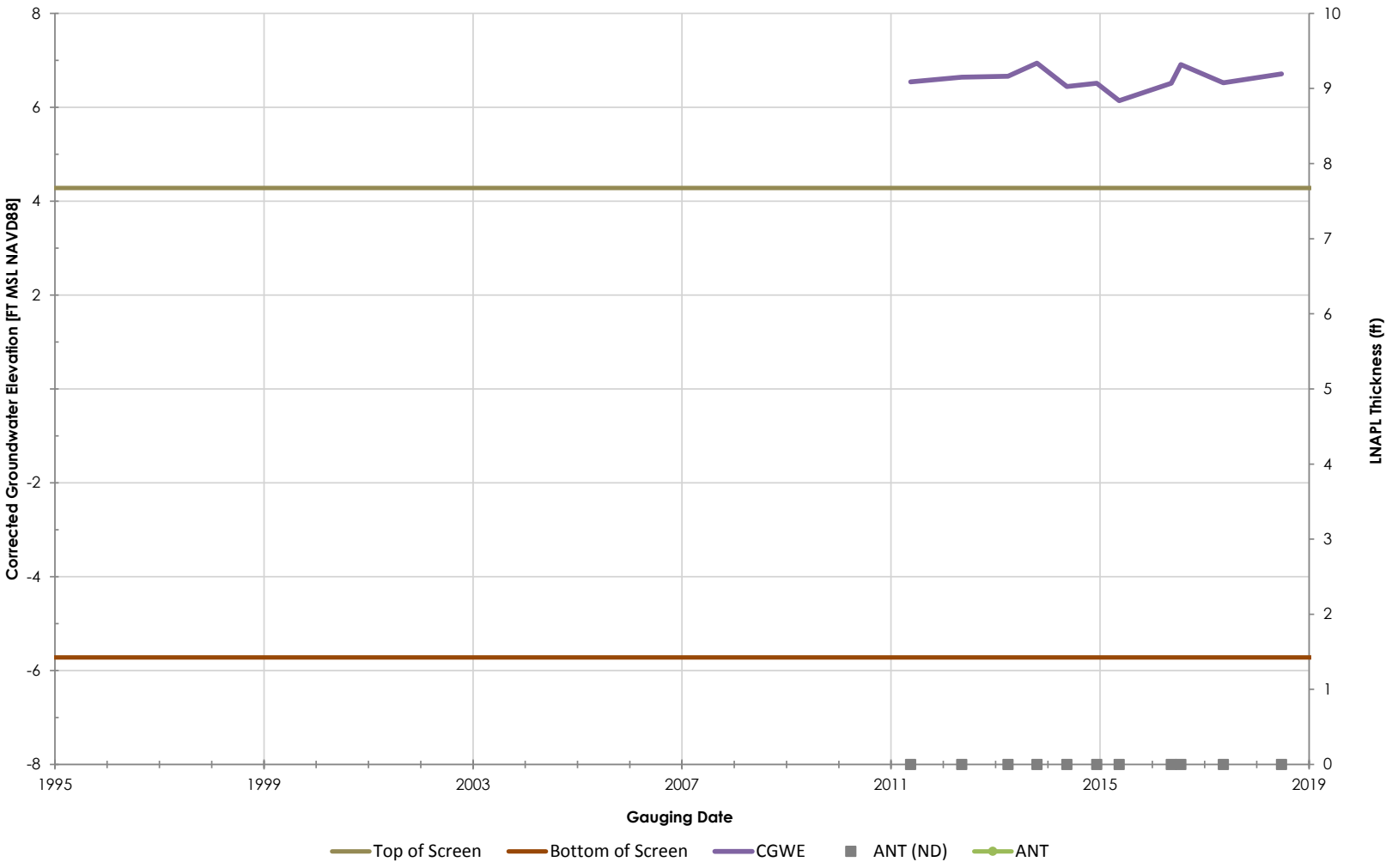
Stantec

Figure/Well No.

C-130

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

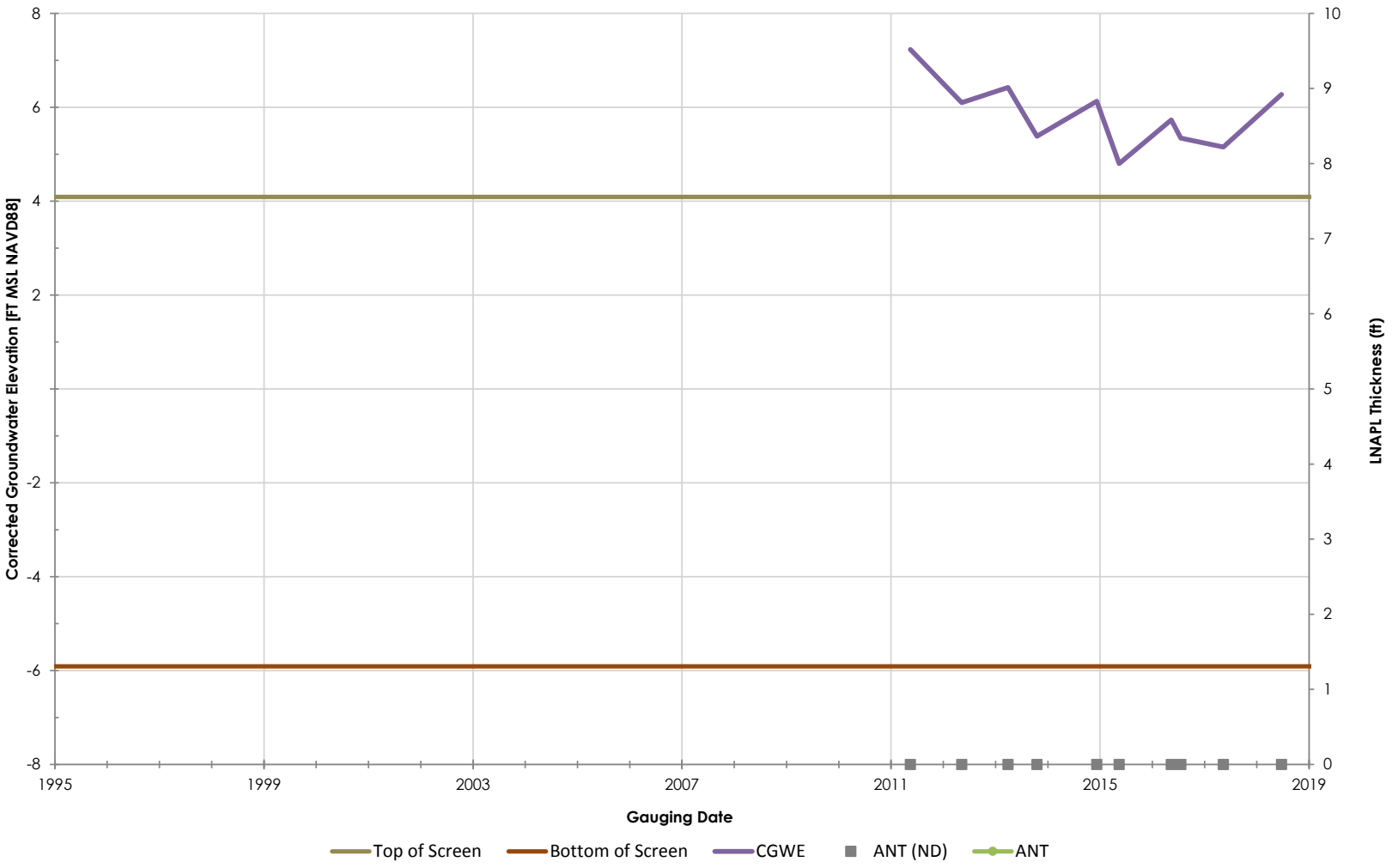
Stantec

Figure/Well No.

C-131

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

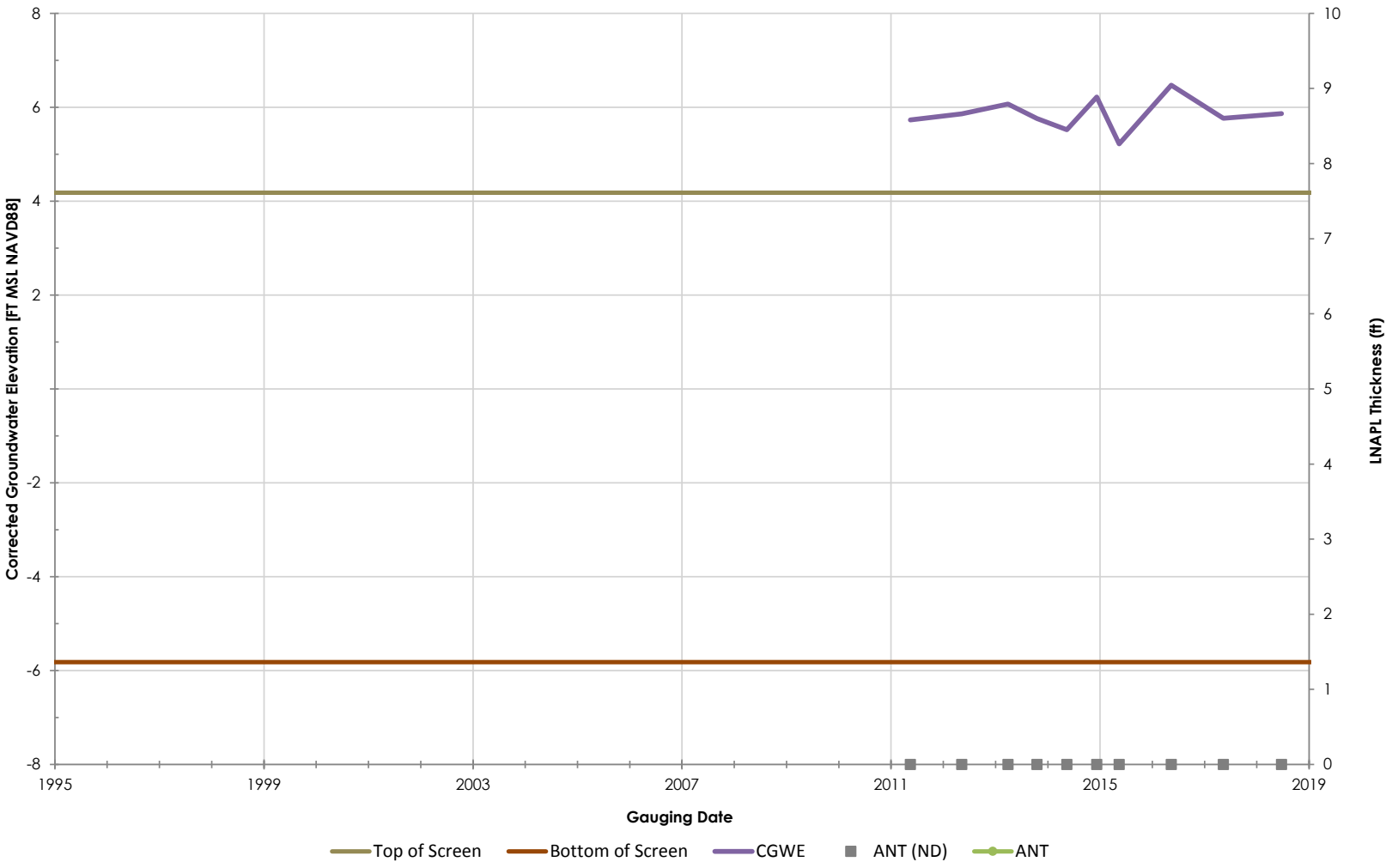
Stantec

Figure/Well No.

C-132

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

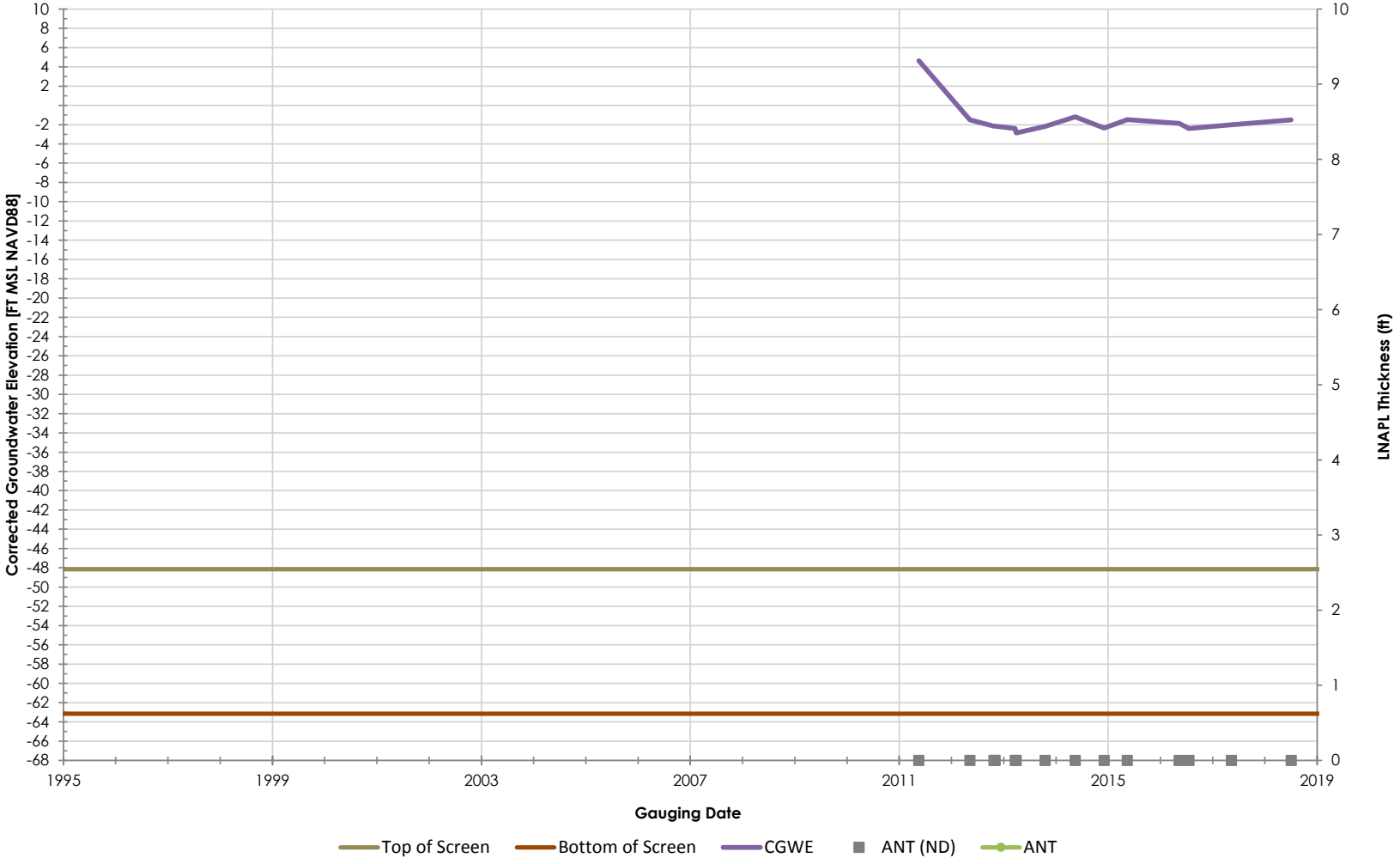
Stantec

Figure/Well No.

C-133

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

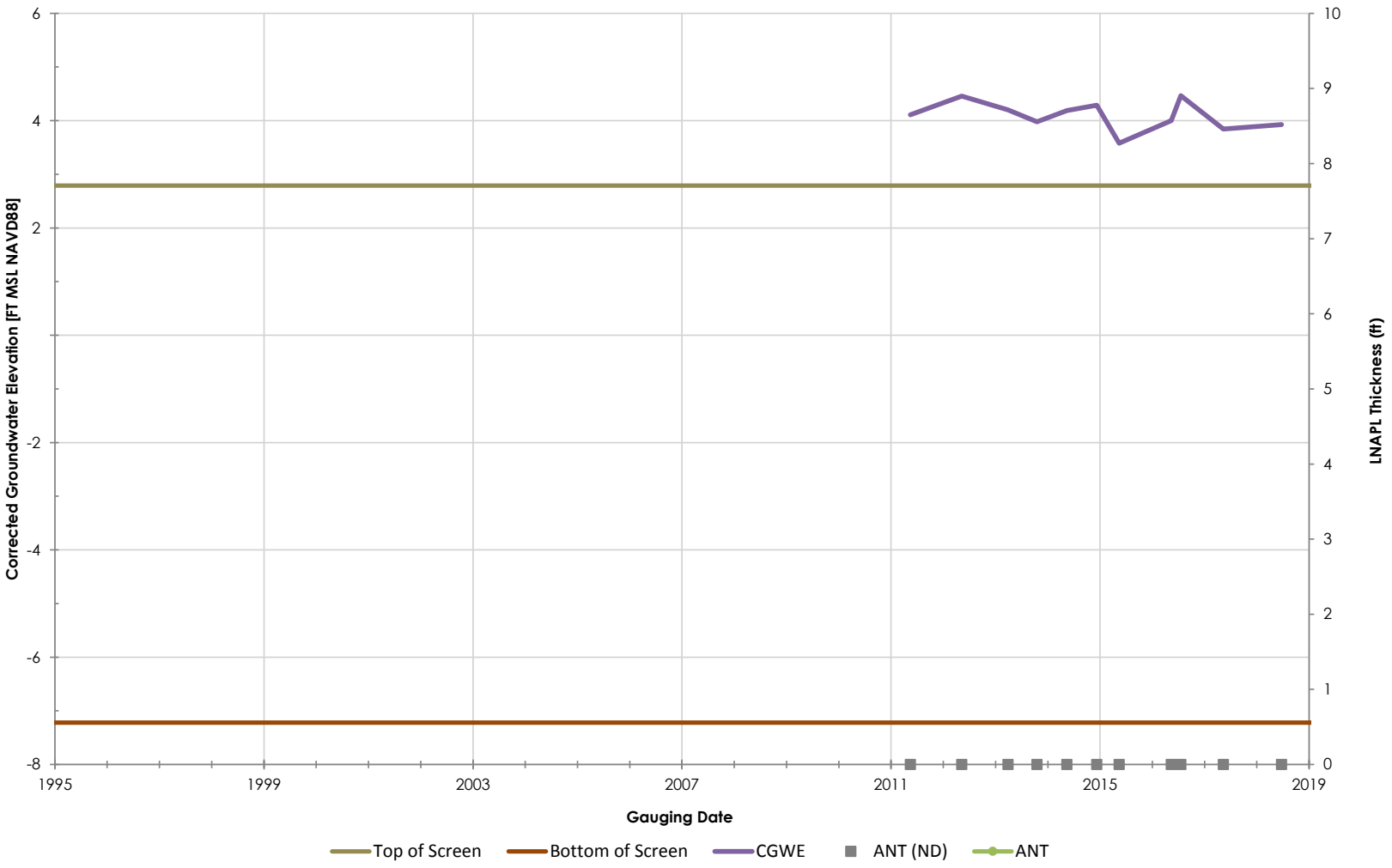
Stantec

Figure/Well No.

C-134D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

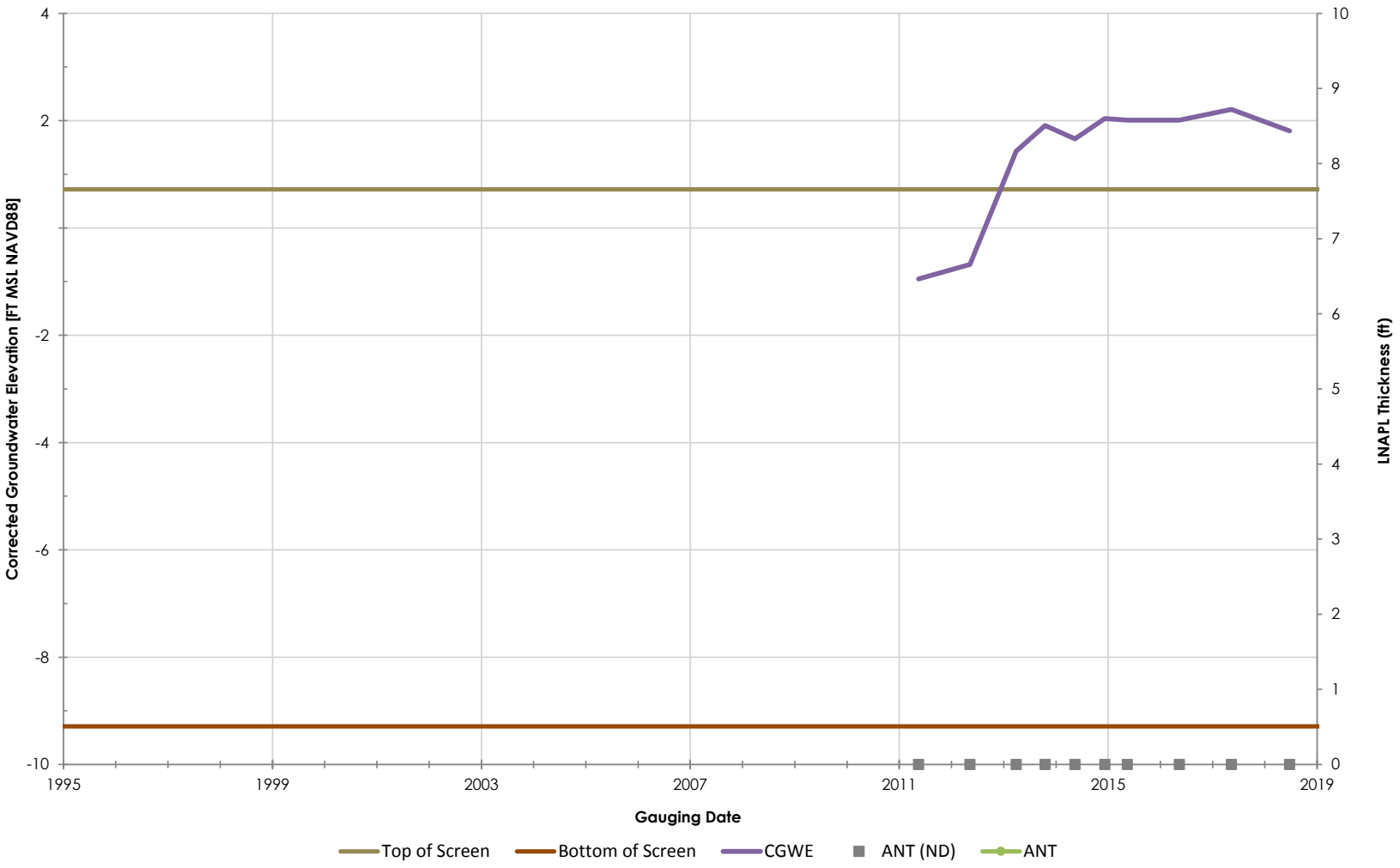
Stantec

Figure/Well No.

C-136

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

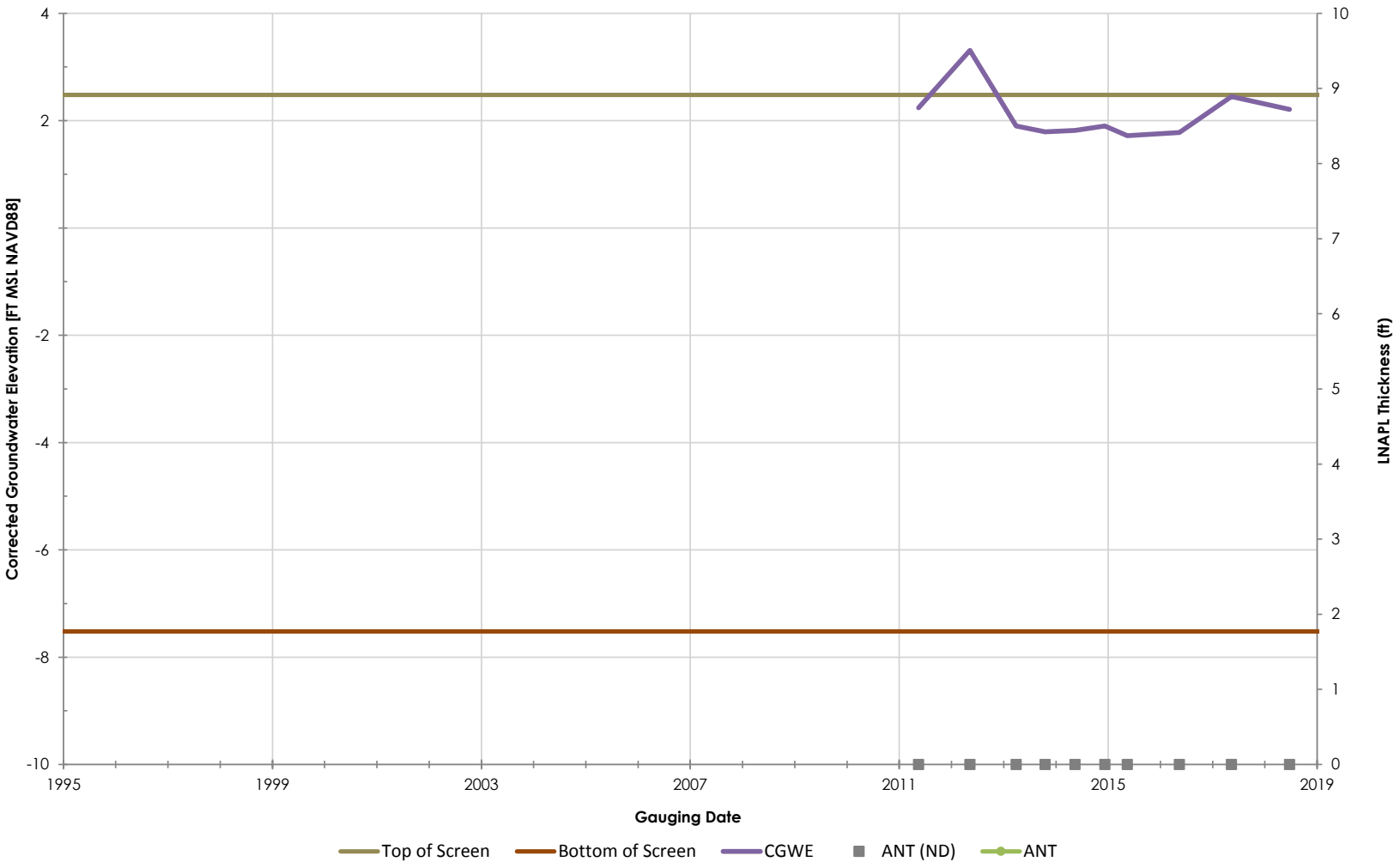
Stantec

Figure/Well No.

C-137

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

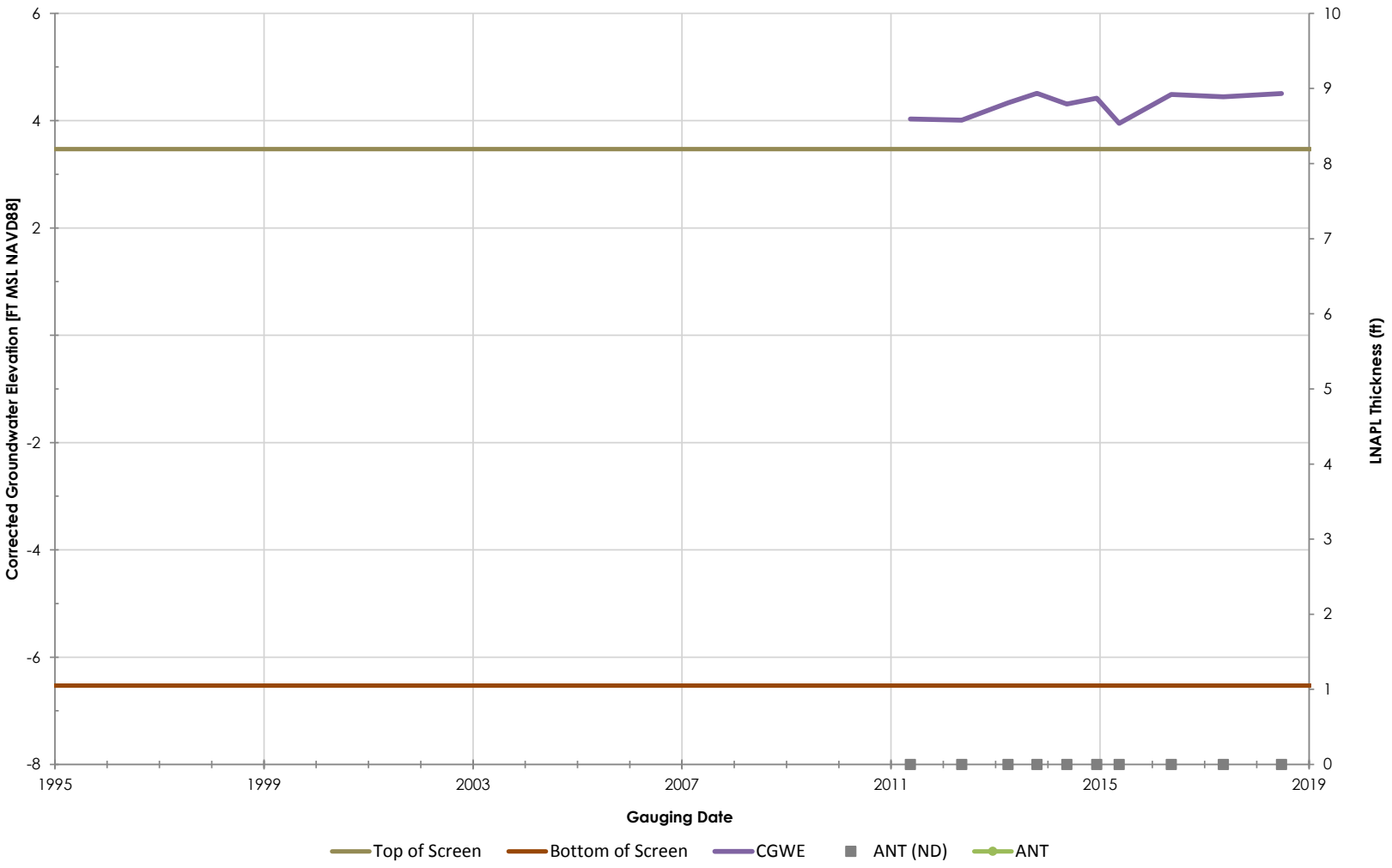
Stantec

Figure/Well No.

C-138

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

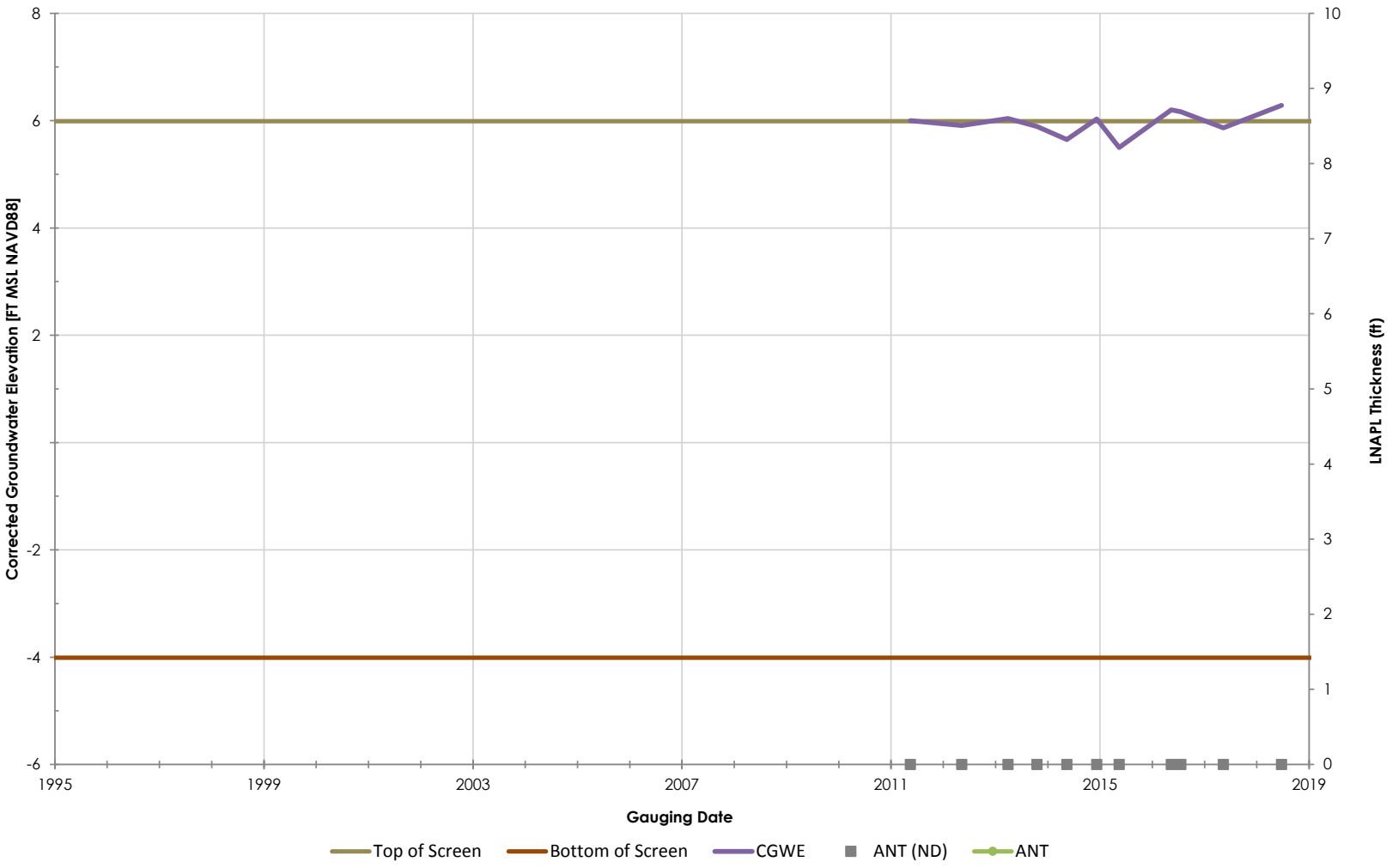
Stantec

Figure/Well No.

C-139

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

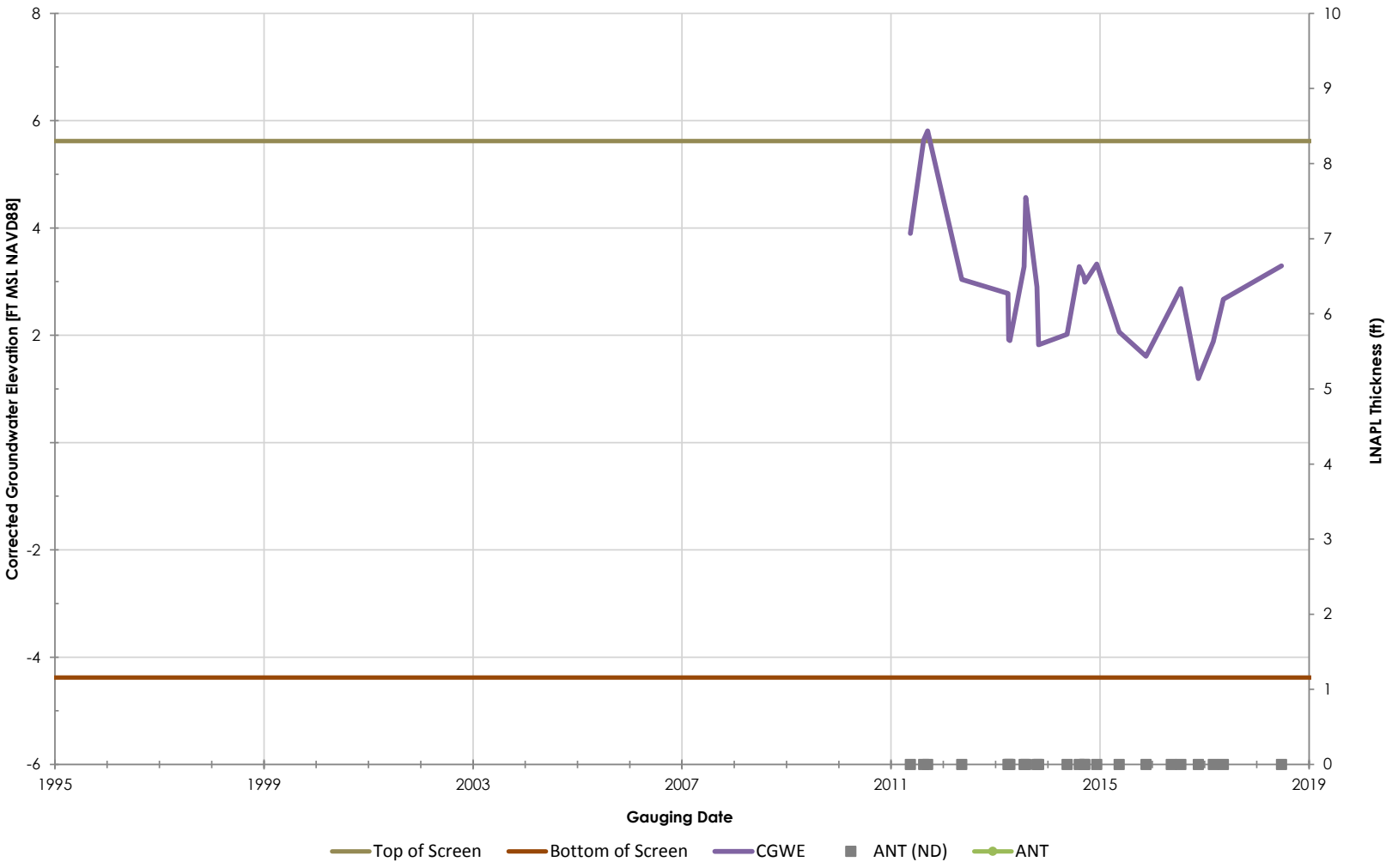
Stantec

Figure/Well No.

C-140

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

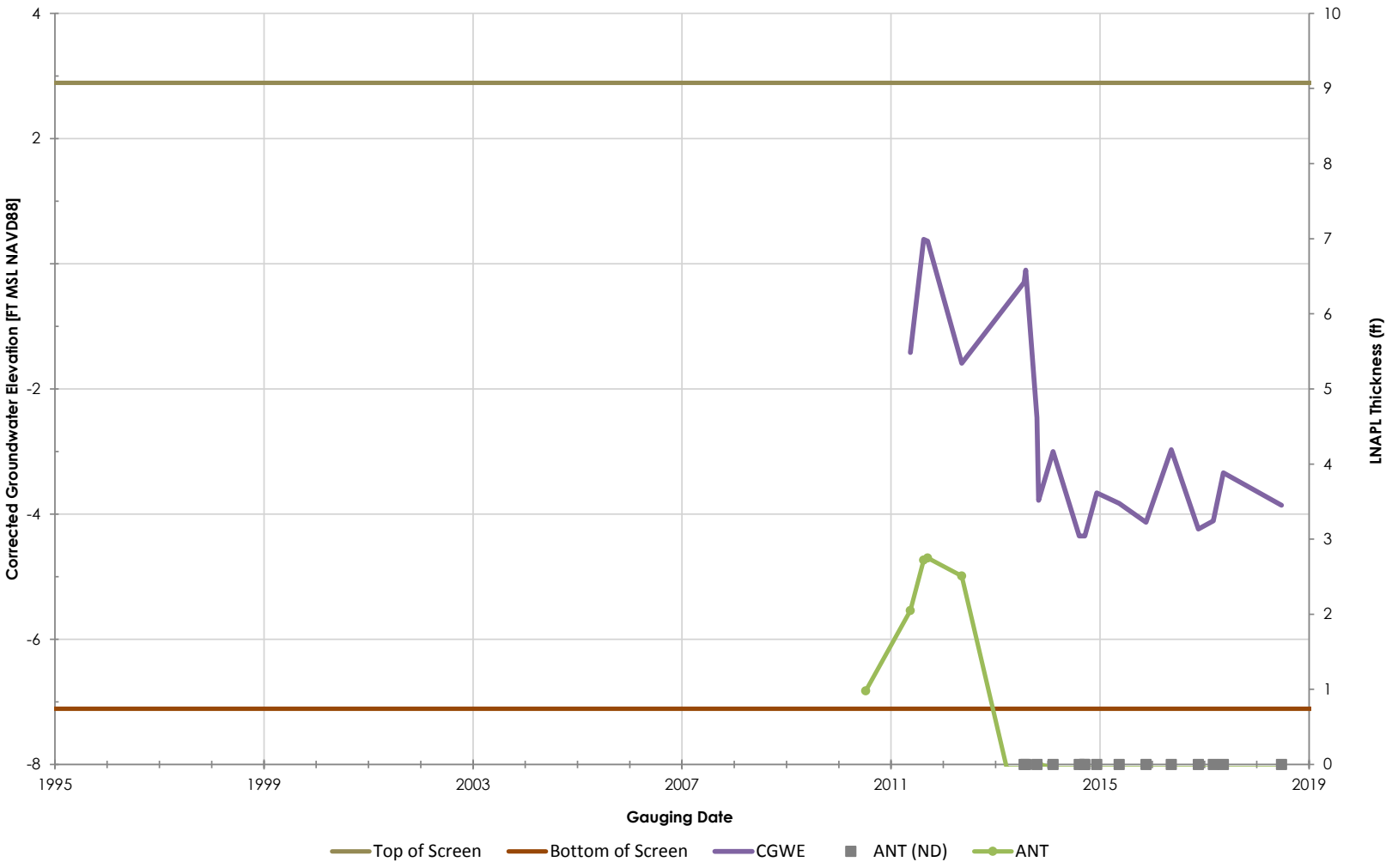
Stantec

Figure/Well No.

C-142

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

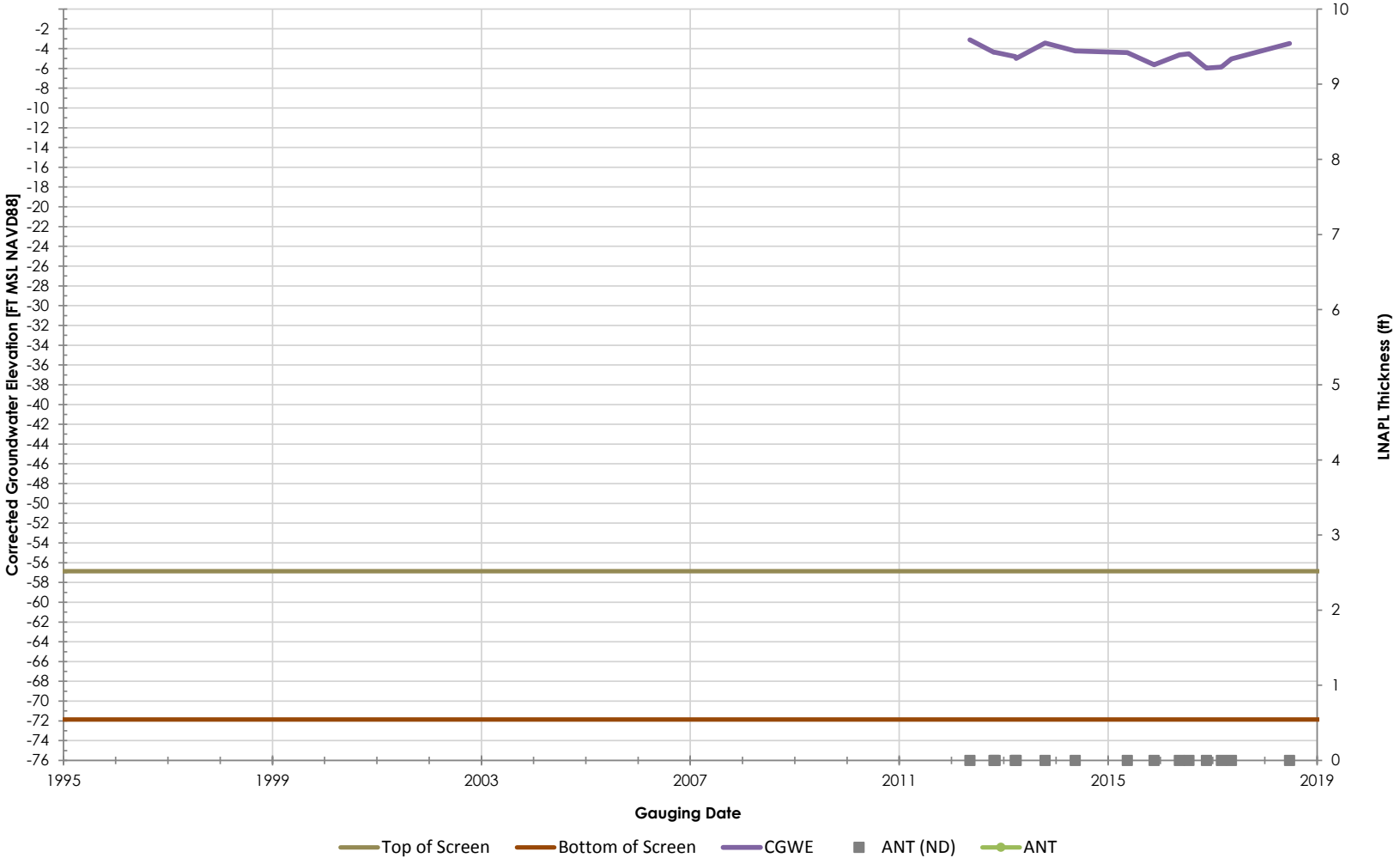
Stantec

Figure/Well No.

C-143

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

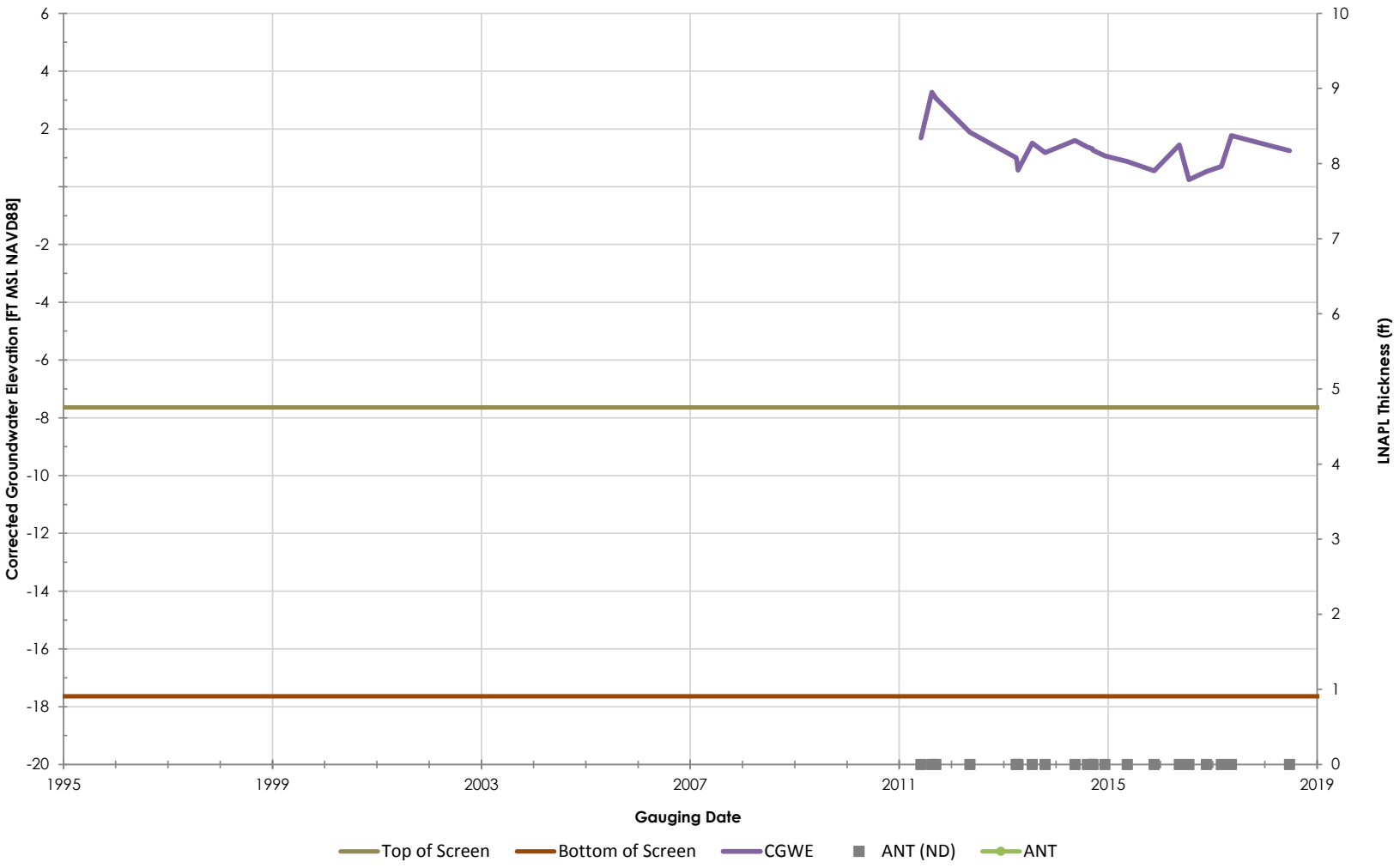
Stantec

Figure/Well No.

C-144D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

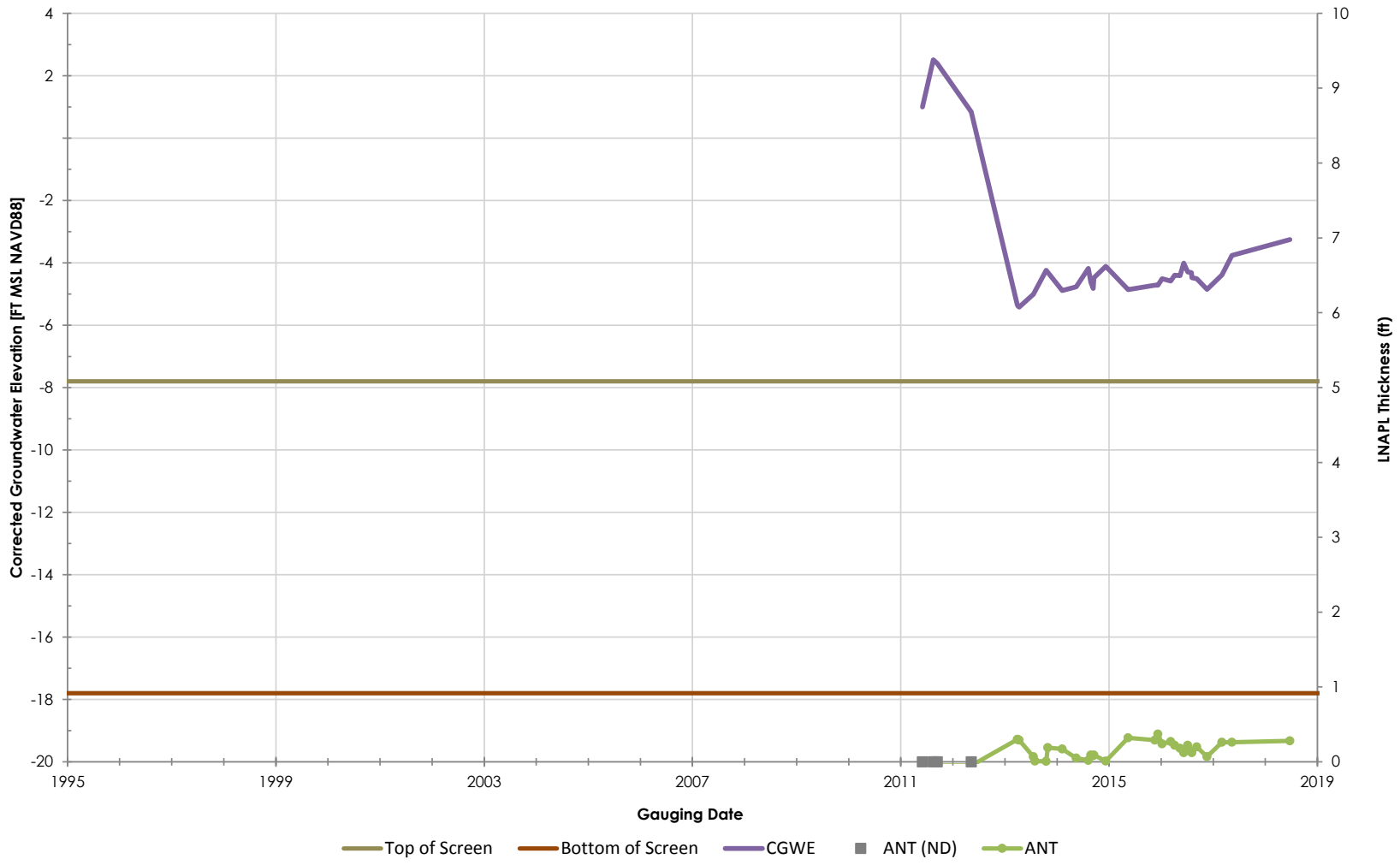
Stantec

Figure/Well No.

C-145

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

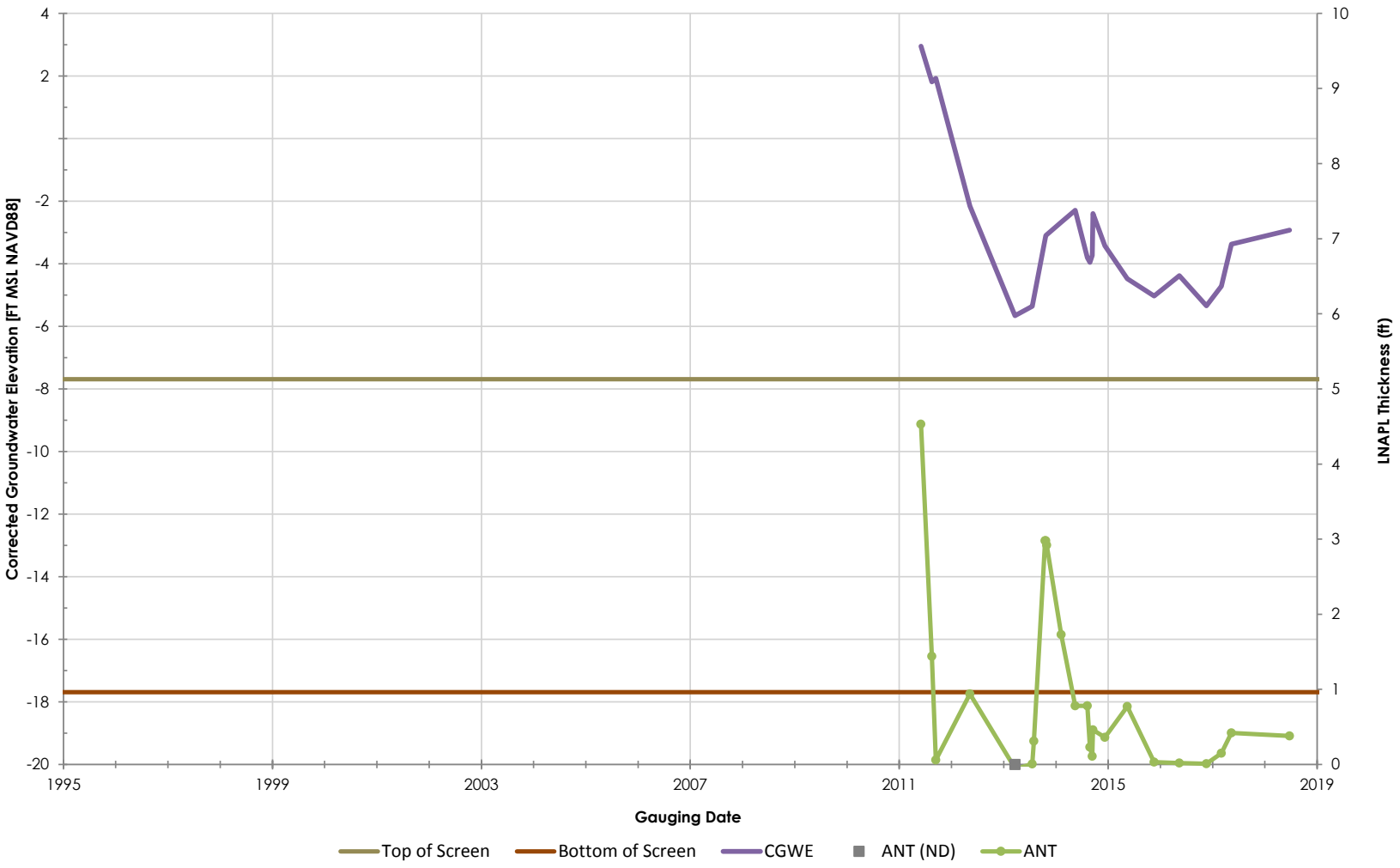
Stantec

Figure/Well No.

C-146

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

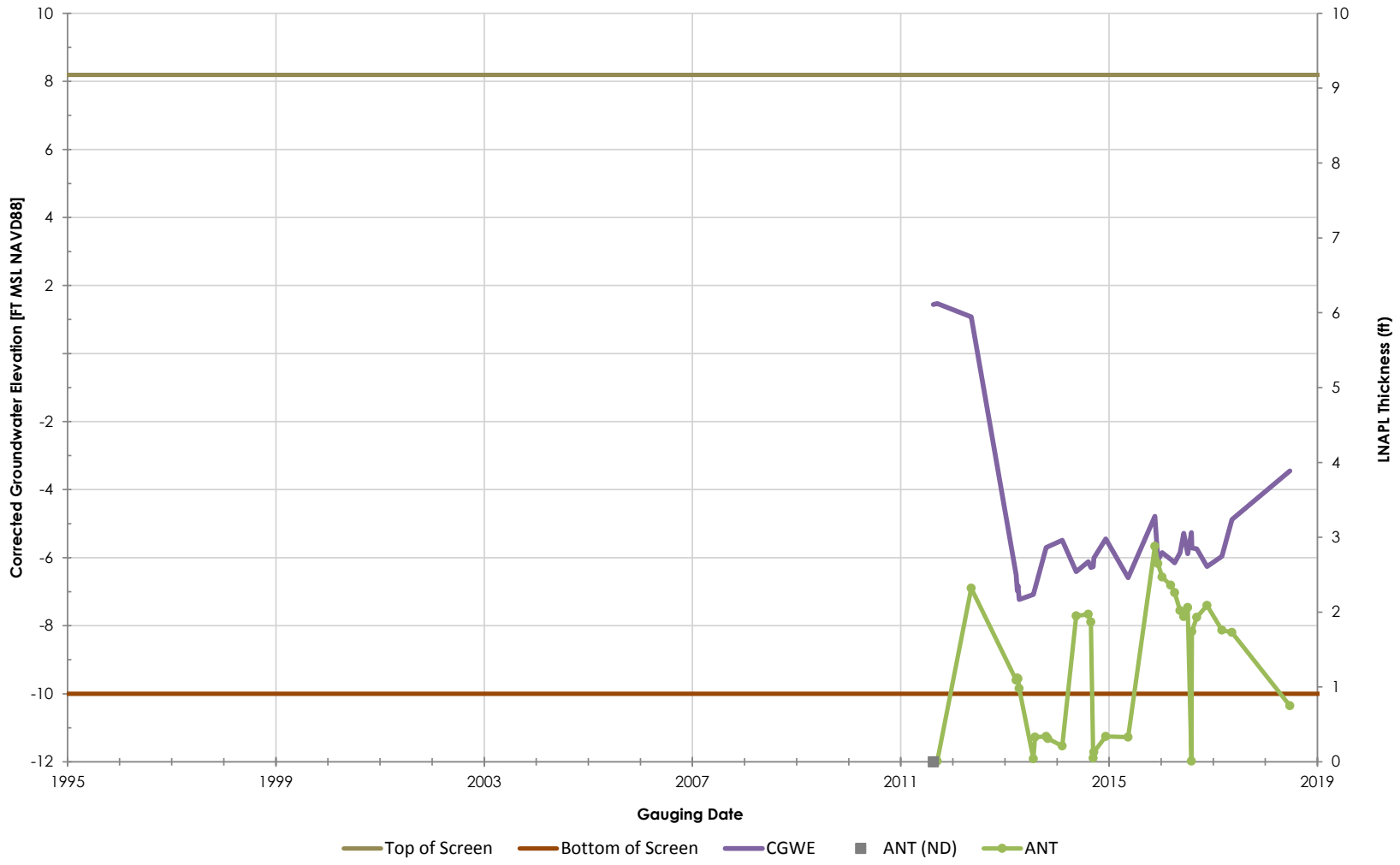
Stantec

Figure/Well No.

C-147

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

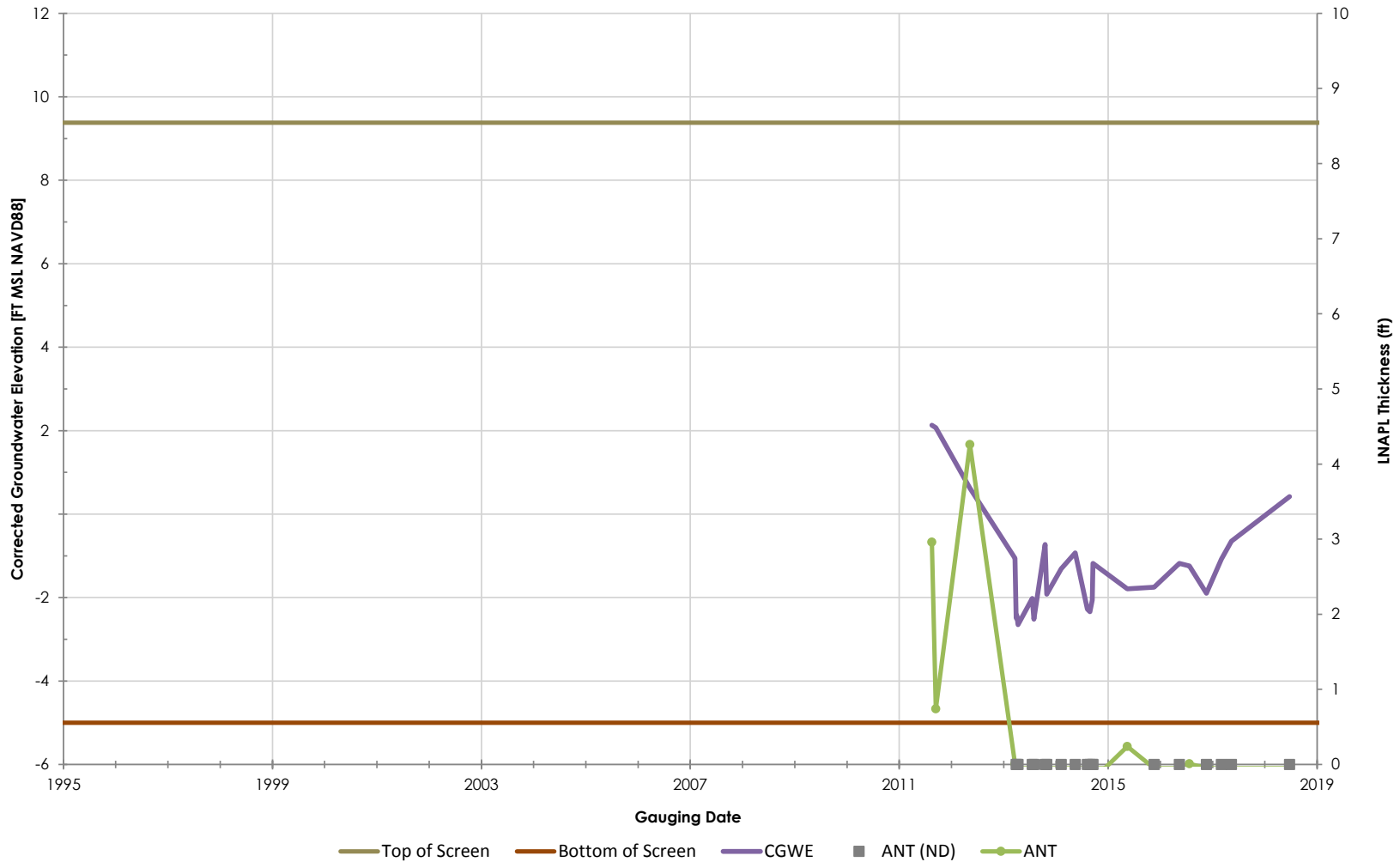
Stantec

Figure/Well No.

C-150

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

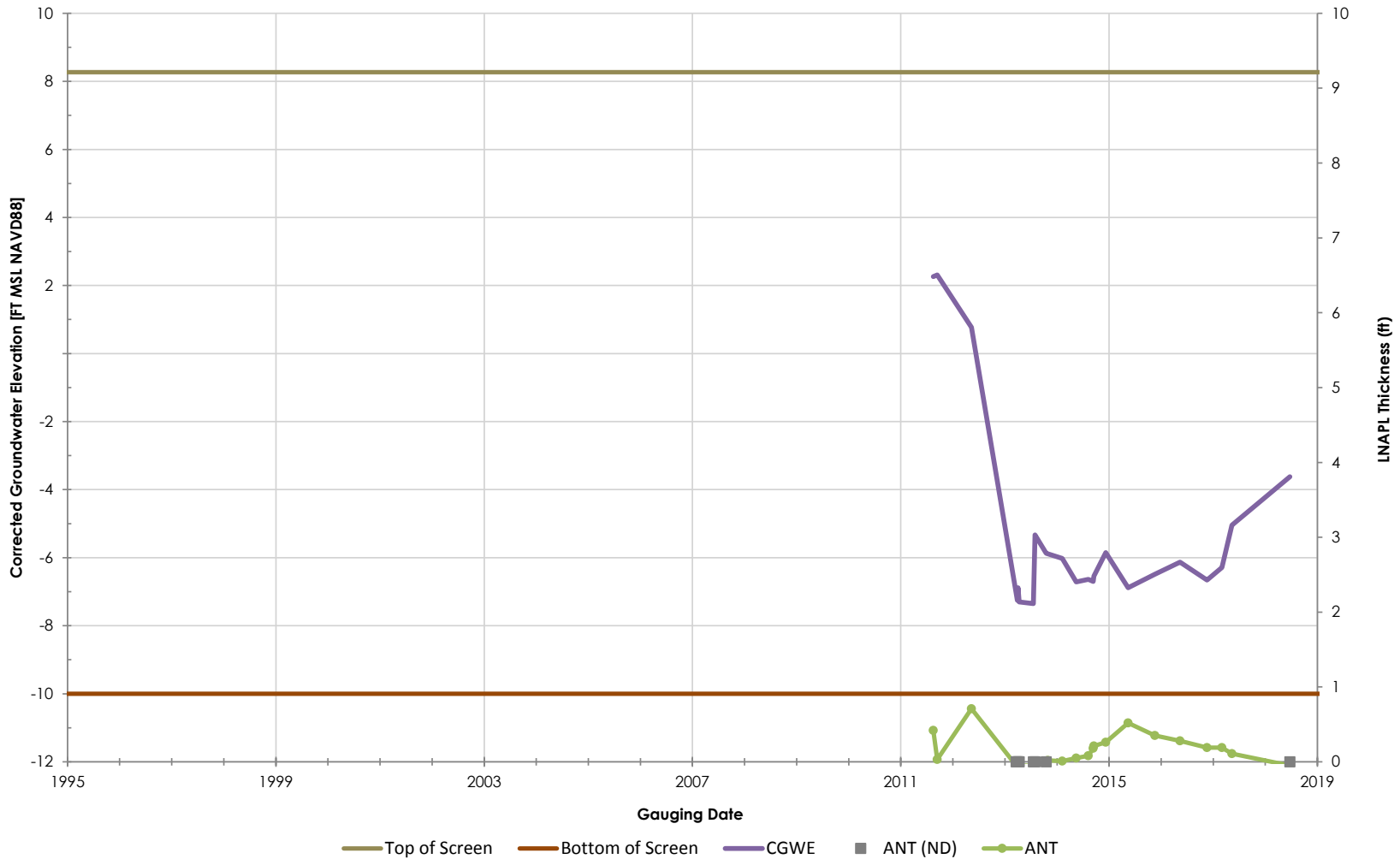
Stantec

Figure/Well No.

C-152

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

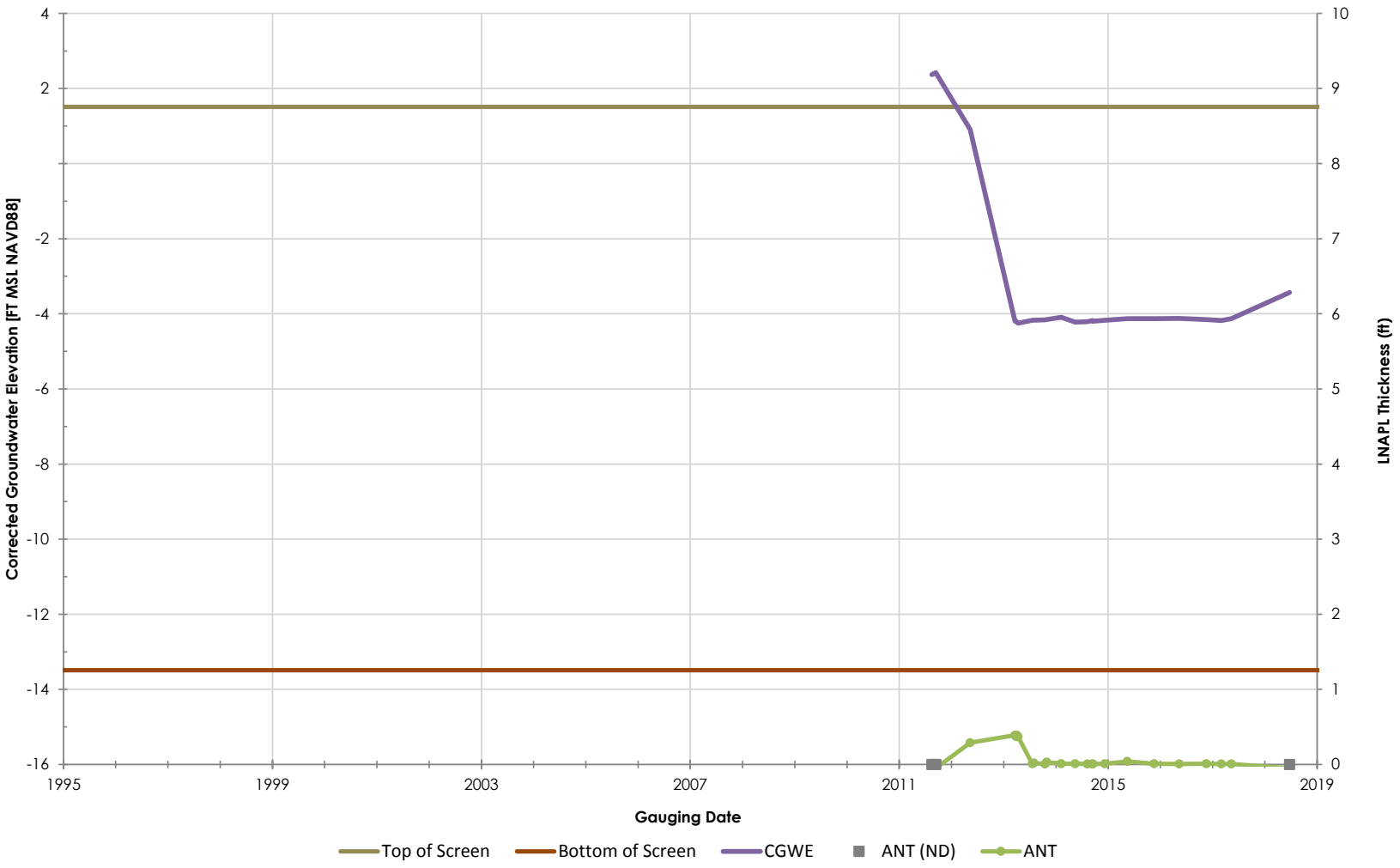
Stantec

Figure/Well No.

C-153

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

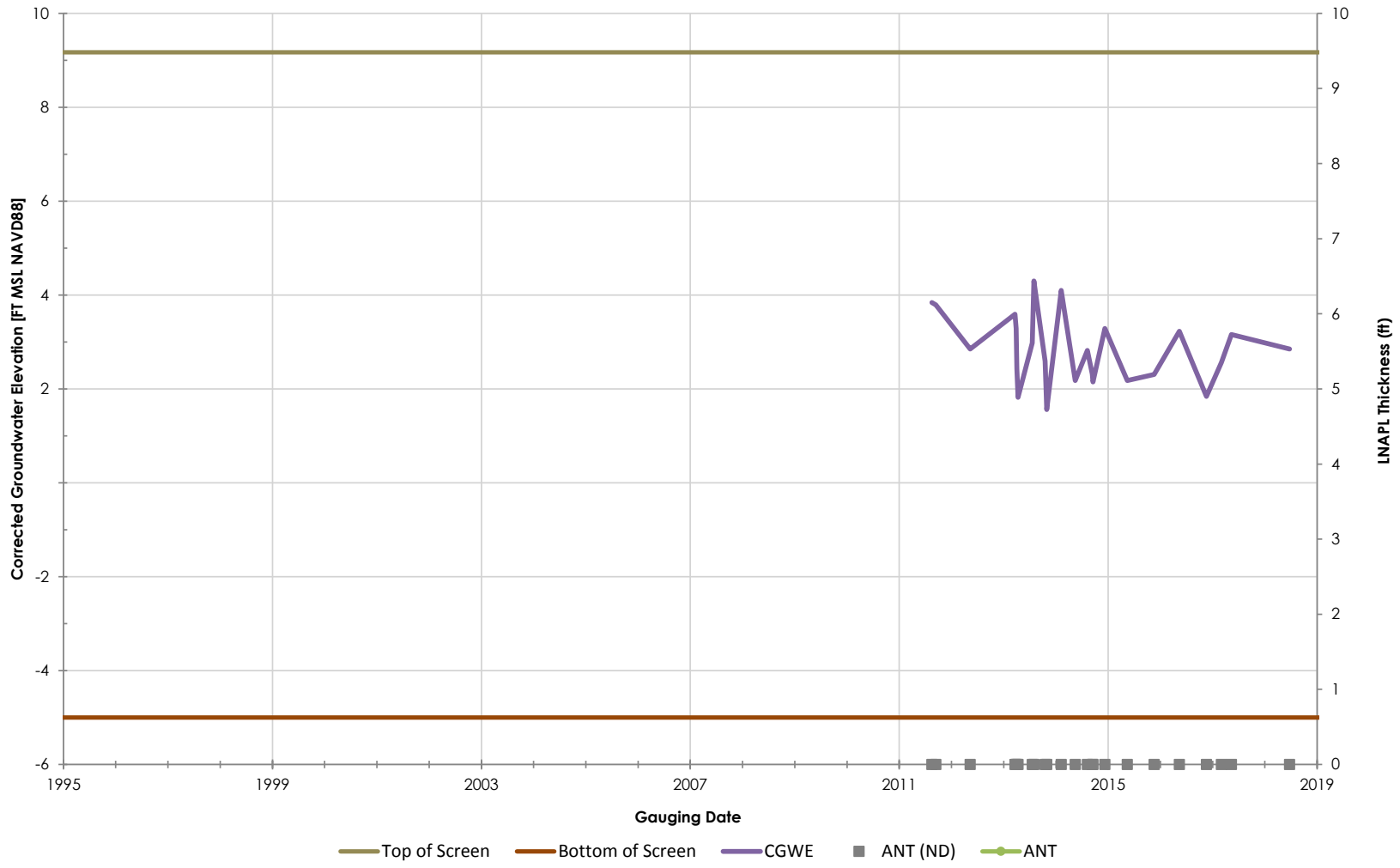
Stantec

Figure/Well No.

C-154

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

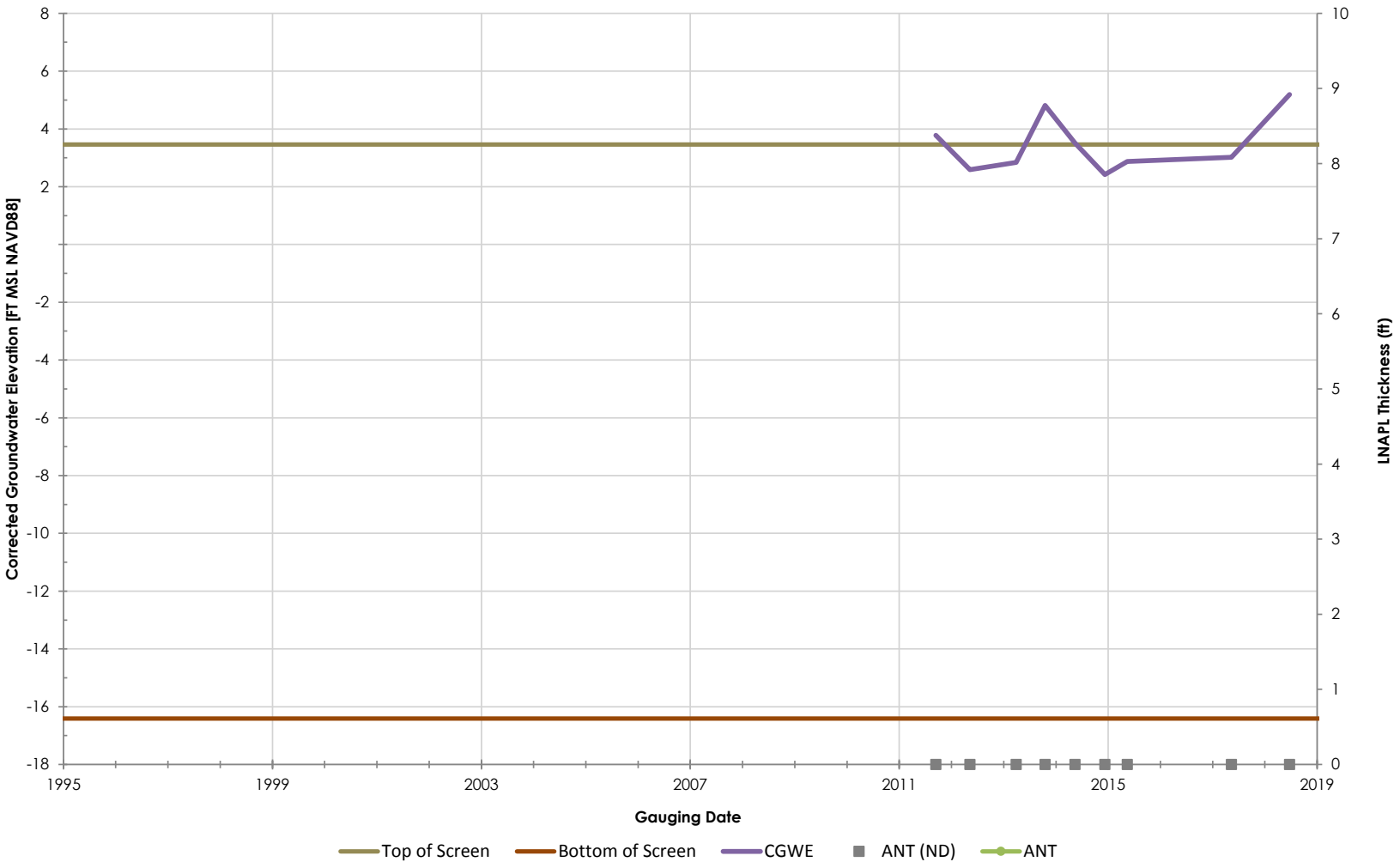
Stantec

Figure/Well No.

C-155

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

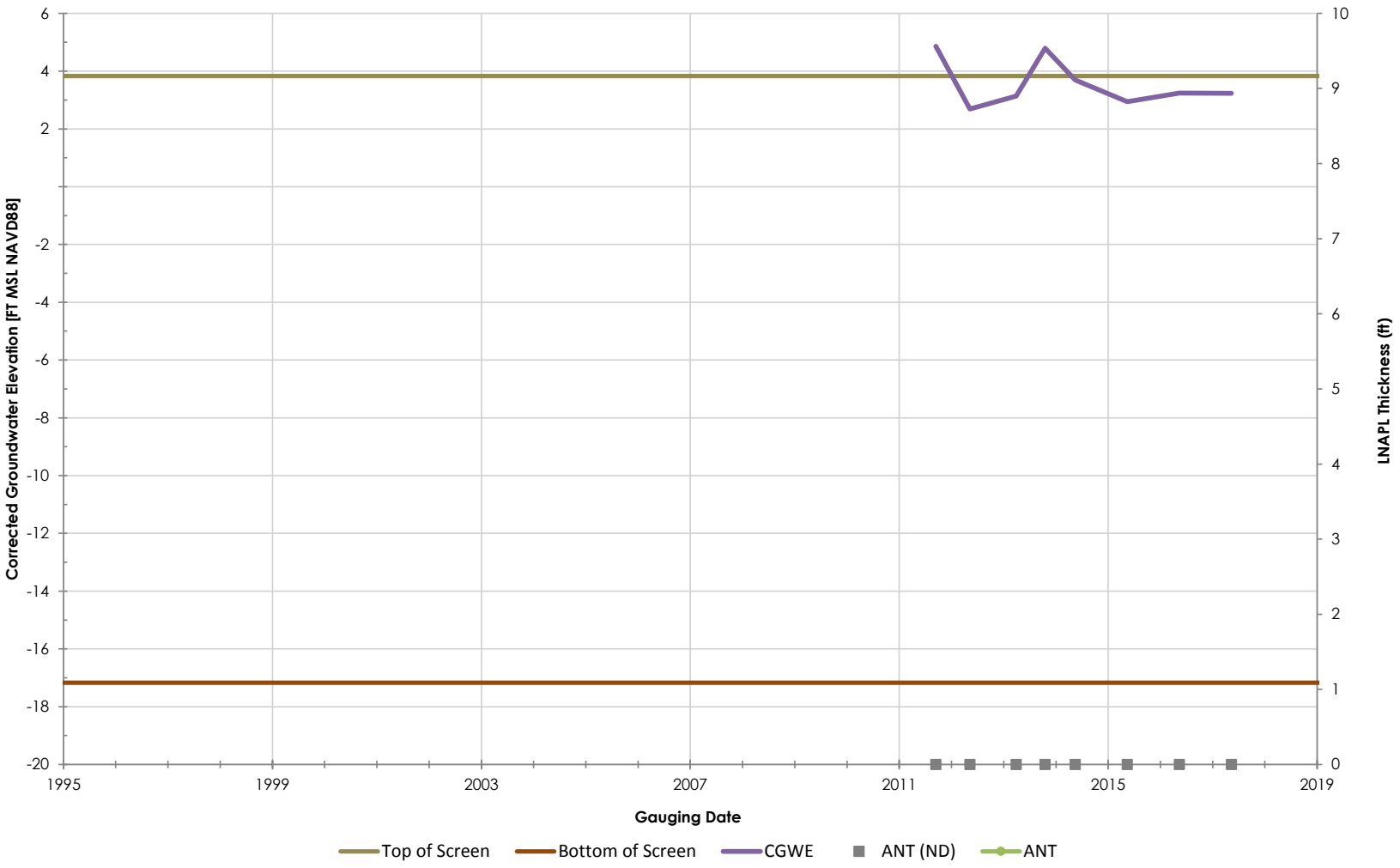
Stantec

Figure/Well No.

C-156

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

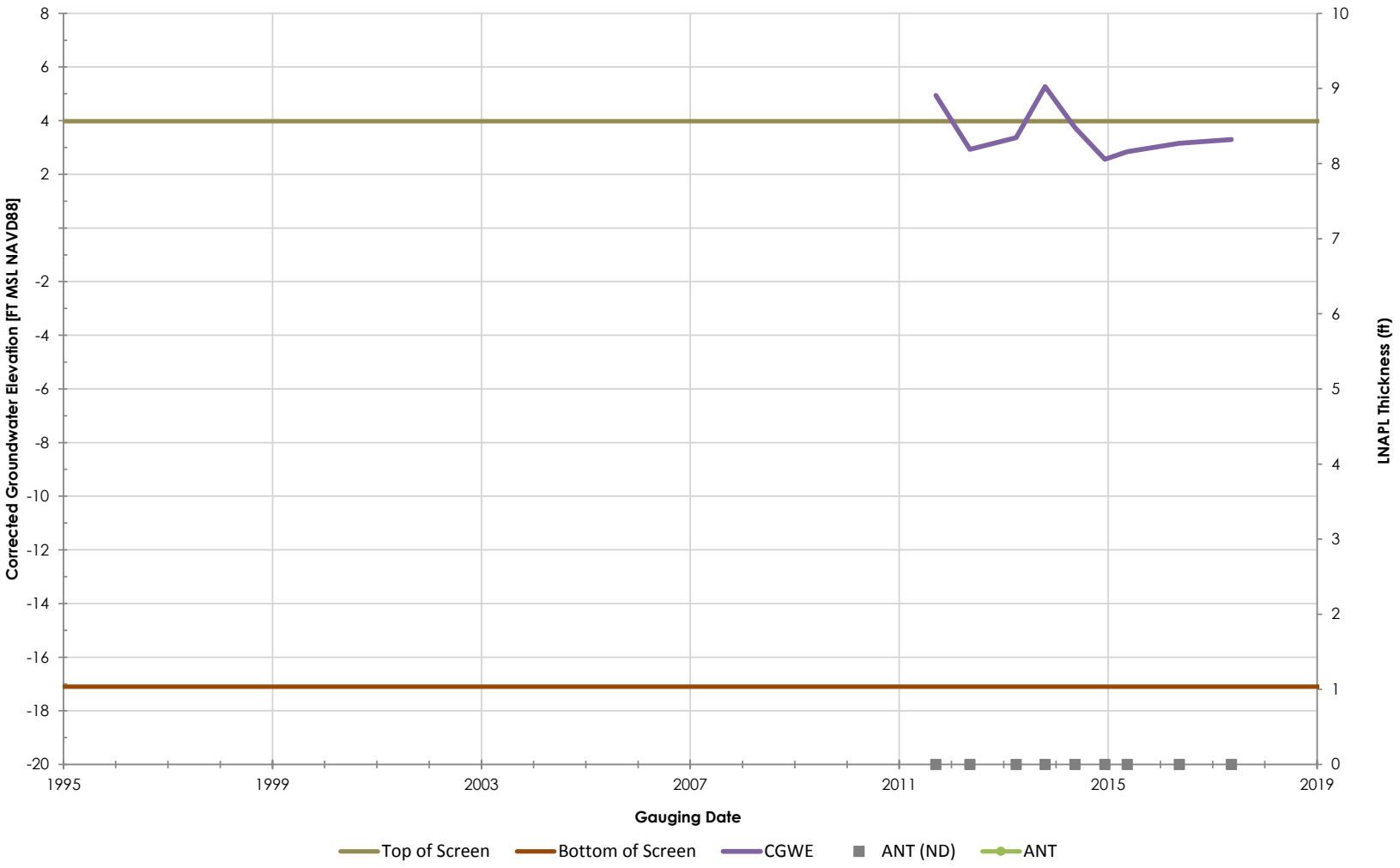
Stantec

Figure/Well No.

C-157

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

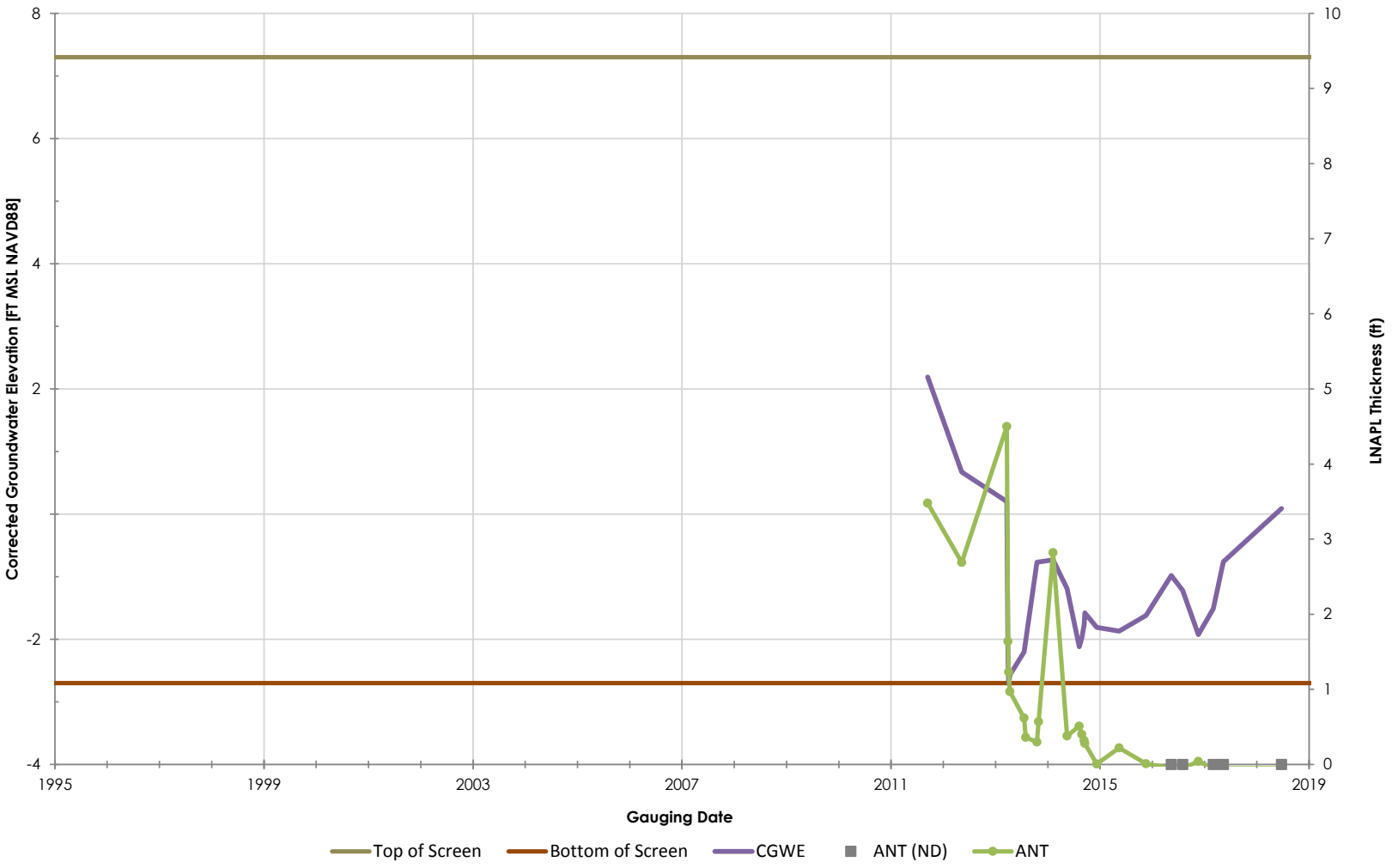
Stantec

Figure/Well No.

C-159

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

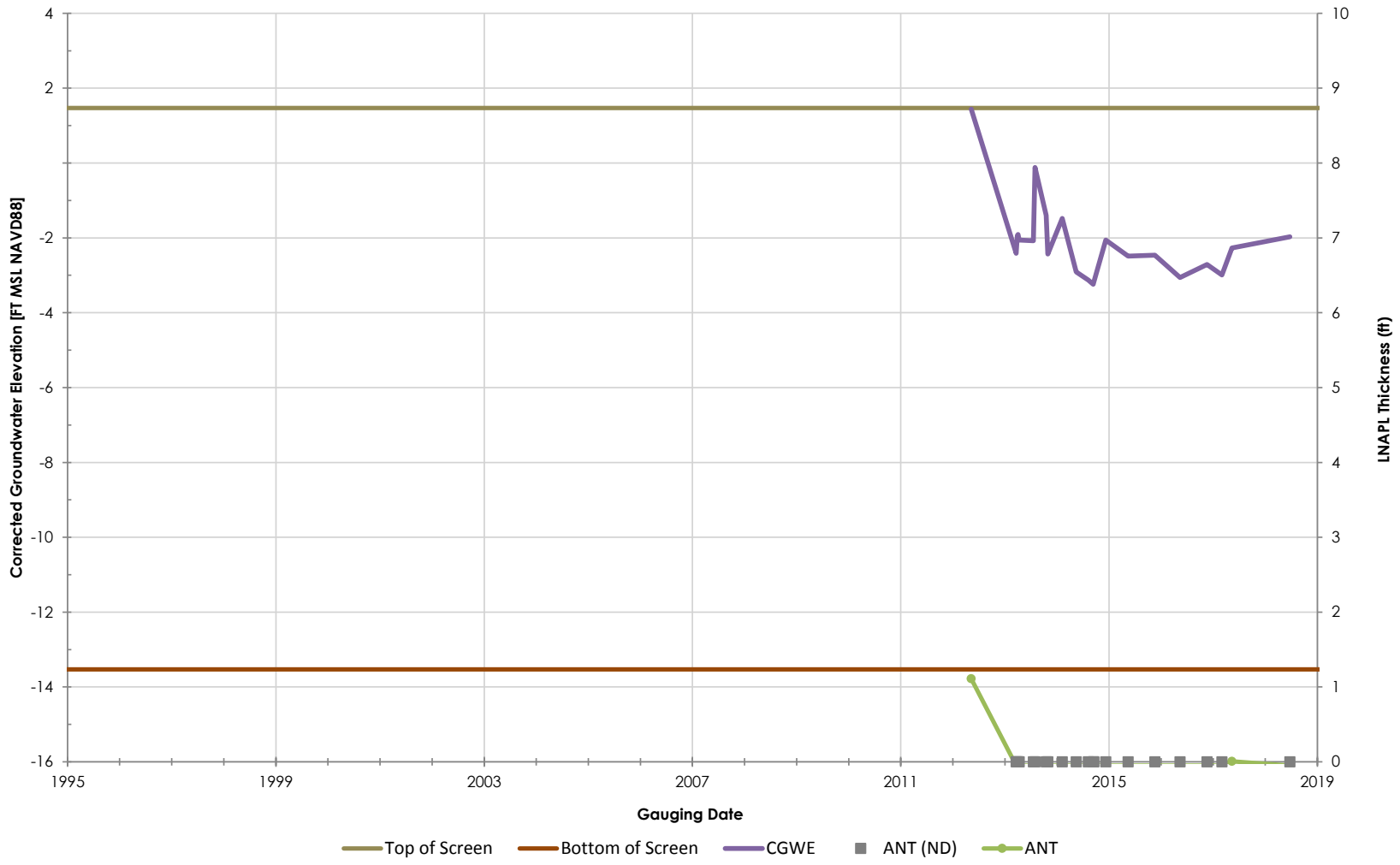
Stantec

Figure/Well No.

C-161

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

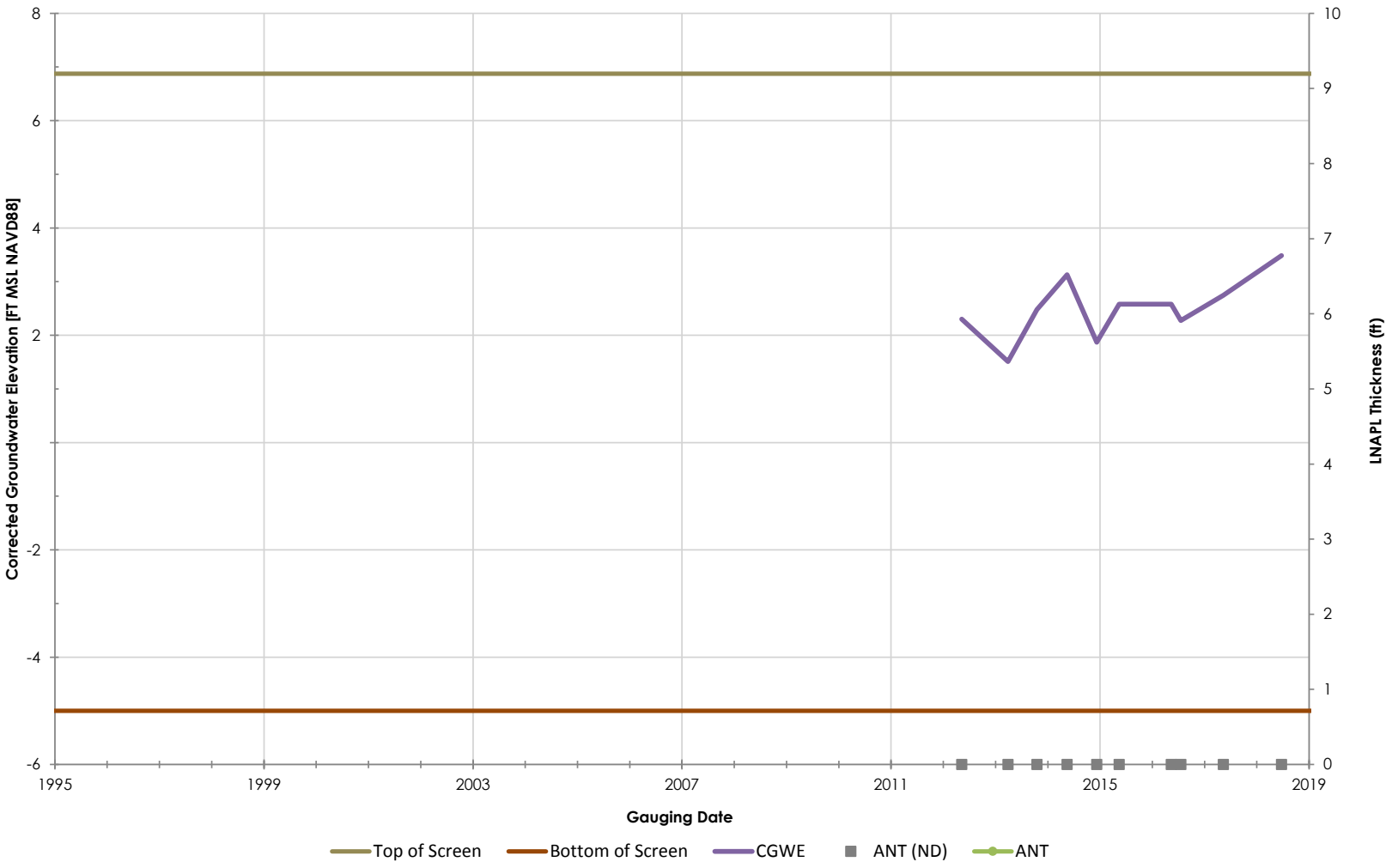
Stantec

Figure/Well No.

C-162

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

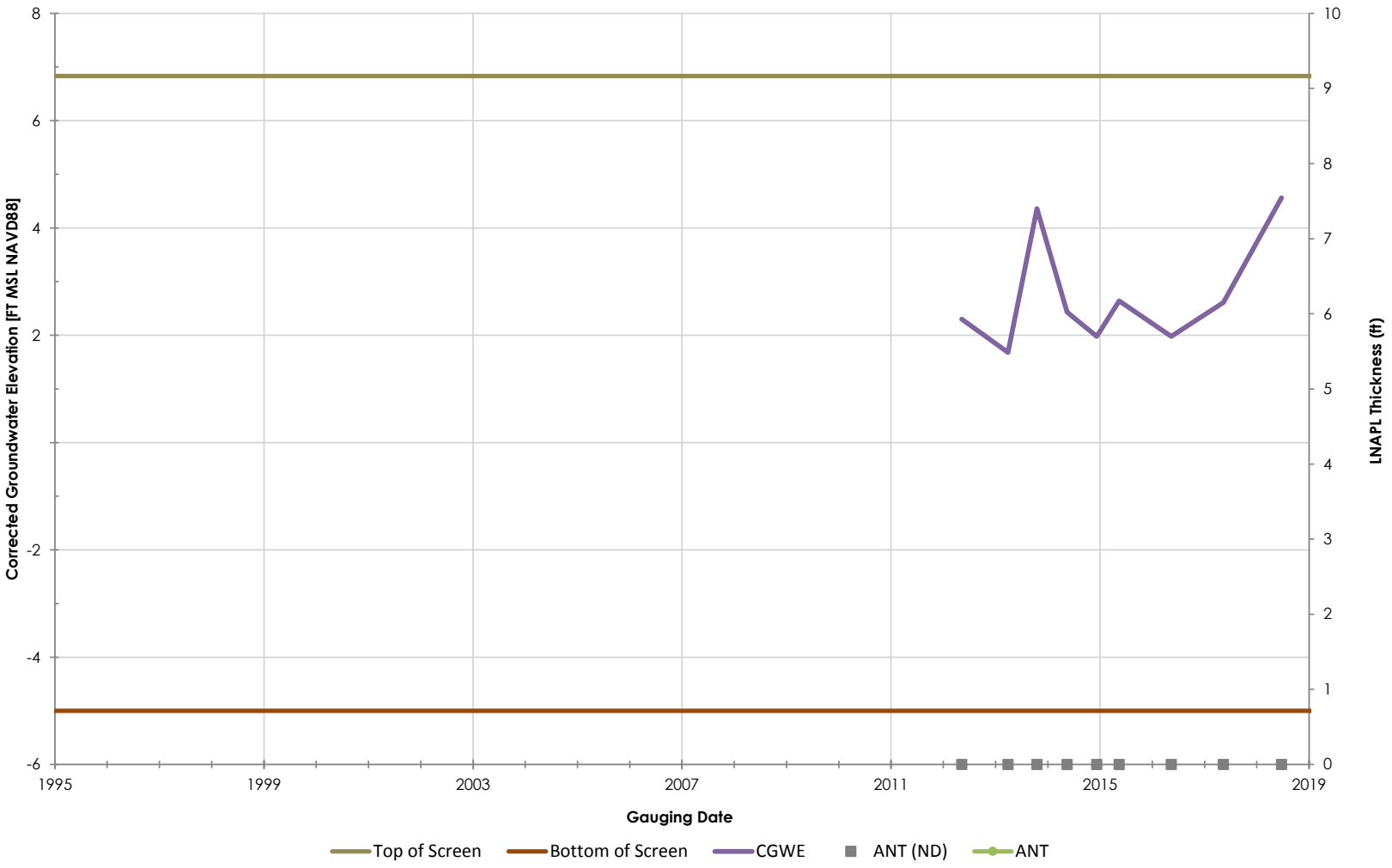
Stantec

Figure/Well No.

C-163

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

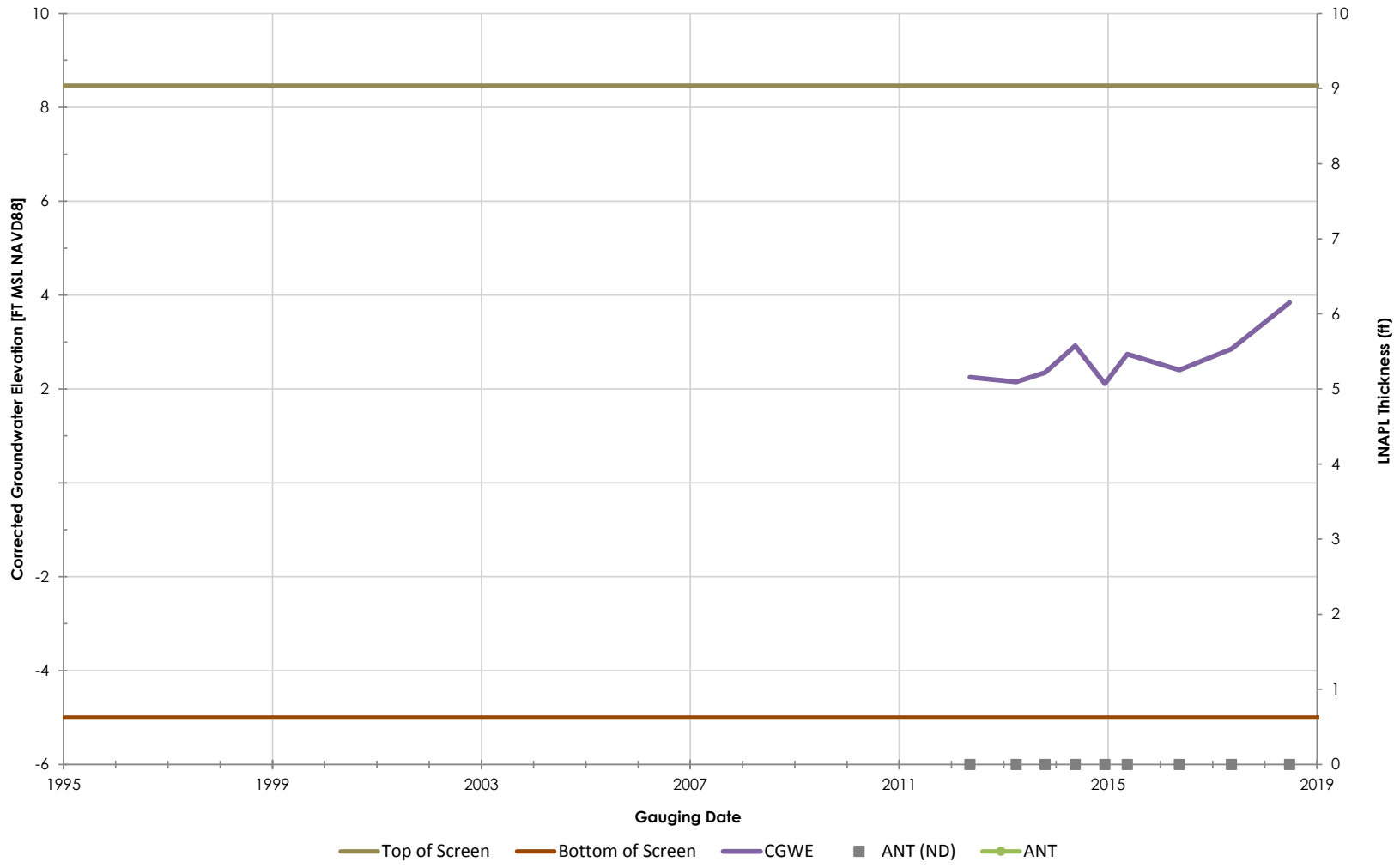
Stantec

Figure/Well No.

C-164

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

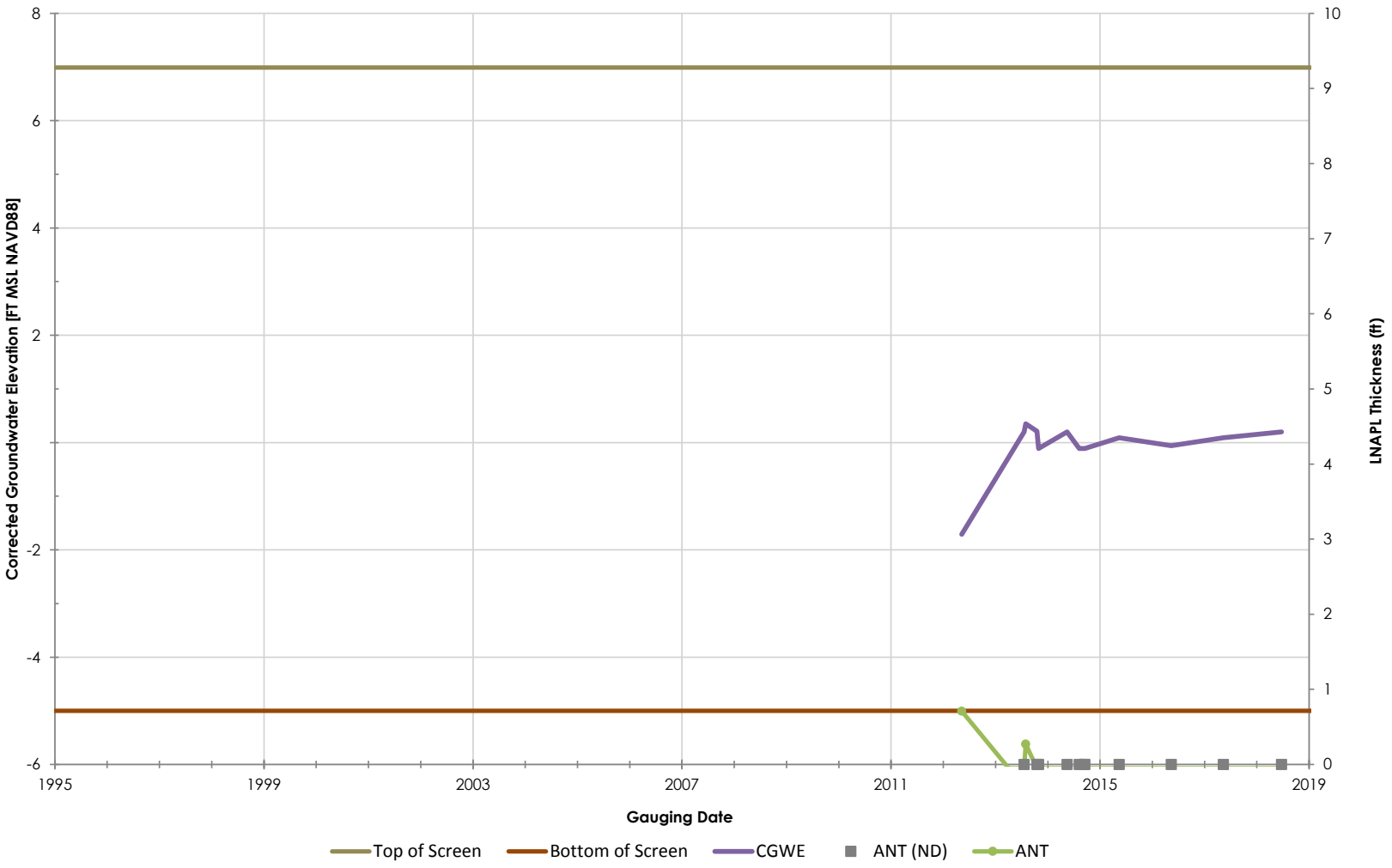
Stantec

Figure/Well No.

C-165

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

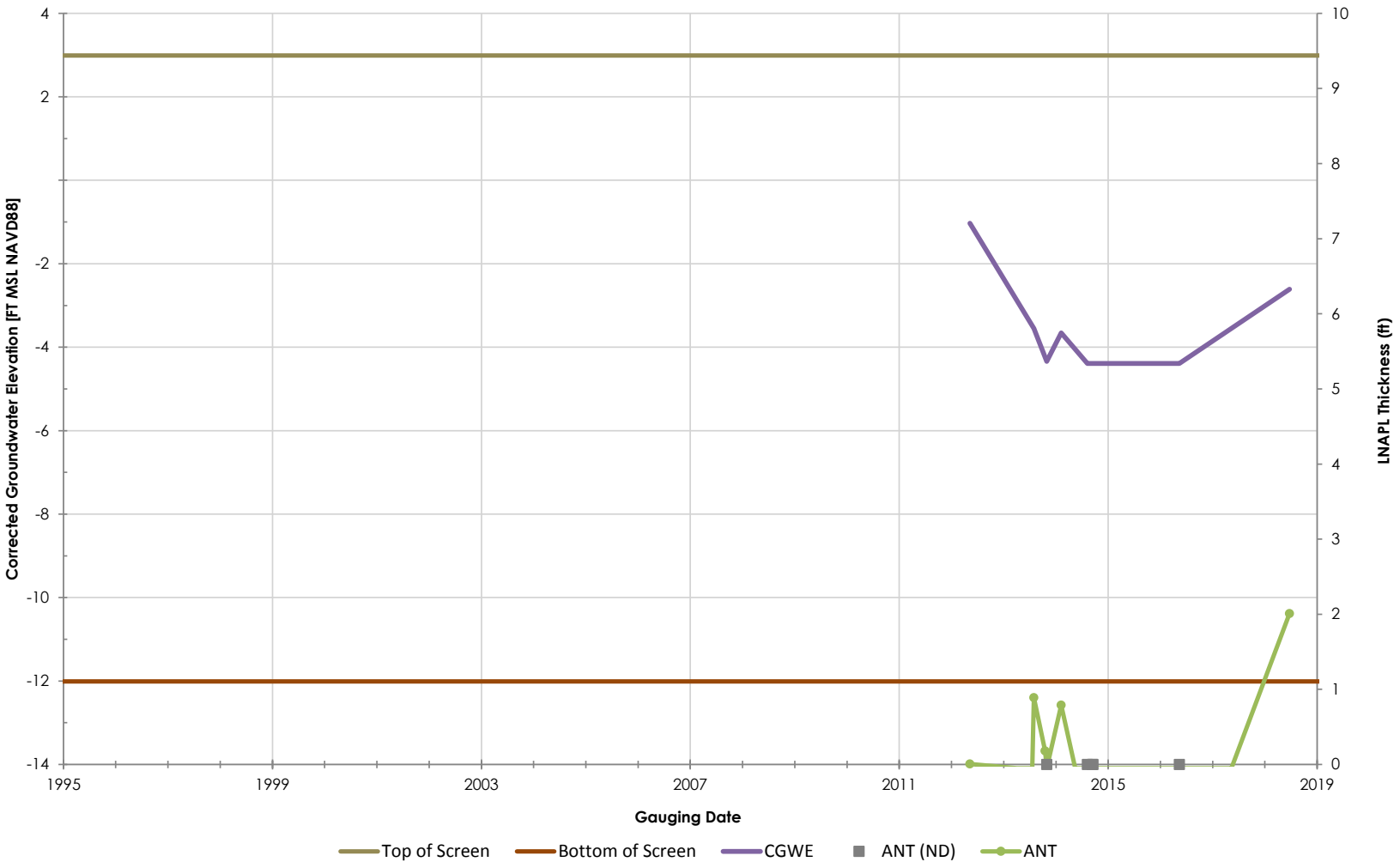
Stantec

Figure/Well No.

C-166

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

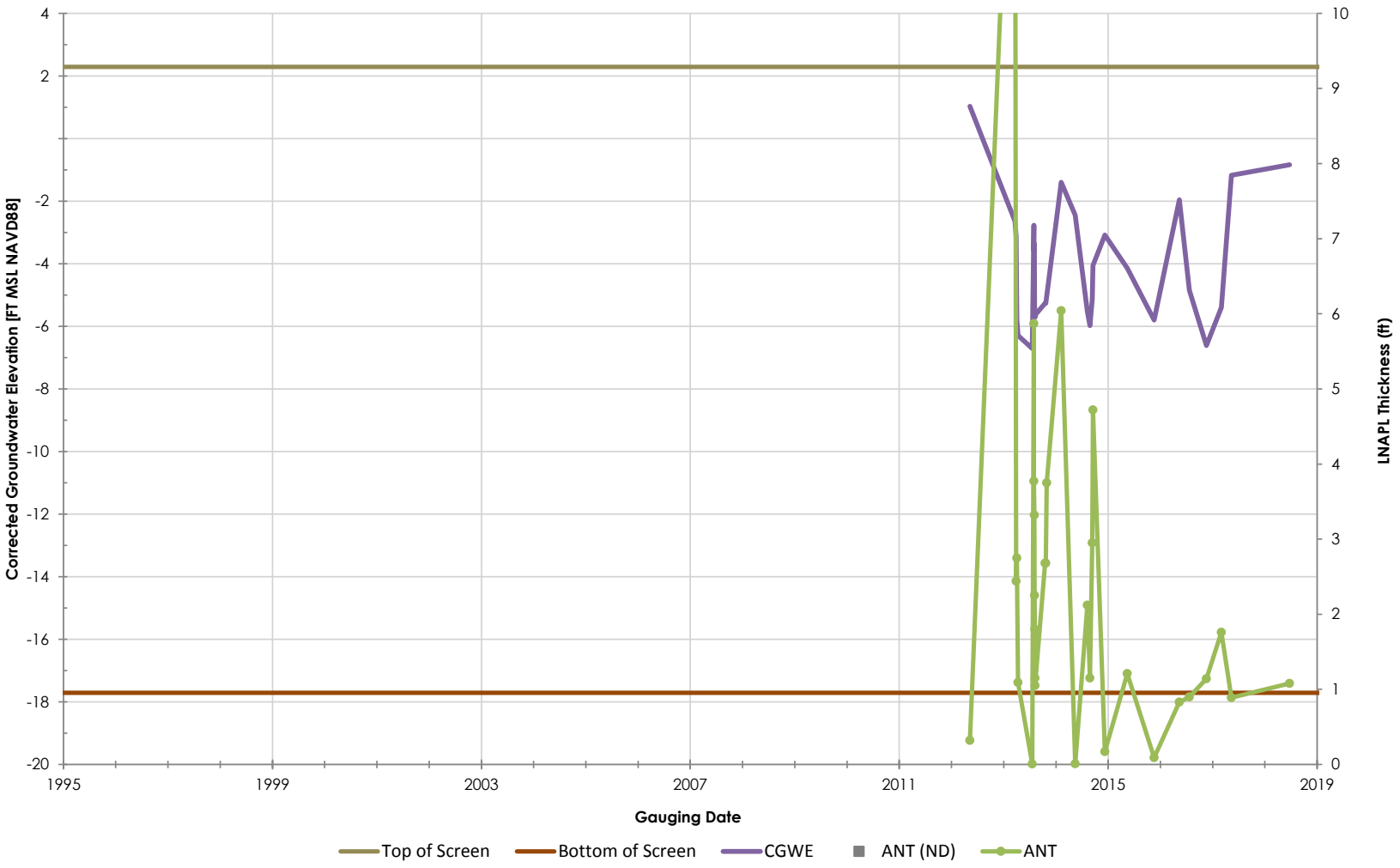
Stantec

Figure/Well No.

C-167

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

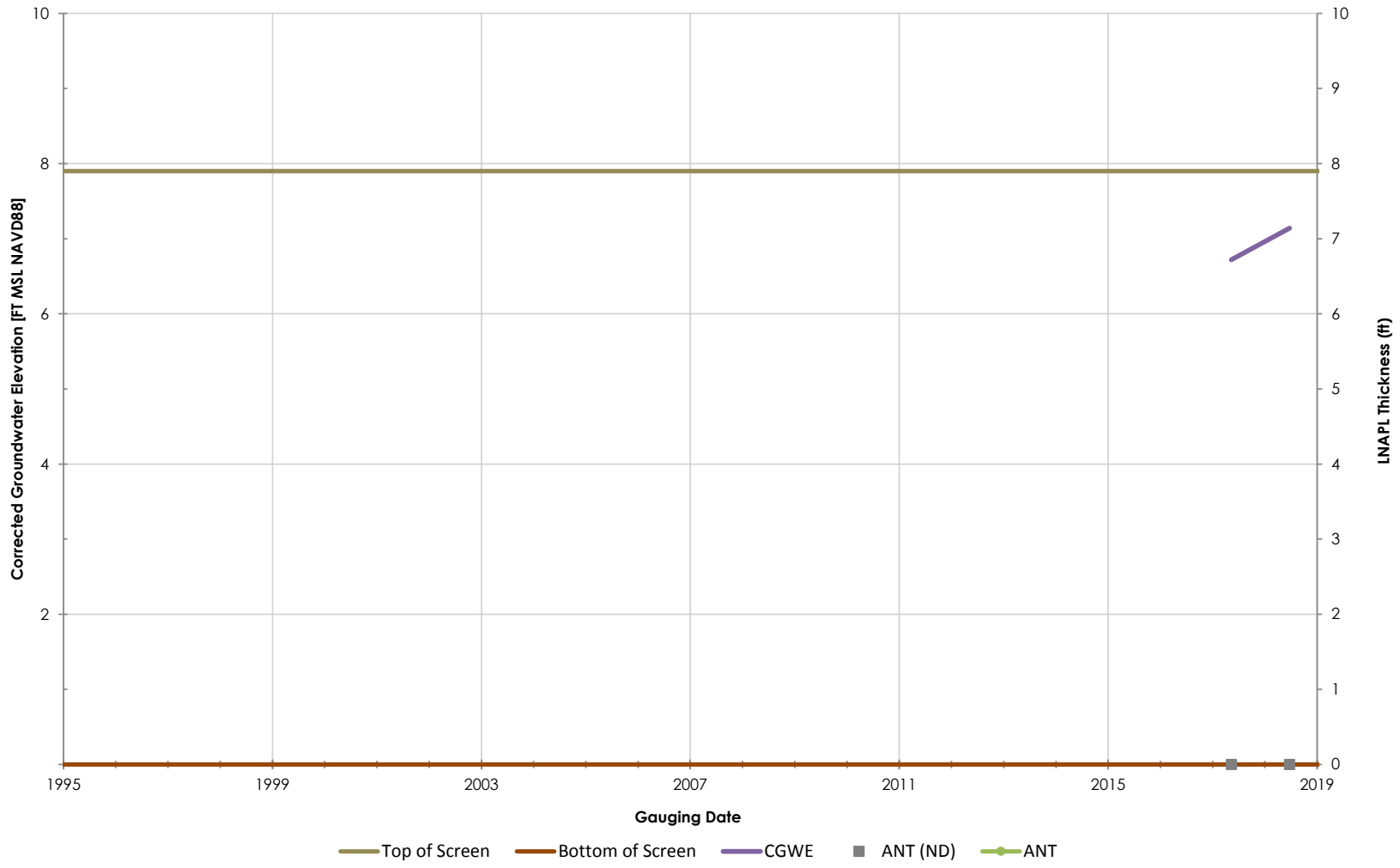
Stantec

Figure/Well No.

C-169

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

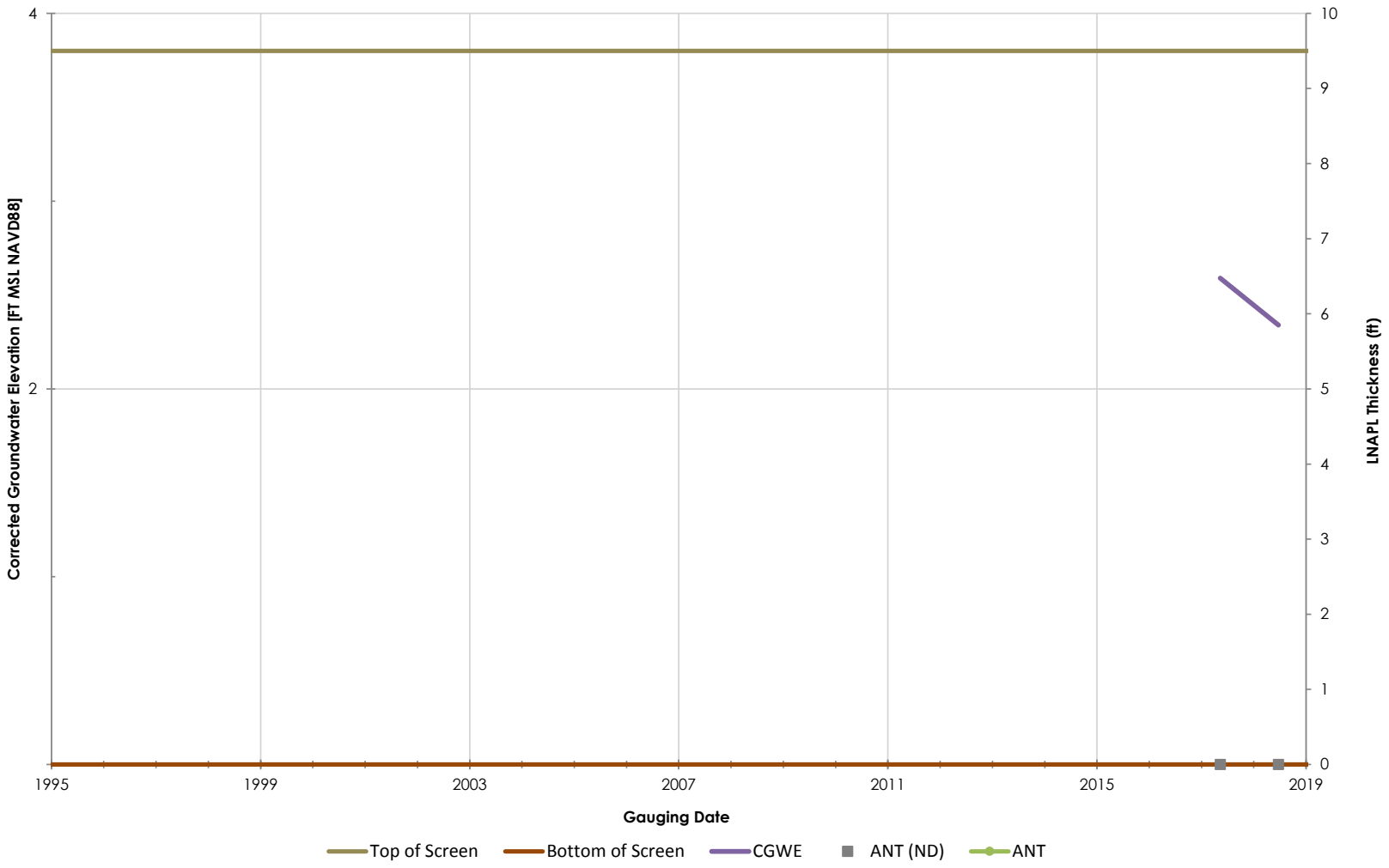
Stantec

Figure/Well No.

C-171

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

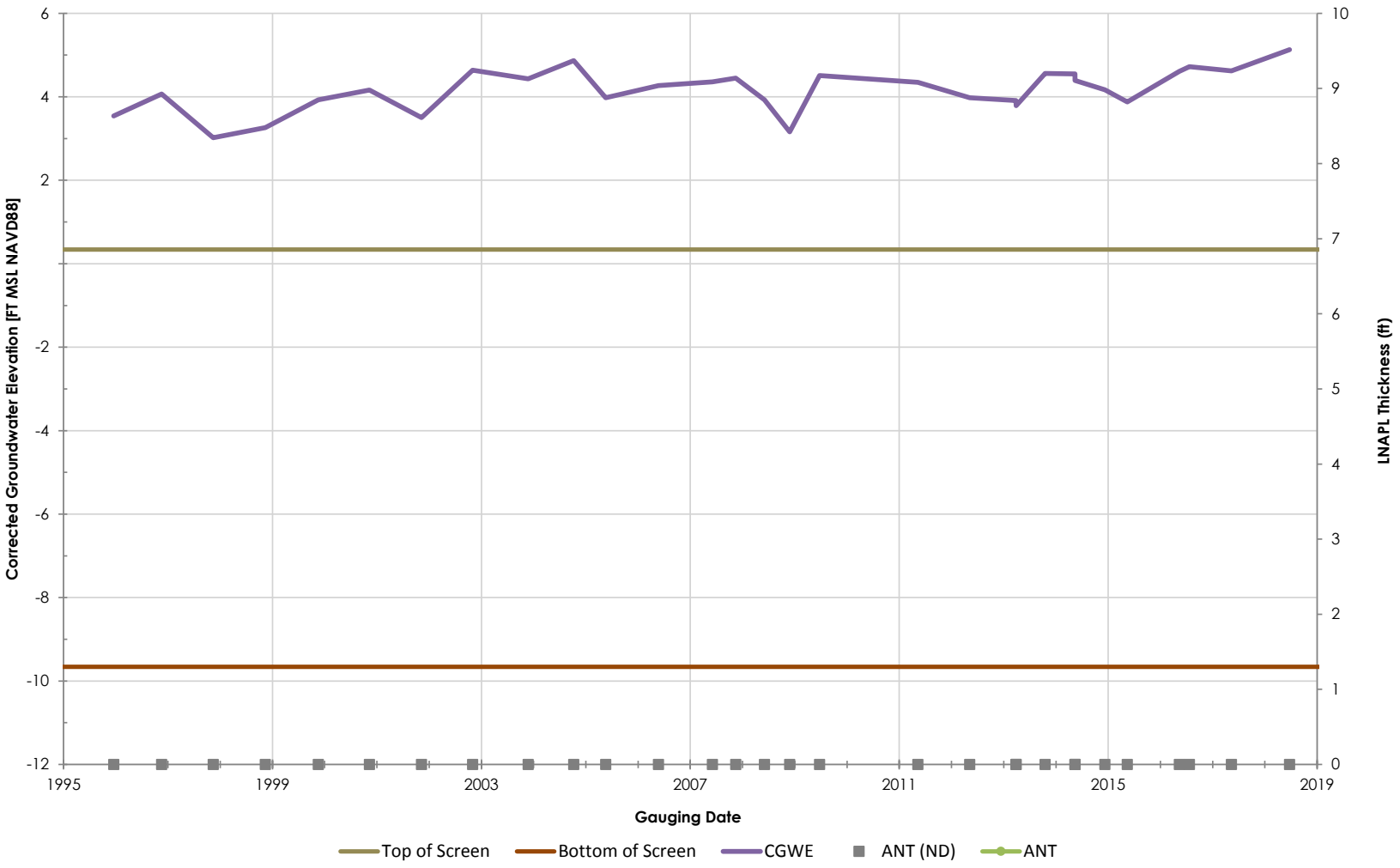
Stantec

Figure/Well No.

C-172

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

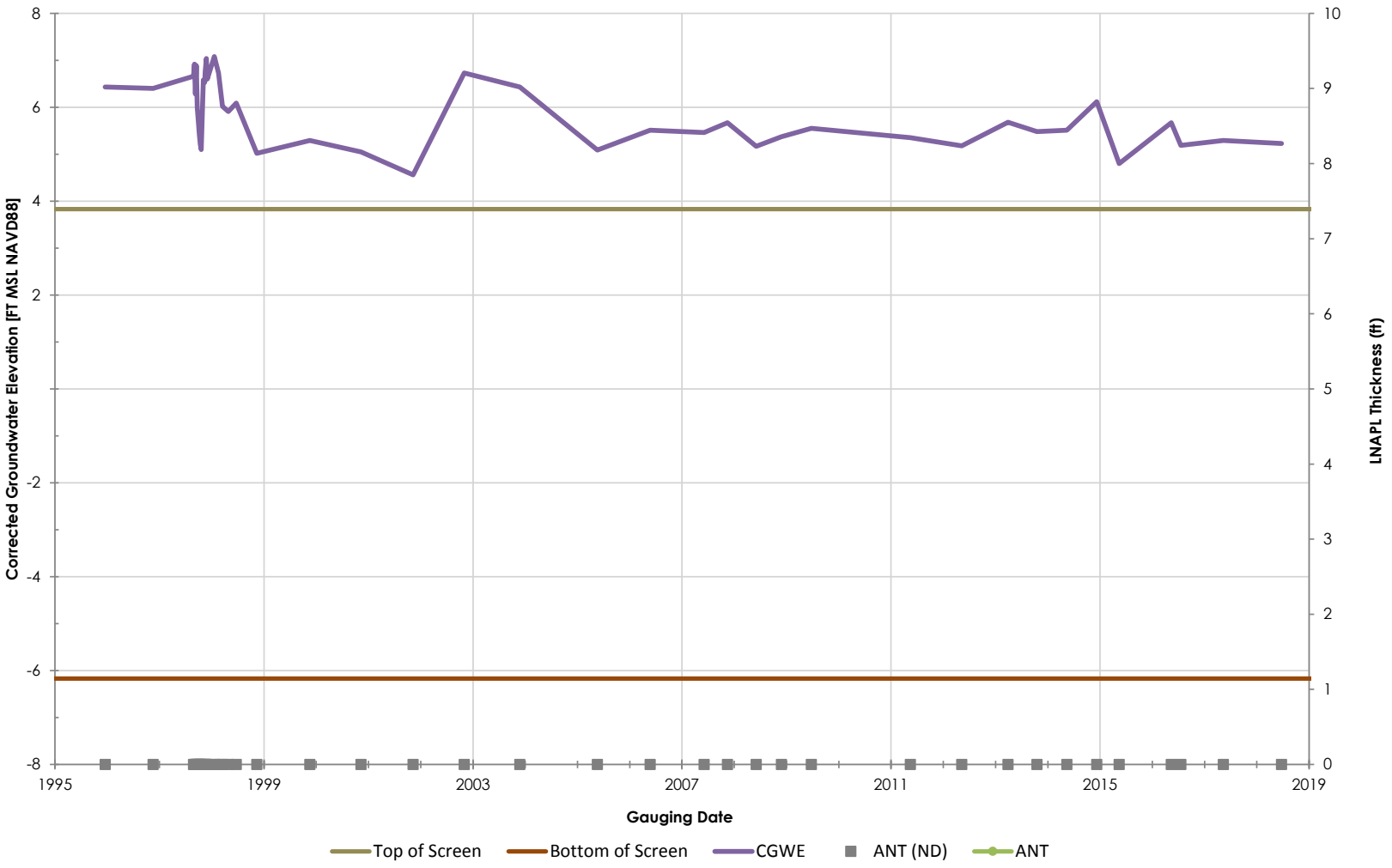
Stantec

Figure/Well No.

C-49

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

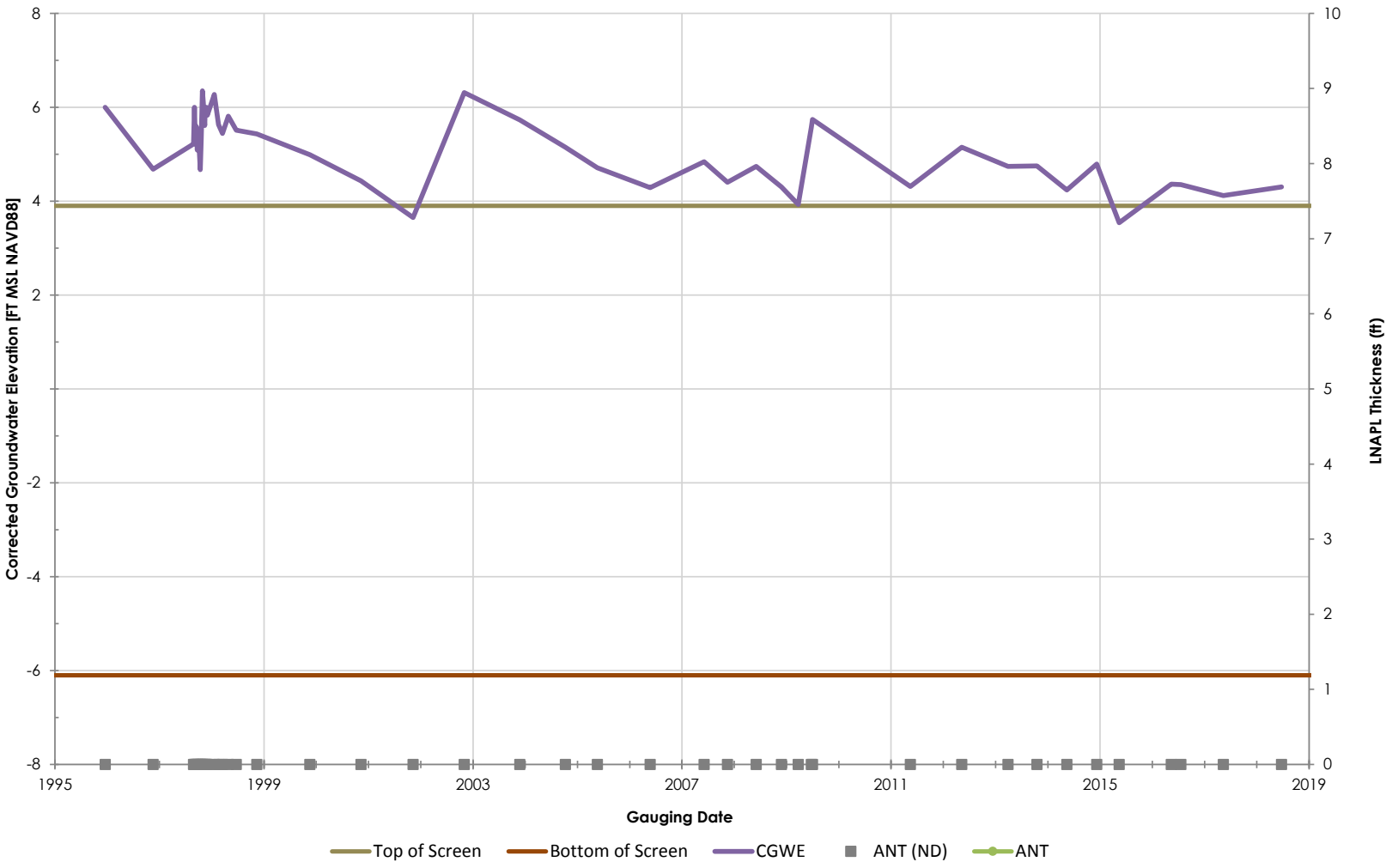
Stantec

Figure/Well No.

C-50

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

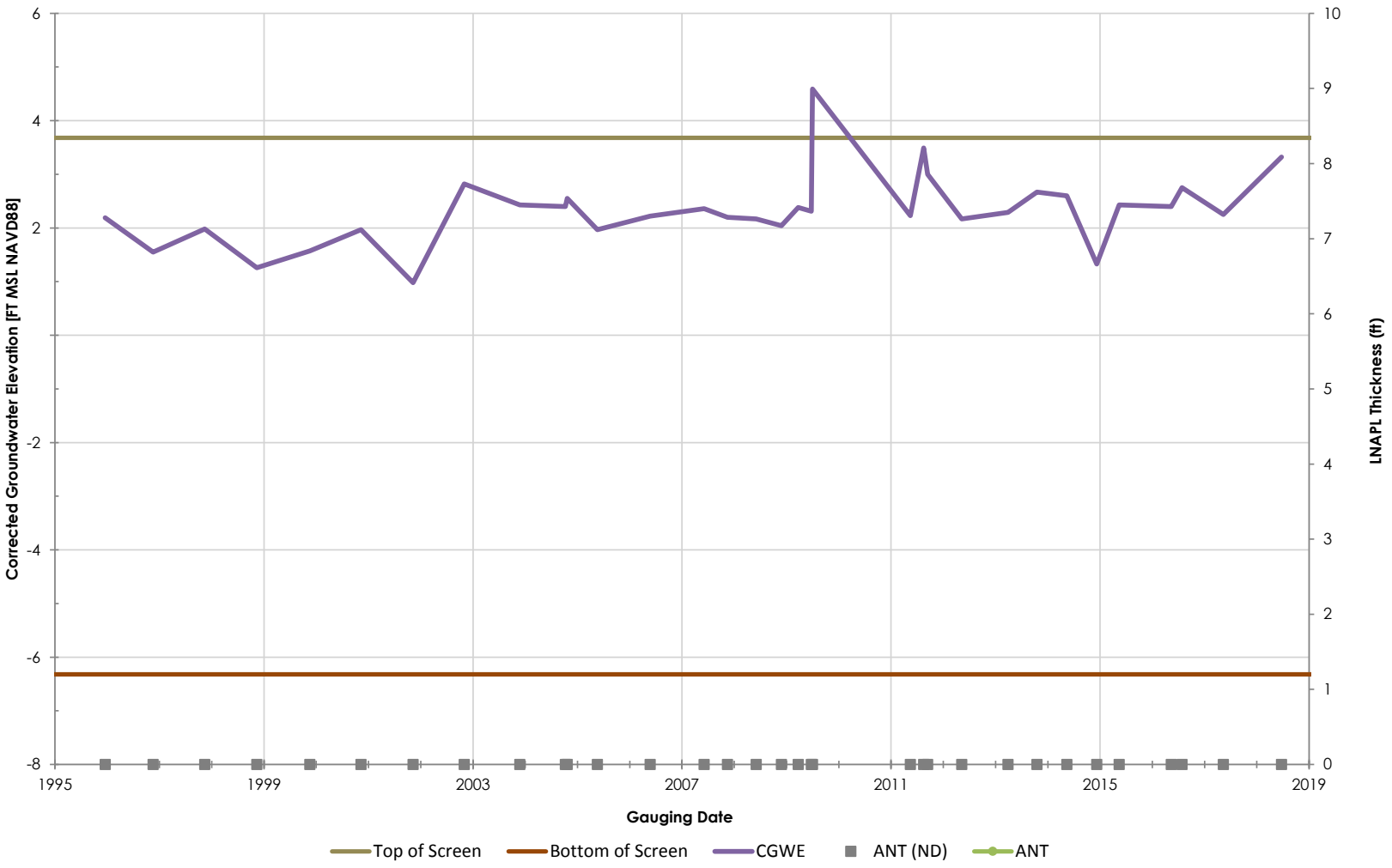
Stantec

Figure/Well No.

C-51

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

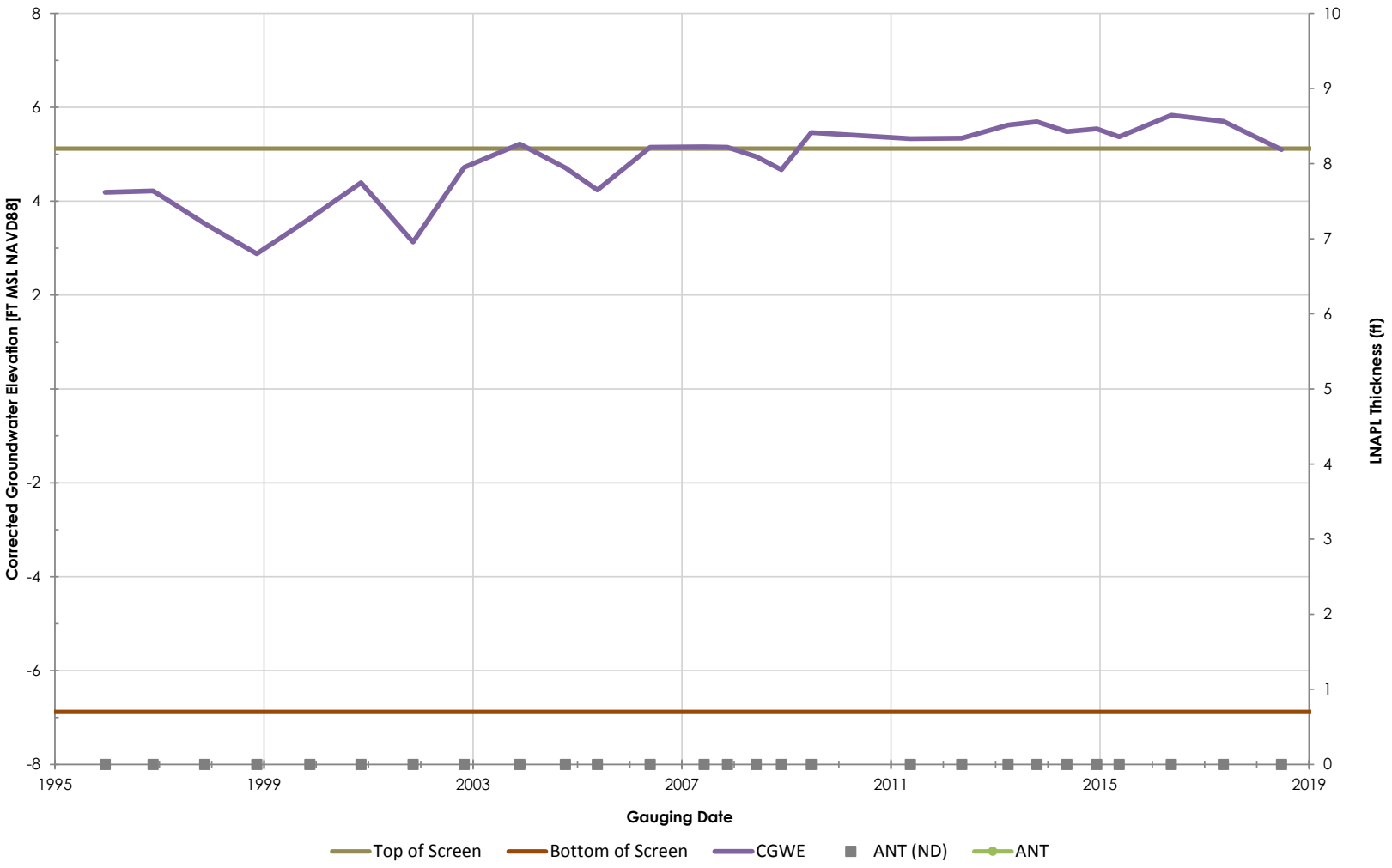
Stantec

Figure/Well No.

C-52

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

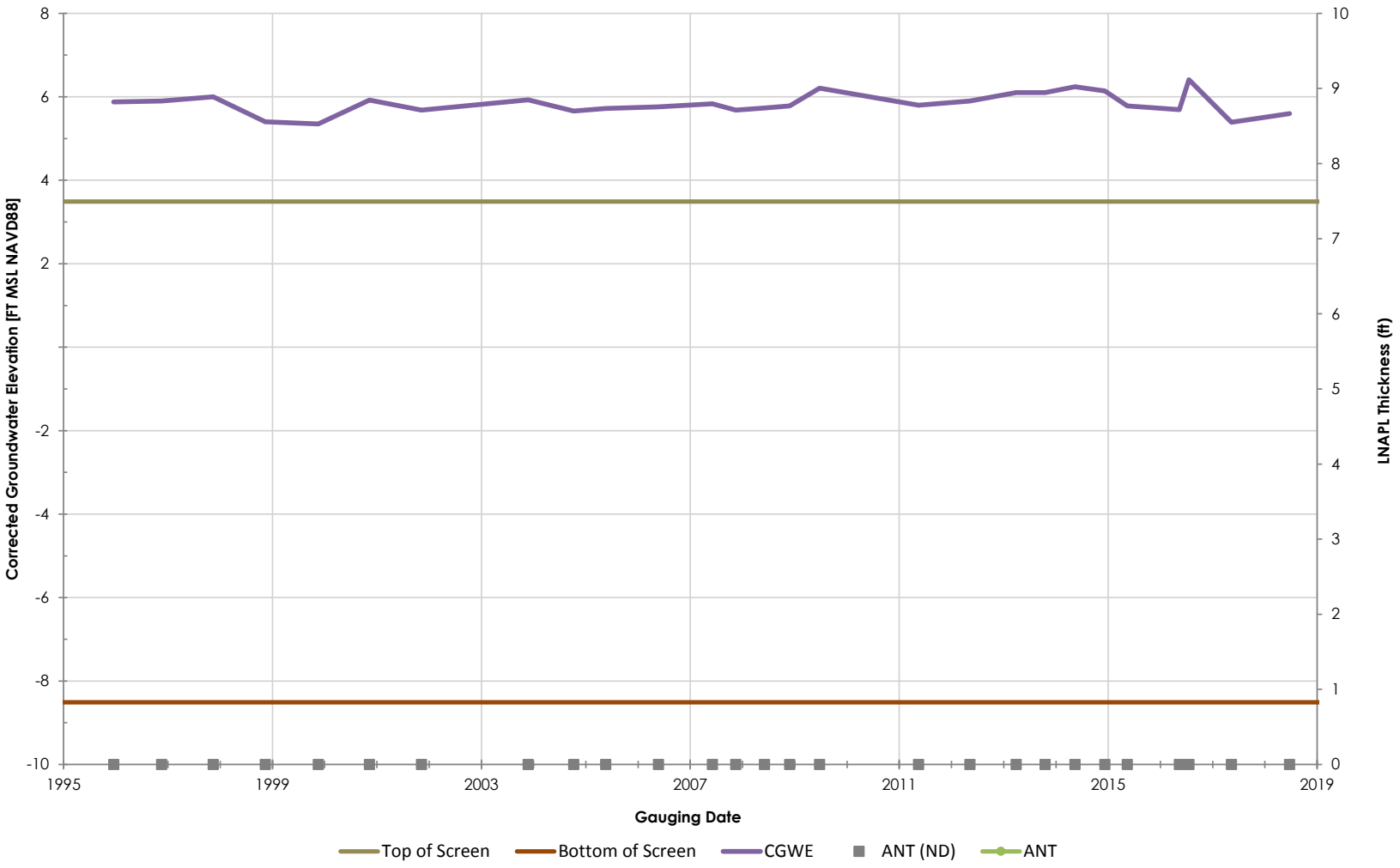
Stantec

Figure/Well No.

C-53A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

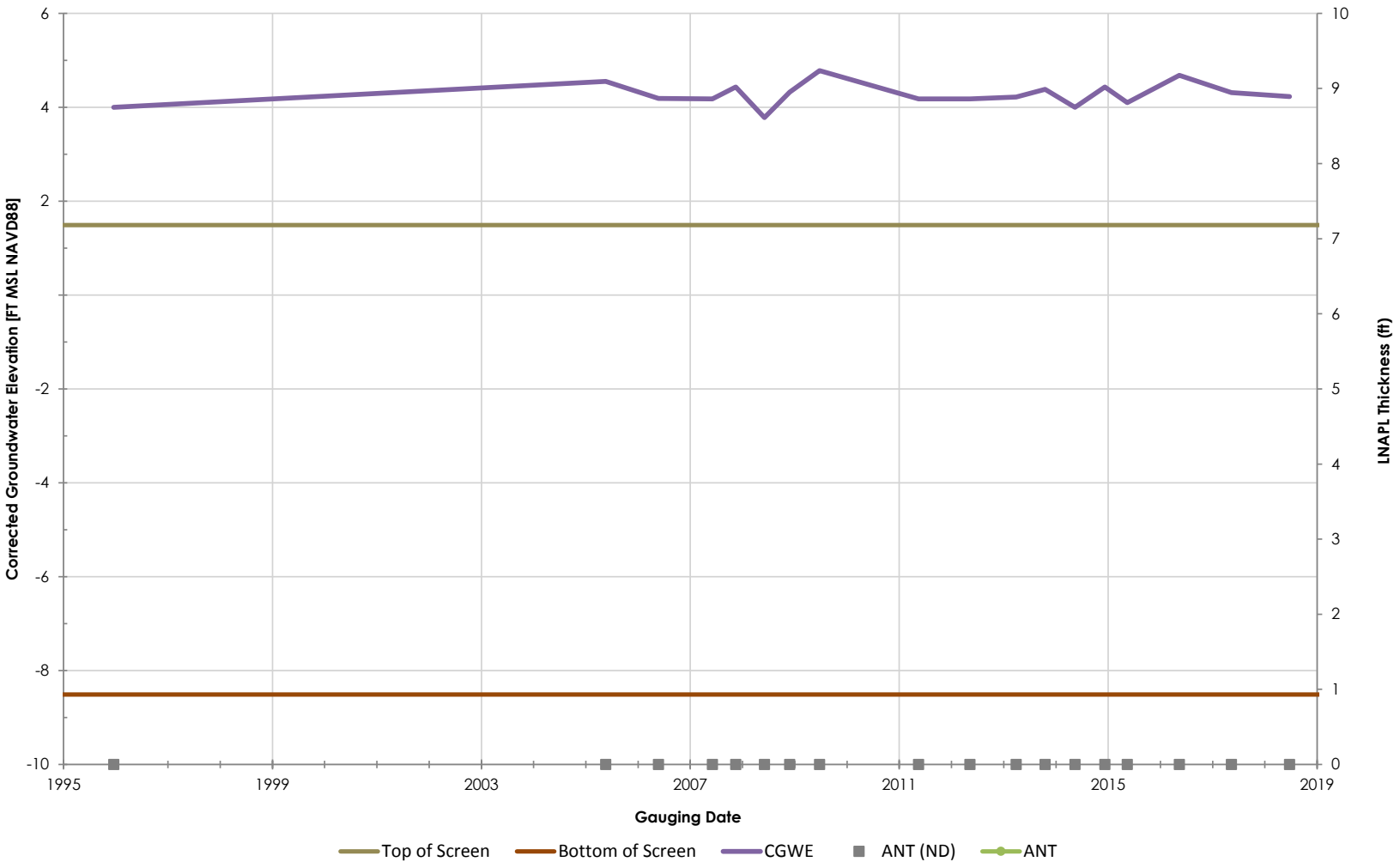
Stantec

Figure/Well No.

C-54

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

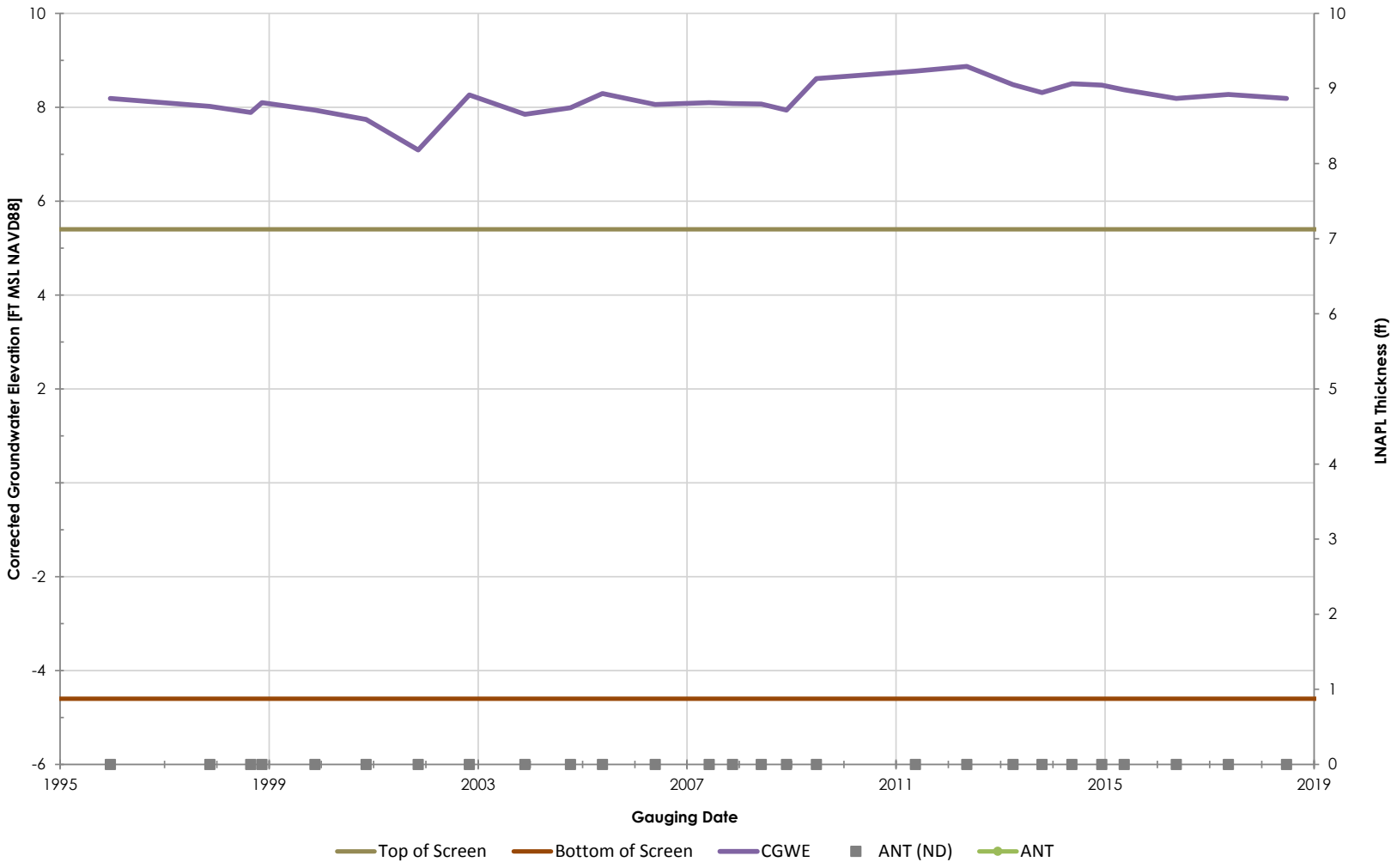
Stantec

Figure/Well No.

C-55

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

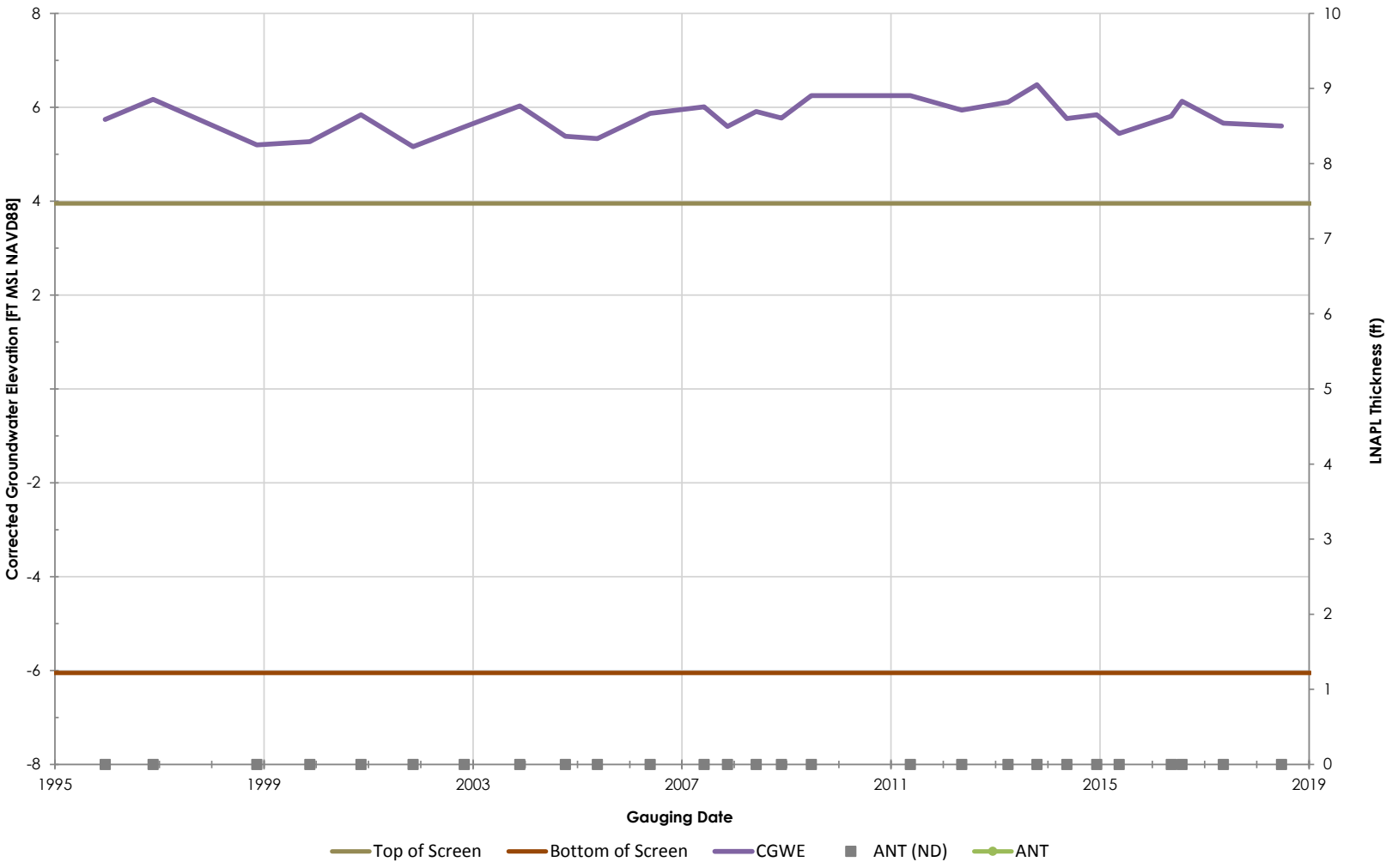
Stantec

Figure/Well No.

C-56

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

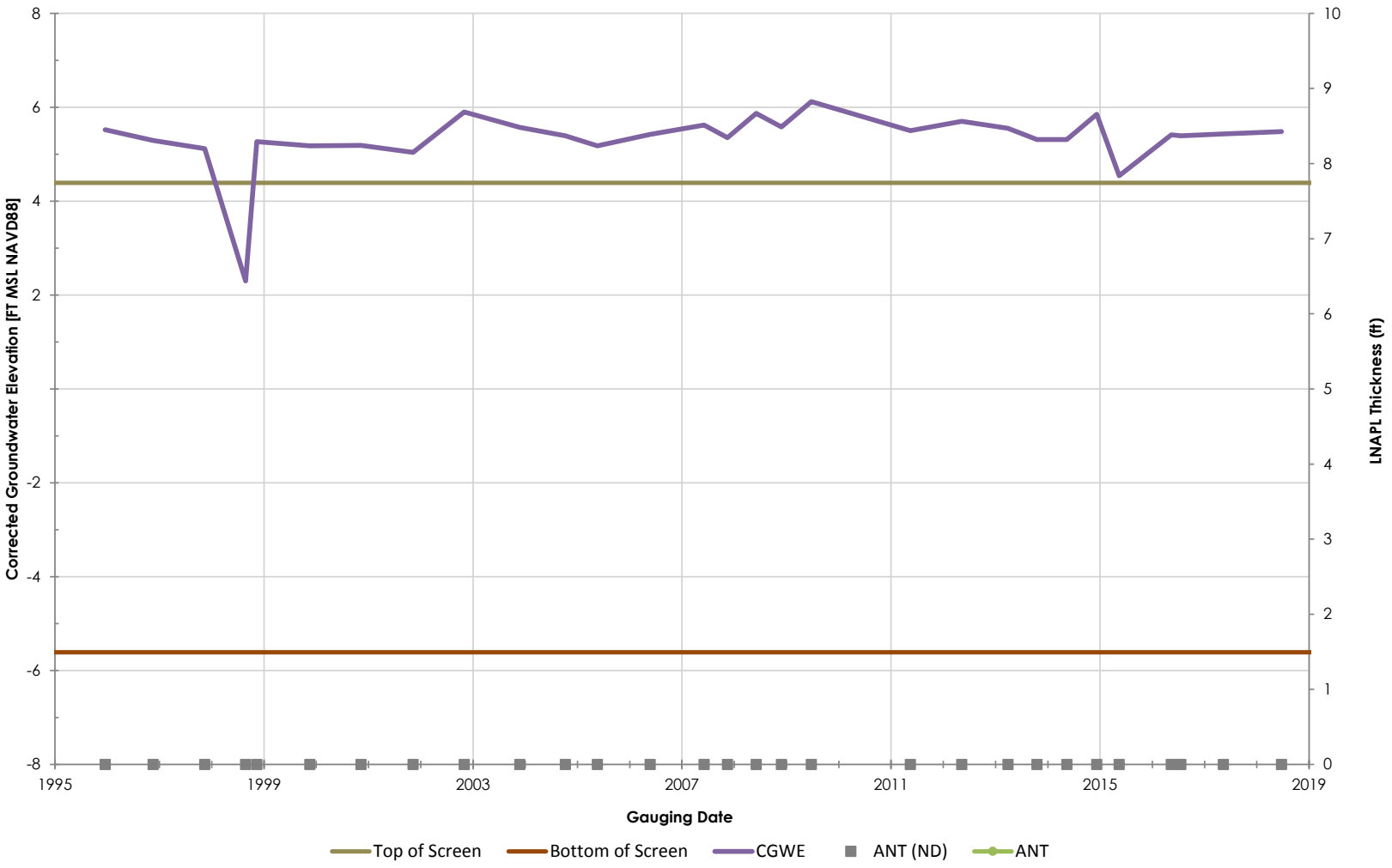
Stantec

Figure/Well No.

C-57

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

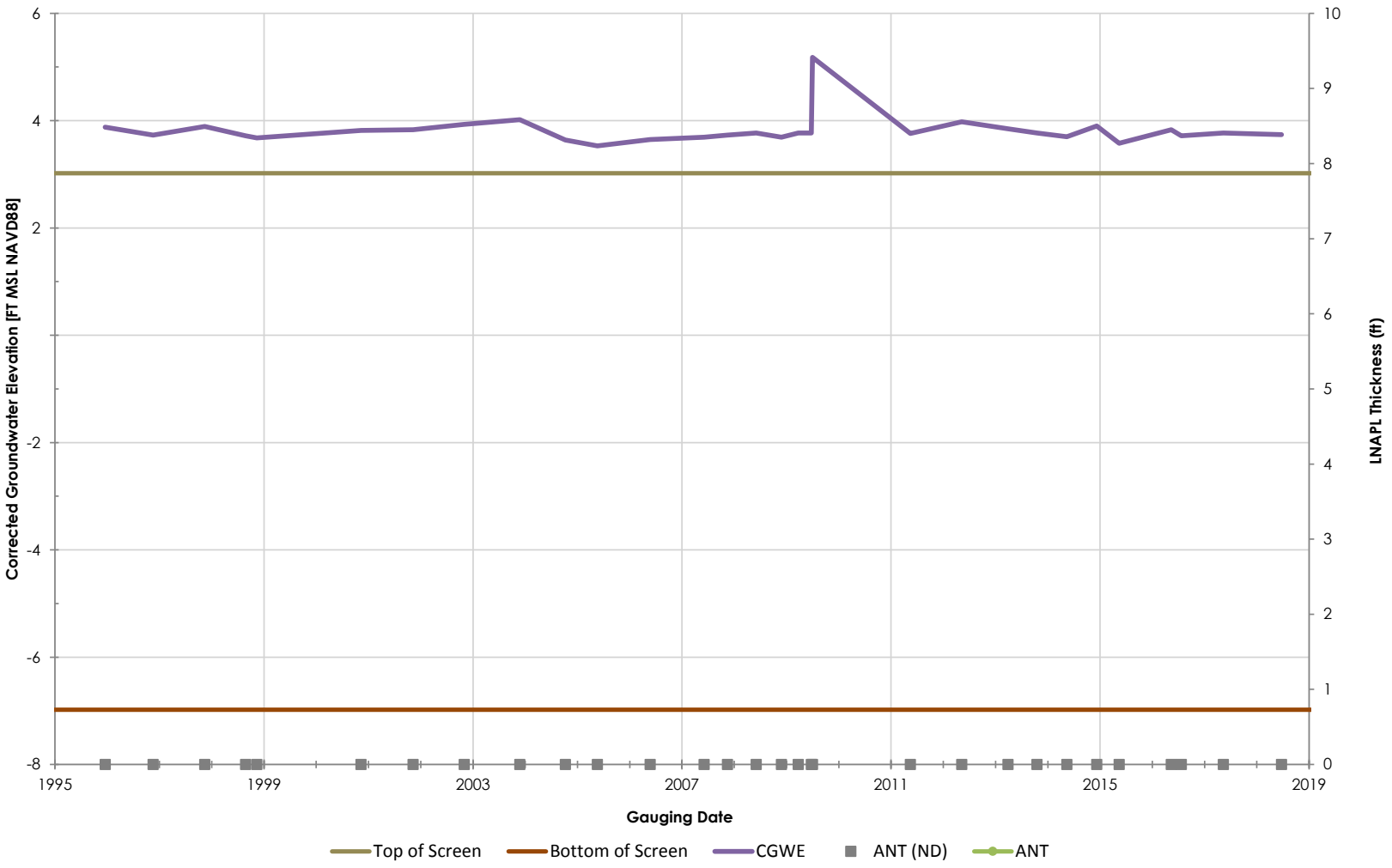
Stantec

Figure/Well No.

C-58

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

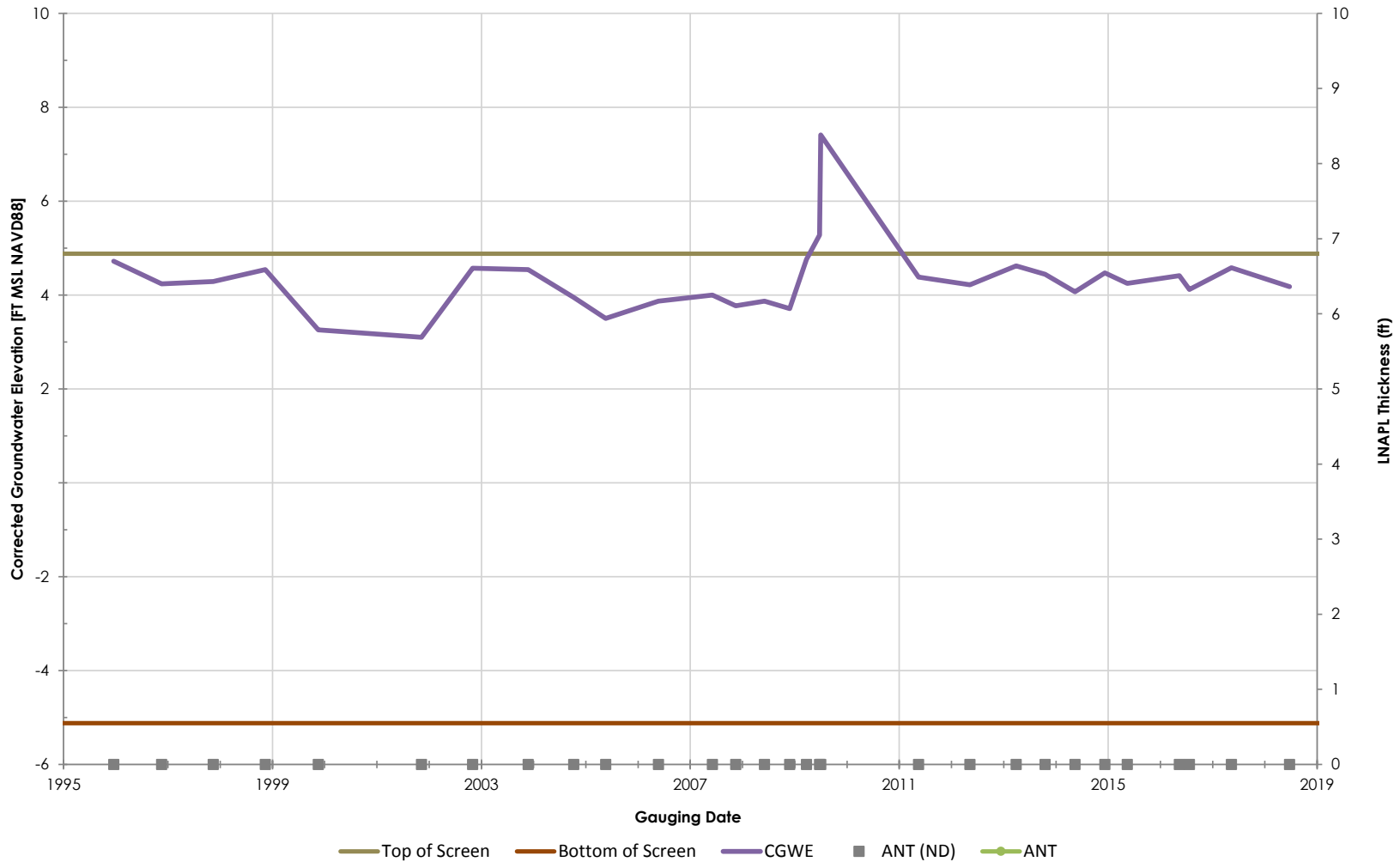
Stantec

Figure/Well No.

C-60

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

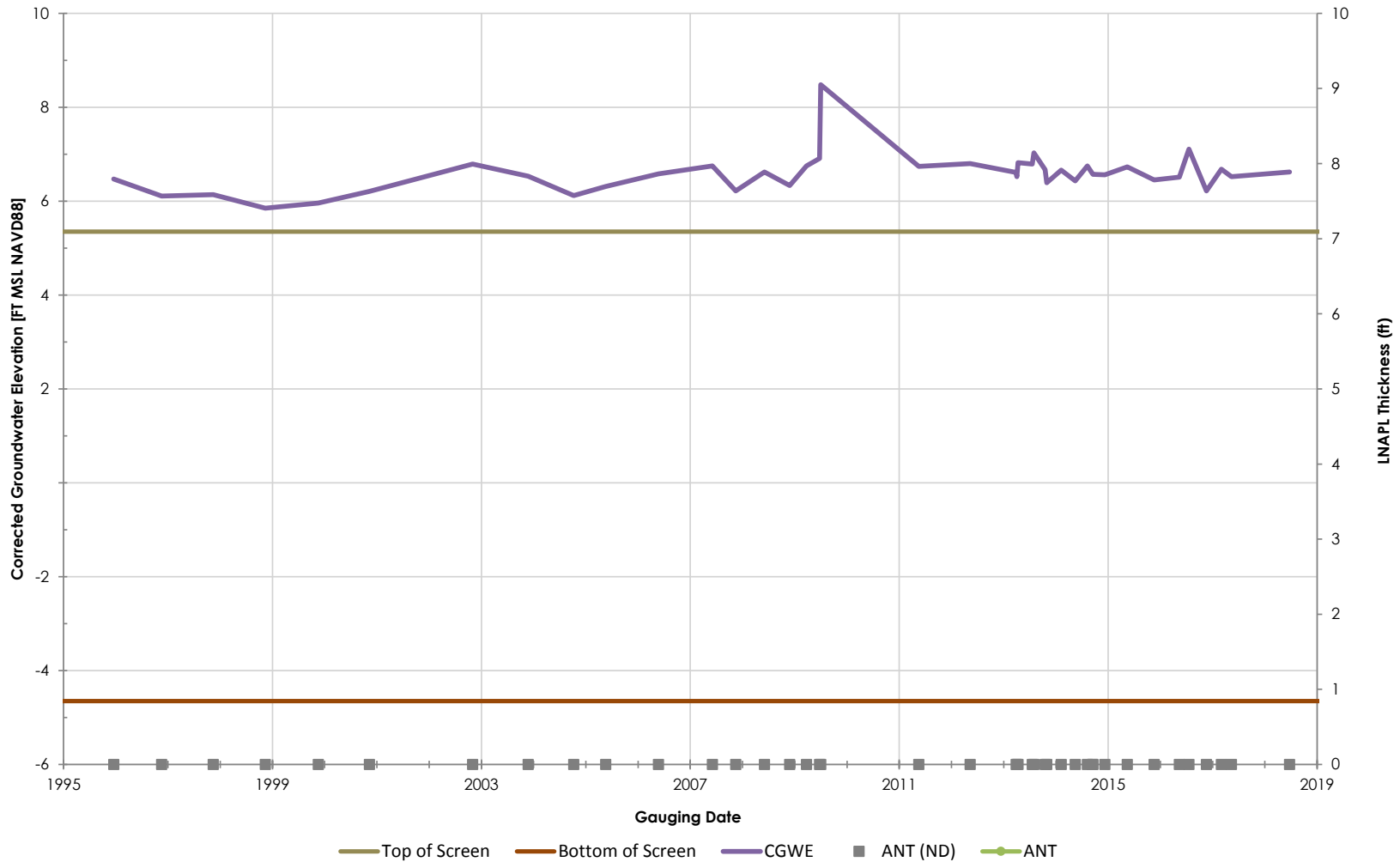
Stantec

Figure/Well No.

C-61

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

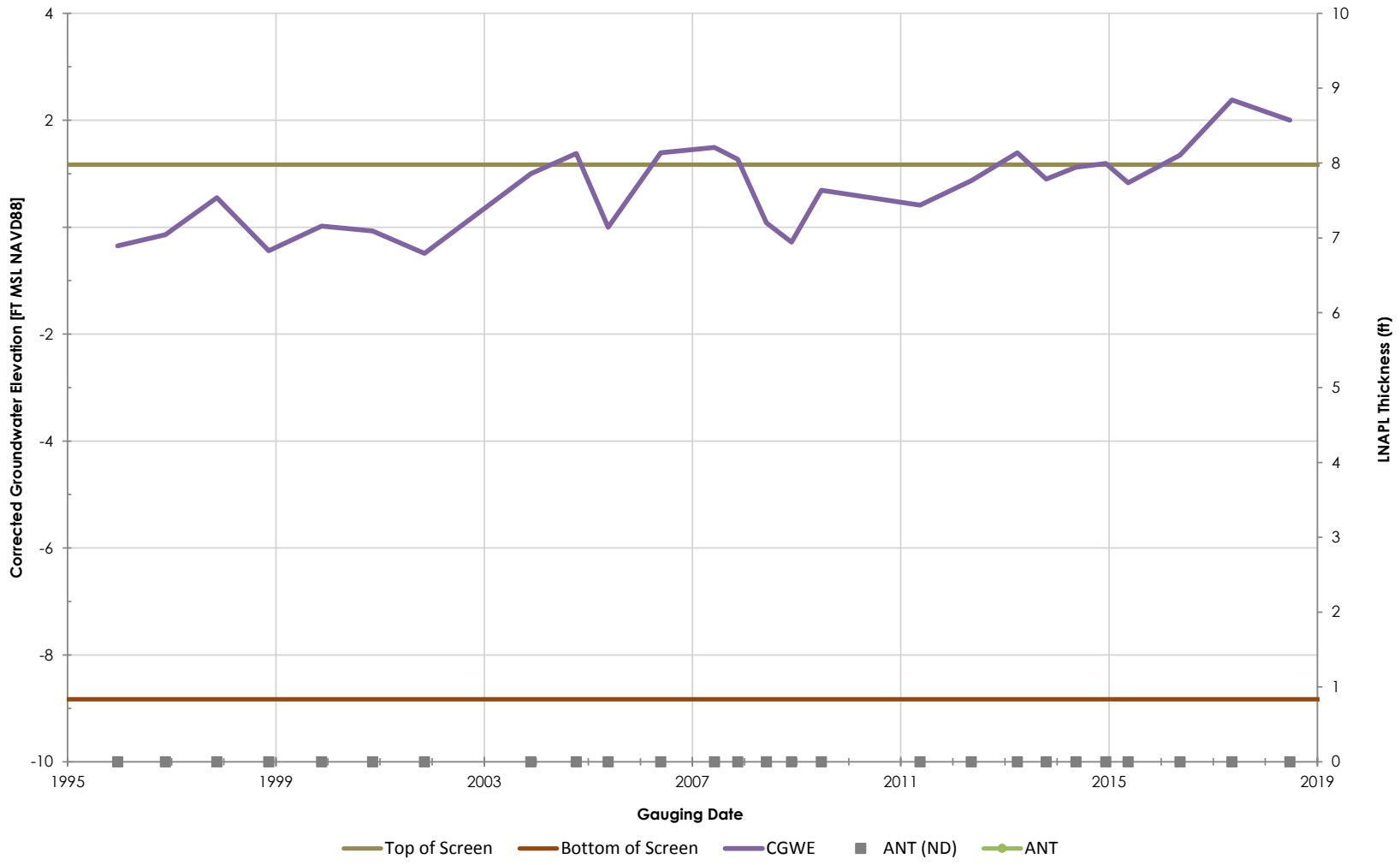
Stantec

Figure/Well No.

C-62

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

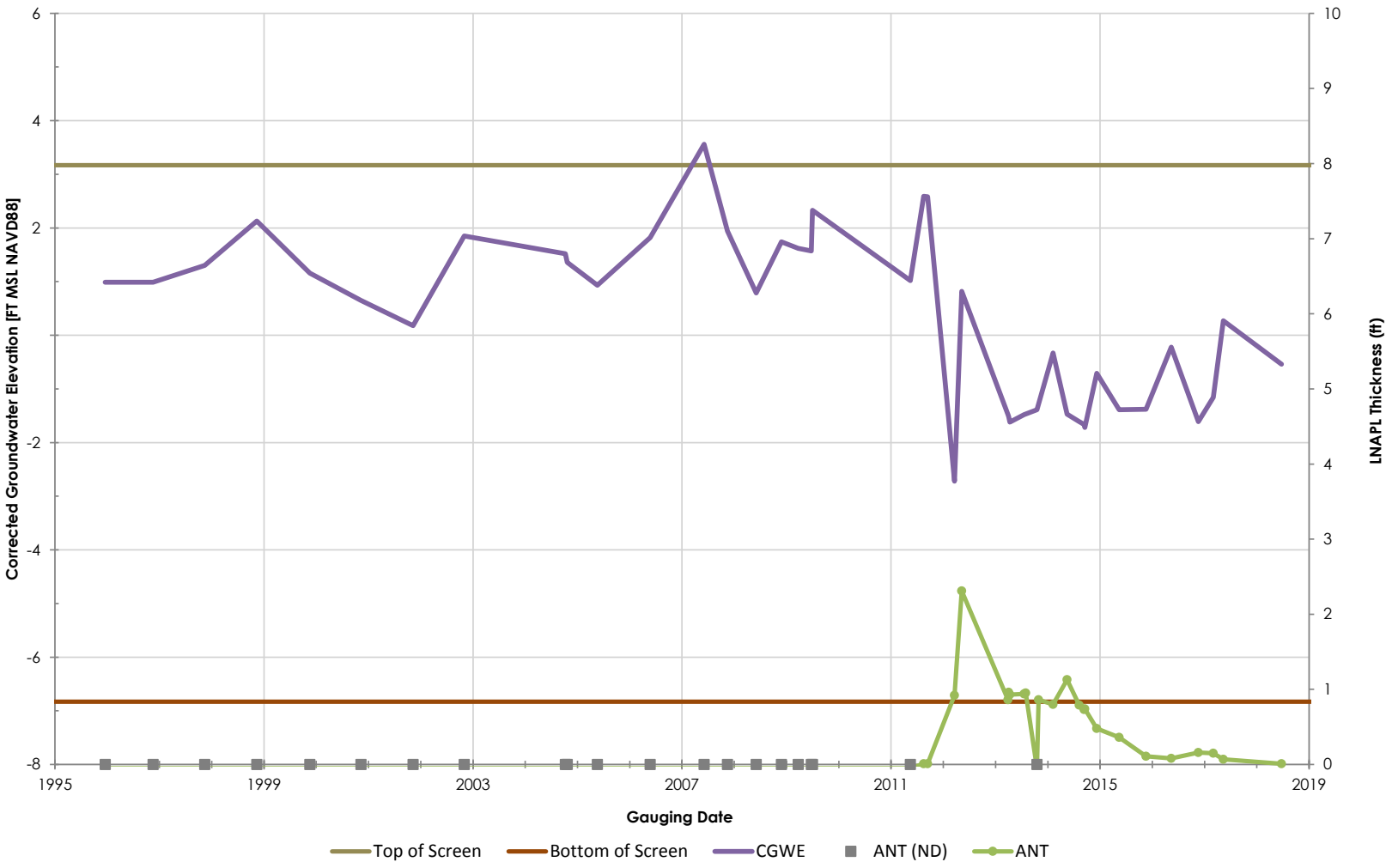
Stantec

Figure/Well No.

C-63

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

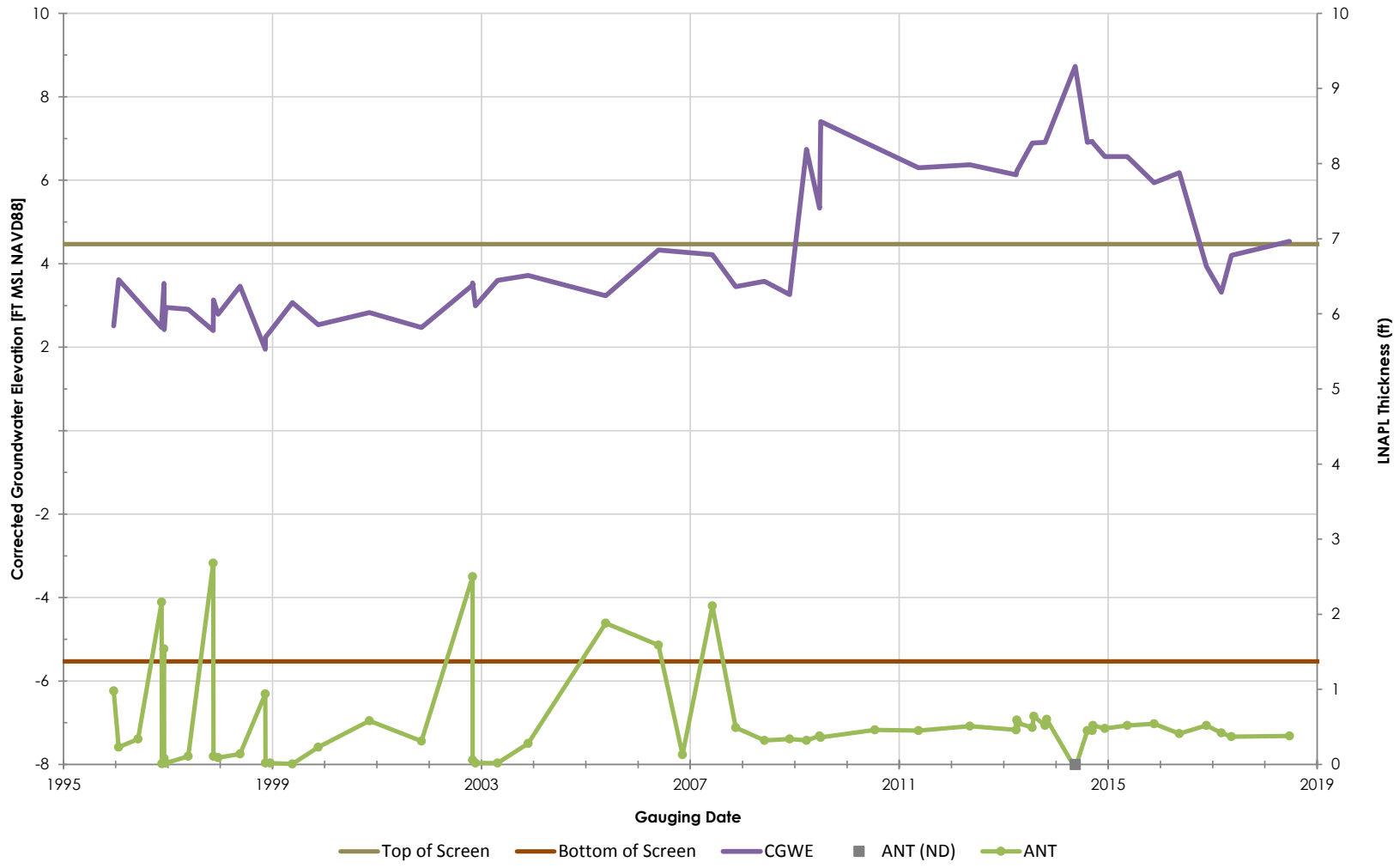
Stantec

Figure/Well No.

C-64

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

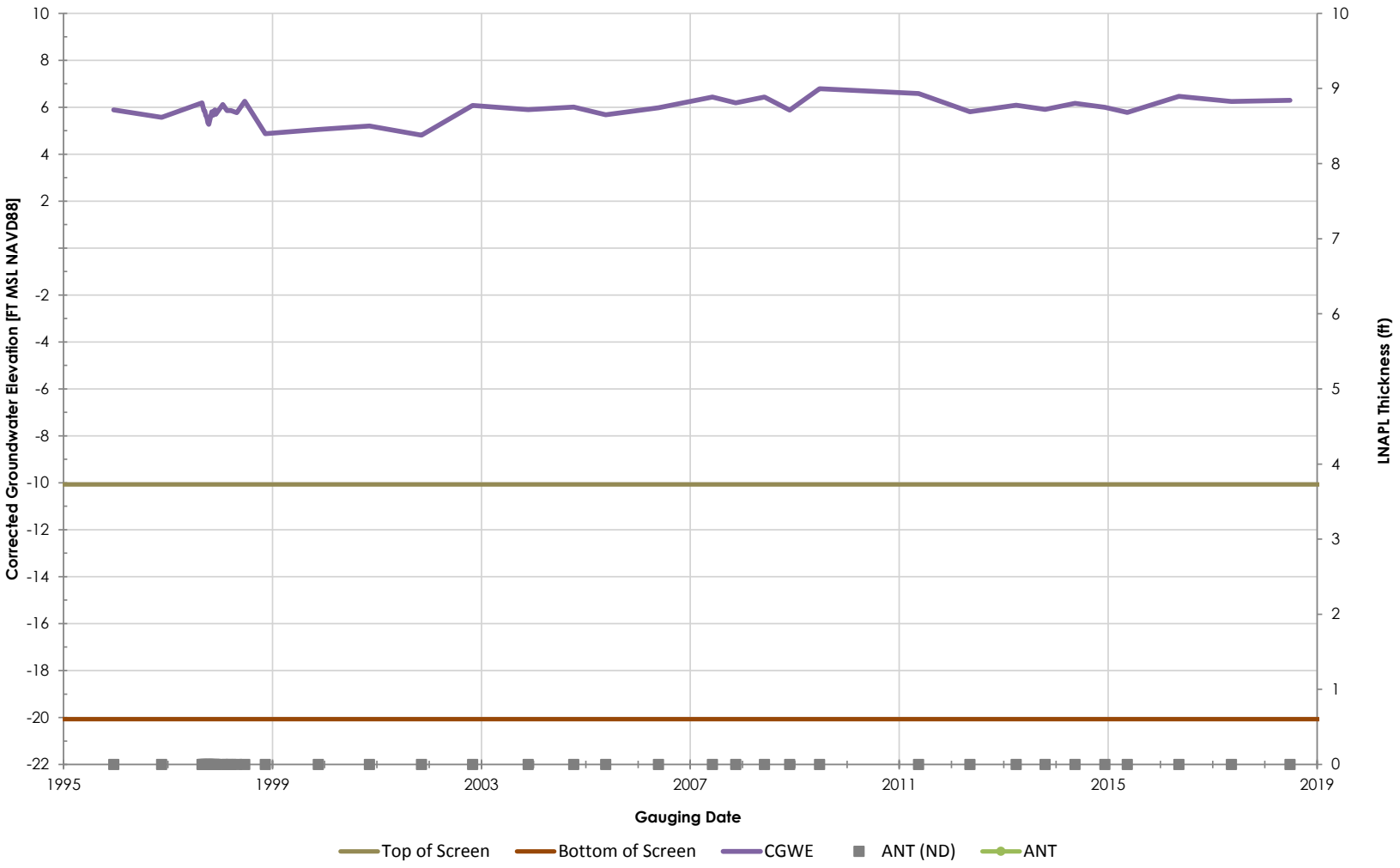
Stantec

Figure/Well No.

C-65

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

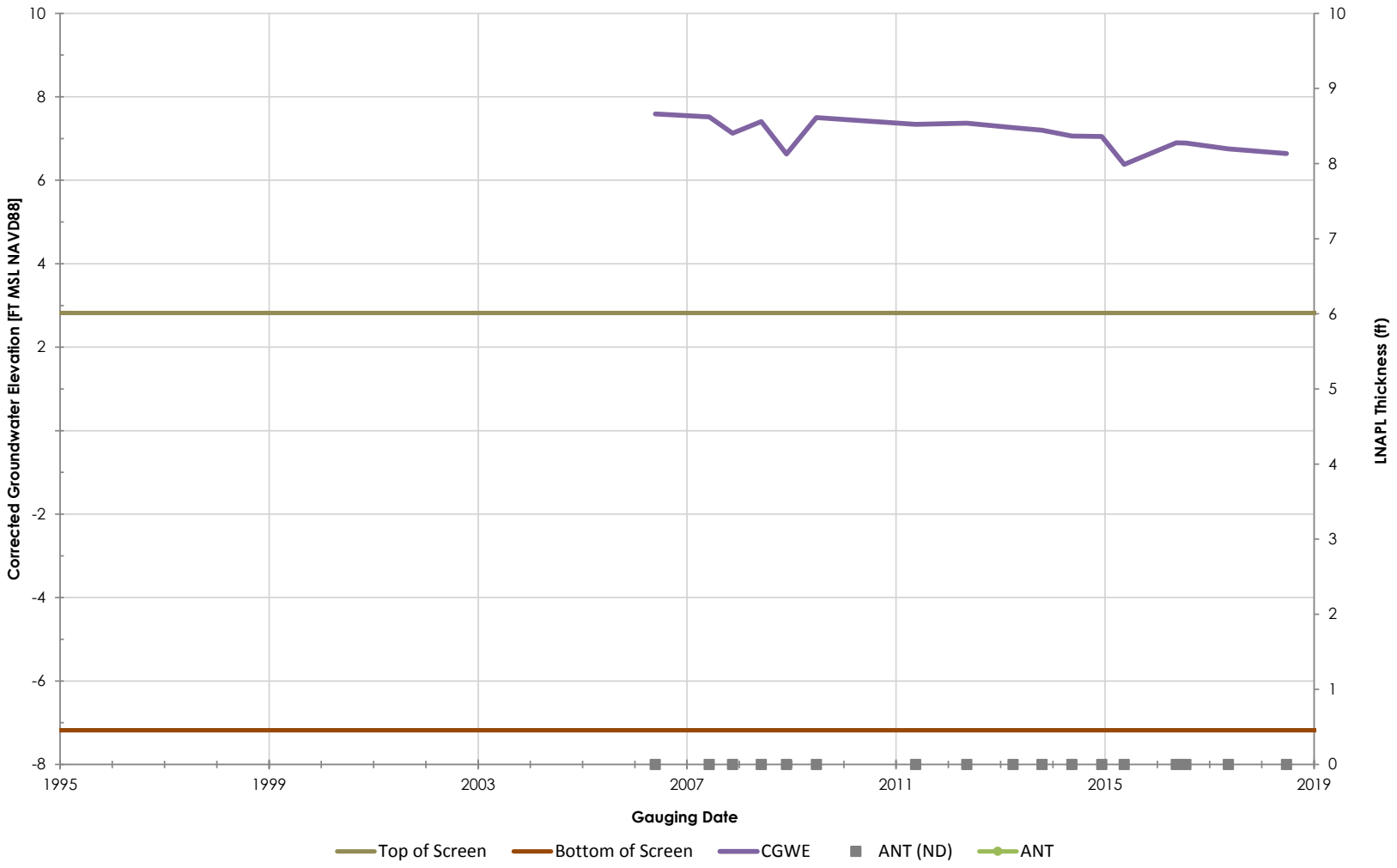
Stantec

Figure/Well No.

C-95

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

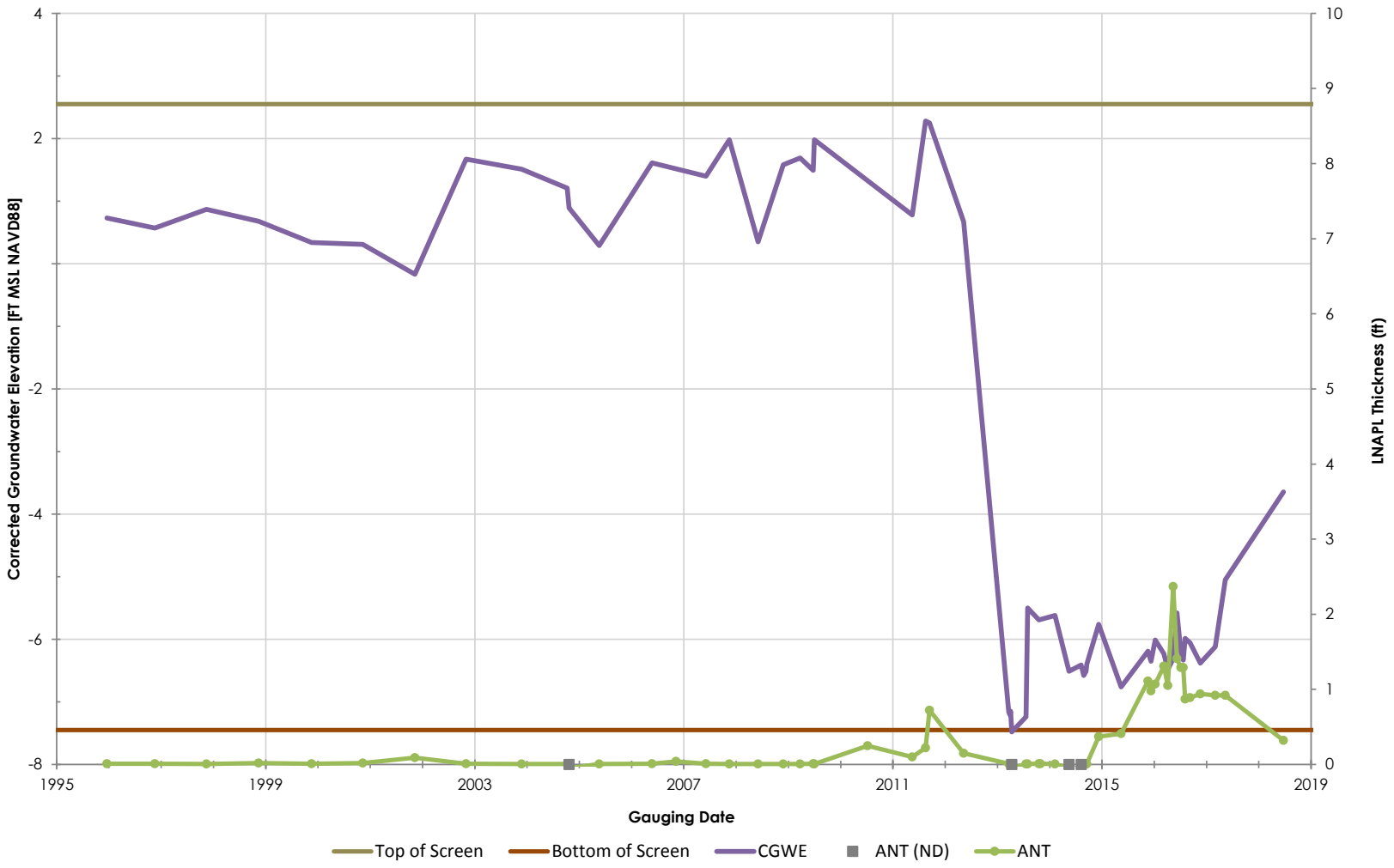
Stantec

Figure/Well No.

C-96

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

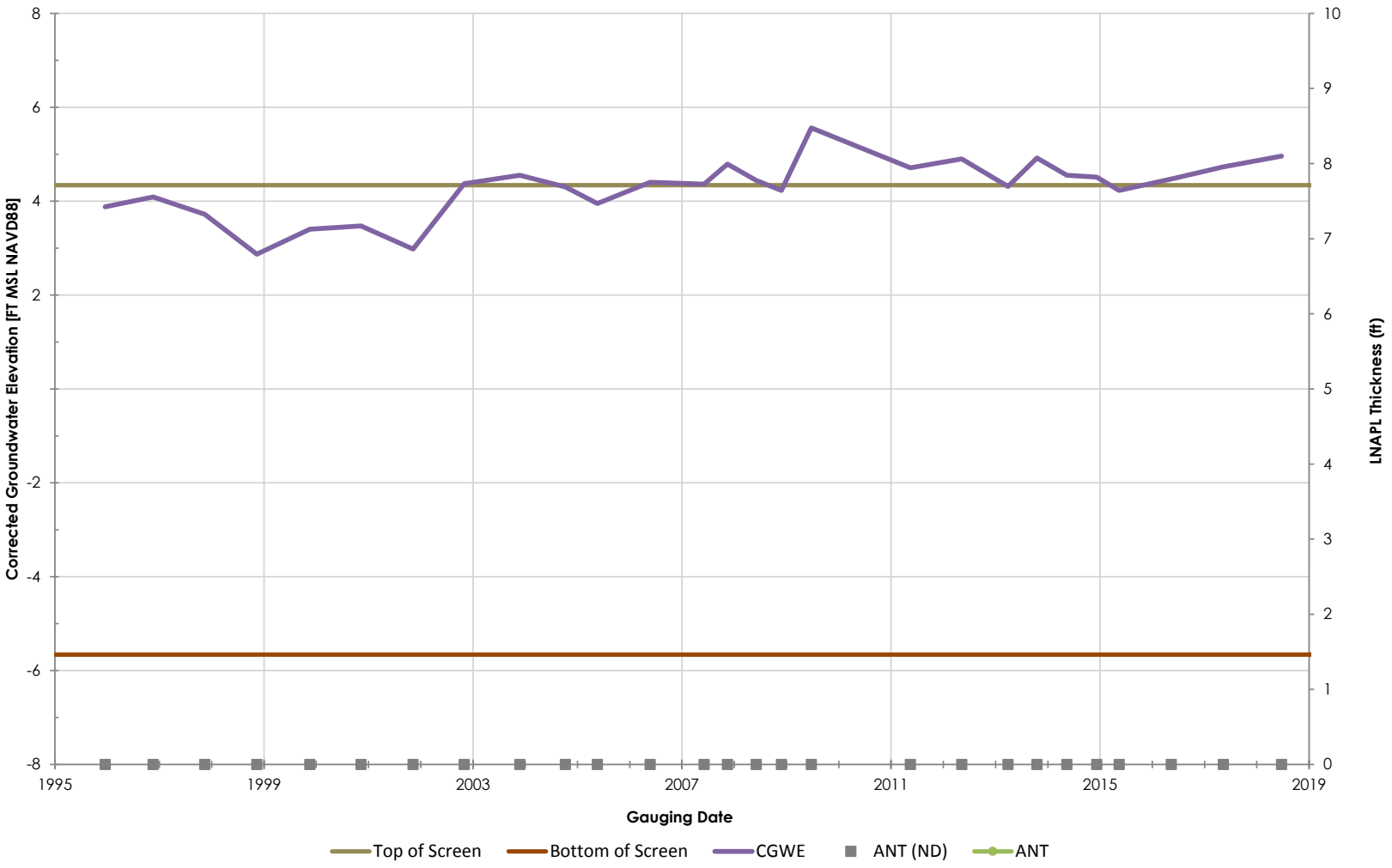
Stantec

Figure/Well No.

C-97

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

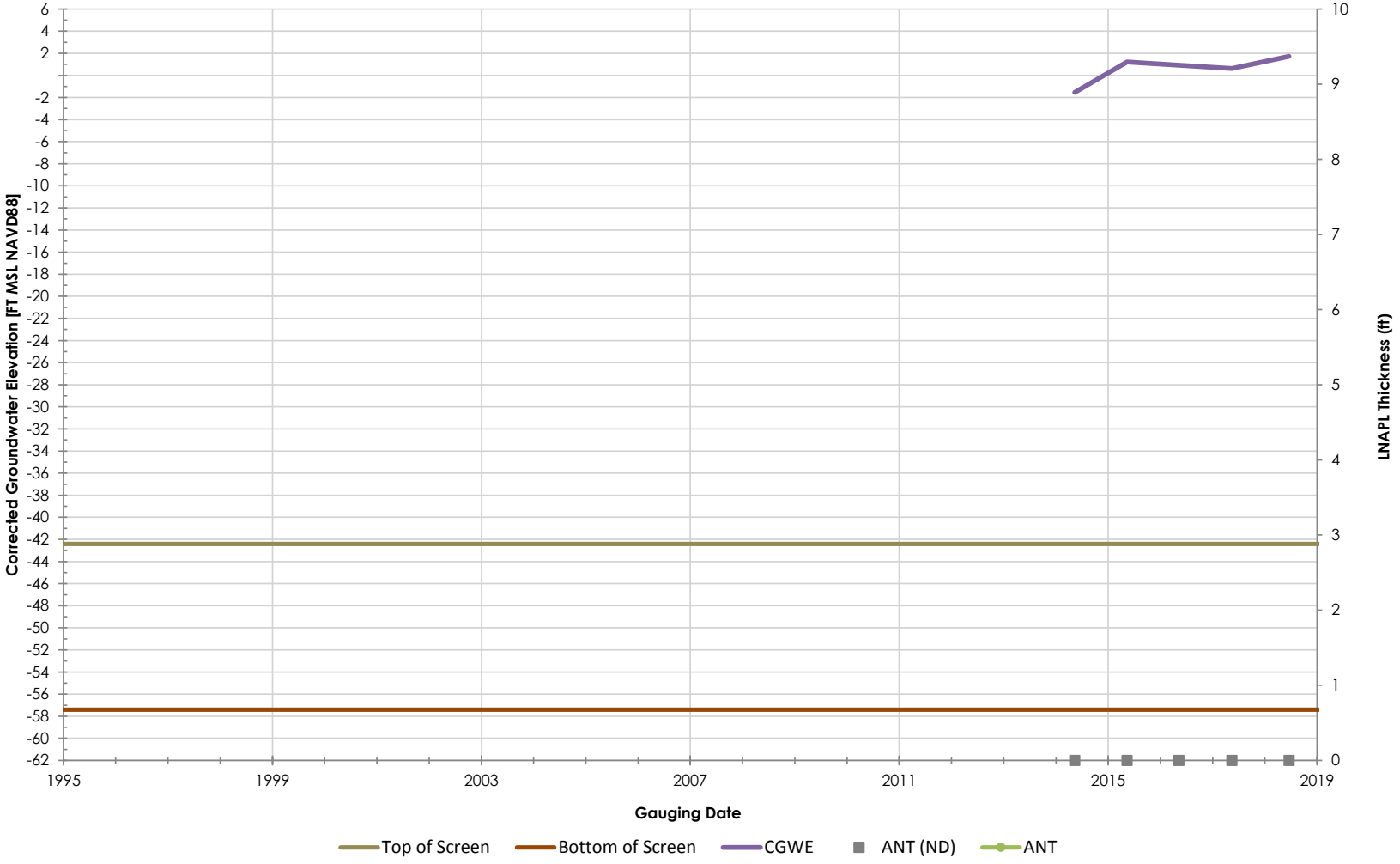
Stantec

Figure/Well No.

C-98

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

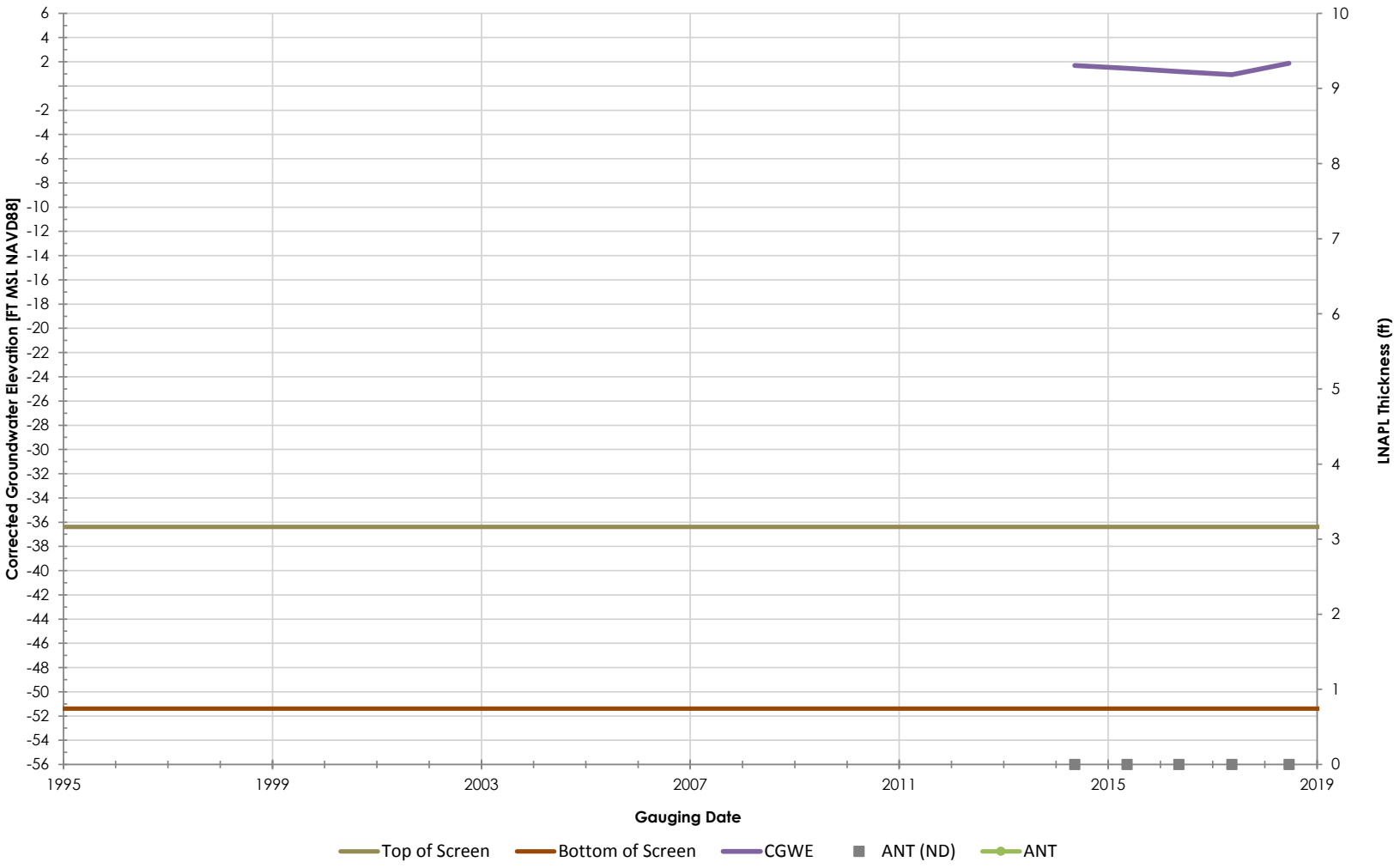
Stantec

Figure/Well No.

CSX-DW-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



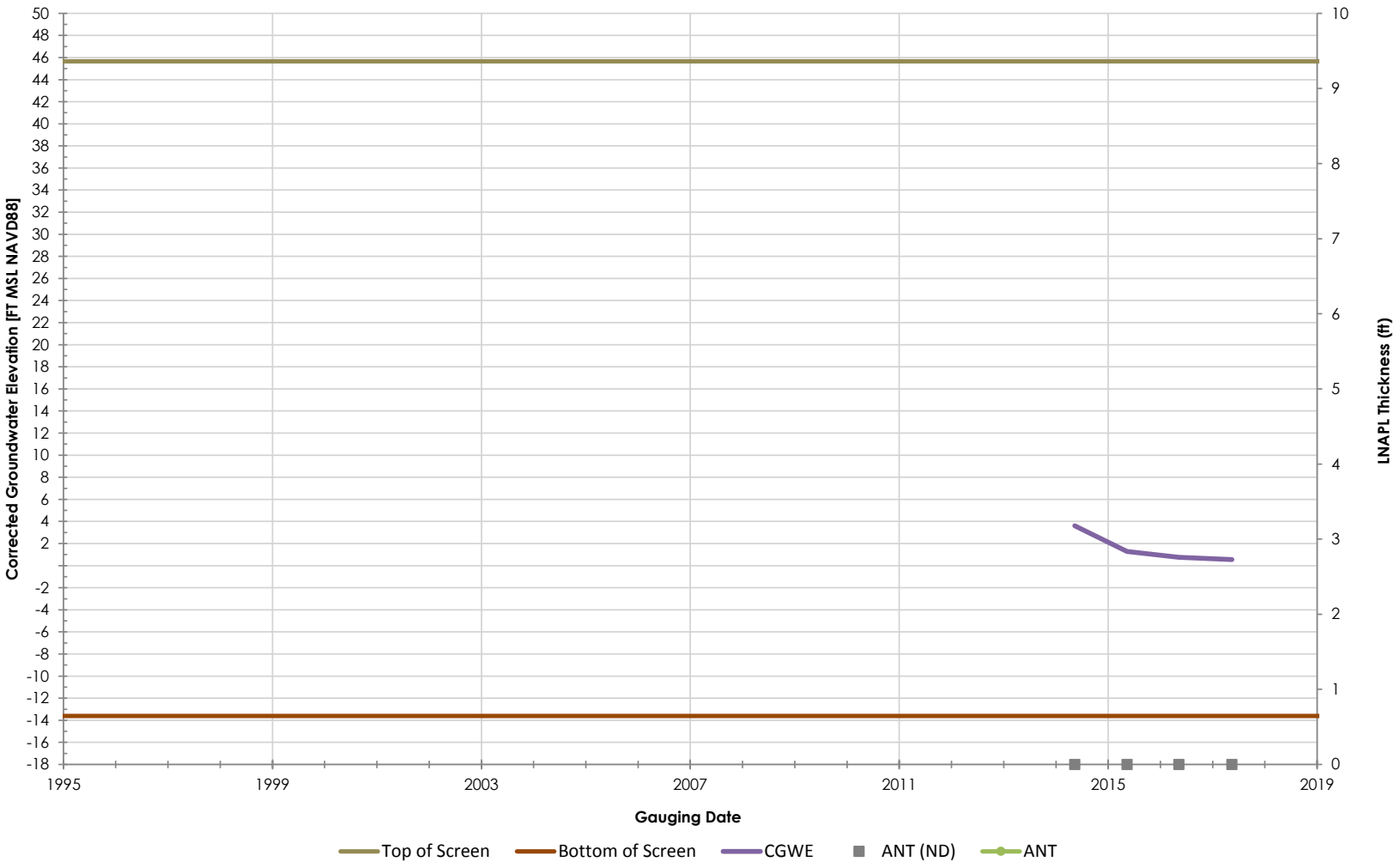
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

CSX-DW-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



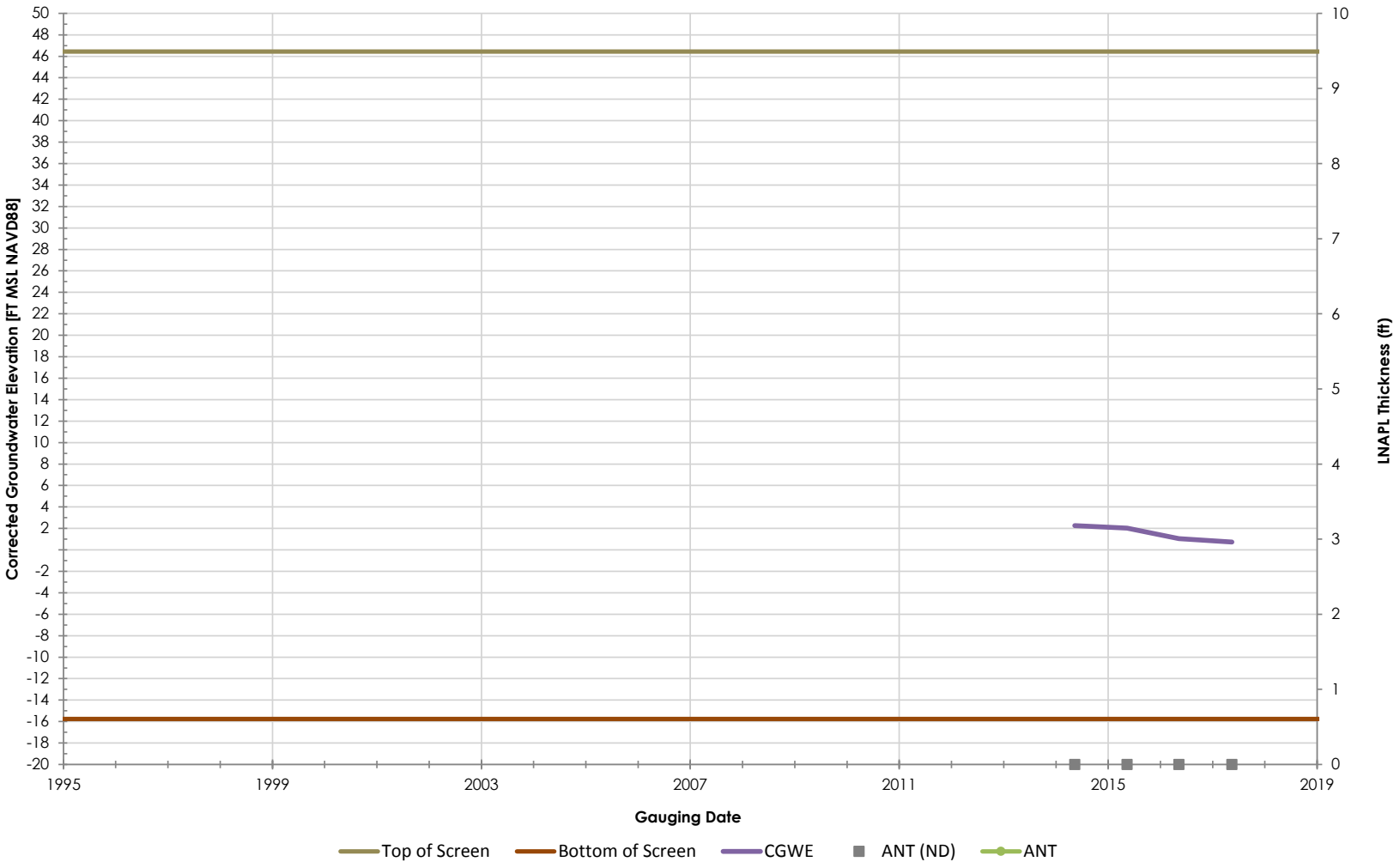
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

CSX-MW2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



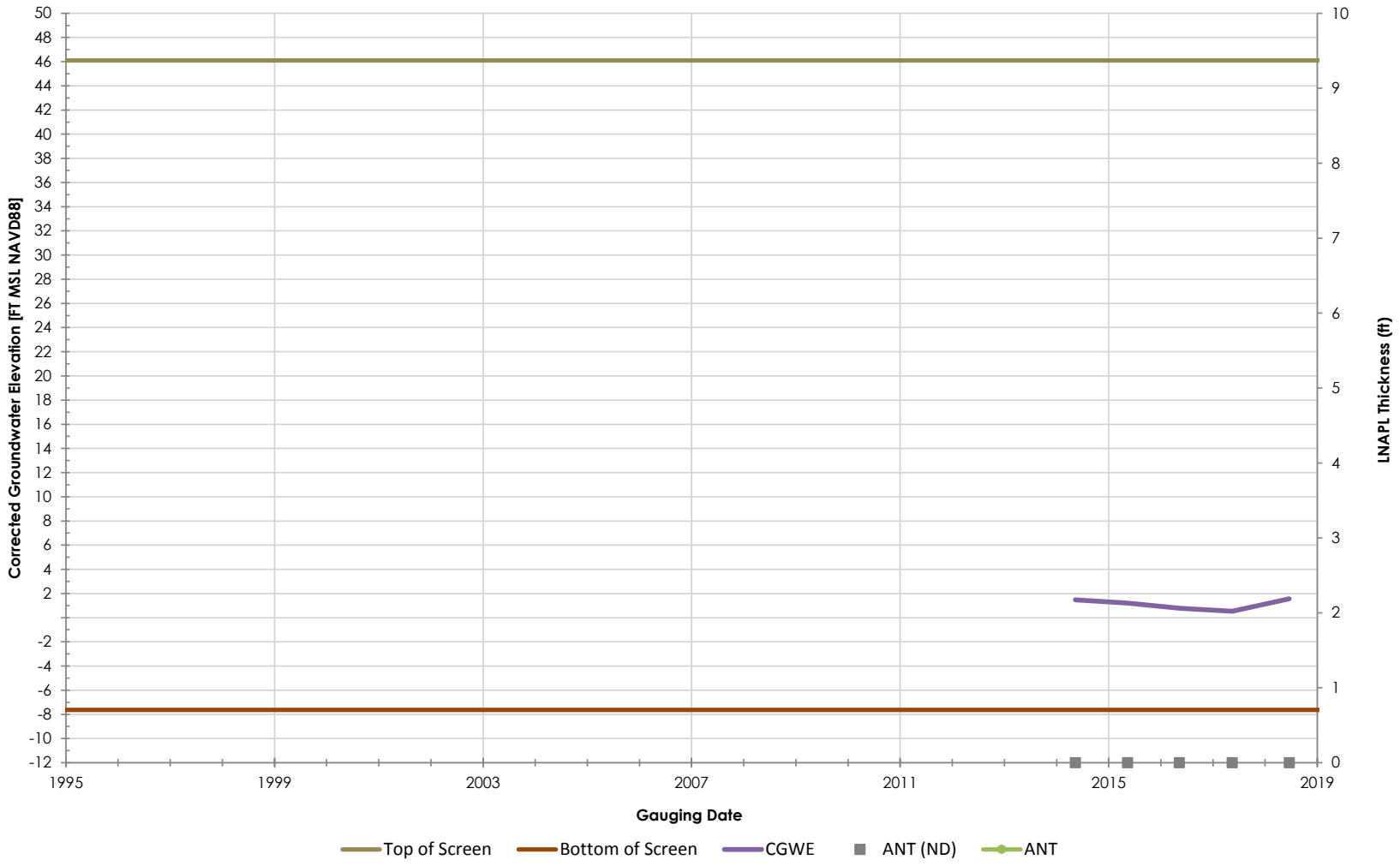
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

CSX-MW3A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

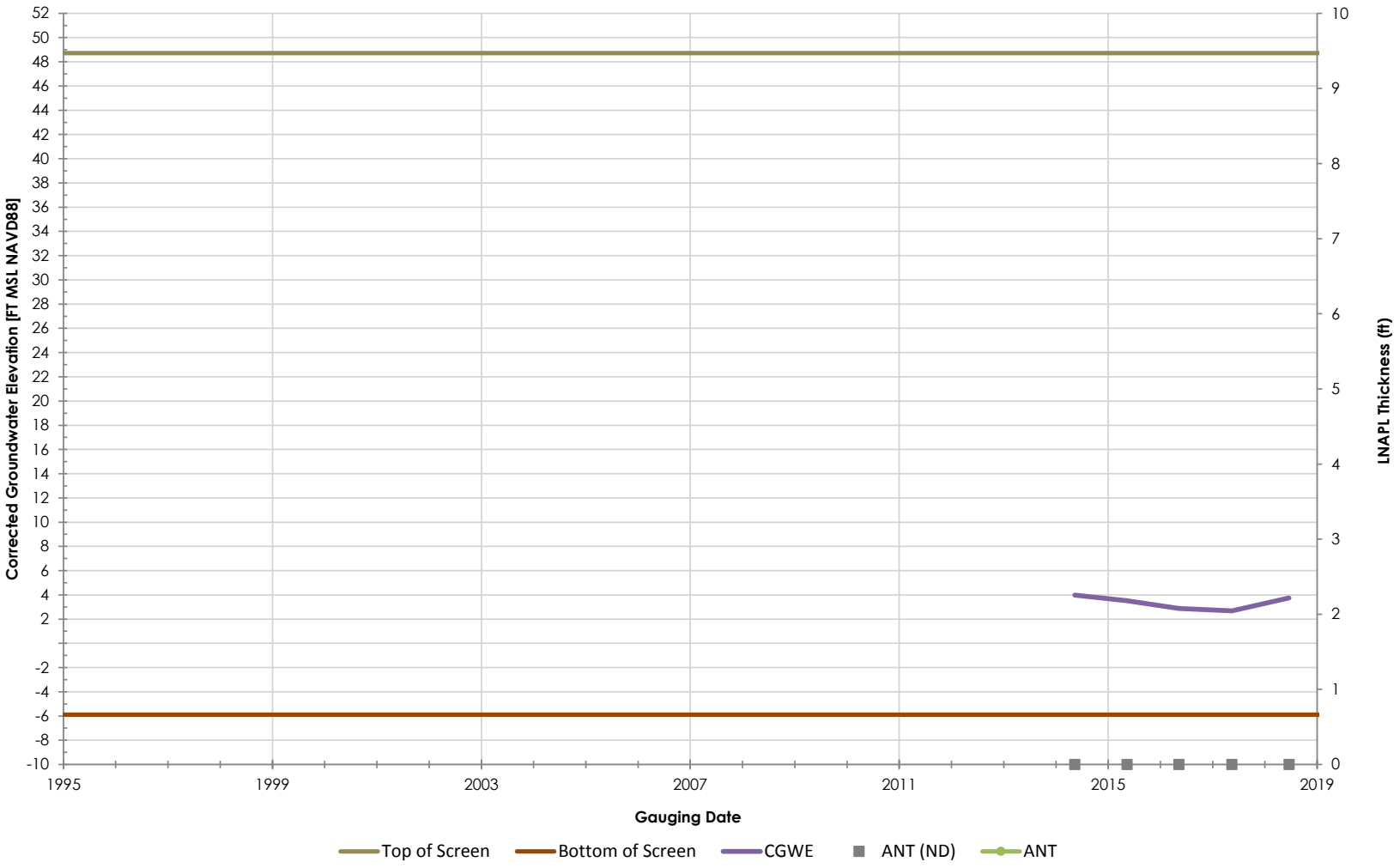
Stantec

Figure/Well No.

CSX-MW4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

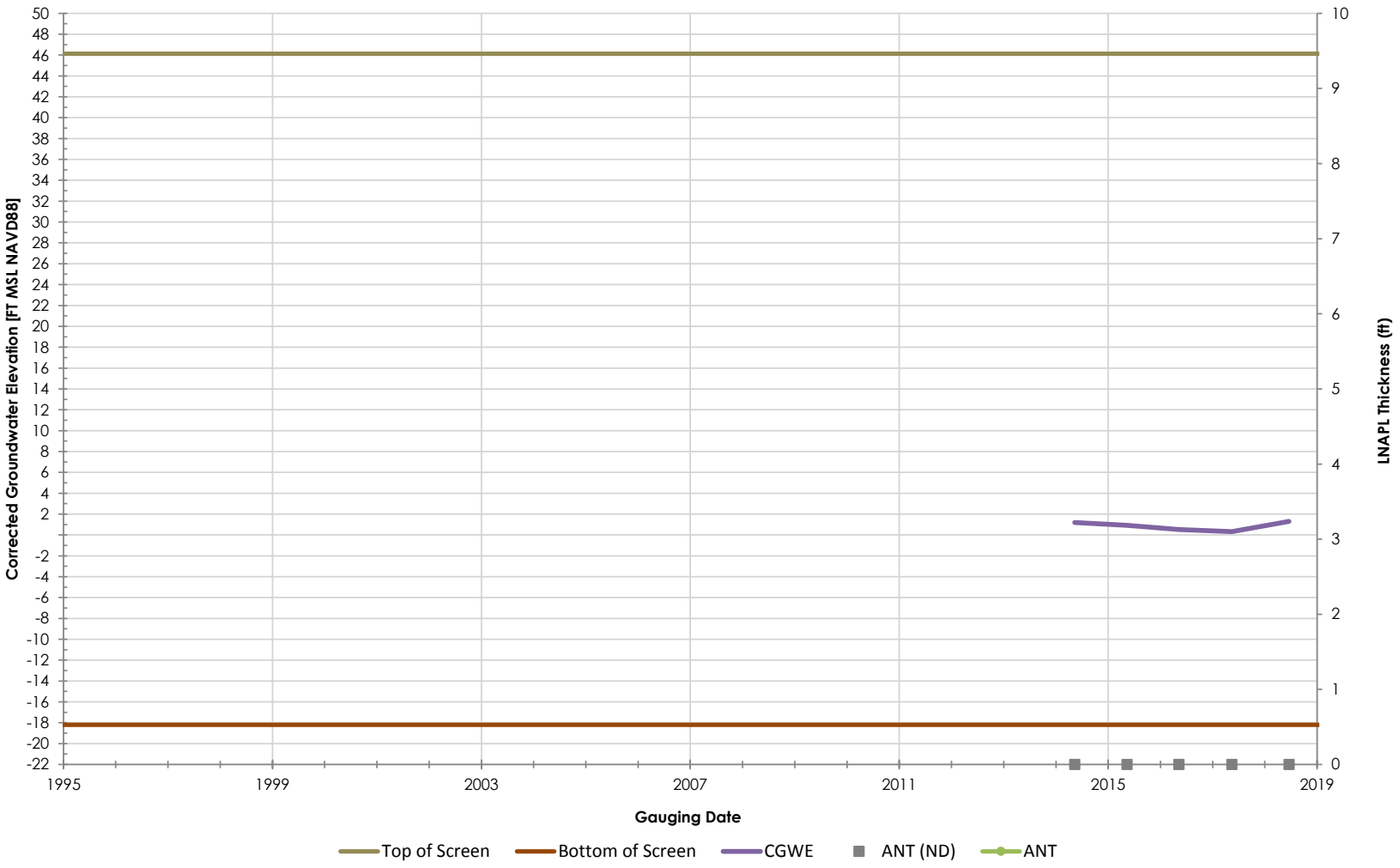
Stantec

Figure/Well No.

CSX-MW5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



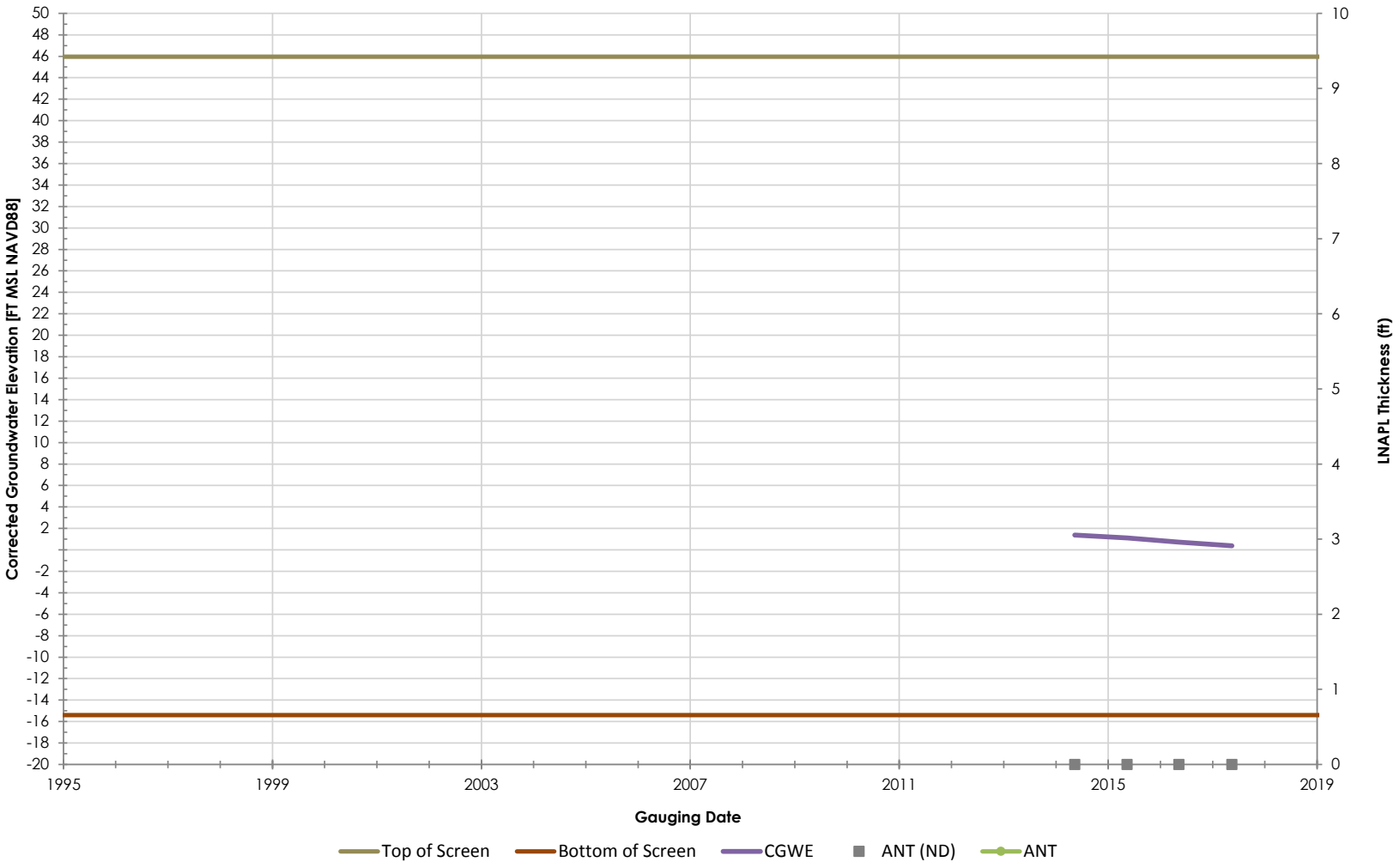
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

CSX-MW7

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



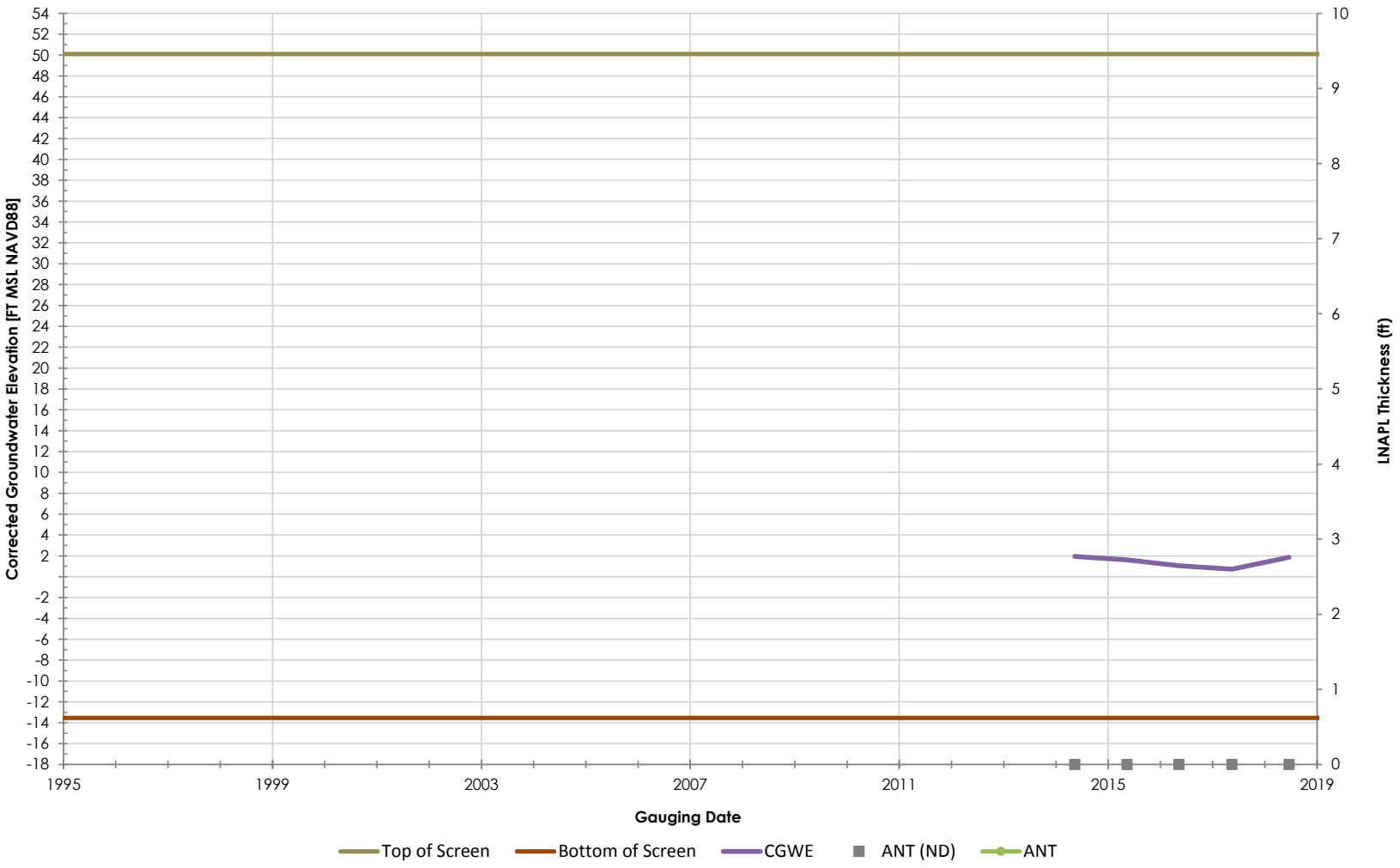
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

CSX-MW8

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



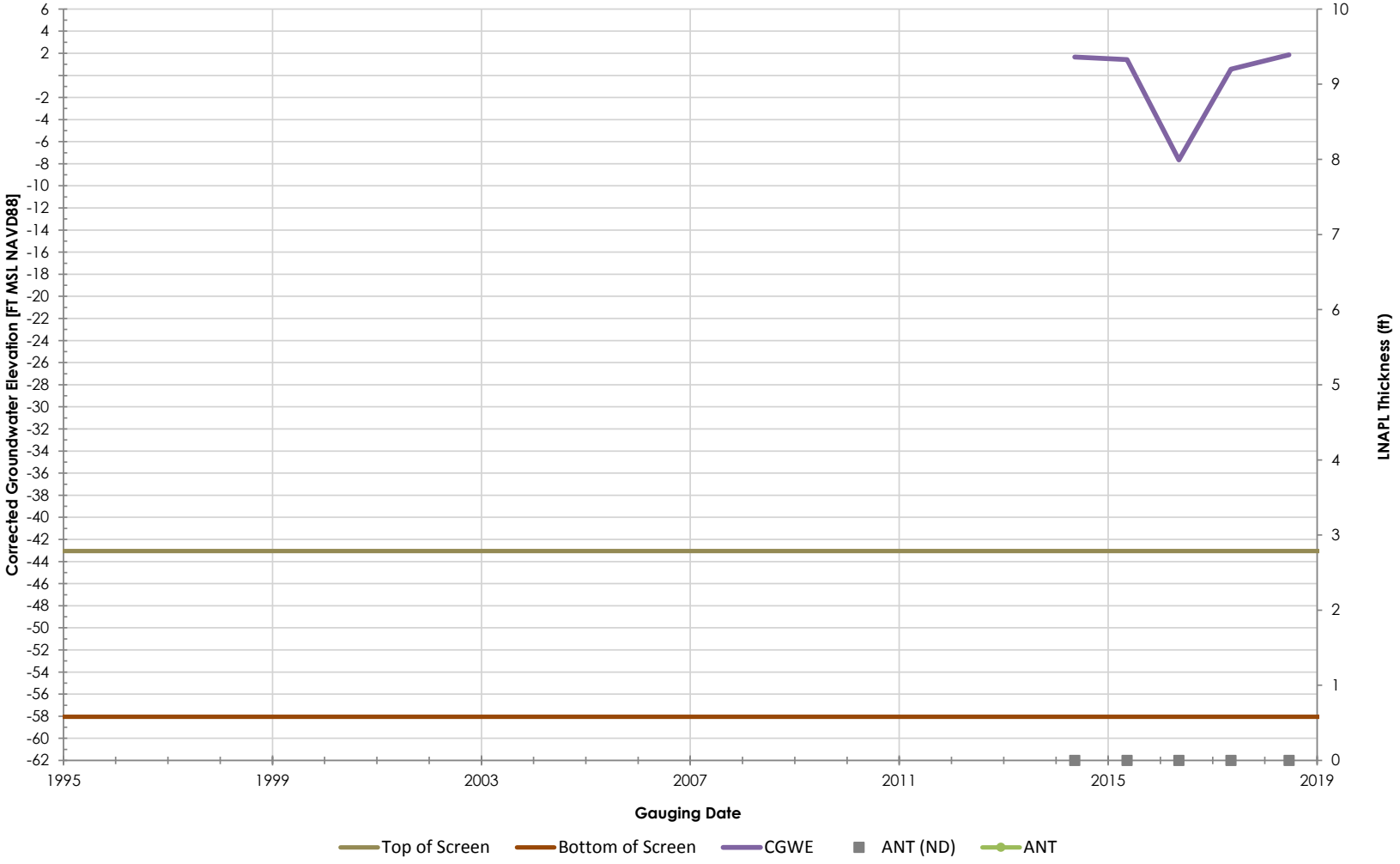
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

CSX-MW9

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

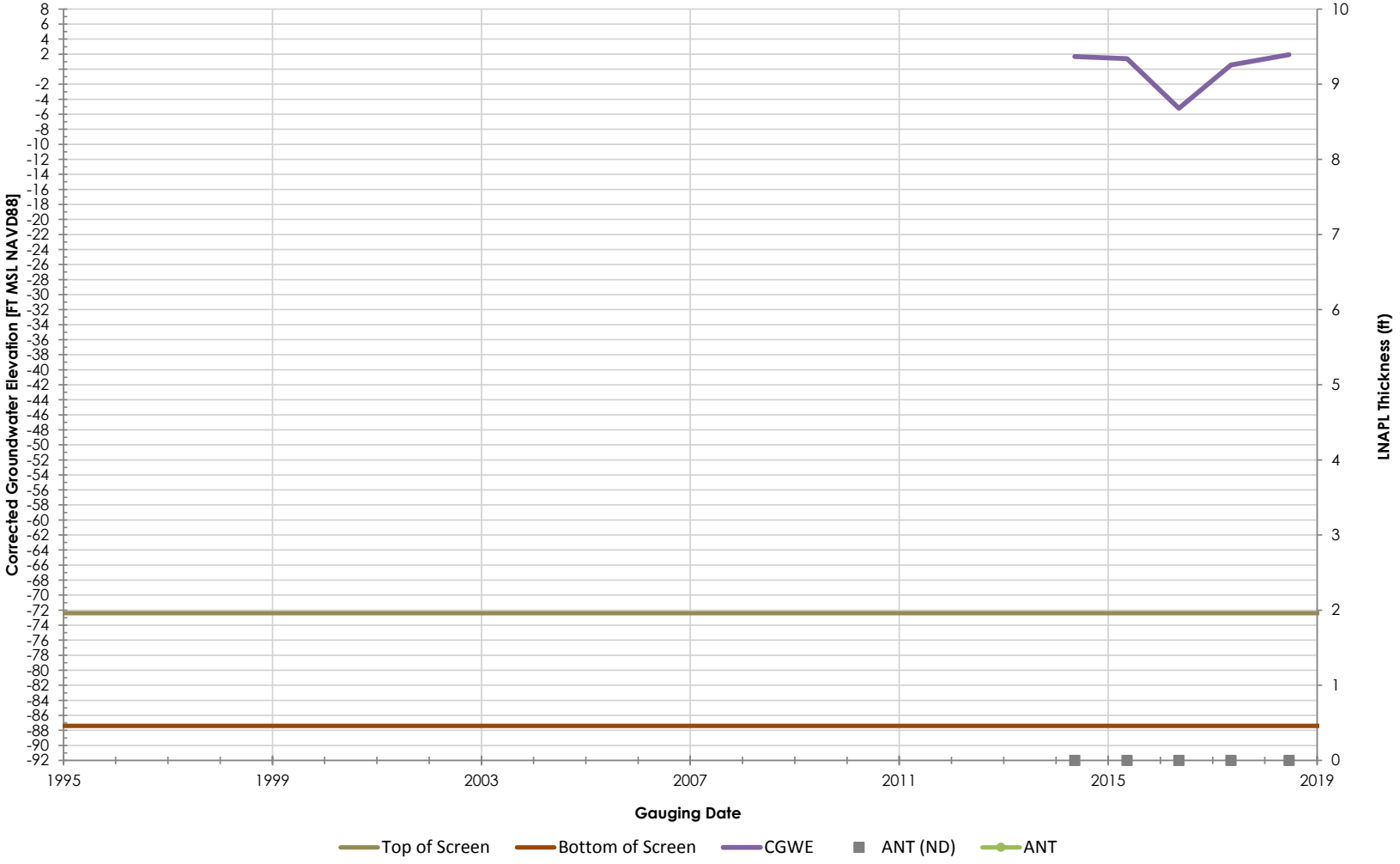
Stantec

Figure/Well No.

DSCP-DW-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

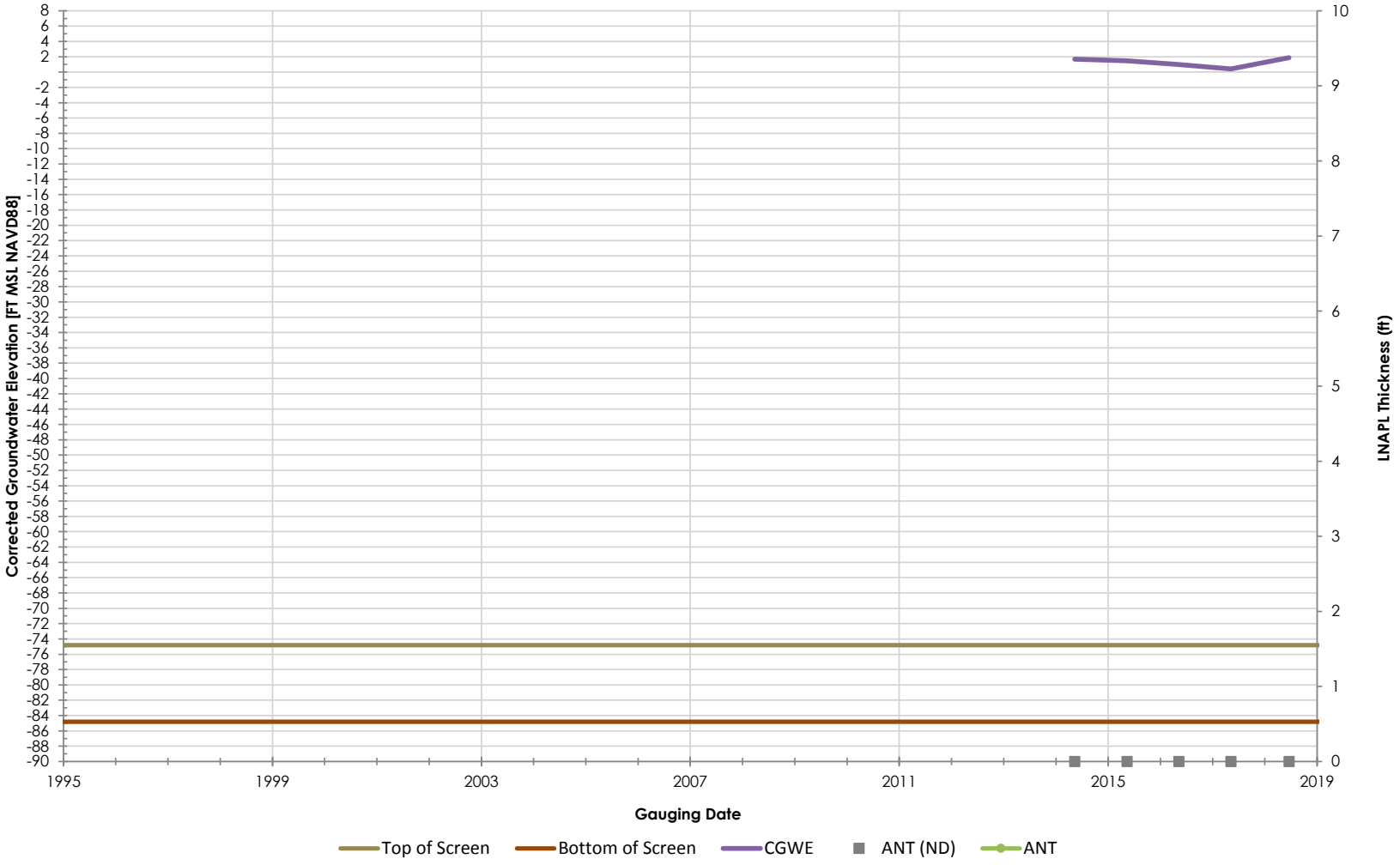
Stantec

Figure/Well No.

DSCP-DW-12

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



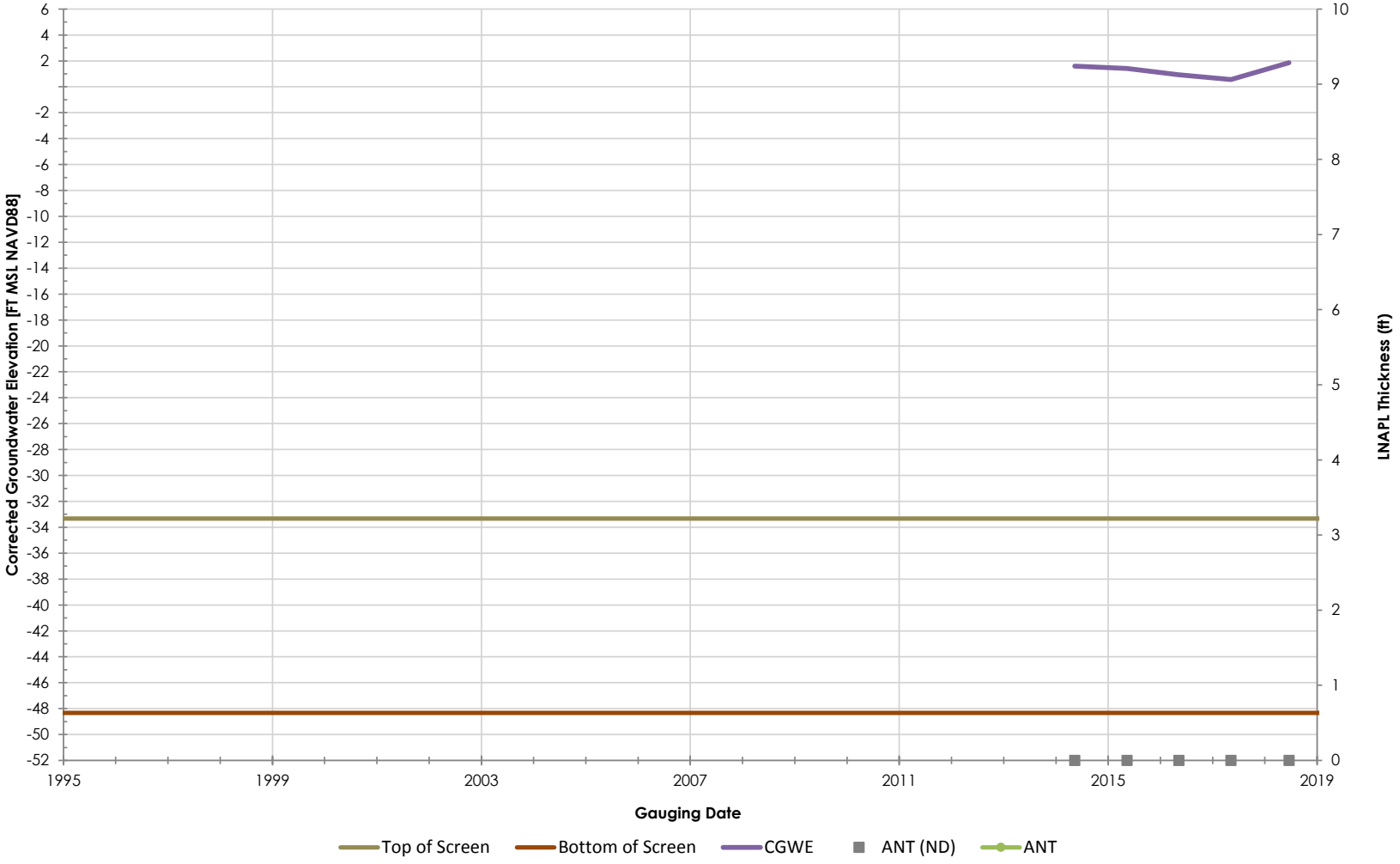
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

DSCP-DW-13

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



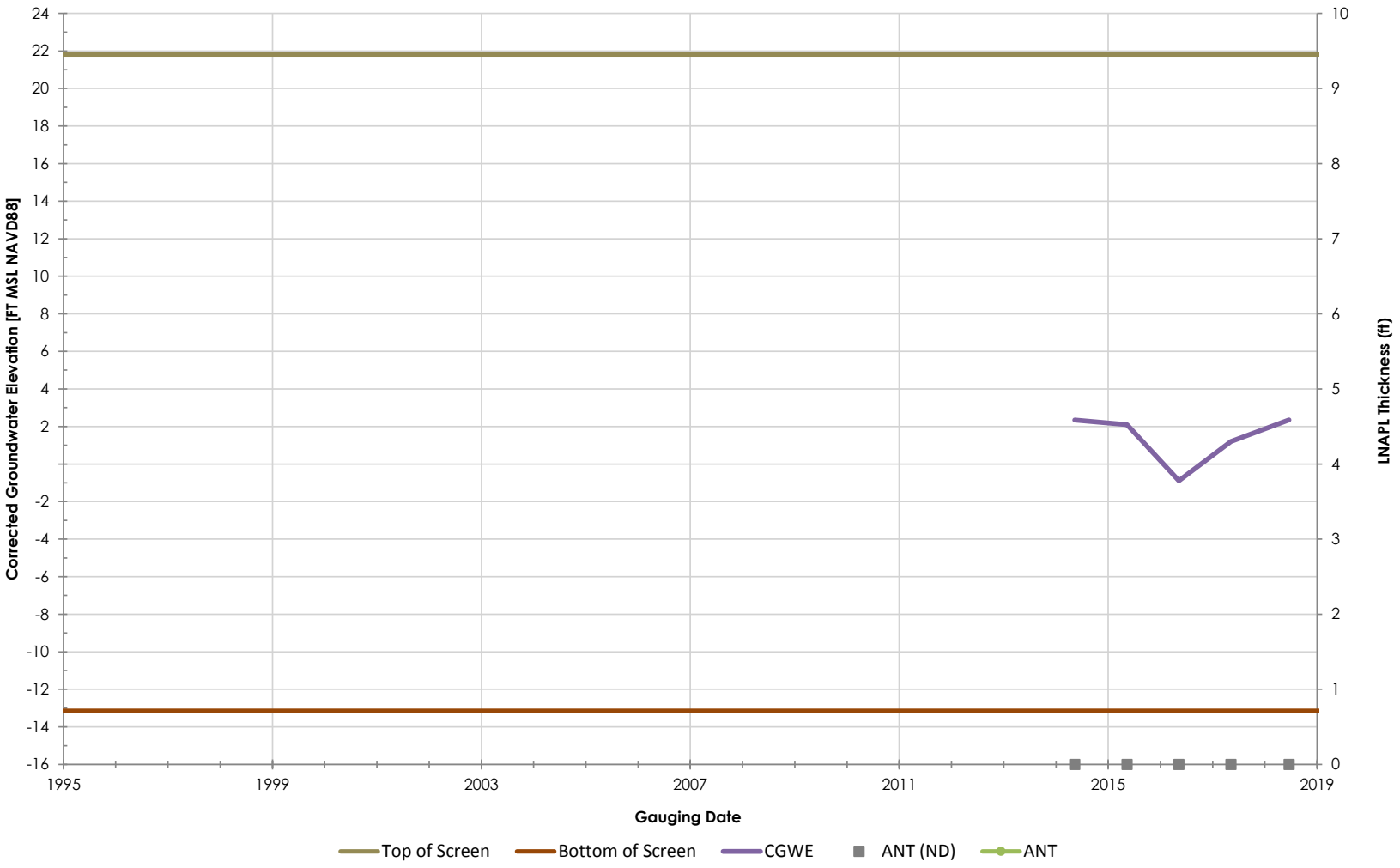
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

DSCP-DW-6

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

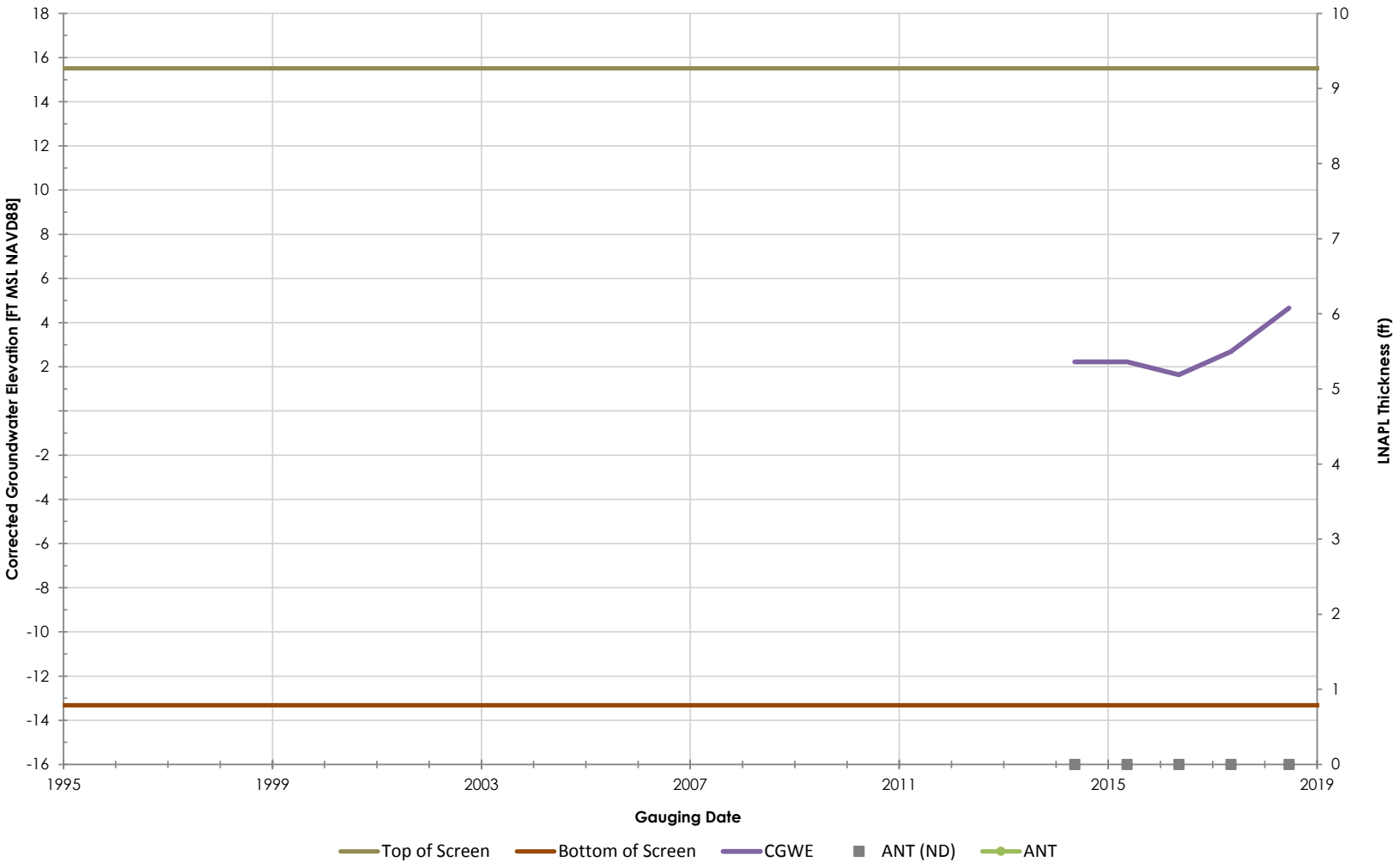
Stantec

Figure/Well No.

DSCP-MW-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

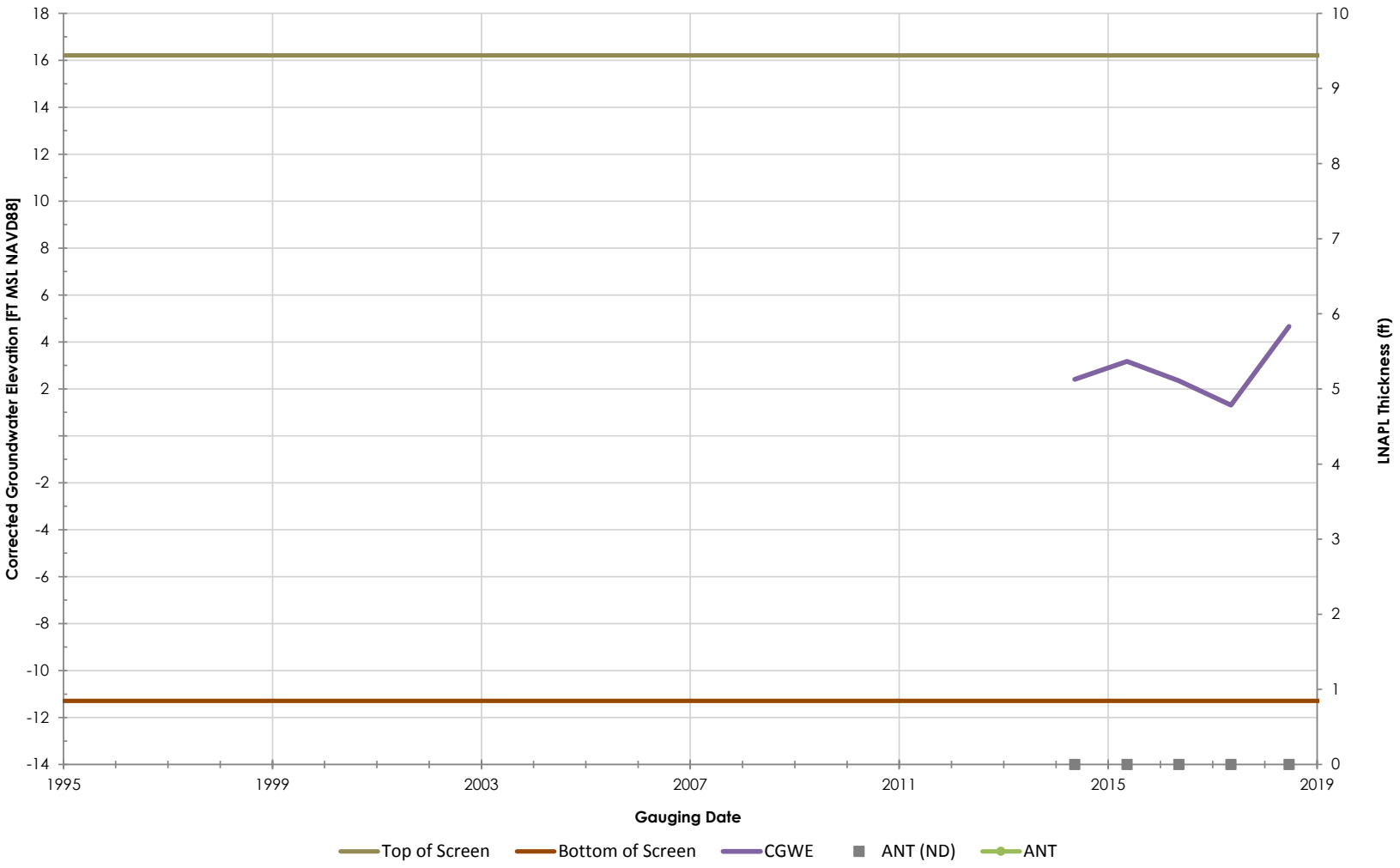
Stantec

Figure/Well No.

DSCP-MW-10

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

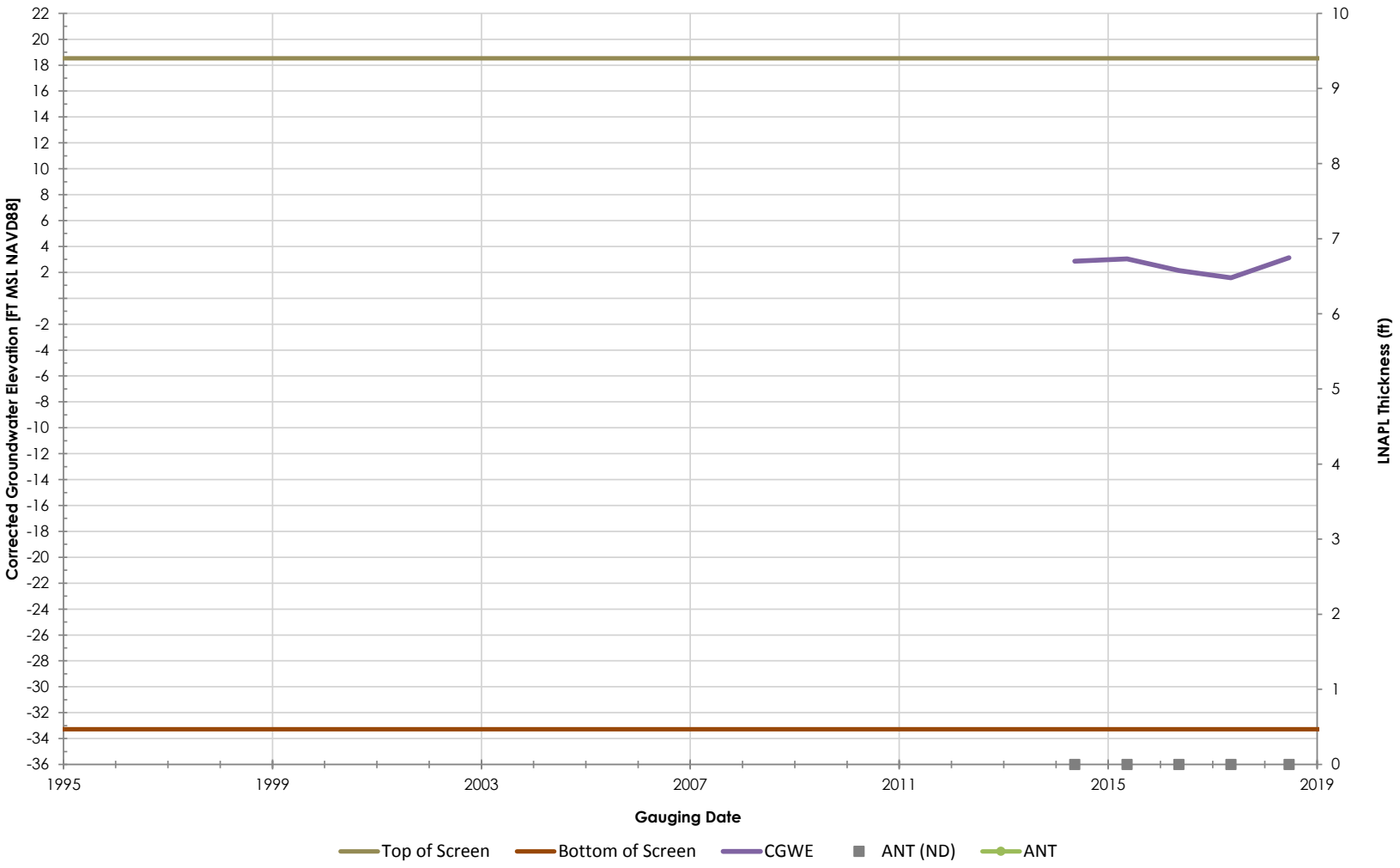
Stantec

Figure/Well No.

DSCP-MW-11

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



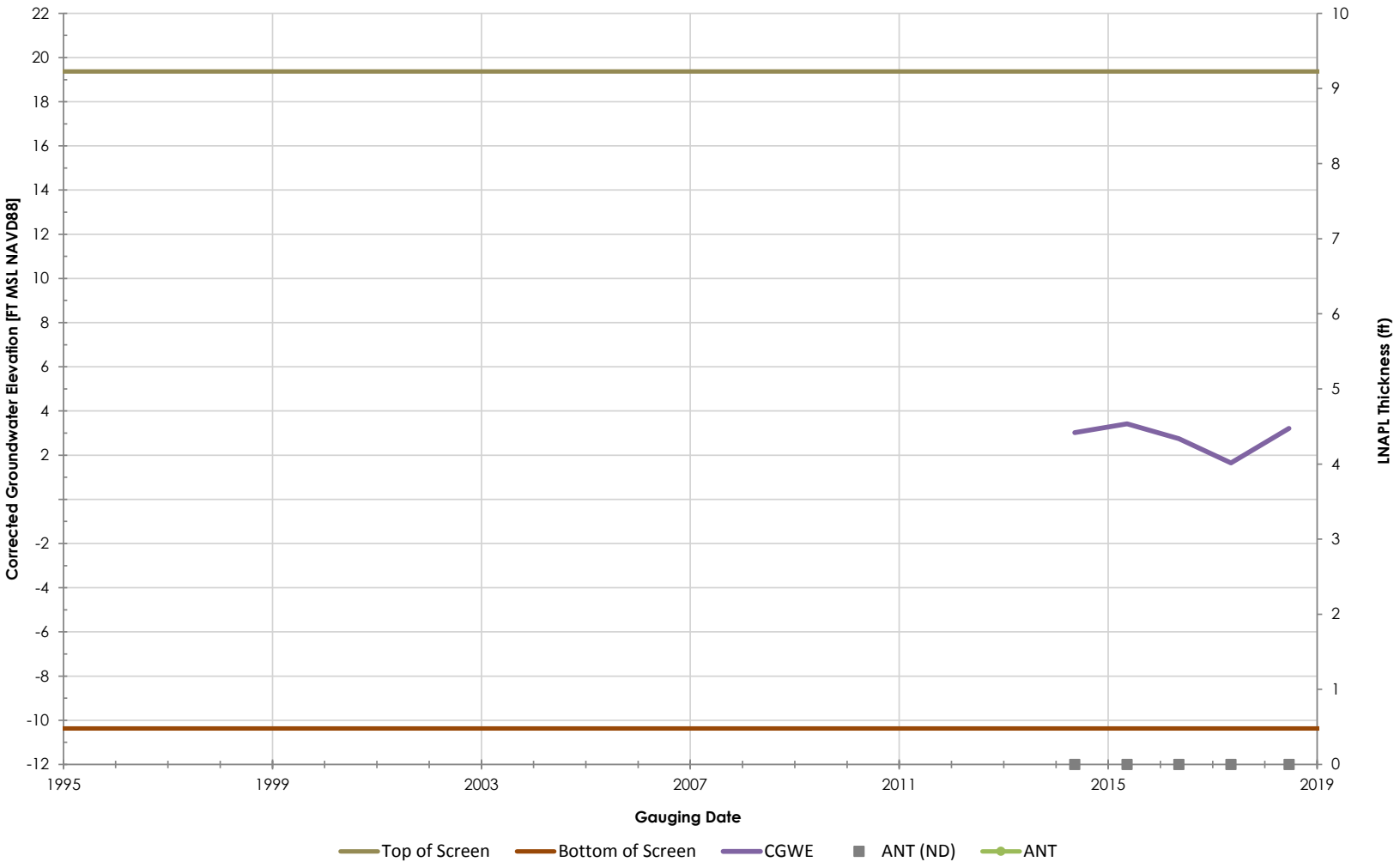
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

DSCP-MW-12

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

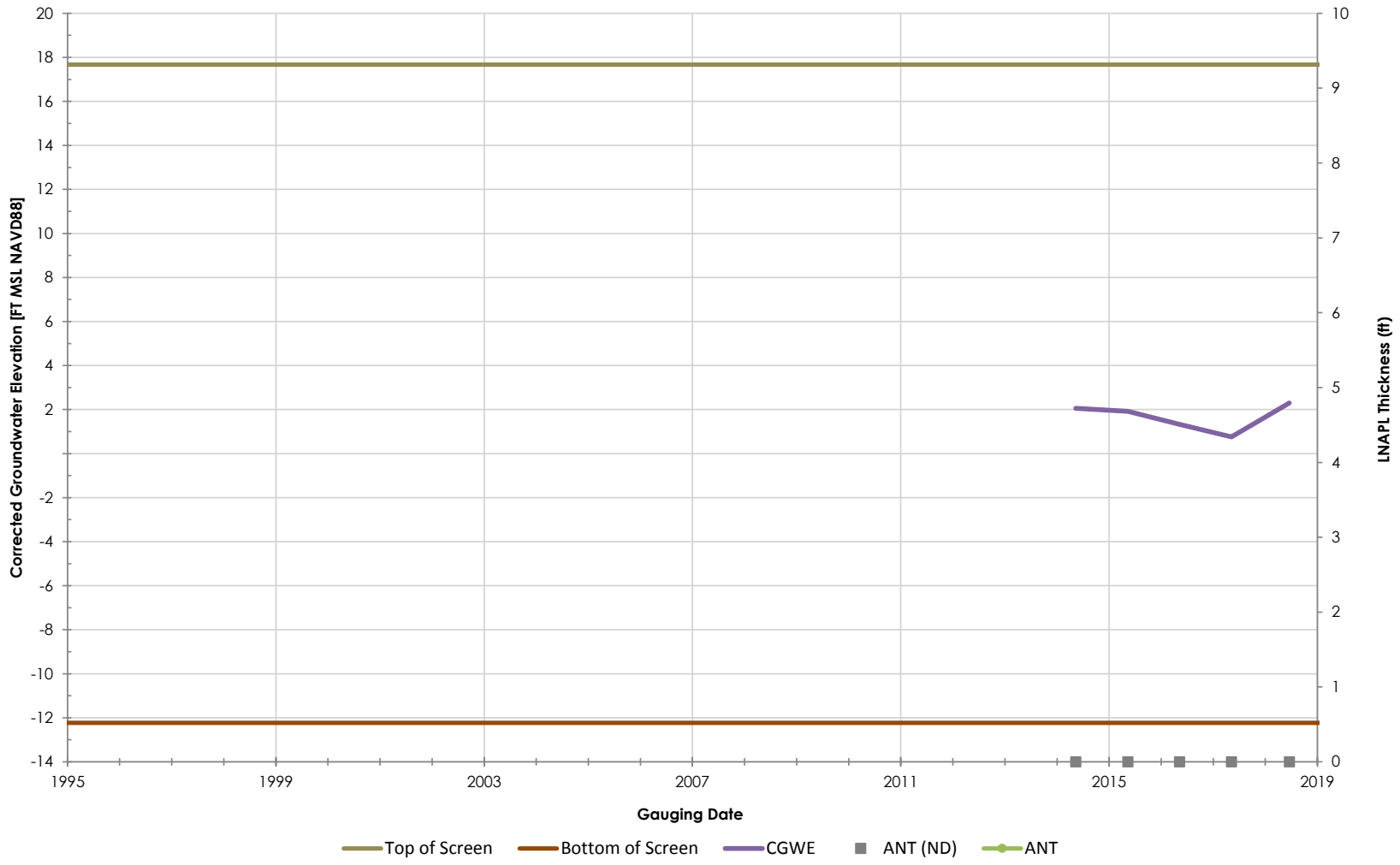
Stantec

Figure/Well No.

DSCP-MW-13

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

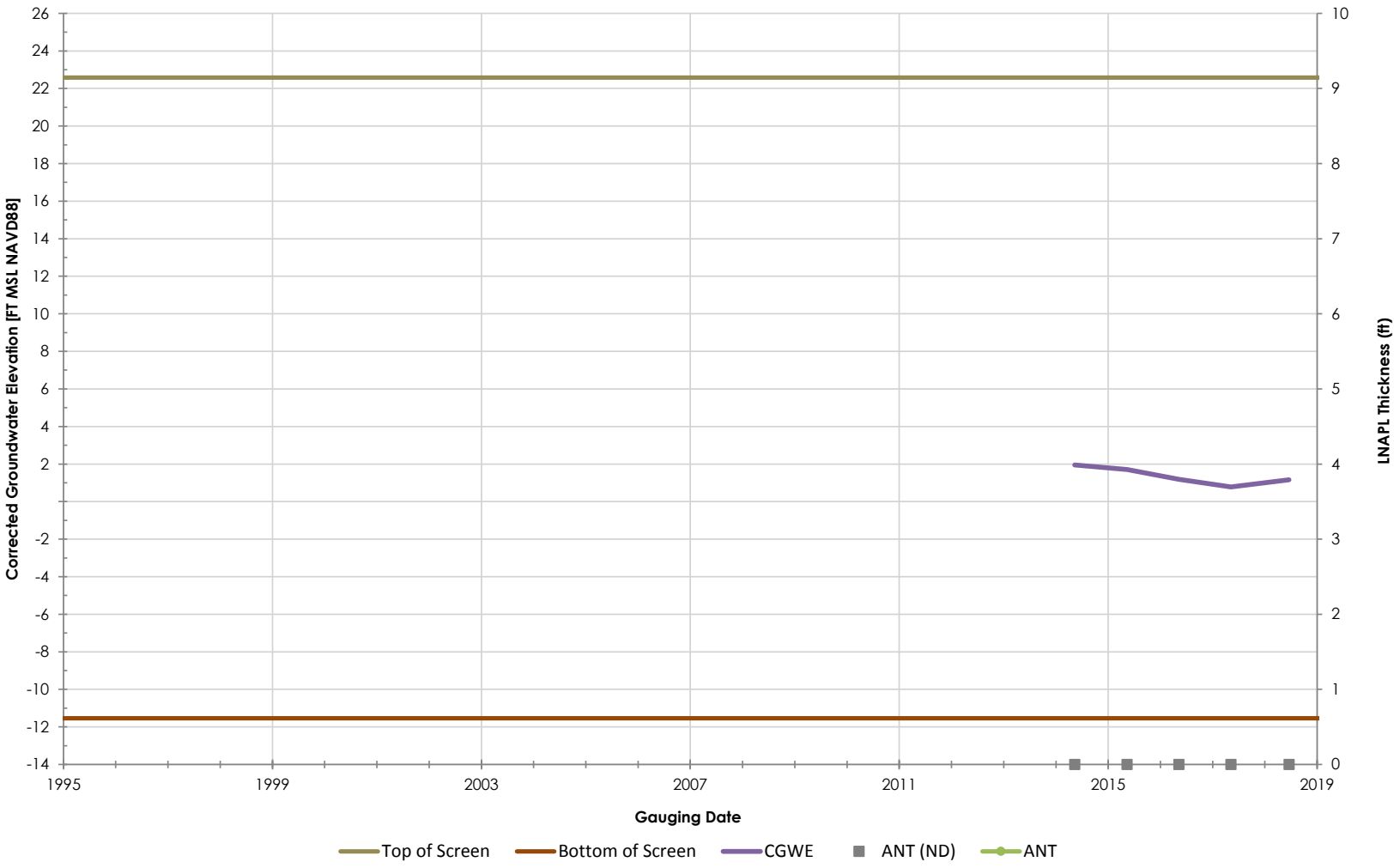
Stantec

Figure/Well No.

DSCP-MW-14

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

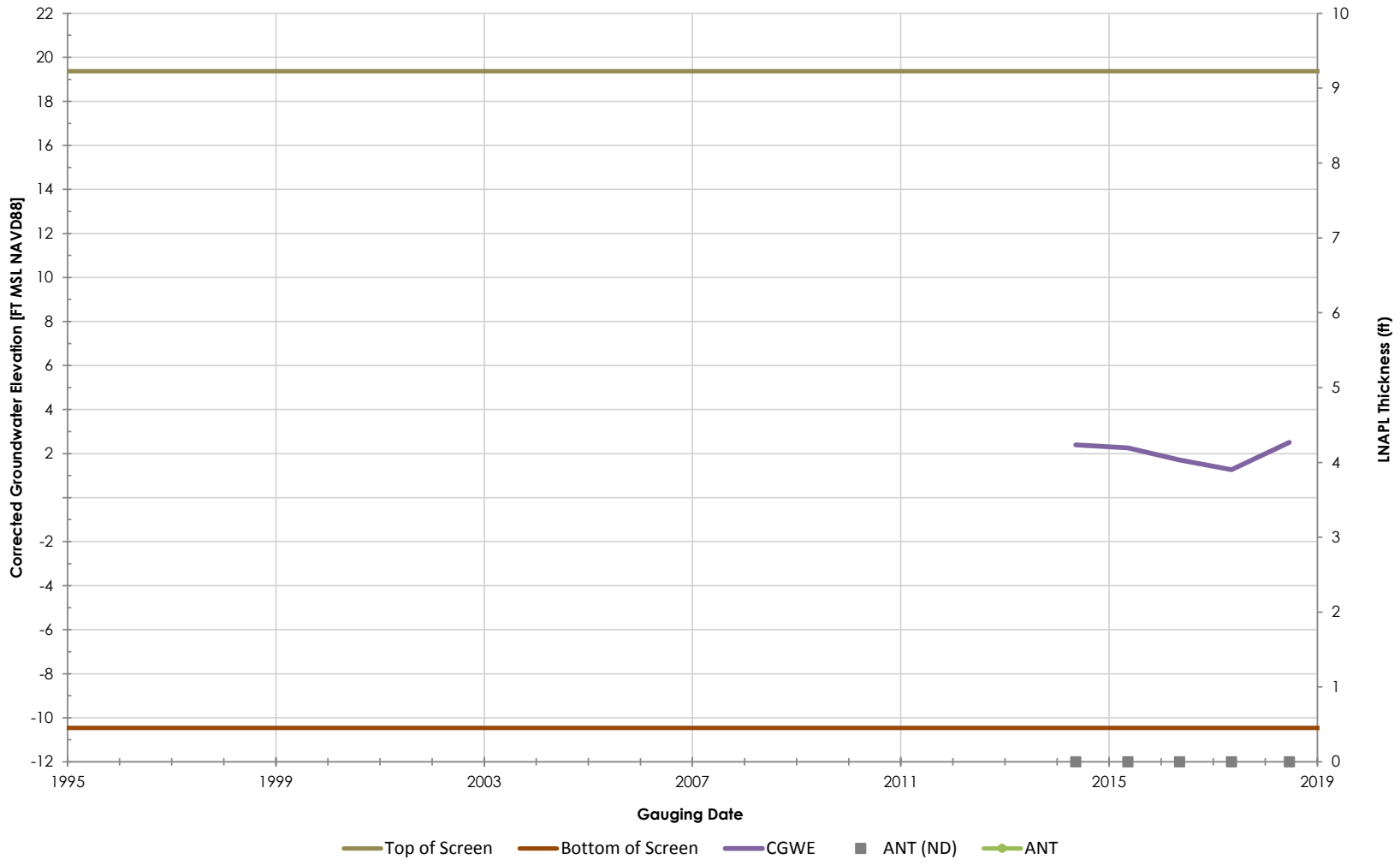
Stantec

Figure/Well No.

DSCP-MW-15

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

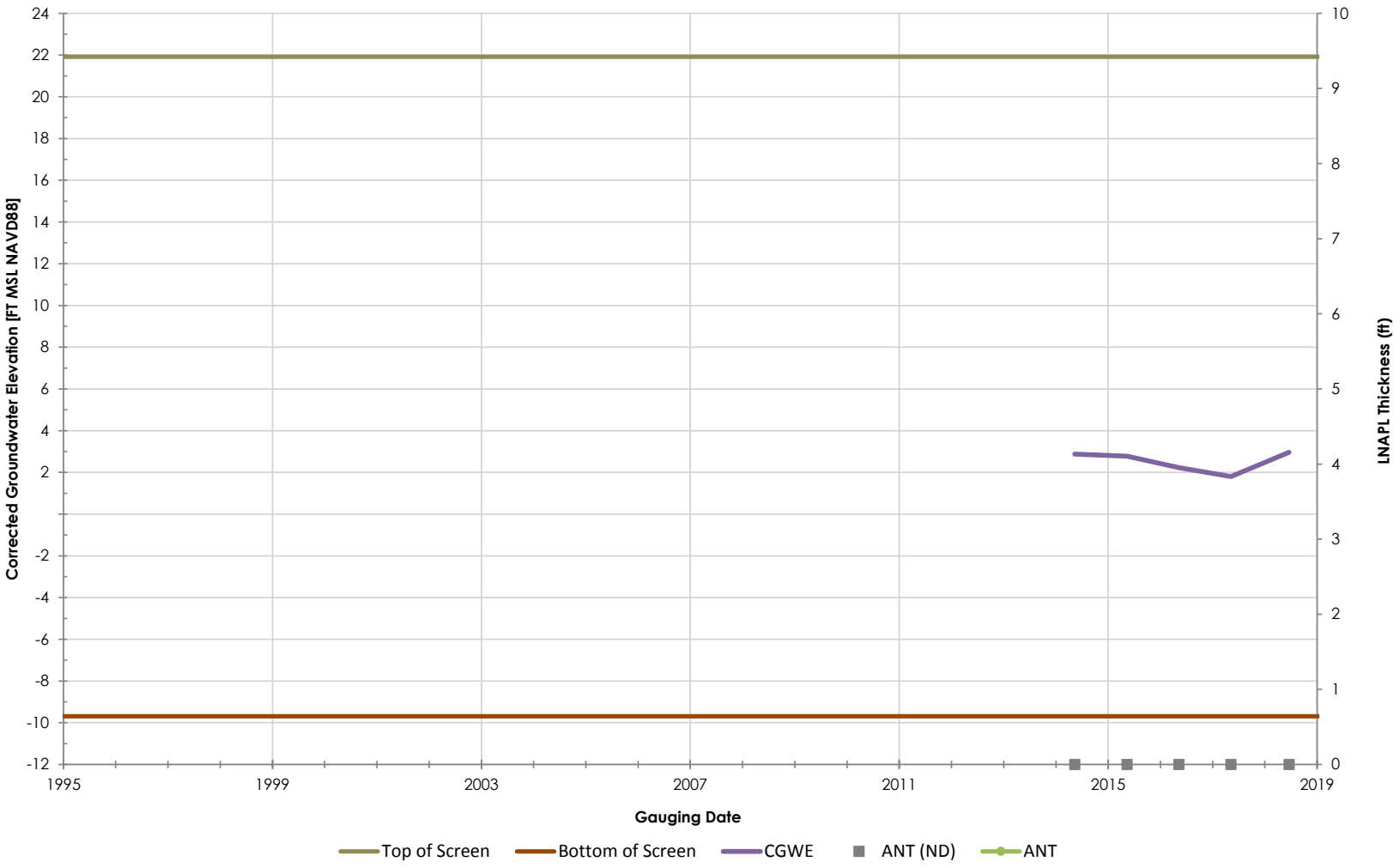
Stantec

Figure/Well No.

DSCP-MW-16

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

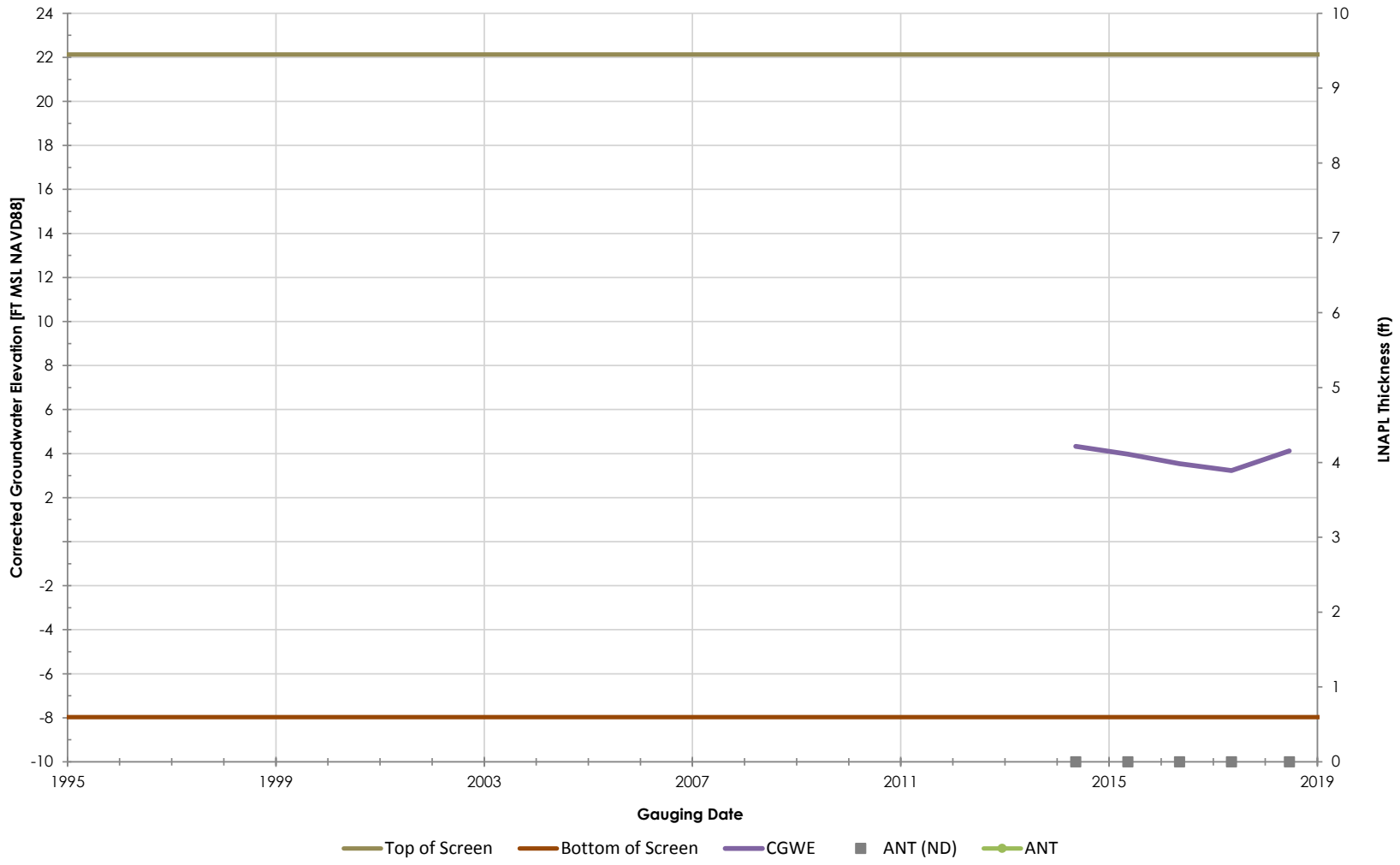
Stantec

Figure/Well No.

DSCP-MW-17

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

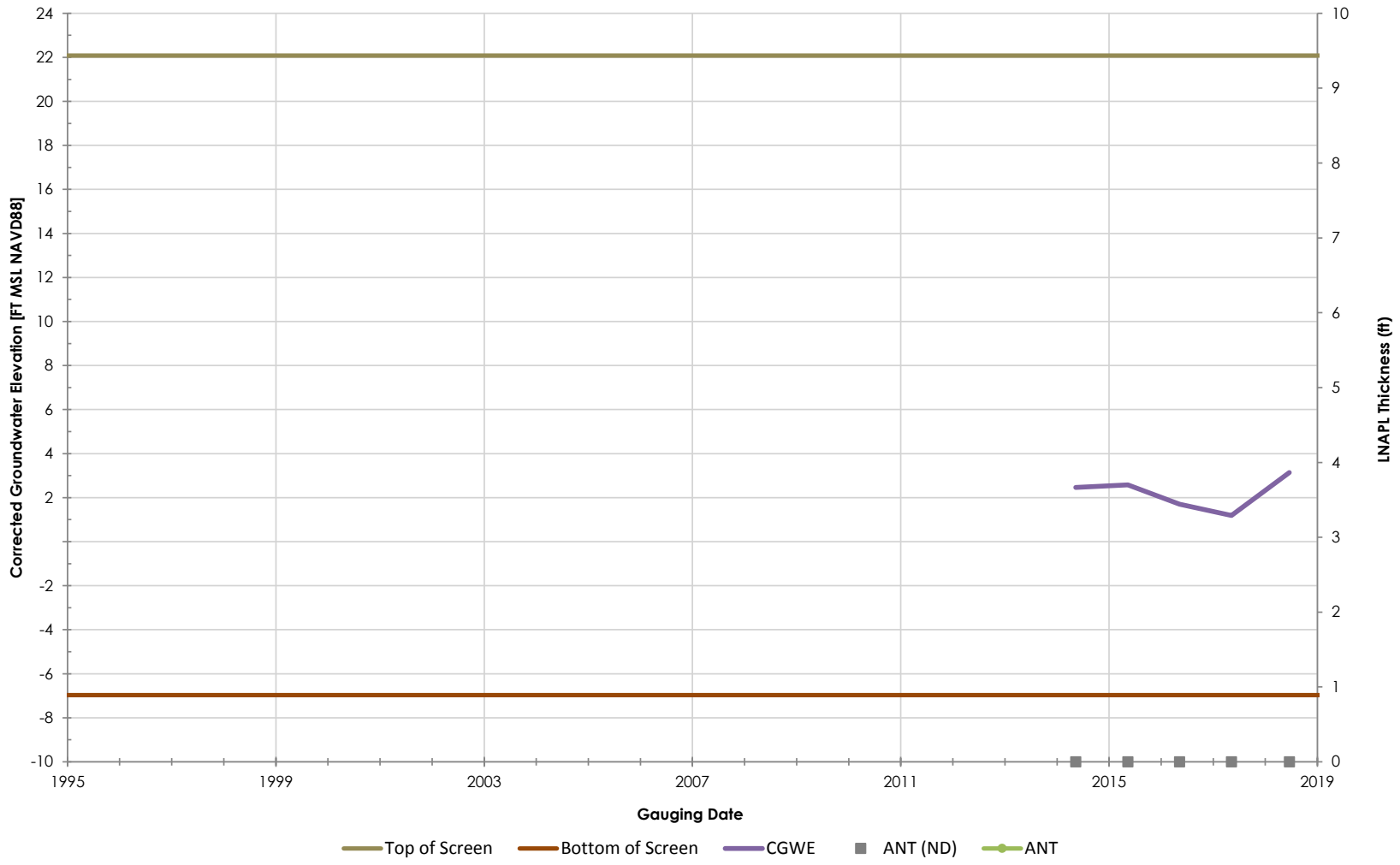
Stantec

Figure/Well No.

DSCP-MW-19

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

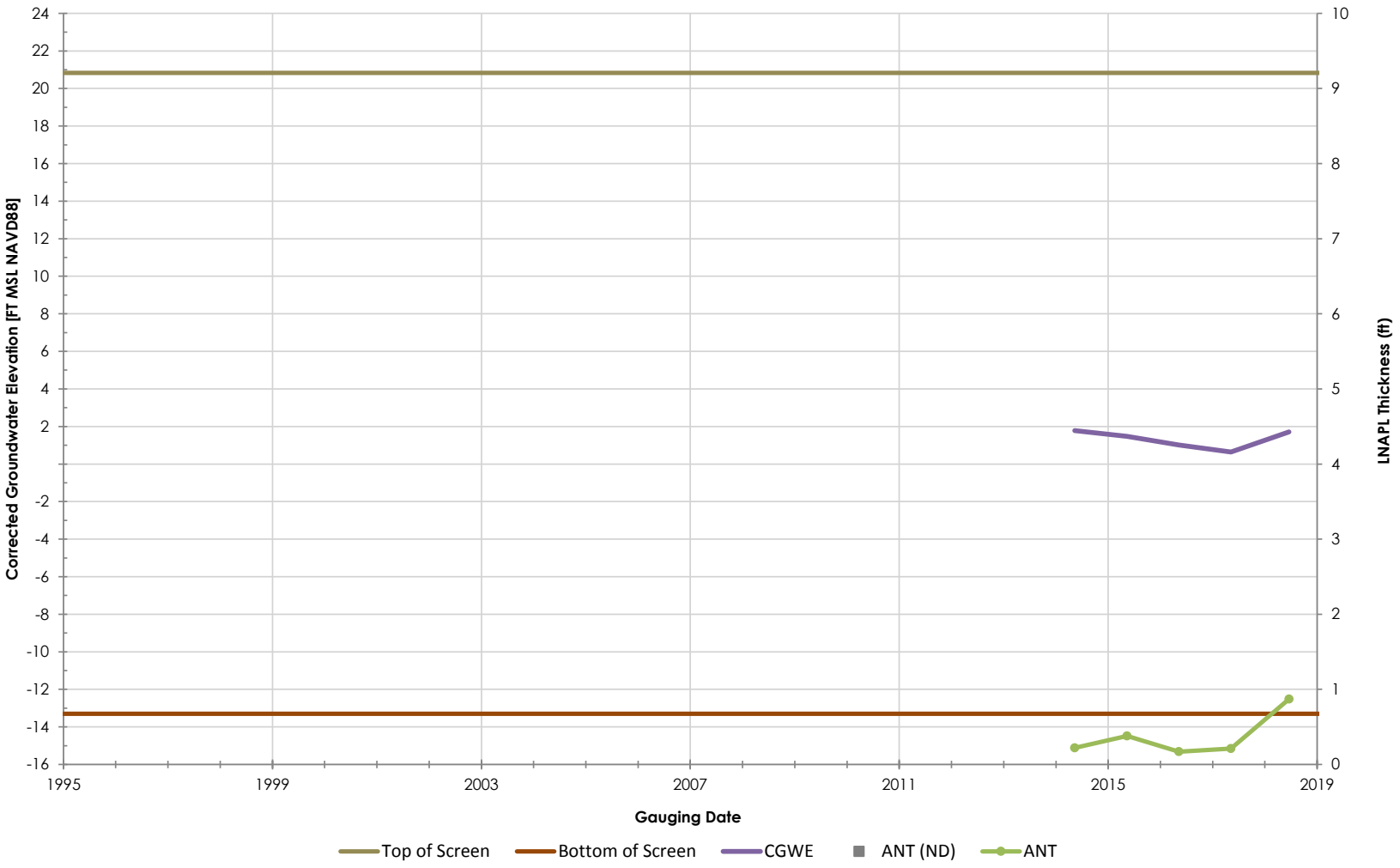
Stantec

Figure/Well No.

DSCP-MW-1A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

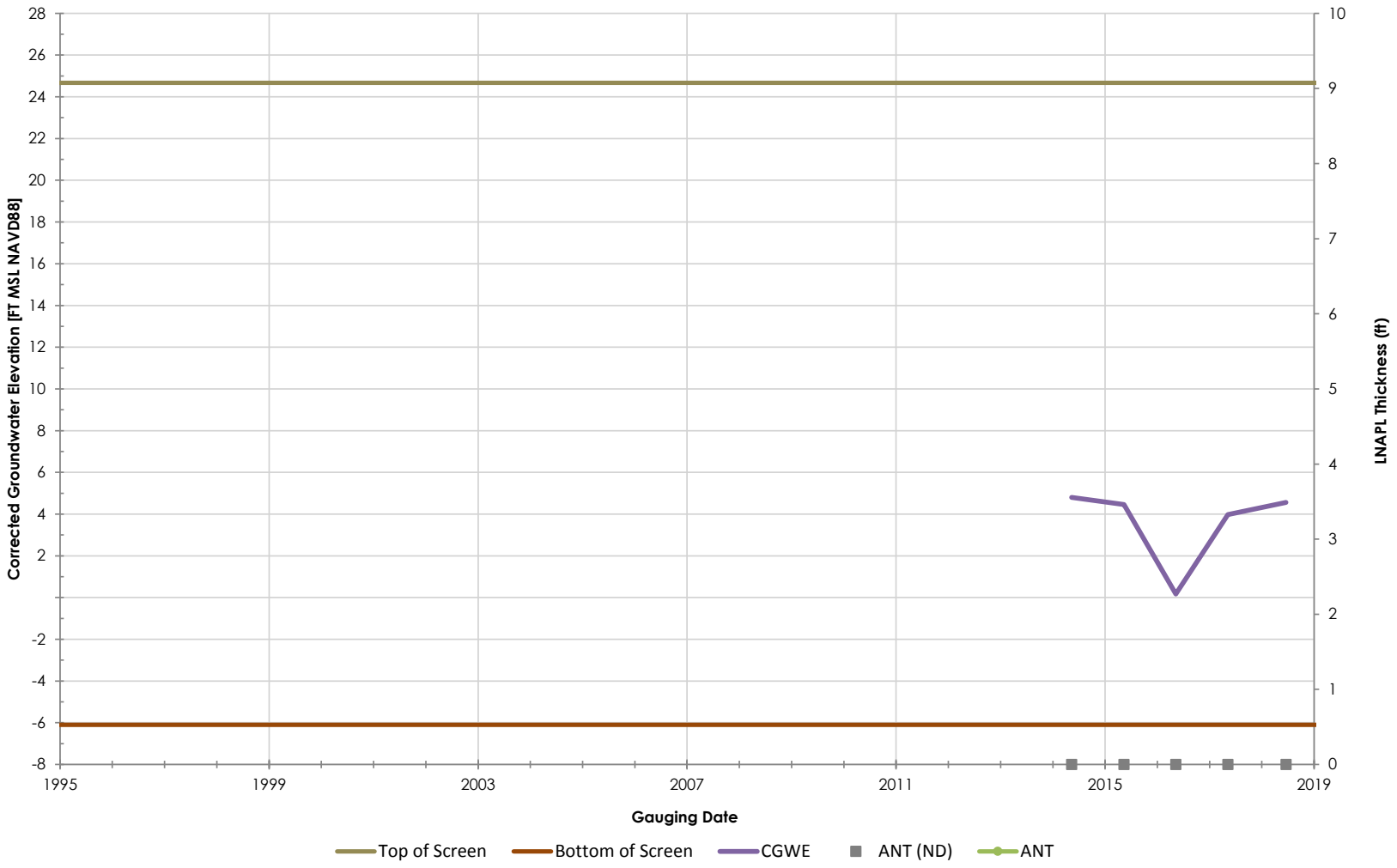
Stantec

Figure/Well No.

DSCP-MW-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

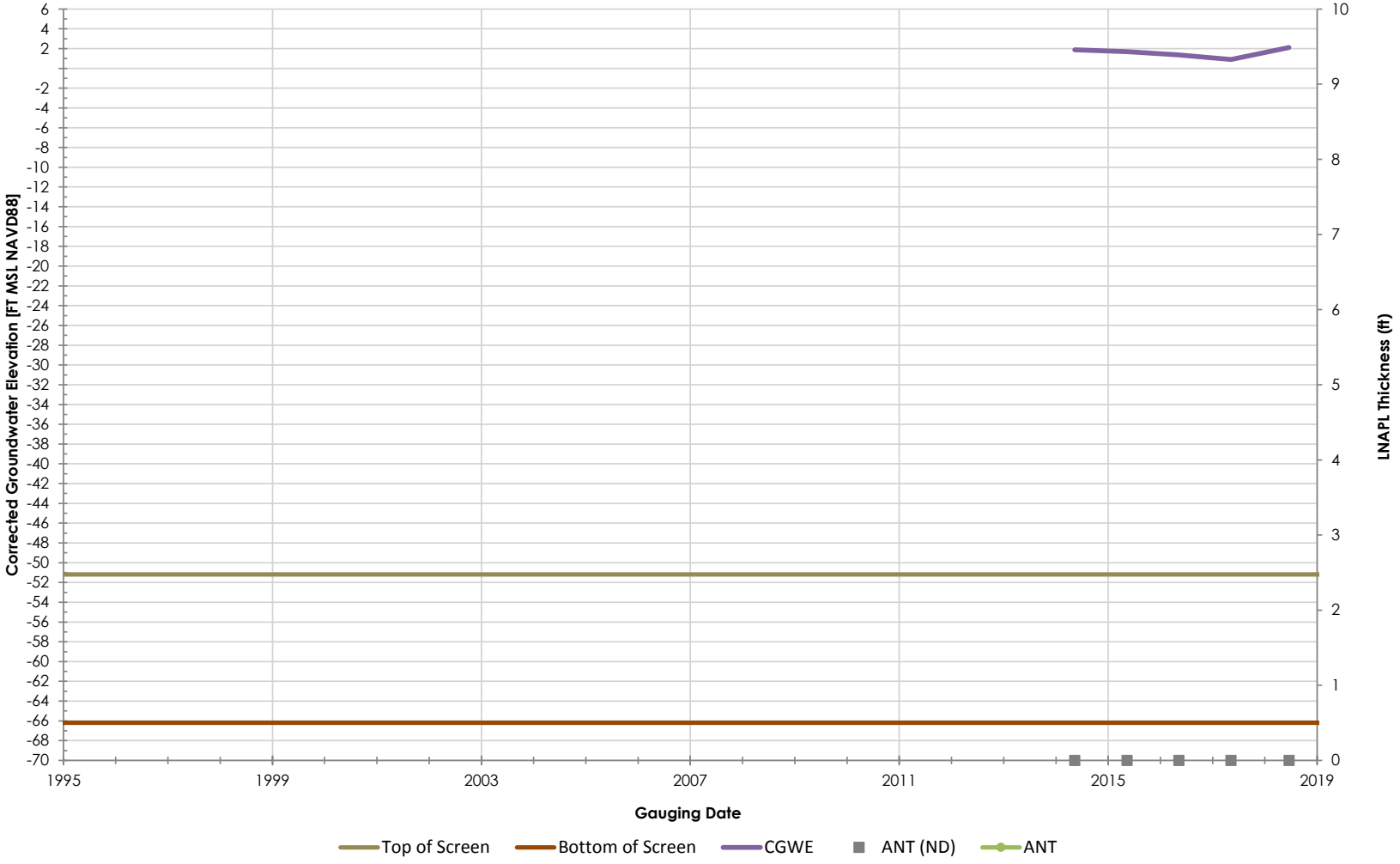
Stantec

Figure/Well No.

DSCP-MW-20

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



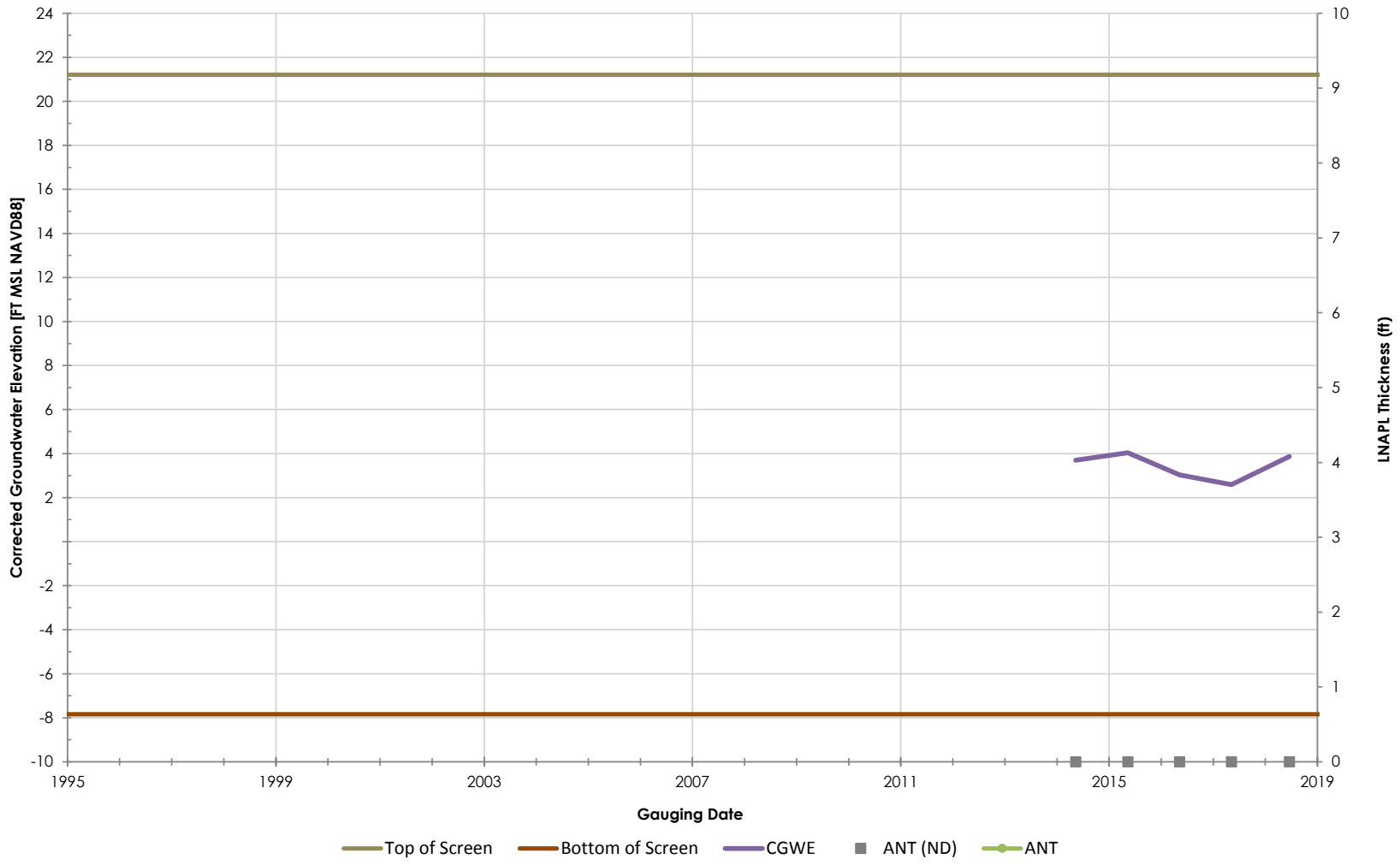
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

DSCP-MW-20D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

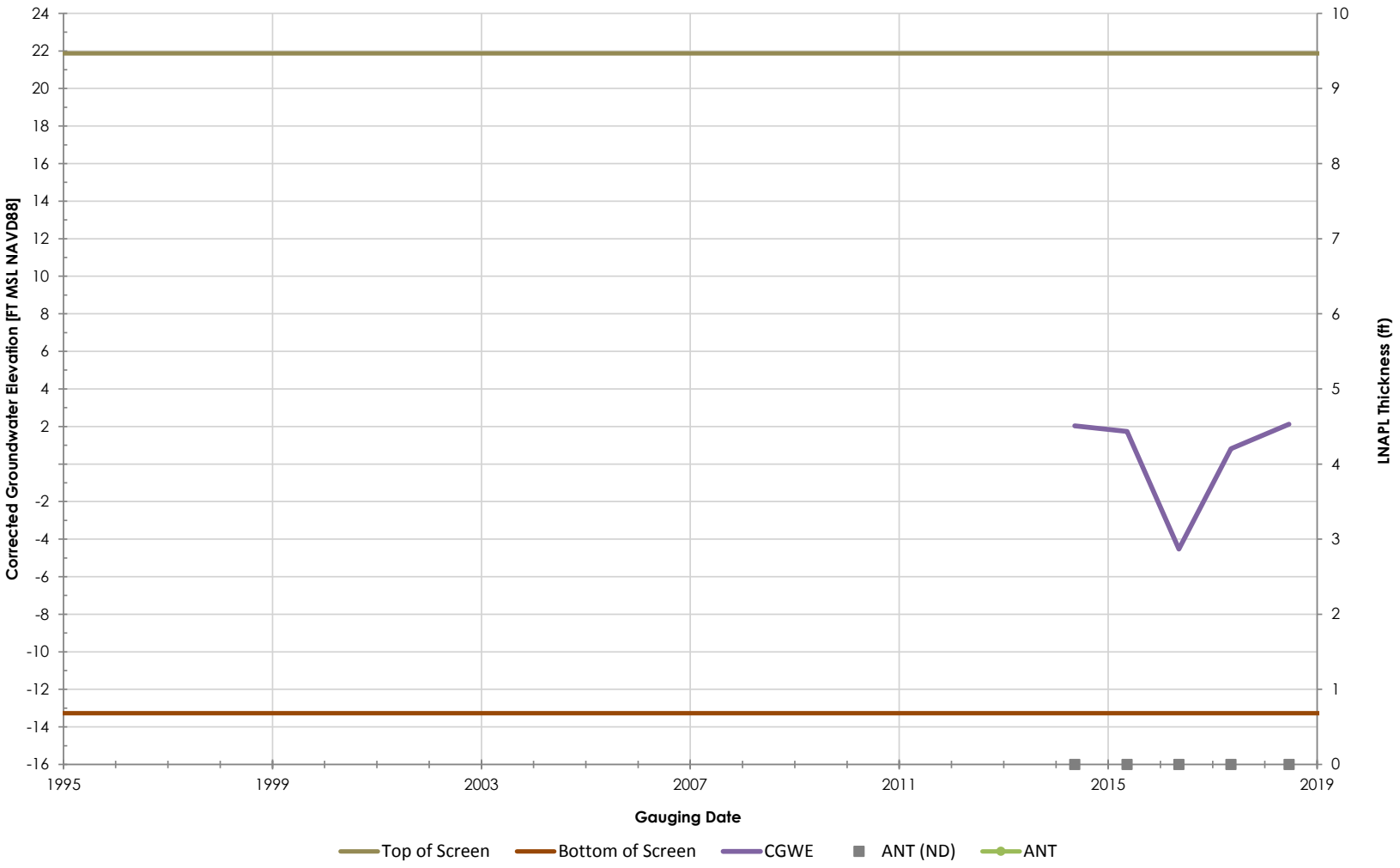
Stantec

Figure/Well No.

DSCP-MW-21A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

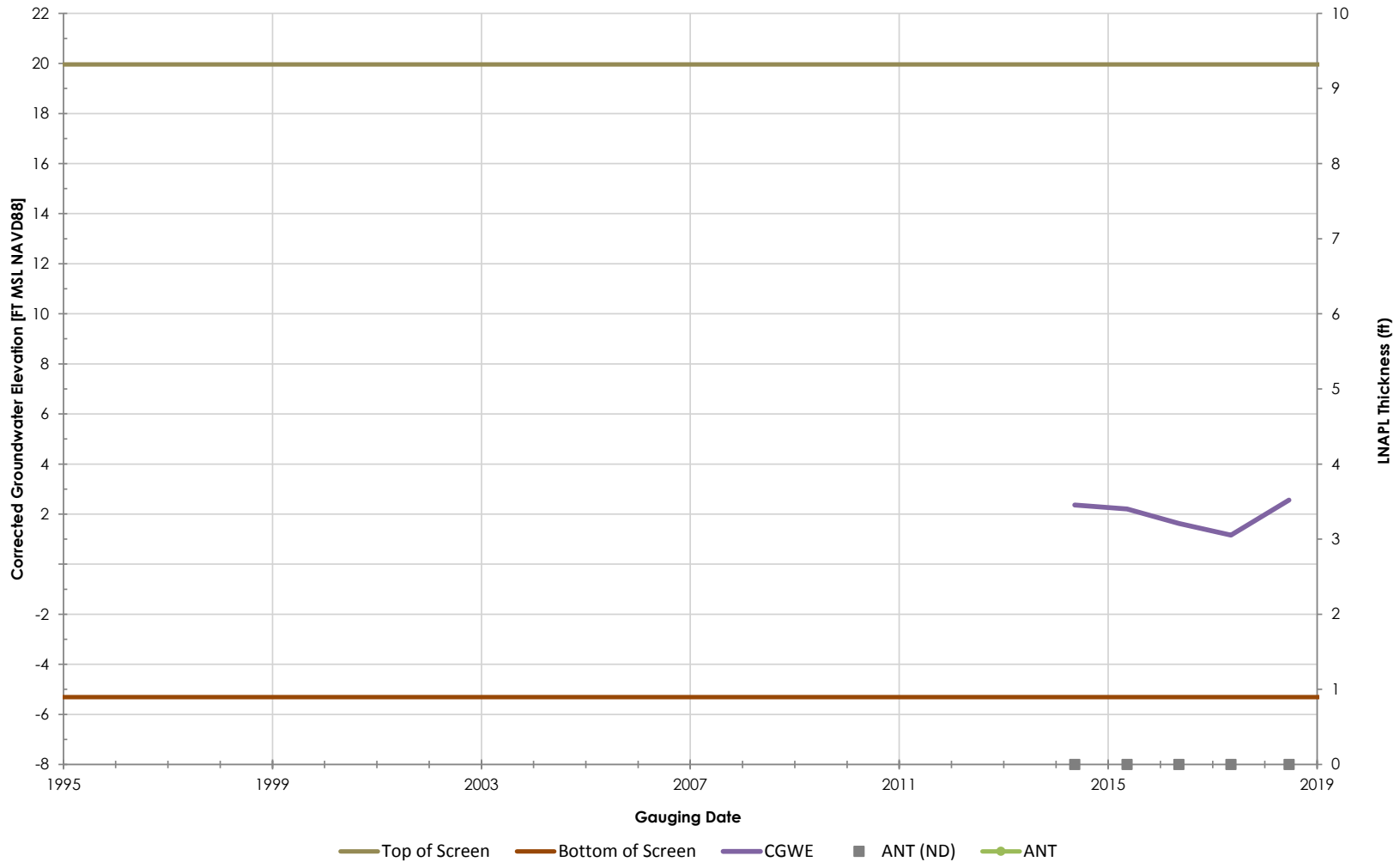
Stantec

Figure/Well No.

DSCP-MW-23A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

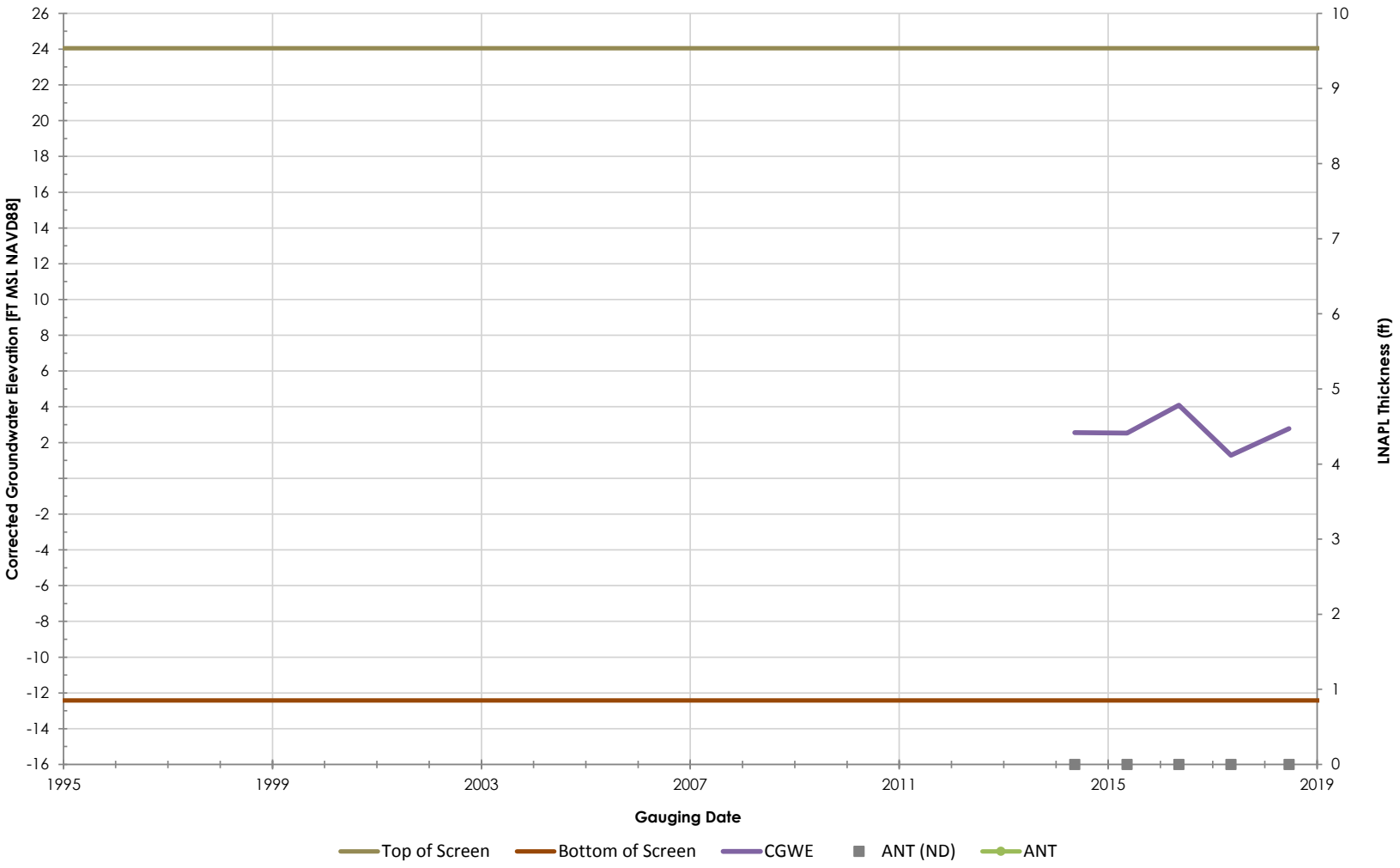
Stantec

Figure/Well No.

DSCP-MW-24

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

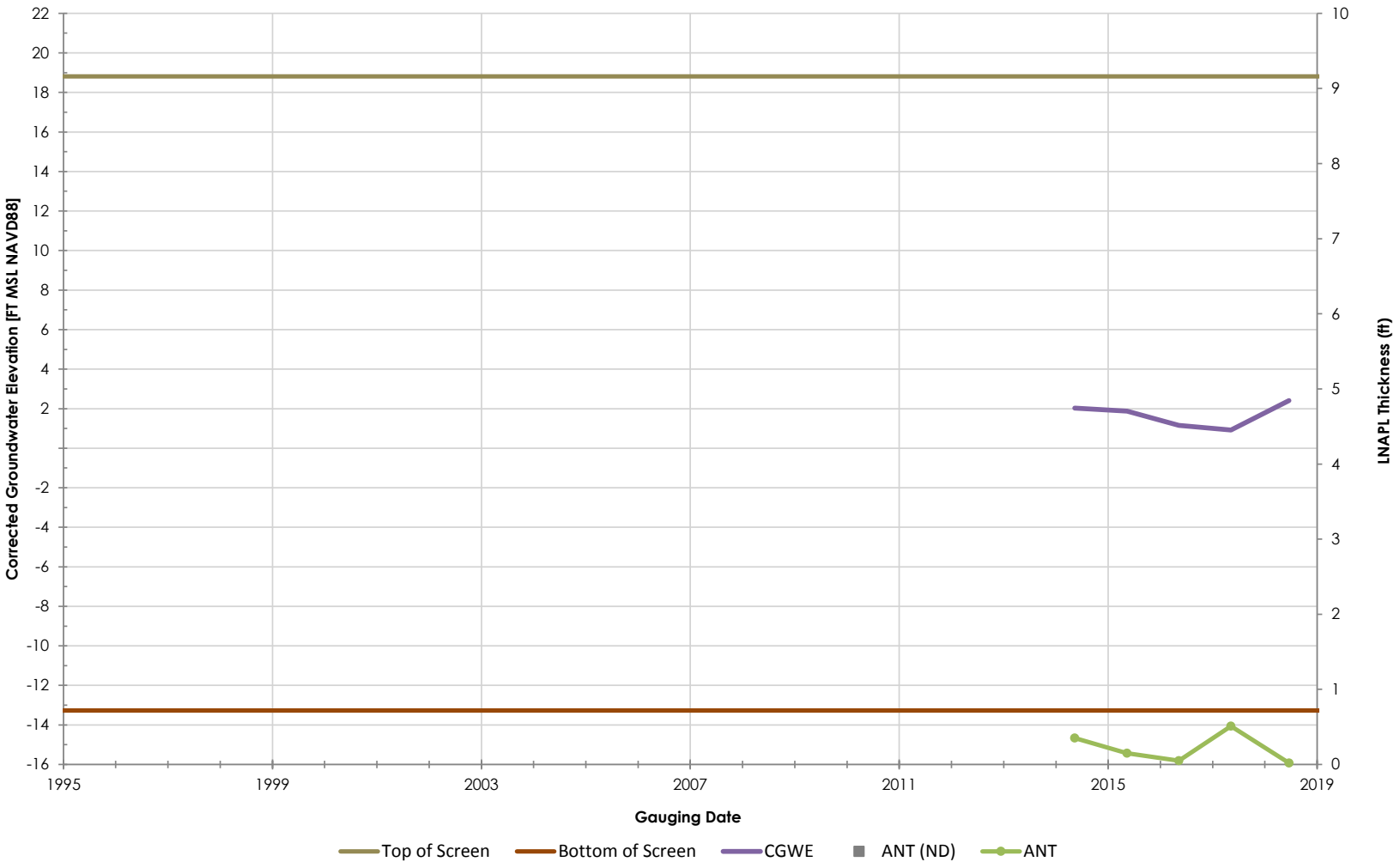
Stantec

Figure/Well No.

DSCP-MW-27A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

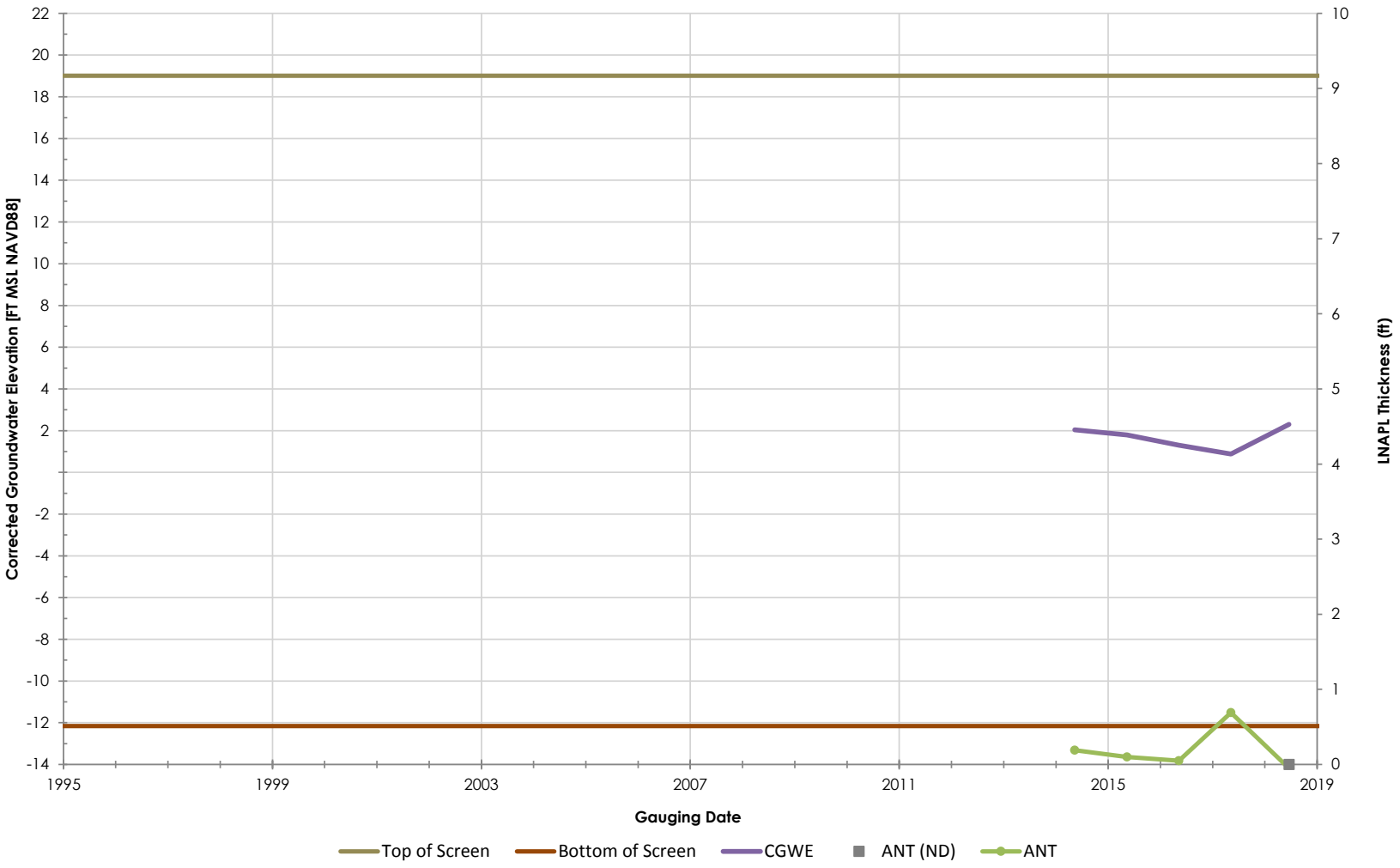
Stantec

Figure/Well No.

DSCP-MW-28

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

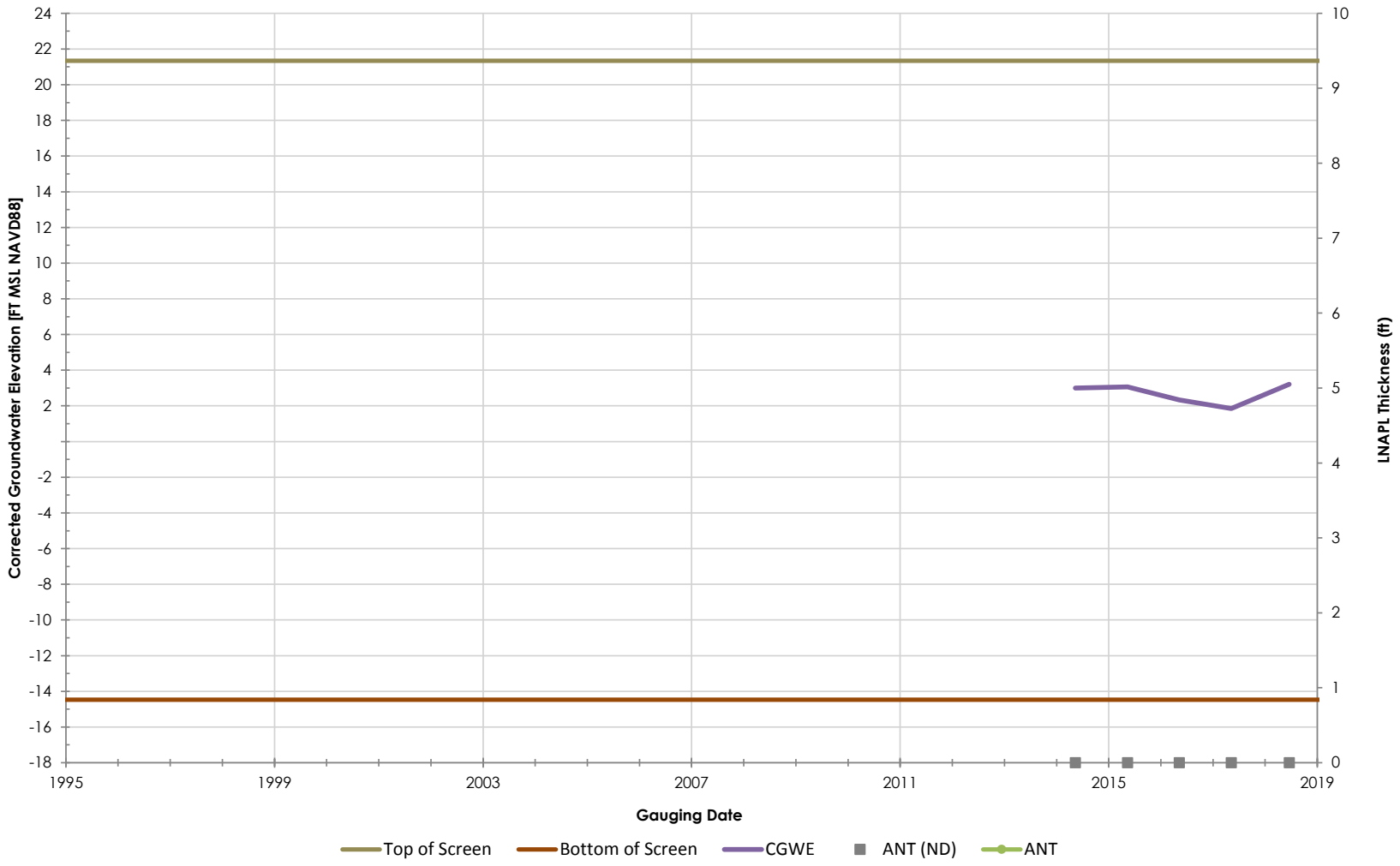
Stantec

Figure/Well No.

DSCP-MW-29

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

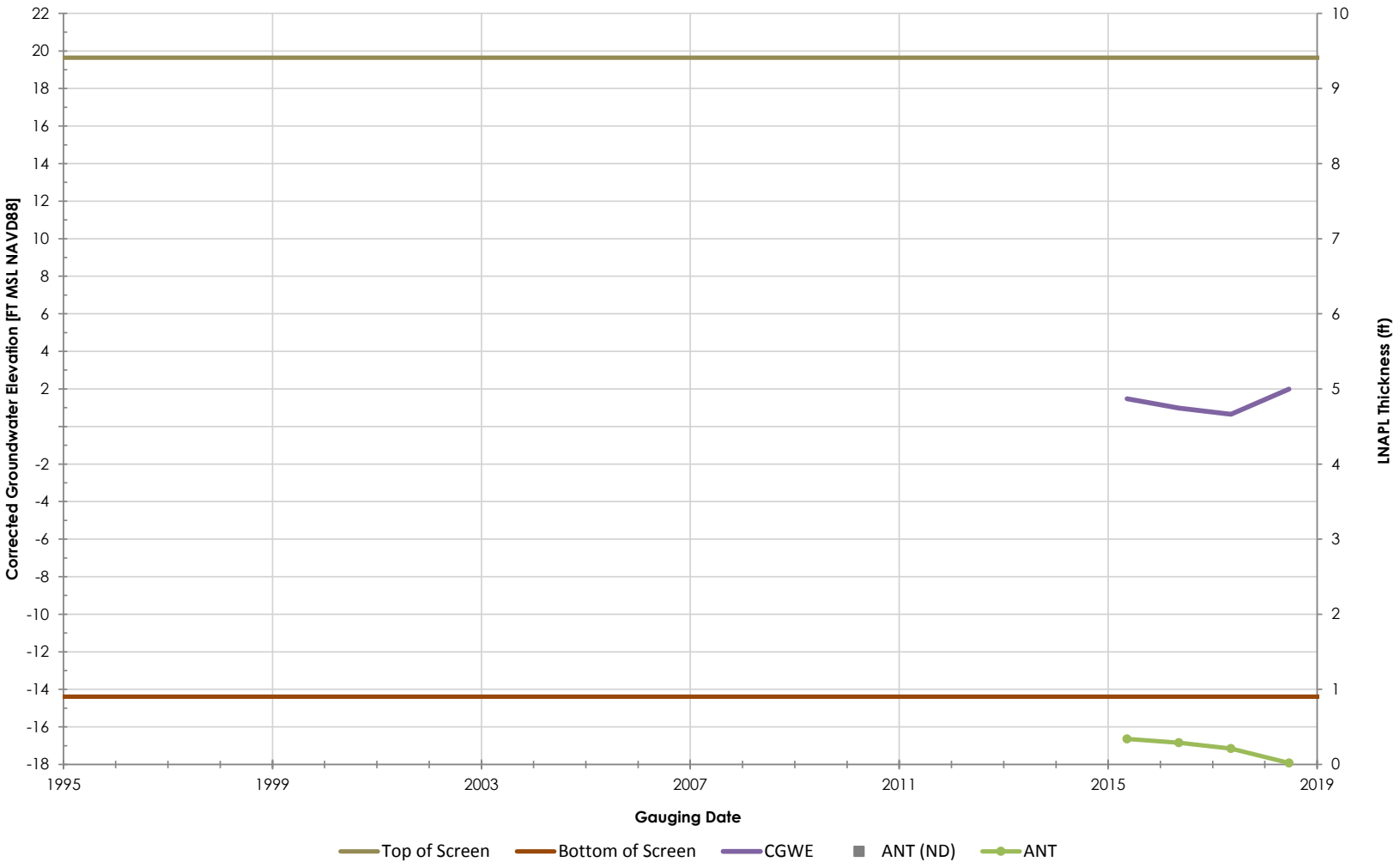
Stantec

Figure/Well No.

DSCP-MW-2B

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

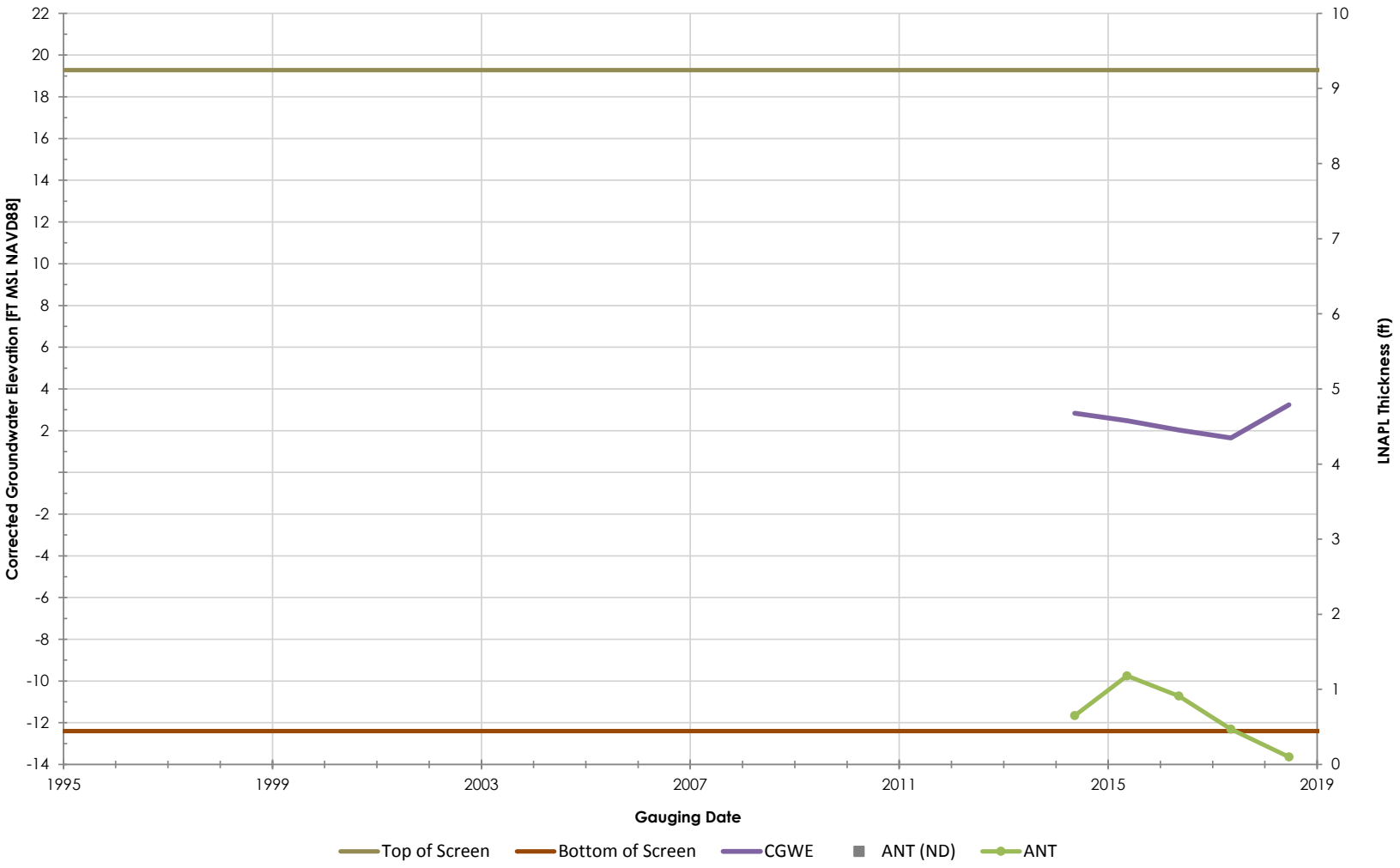
Stantec

Figure/Well No.

DSCP-MW-30

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

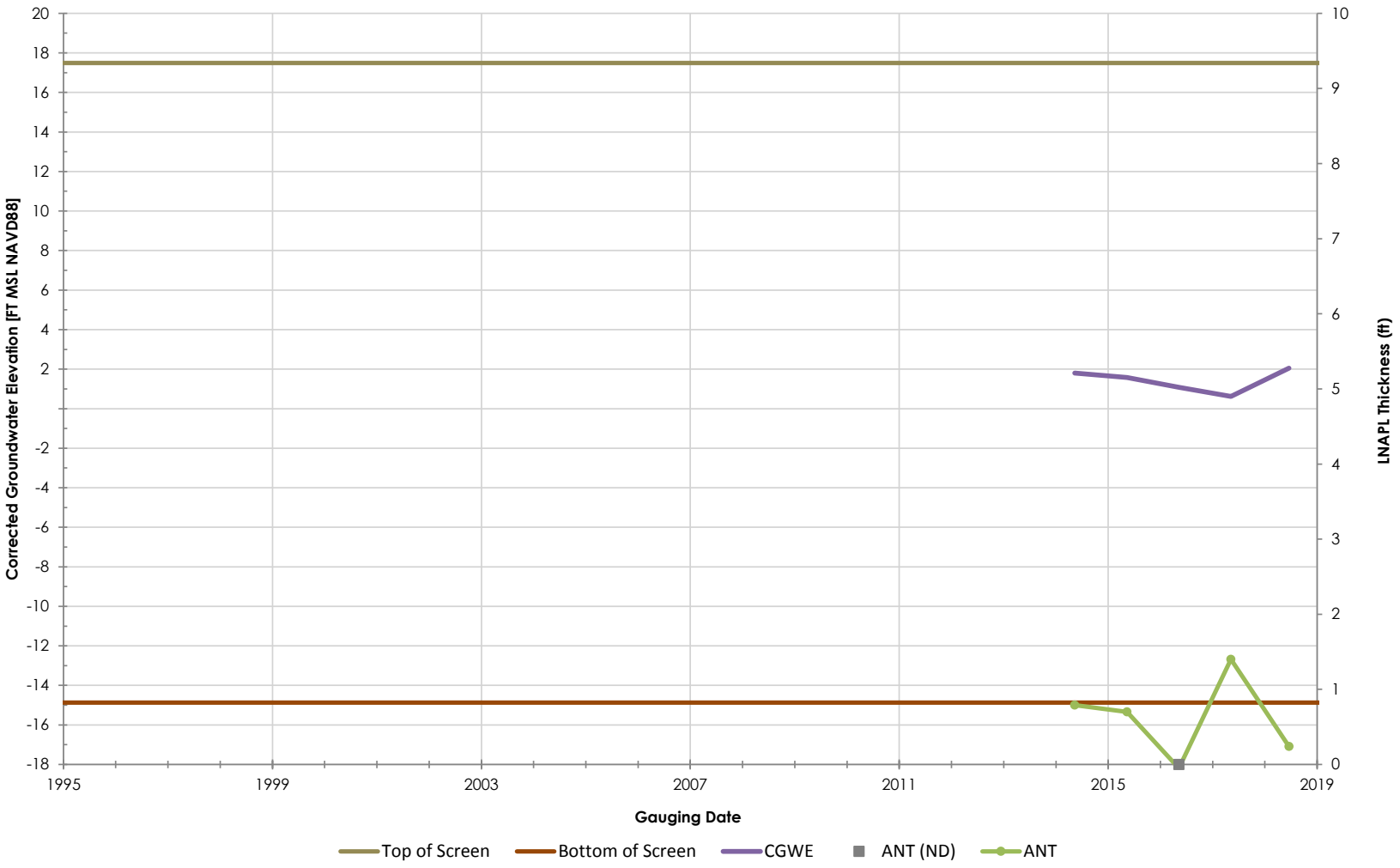
Stantec

Figure/Well No.

DSCP-MW-32

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

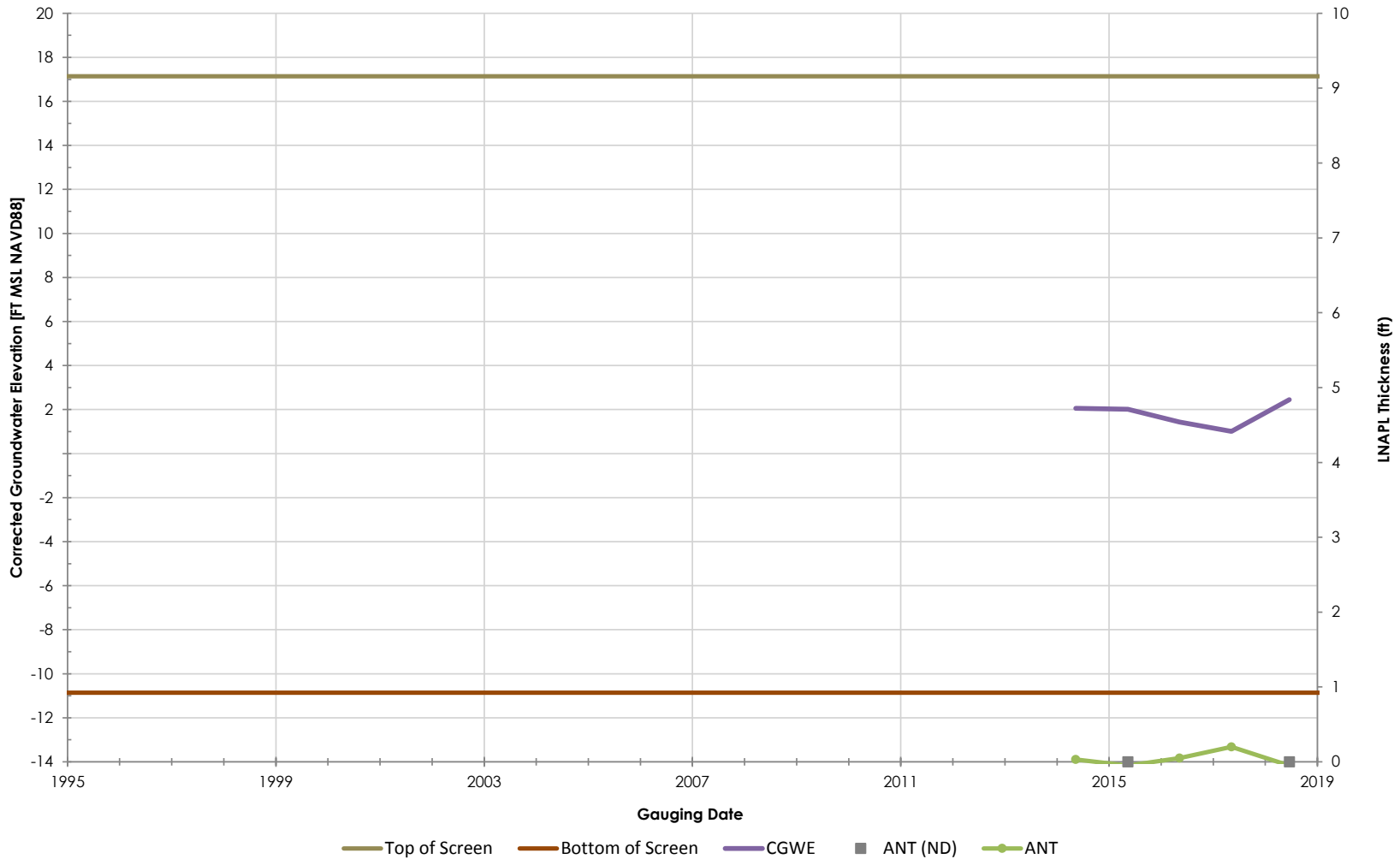
Stantec

Figure/Well No.

DSCP-MW-33

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

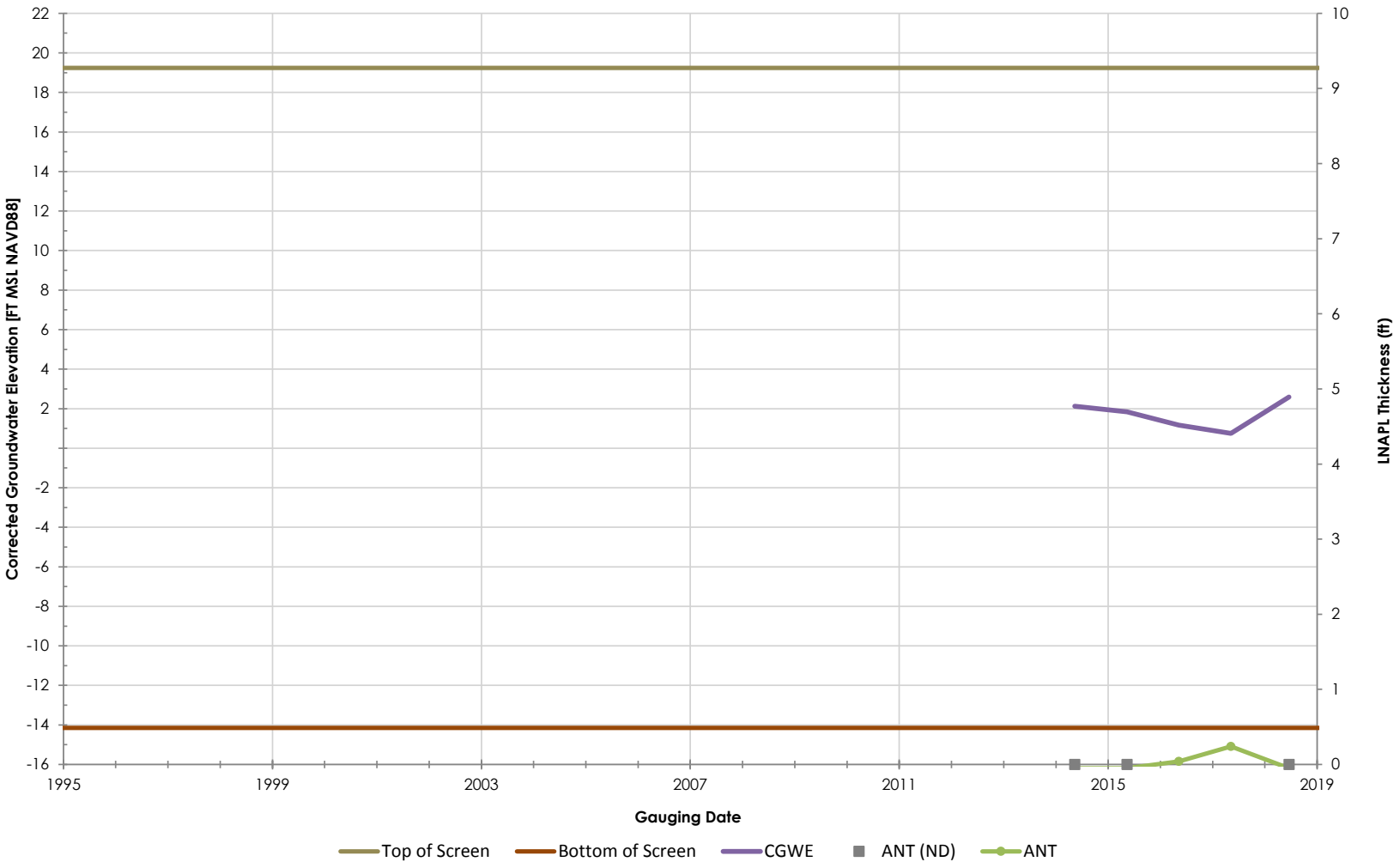
Stantec

Figure/Well No.

DSCP-MW-35A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

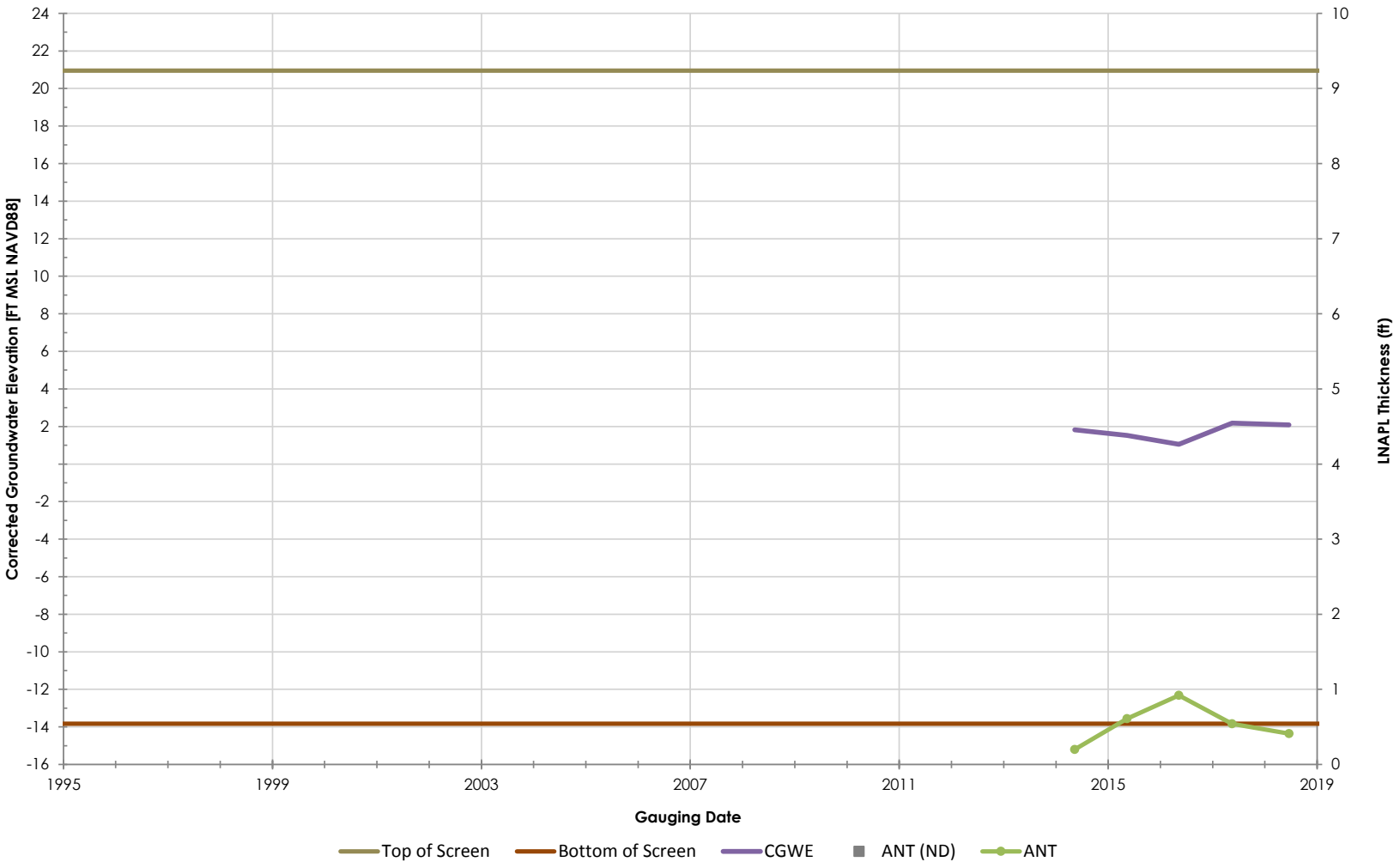
Stantec

Figure/Well No.

DSCP-MW-36

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

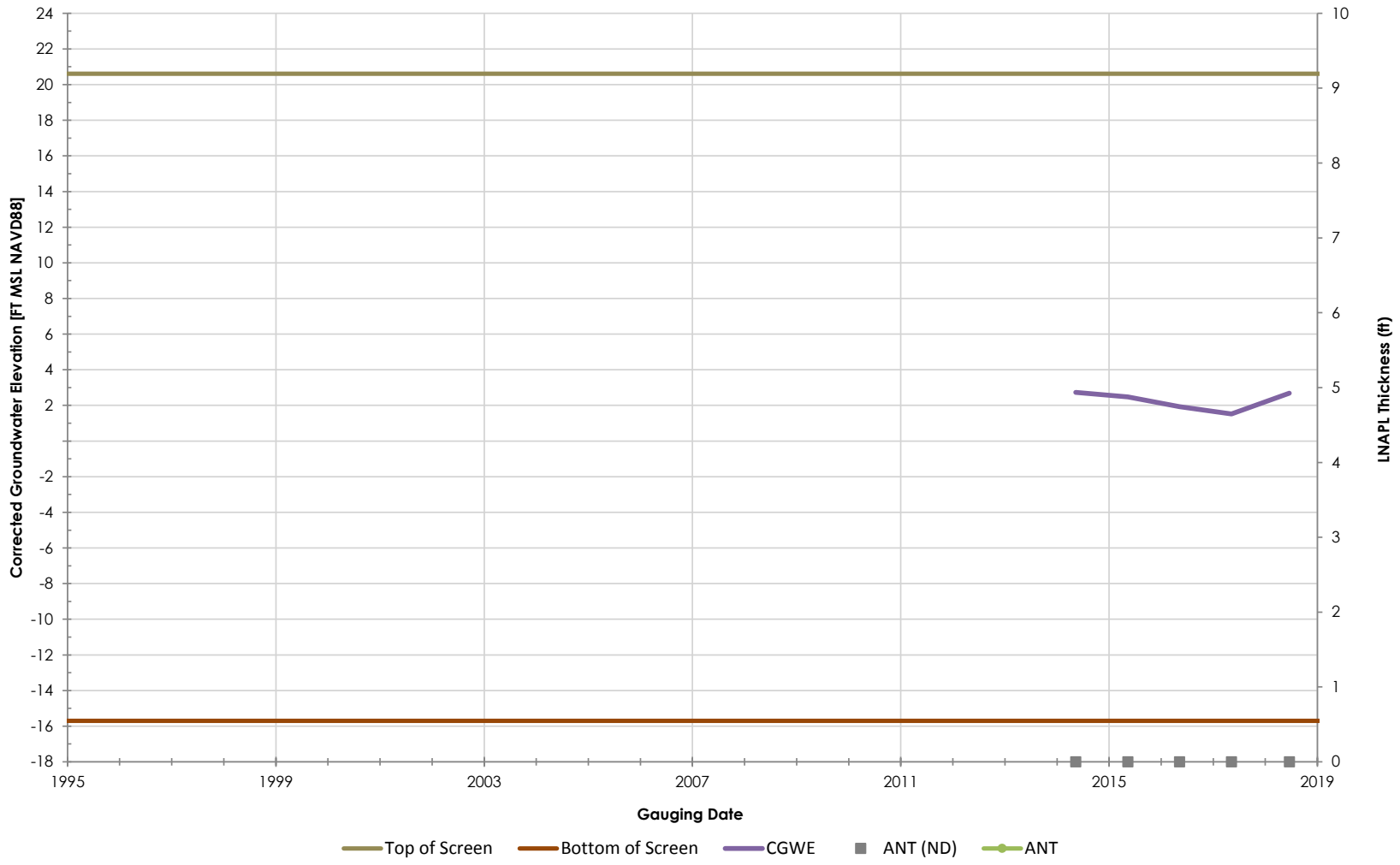
Stantec

Figure/Well No.

DSCP-MW-3A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

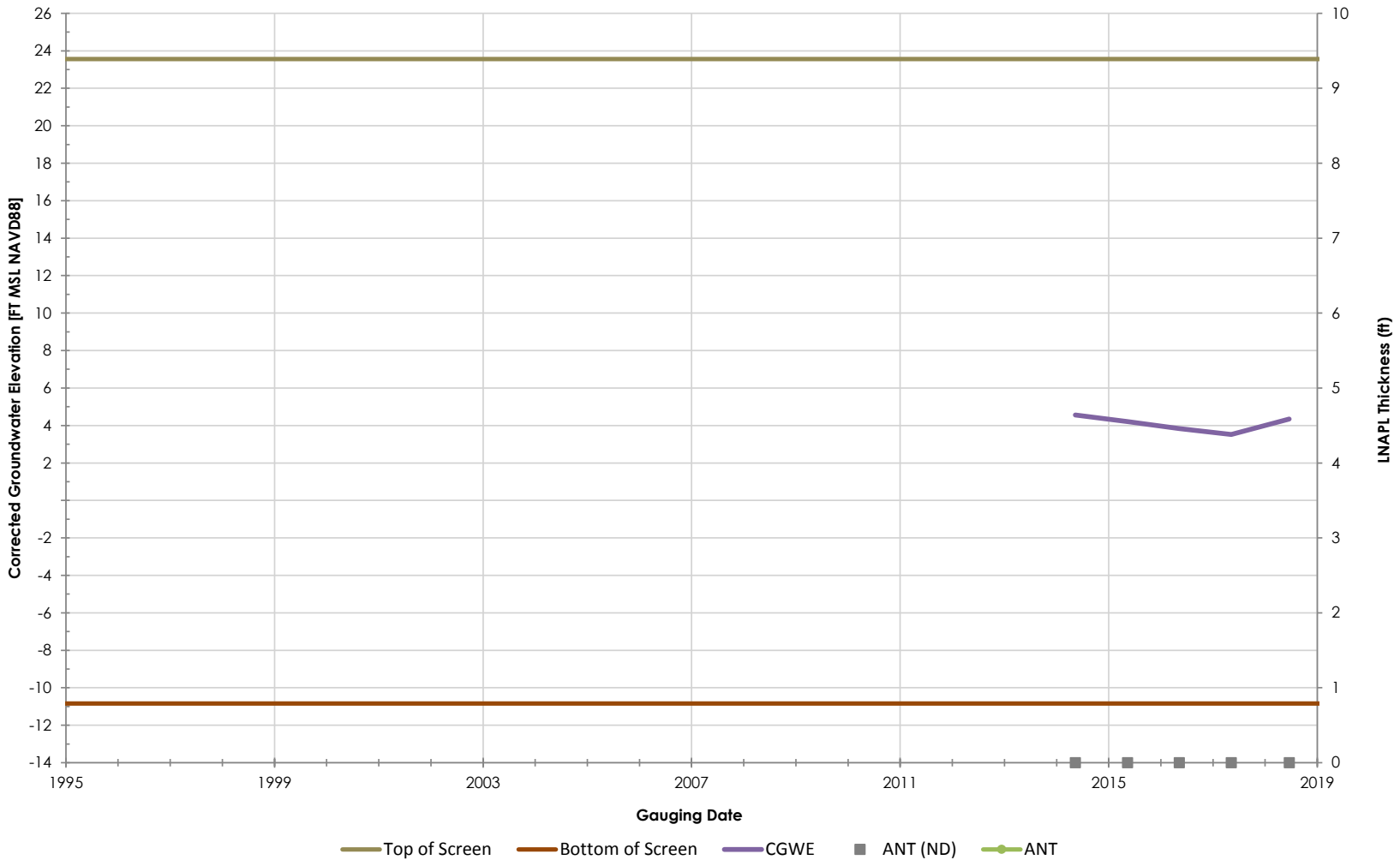
Stantec

Figure/Well No.

DSCP-MW-44A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

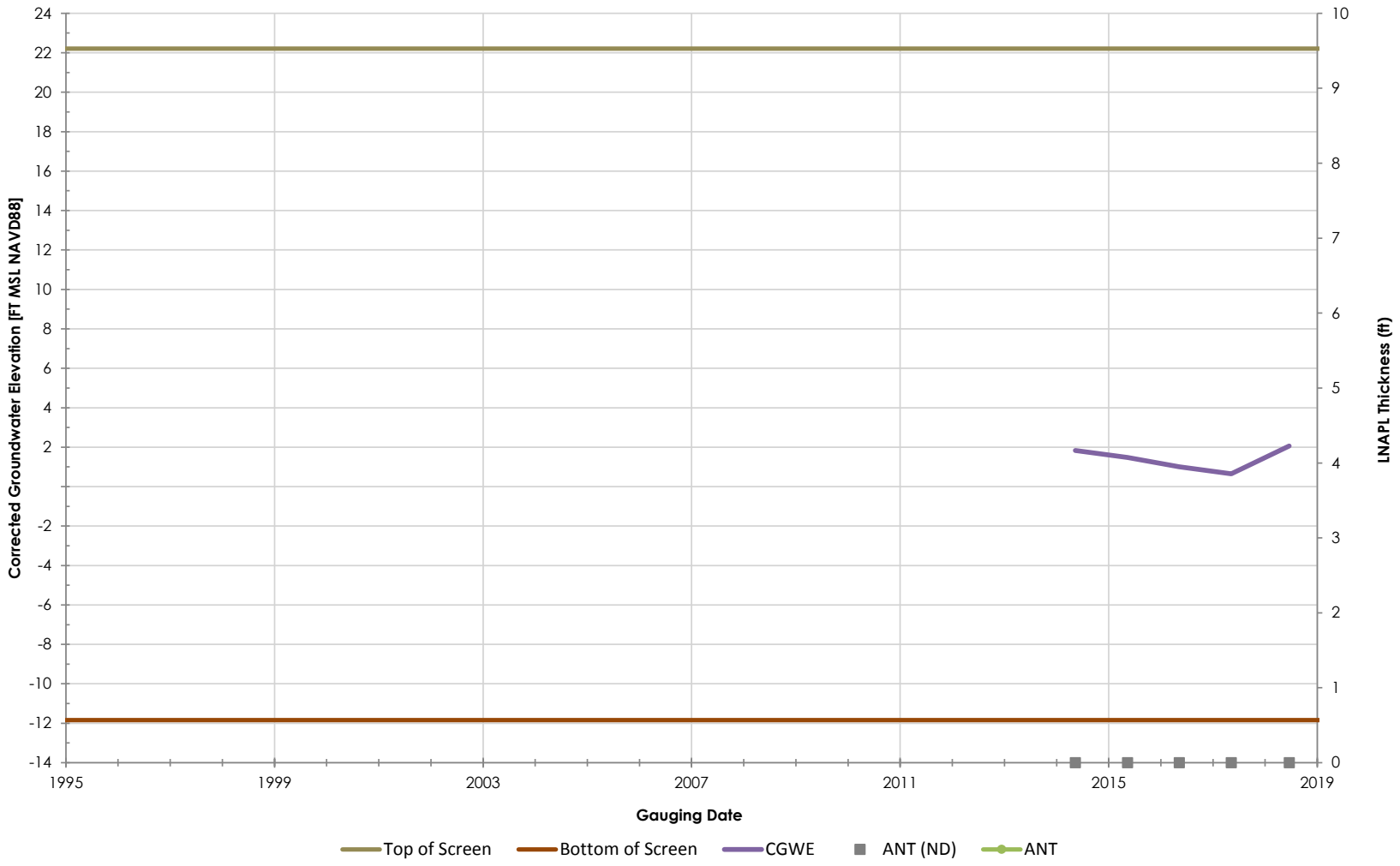
Stantec

Figure/Well No.

DSCP-MW-45A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

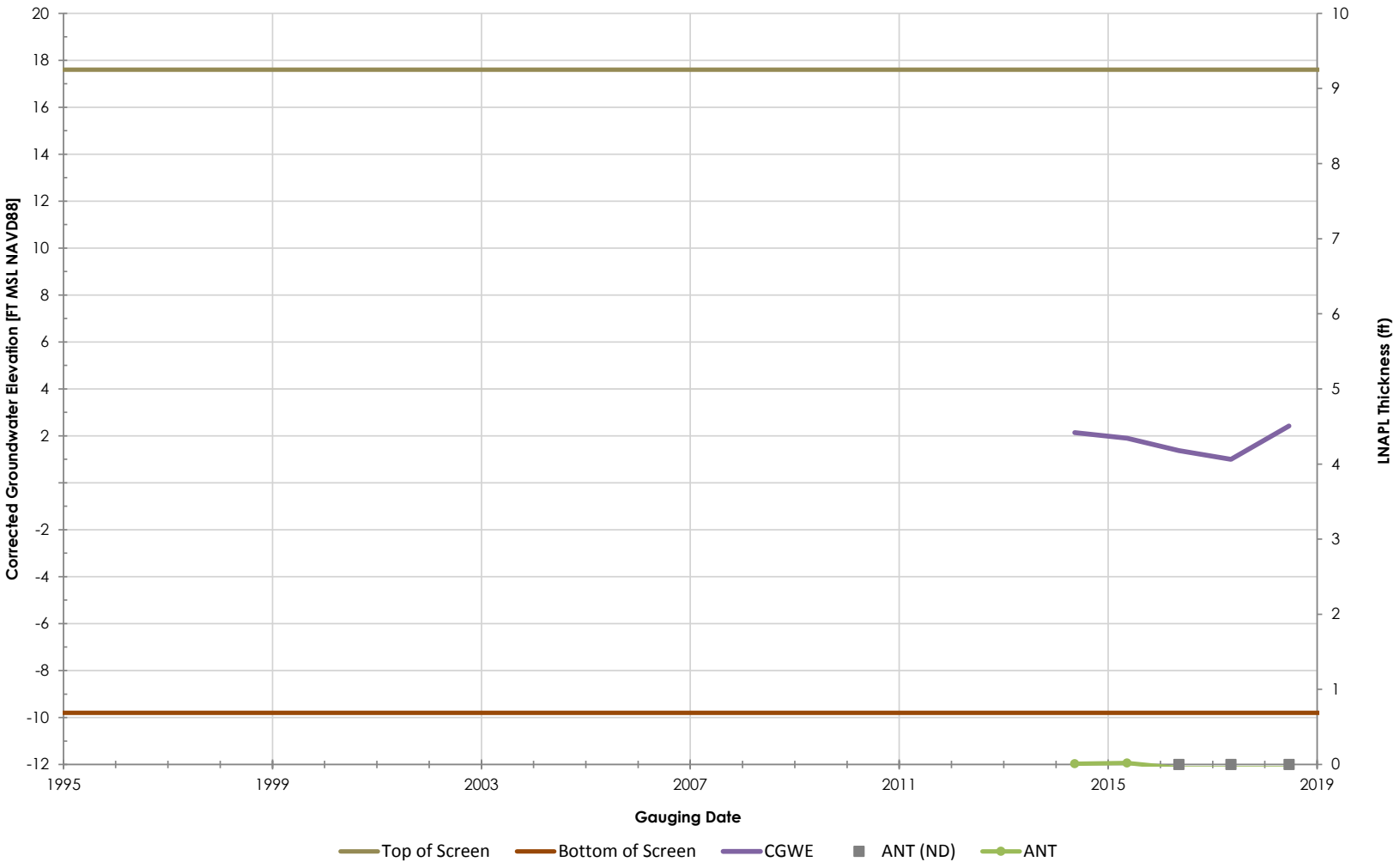
Stantec

Figure/Well No.

DSCP-MW-4A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

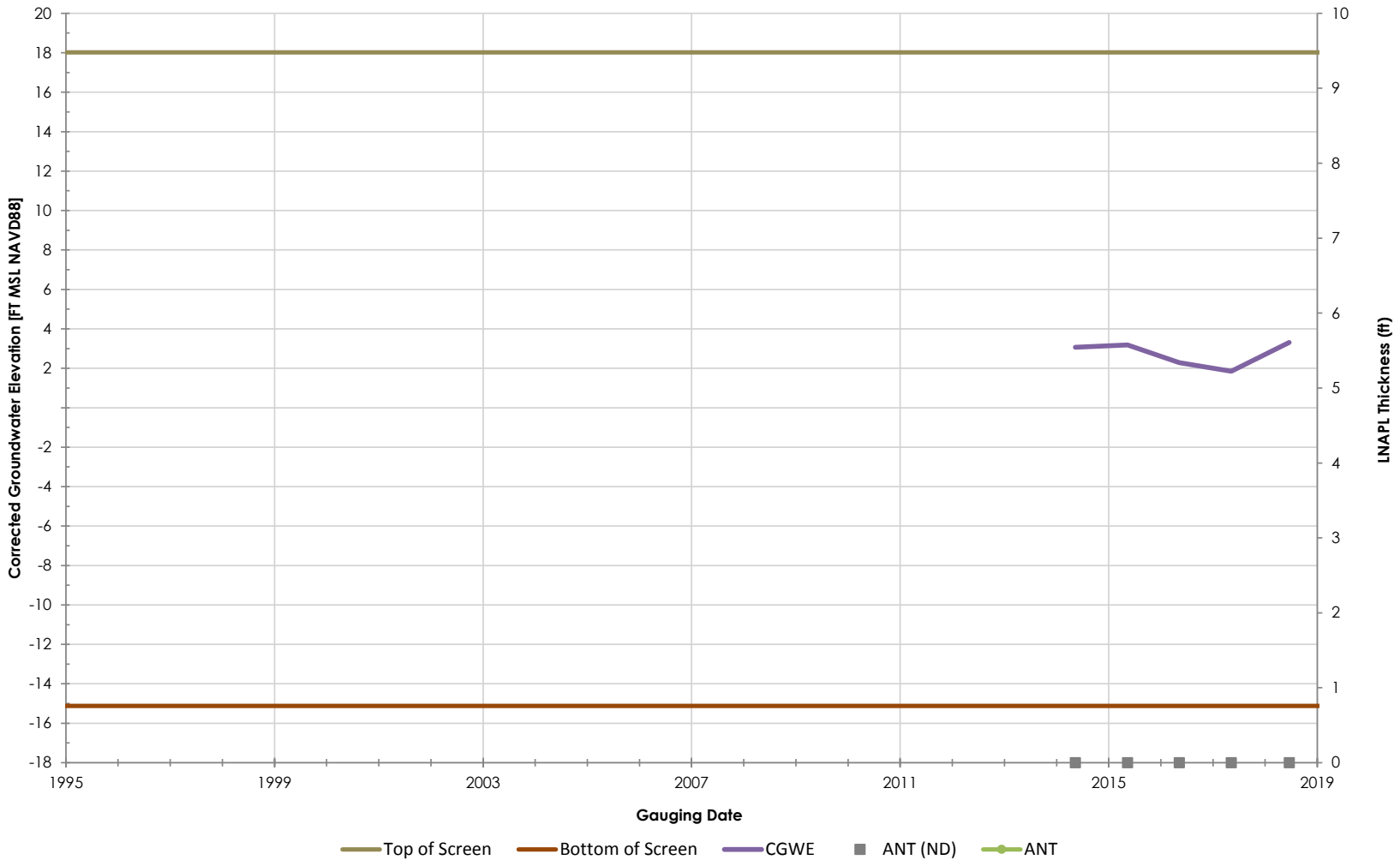
Stantec

Figure/Well No.

DSCP-MW-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

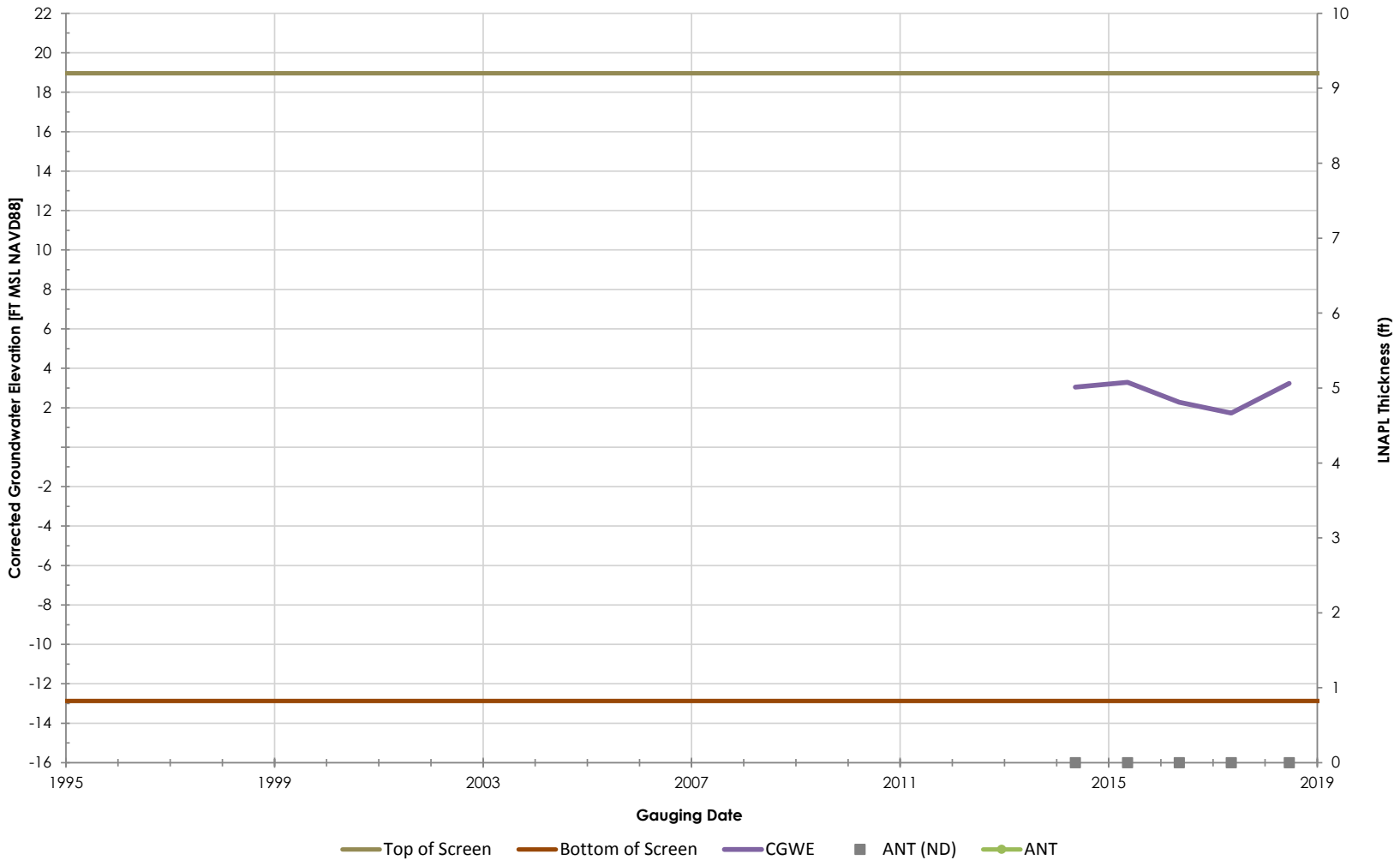
Stantec

Figure/Well No.

DSCP-MW-53

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

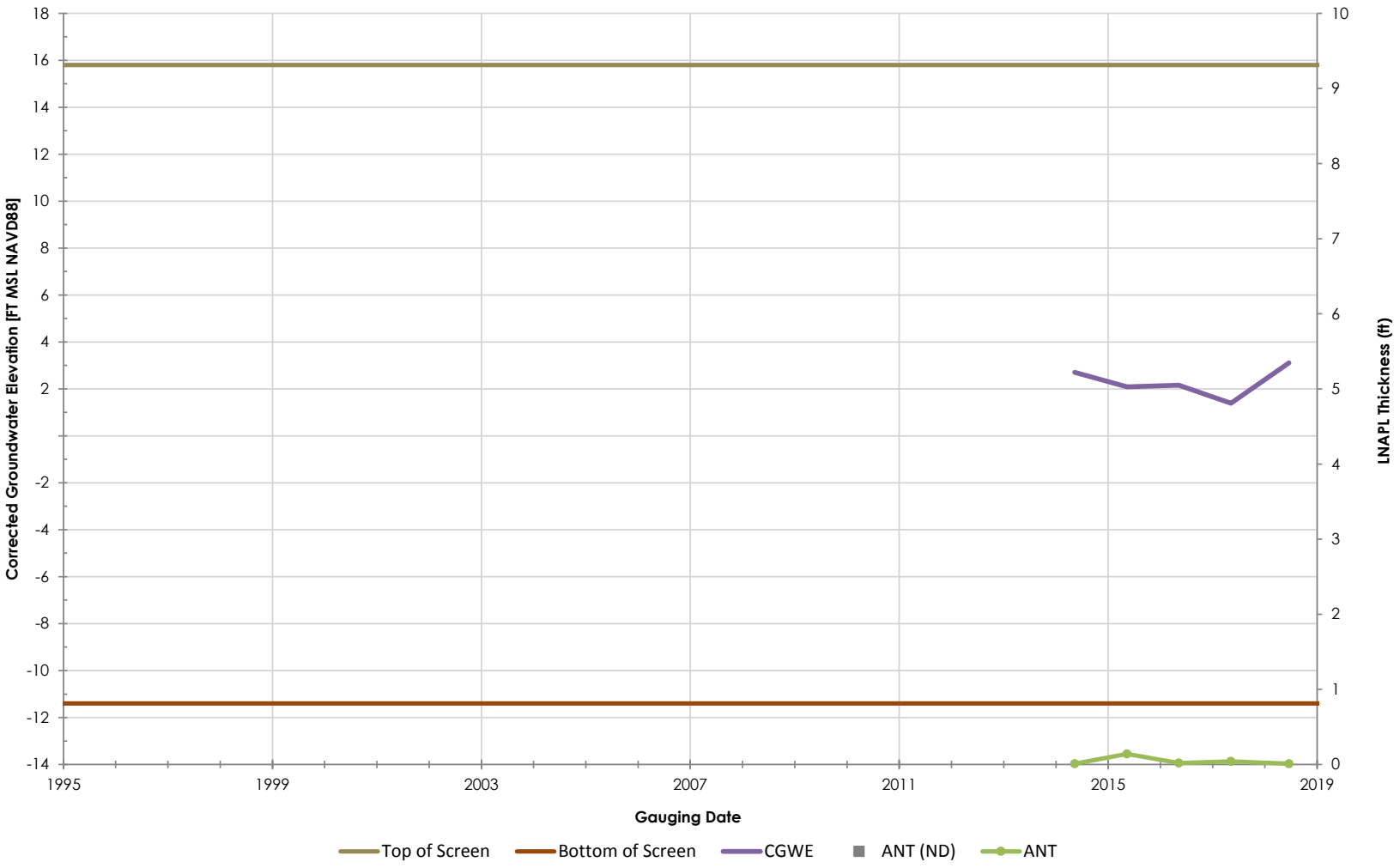
Stantec

Figure/Well No.

DSCP-MW-54

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

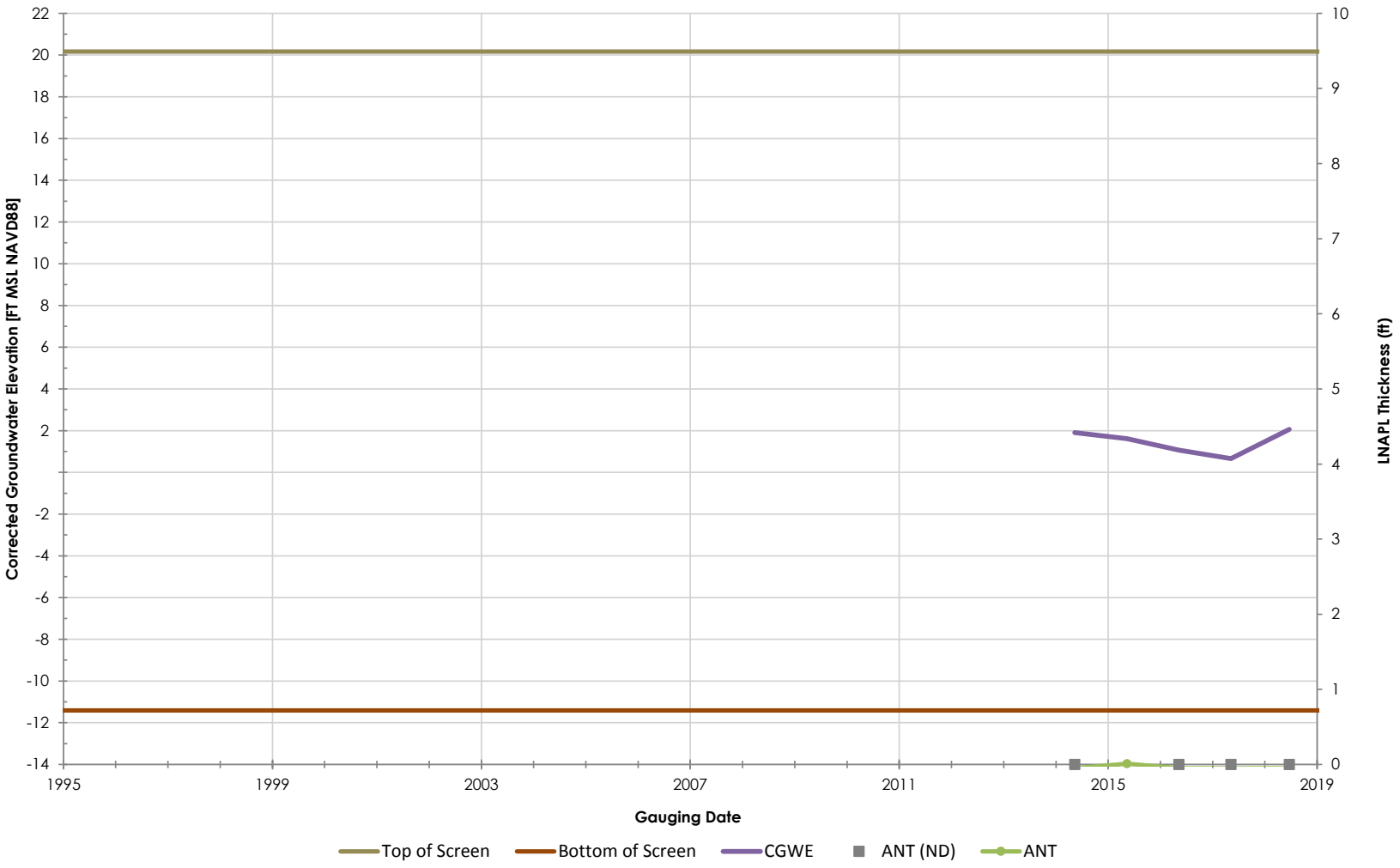
Stantec

Figure/Well No.

DSCP-MW-59

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

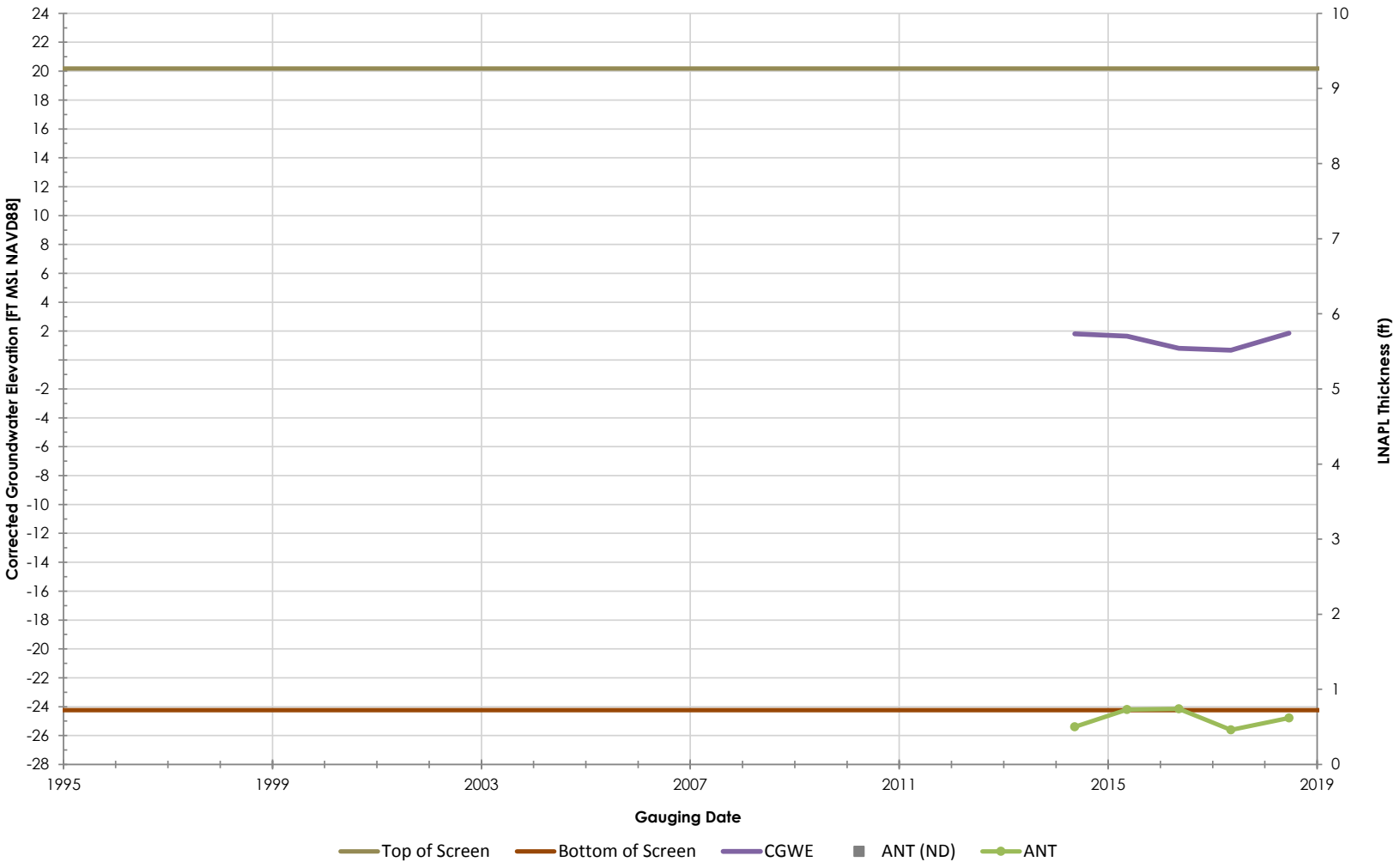
Stantec

Figure/Well No.

DSCP-MW-6

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

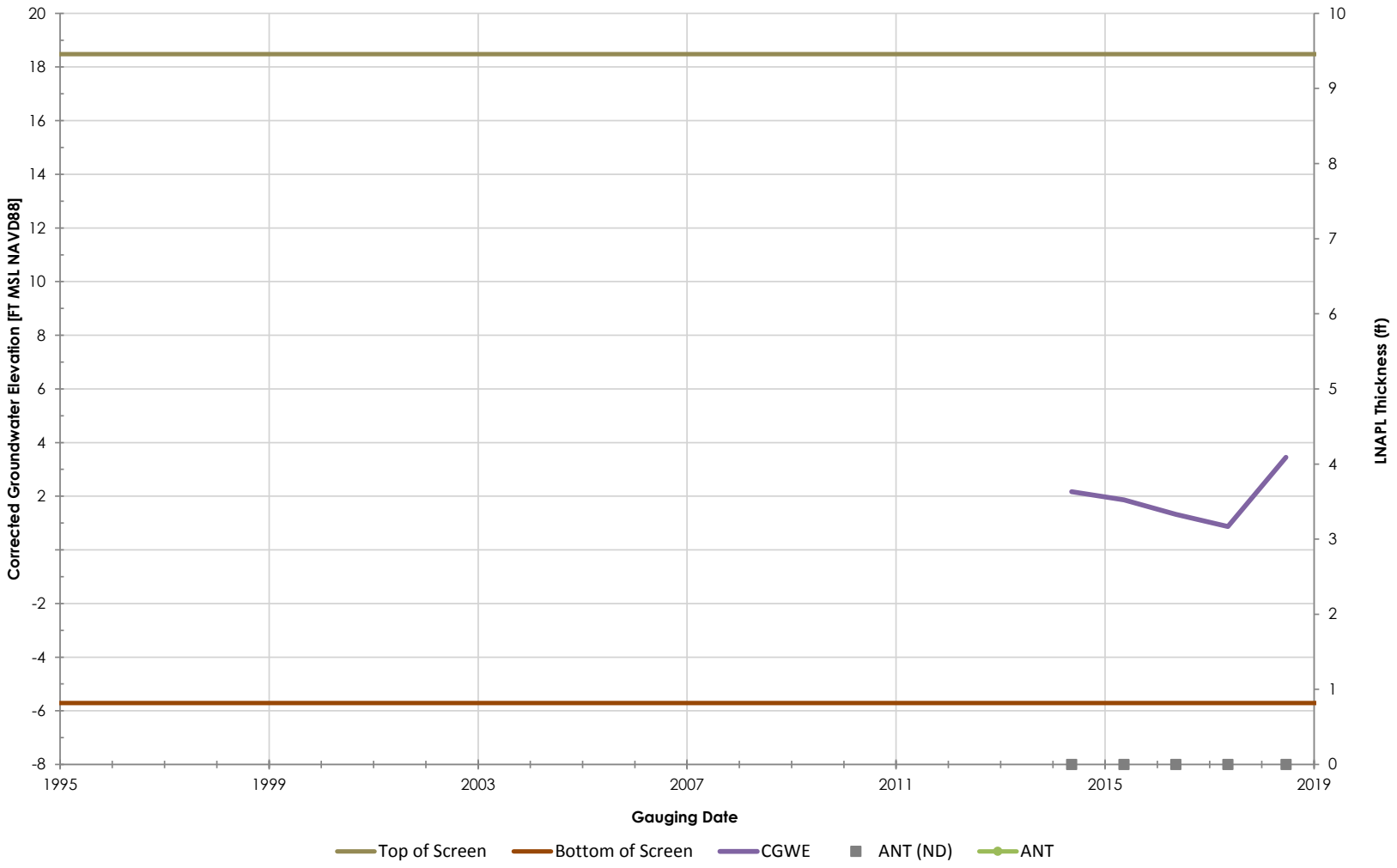
Stantec

Figure/Well No.

DSCP-MW-65

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

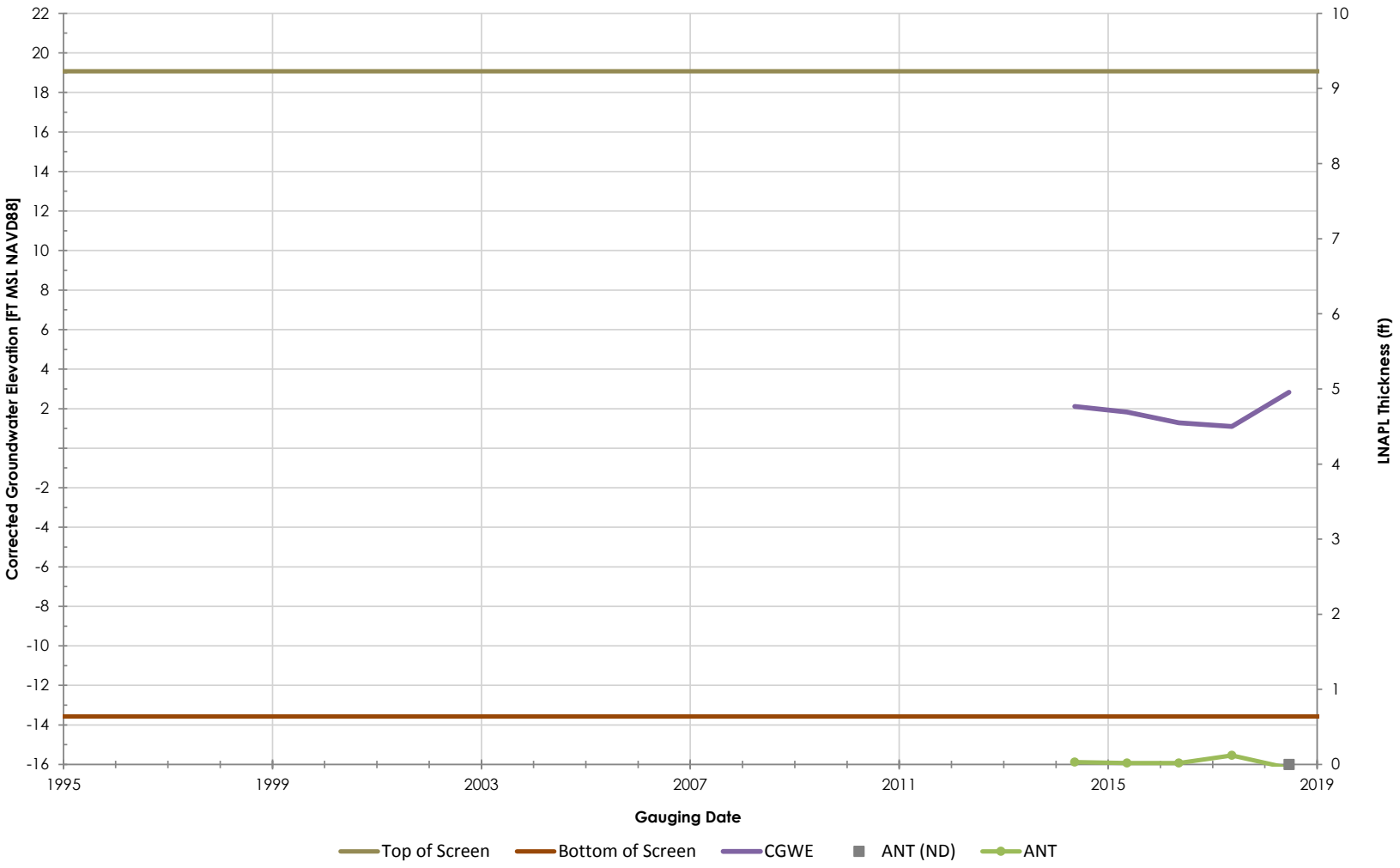
Stantec

Figure/Well No.

DSCP-MW-7

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

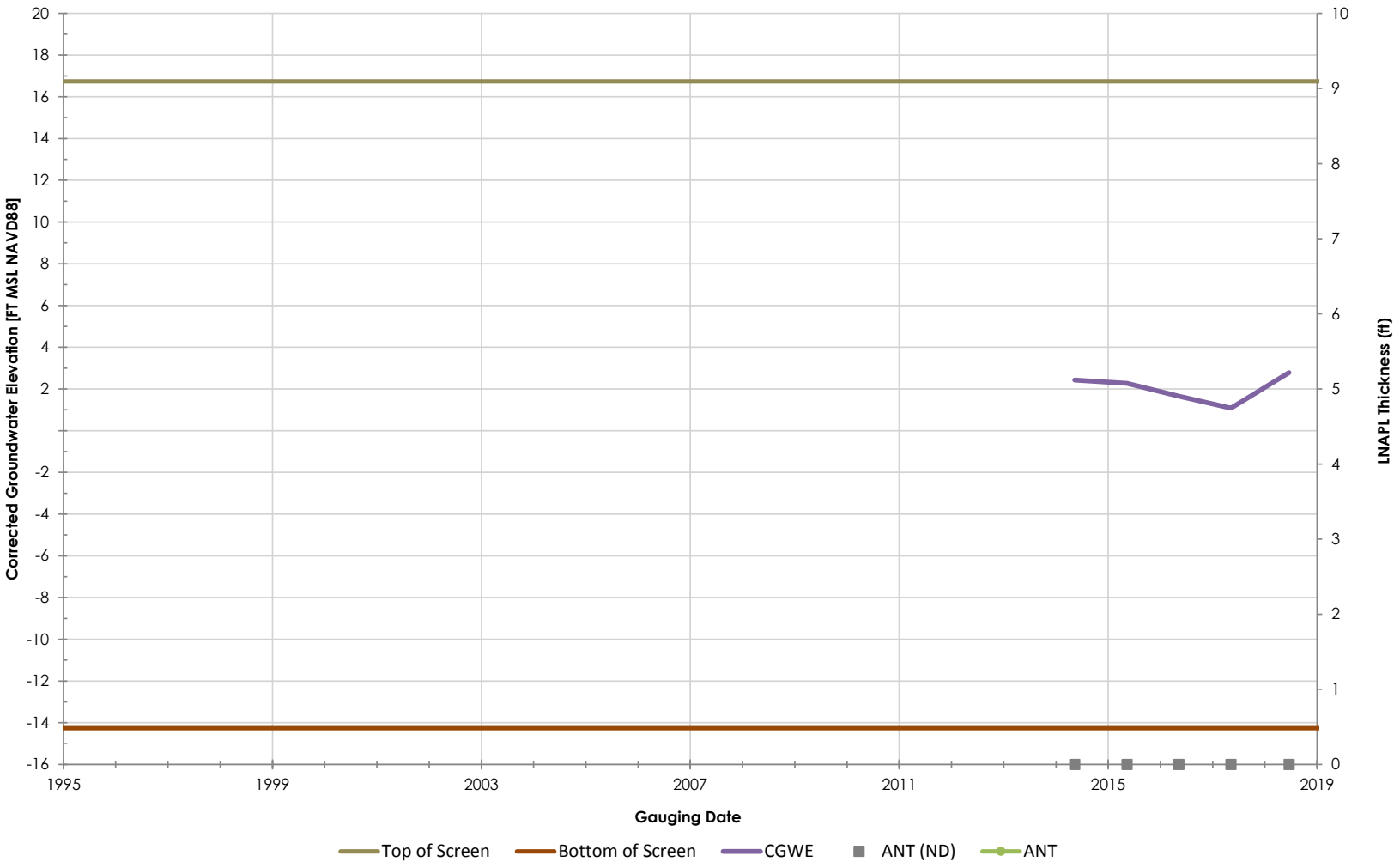
Stantec

Figure/Well No.

DSCP-MW-9

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

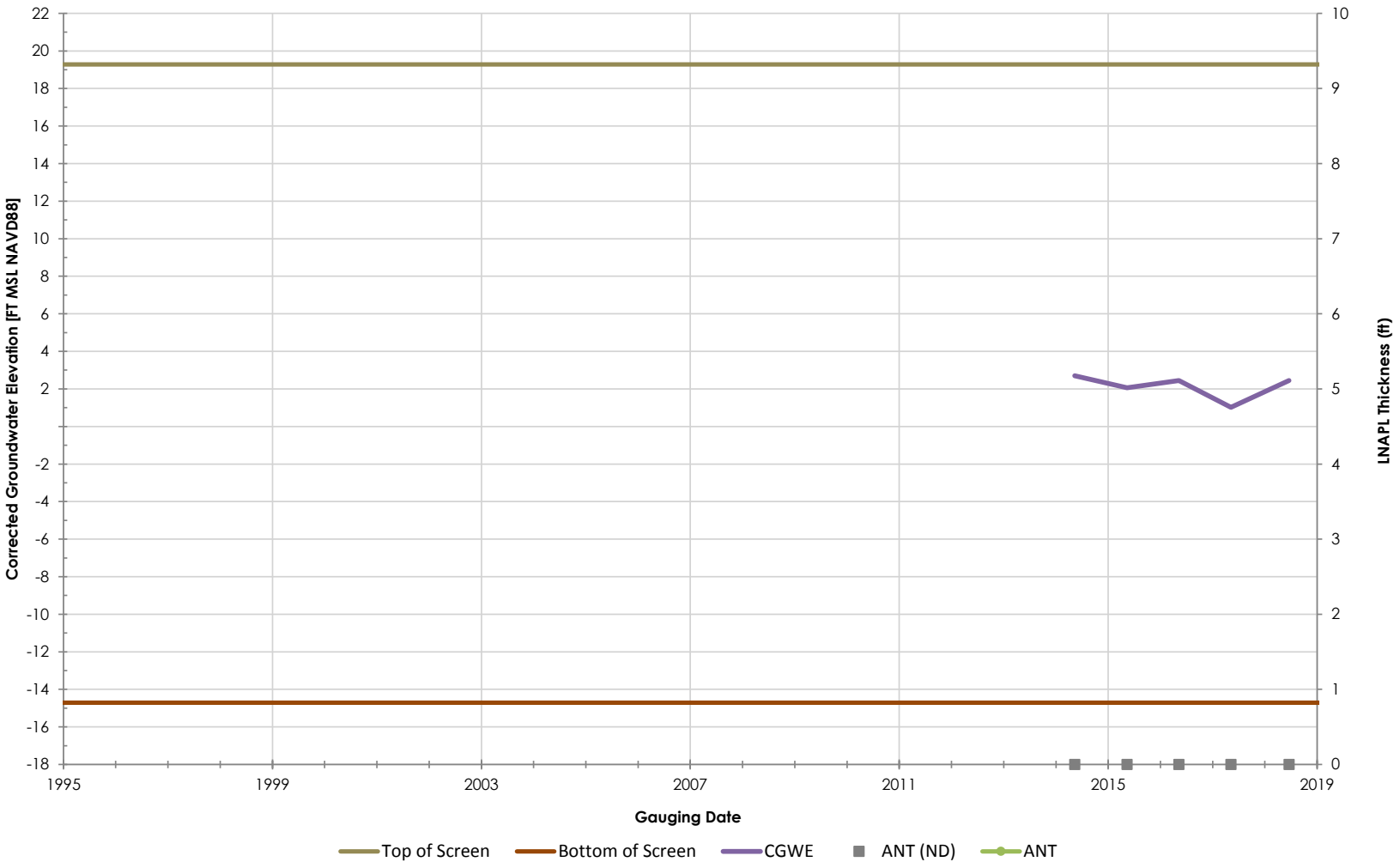
Stantec

Figure/Well No.

DSCP-RW-10

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

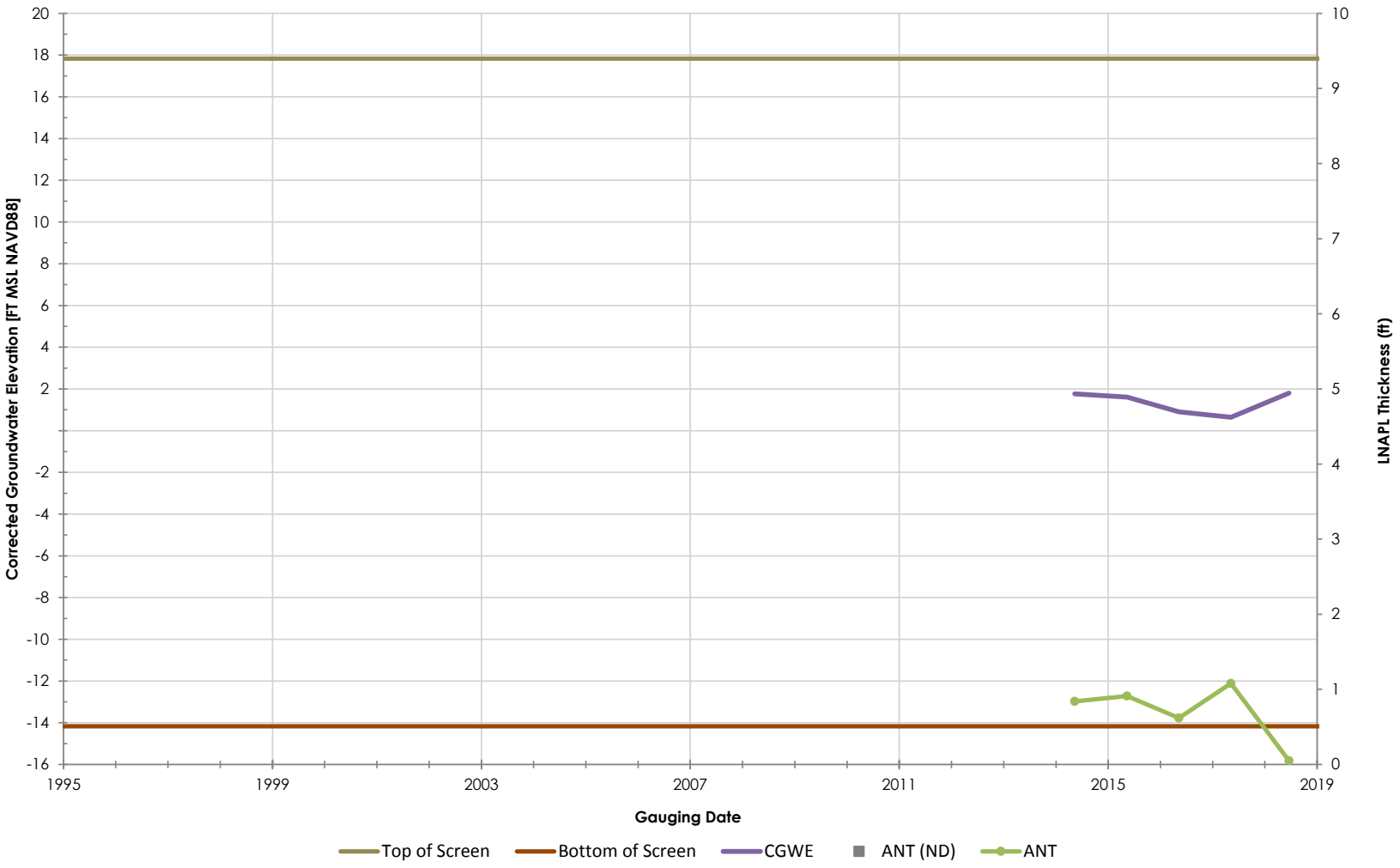
Stantec

Figure/Well No.

DSCP-RW-11

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

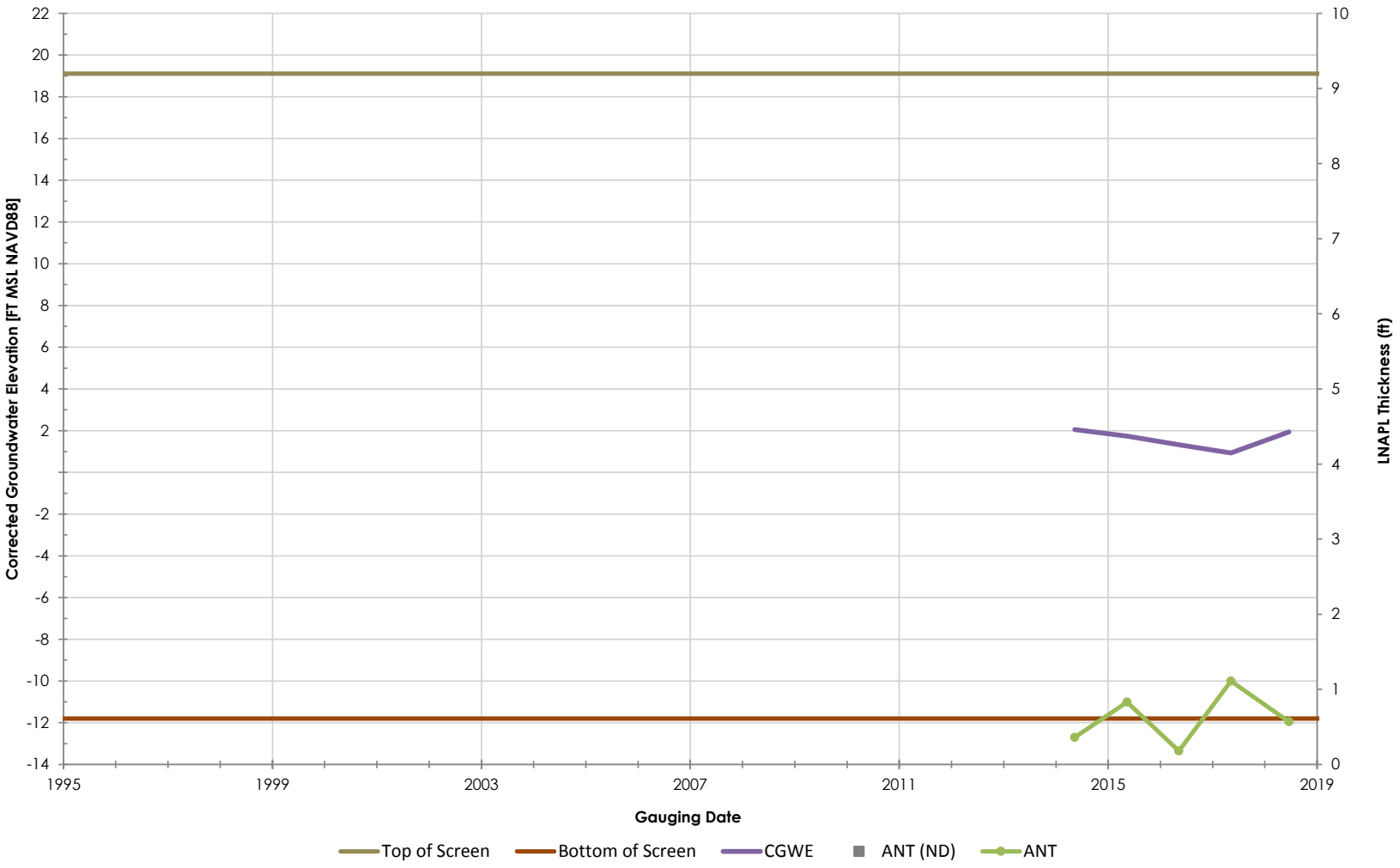
Stantec

Figure/Well No.

DSCP-RW-1A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

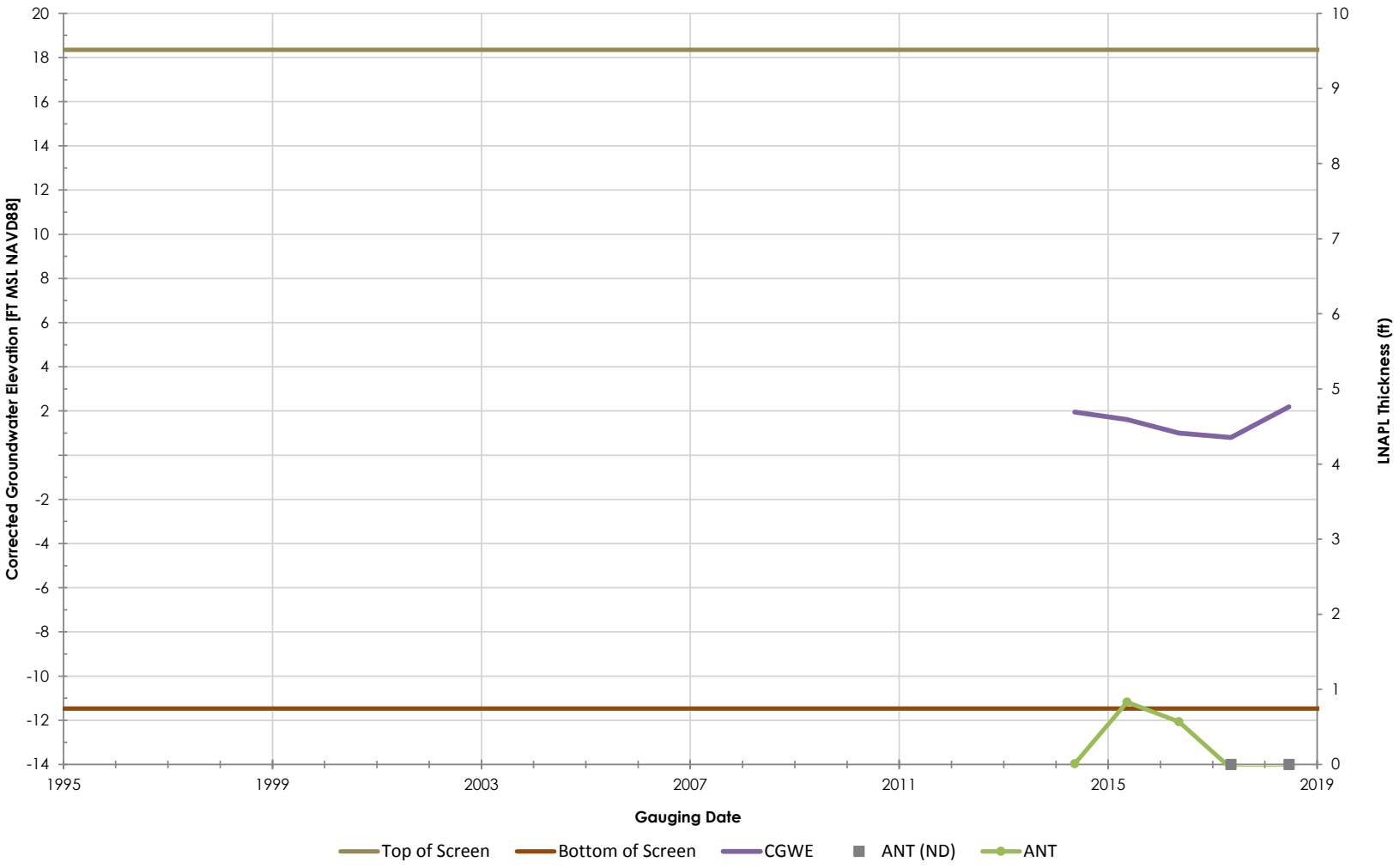
Stantec

Figure/Well No.

DSCP-RW-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

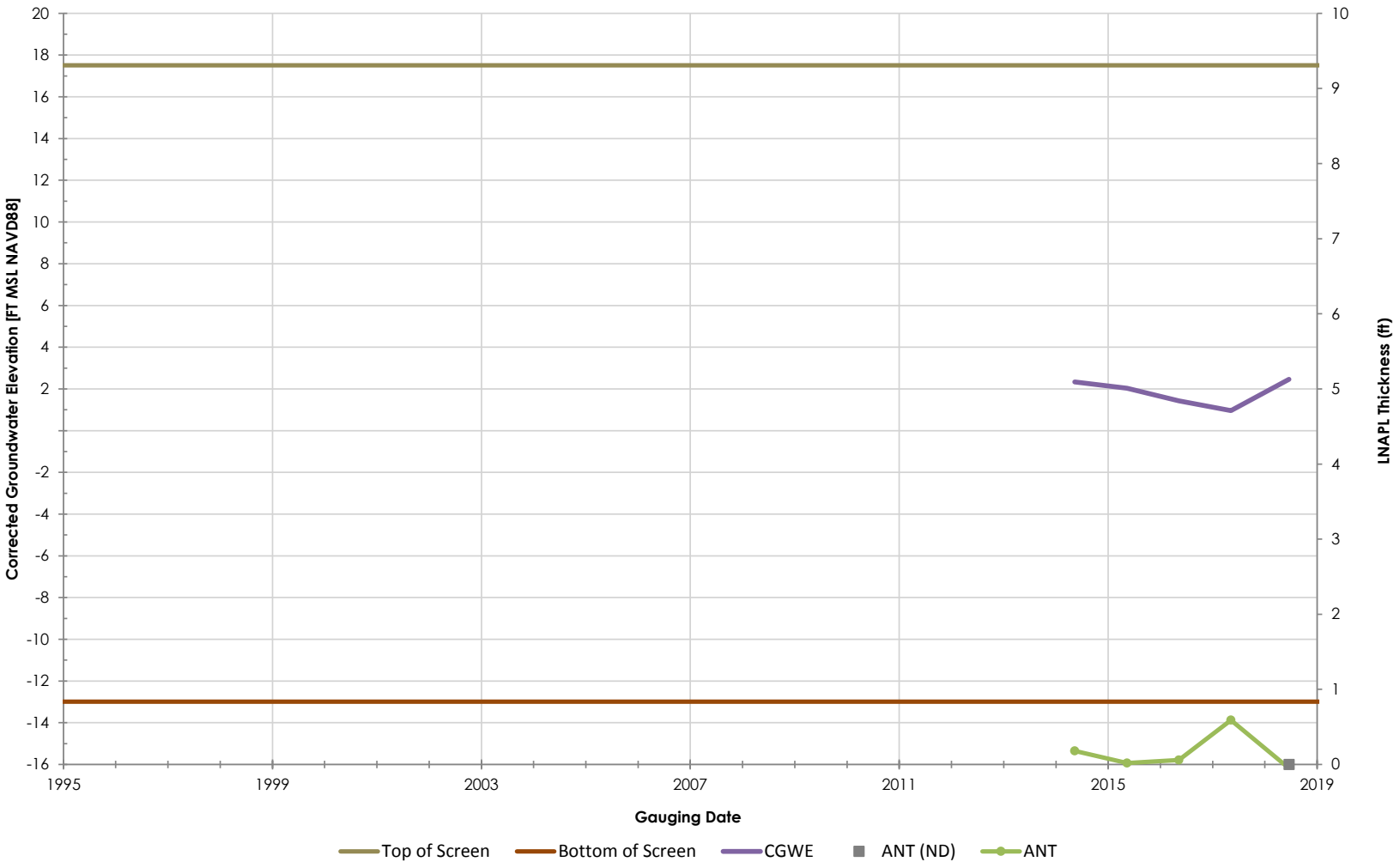
Stantec

Figure/Well No.

DSCP-RW-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

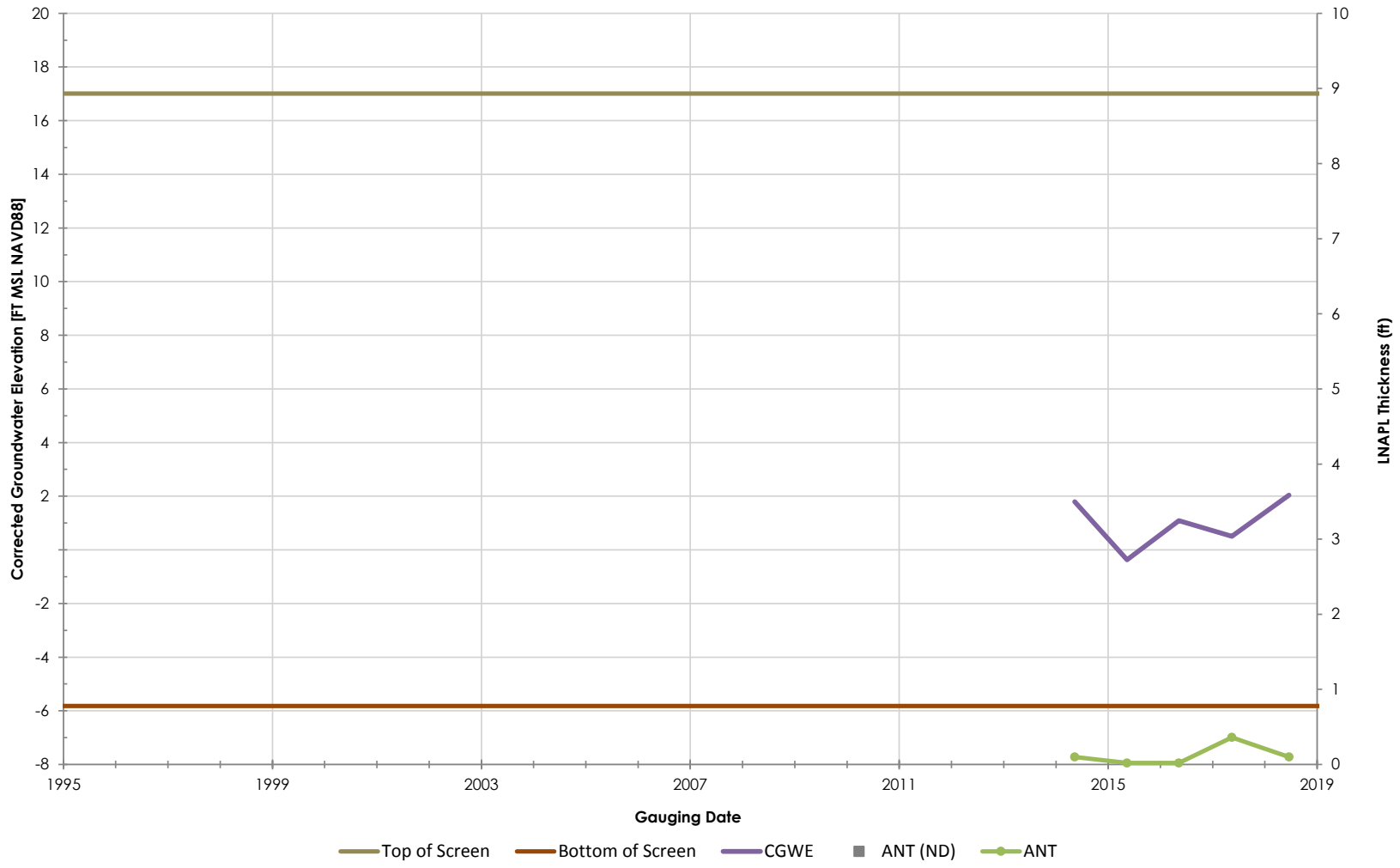
Stantec

Figure/Well No.

DSCP-RW-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

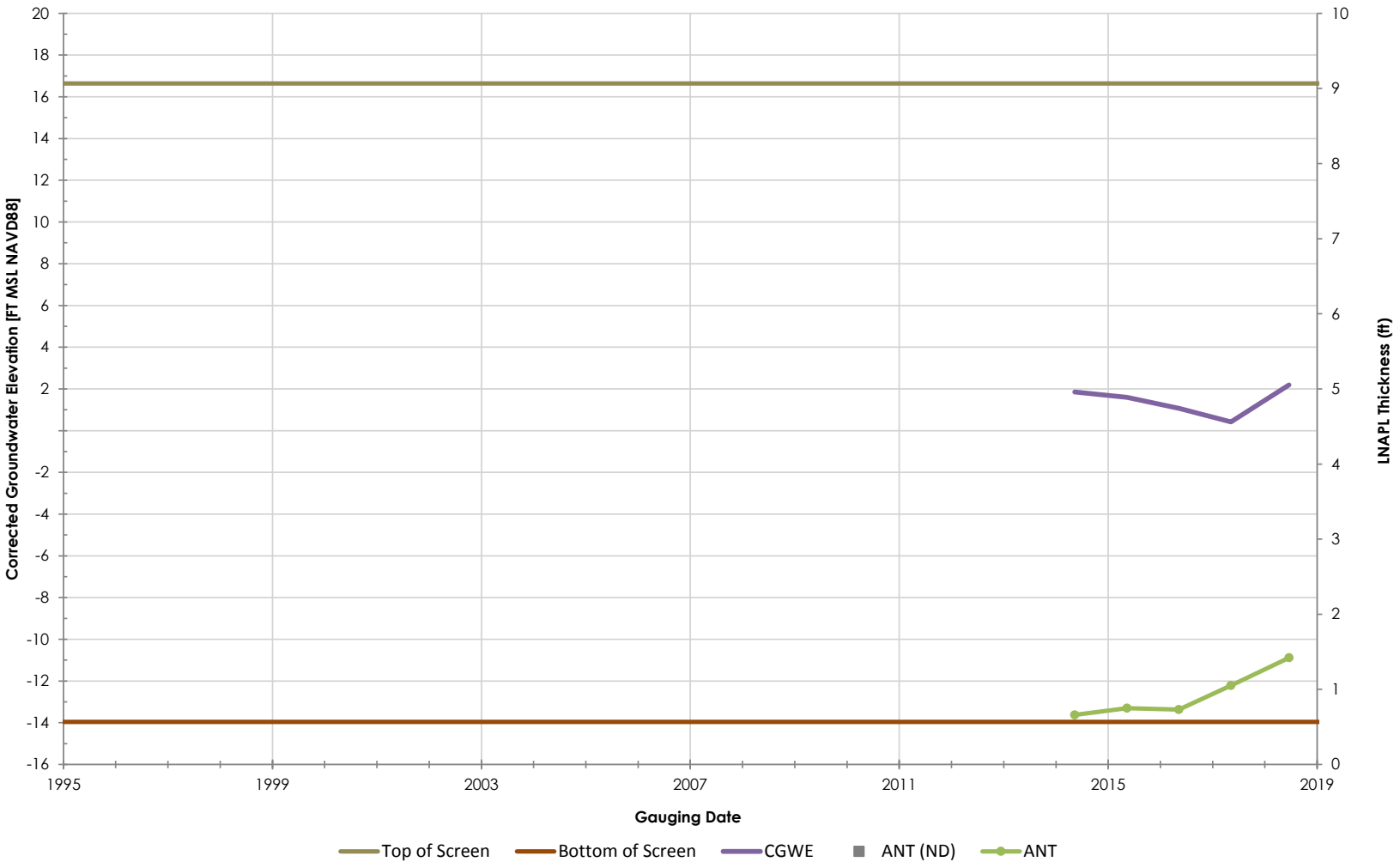
Stantec

Figure/Well No.

DSCP-RW-5_MW-25

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

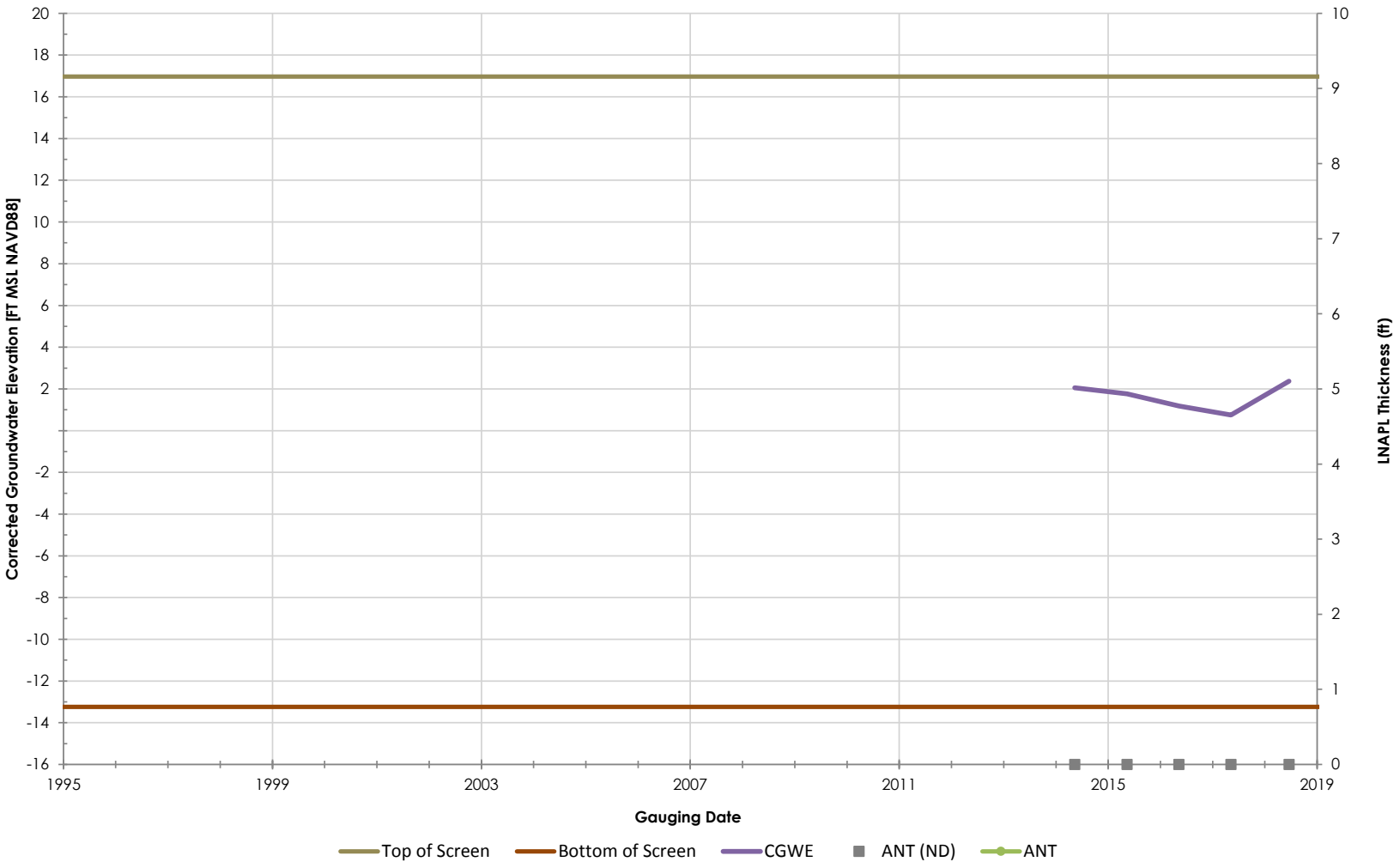
Stantec

Figure/Well No.

DSCP-RW-6

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

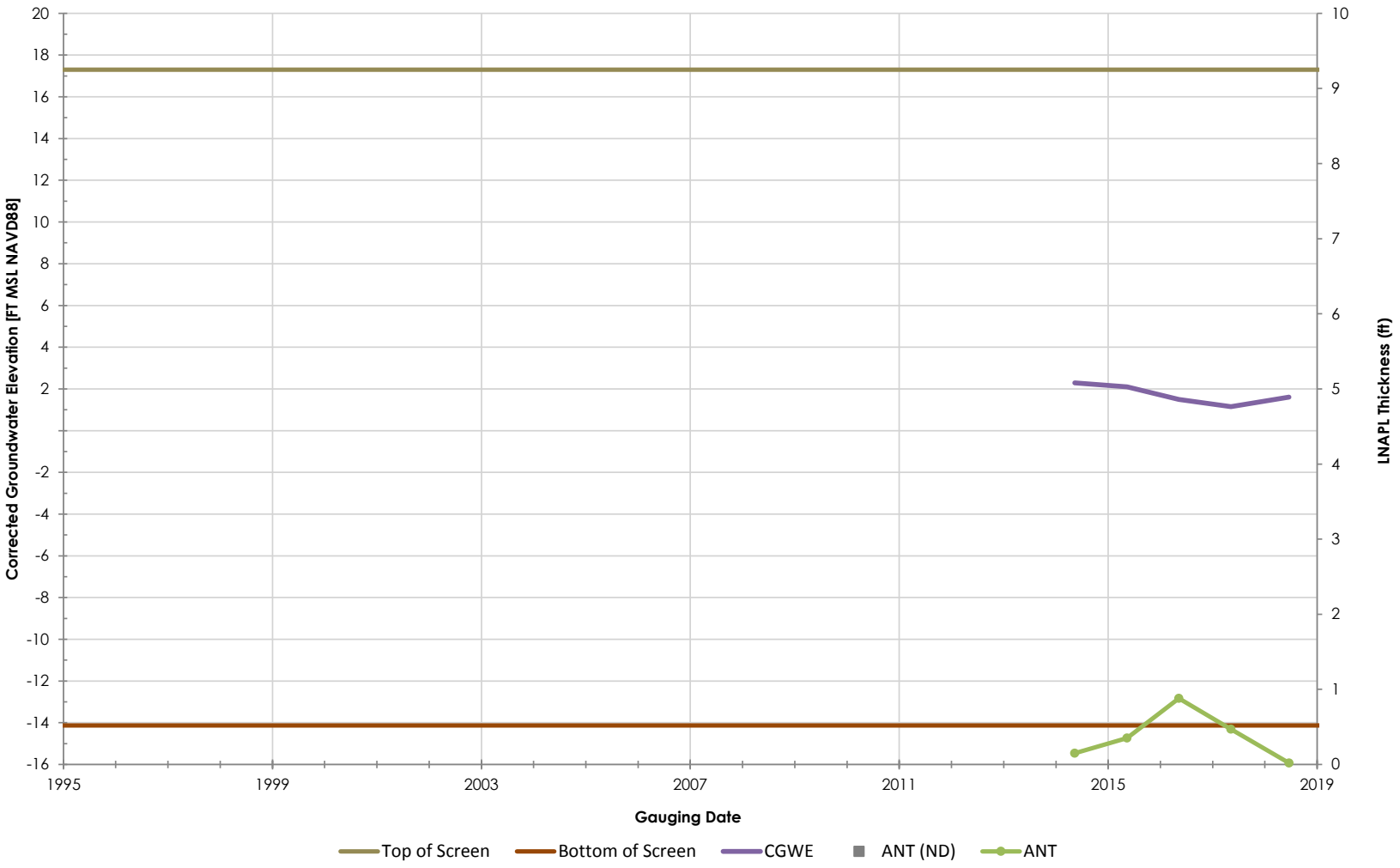
Stantec

Figure/Well No.

DSCP-RW-7

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

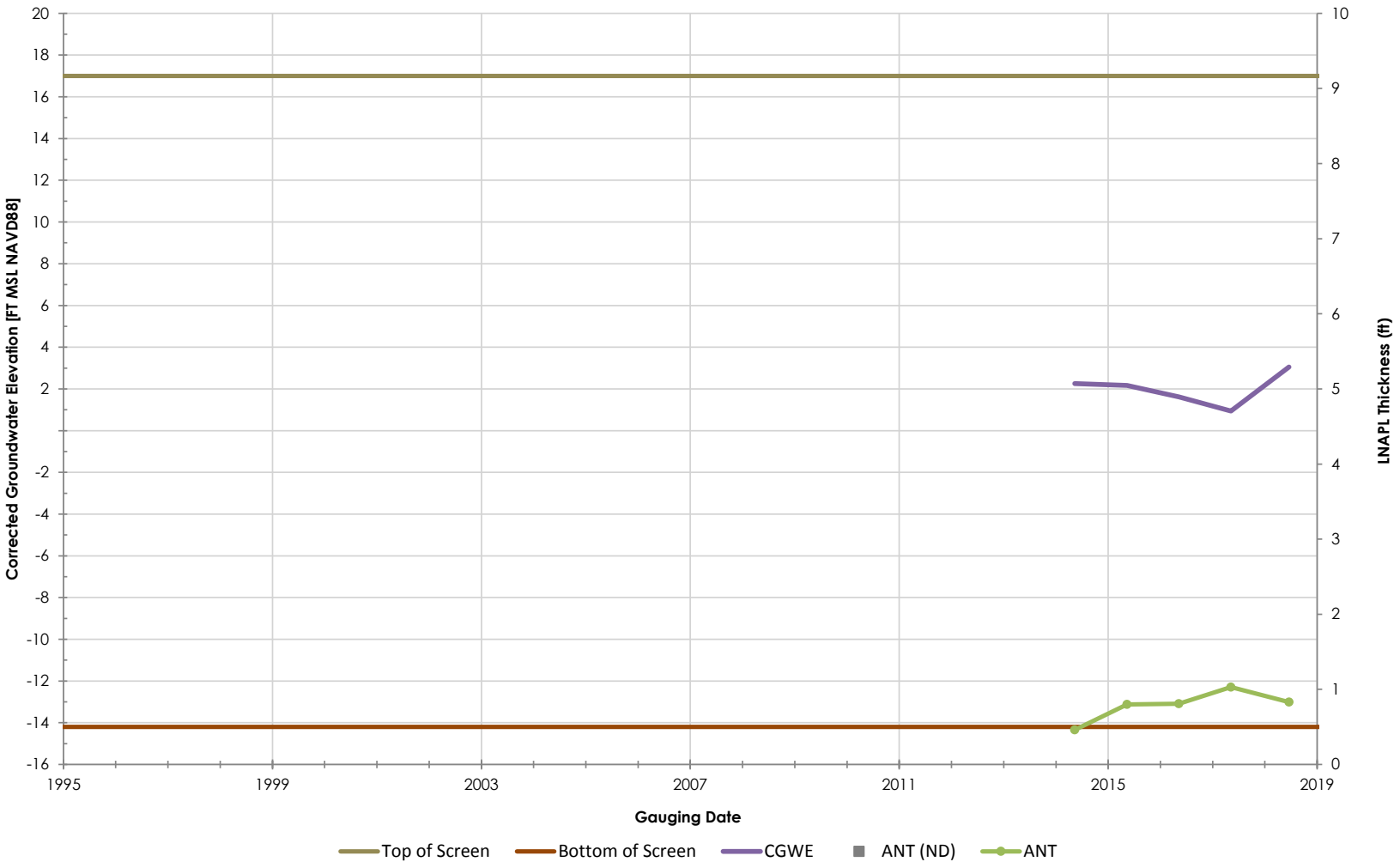
Stantec

Figure/Well No.

DSCP-RW-8

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

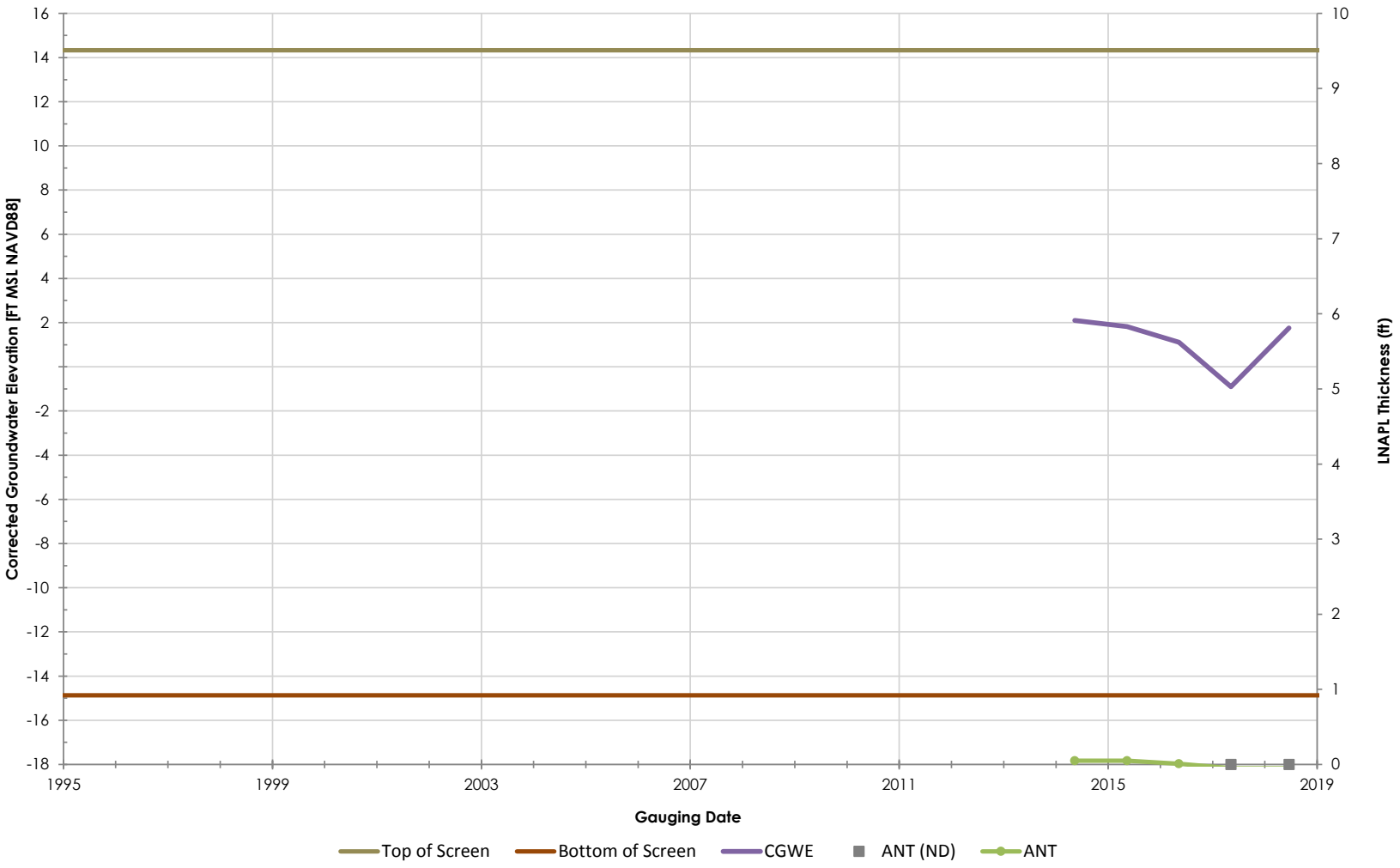
Stantec

Figure/Well No.

DSCP-RW-9

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

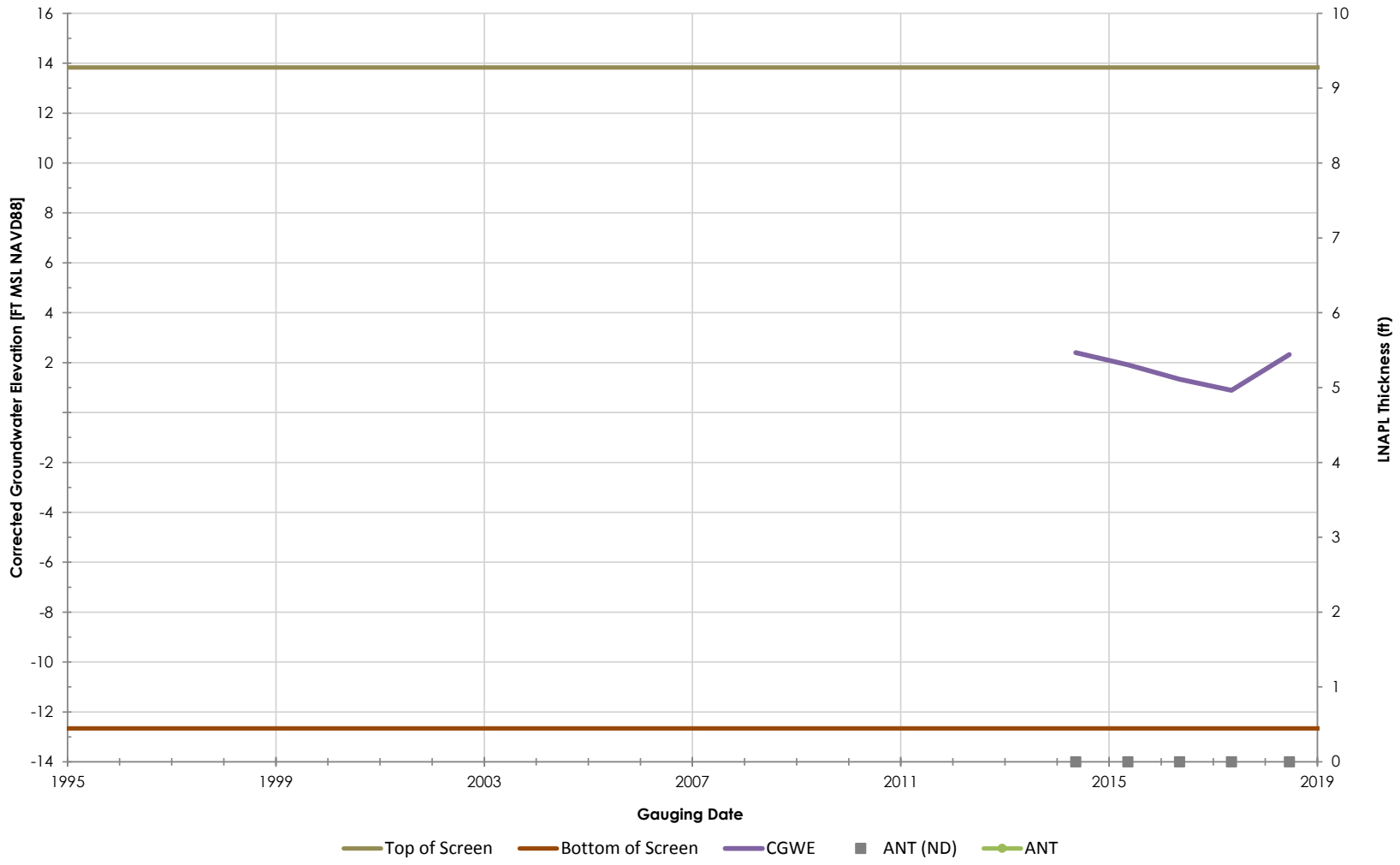
Stantec

Figure/Well No.

EPH-MW-39

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

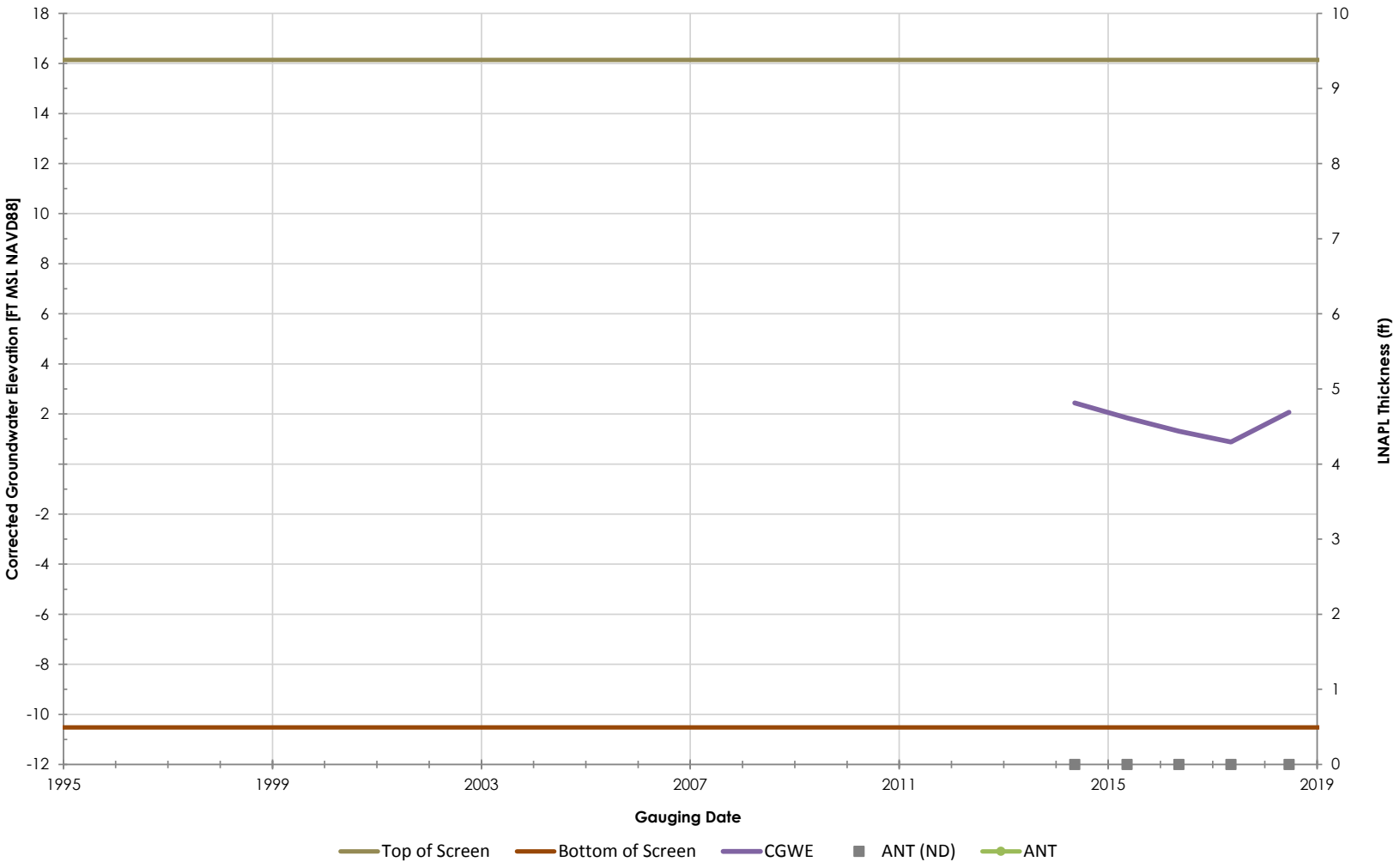
Stantec

Figure/Well No.

EPH-MW-48

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

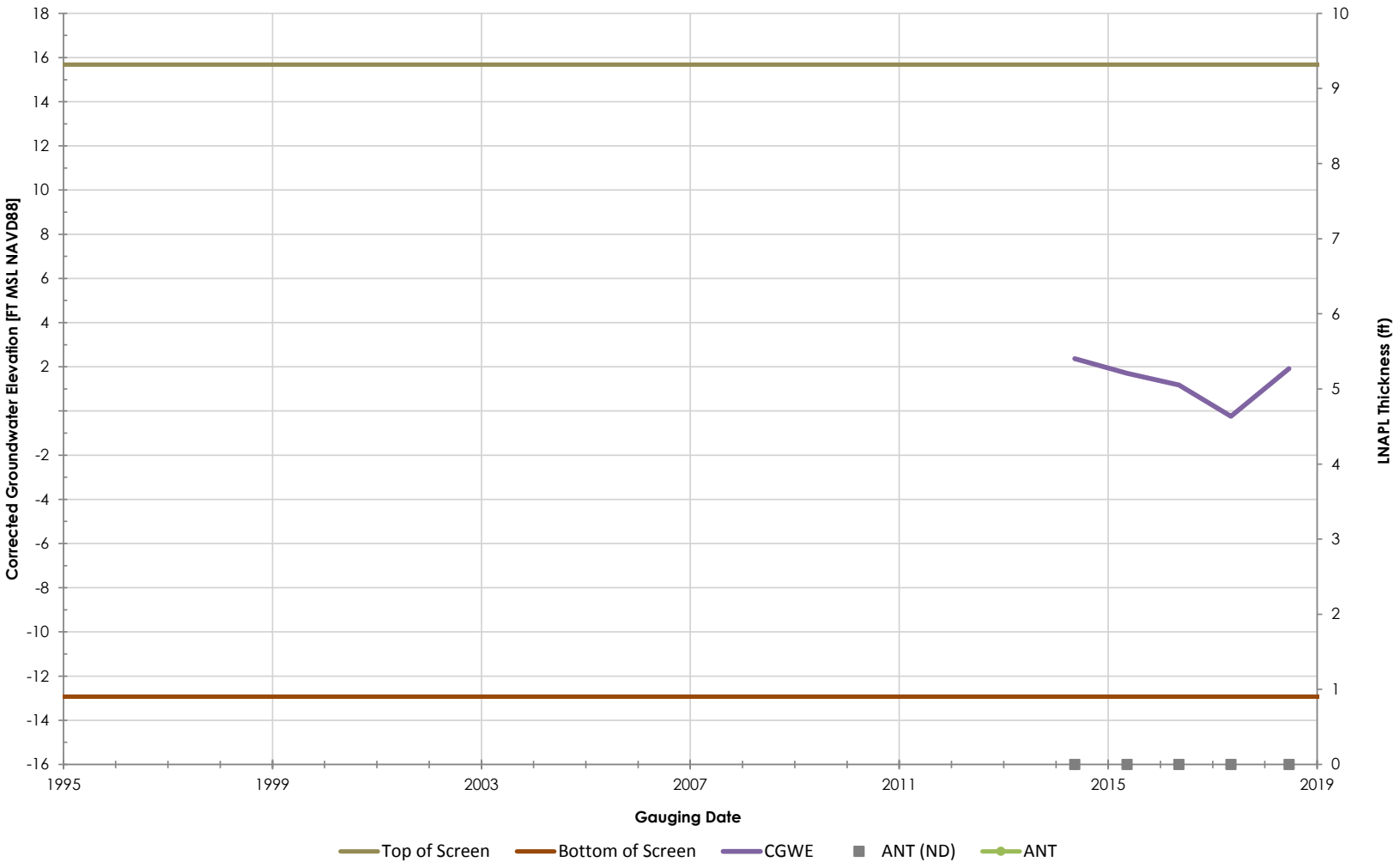
Stantec

Figure/Well No.

EPH-MW-49

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

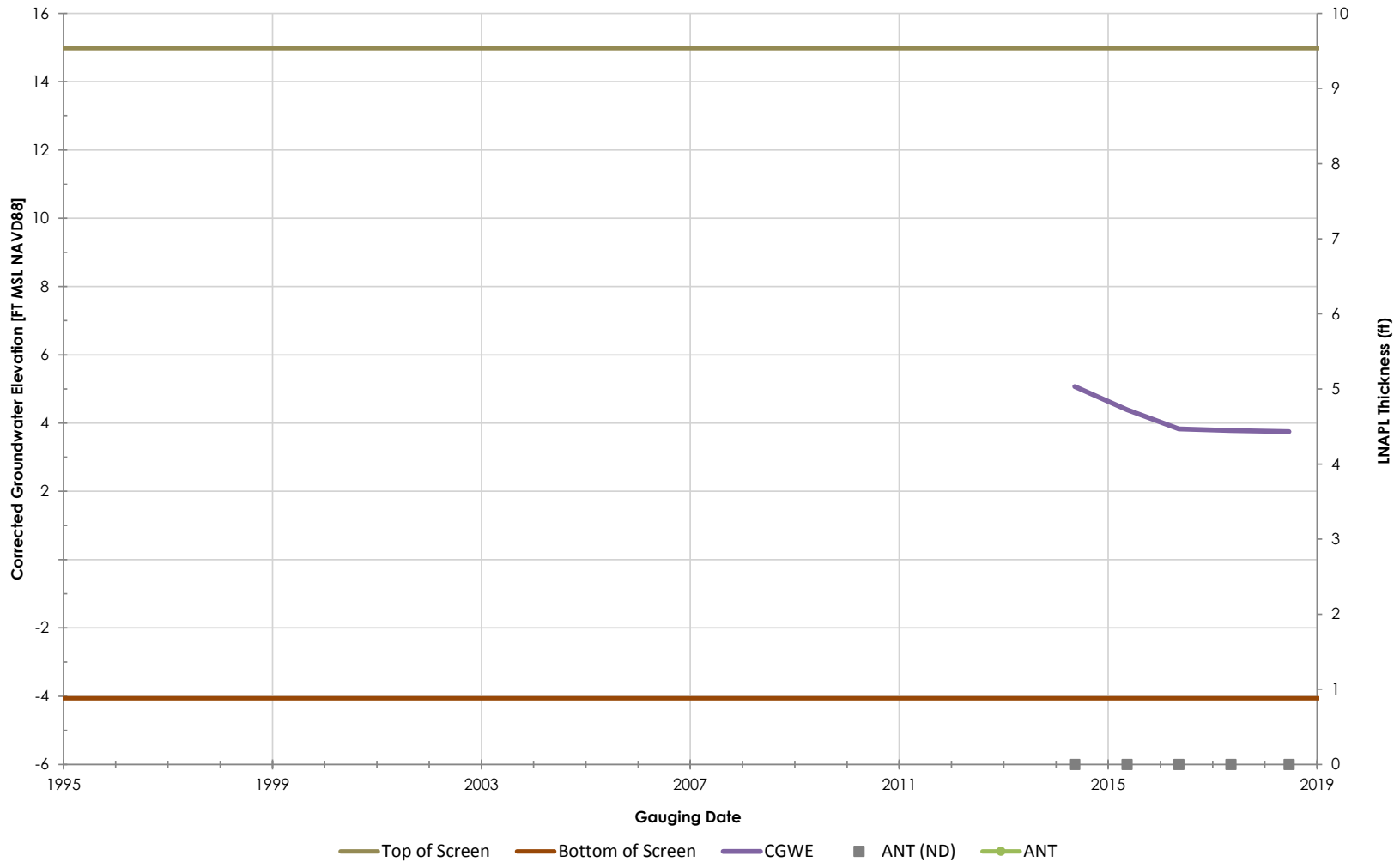
Stantec

Figure/Well No.

EPH-MW-50

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

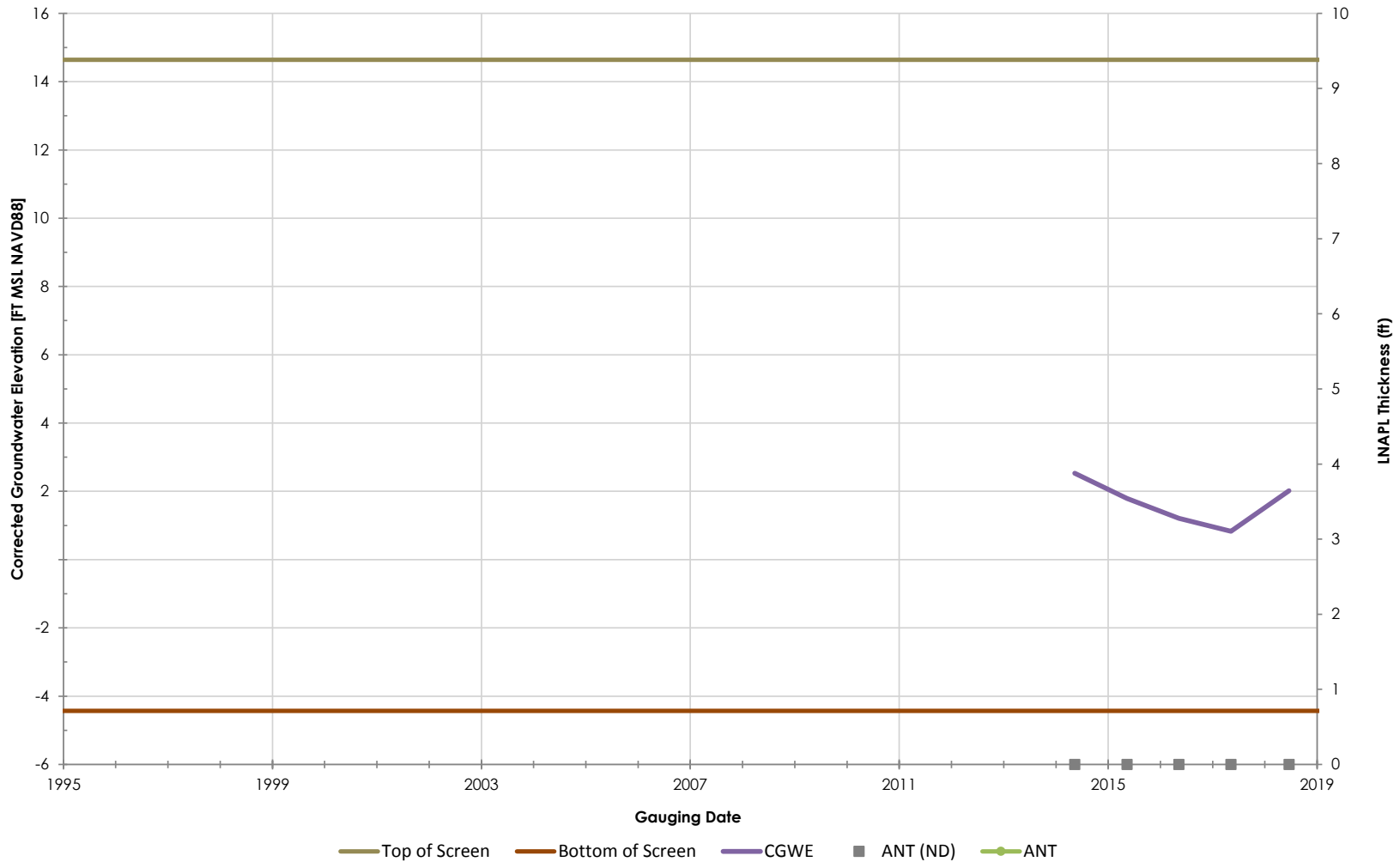
Stantec

Figure/Well No.

EPH-MWS-10

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

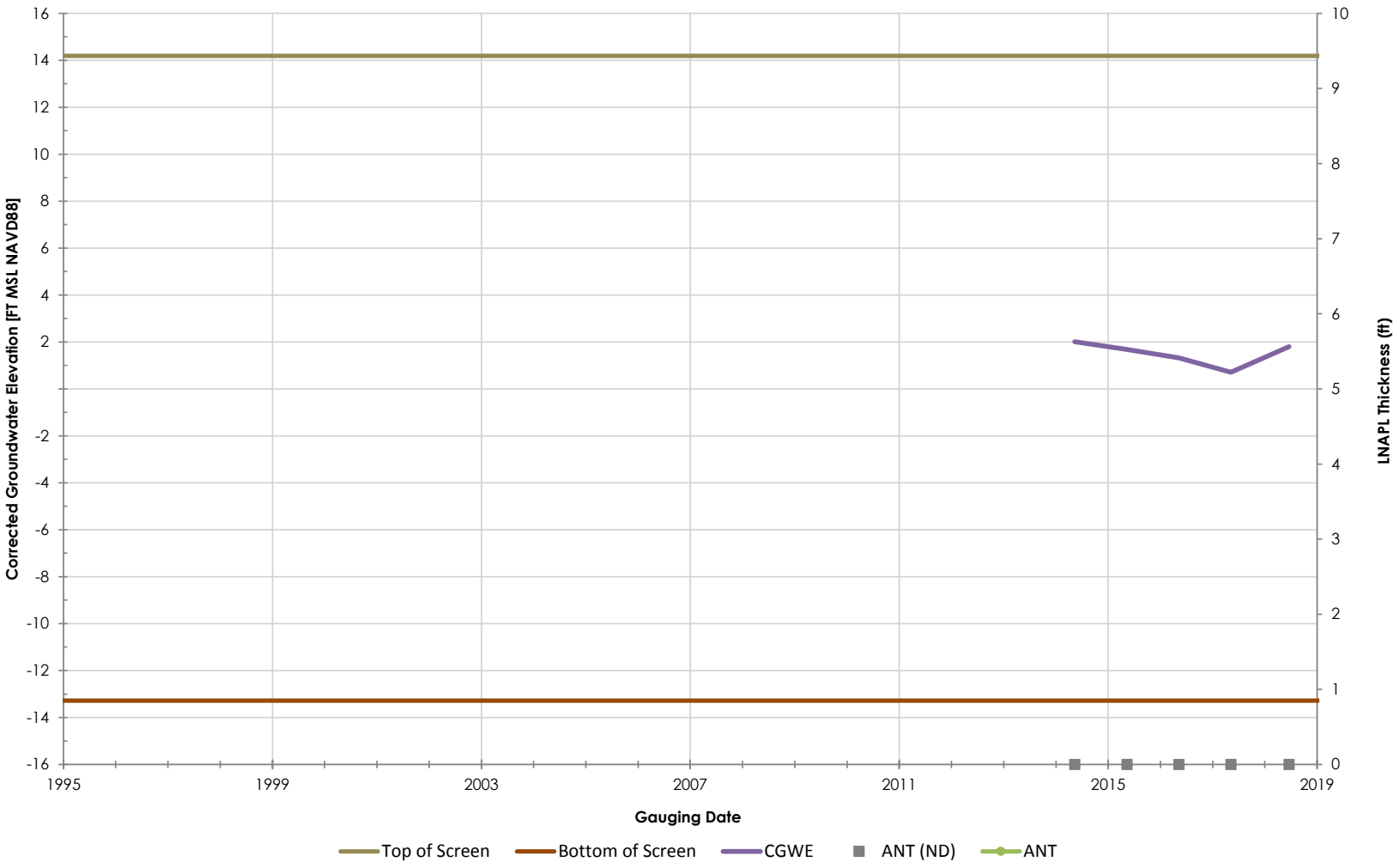
Stantec

Figure/Well No.

EPH-MWS-11

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

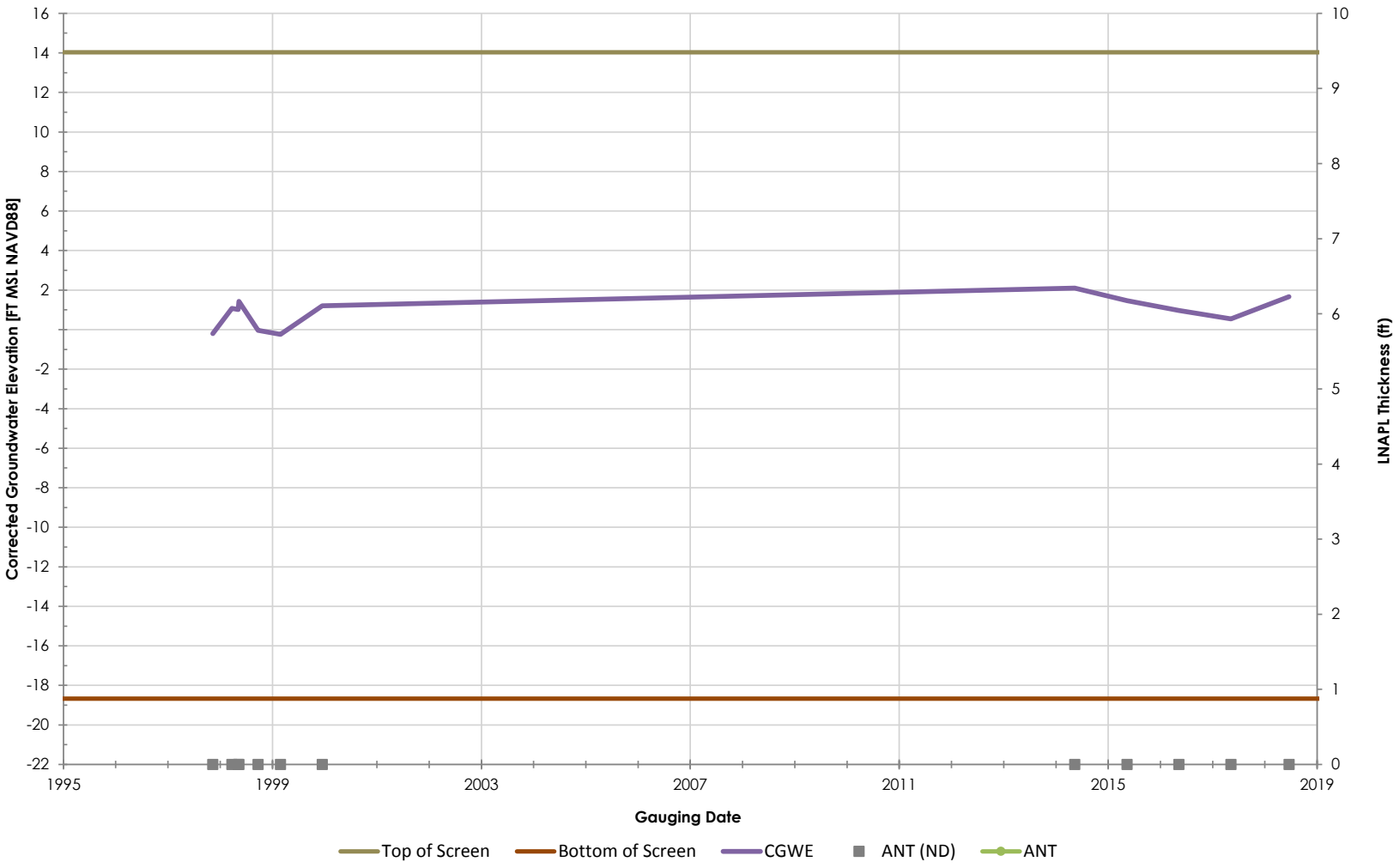
Stantec

Figure/Well No.

EPH-MWS-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

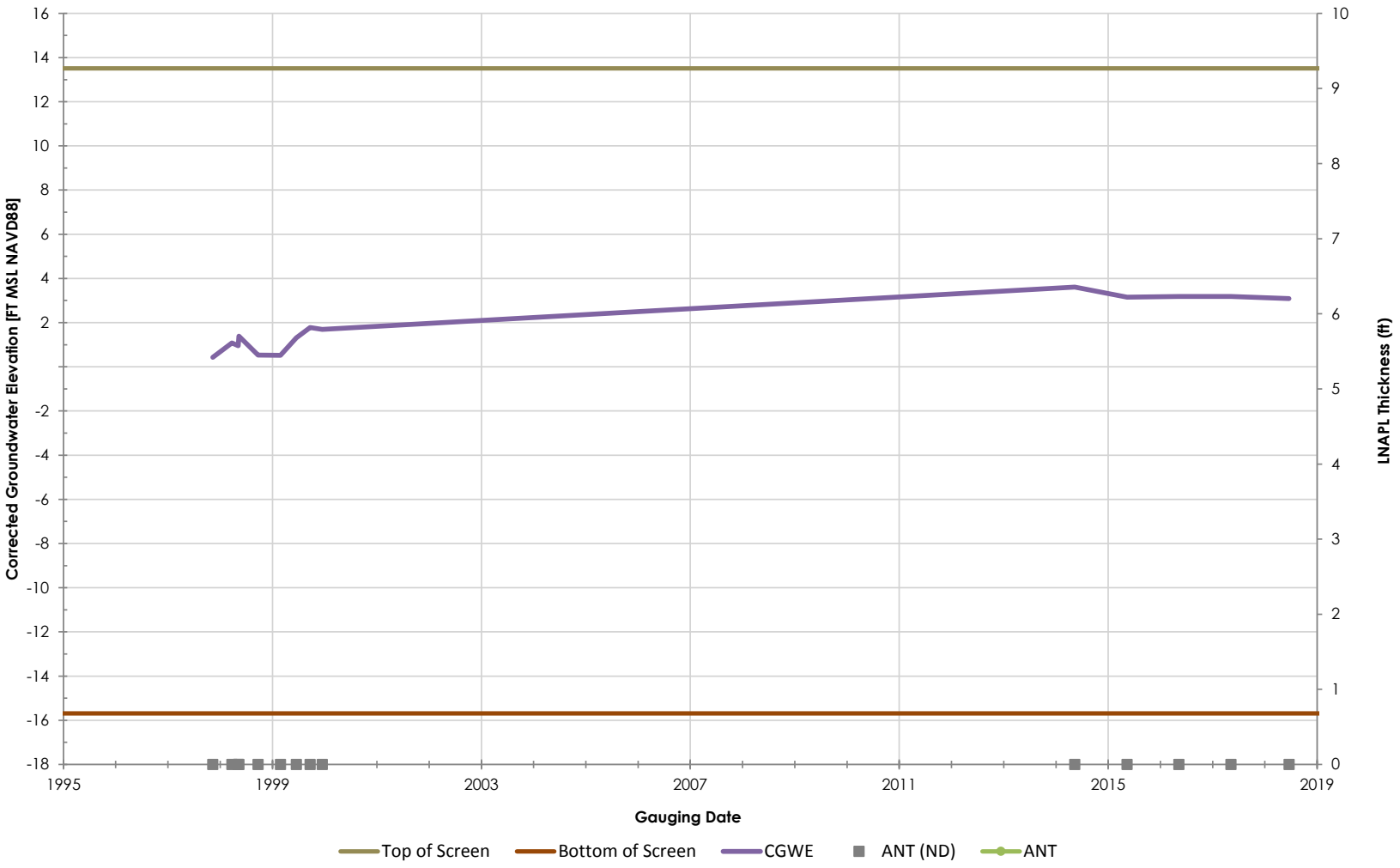
Stantec

Figure/Well No.

EPH-PH-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

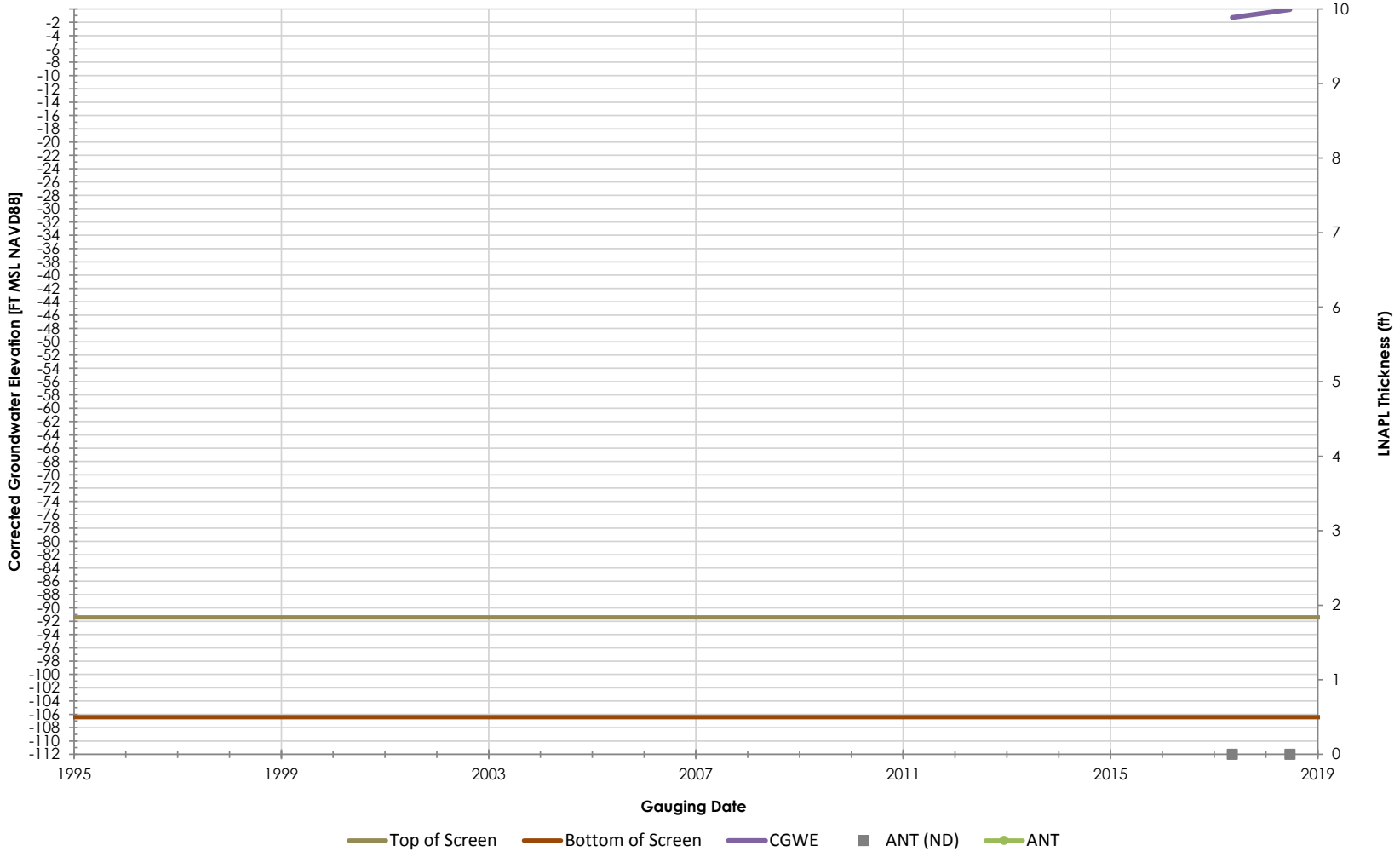
Stantec

Figure/Well No.

EPH-PH-7

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

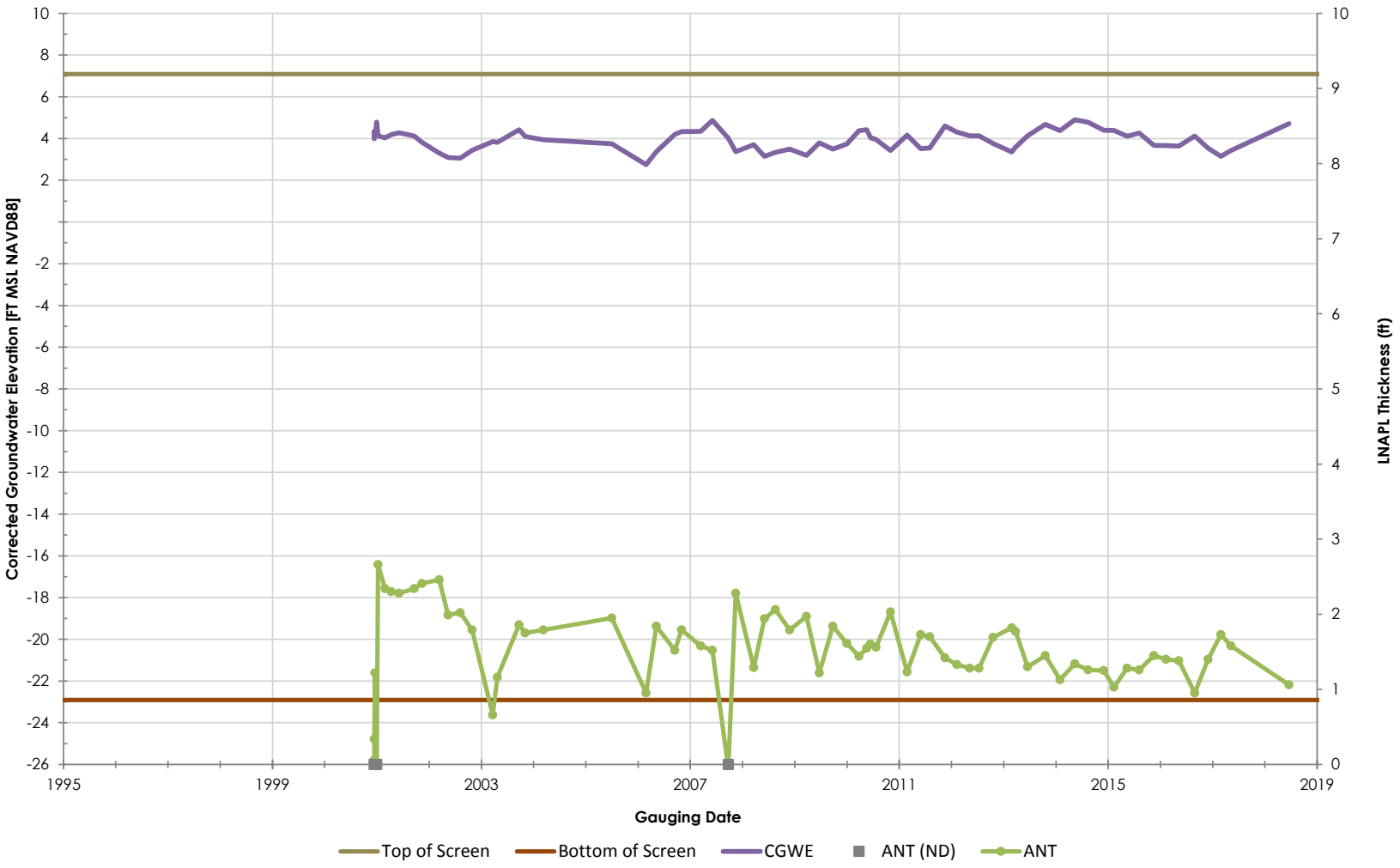
Stantec

Figure/Well No.

FDR-DW-15

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

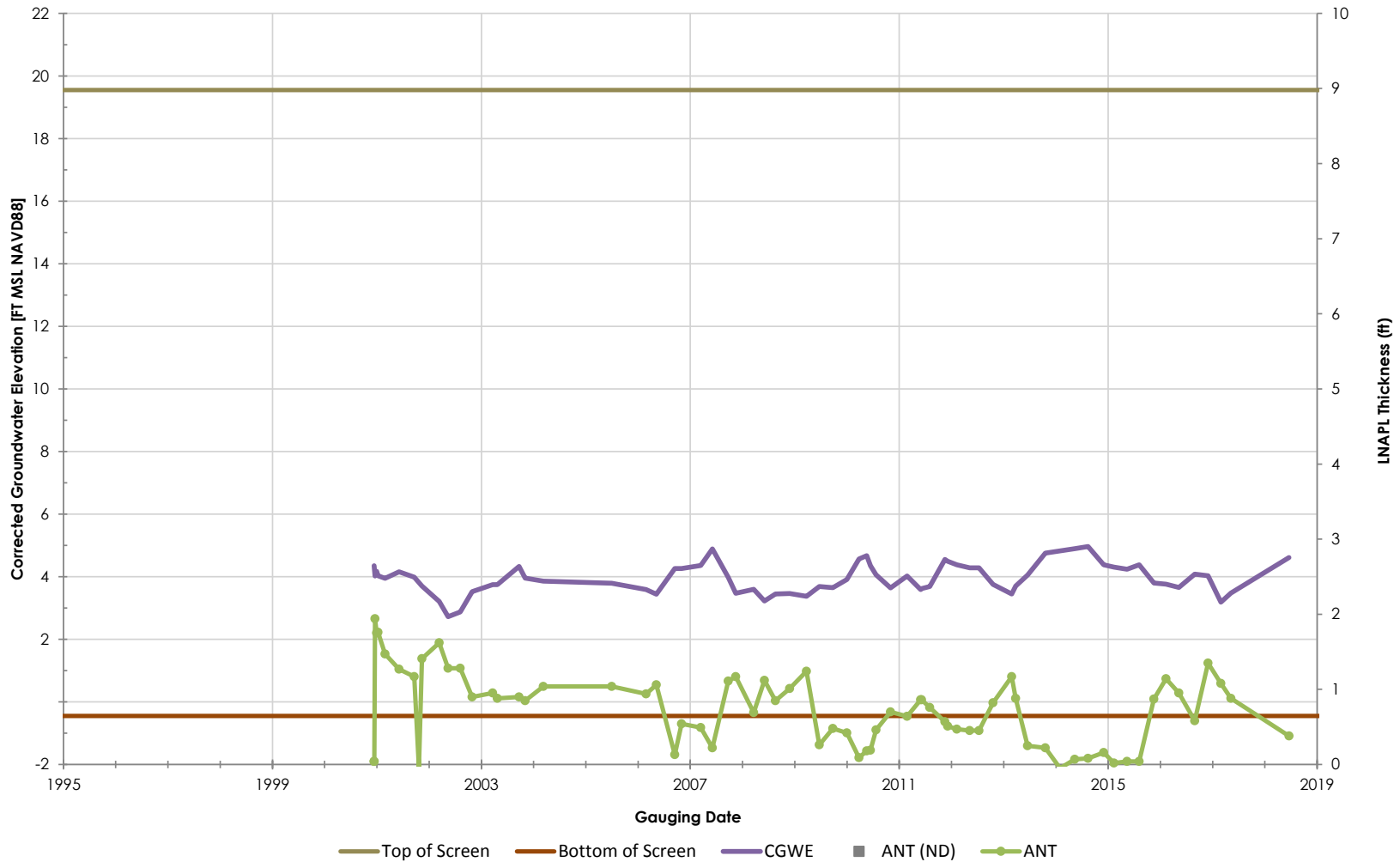
Stantec

Figure/Well No.

MW-26

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

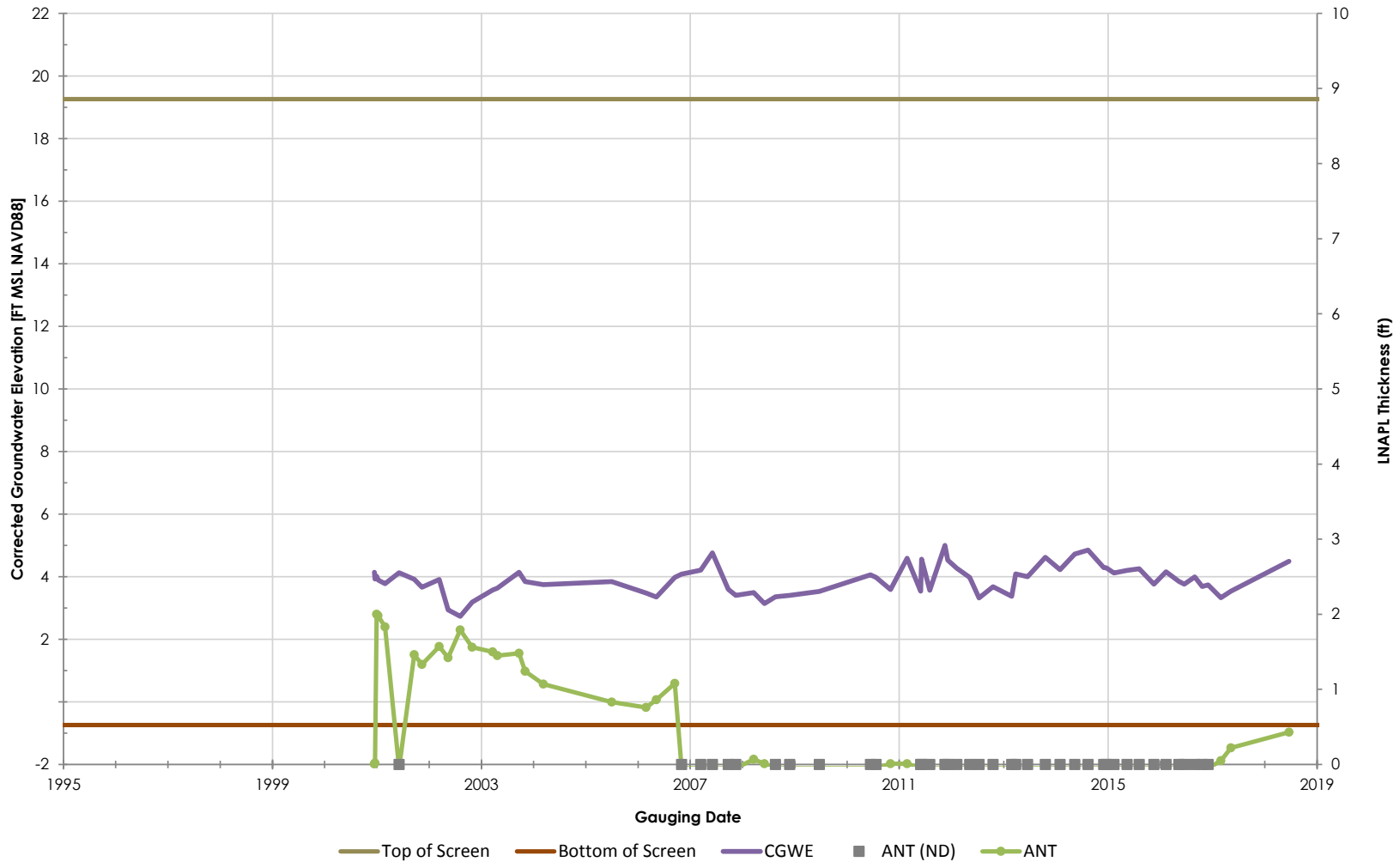
Stantec

Figure/Well No.

MW-27

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

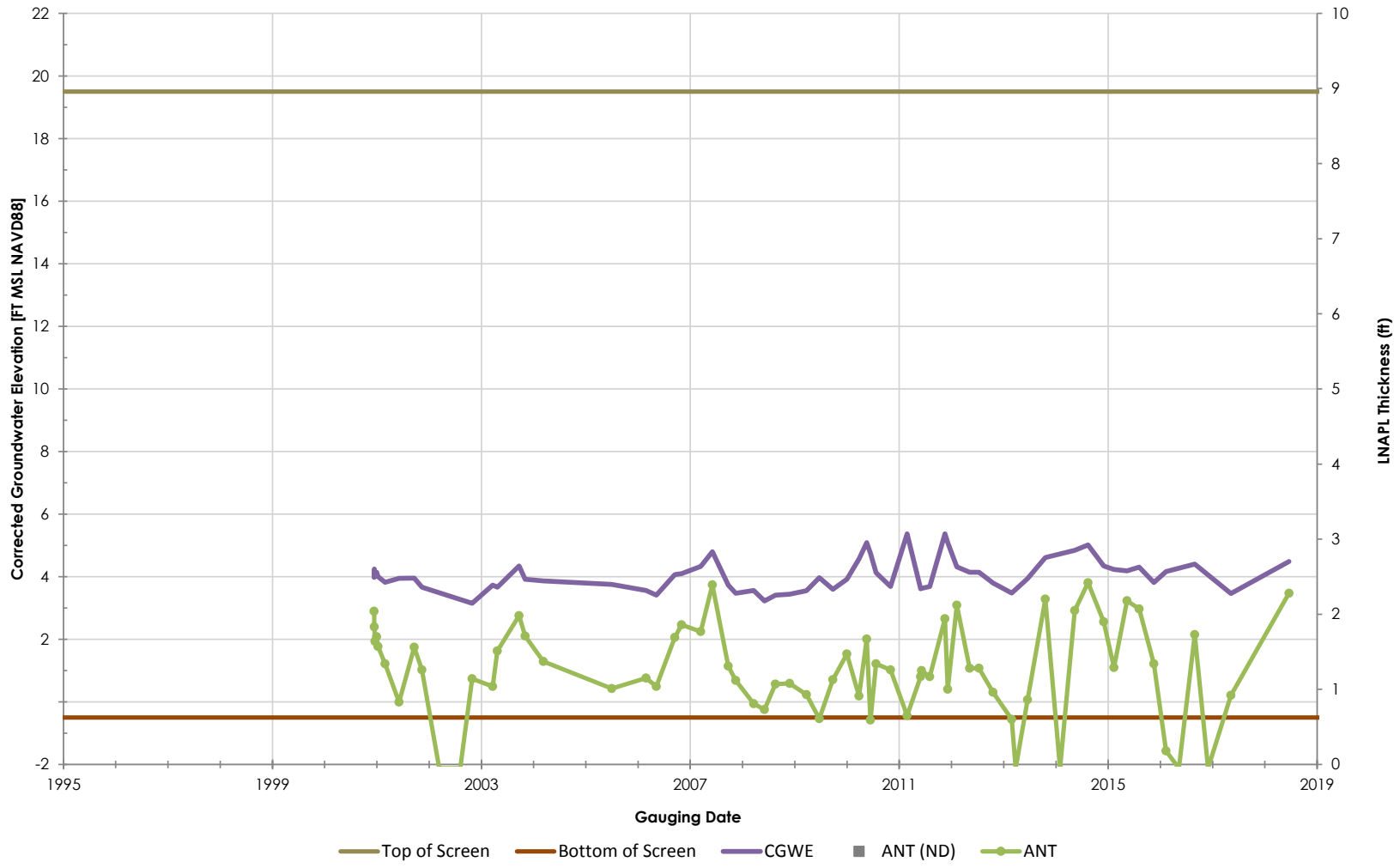
Stantec

Figure/Well No.

MW-28

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

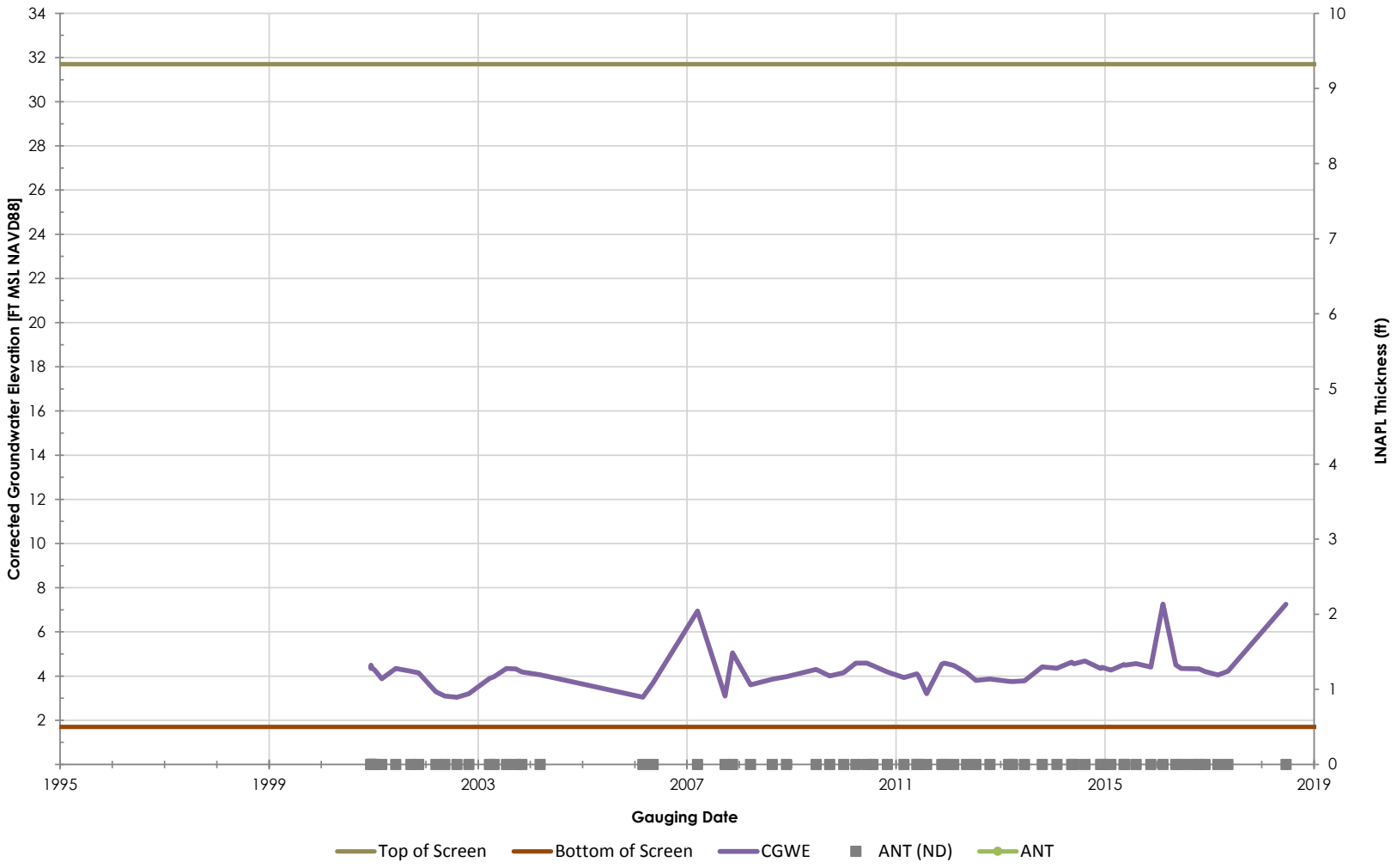
Stantec

Figure/Well No.

MW-29

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

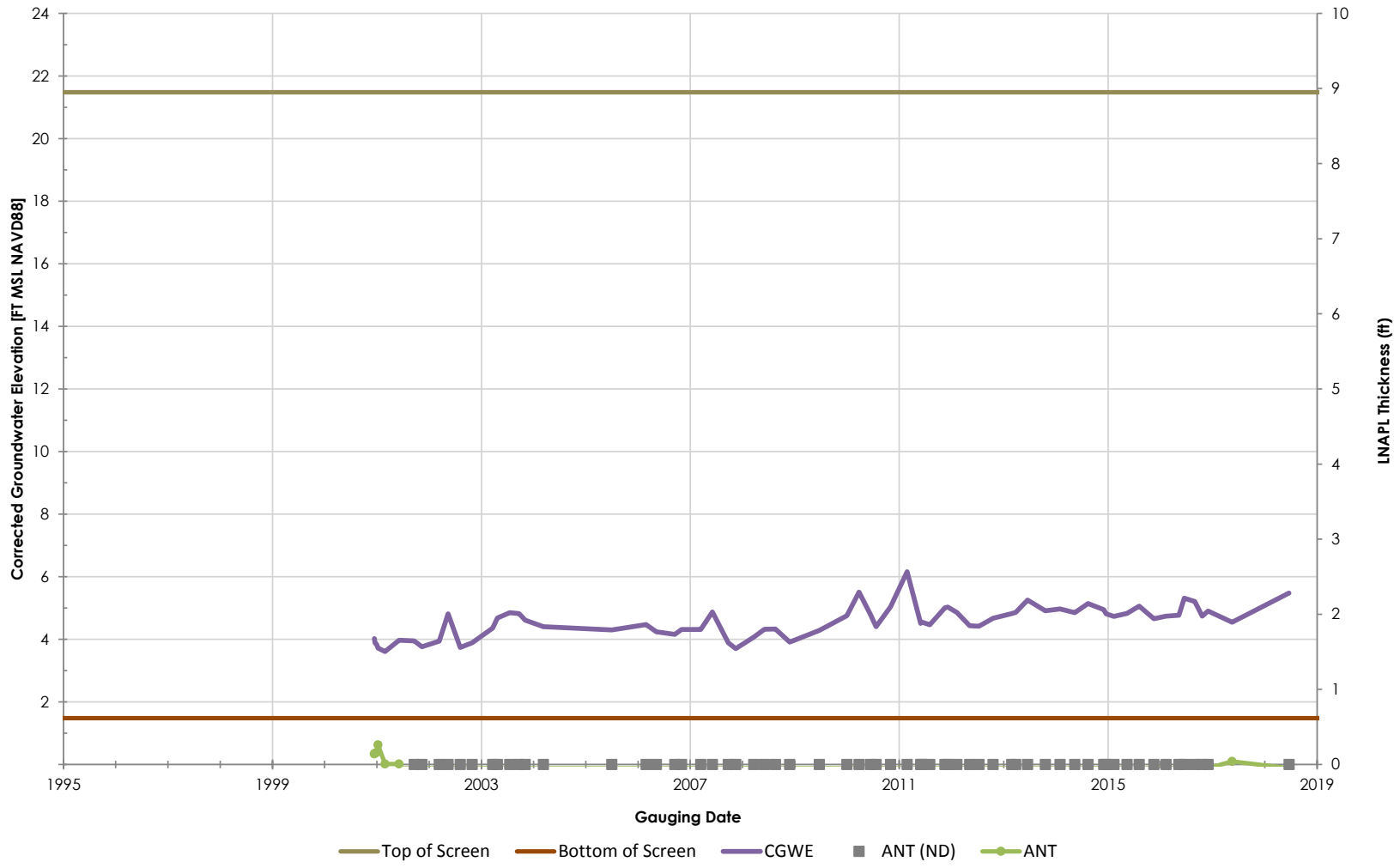
Stantec

Figure/Well No.

MW-30

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

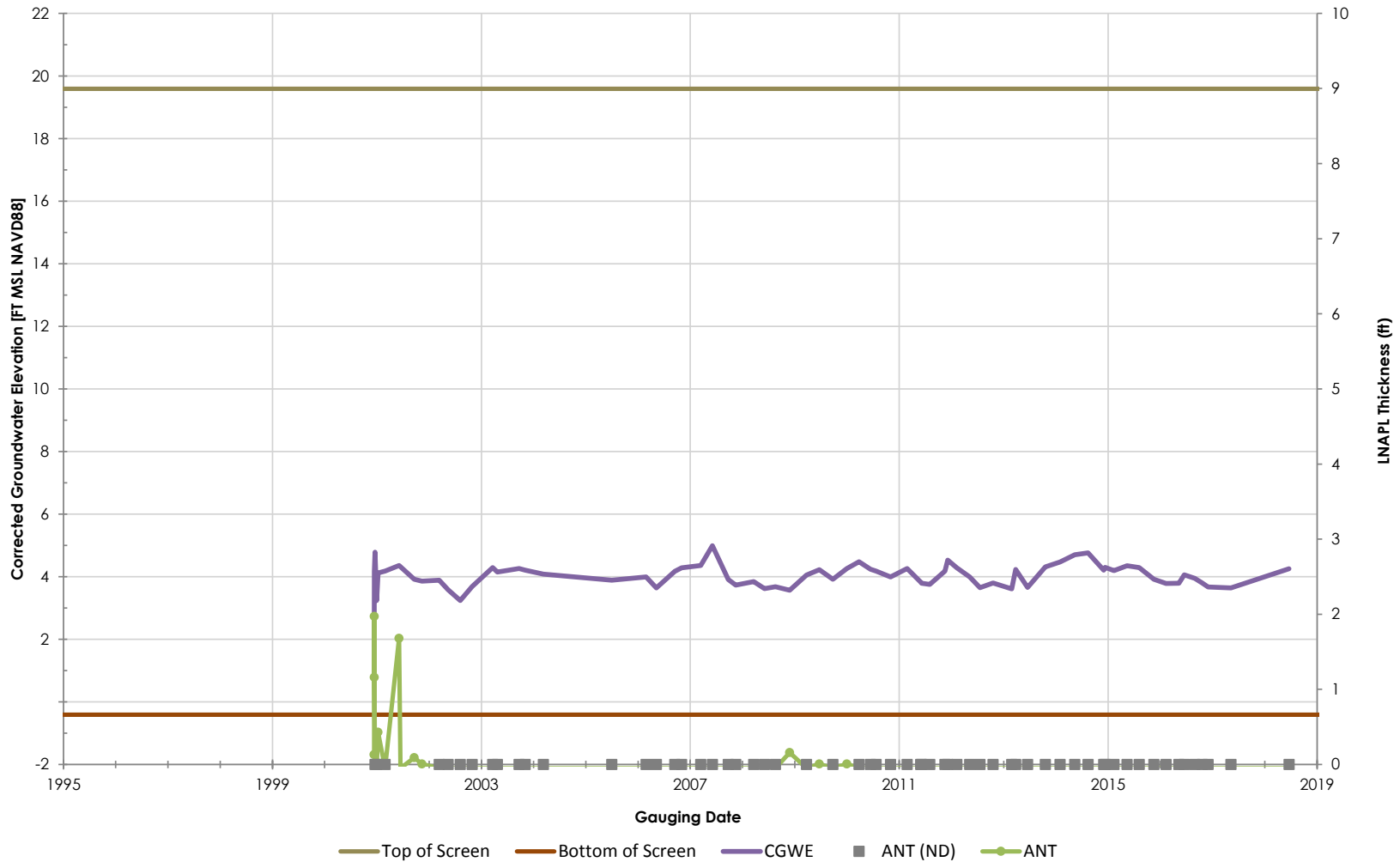
Stantec

Figure/Well No.

MW-31

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

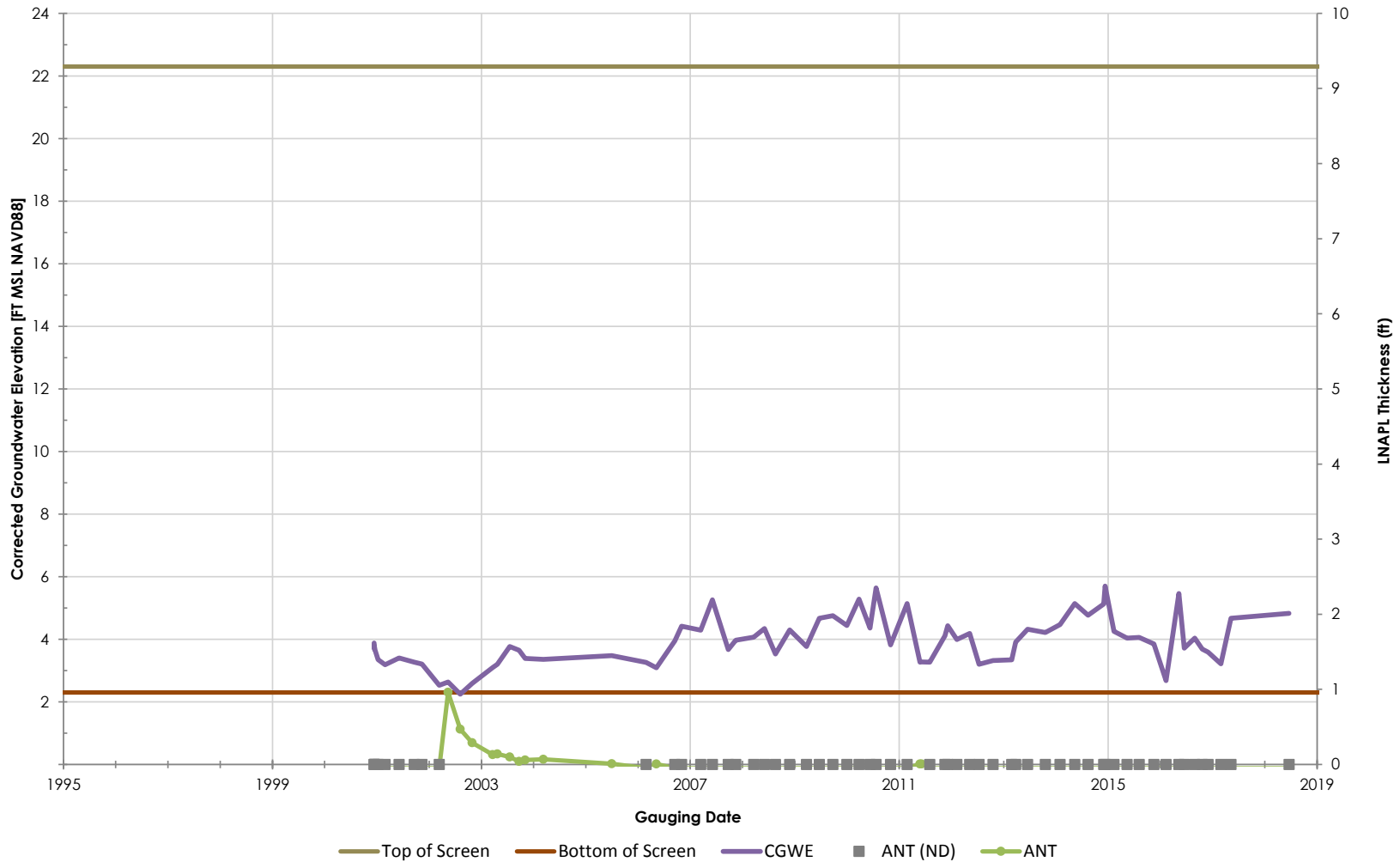
Stantec

Figure/Well No.

MW-32

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

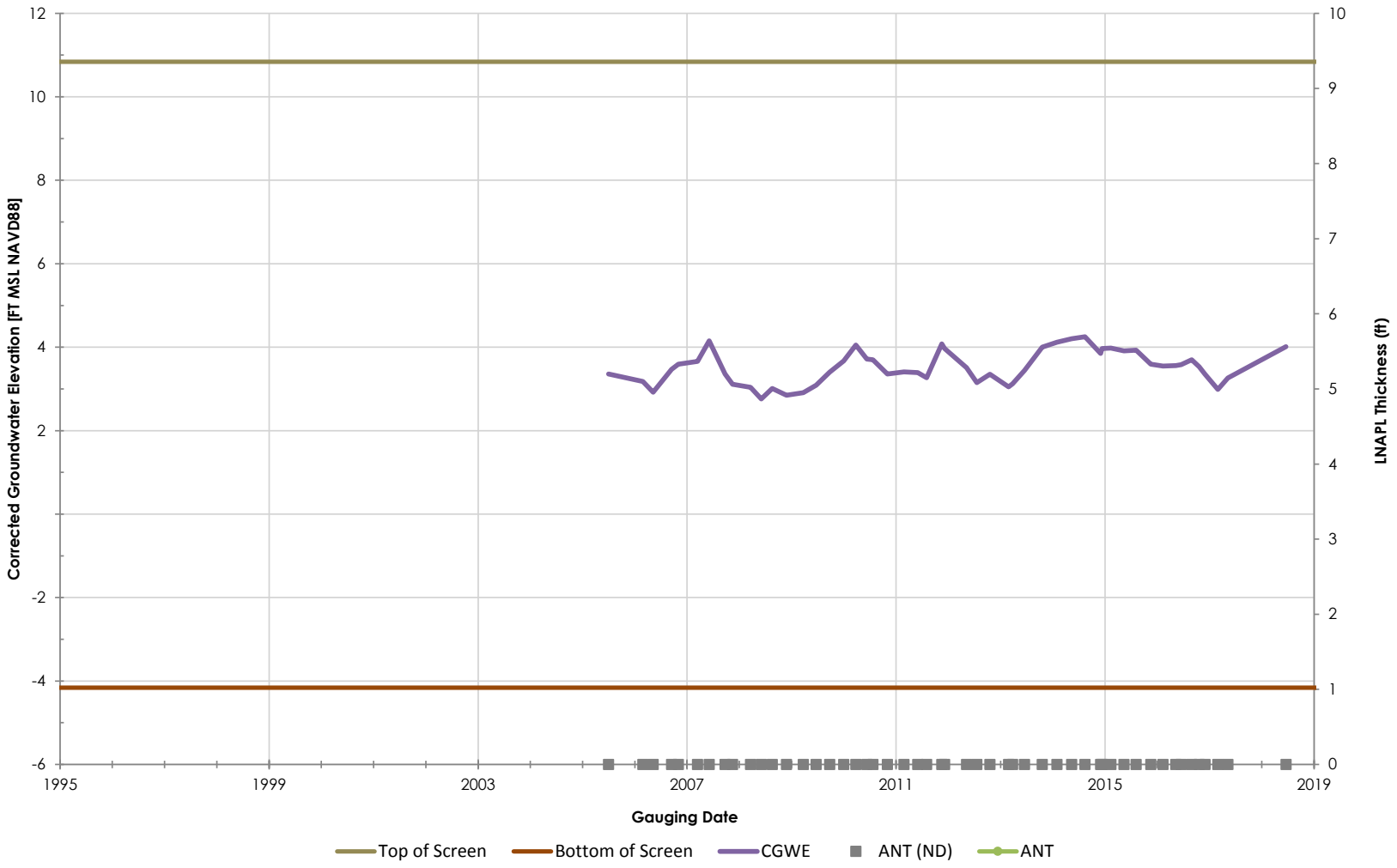
Stantec

Figure/Well No.

MW-33

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

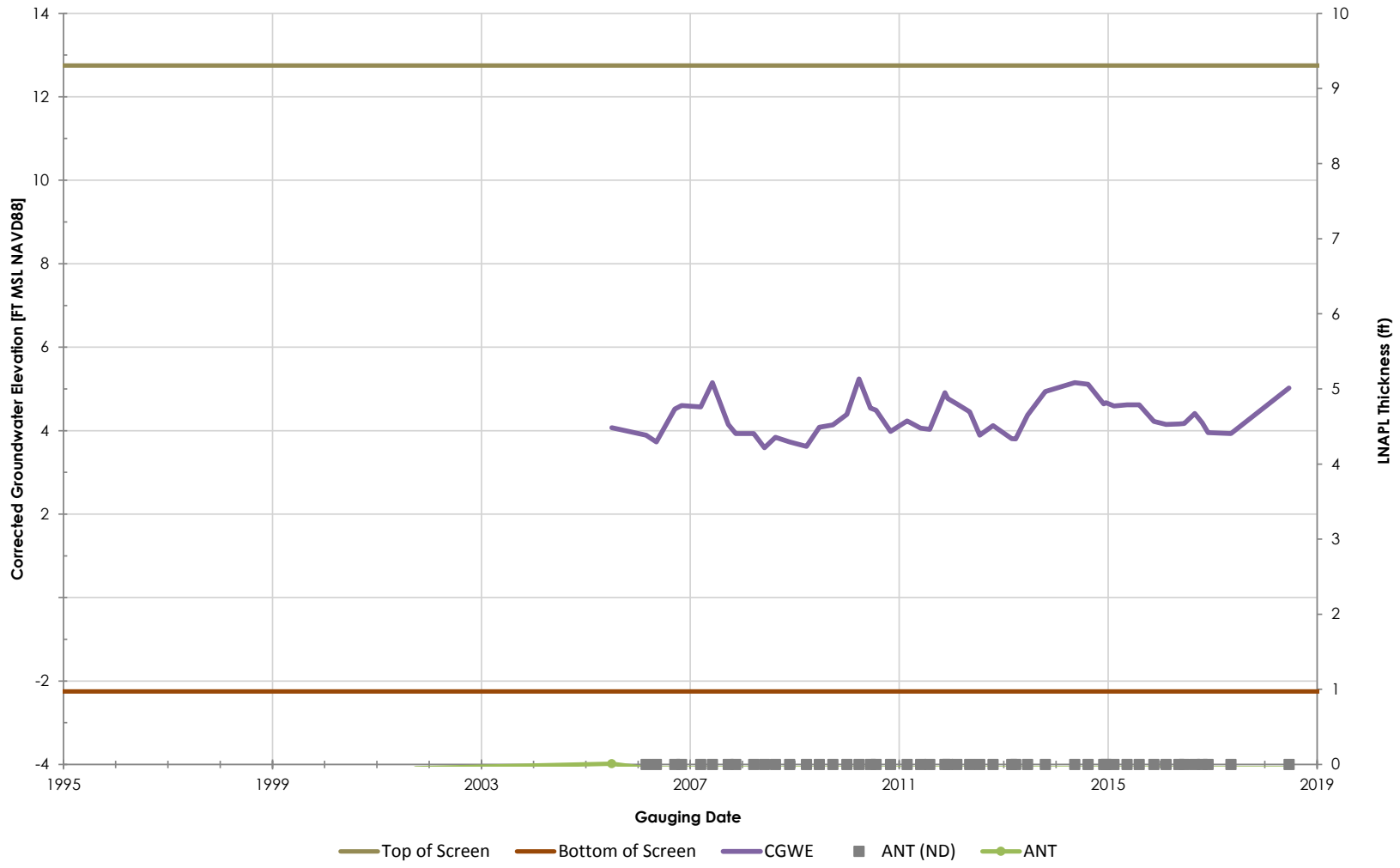
Stantec

Figure/Well No.

MW-35

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

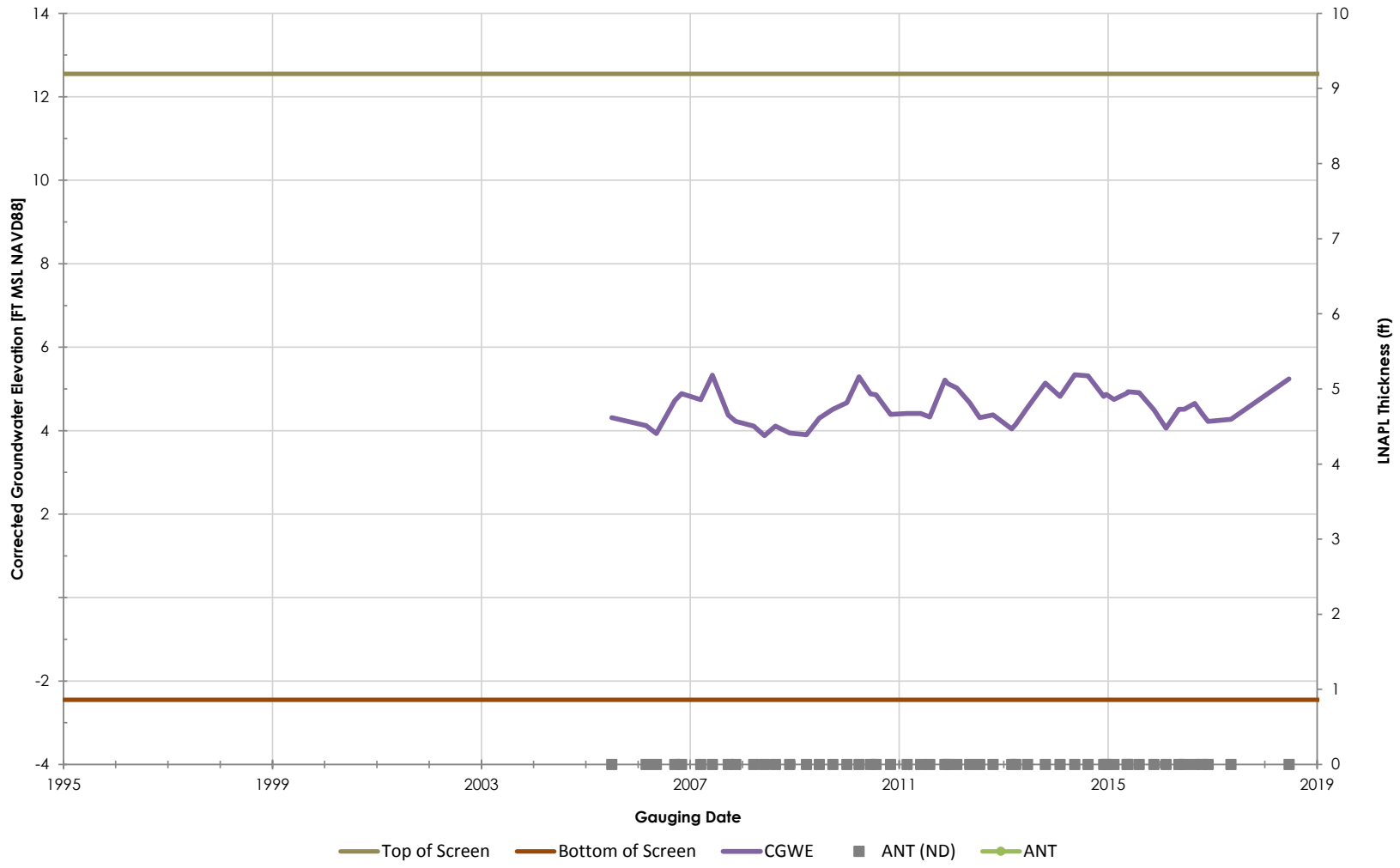
Stantec

Figure/Well No.

MW-36

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

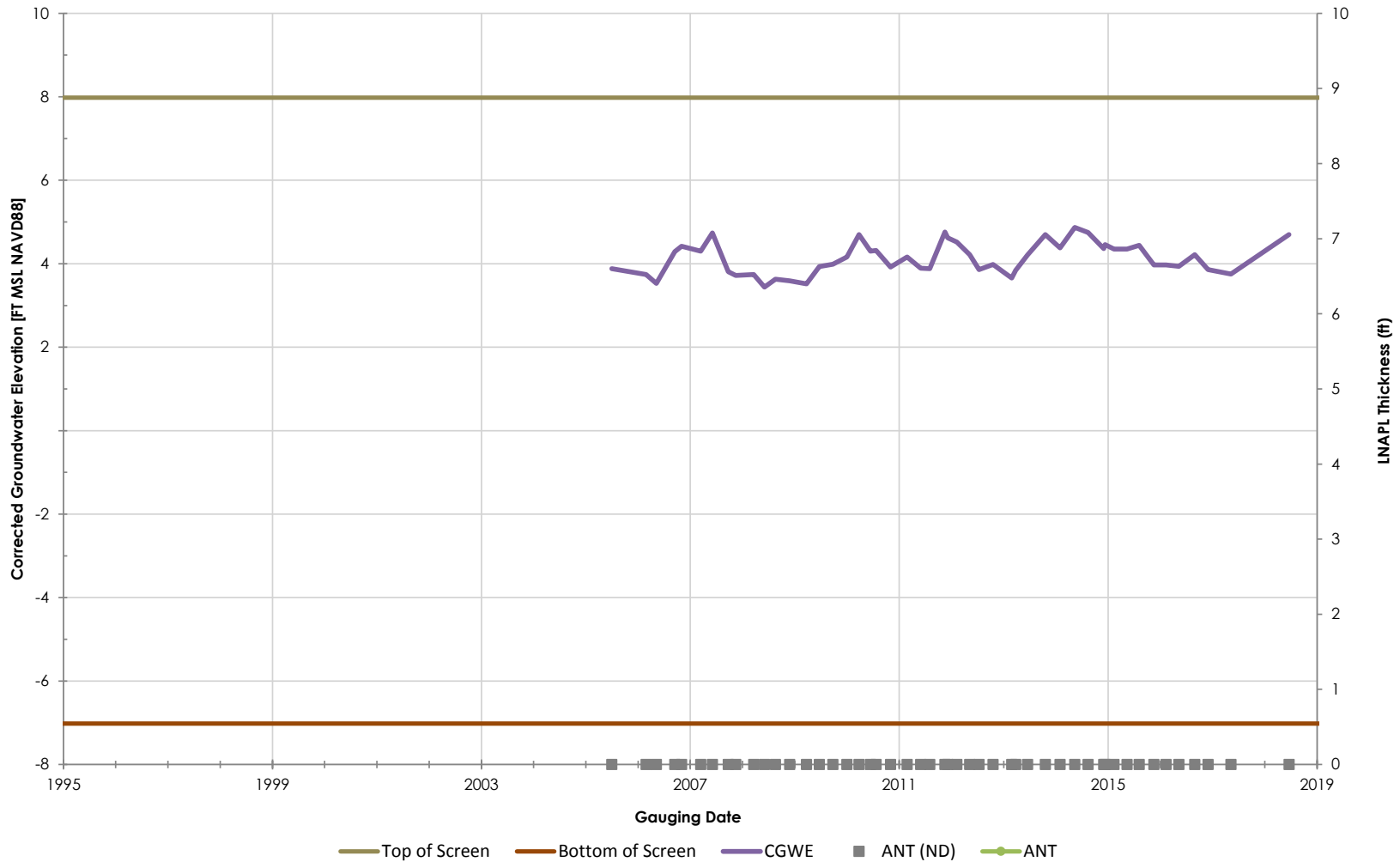
Stantec

Figure/Well No.

MW-37

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

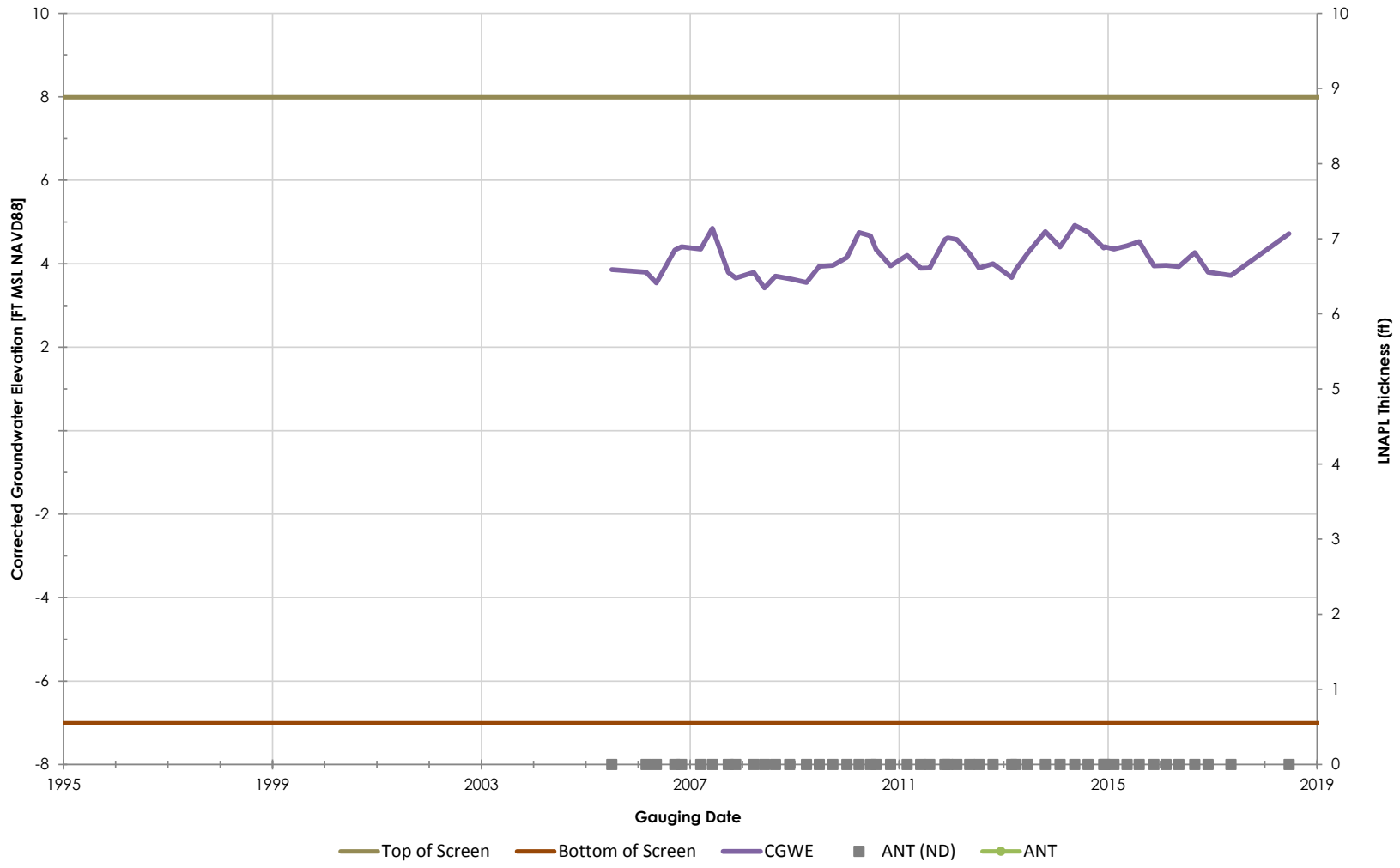
Stantec

Figure/Well No.

MW-38

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

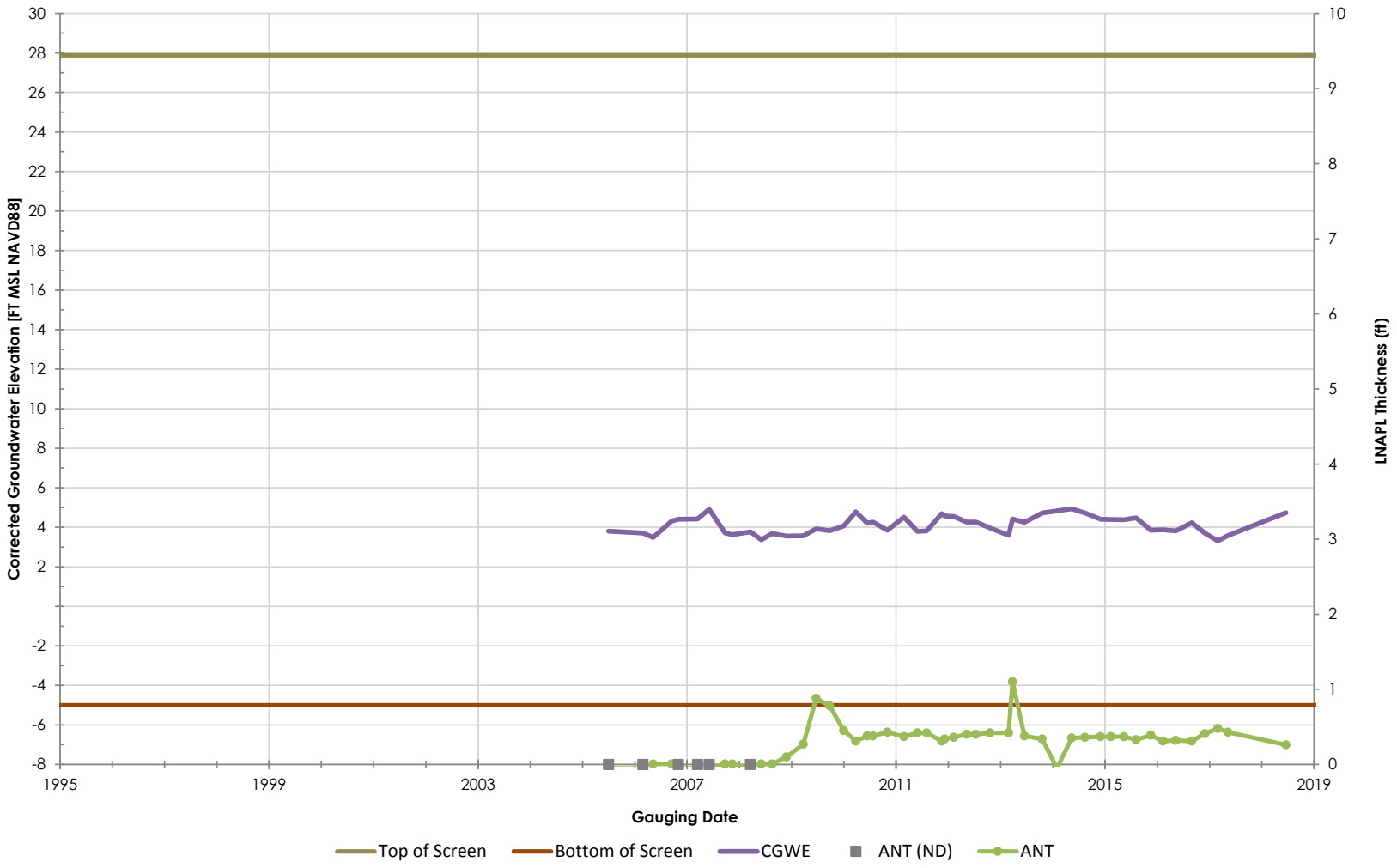
Stantec

Figure/Well No.

MW-39

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

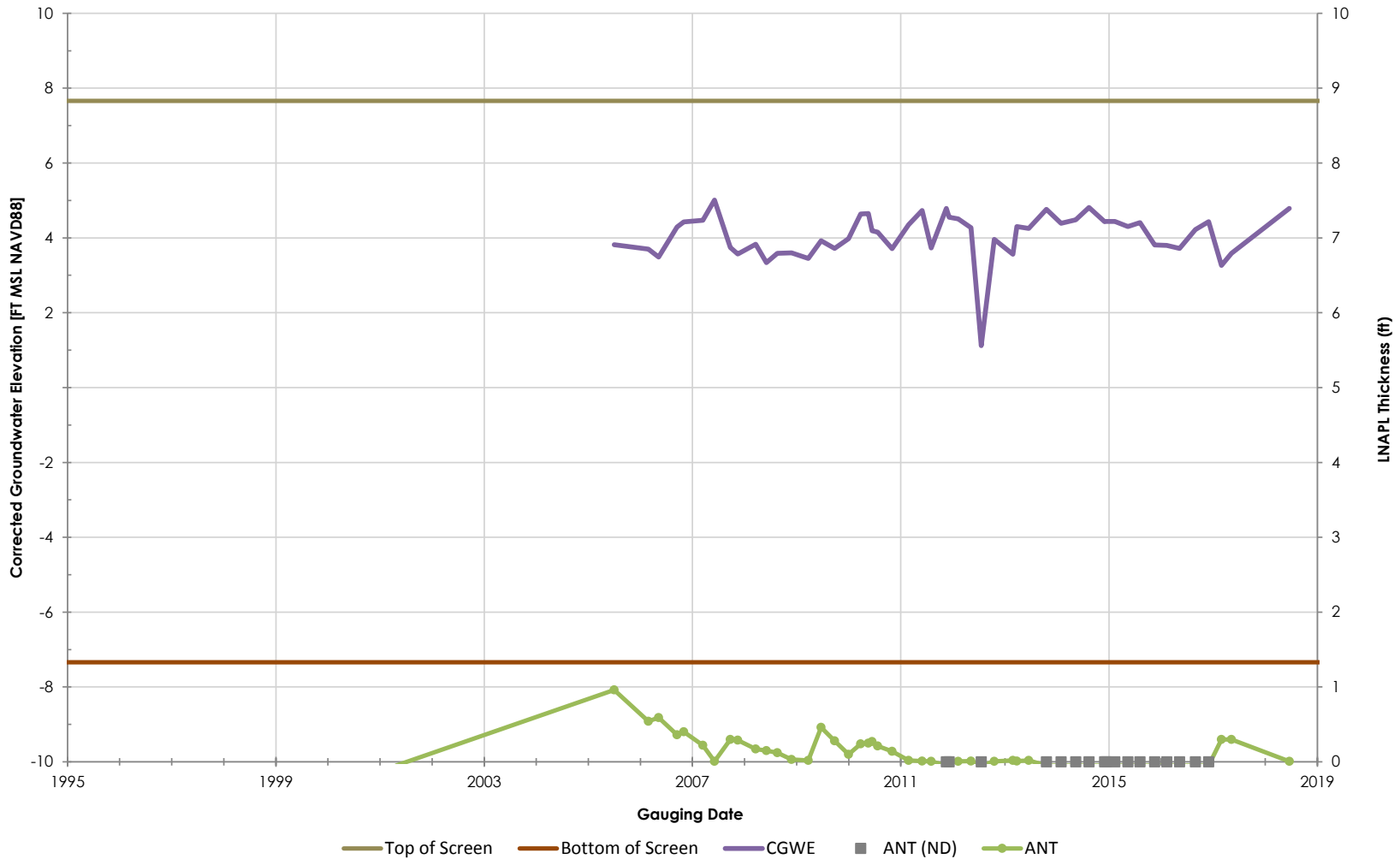
Stantec

Figure/Well No.

MW-40

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

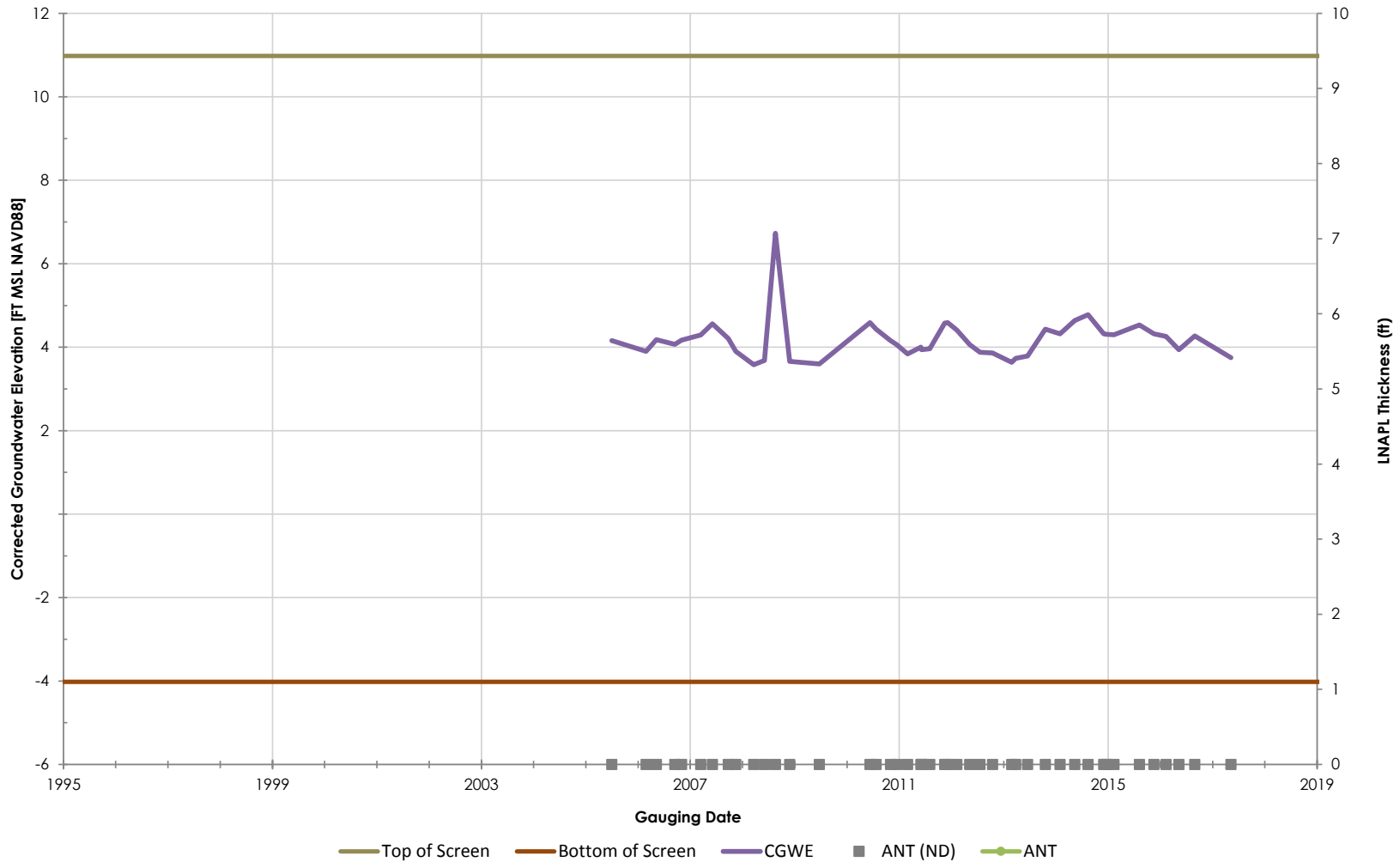
Stantec

Figure/Well No.

MW-41

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

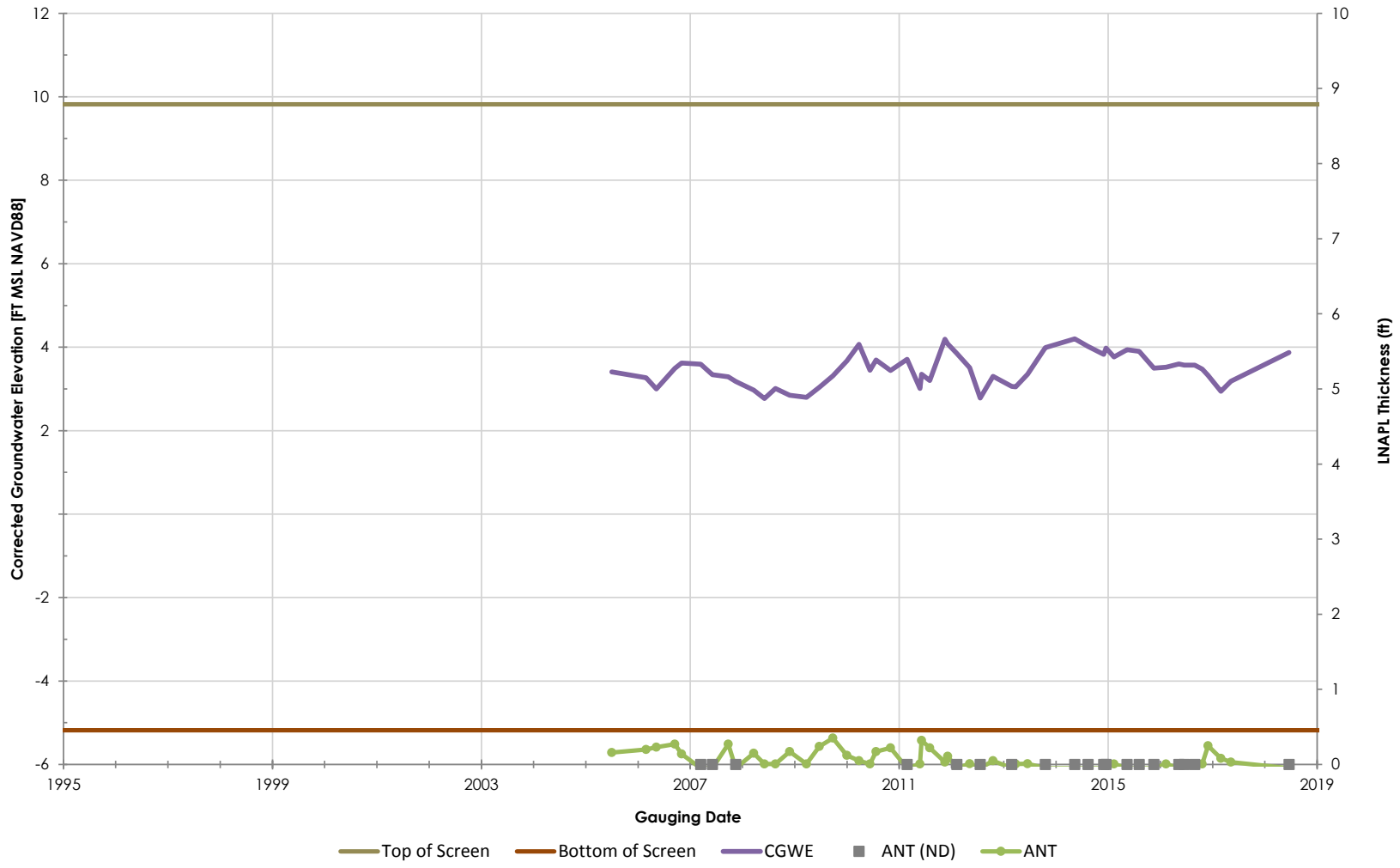
Stantec

Figure/Well No.

MW-43

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

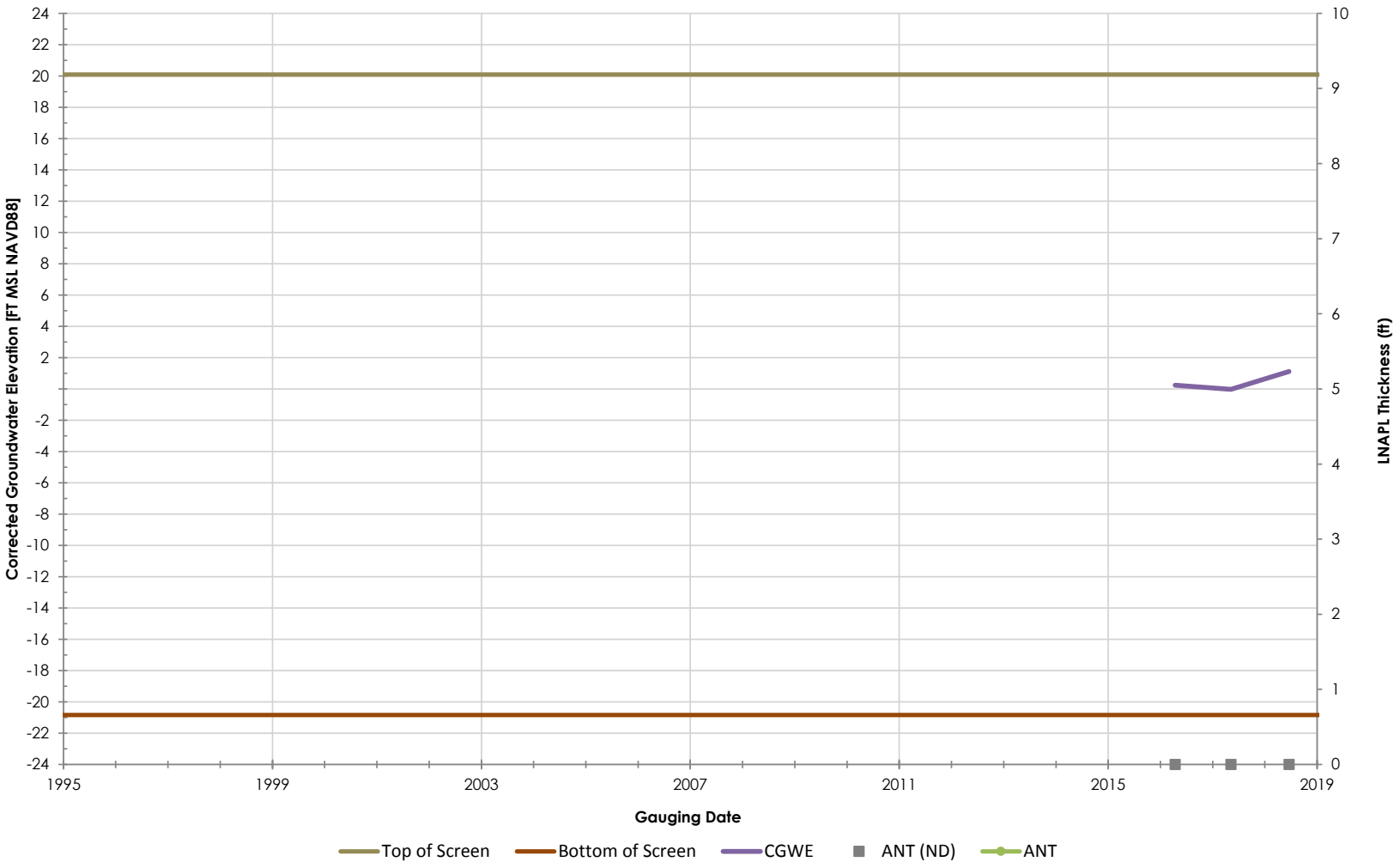
Stantec

Figure/Well No.

MW-44

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

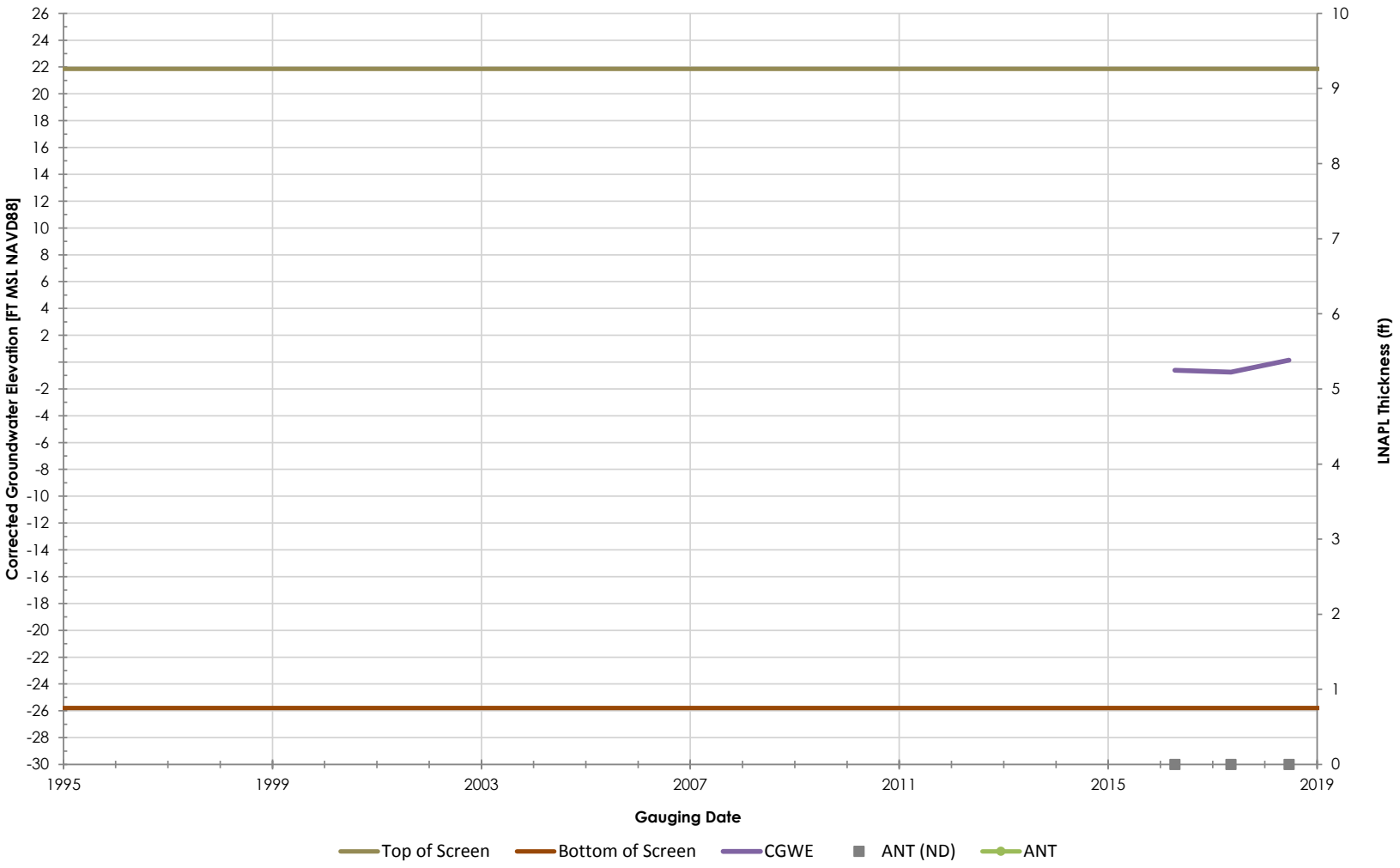
Stantec

Figure/Well No.

MWELL-28

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

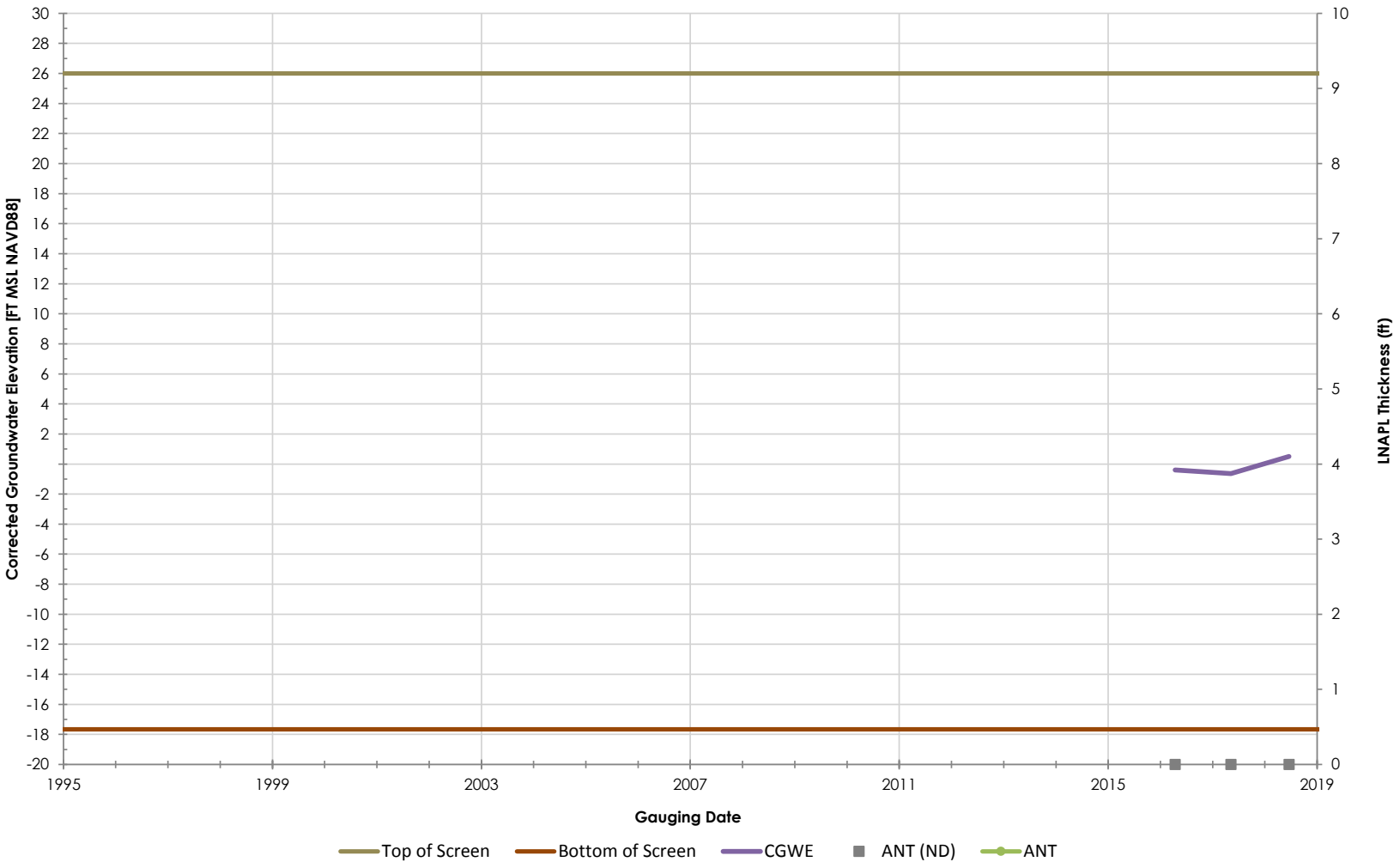
Stantec

Figure/Well No.

MWELL-29

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



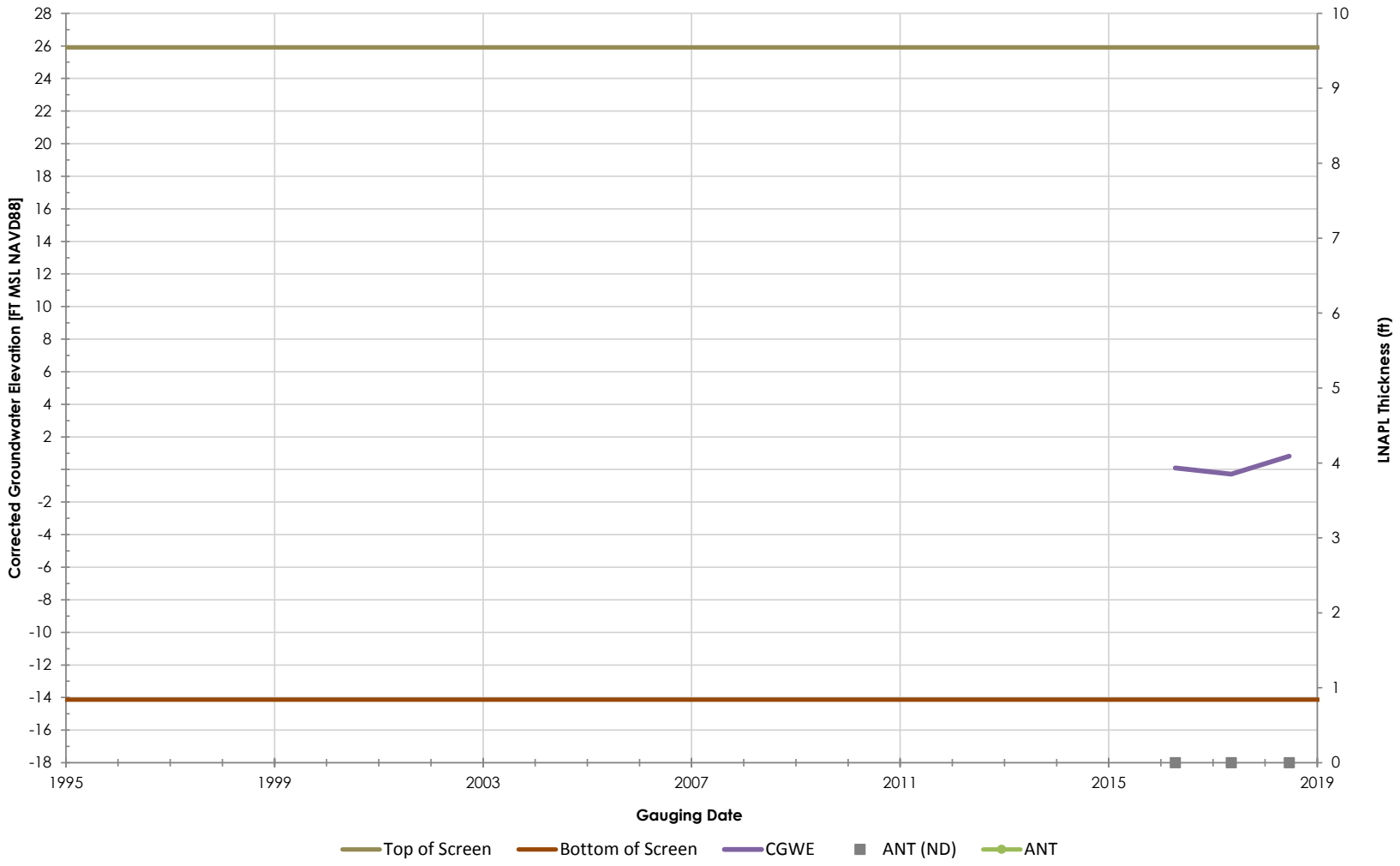
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

MWELL-30

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

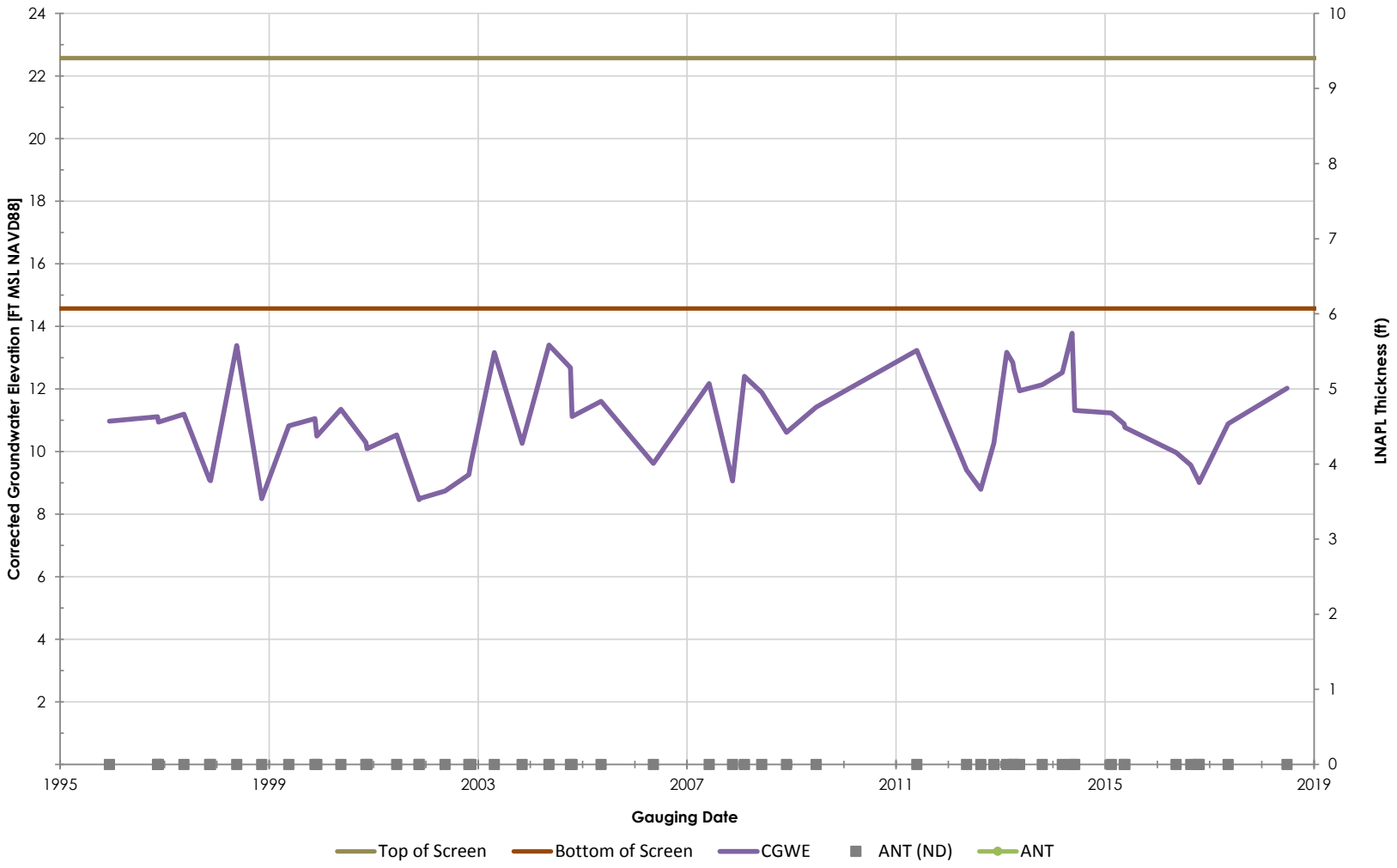
Stantec

Figure/Well No.

MWELL-31

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

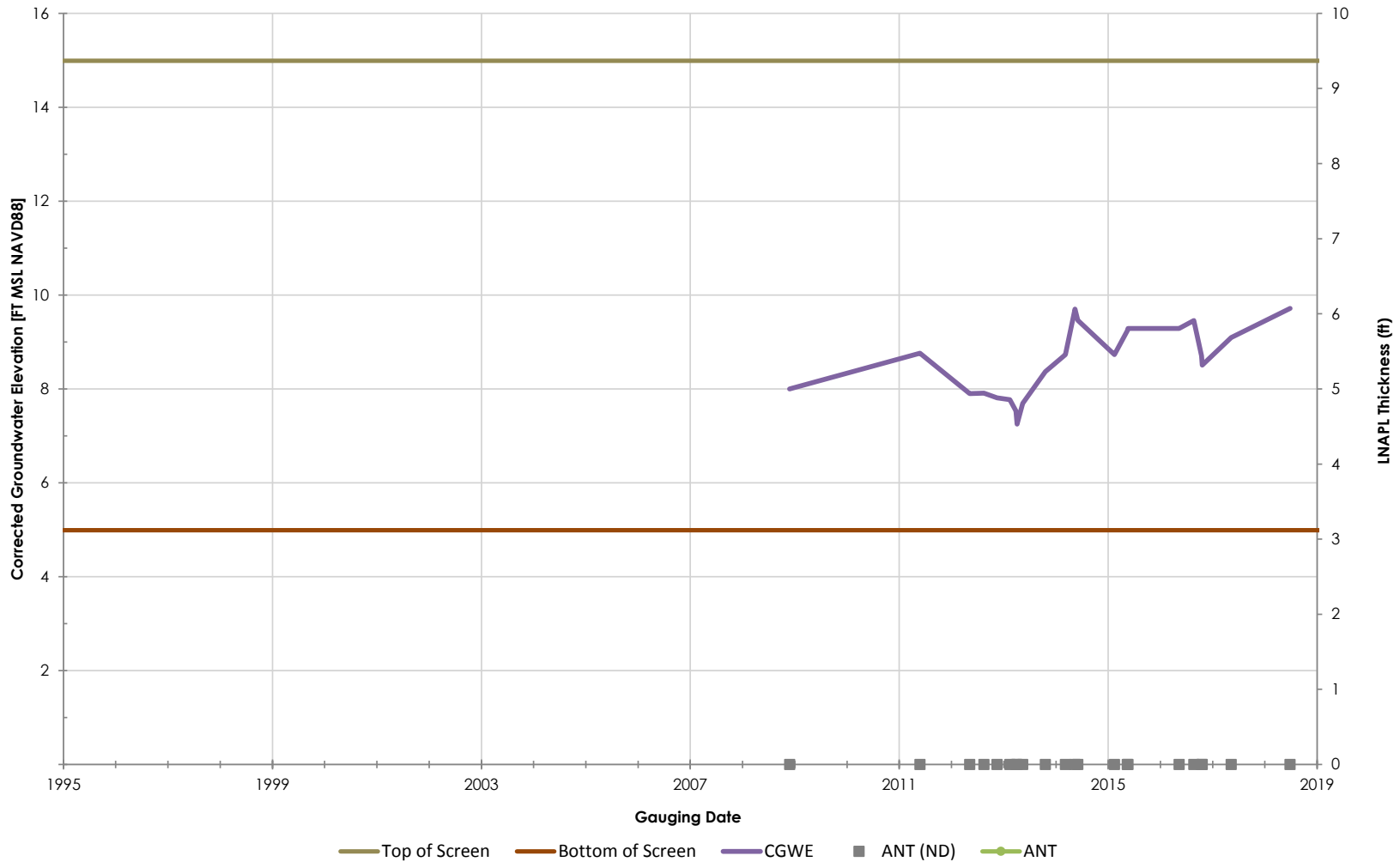
Stantec

Figure/Well No.

N-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

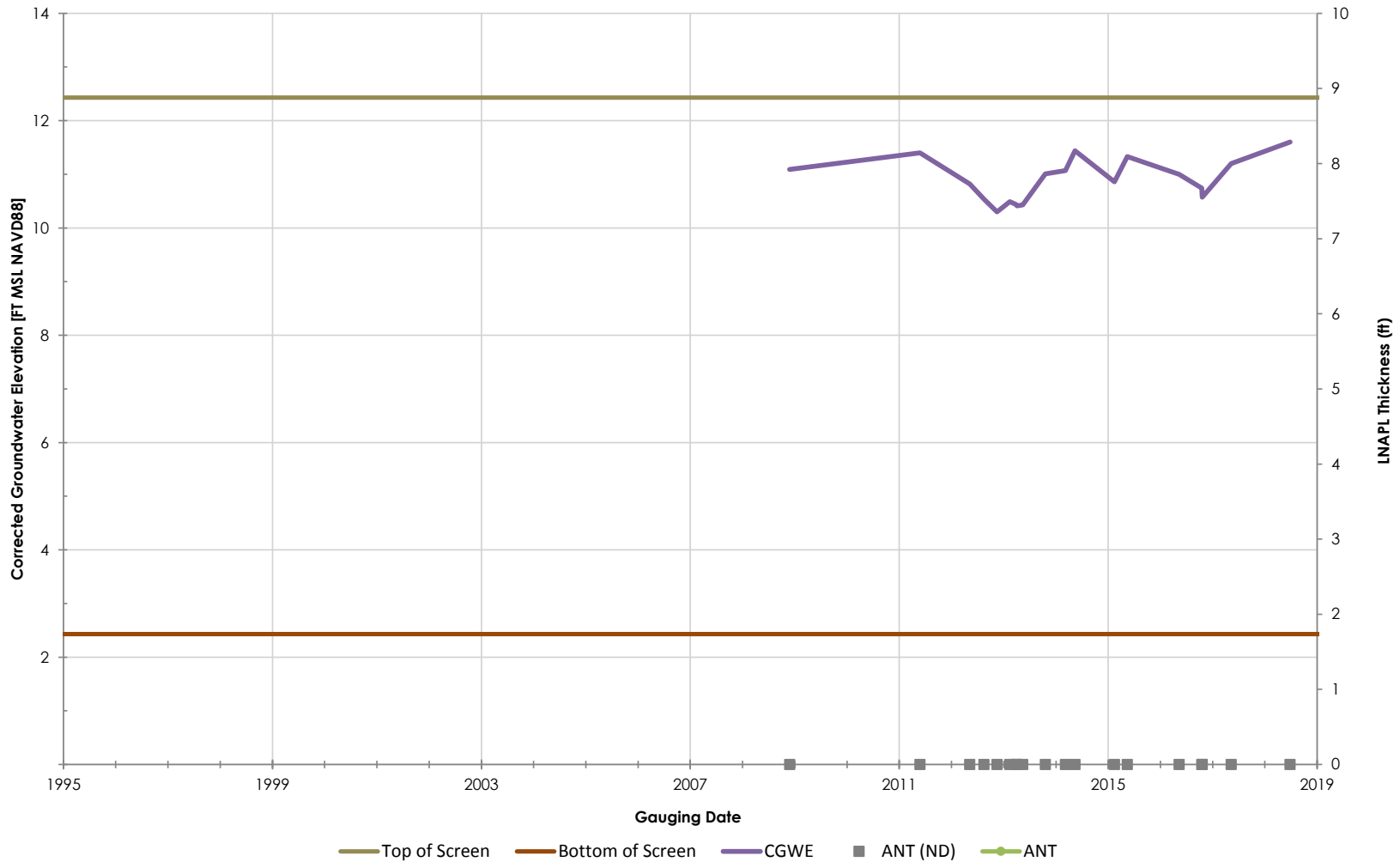
Stantec

Figure/Well No.

N-100

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

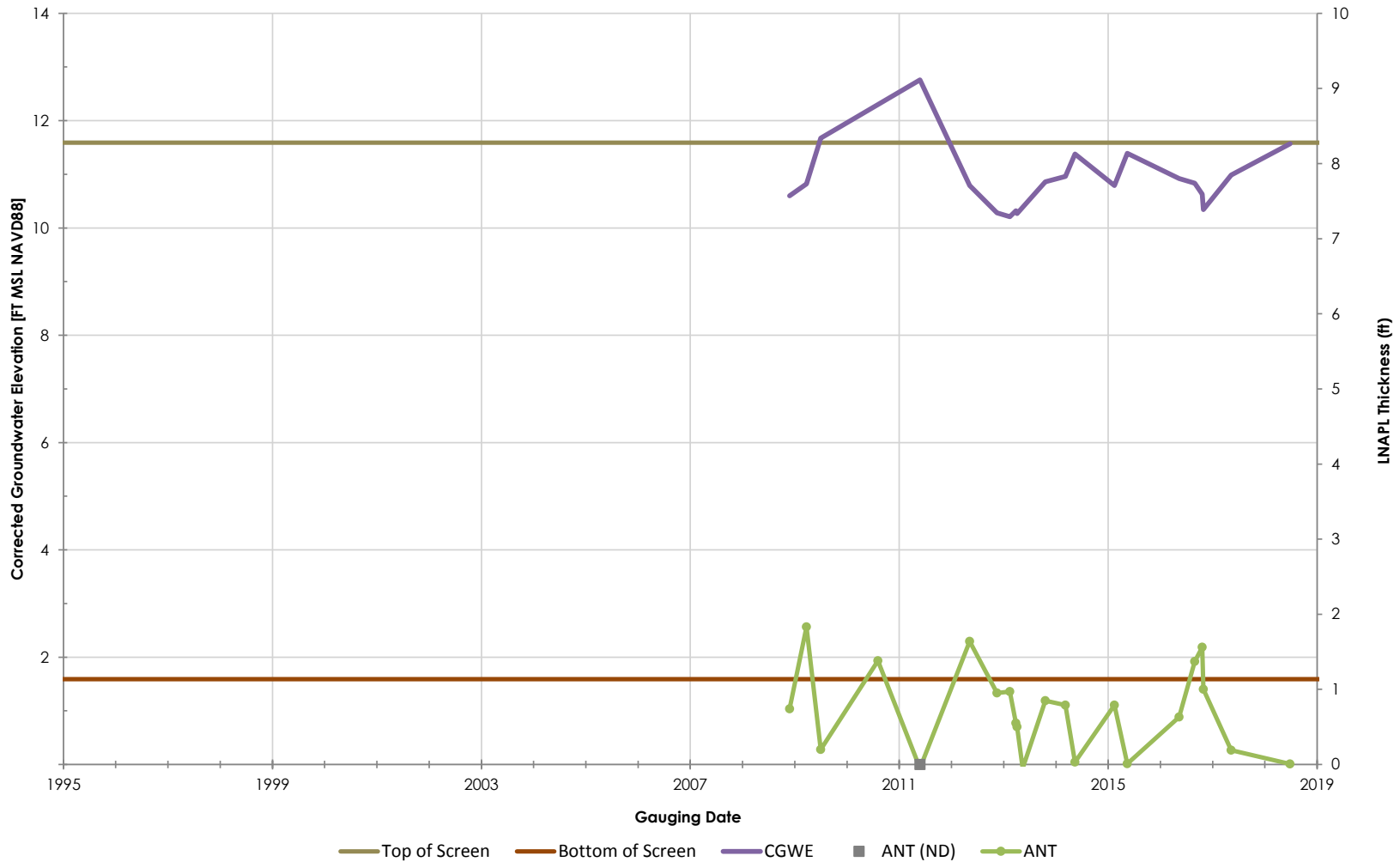
Stantec

Figure/Well No.

N-101

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

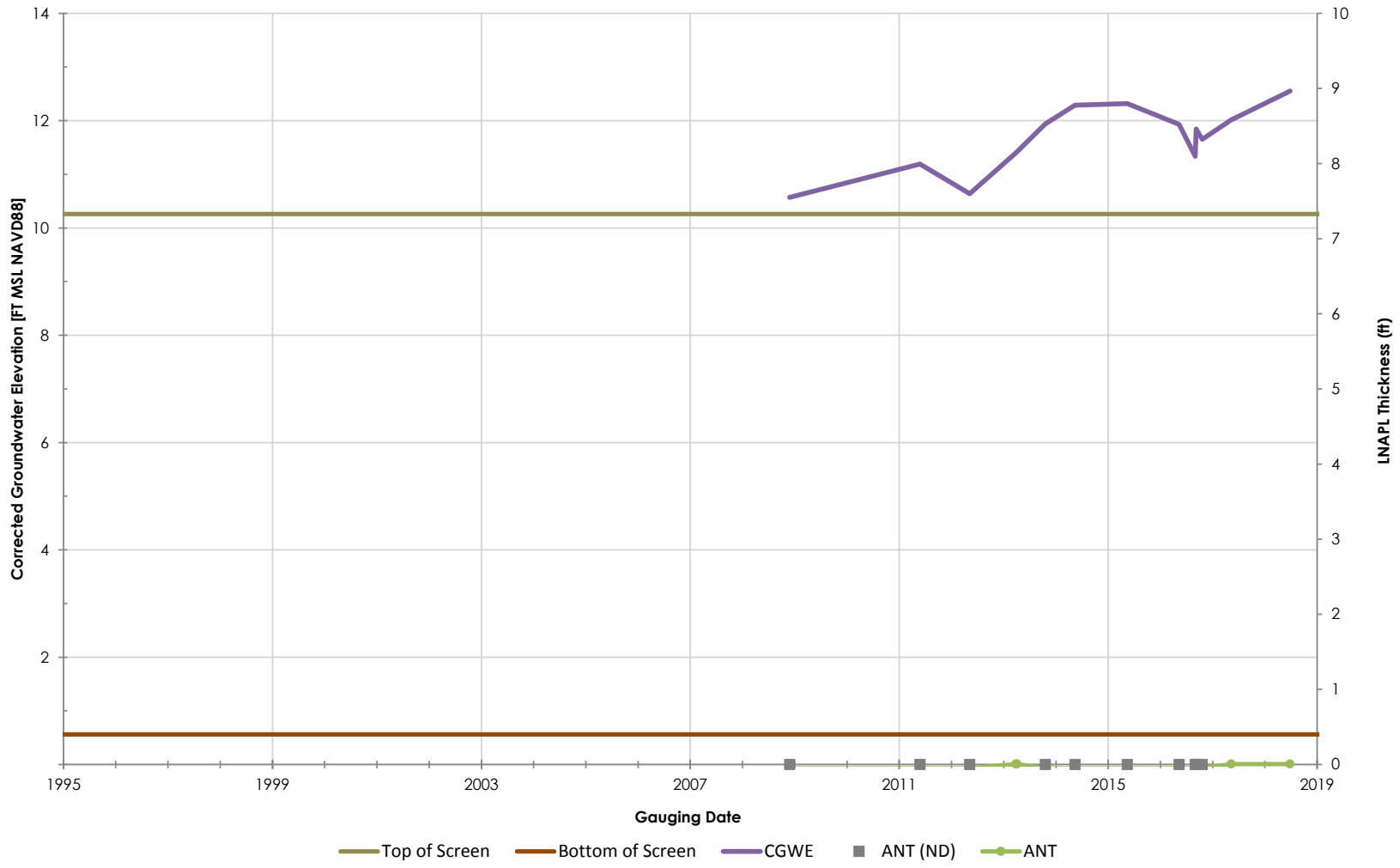
Stantec

Figure/Well No.

N-102

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

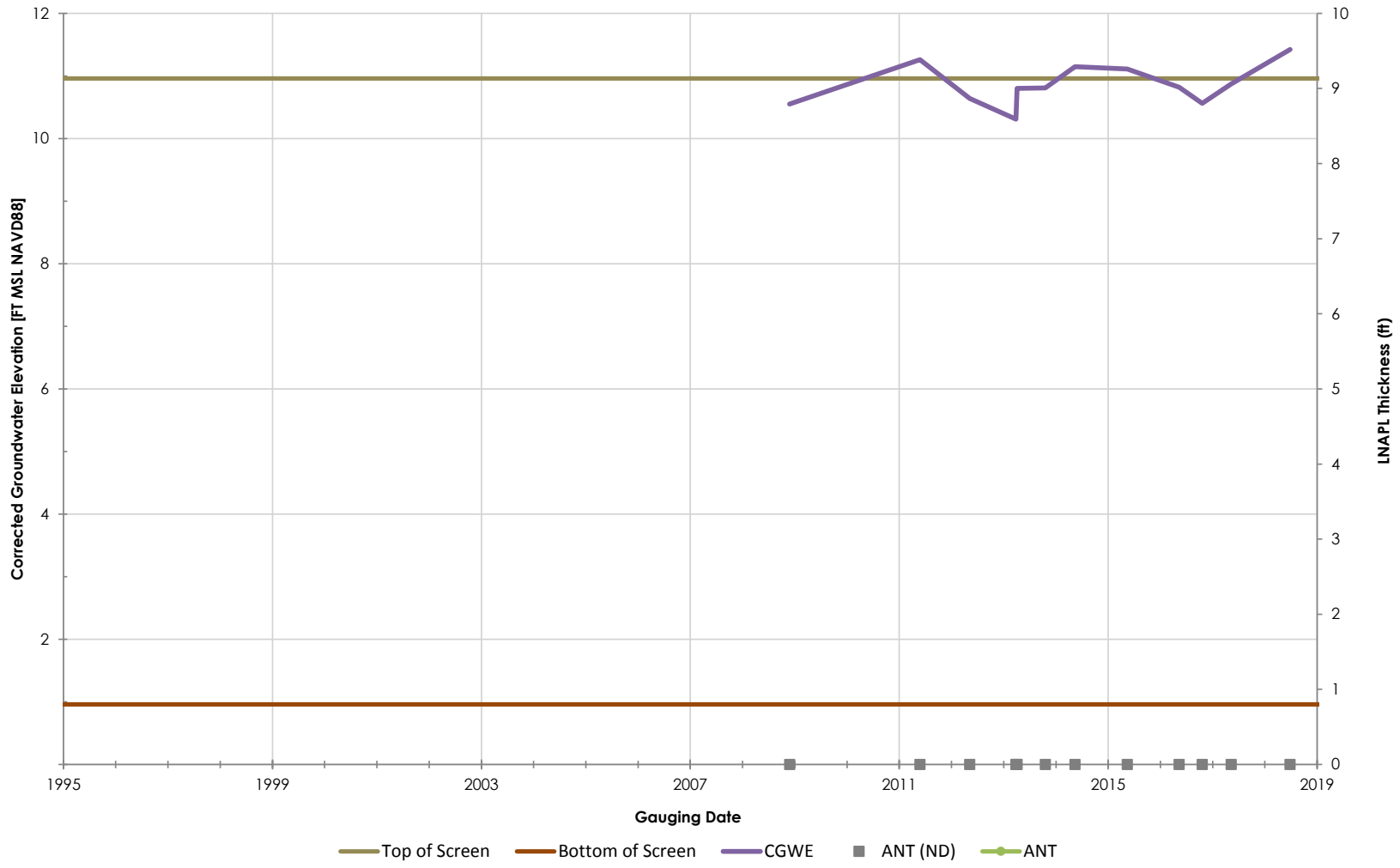
Stantec

Figure/Well No.

N-103

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

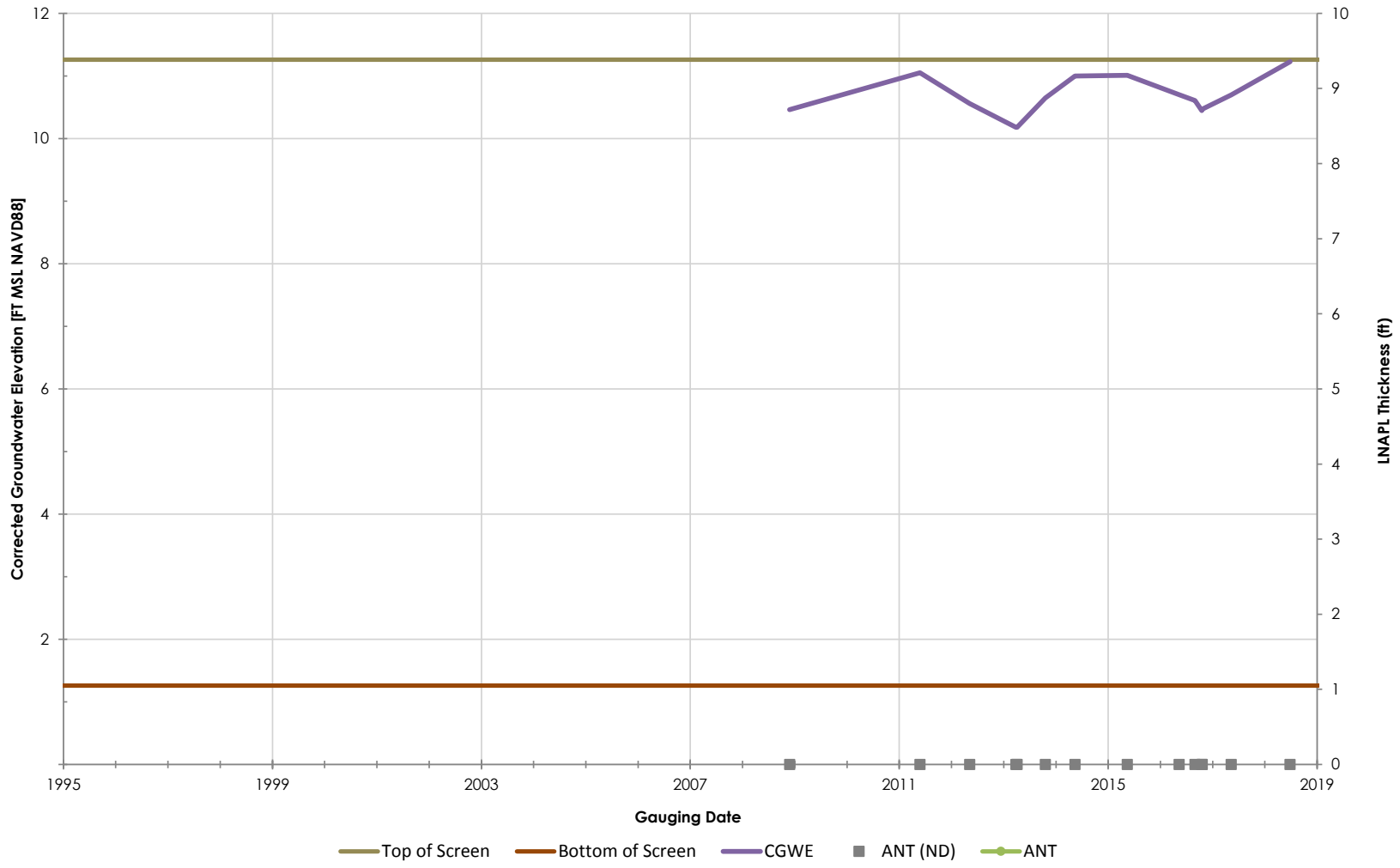
Stantec

Figure/Well No.

N-104

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

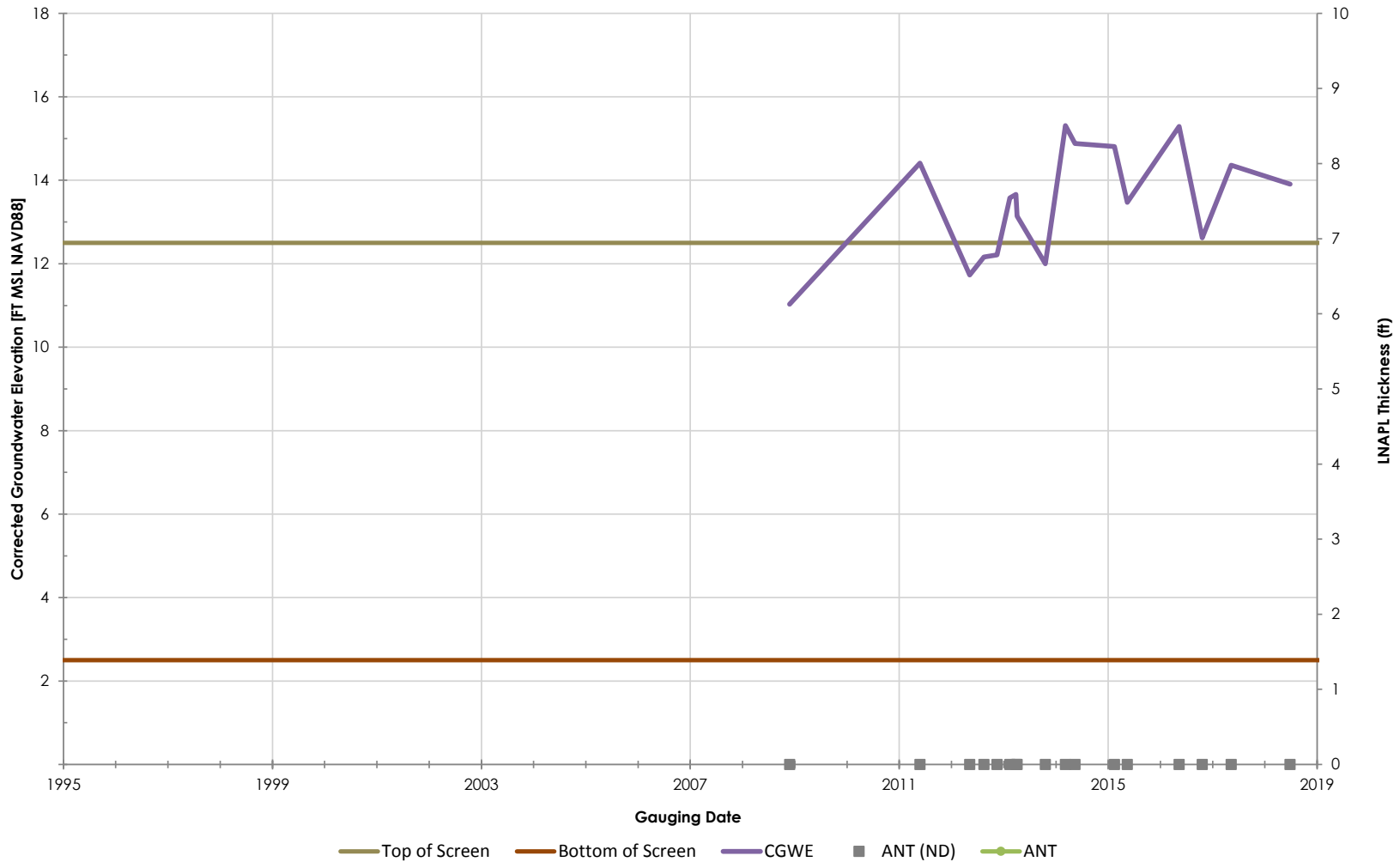
Stantec

Figure/Well No.

N-105

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

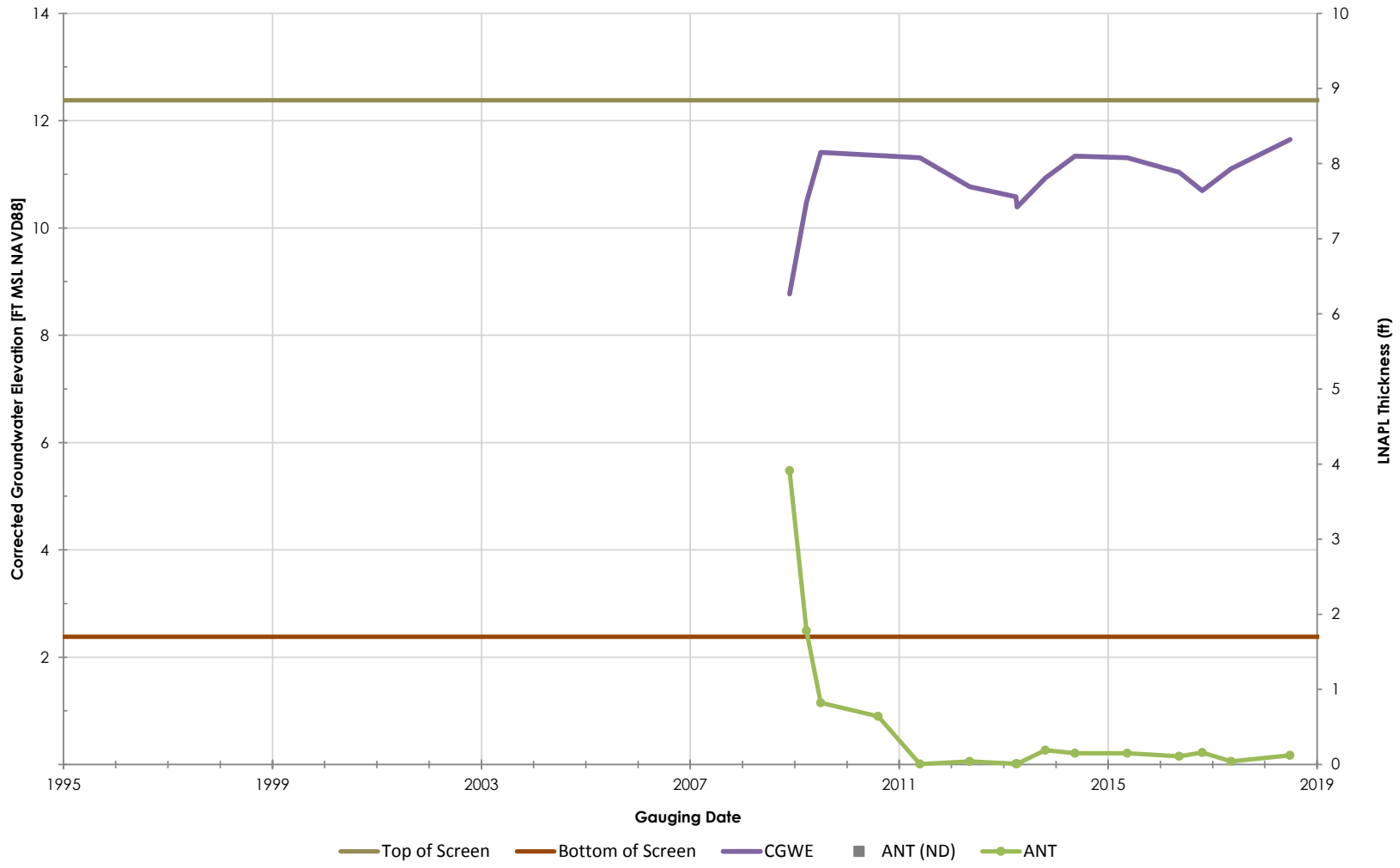
Stantec

Figure/Well No.

N-106

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

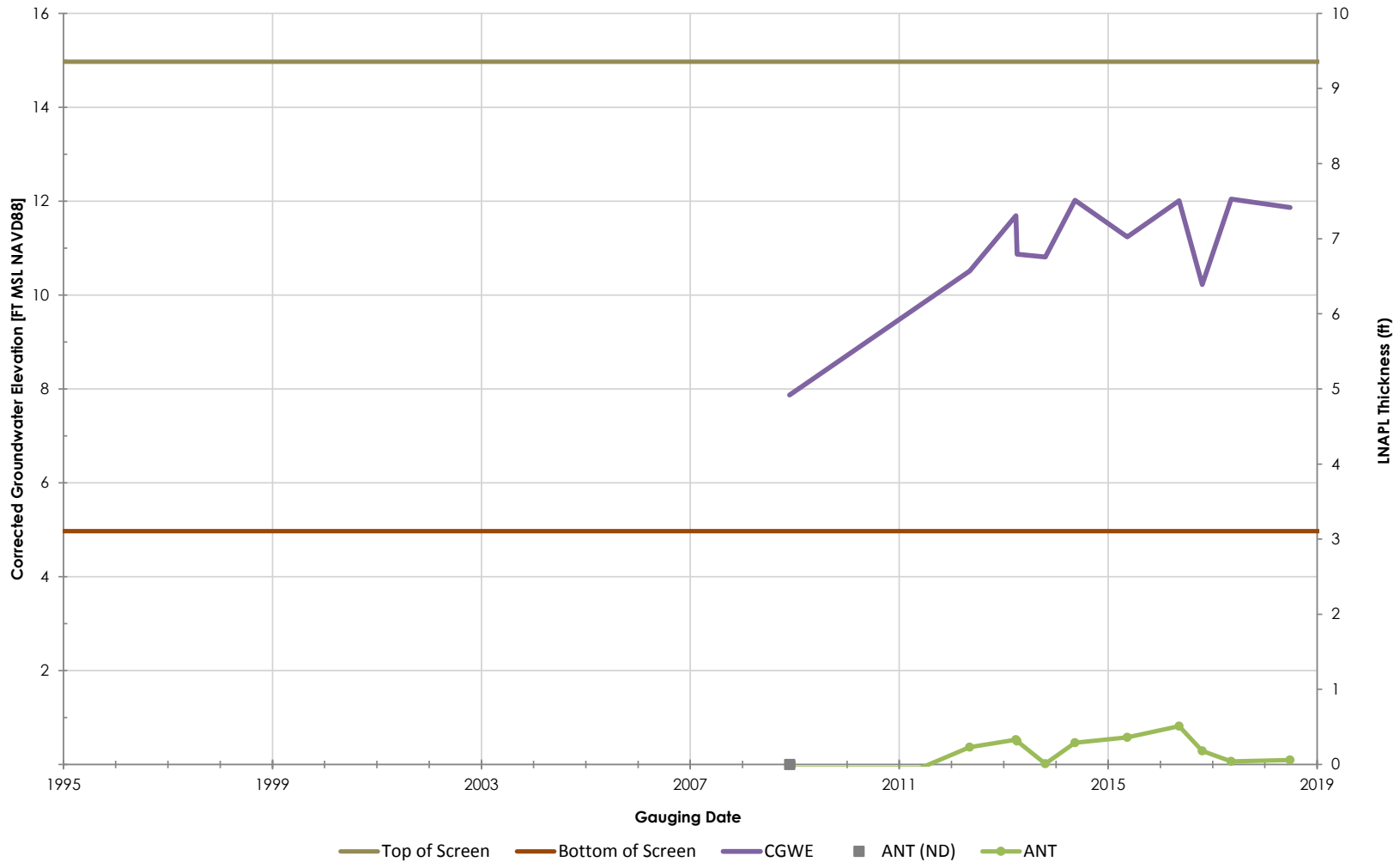
Stantec

Figure/Well No.

N-107

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

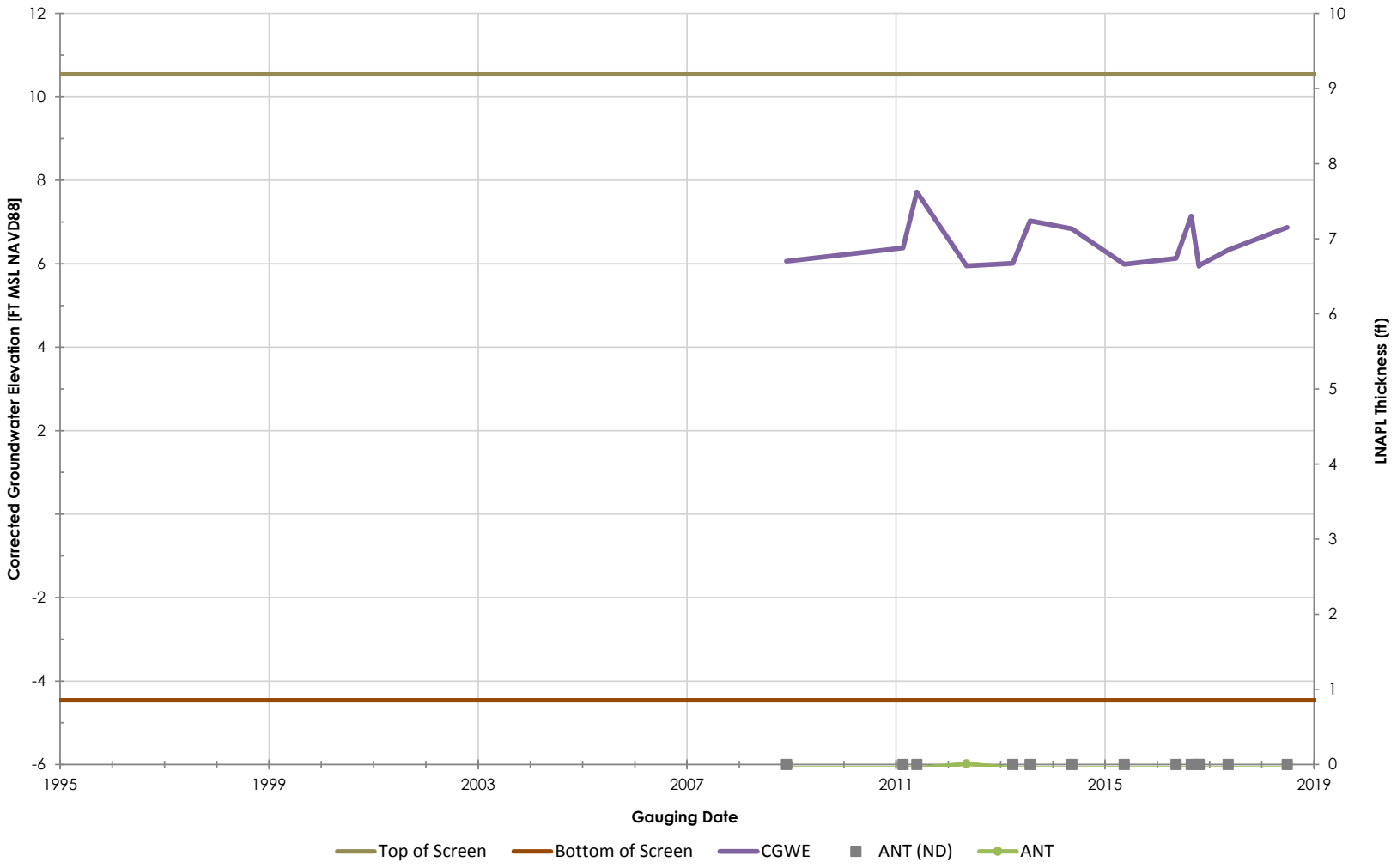
Stantec

Figure/Well No.

N-108

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

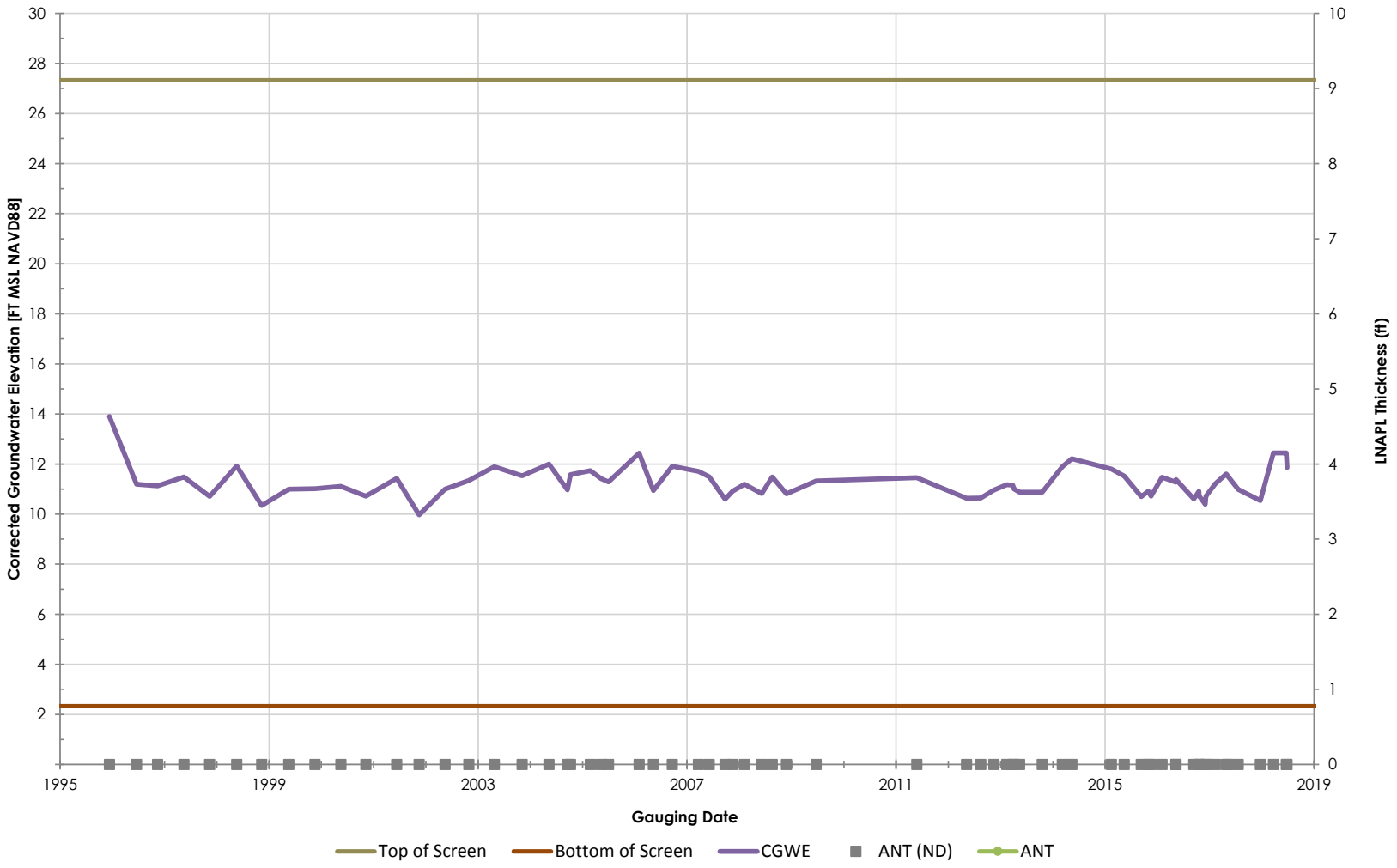
Stantec

Figure/Well No.

N-109

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

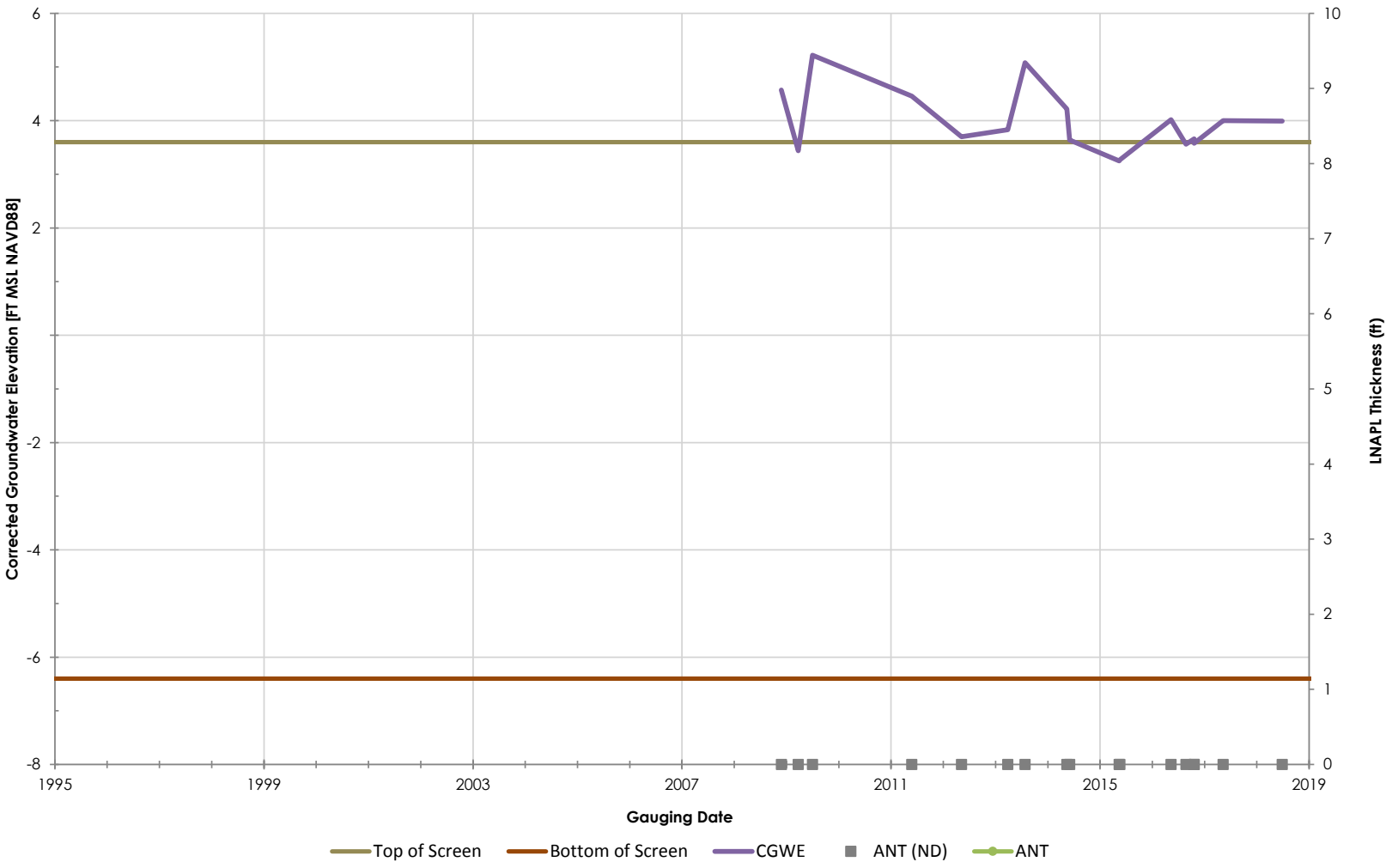
Stantec

Figure/Well No.

N-11

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

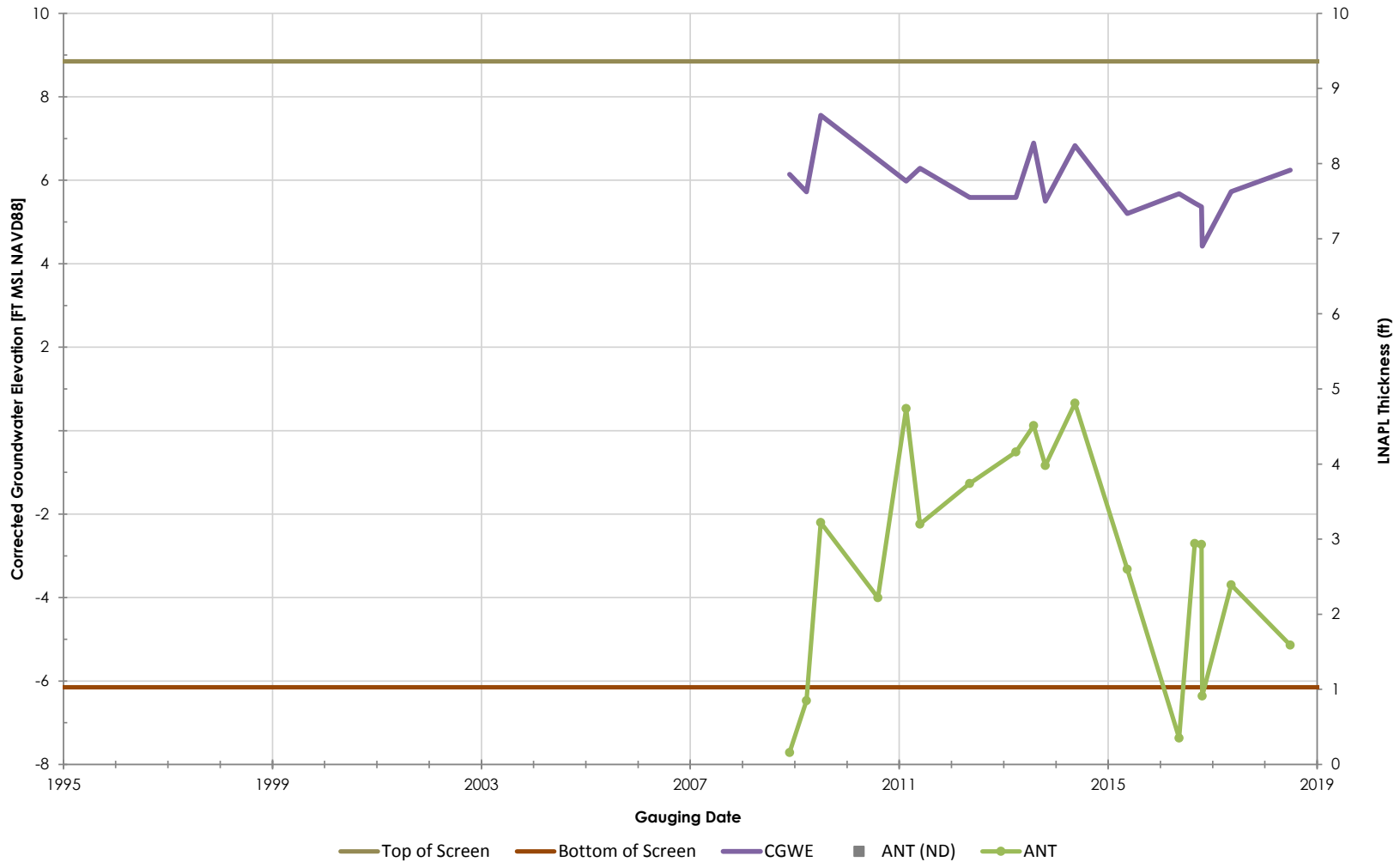
Stantec

Figure/Well No.

N-111

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

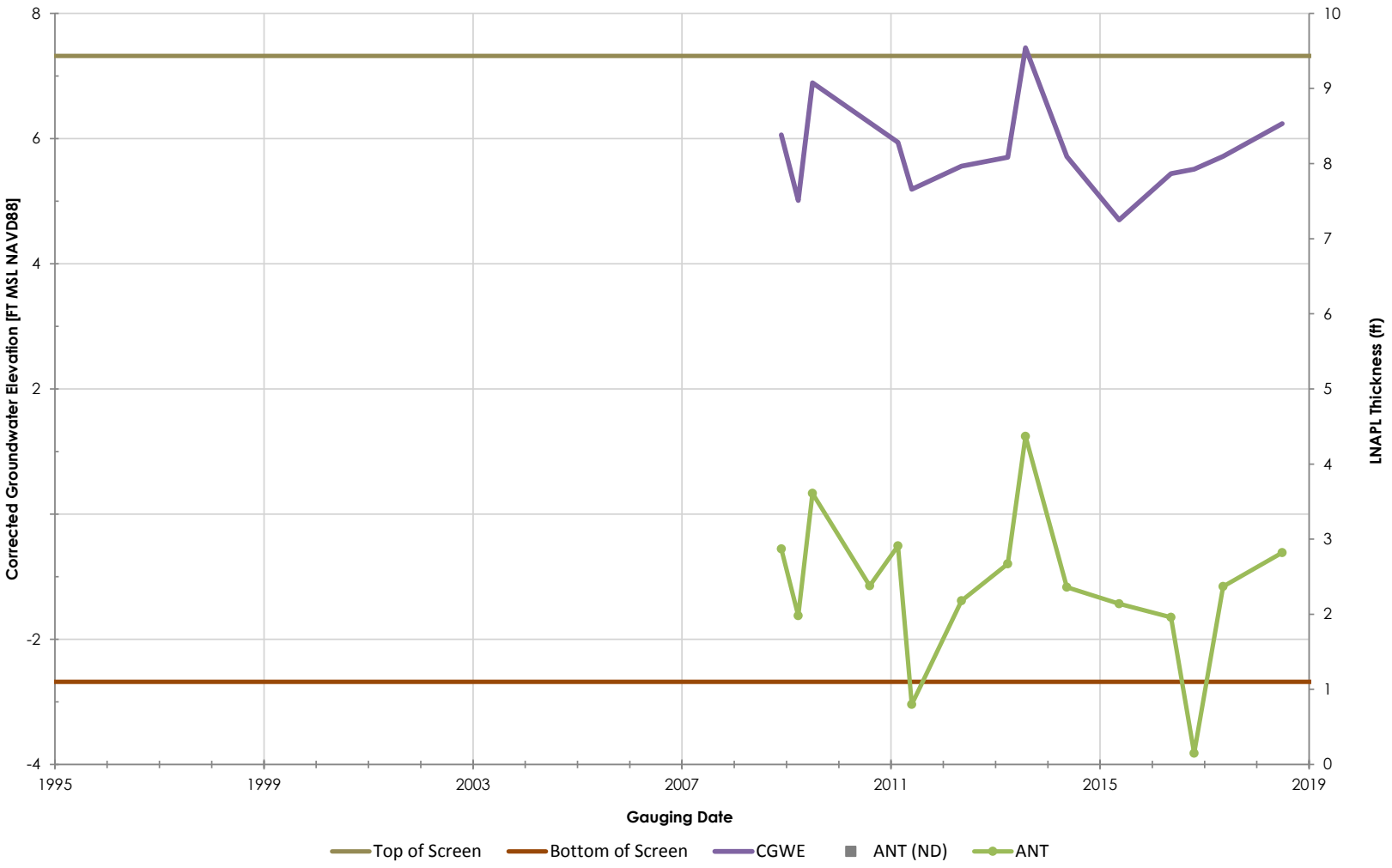
Stantec

Figure/Well No.

N-112

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

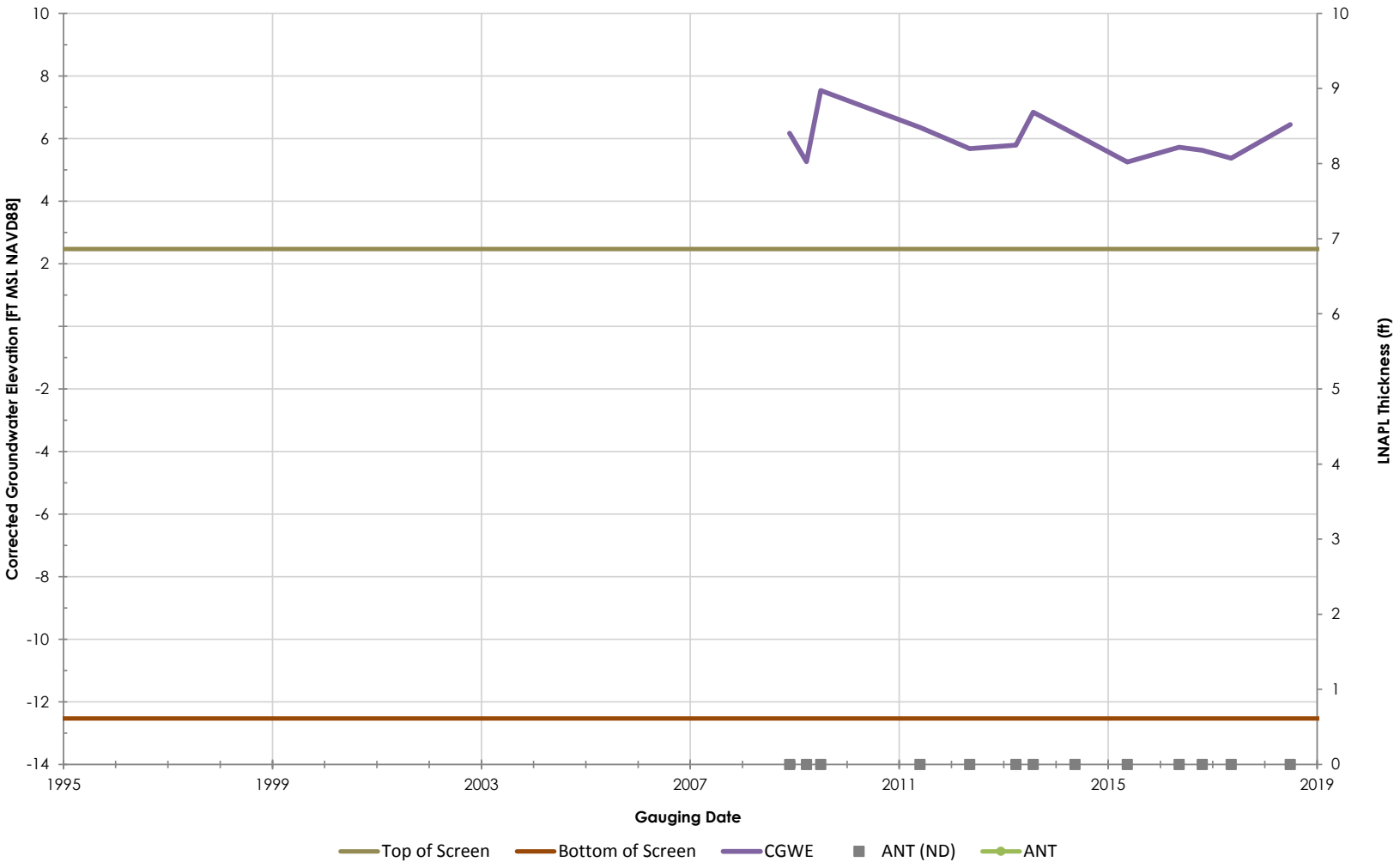
Stantec

Figure/Well No.

N-113

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

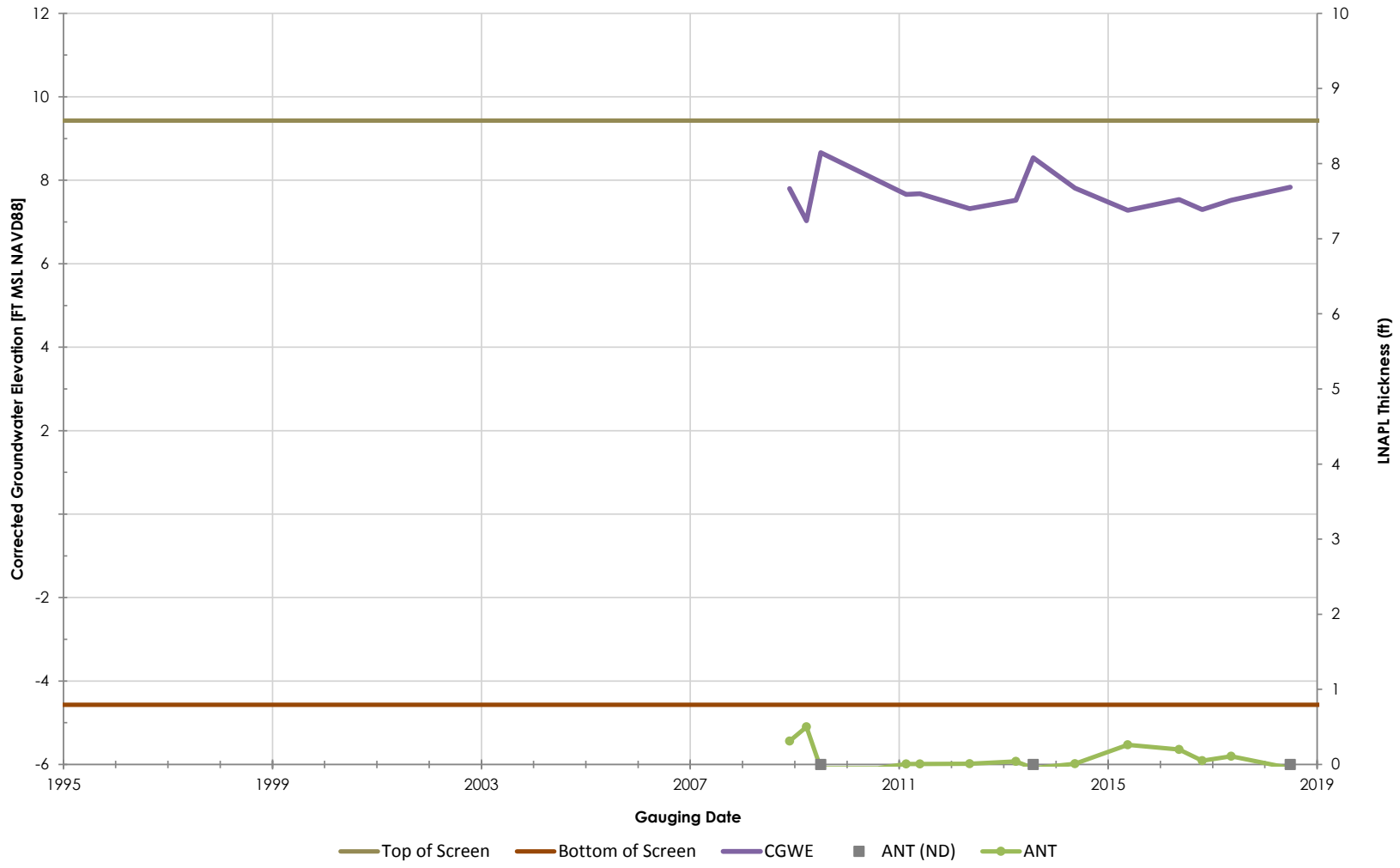
Stantec

Figure/Well No.

N-114

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

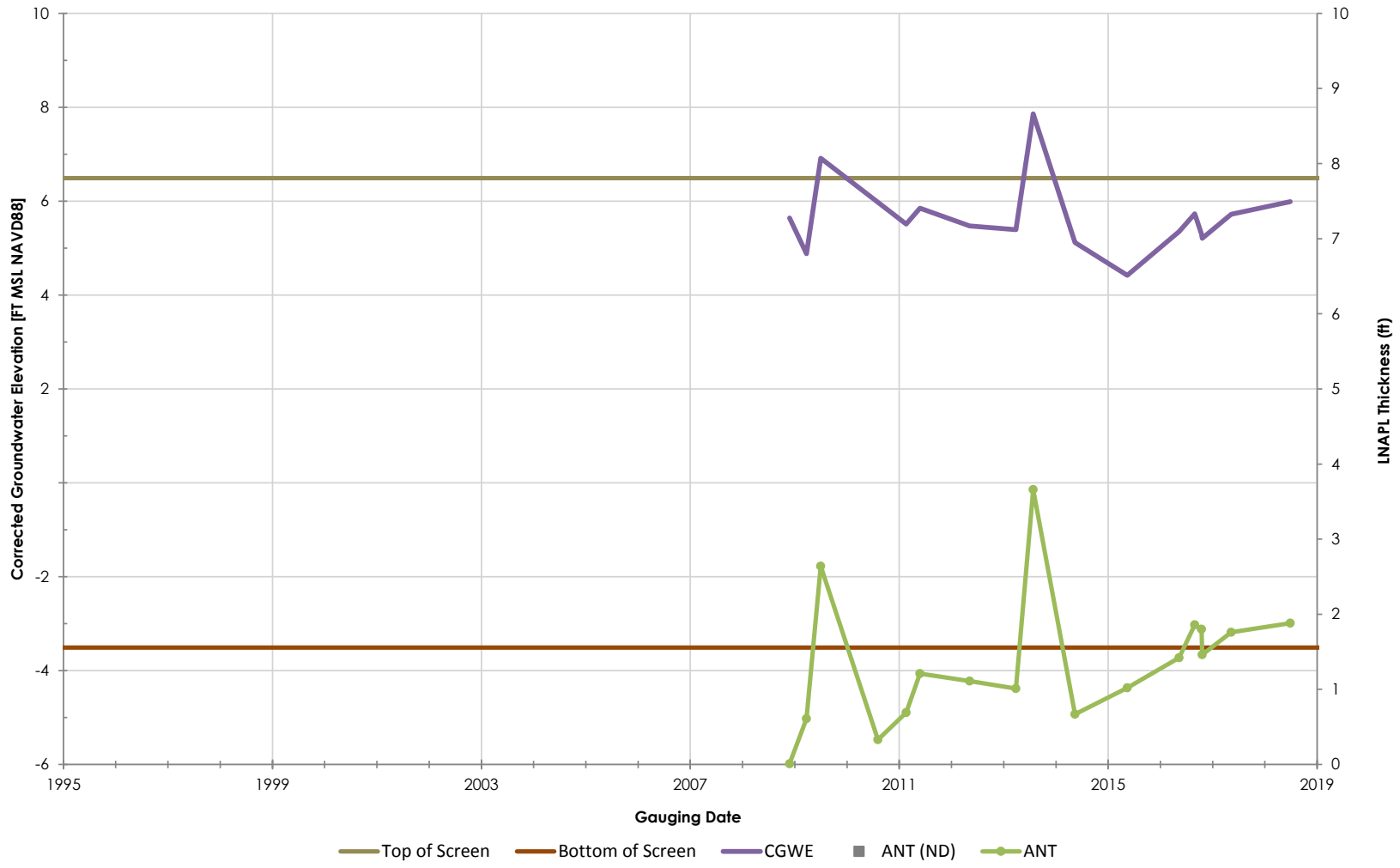
Stantec

Figure/Well No.

N-115

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

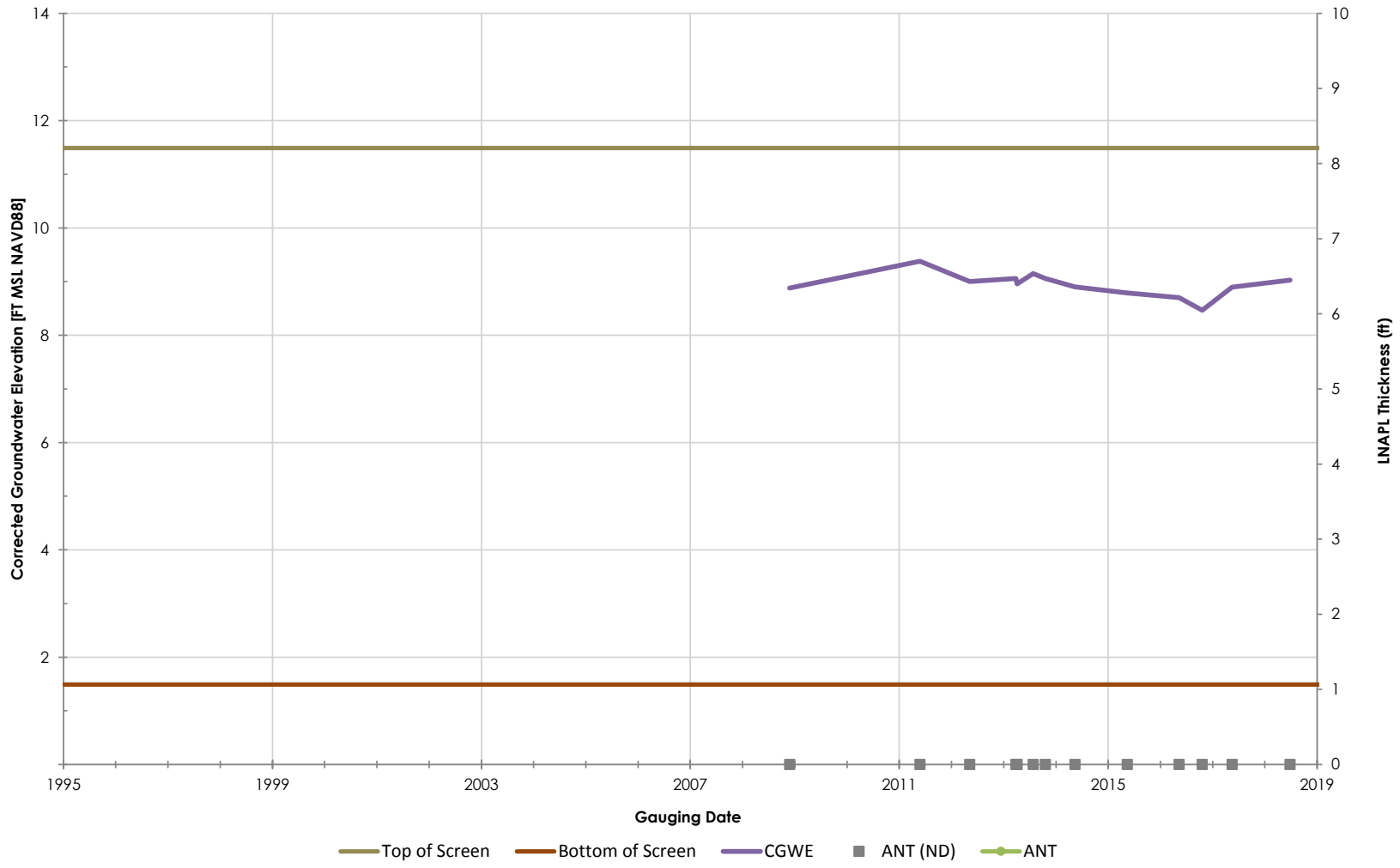
Stantec

Figure/Well No.

N-116

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

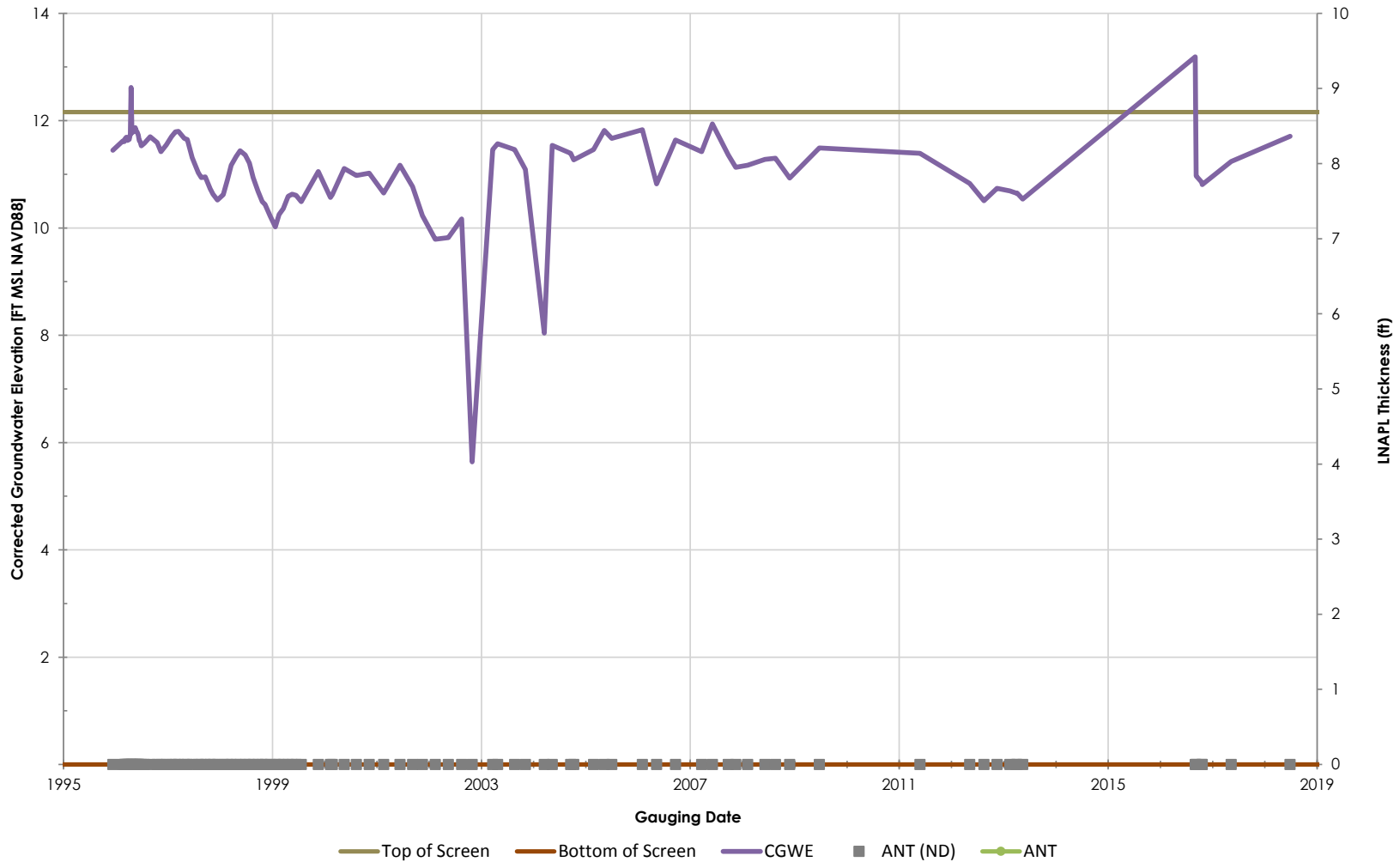
Stantec

Figure/Well No.

N-118

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

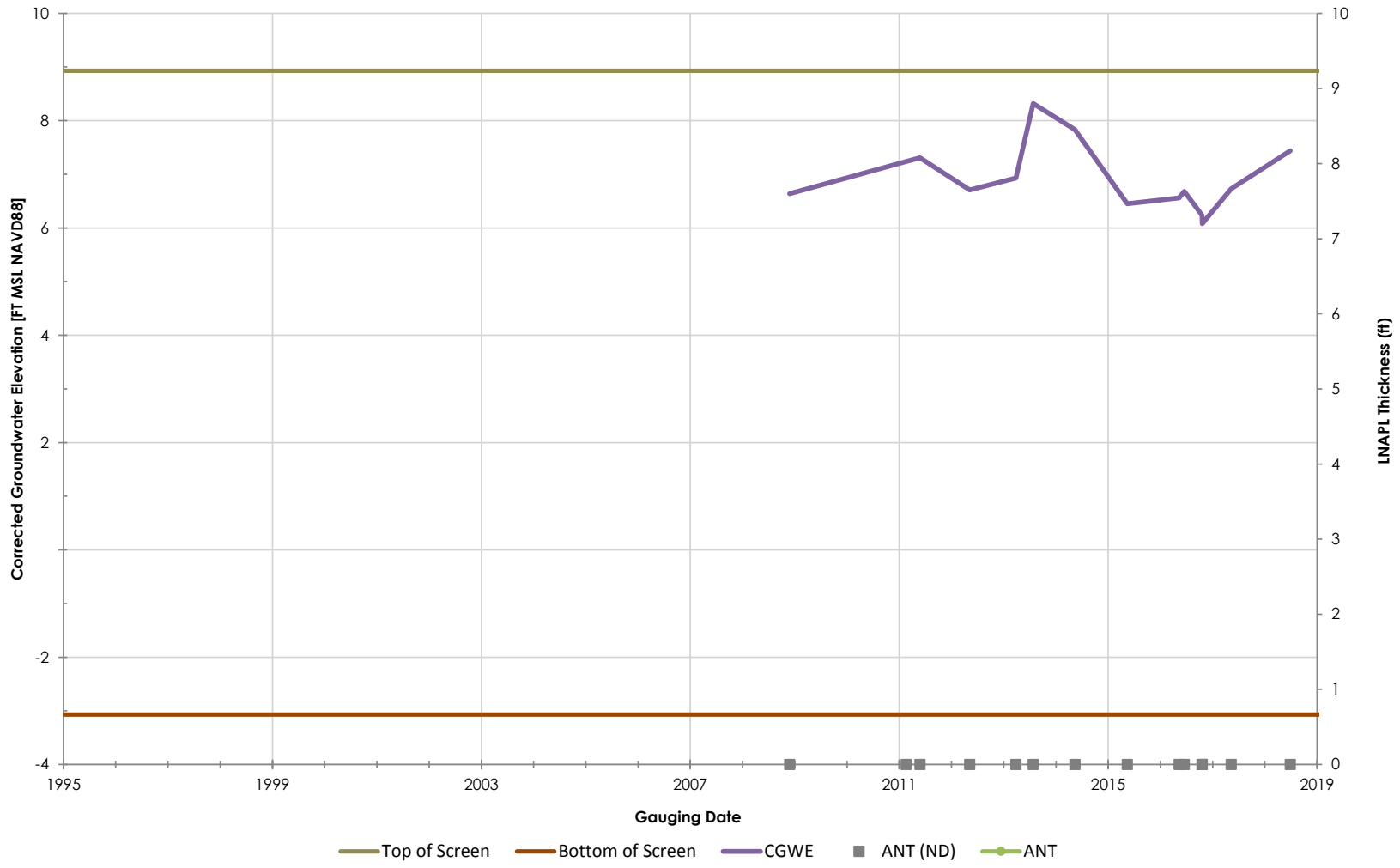
Stantec

Figure/Well No.

N-12

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

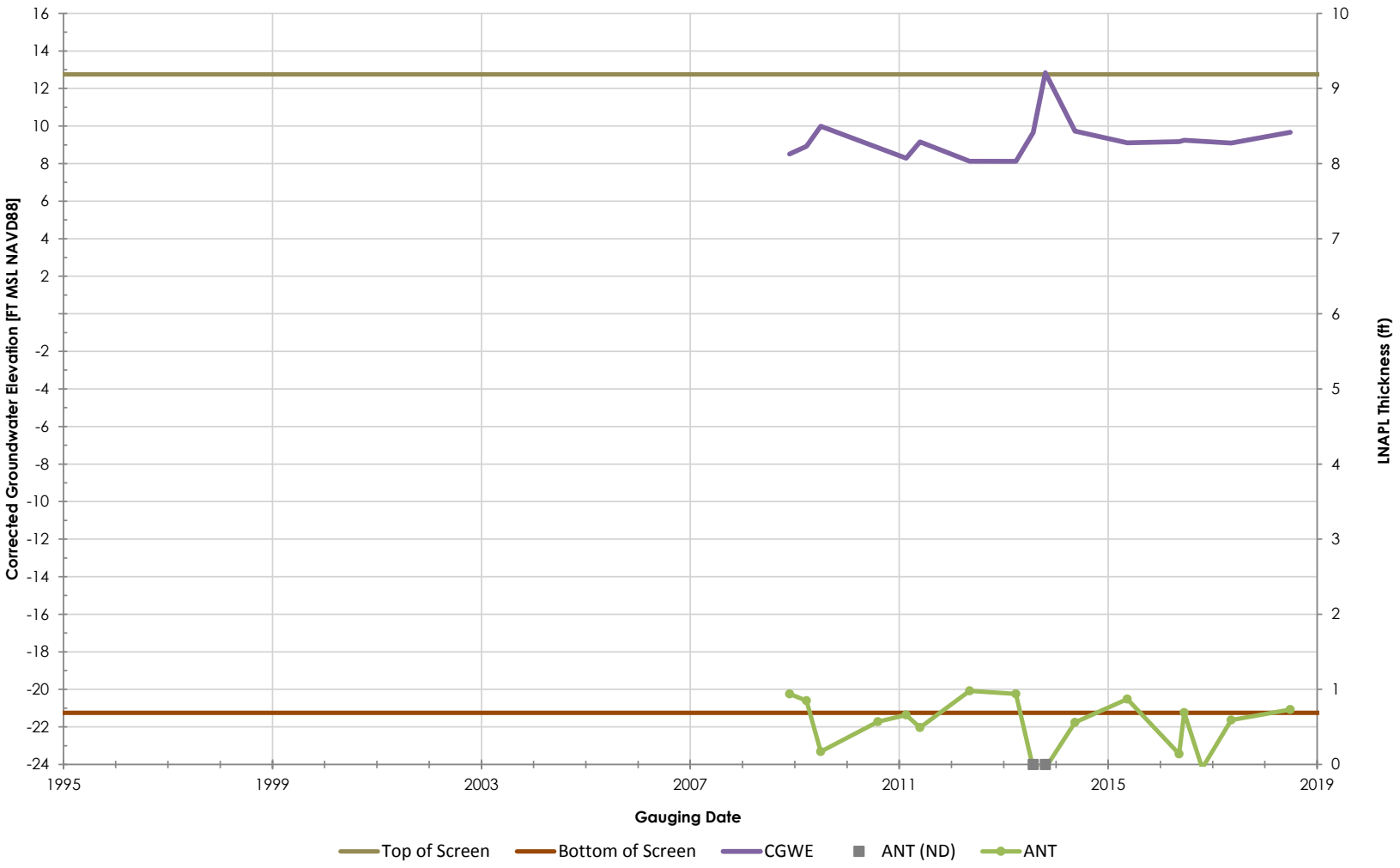
Stantec

Figure/Well No.

N-122

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

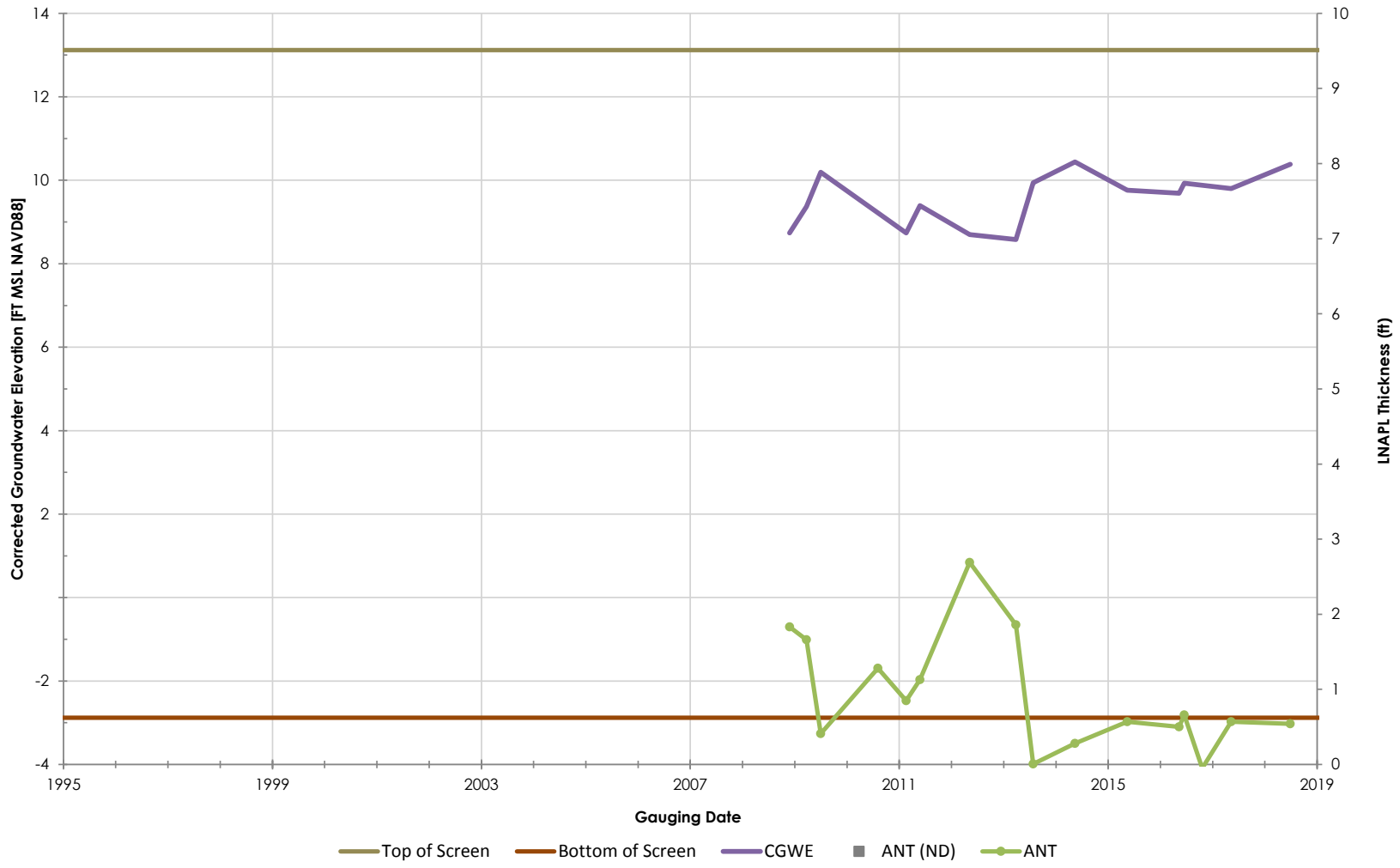
Stantec

Figure/Well No.

N-127

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

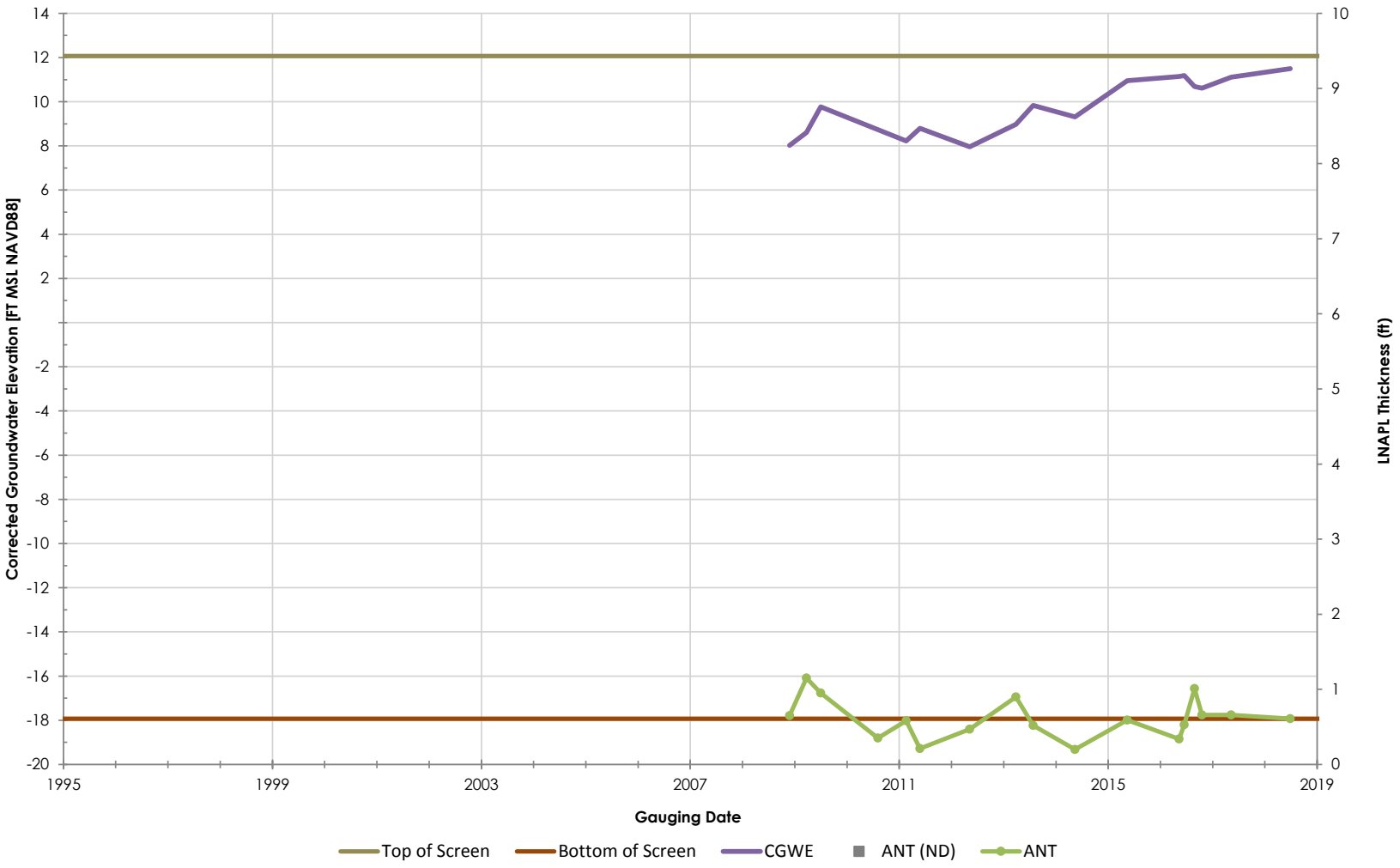
Stantec

Figure/Well No.

N-129

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

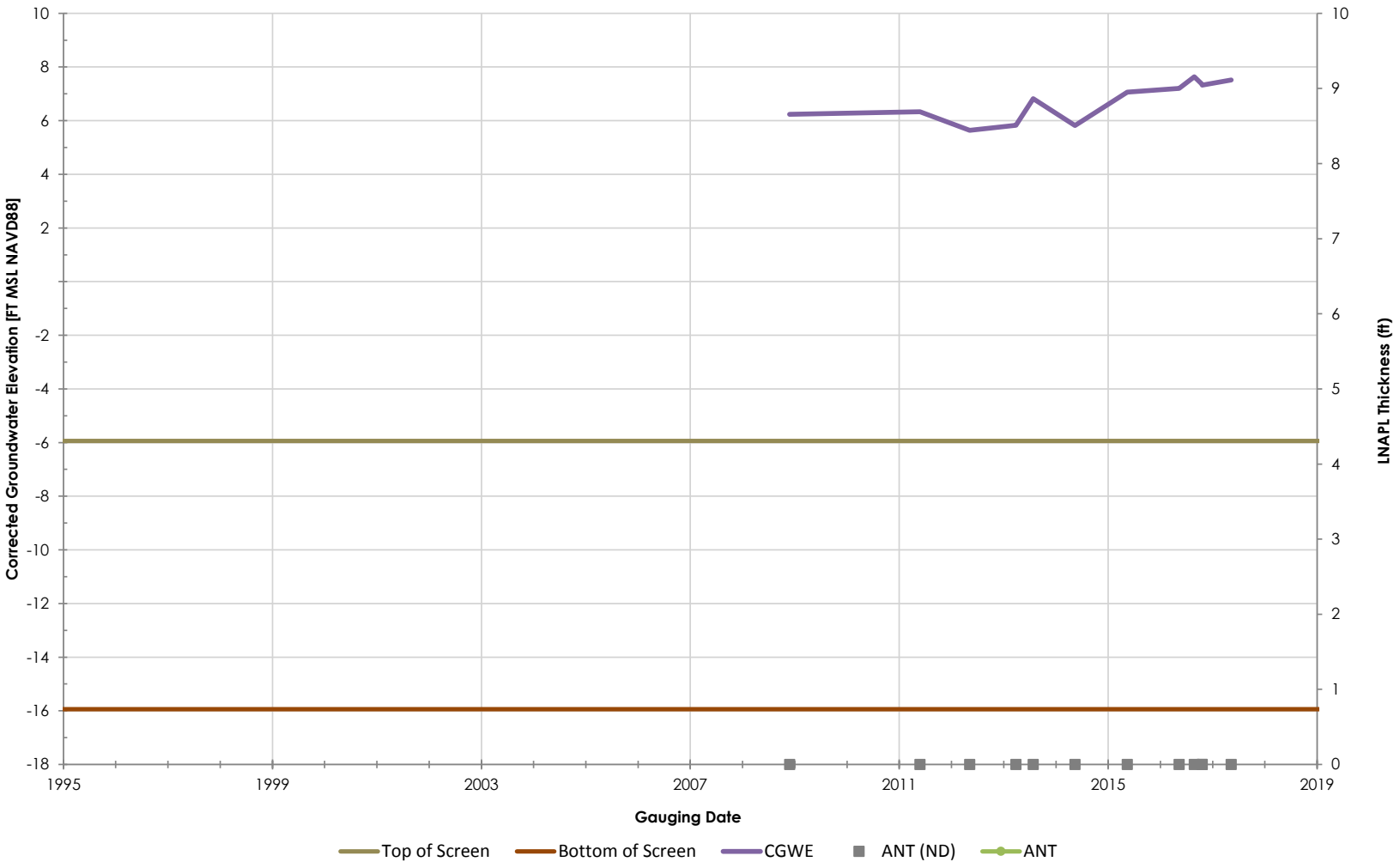
Stantec

Figure/Well No.

N-130

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

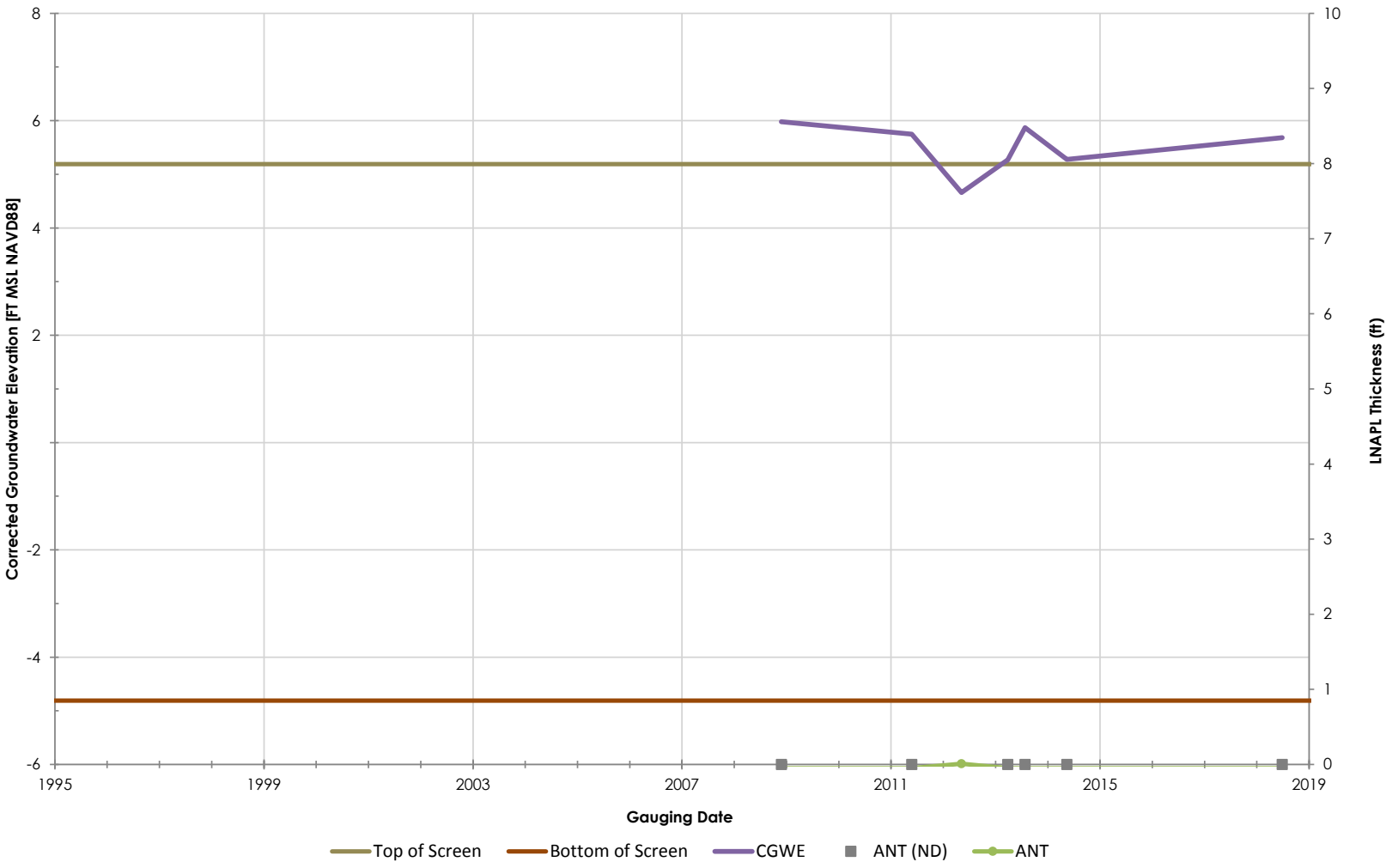
Stantec

Figure/Well No.

N-132

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

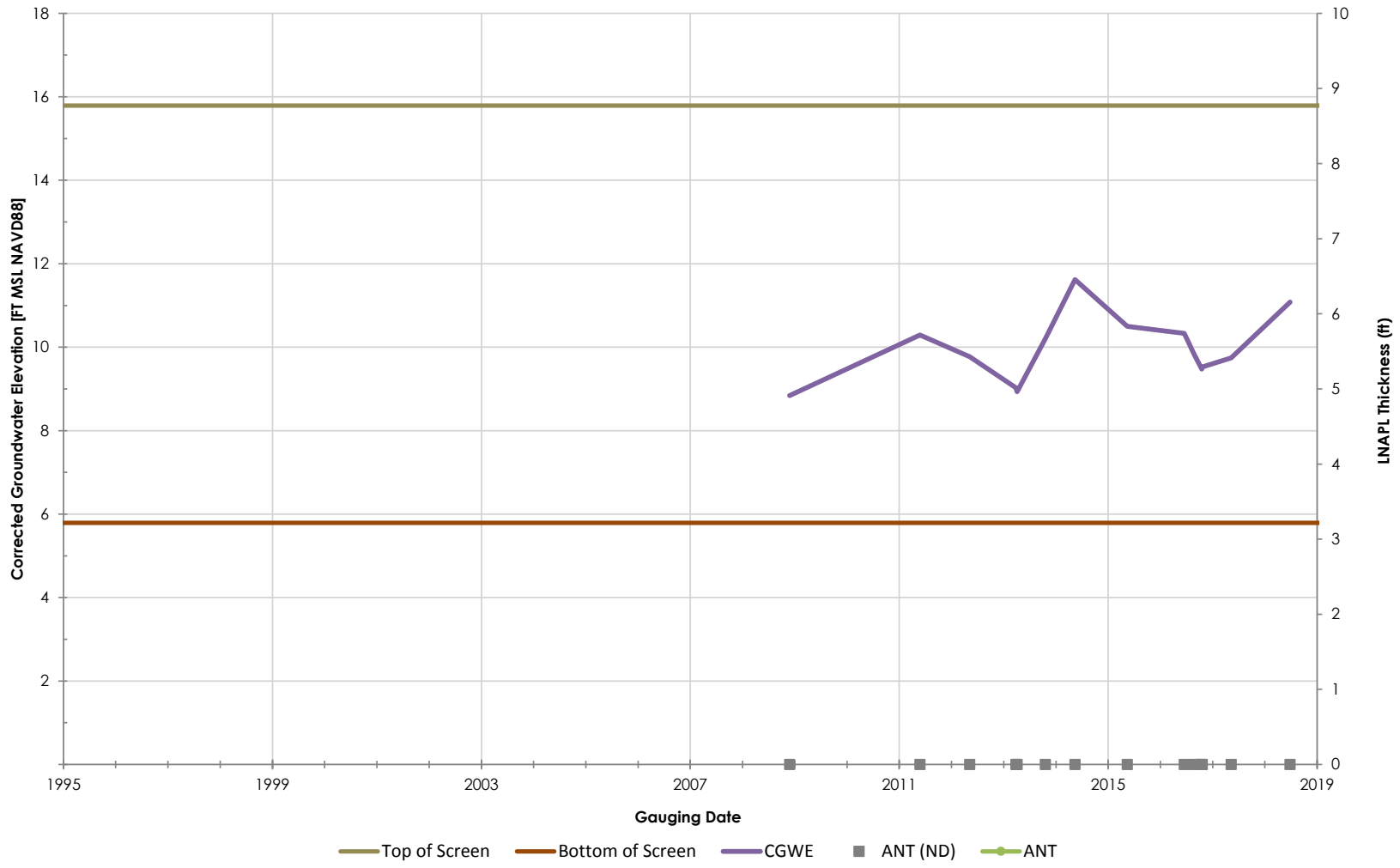
Stantec

Figure/Well No.

N-133

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

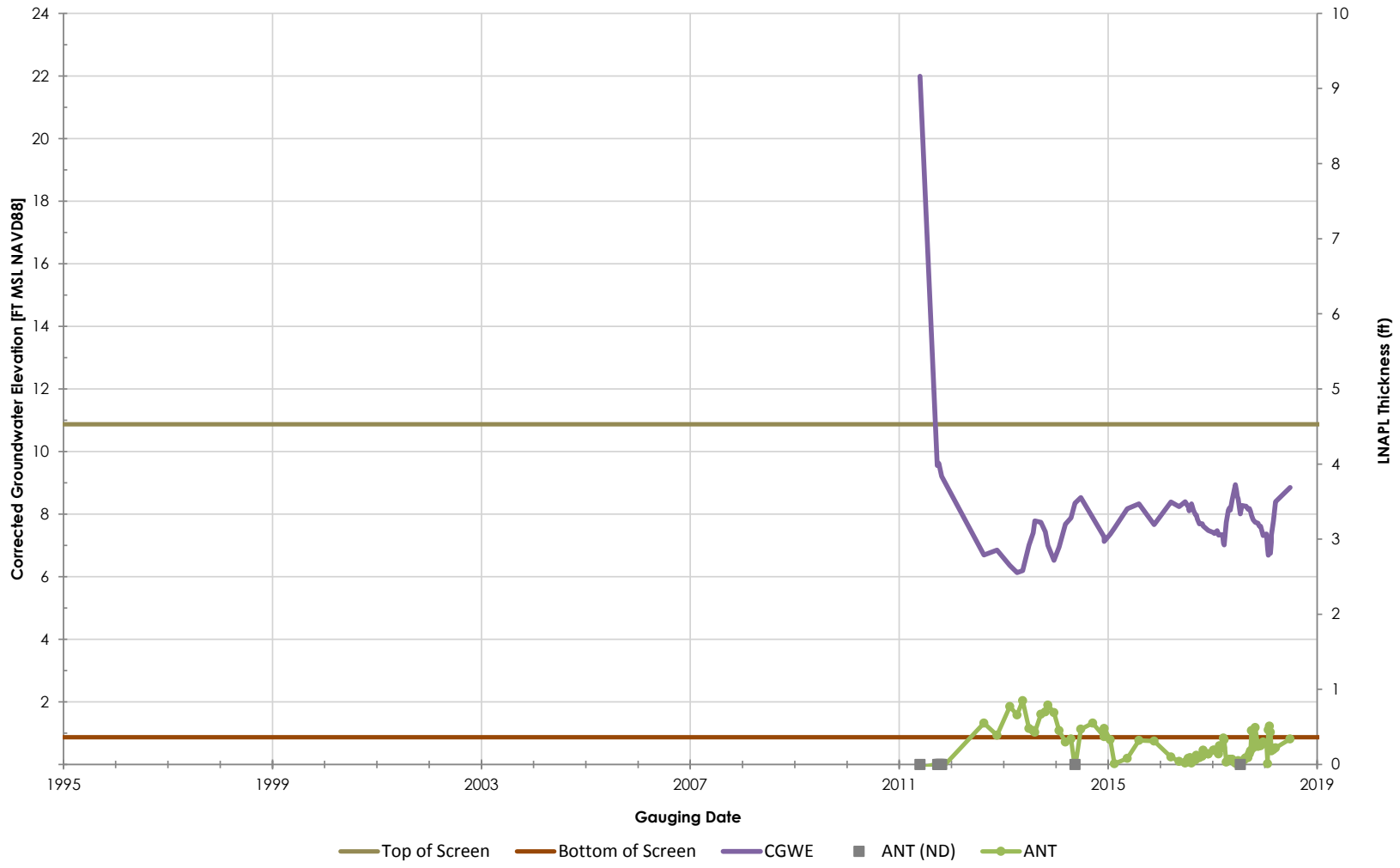
Stantec

Figure/Well No.

N-134

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

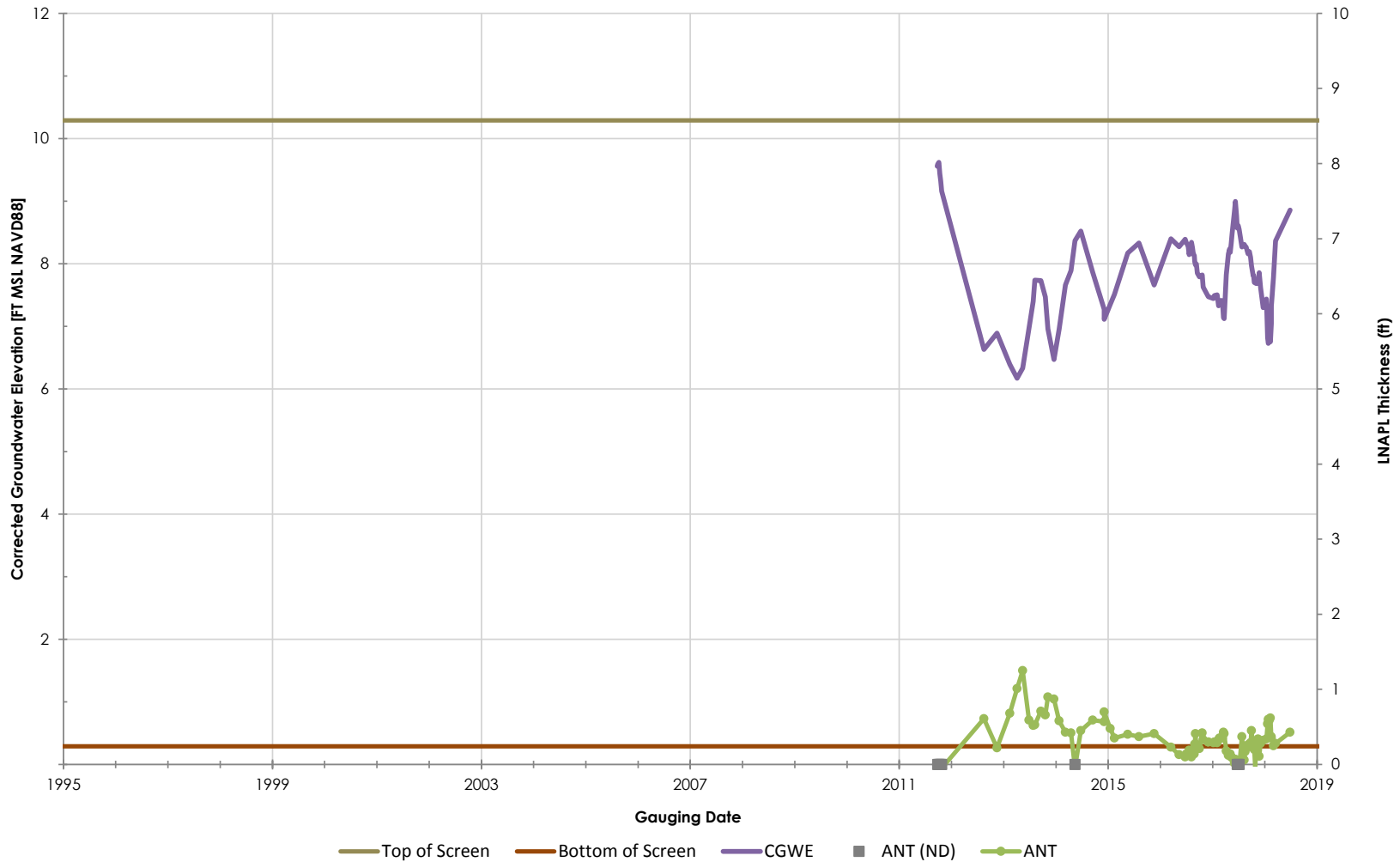
Stantec

Figure/Well No.

N-137

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

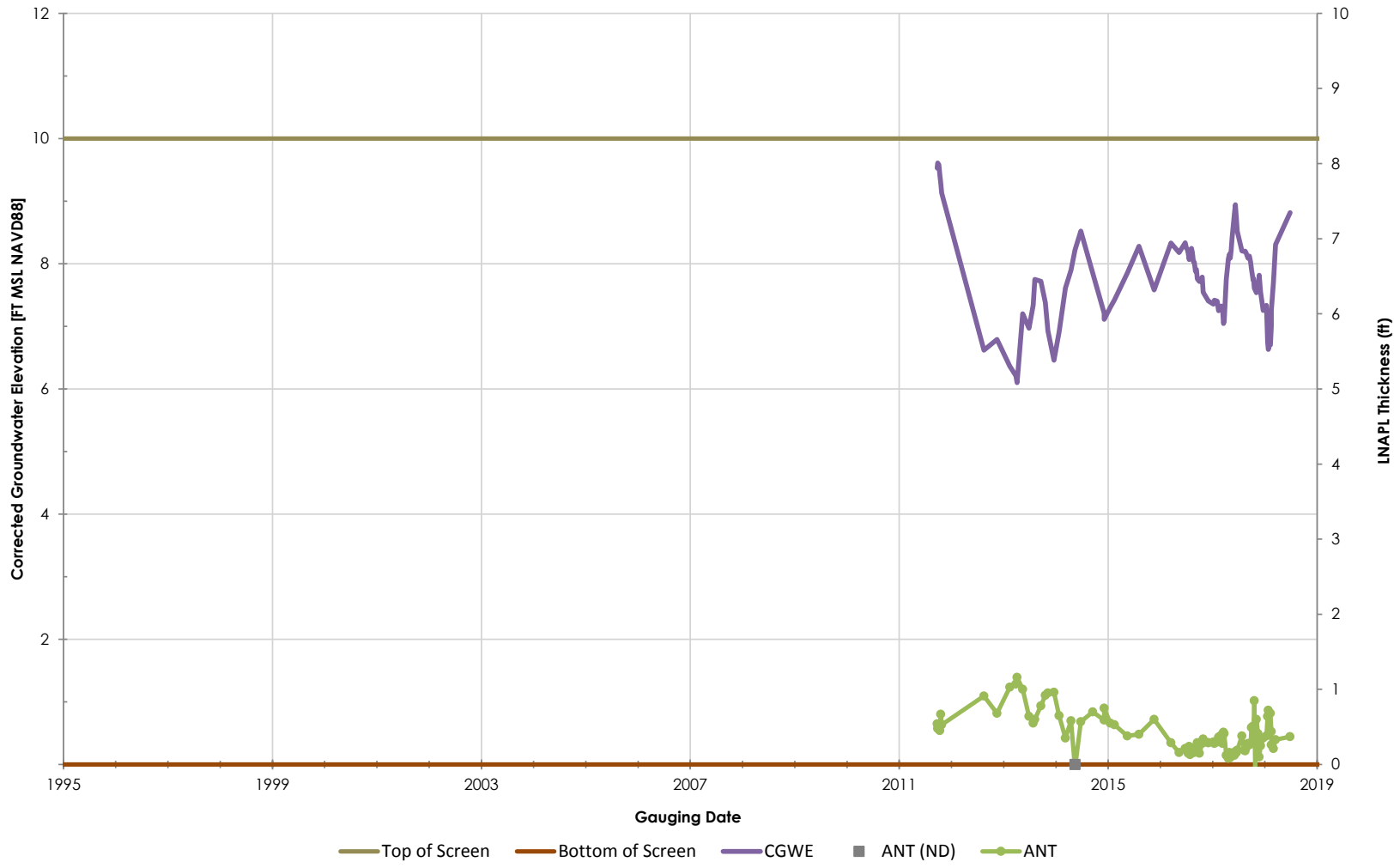
Stantec

Figure/Well No.

N-138

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

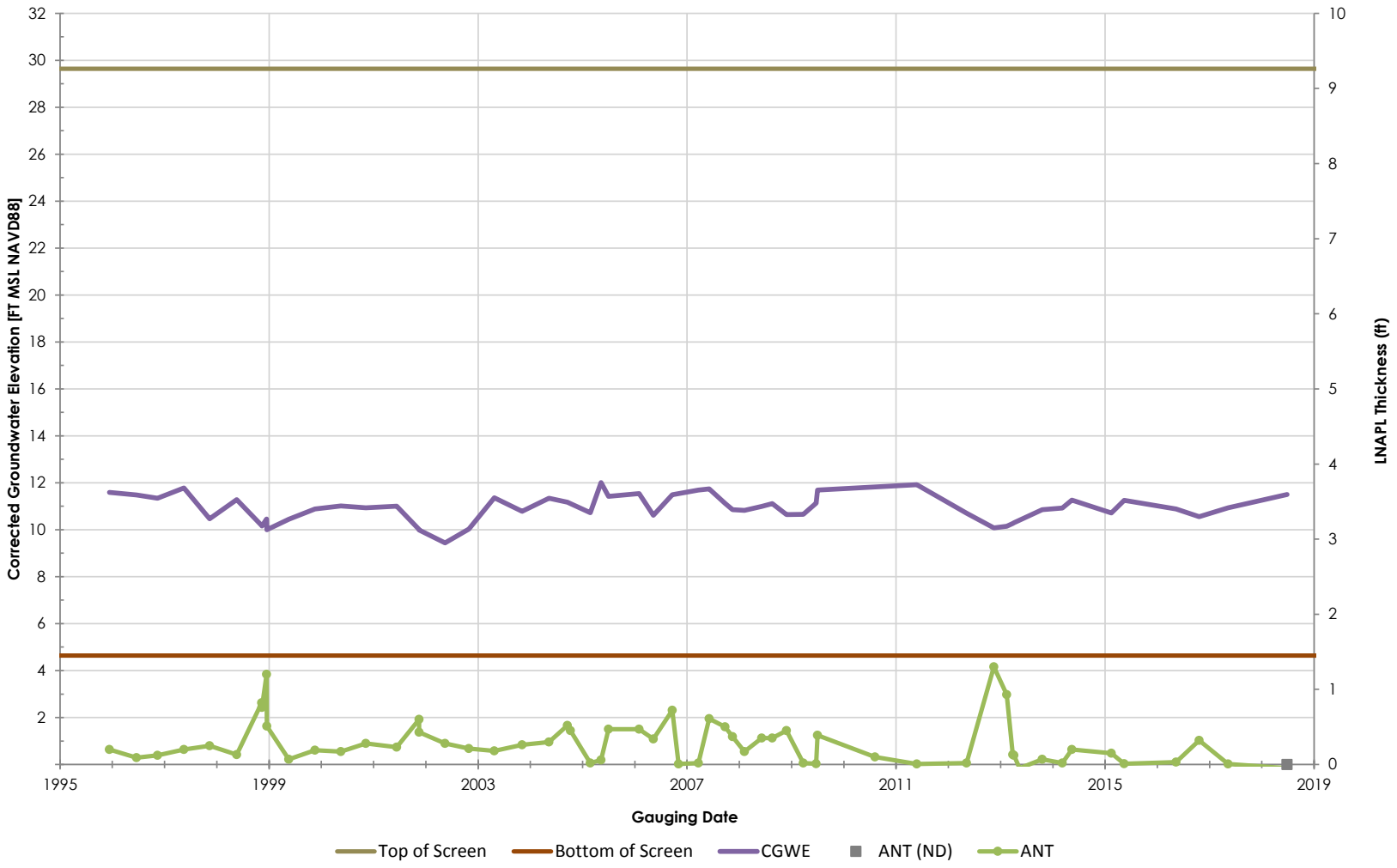
Stantec

Figure/Well No.

N-139

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

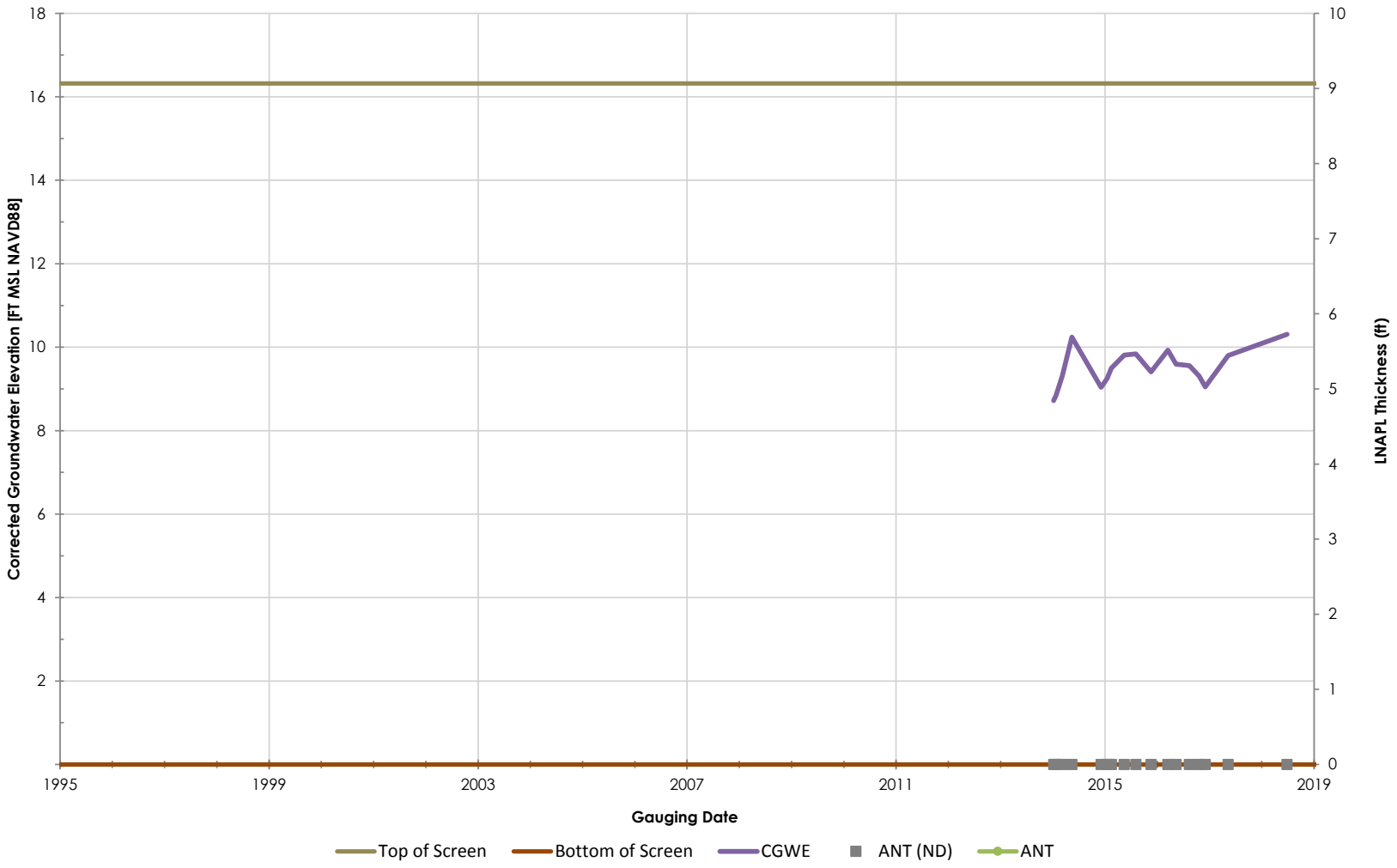
Stantec

Figure/Well No.

N-14

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

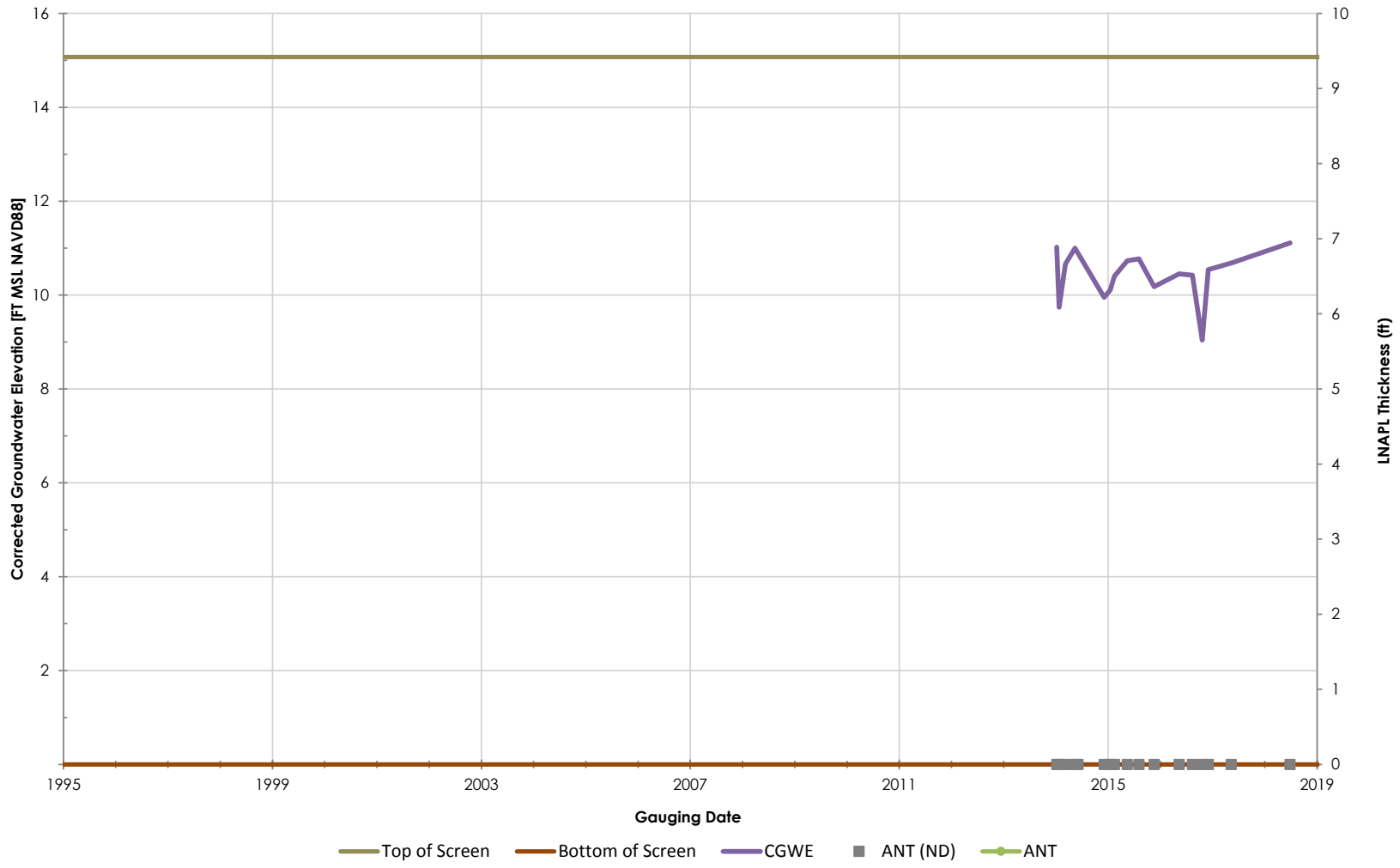
Stantec

Figure/Well No.

N-140

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

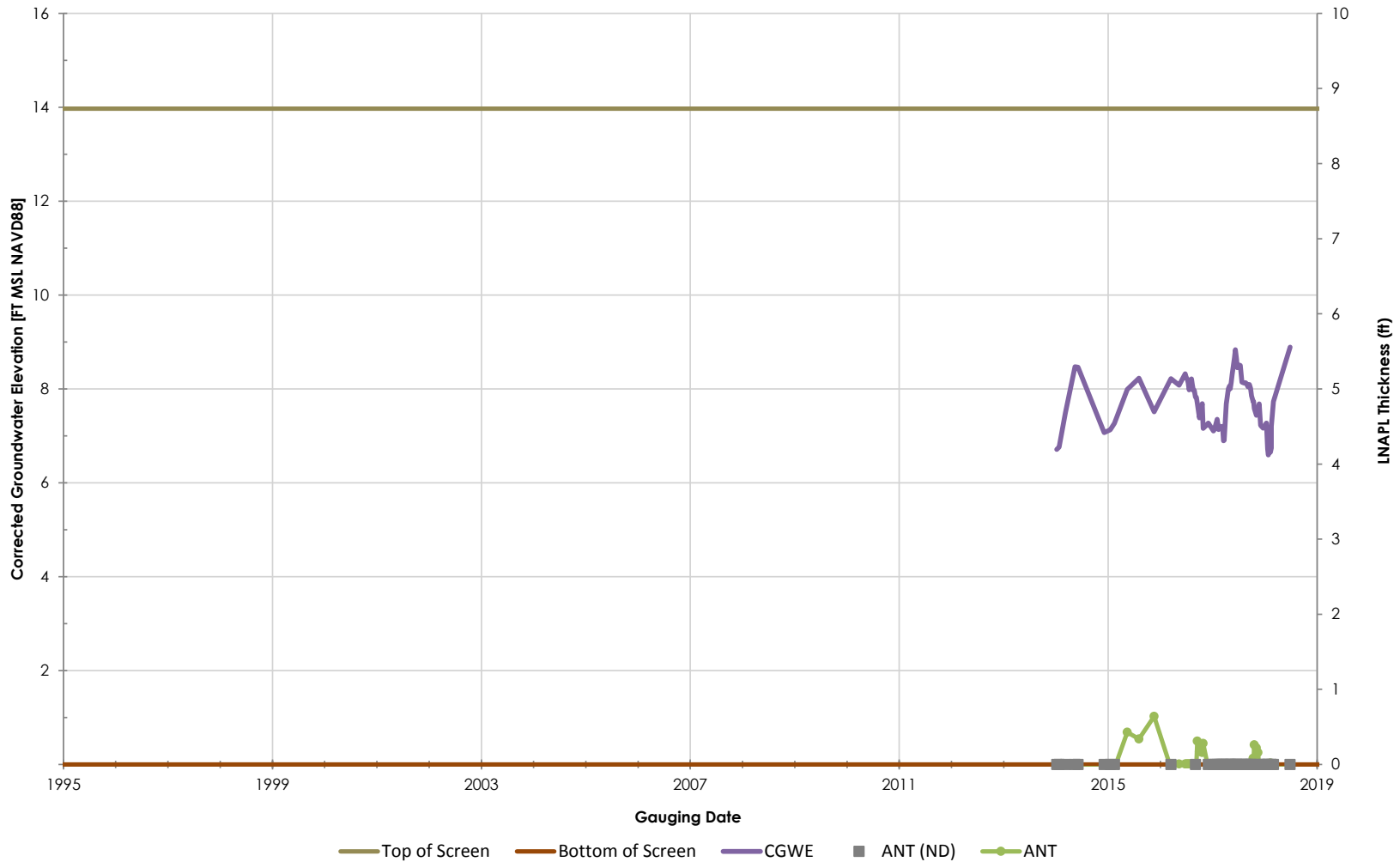
Stantec

Figure/Well No.

N-141

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

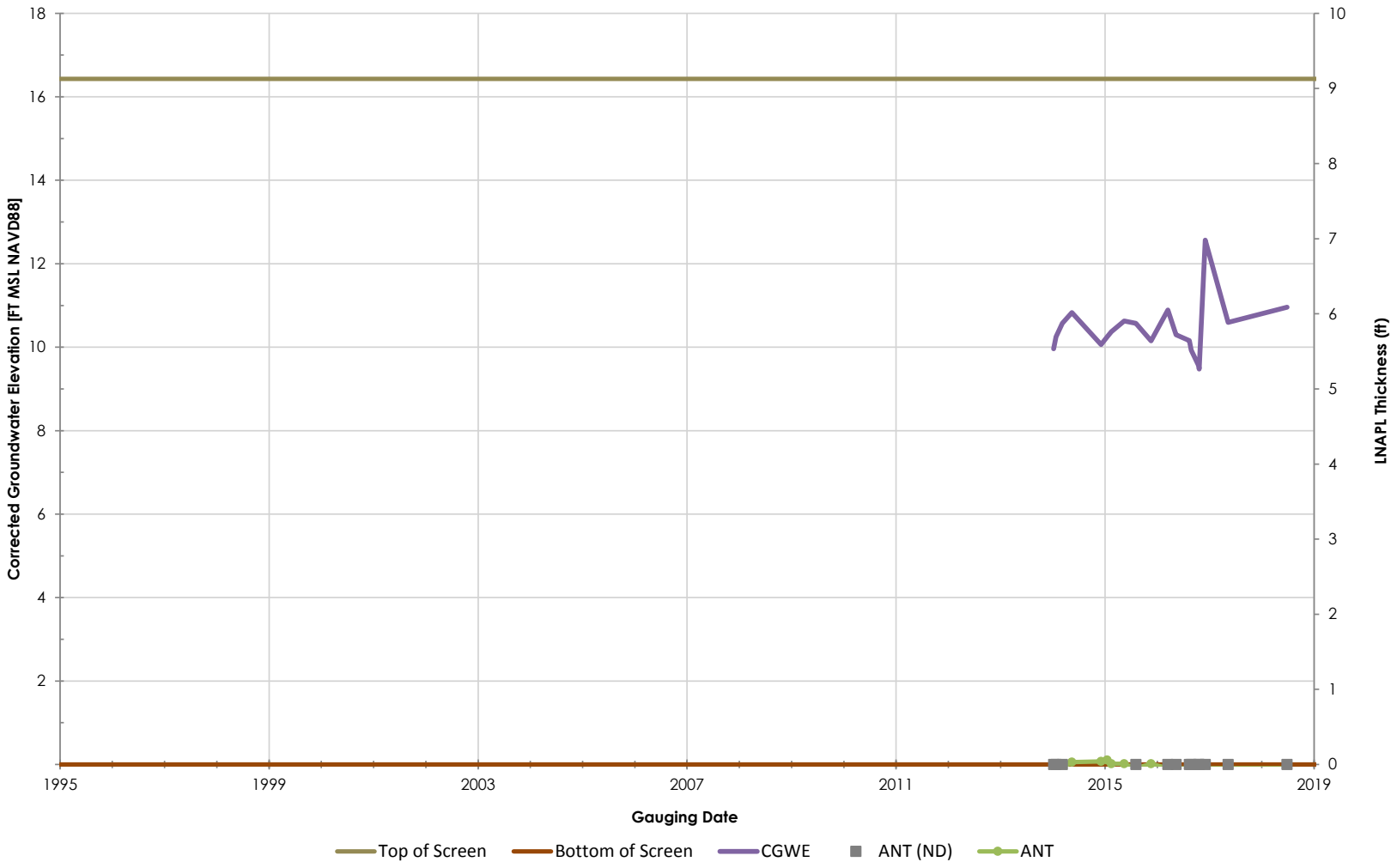
Stantec

Figure/Well No.

N-142

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

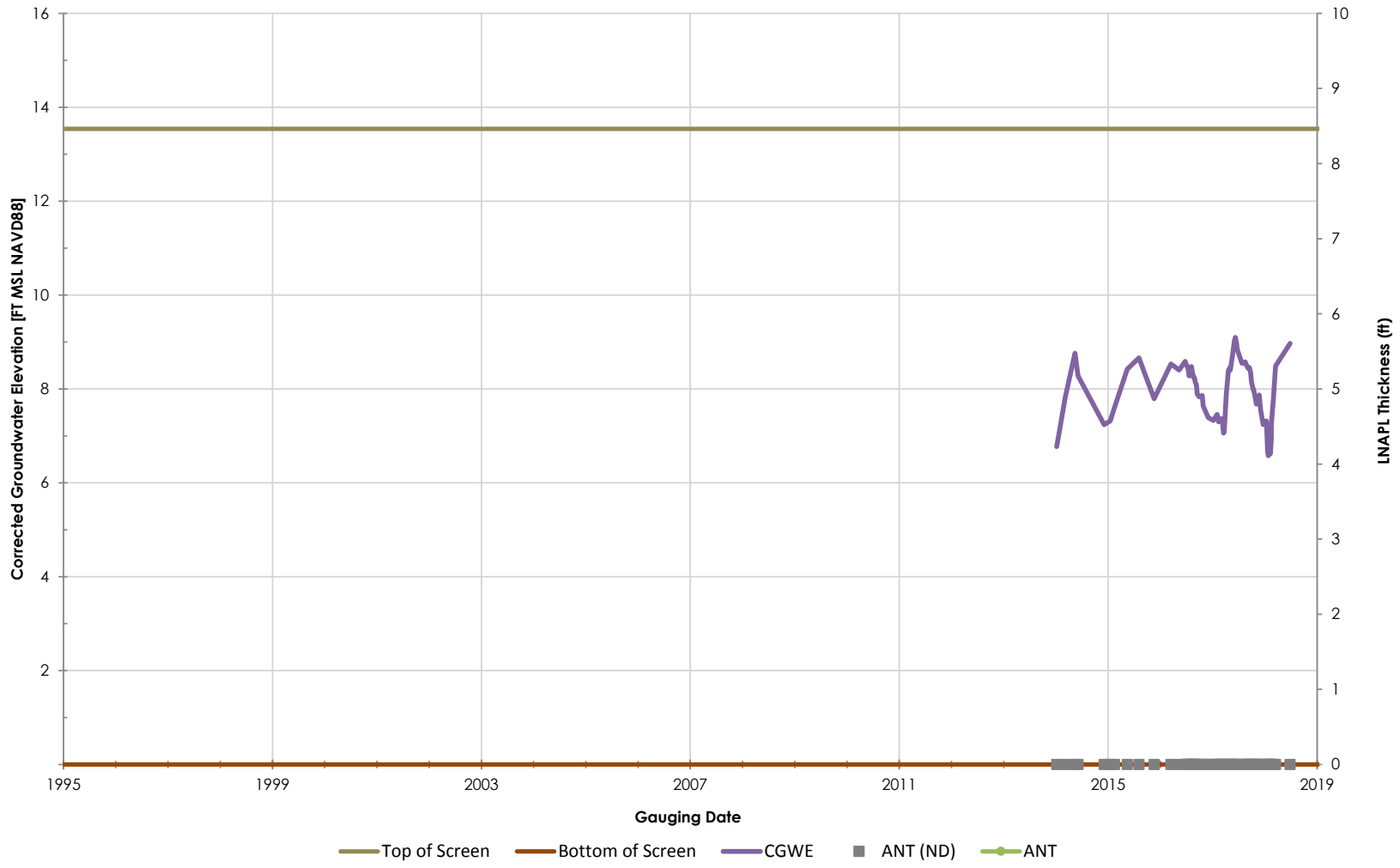
Stantec

Figure/Well No.

N-143

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

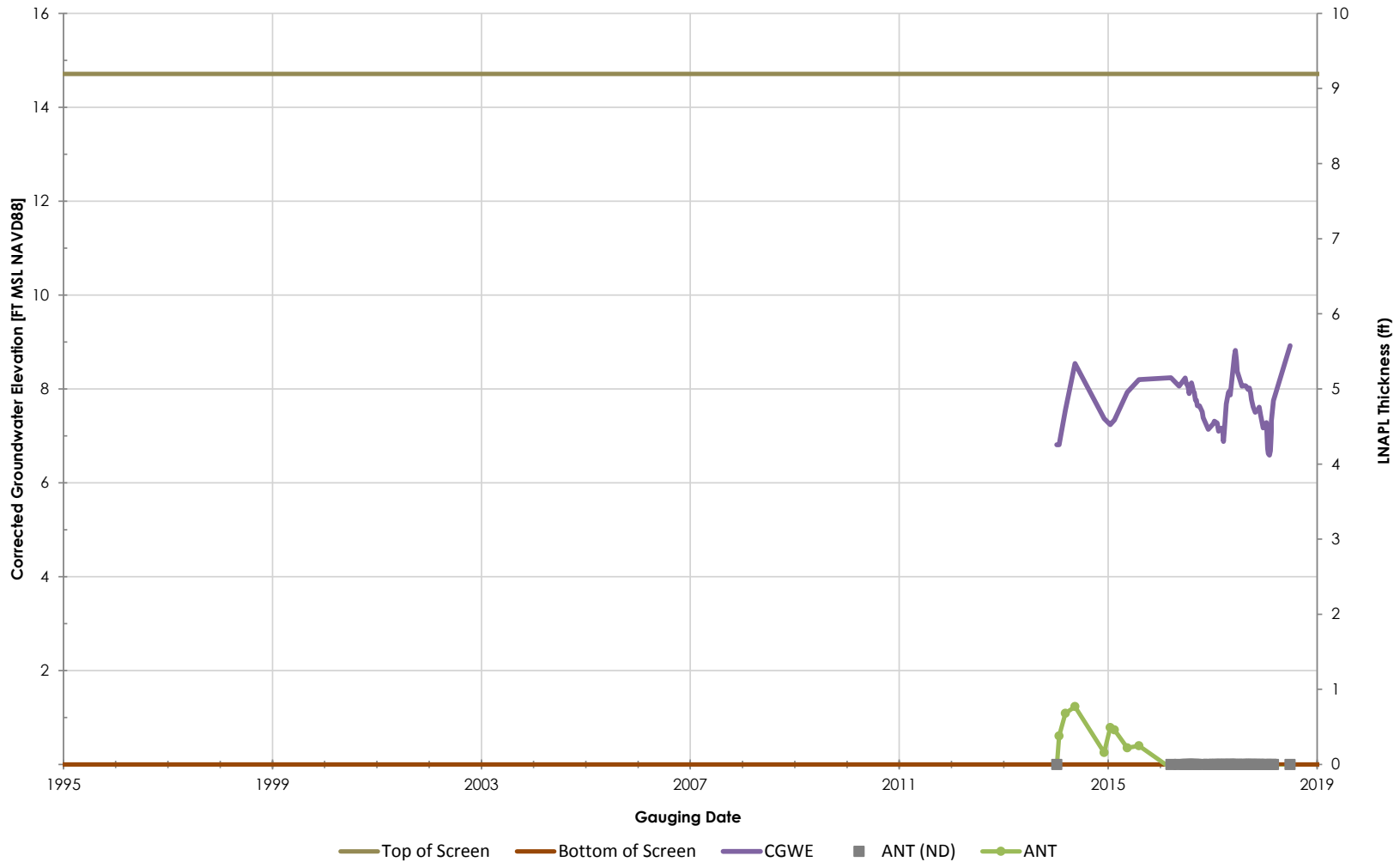
Stantec

Figure/Well No.

N-144

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

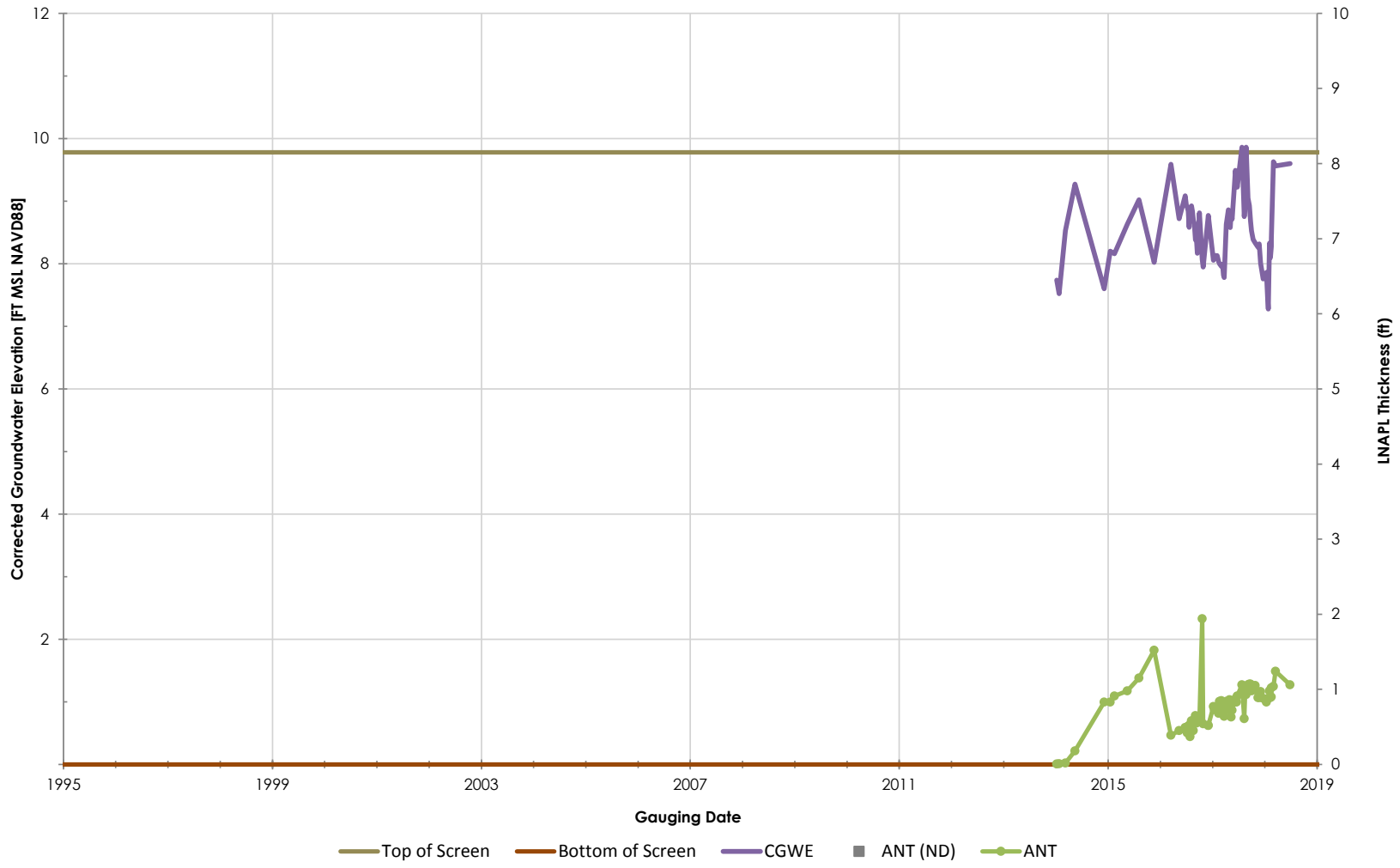
Stantec

Figure/Well No.

N-145

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

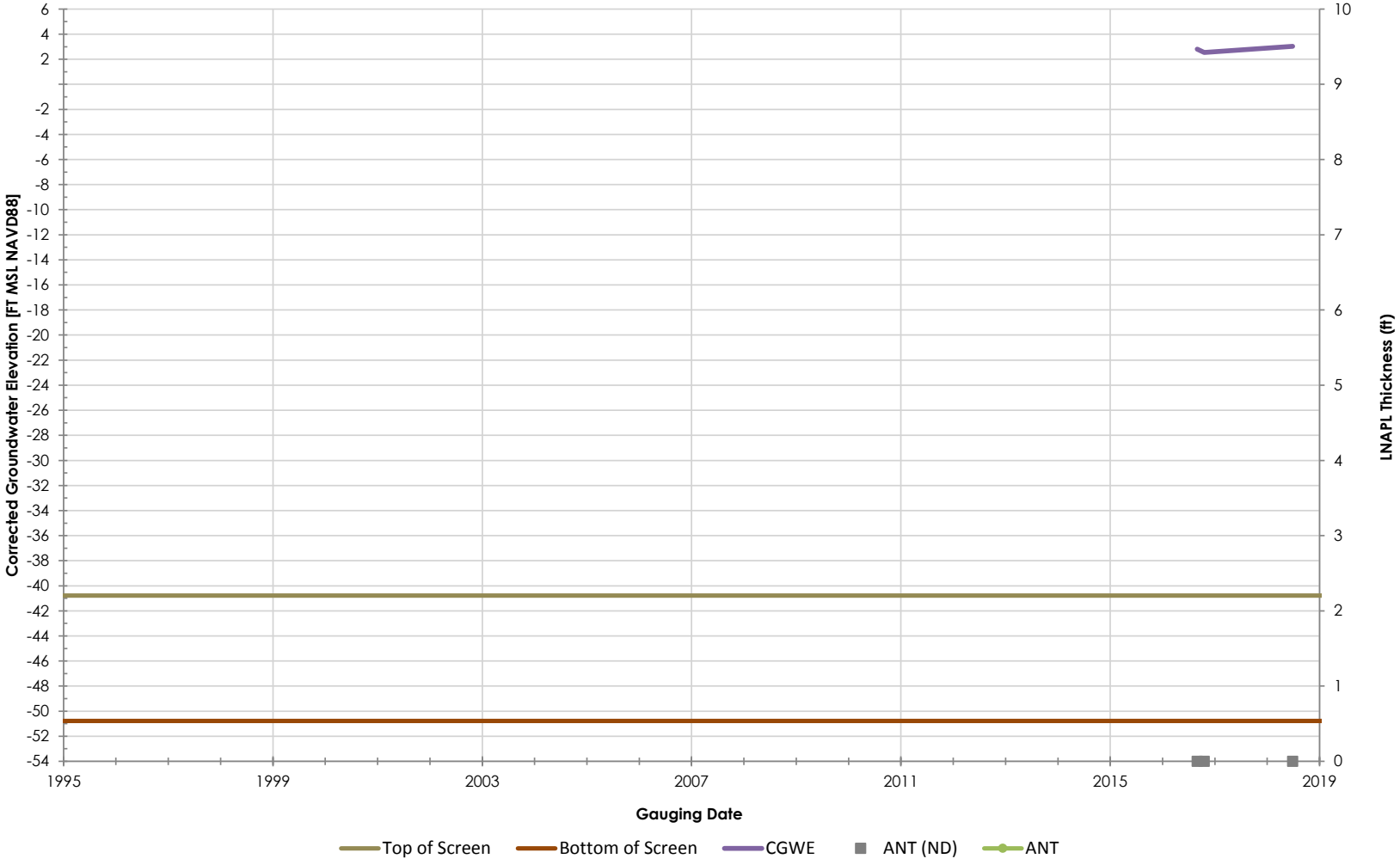
Stantec

Figure/Well No.

N-146

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



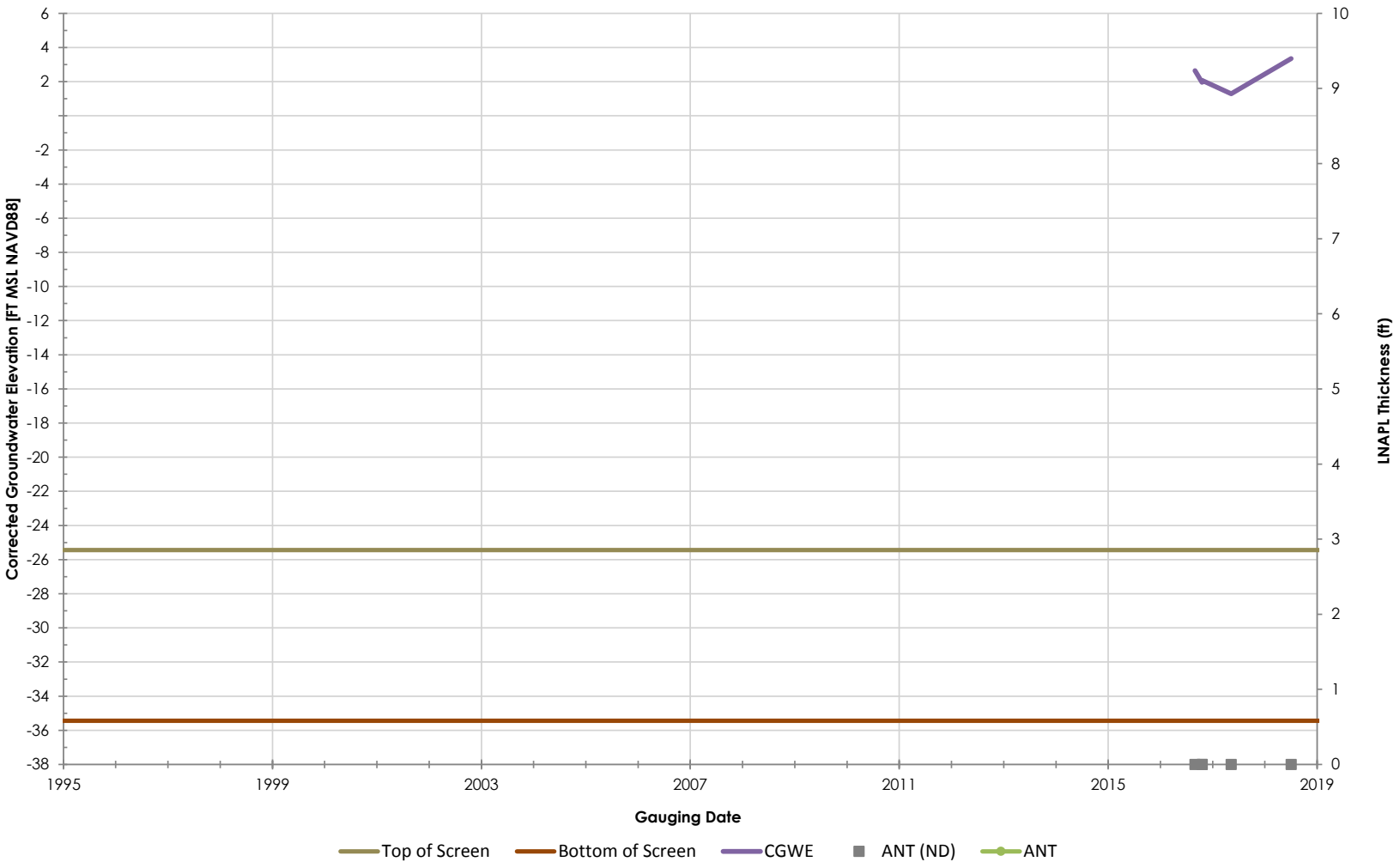
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

N-147D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

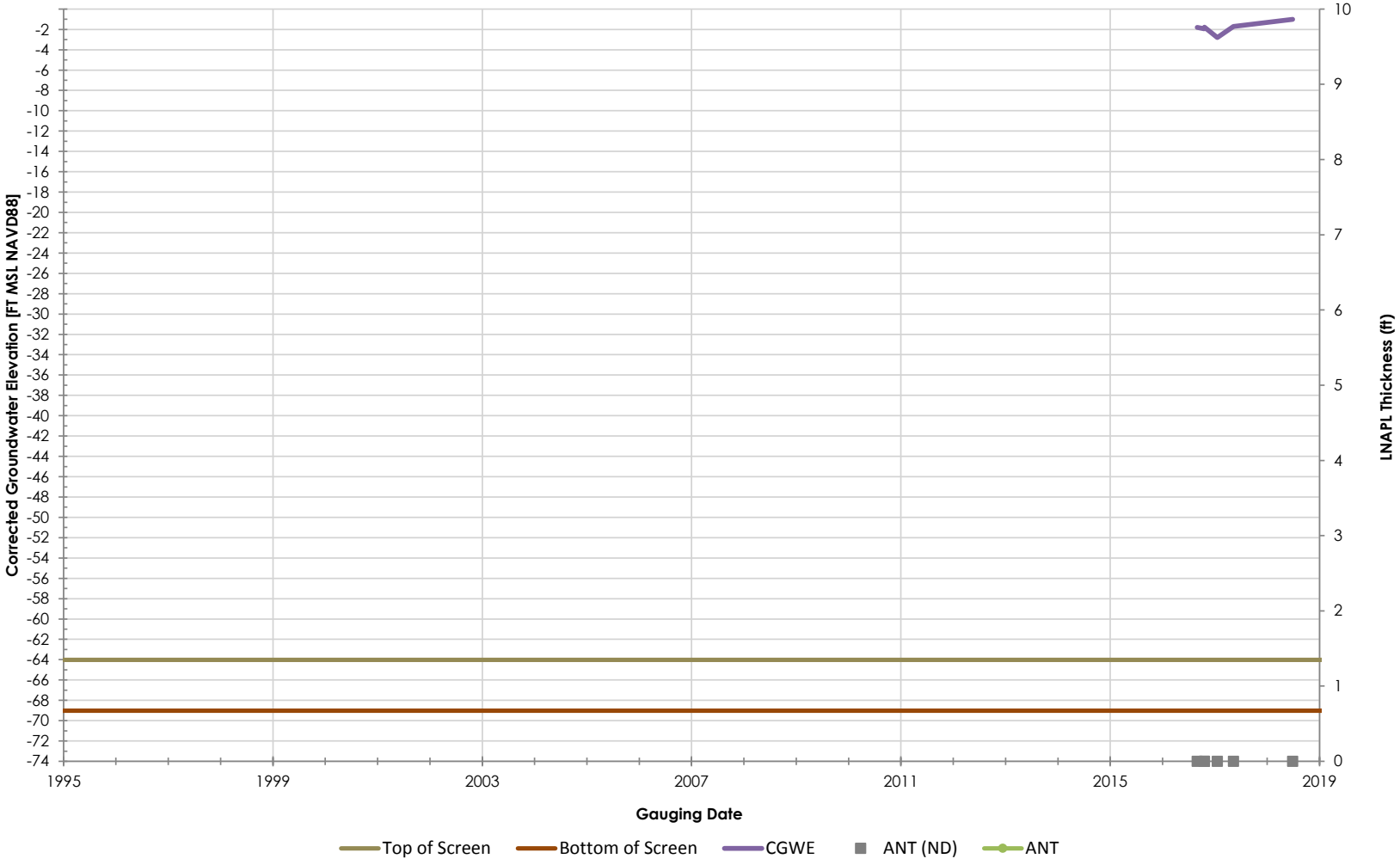
Stantec

Figure/Well No.

N-148D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

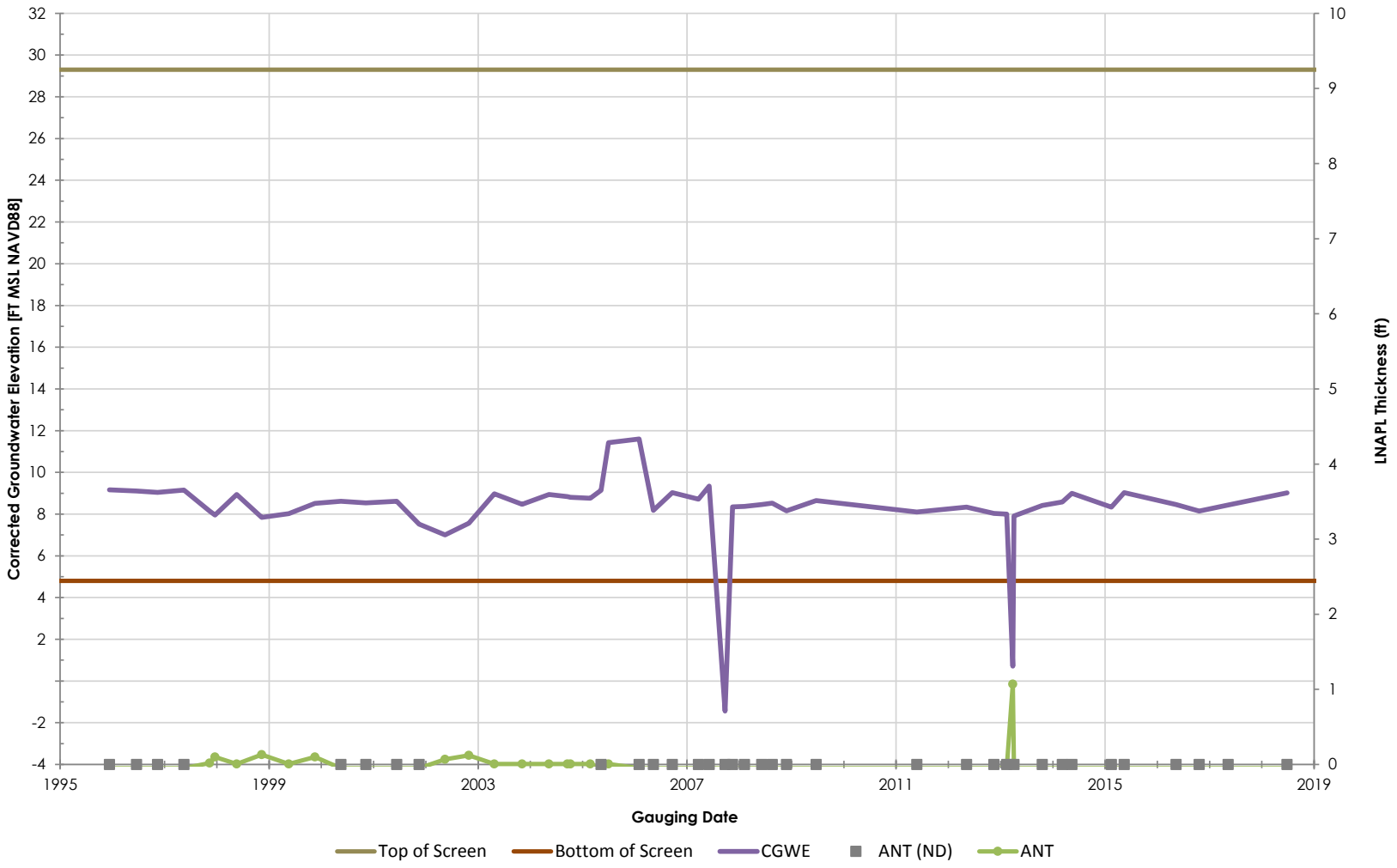
Stantec

Figure/Well No.

N-149D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

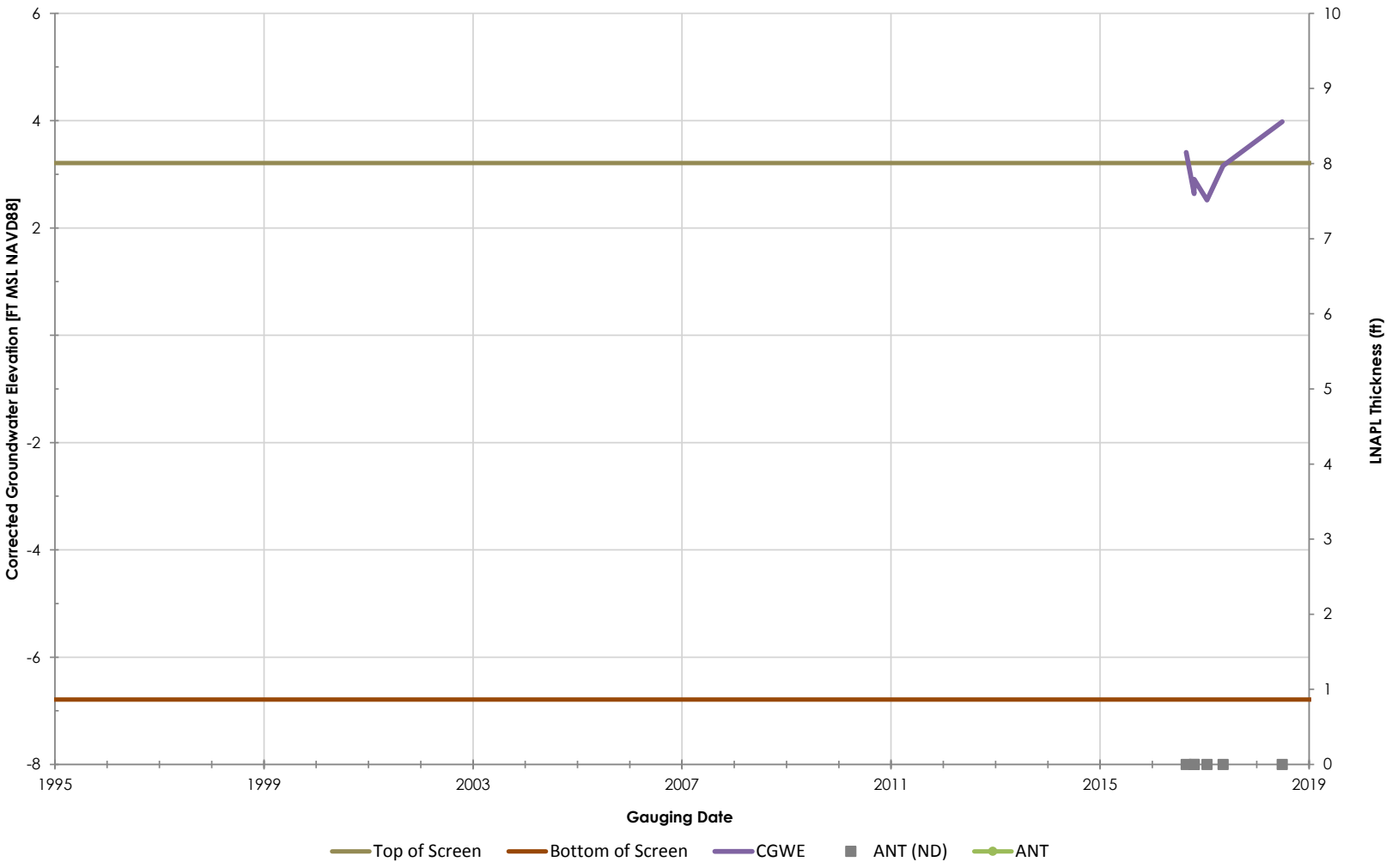
Stantec

Figure/Well No.

N-15

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

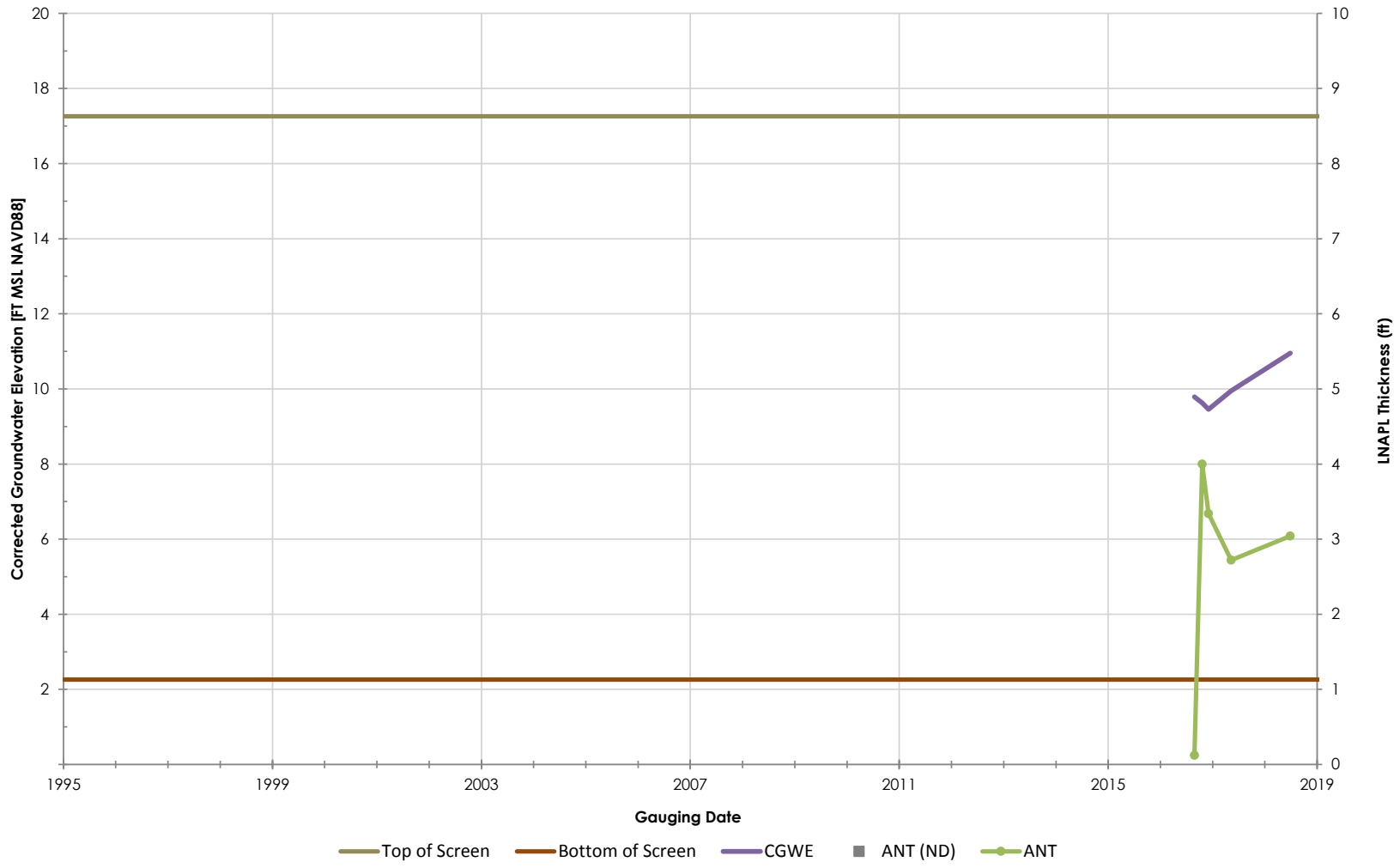
Stantec

Figure/Well No.

N-150

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

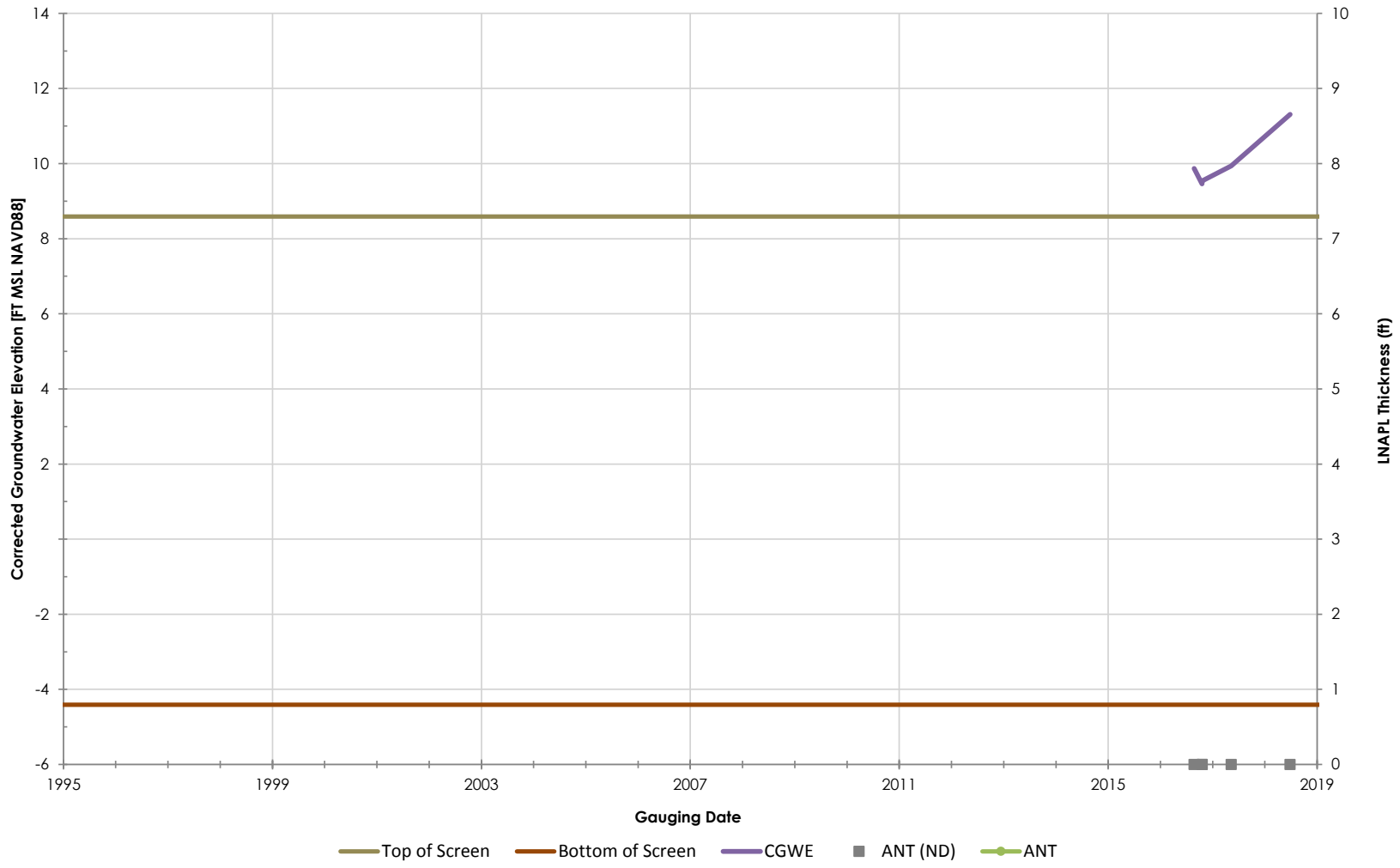
Stantec

Figure/Well No.

N-151

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

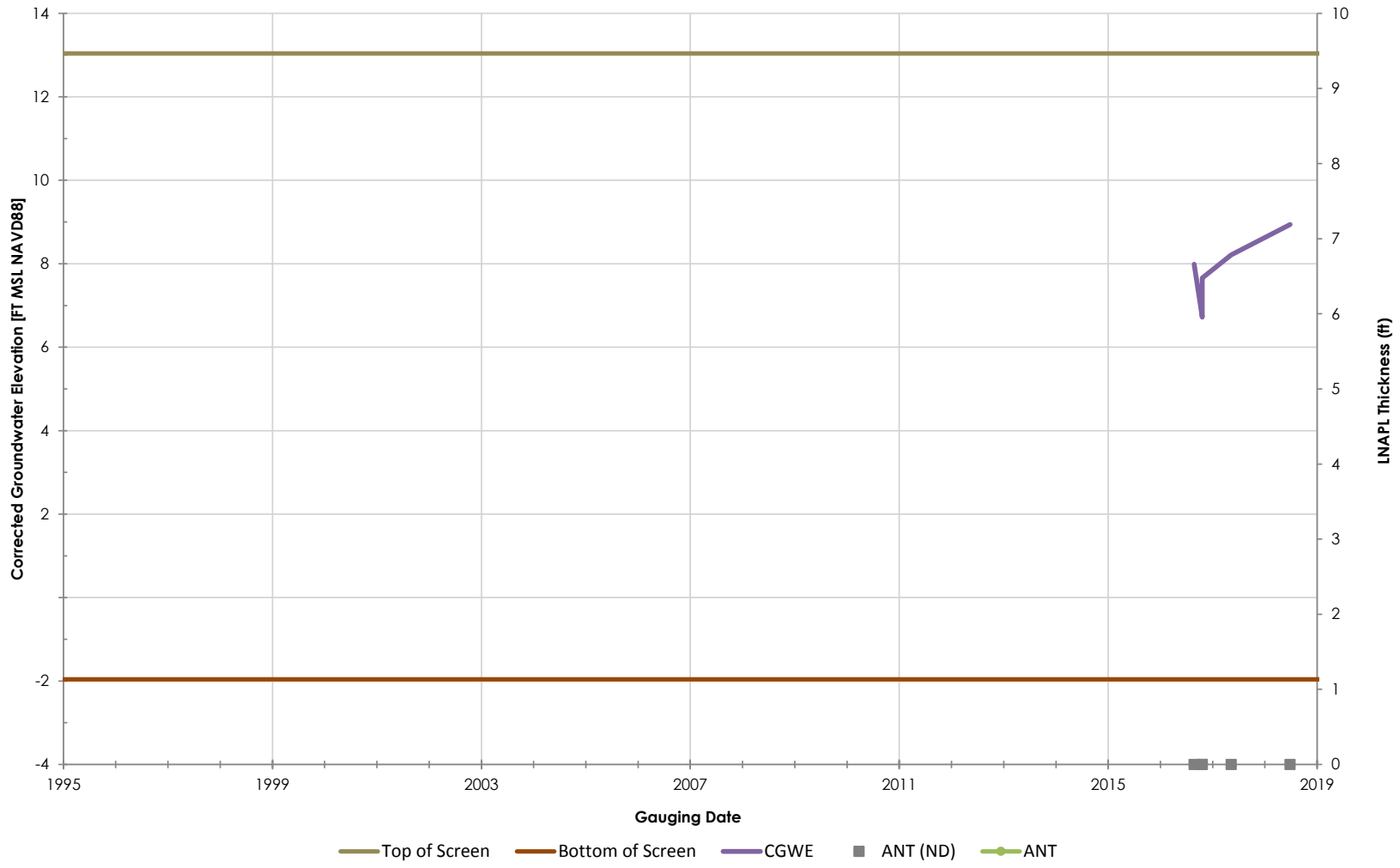
Stantec

Figure/Well No.

N-152

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

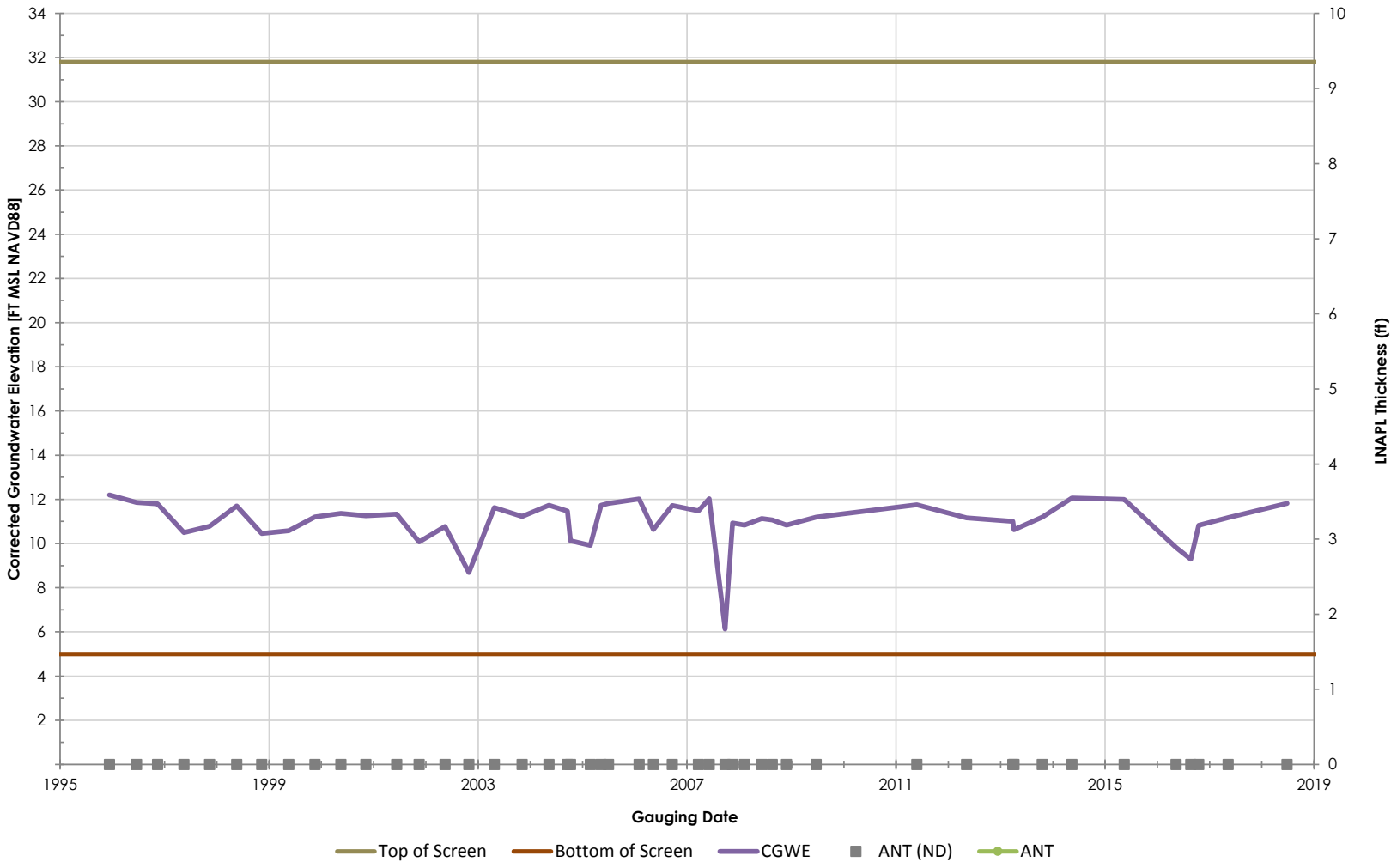
Stantec

Figure/Well No.

N-153

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

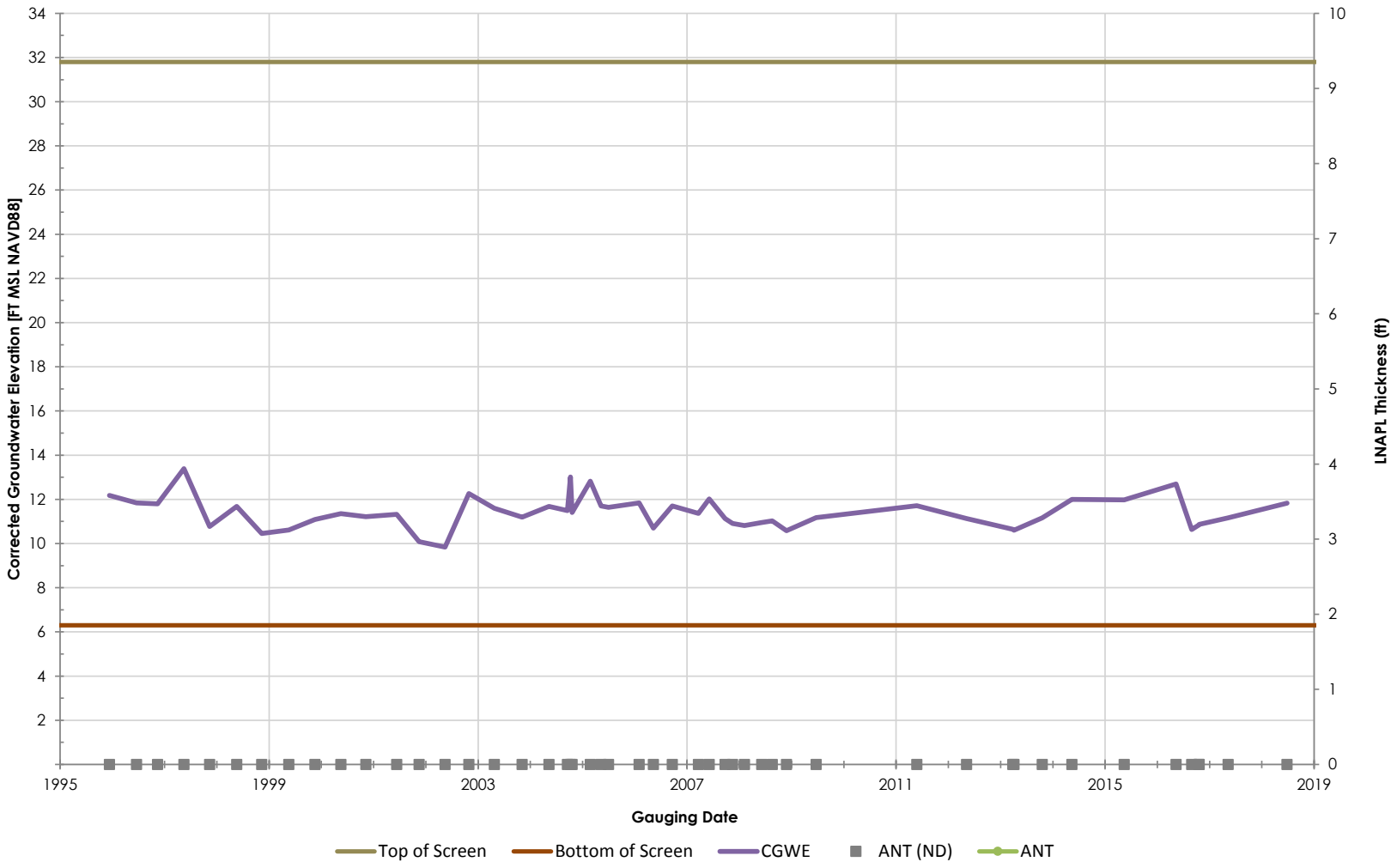
Stantec

Figure/Well No.

N-16

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

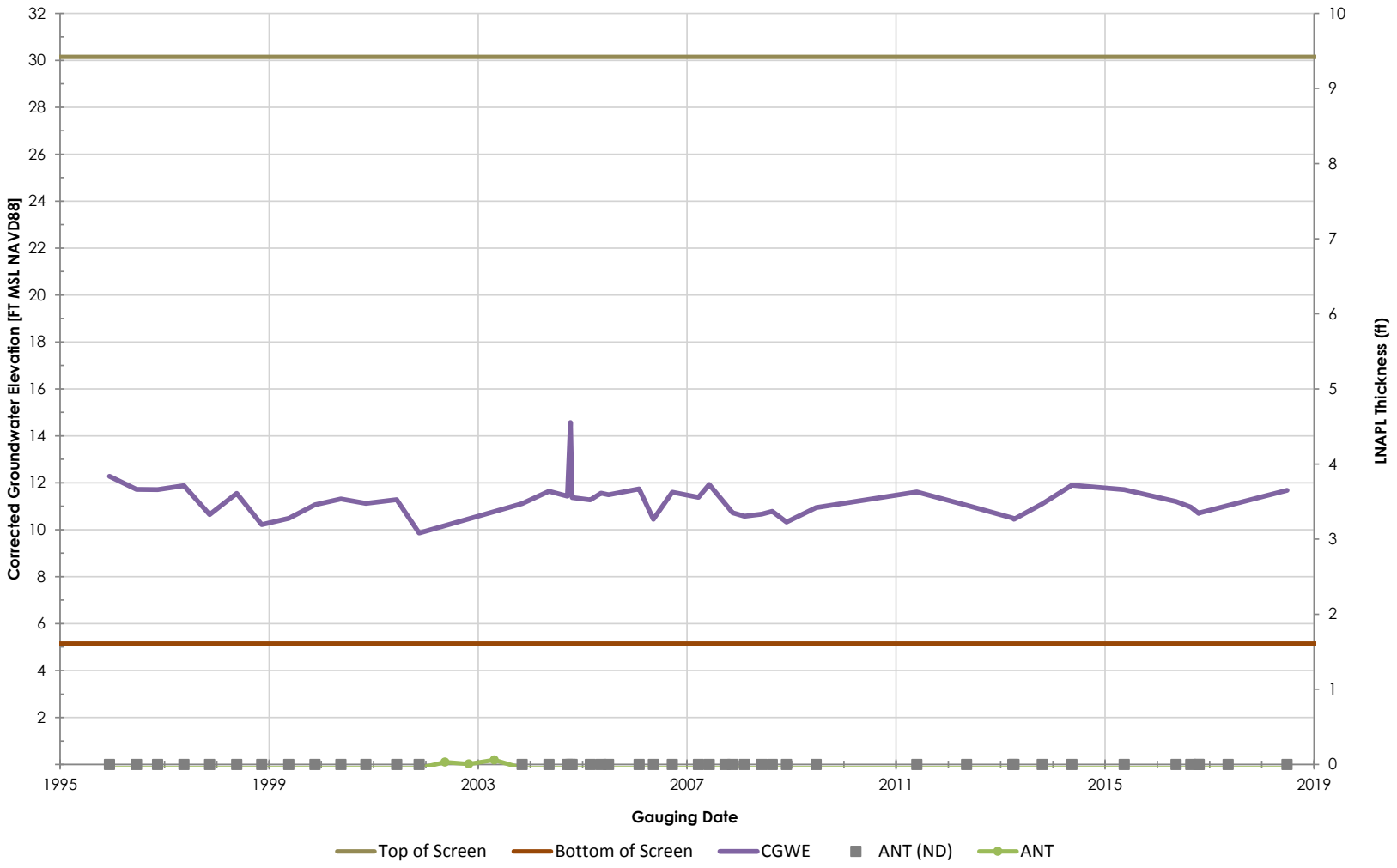
Stantec

Figure/Well No.

N-17

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

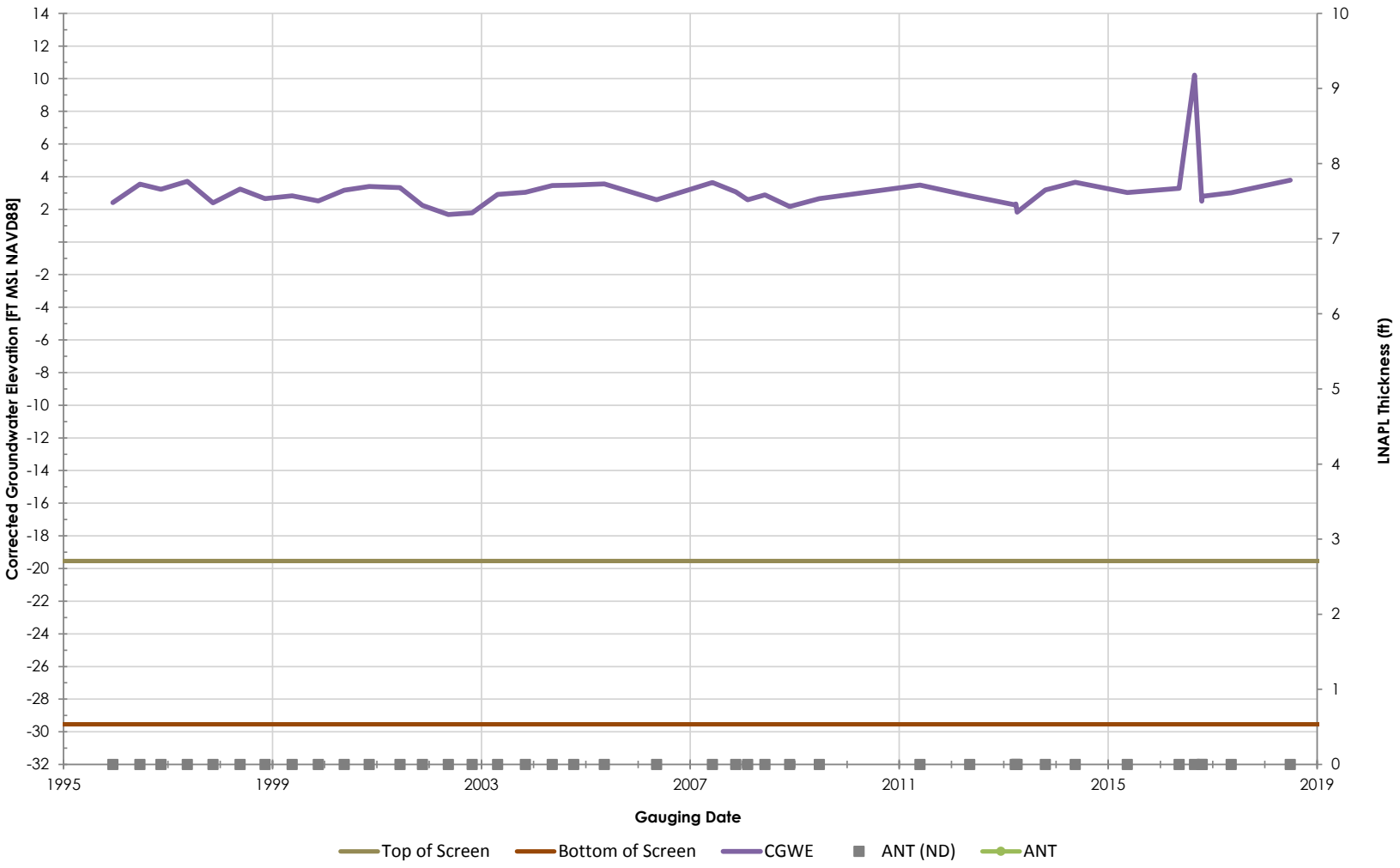
Stantec

Figure/Well No.

N-18

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

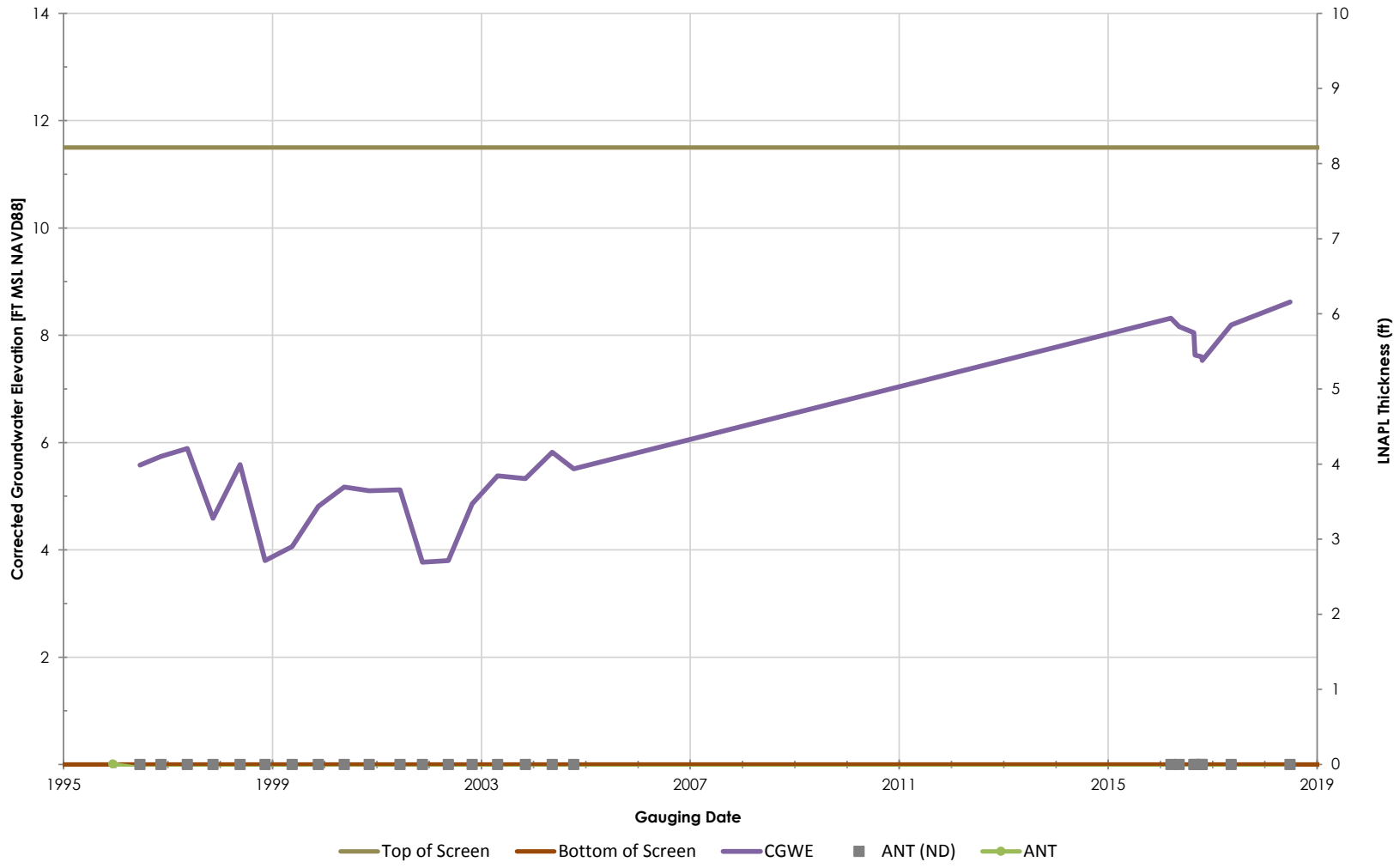
Stantec

Figure/Well No.

N-19

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

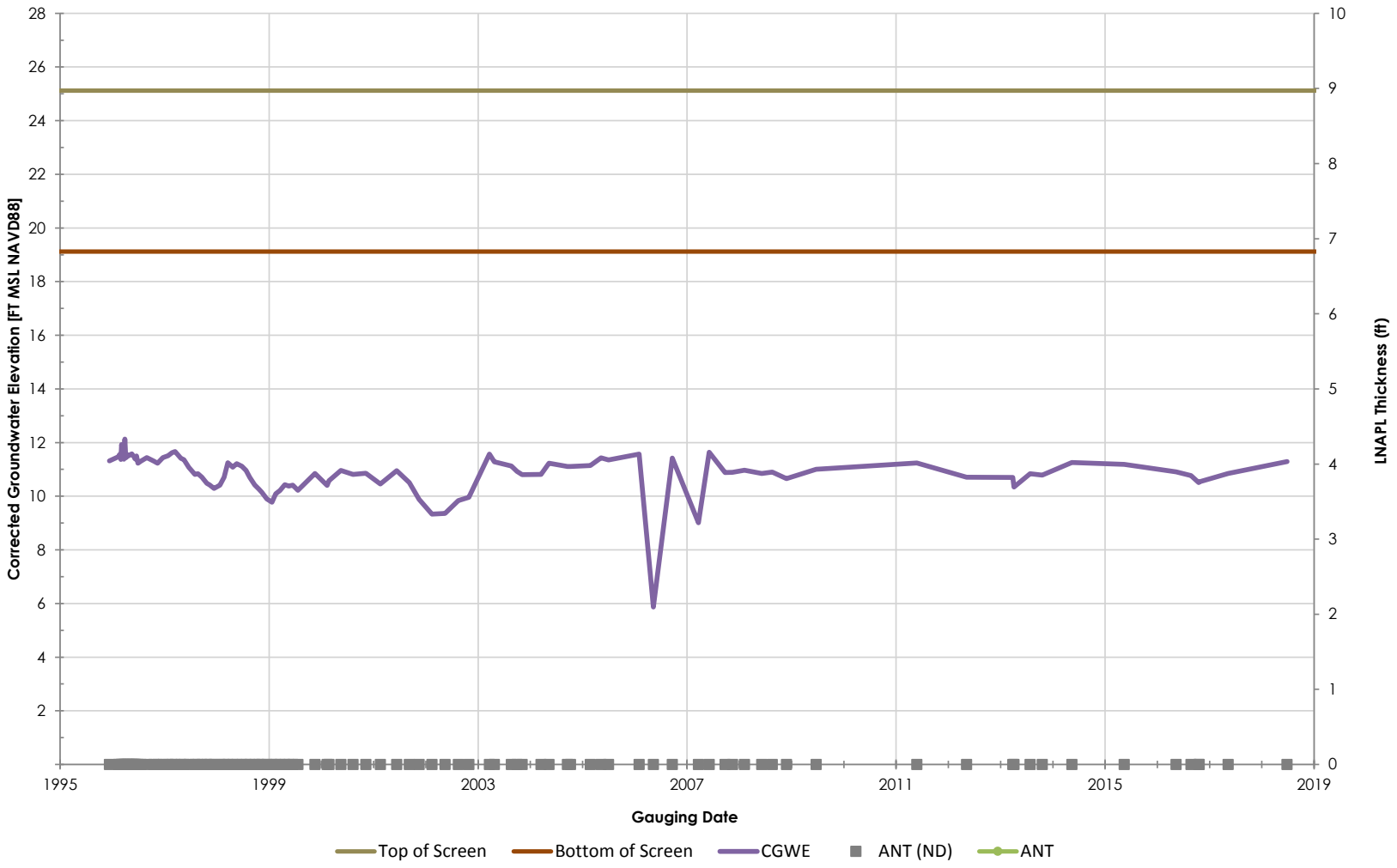
Stantec

Figure/Well No.

N-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

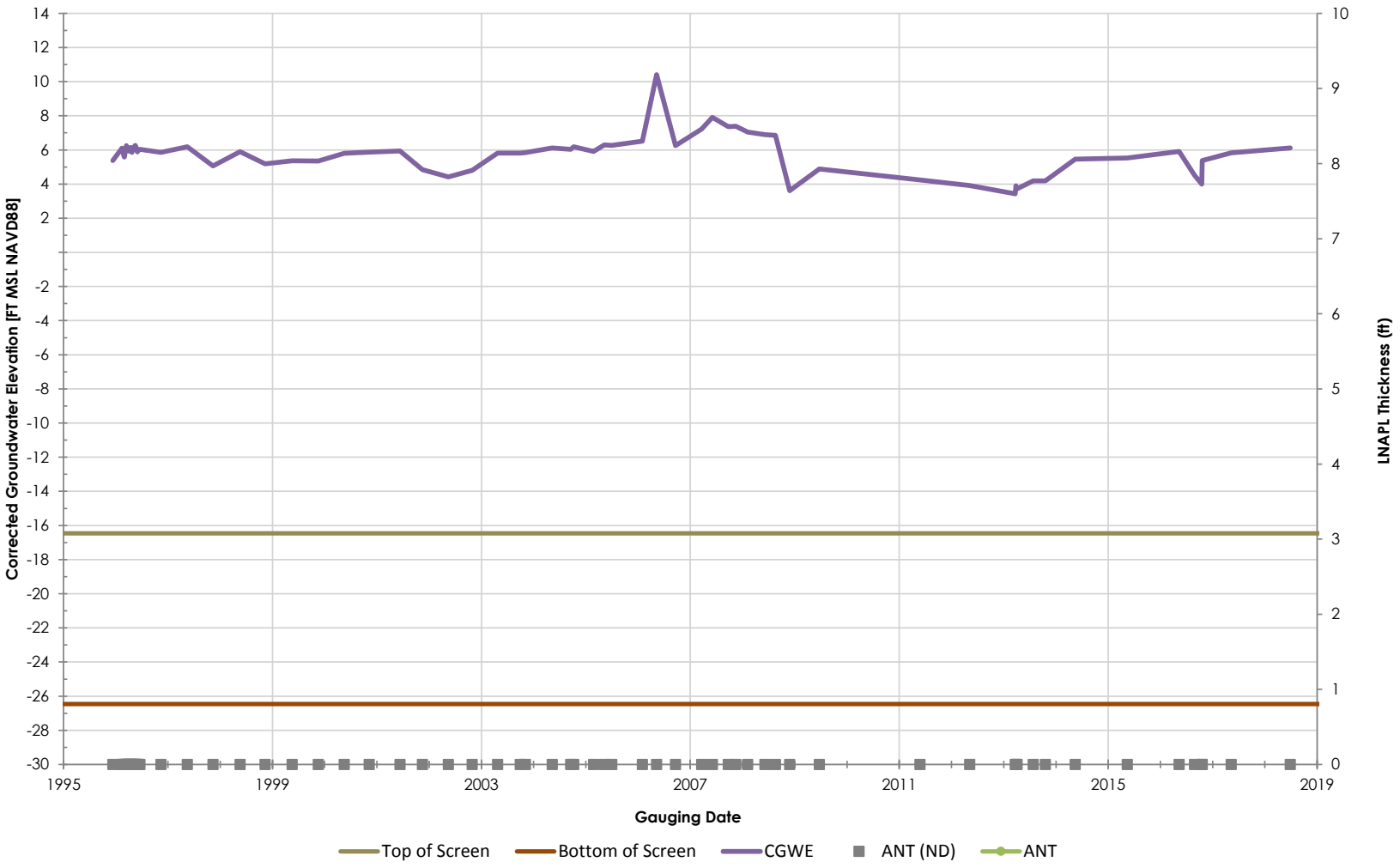
Stantec

Figure/Well No.

N-20

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

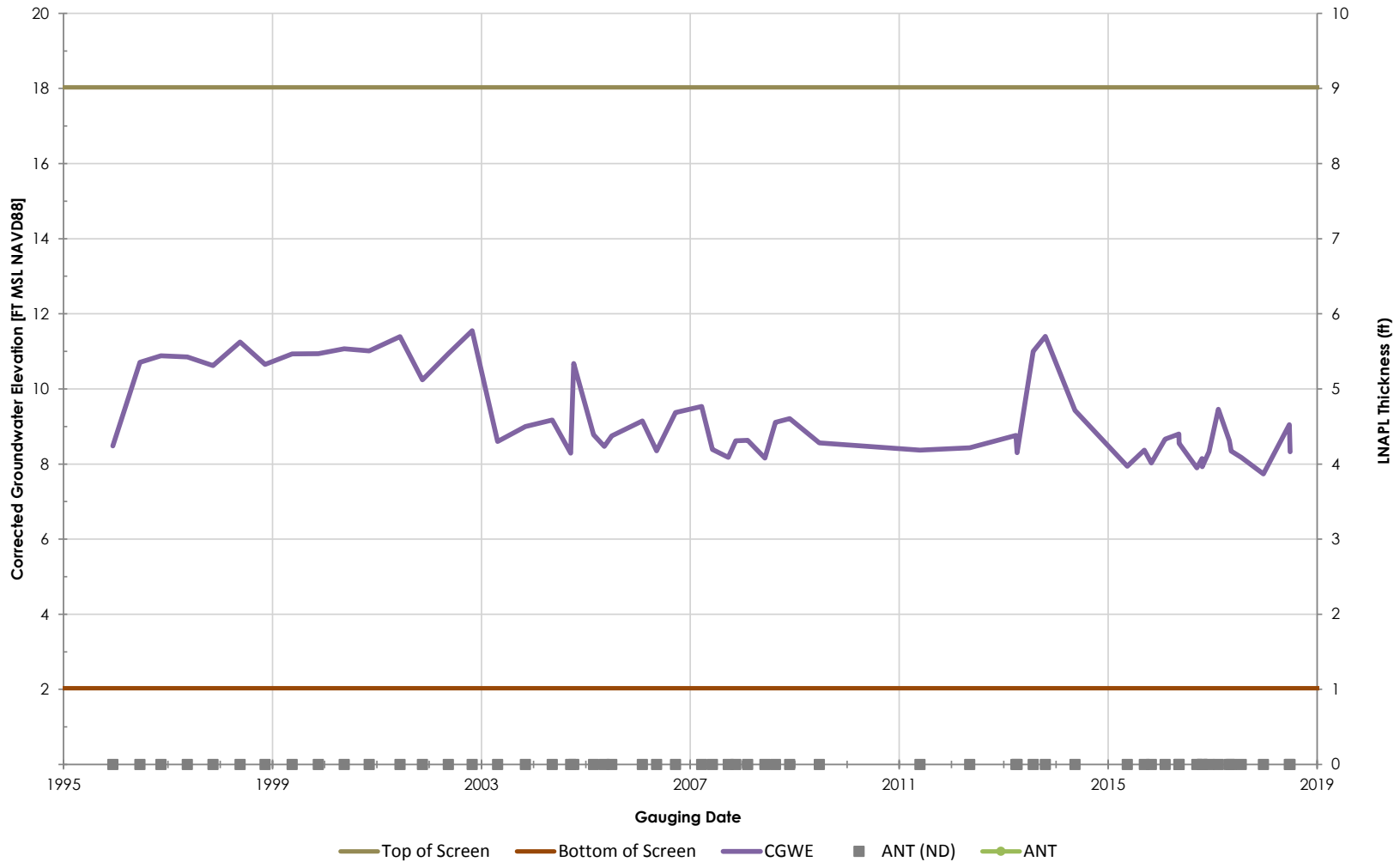
Stantec

Figure/Well No.

N-21

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

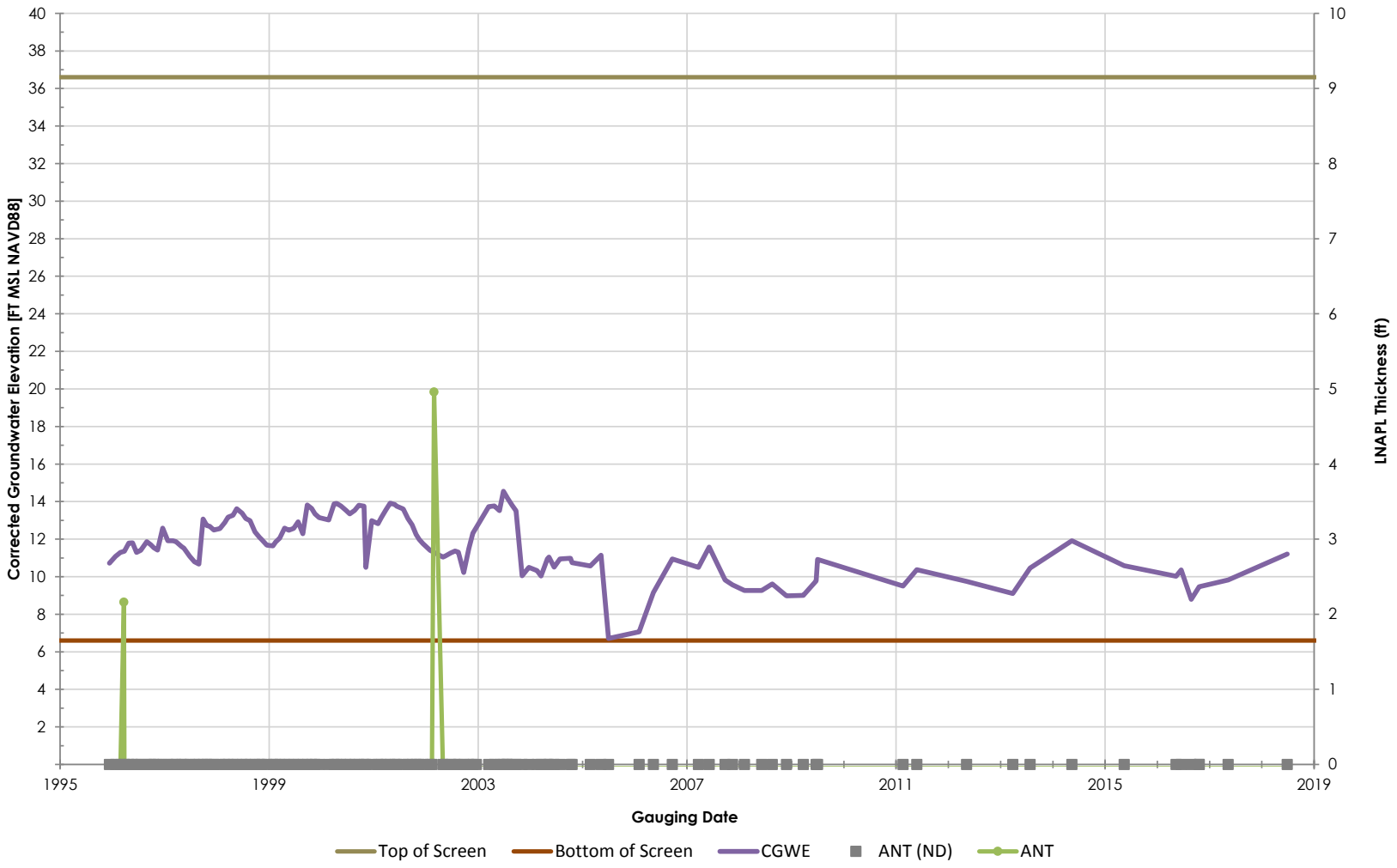
Stantec

Figure/Well No.

N-24

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

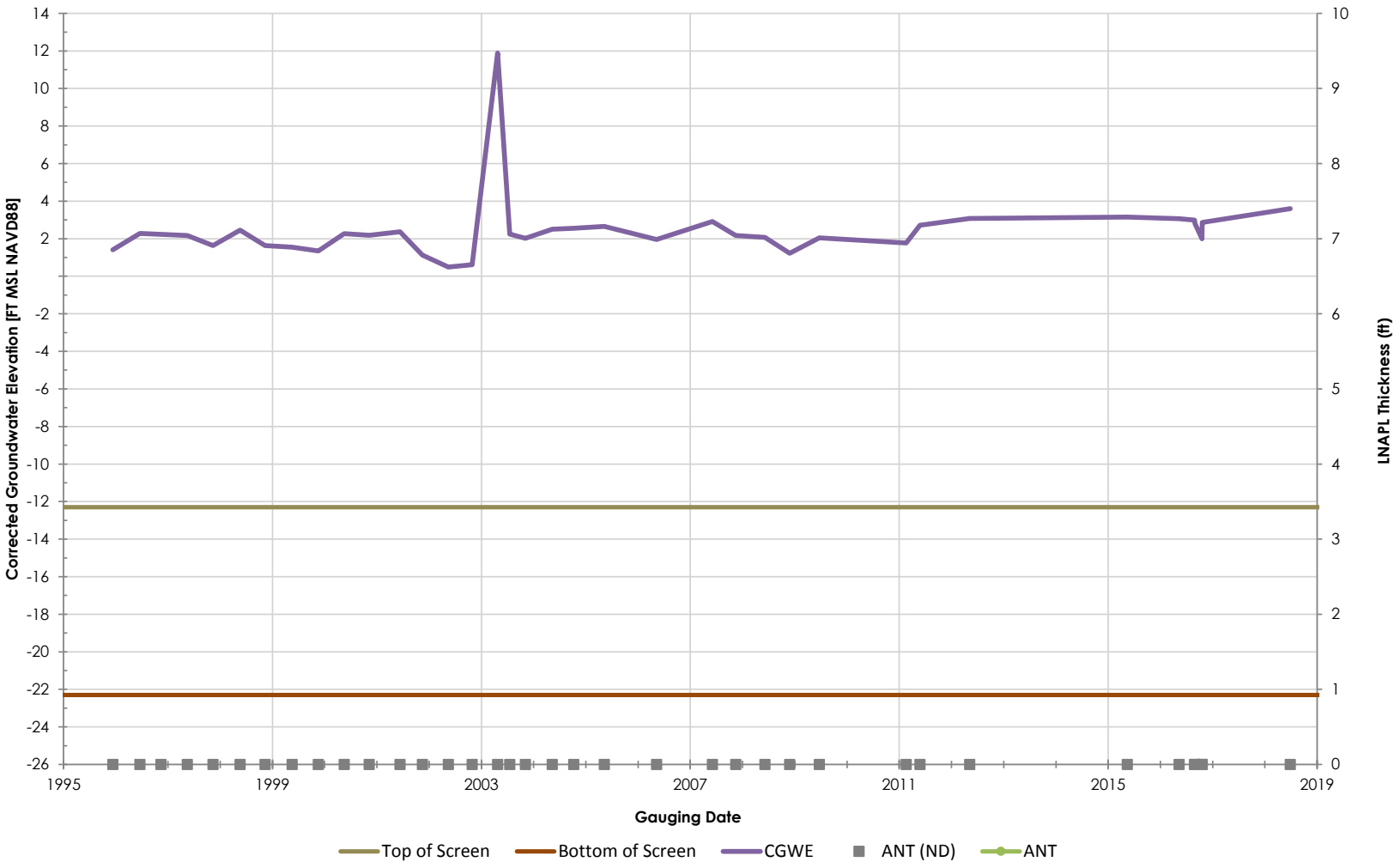
Stantec

Figure/Well No.

N-29

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

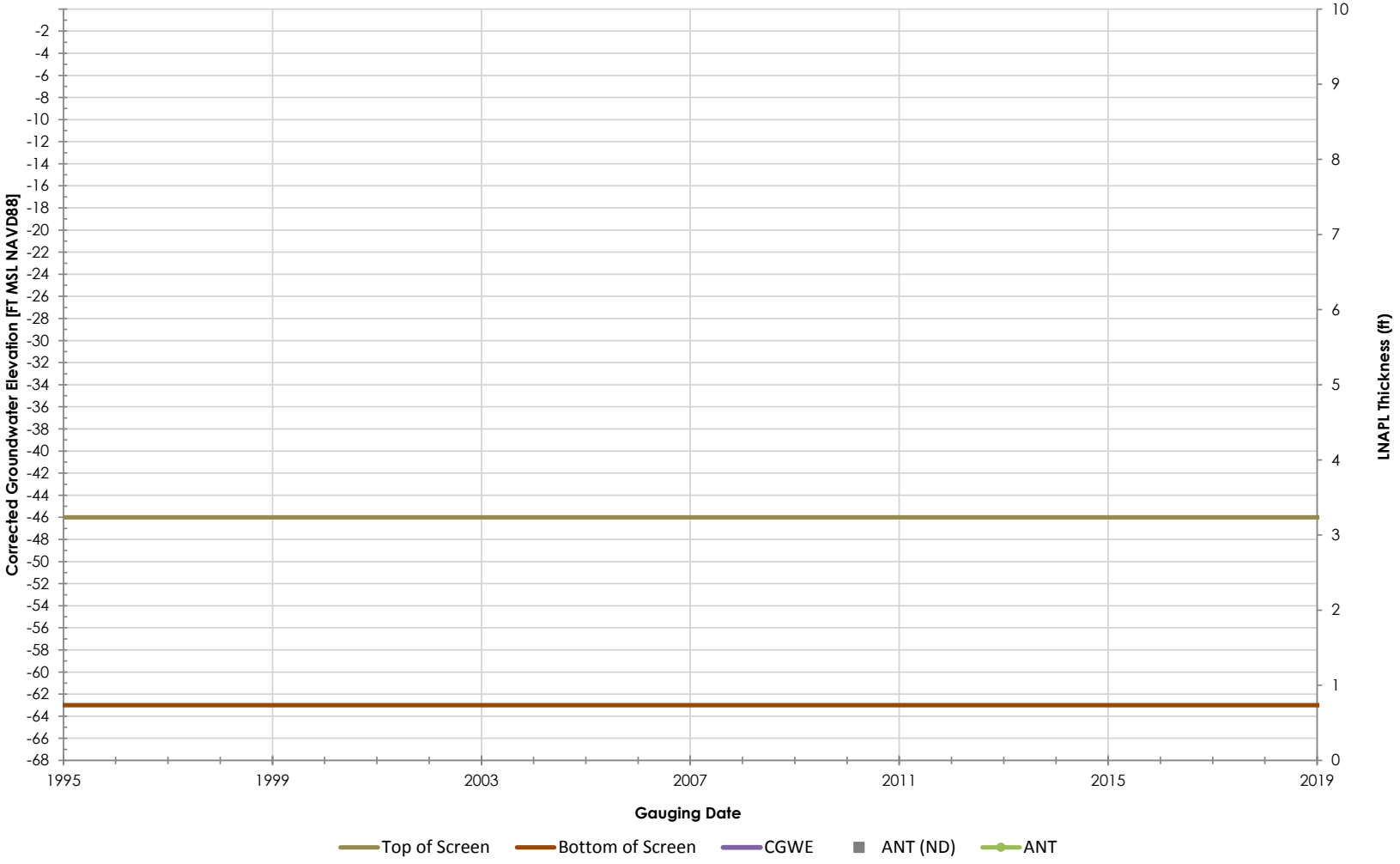
Stantec

Figure/Well No.

N-30

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

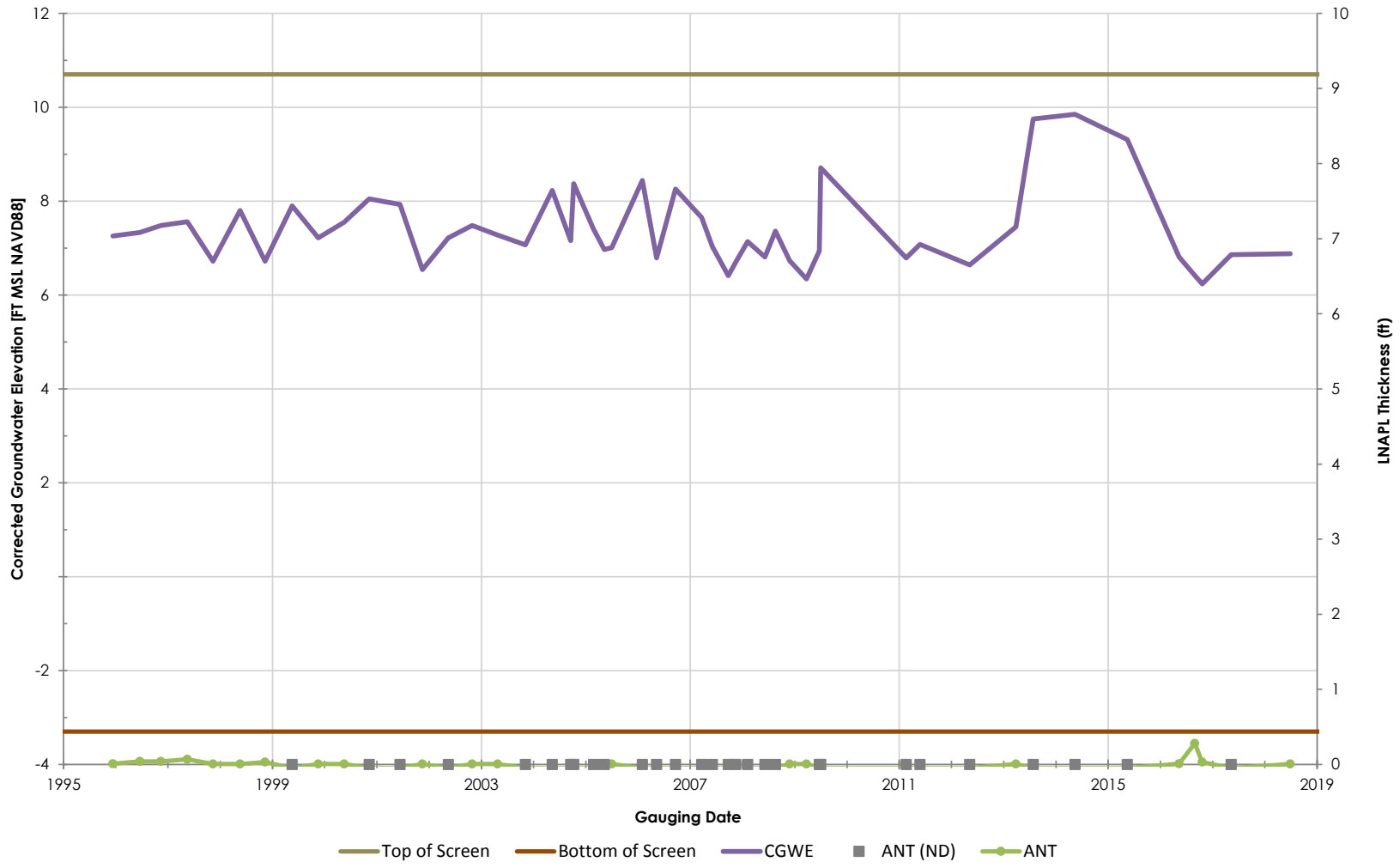
Stantec

Figure/Well No.

N-33

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

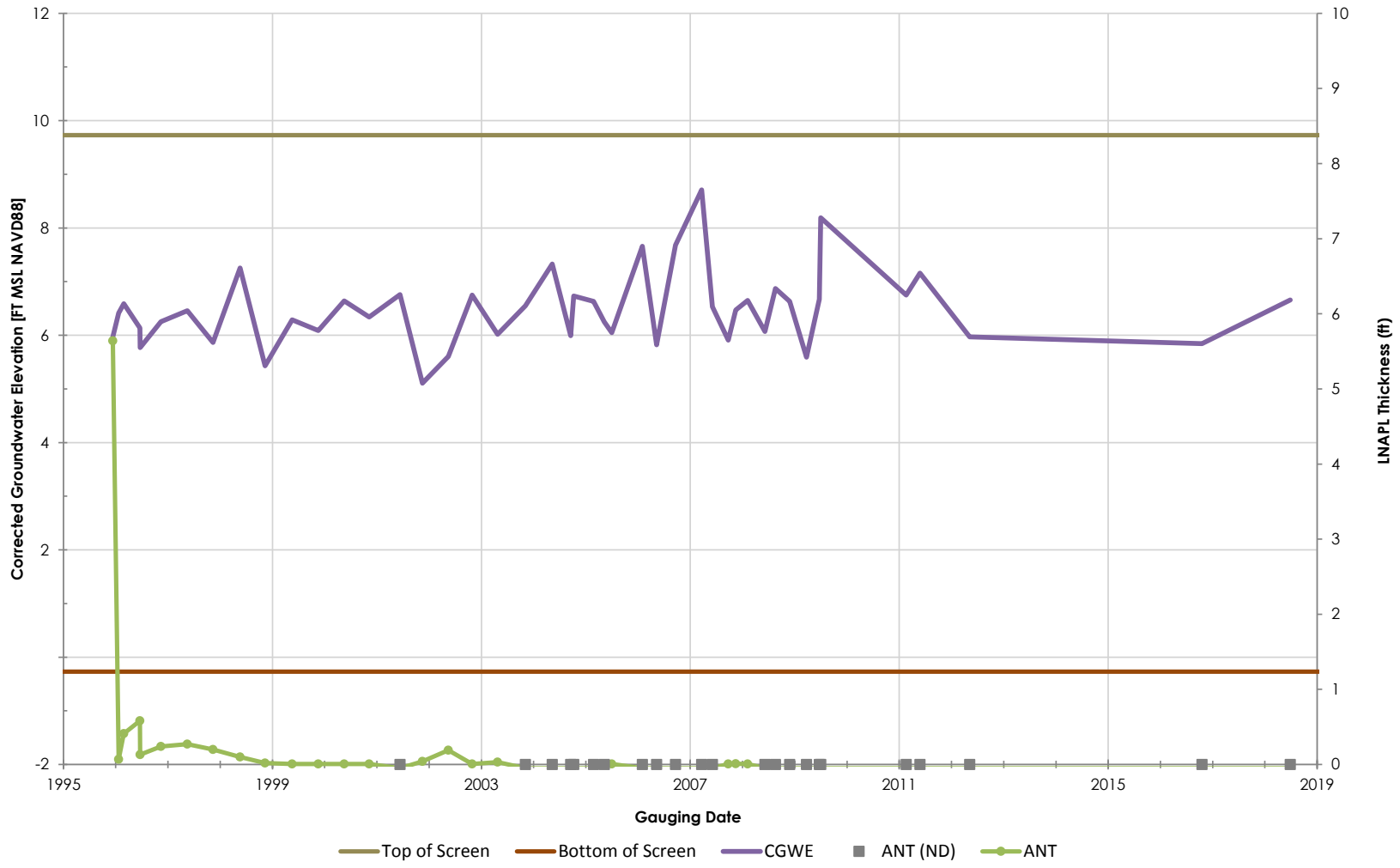
Stantec

Figure/Well No.

N-34

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

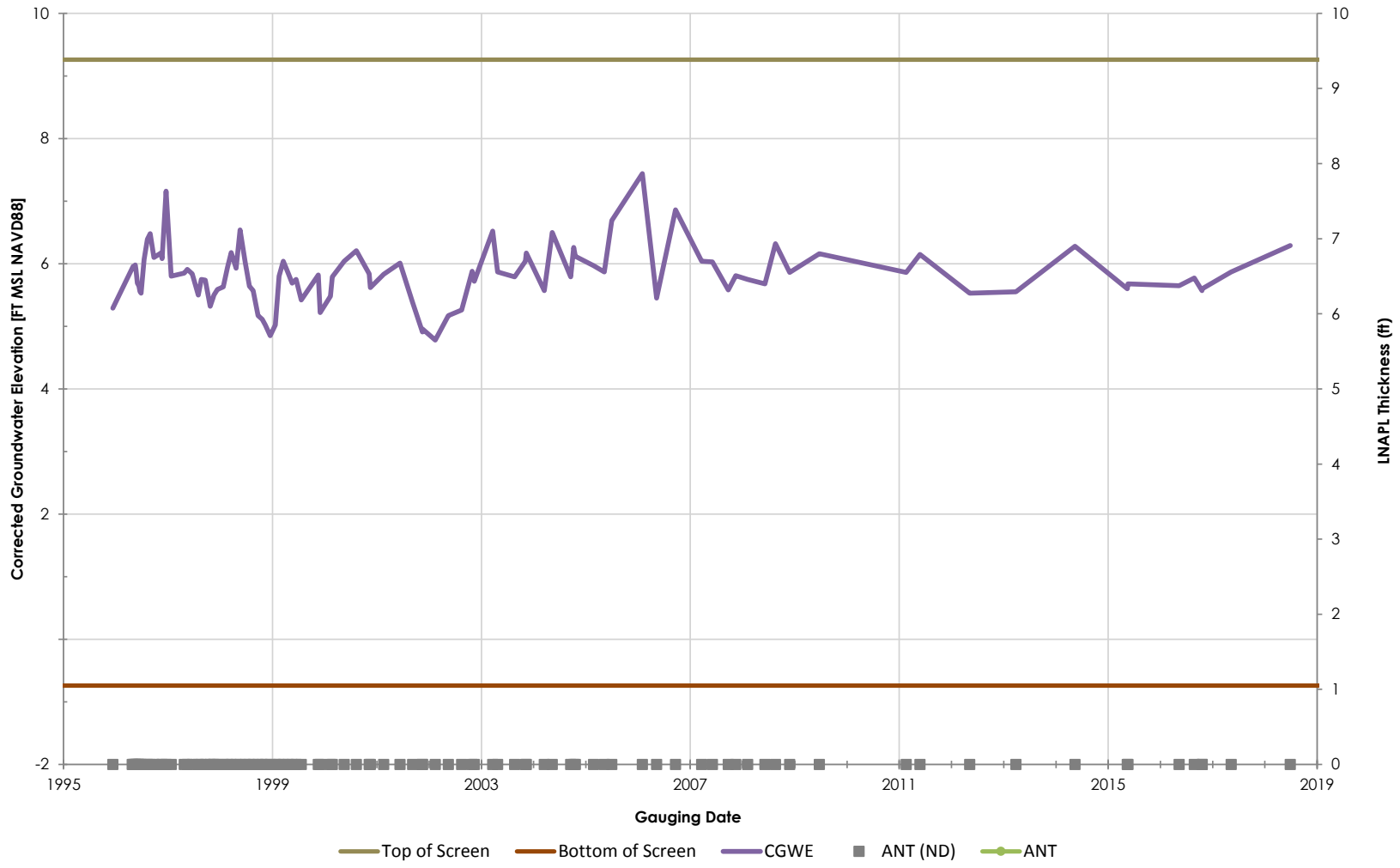
Stantec

Figure/Well No.

N-36

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

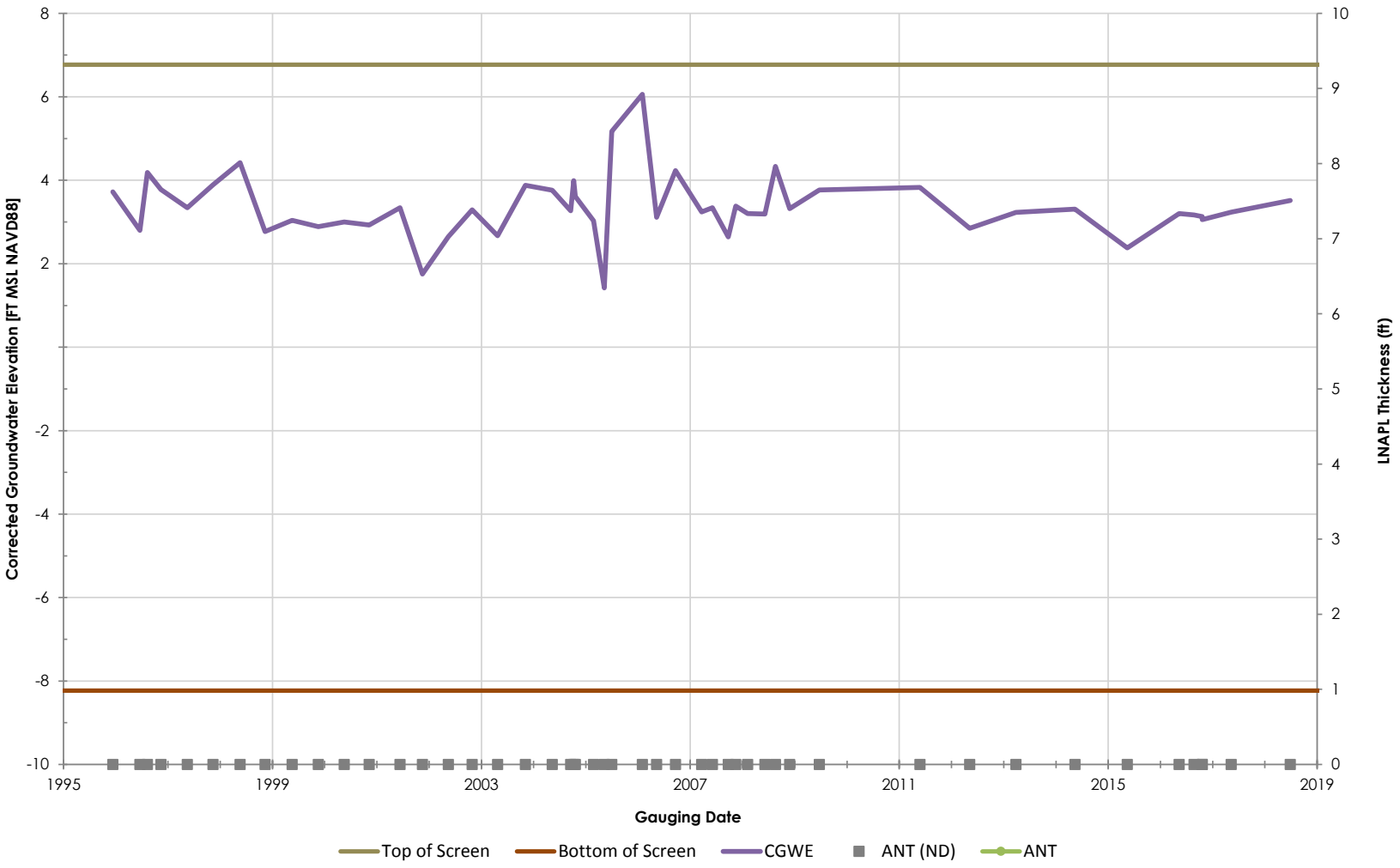
Stantec

Figure/Well No.

N-37

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

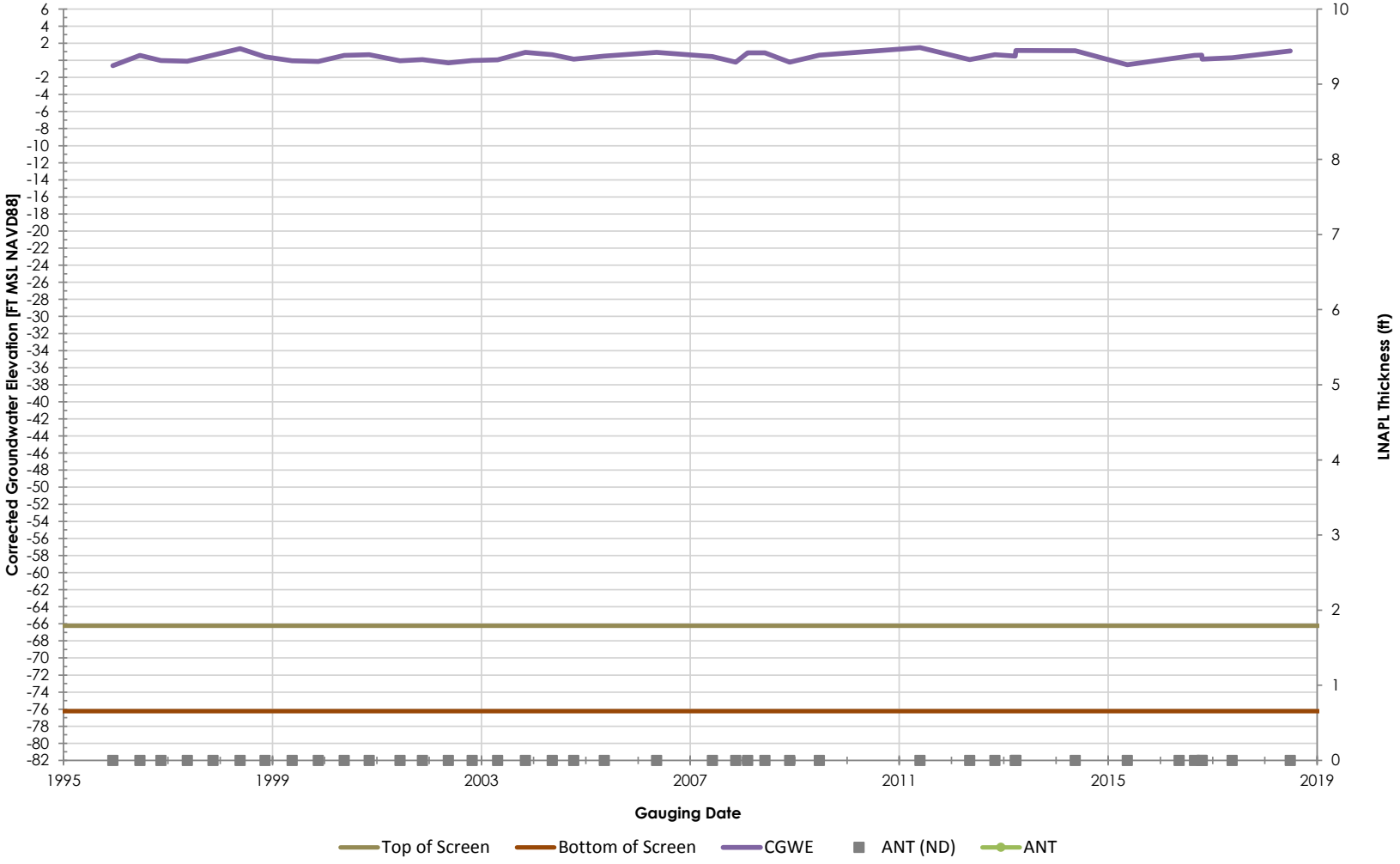
Stantec

Figure/Well No.

N-38

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

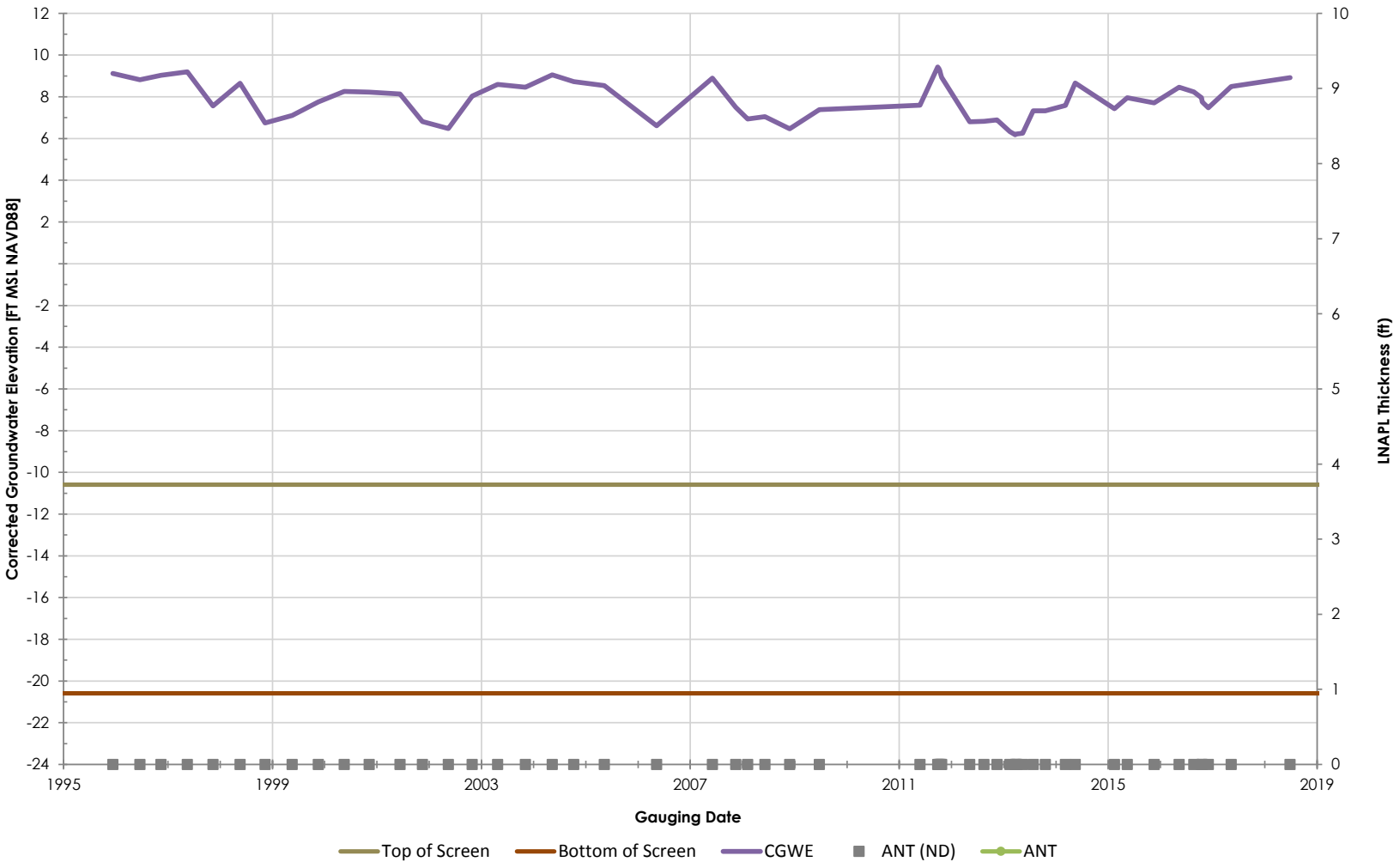
Stantec

Figure/Well No.

N-38D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

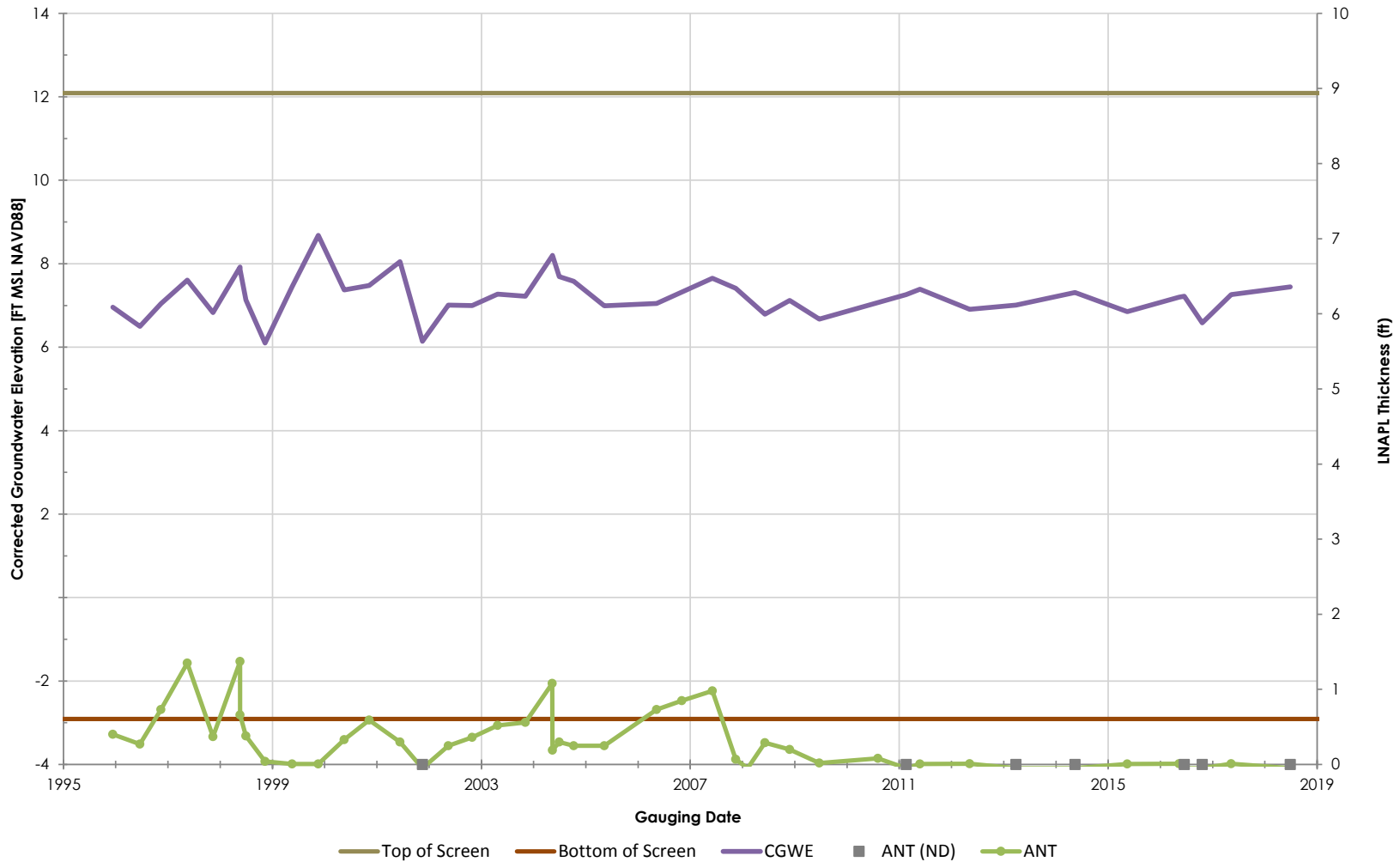
Stantec

Figure/Well No.

N-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Stantec

Figure/Well No.

N-42

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

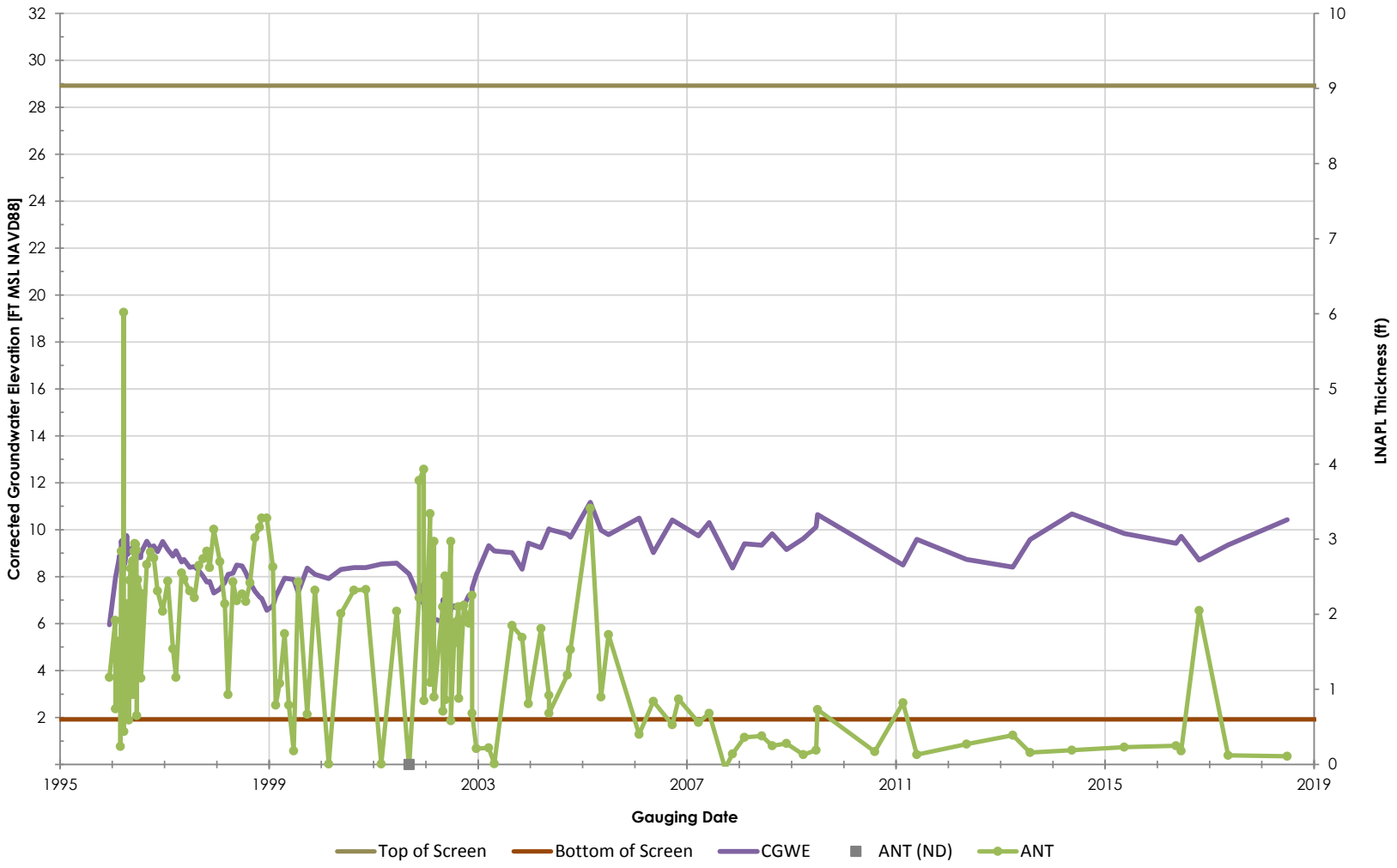
Stantec

Figure/Well No.

N-47

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

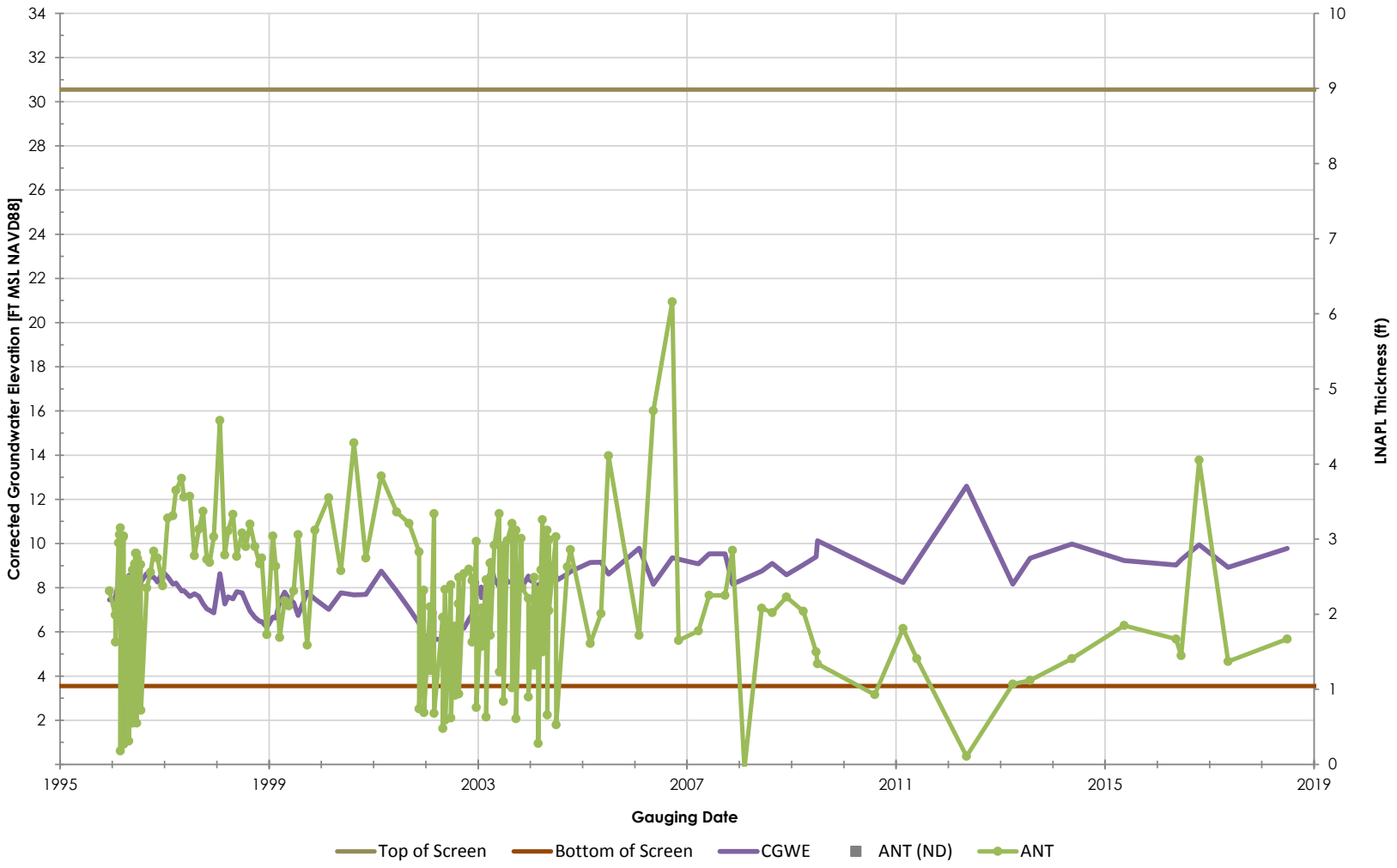
Stantec

Figure/Well No.

N-48

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

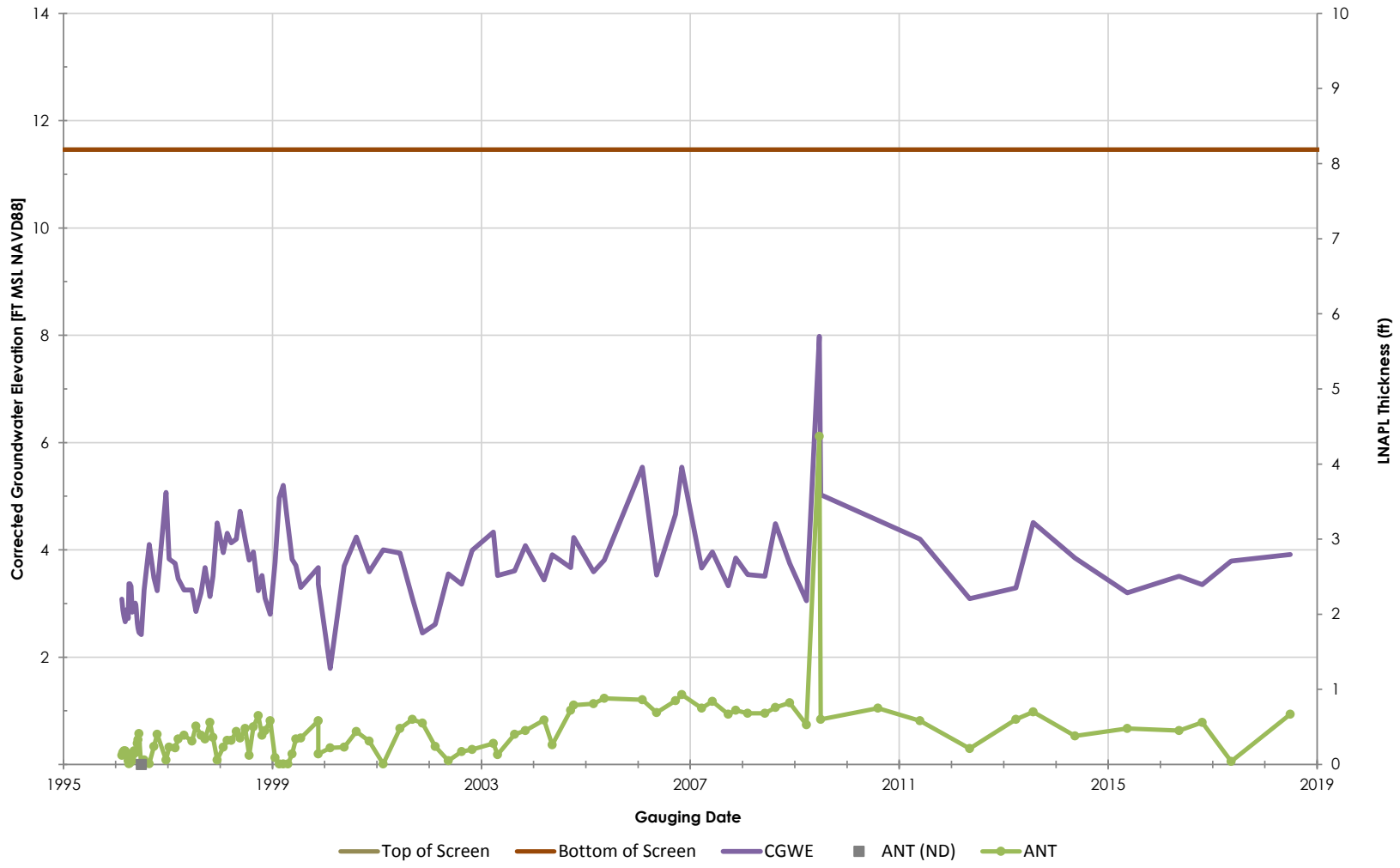
Stantec

Figure/Well No.

N-49

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

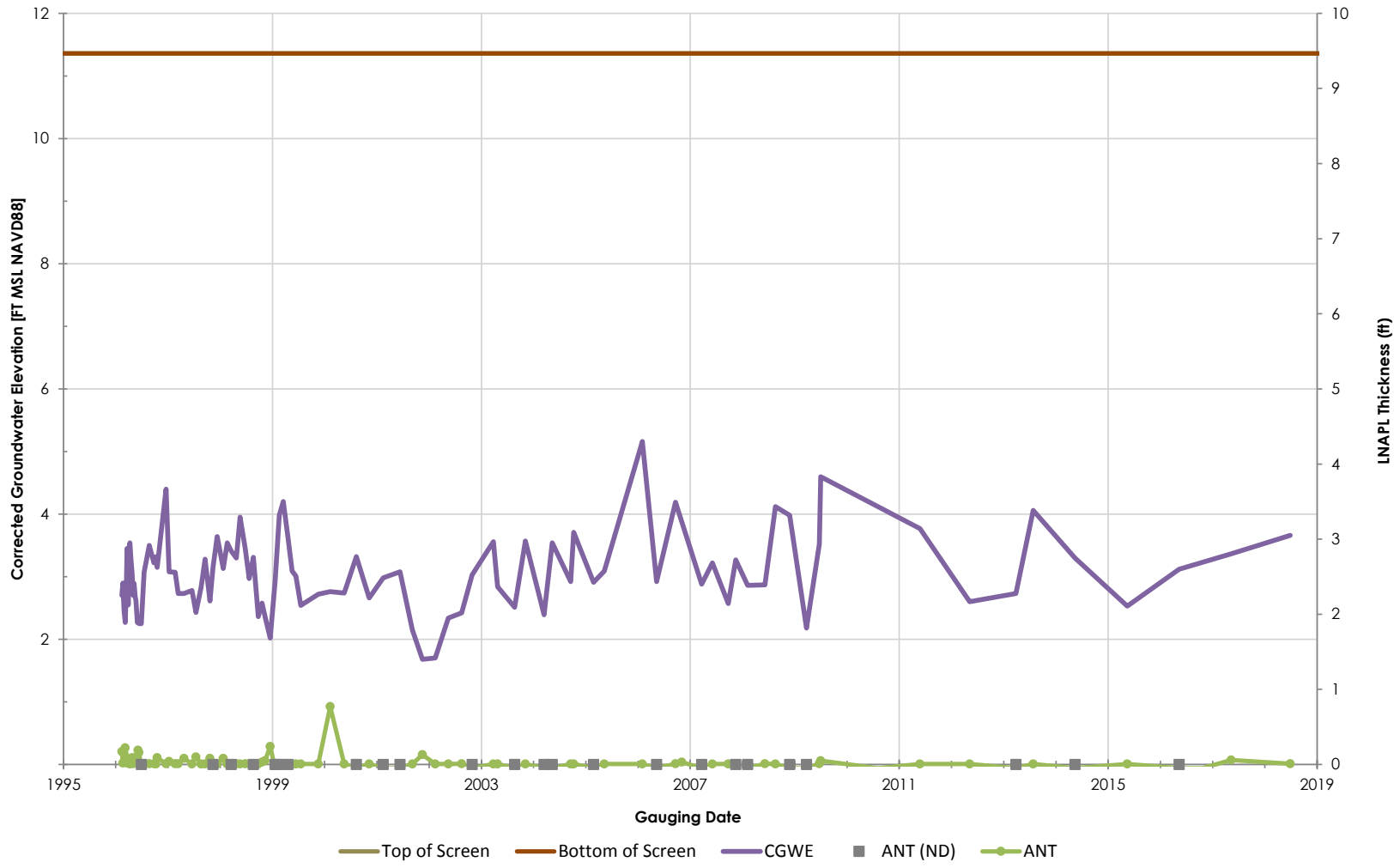
Stantec

Figure/Well No.

N-503

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

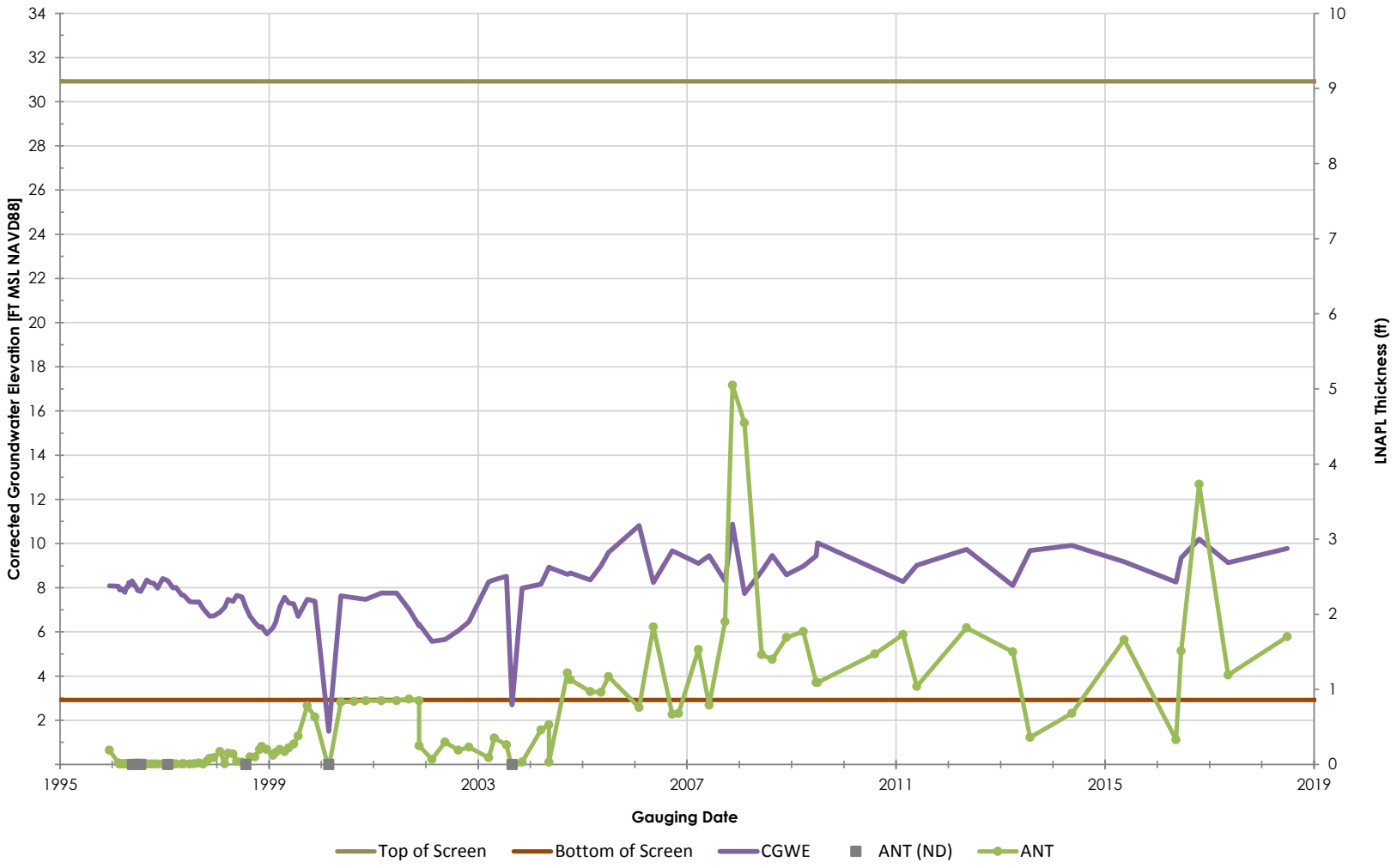
Stantec

Figure/Well No.

N-504

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

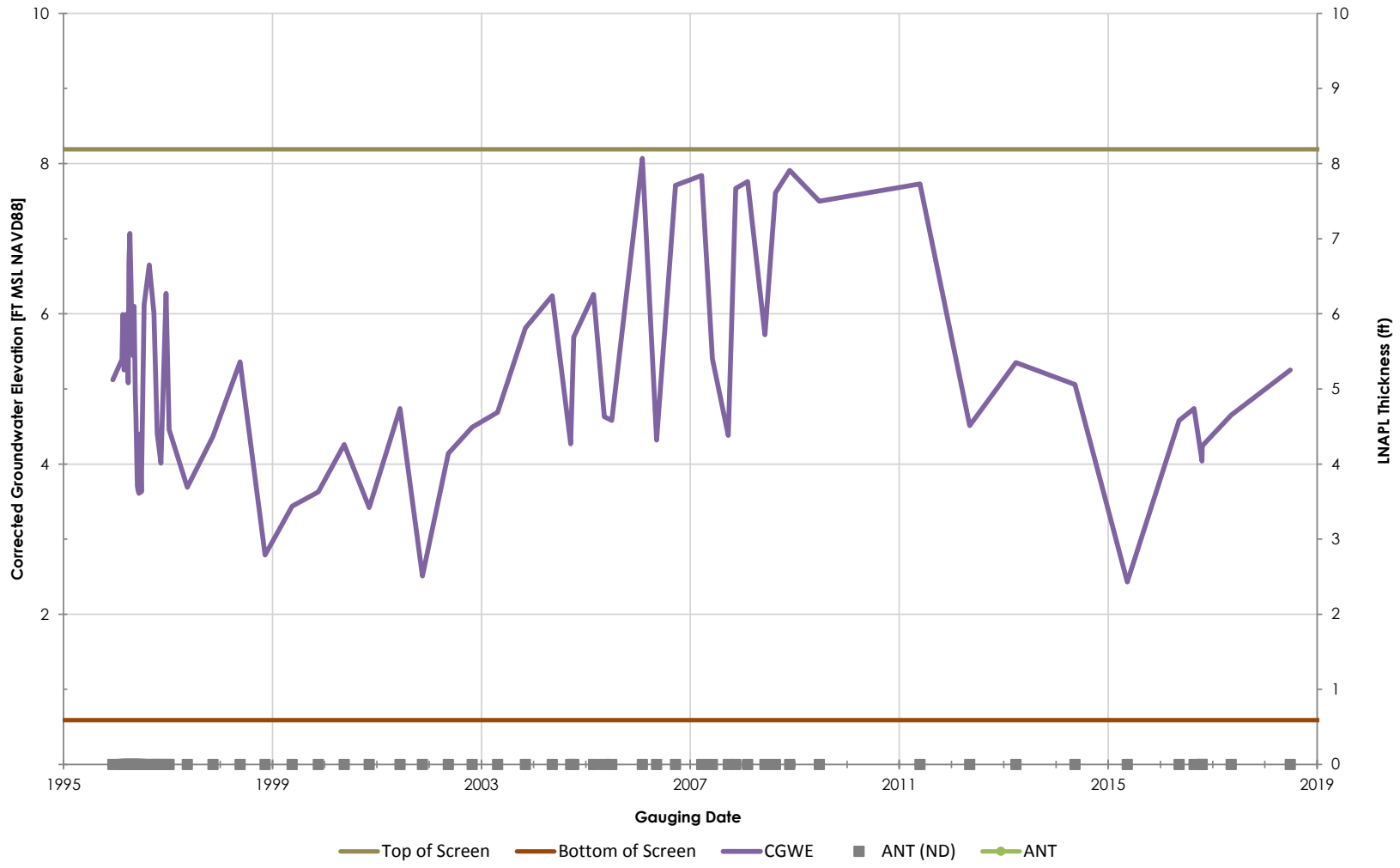
Stantec

Figure/Well No.

N-51

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

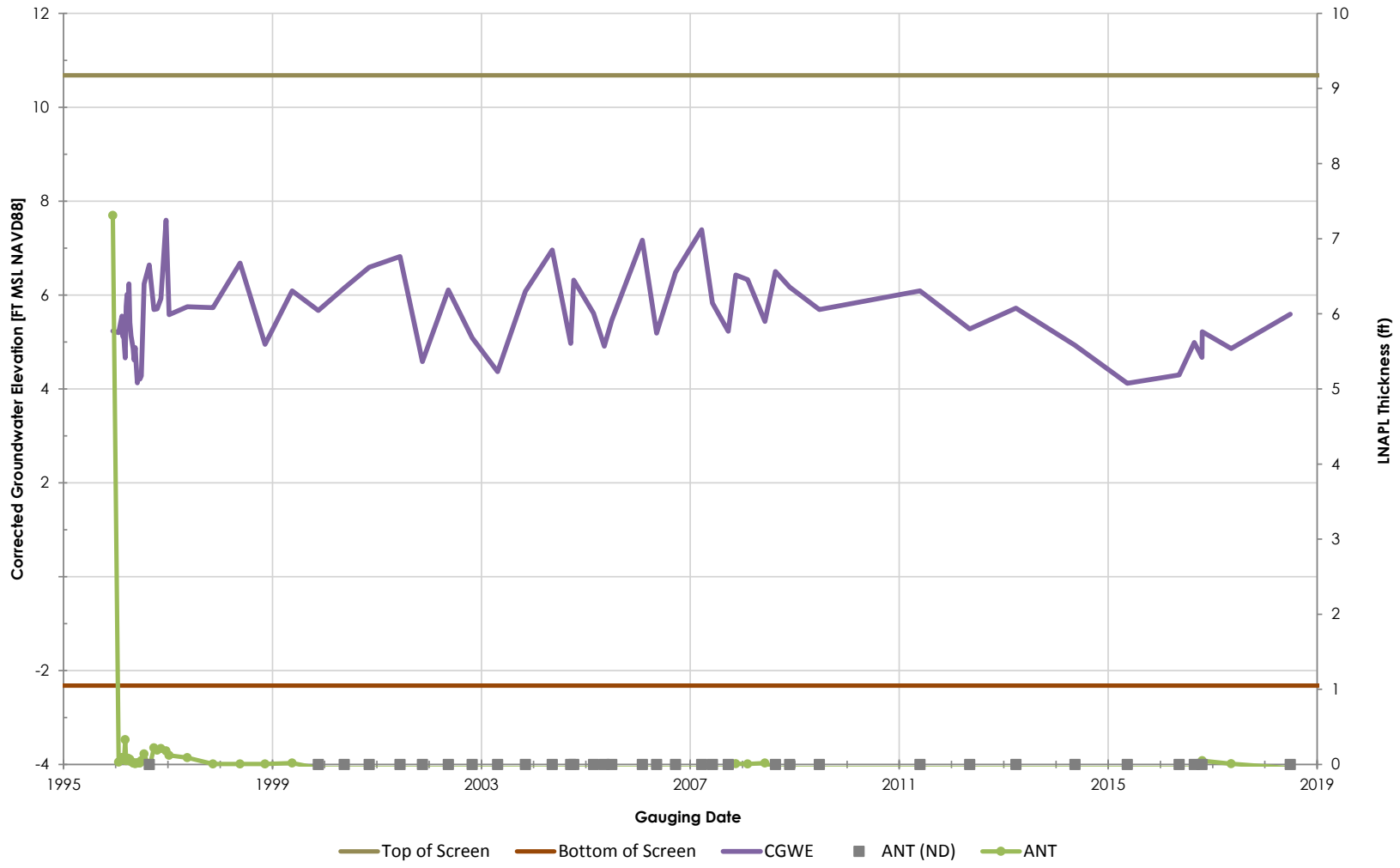
Stantec

Figure/Well No.

N-55

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

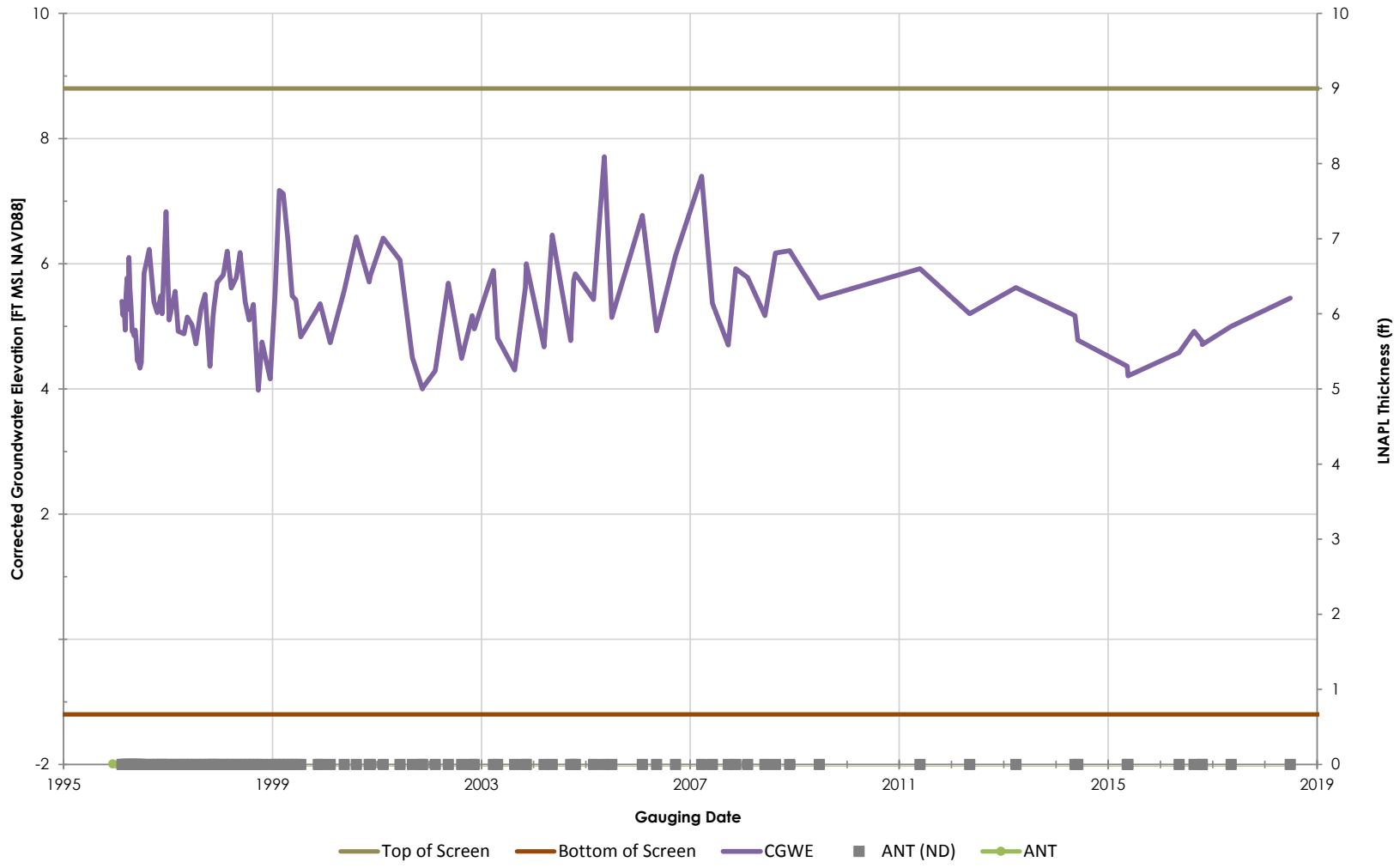
Stantec

Figure/Well No.

N-56

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

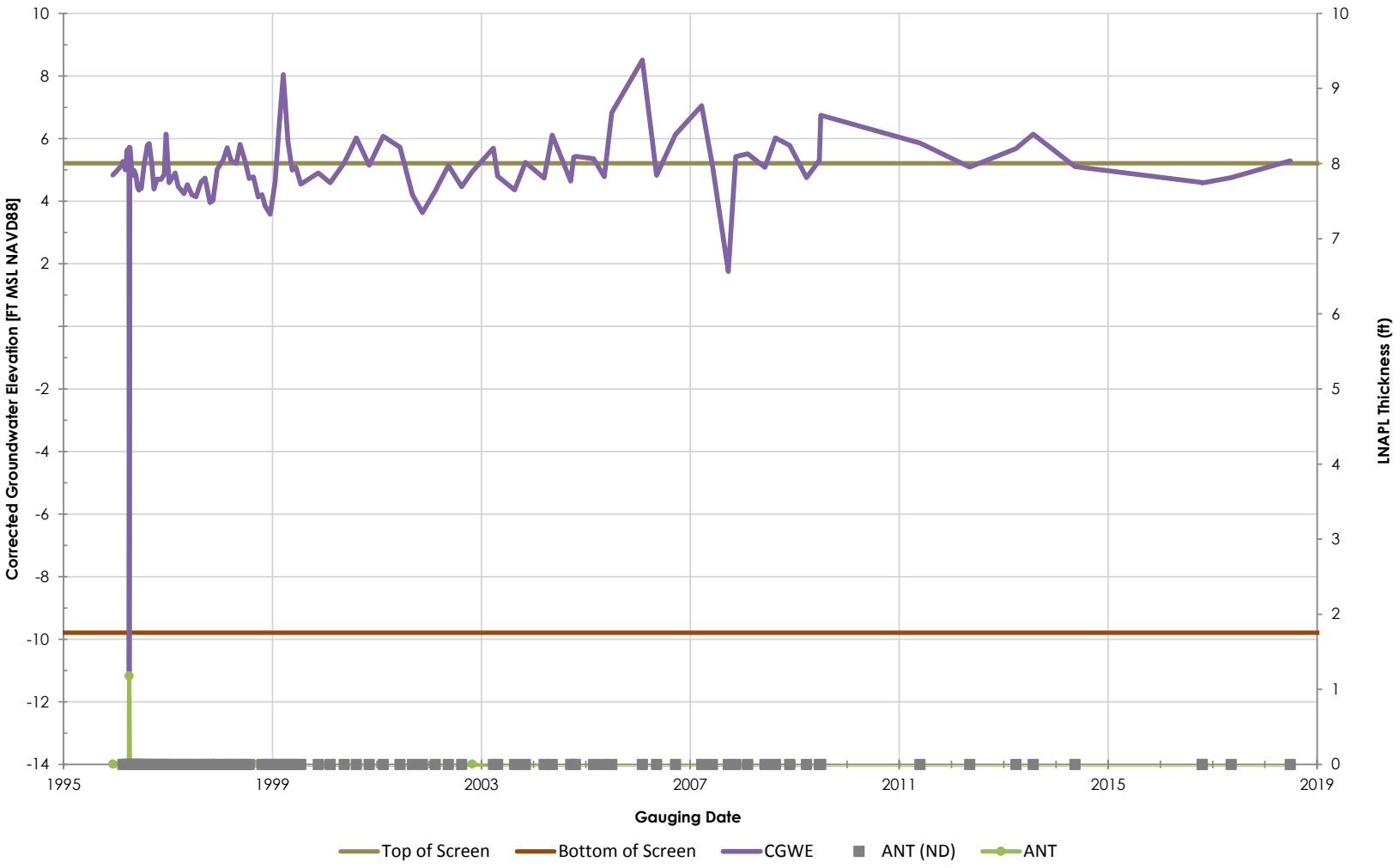
Stantec

Figure/Well No.

N-57

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

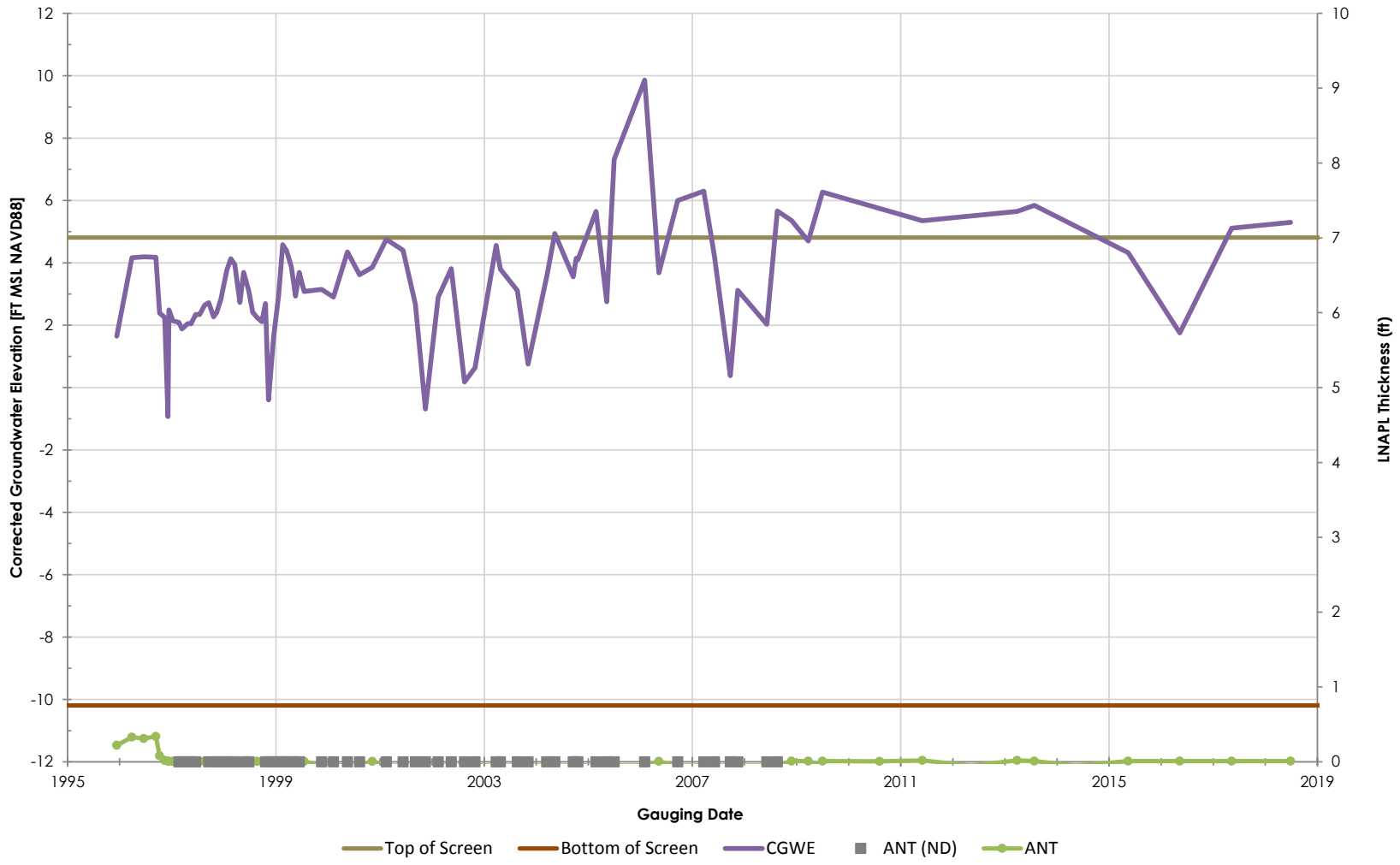
Stantec

Figure/Well No.

N-58

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

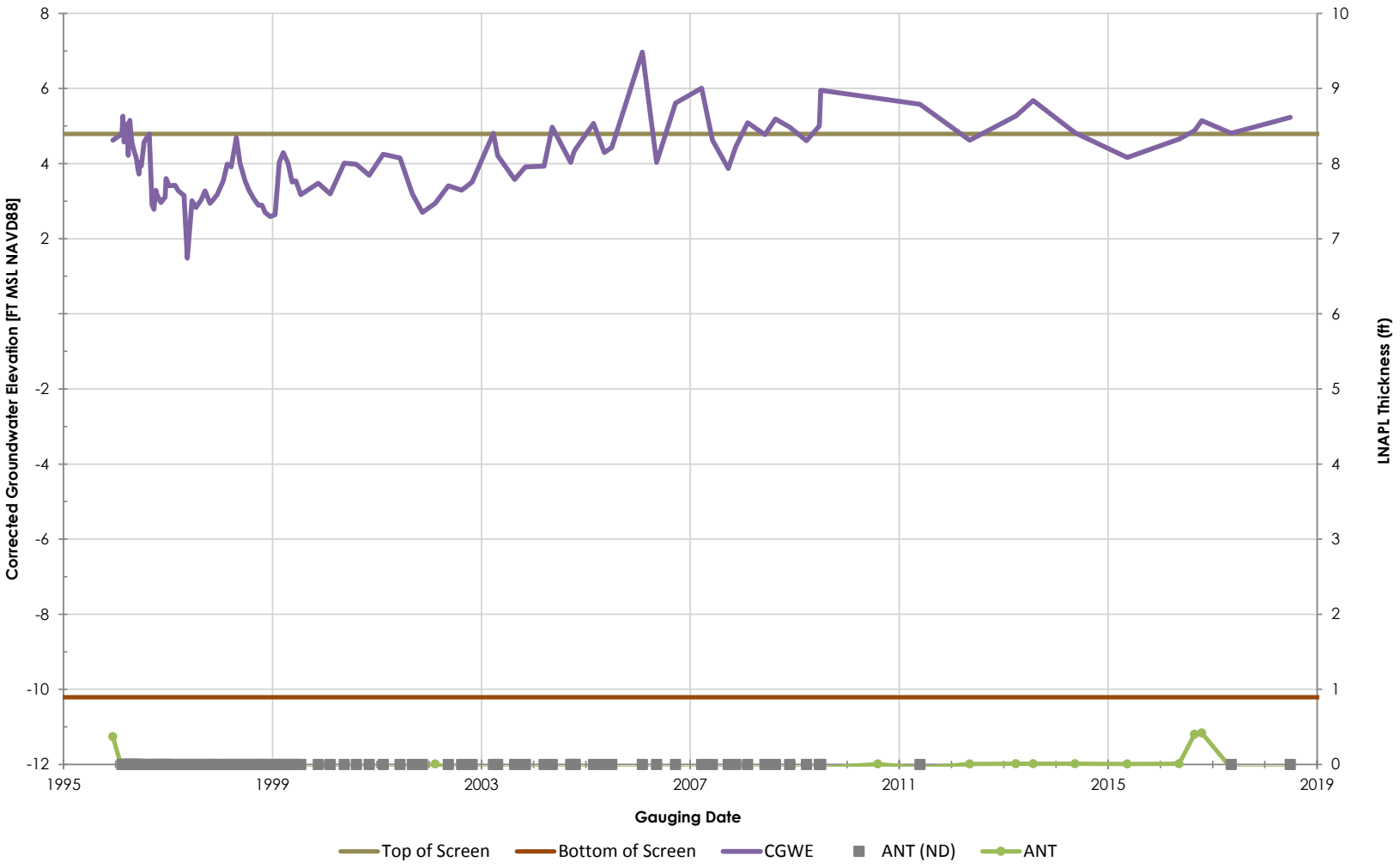
Stantec

Figure/Well No.

N-59

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

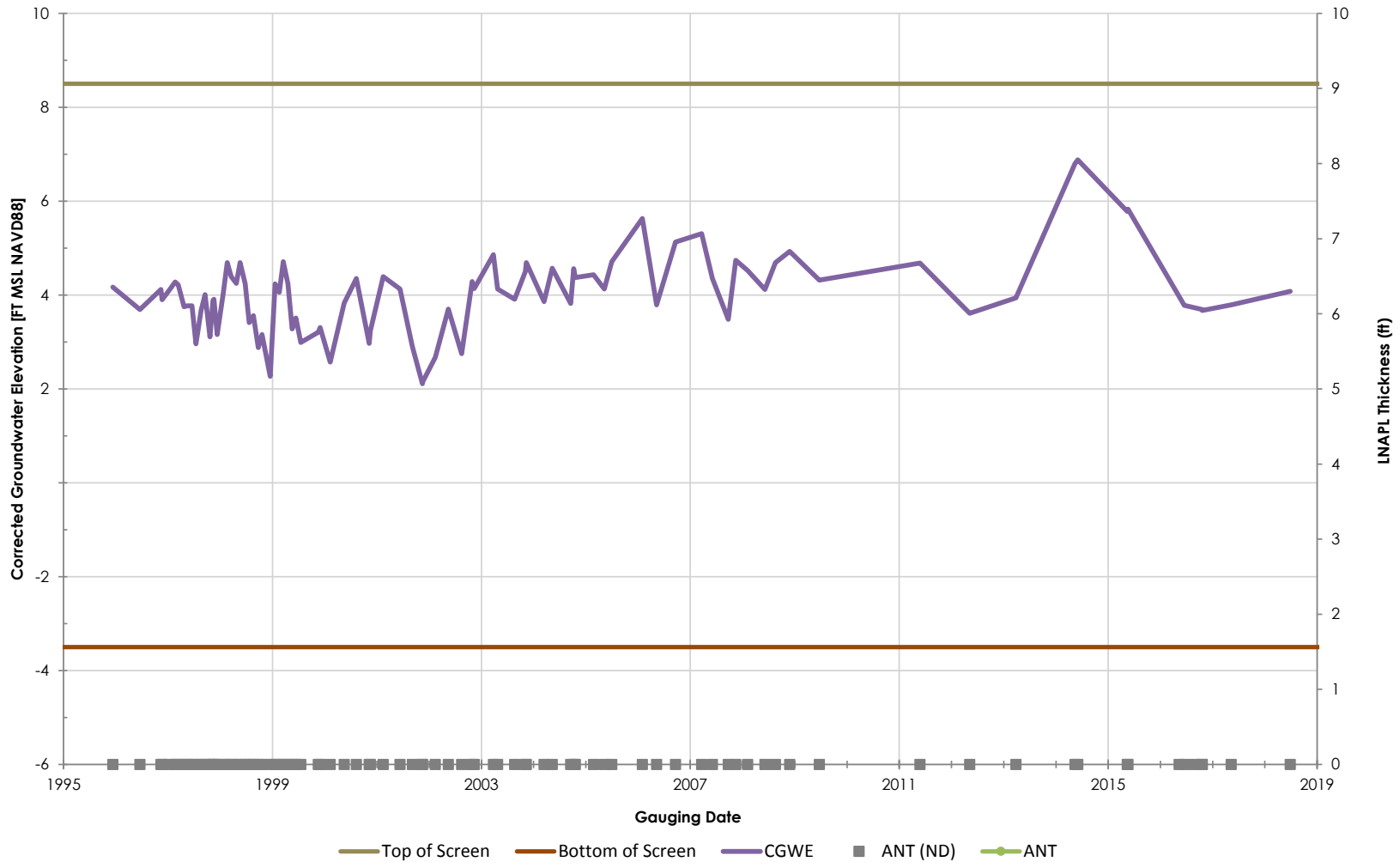
Stantec

Figure/Well No.

N-61

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

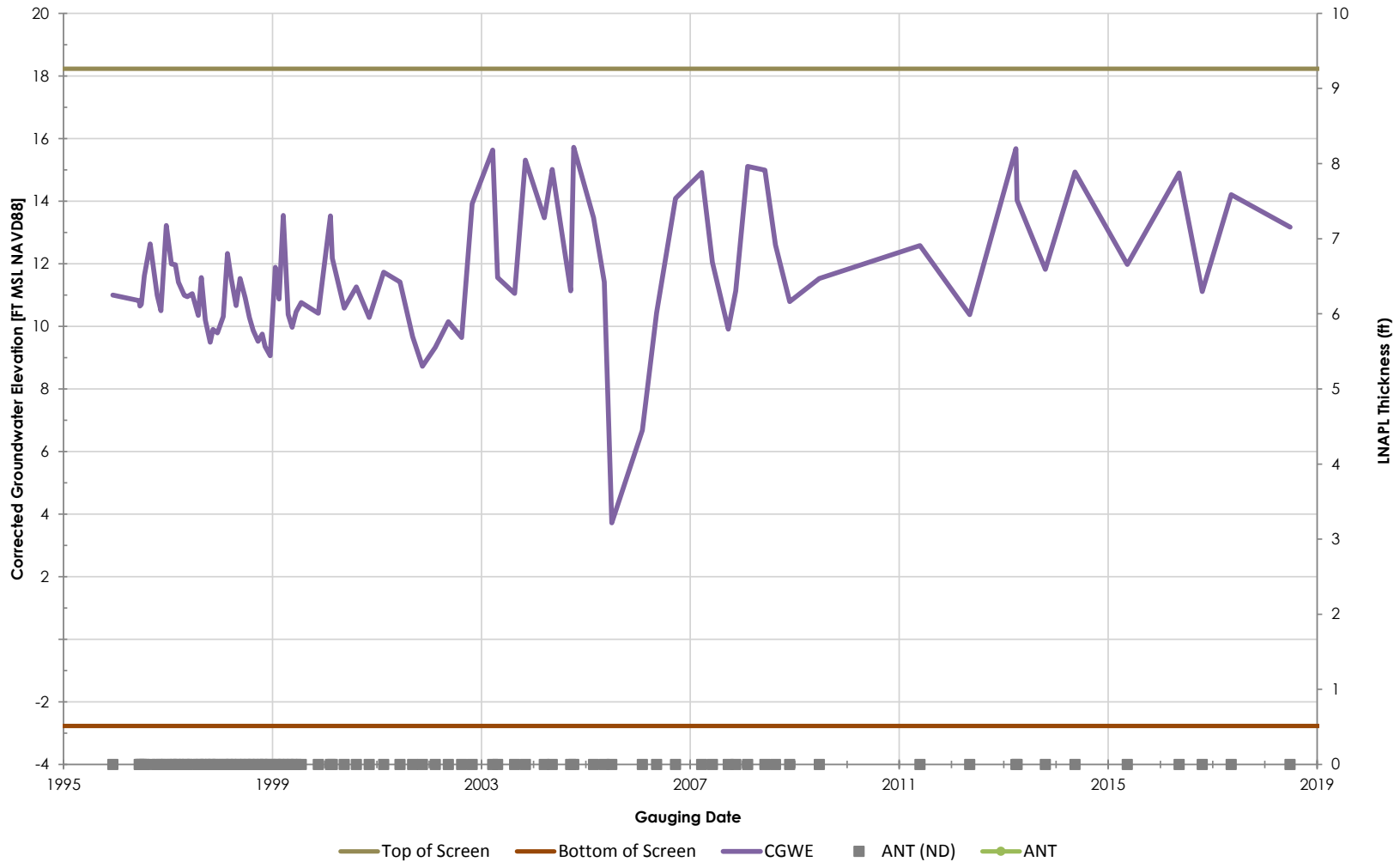
Stantec

Figure/Well No.

N-64

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

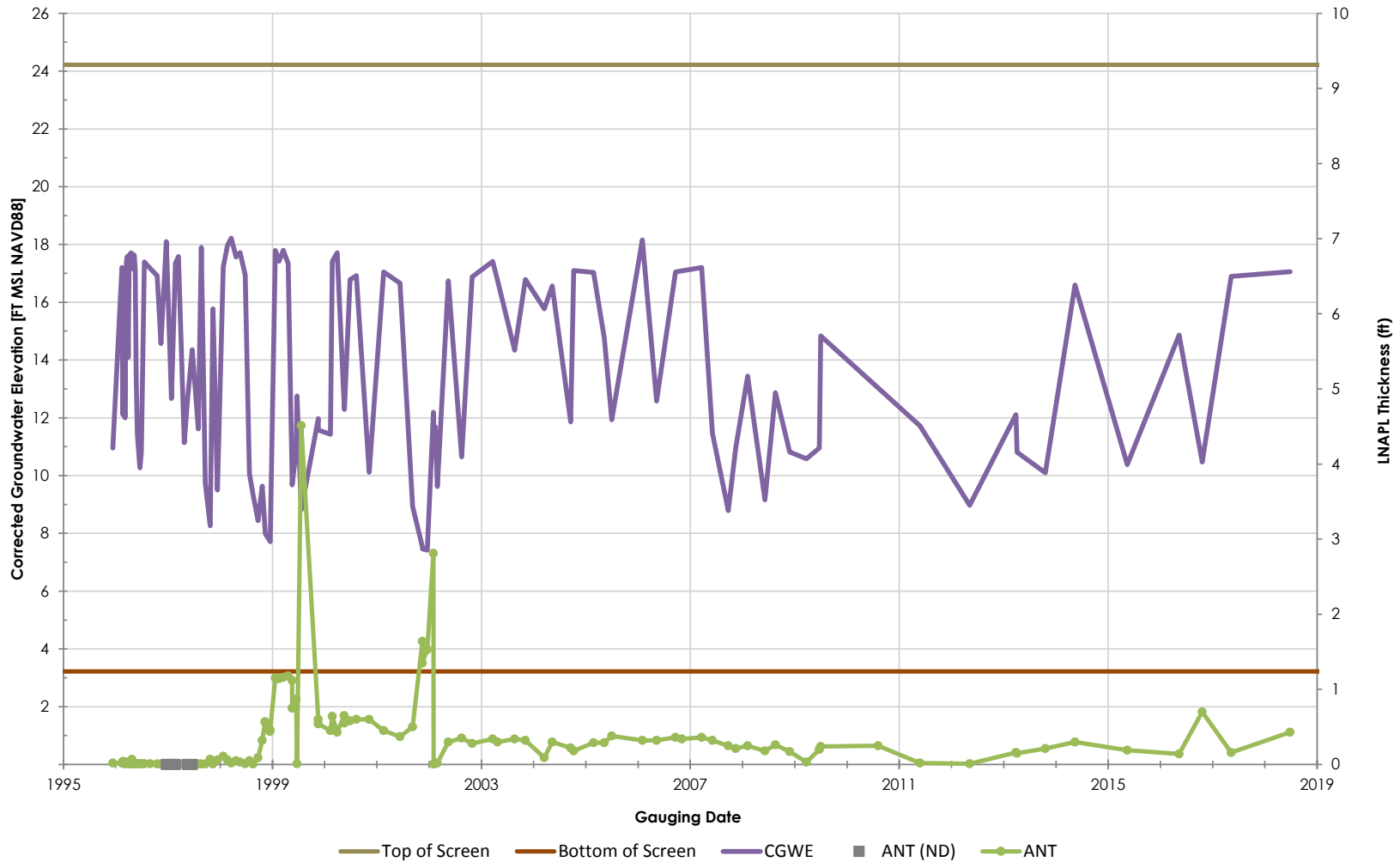
Stantec

Figure/Well No.

N-67

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

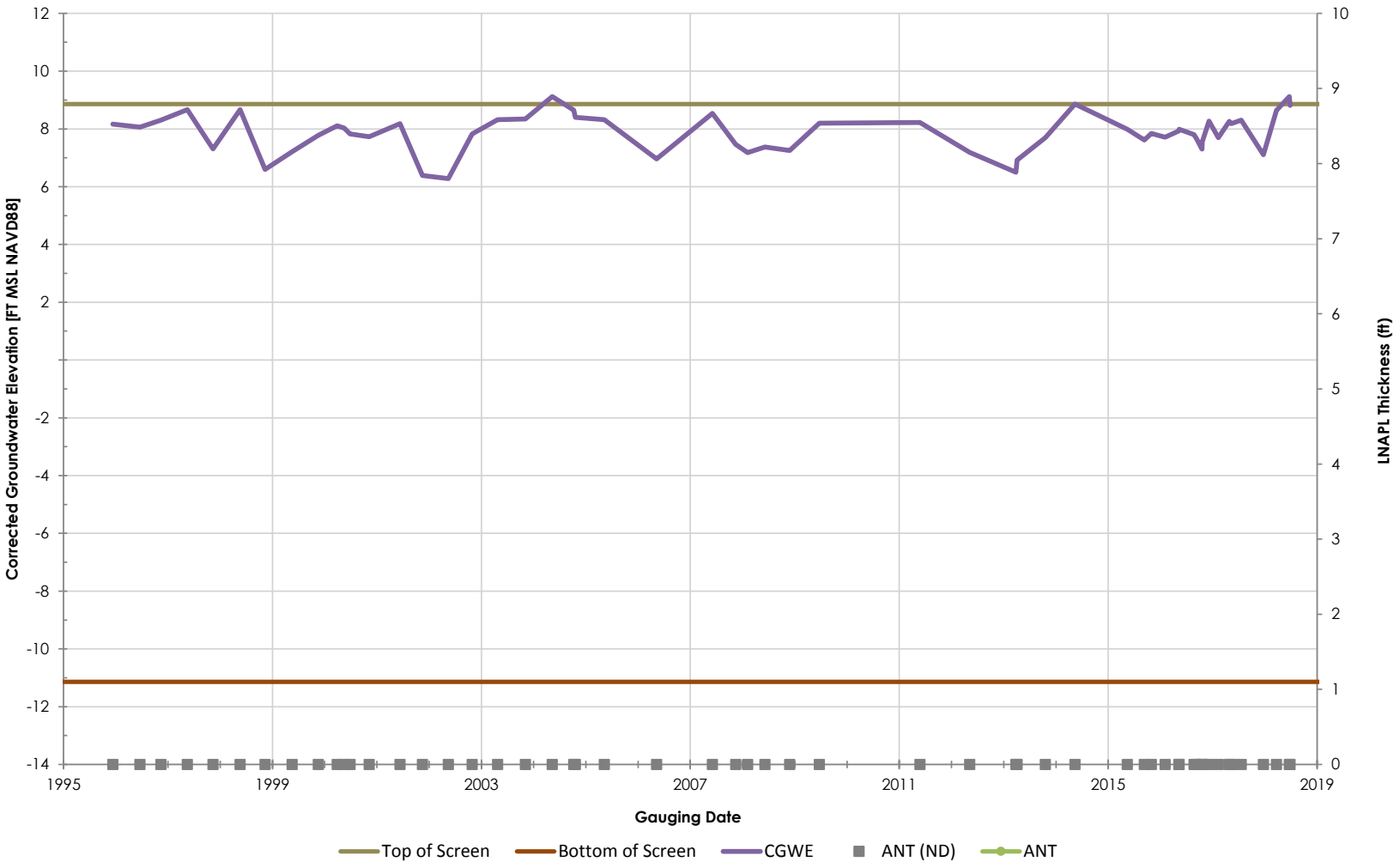
Stantec

Figure/Well No.

N-68

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

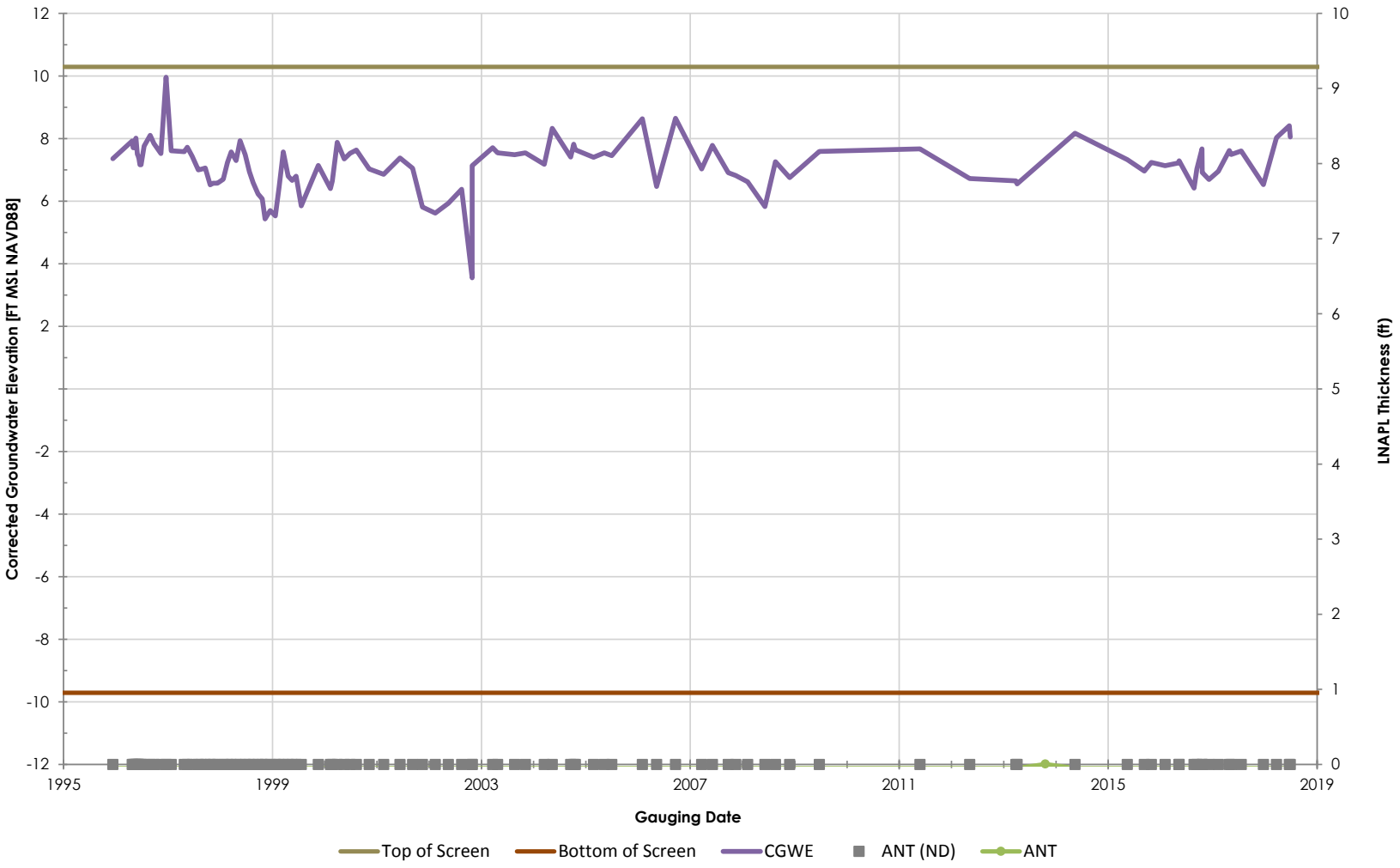
Stantec

Figure/Well No.

N-69

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

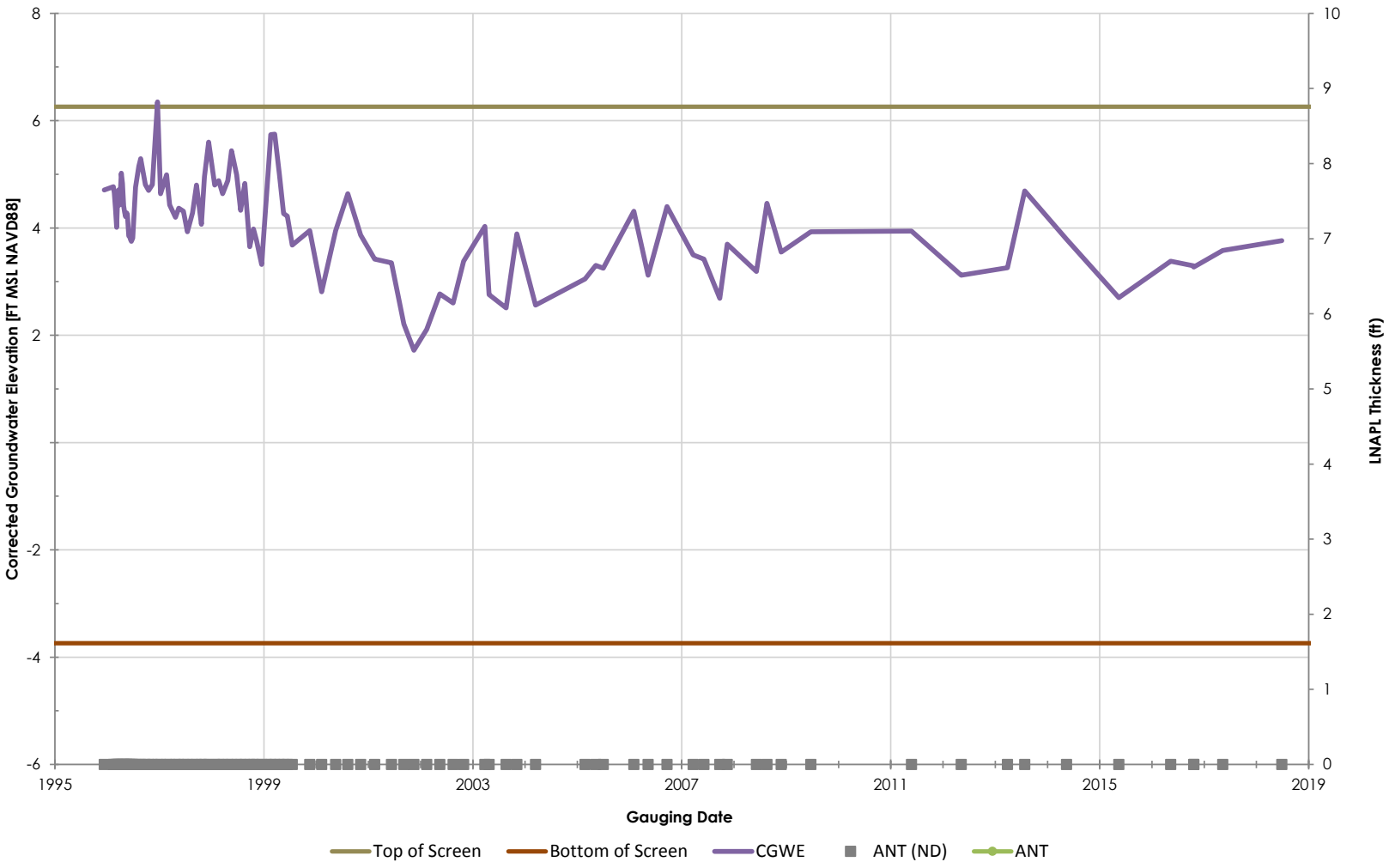
Stantec

Figure/Well No.

N-70

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

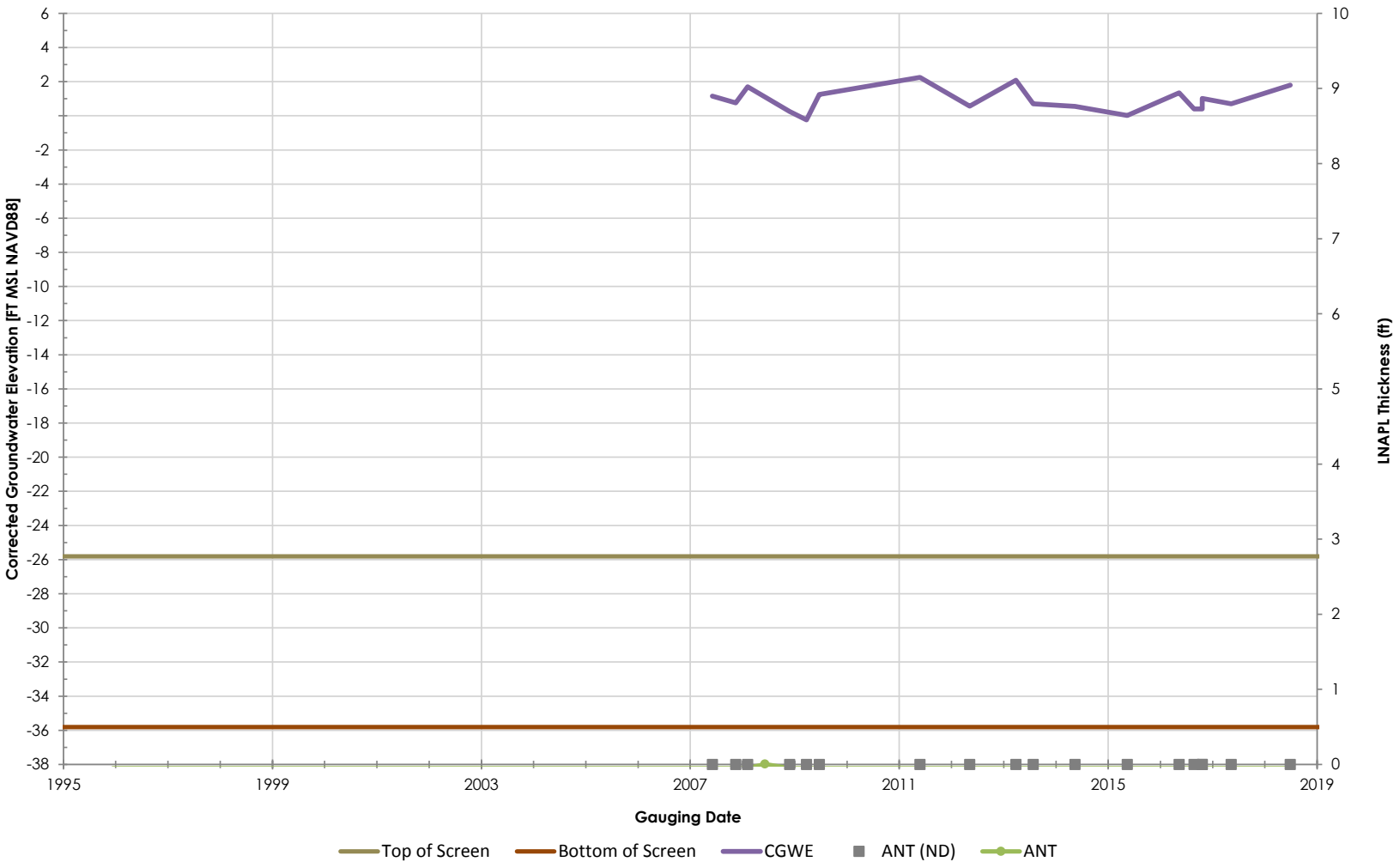
Stantec

Figure/Well No.

N-72

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

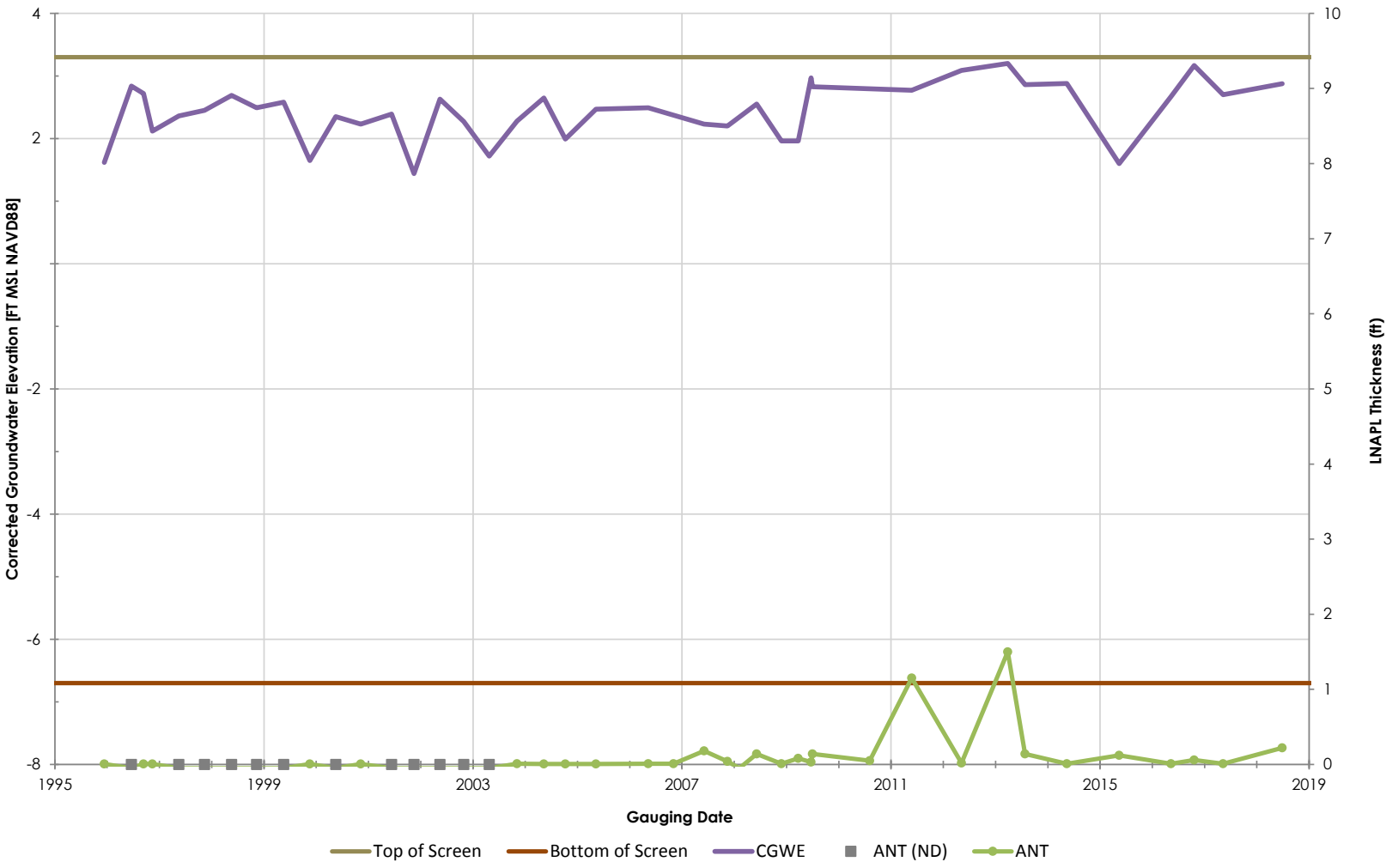
Stantec

Figure/Well No.

N-73

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

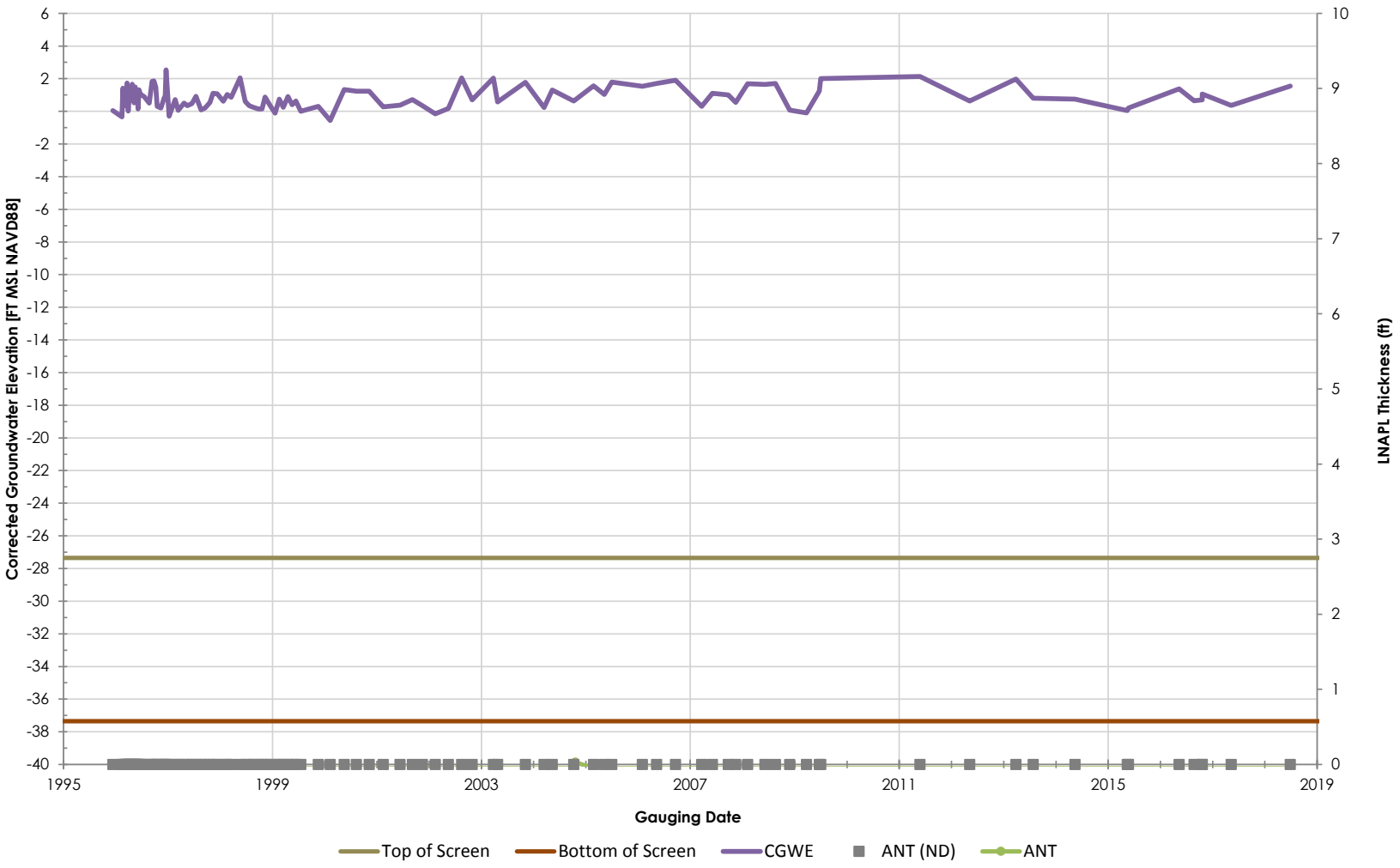
Stantec

Figure/Well No.

N-74

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

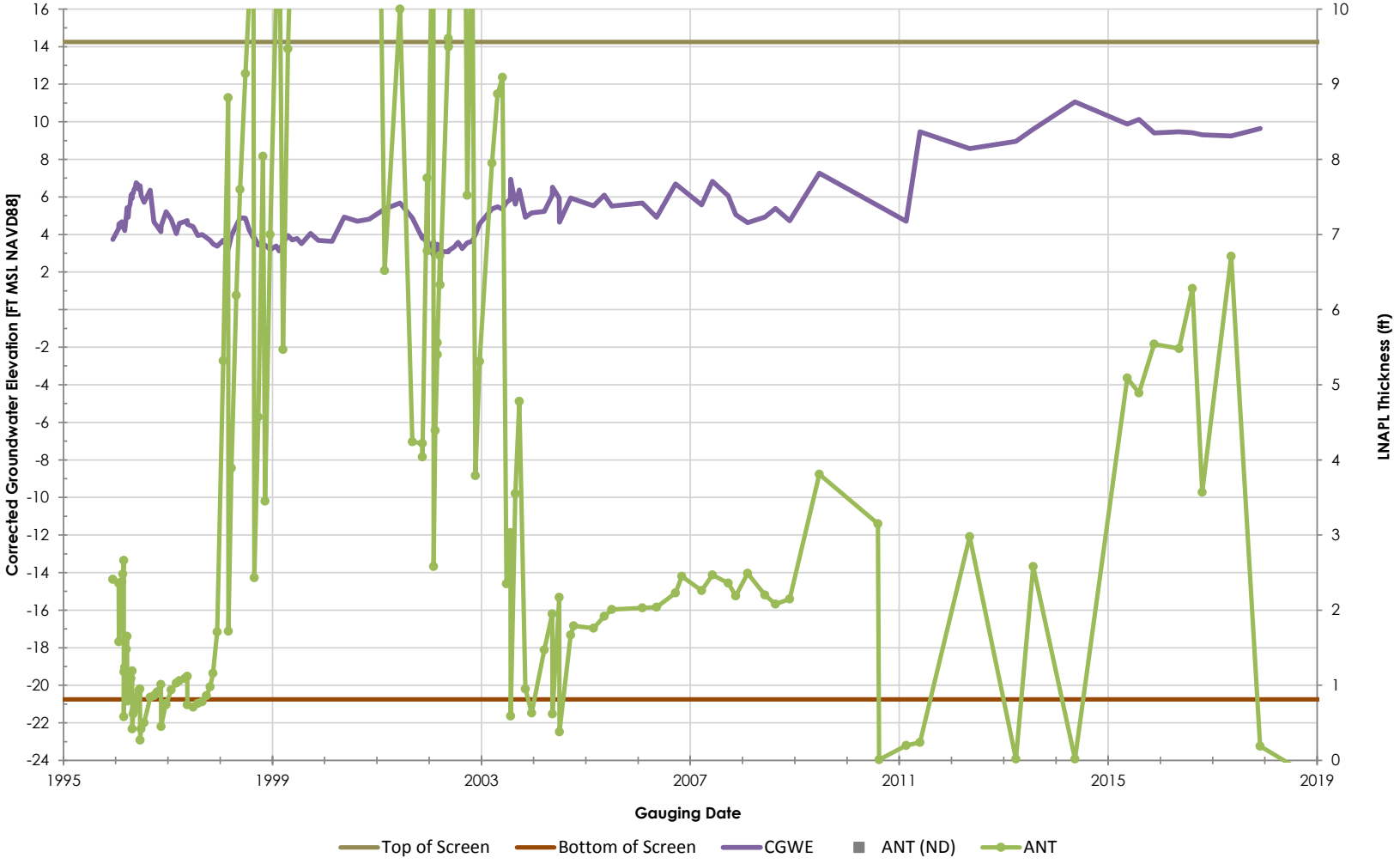
Stantec

Figure/Well No.

N-75

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

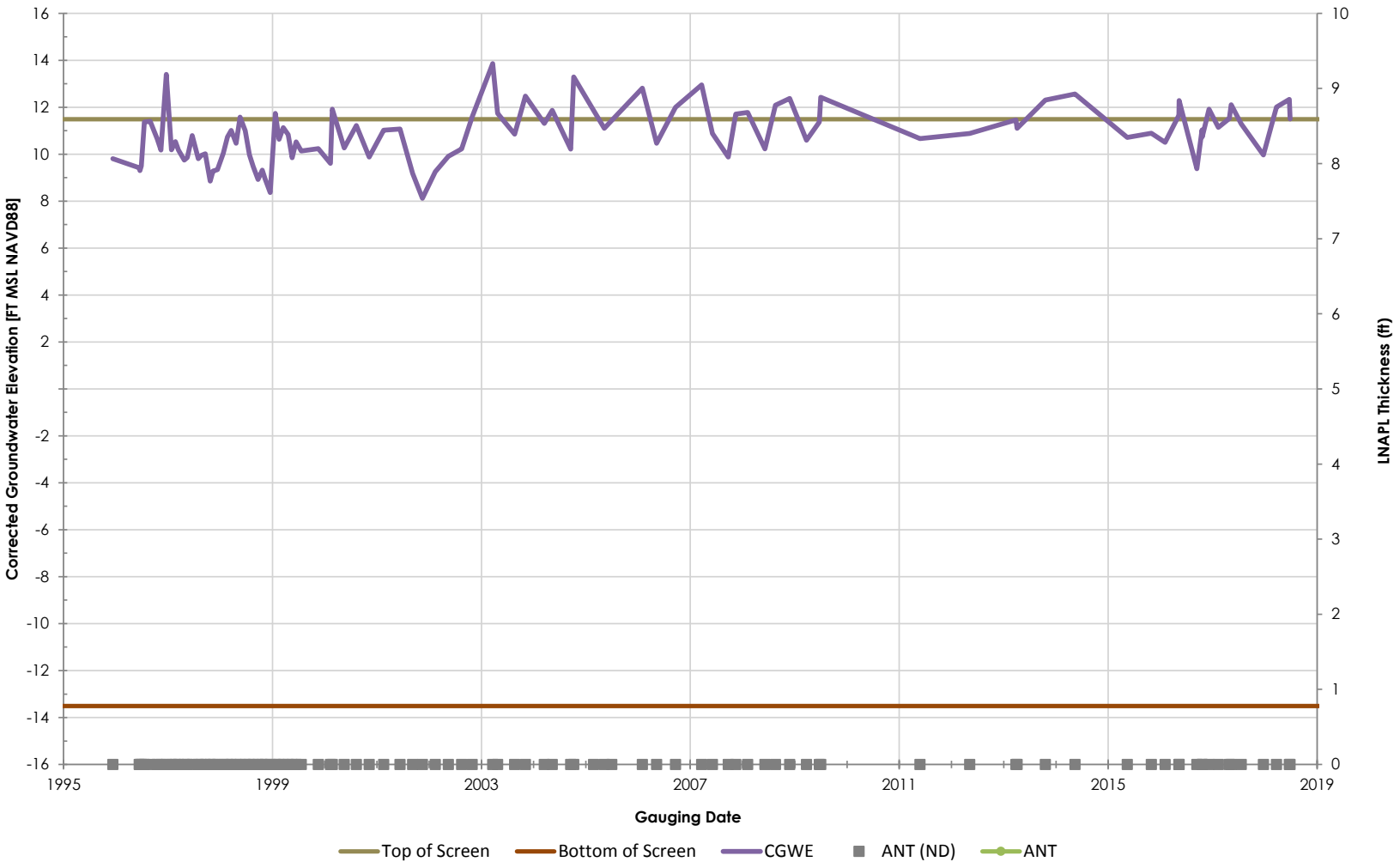
Stantec

Figure/Well No.

N-76

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

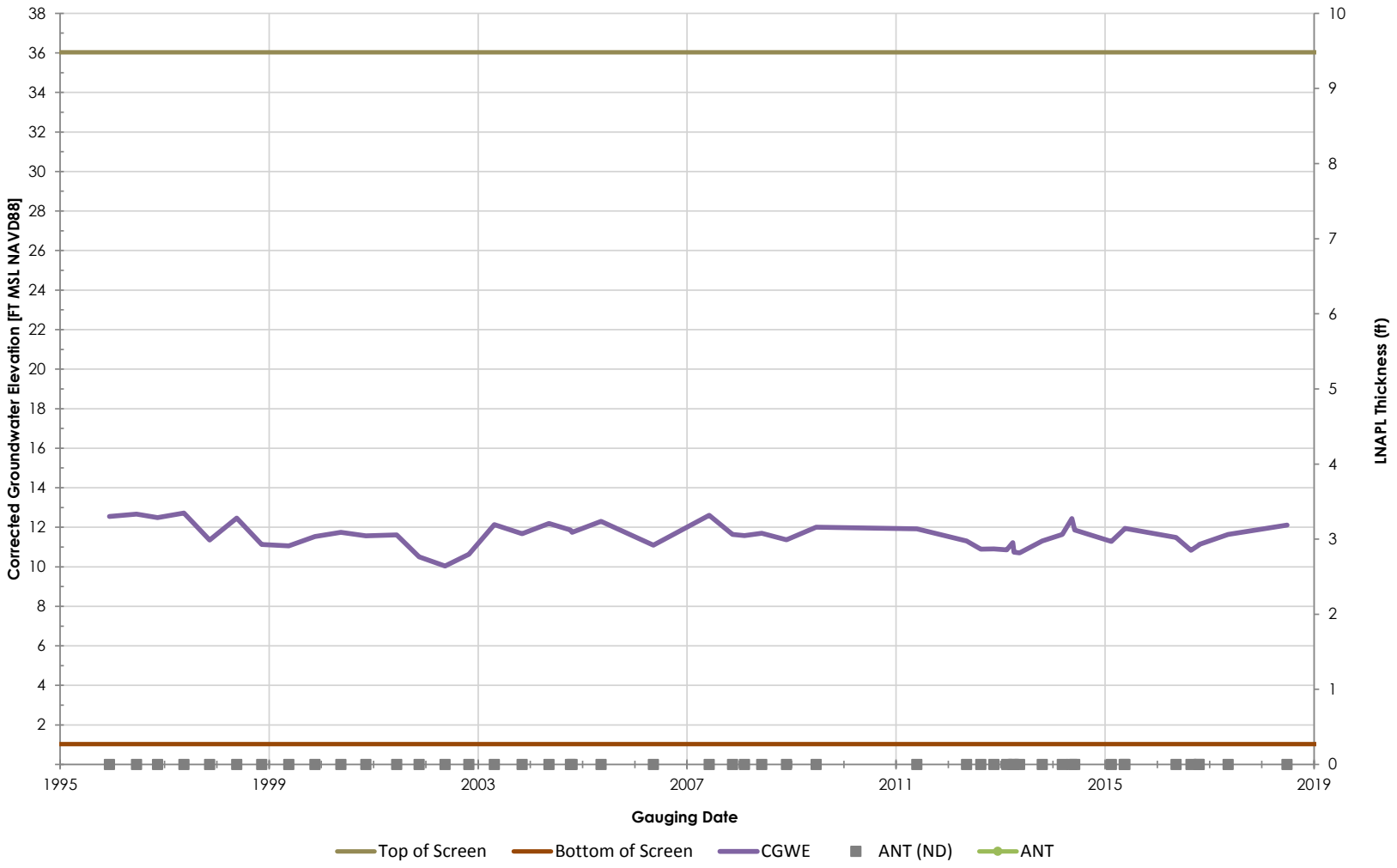
Stantec

Figure/Well No.

N-77

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

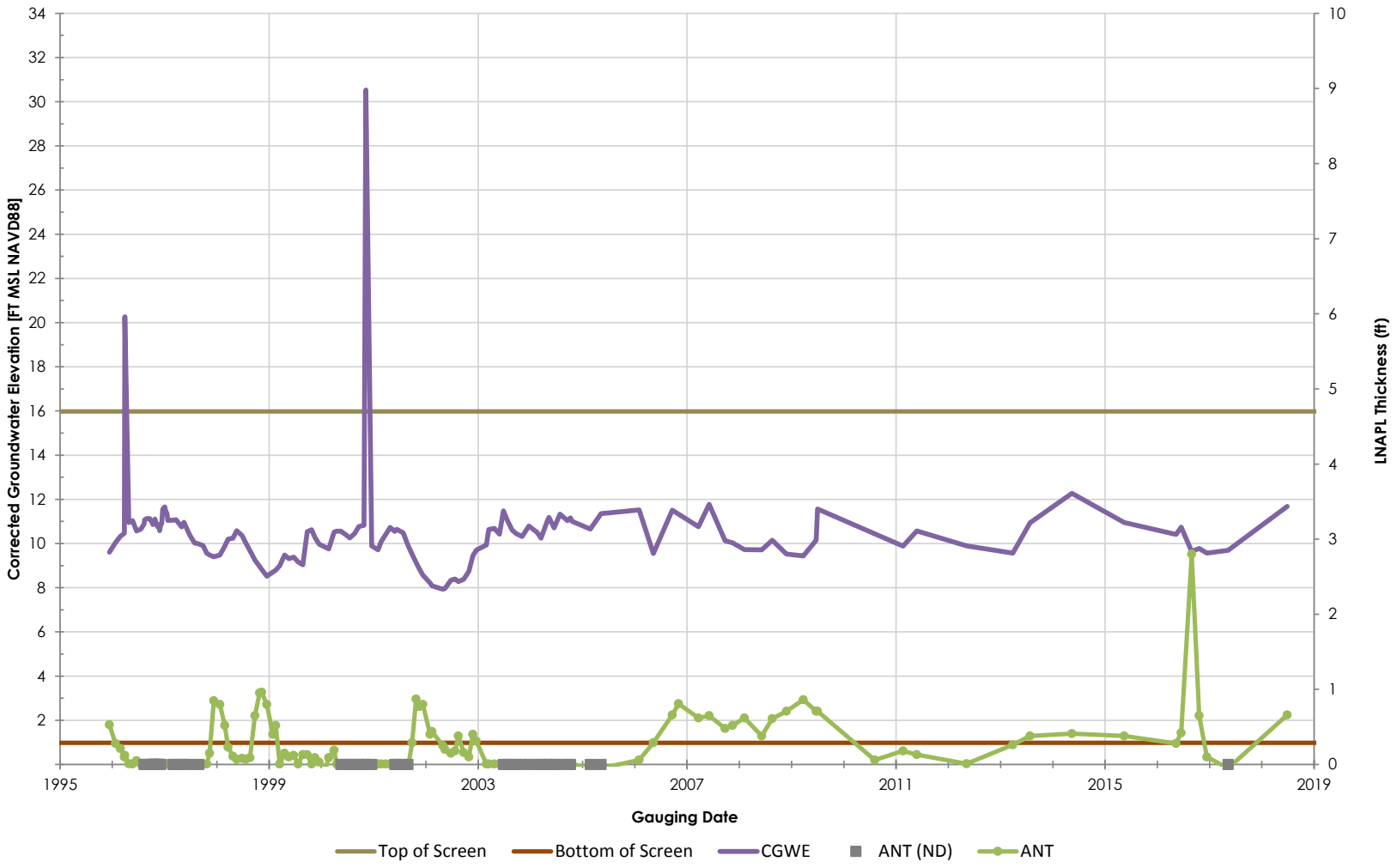
Stantec

Figure/Well No.

N-8

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

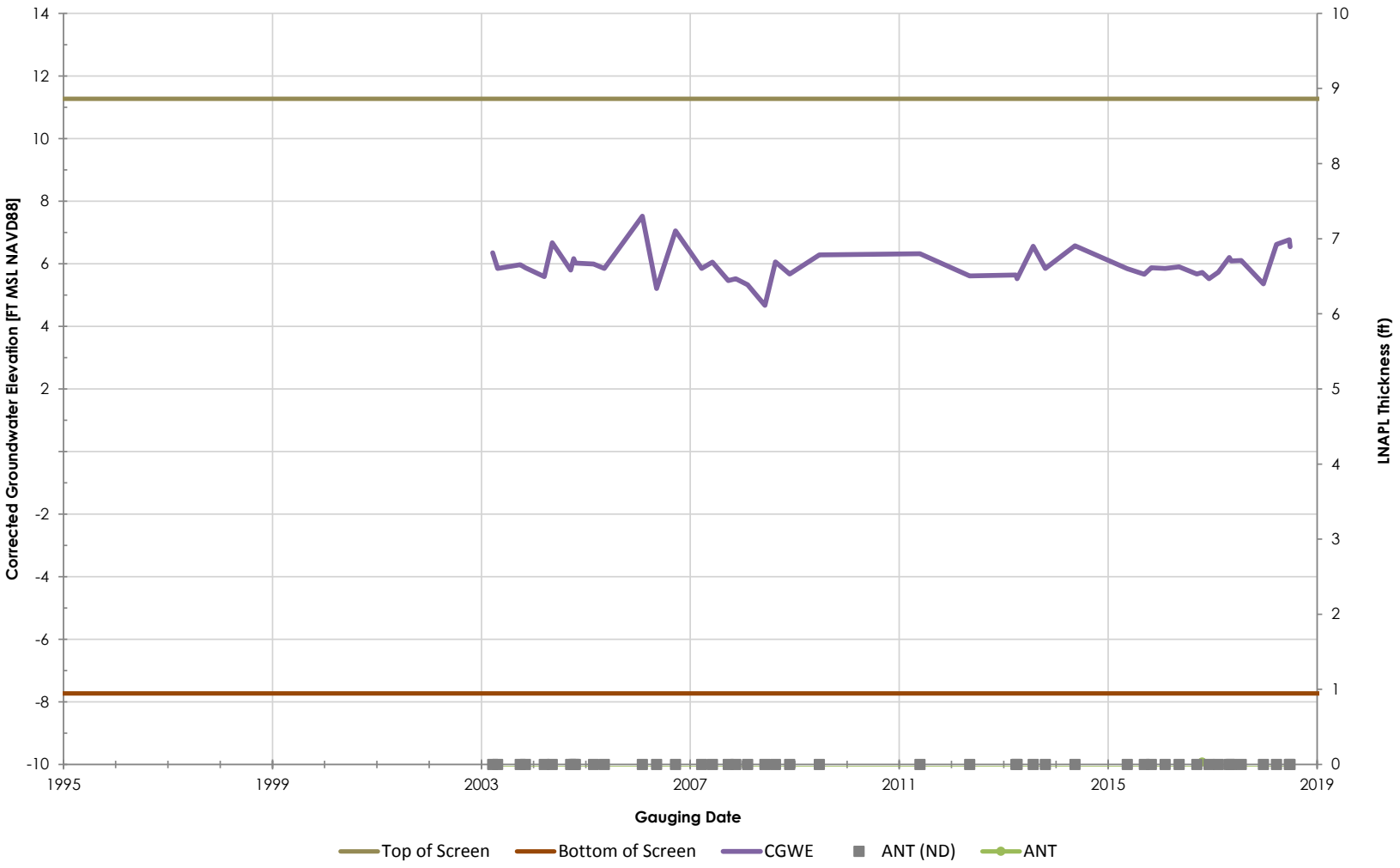
Stantec

Figure/Well No.

N-82

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

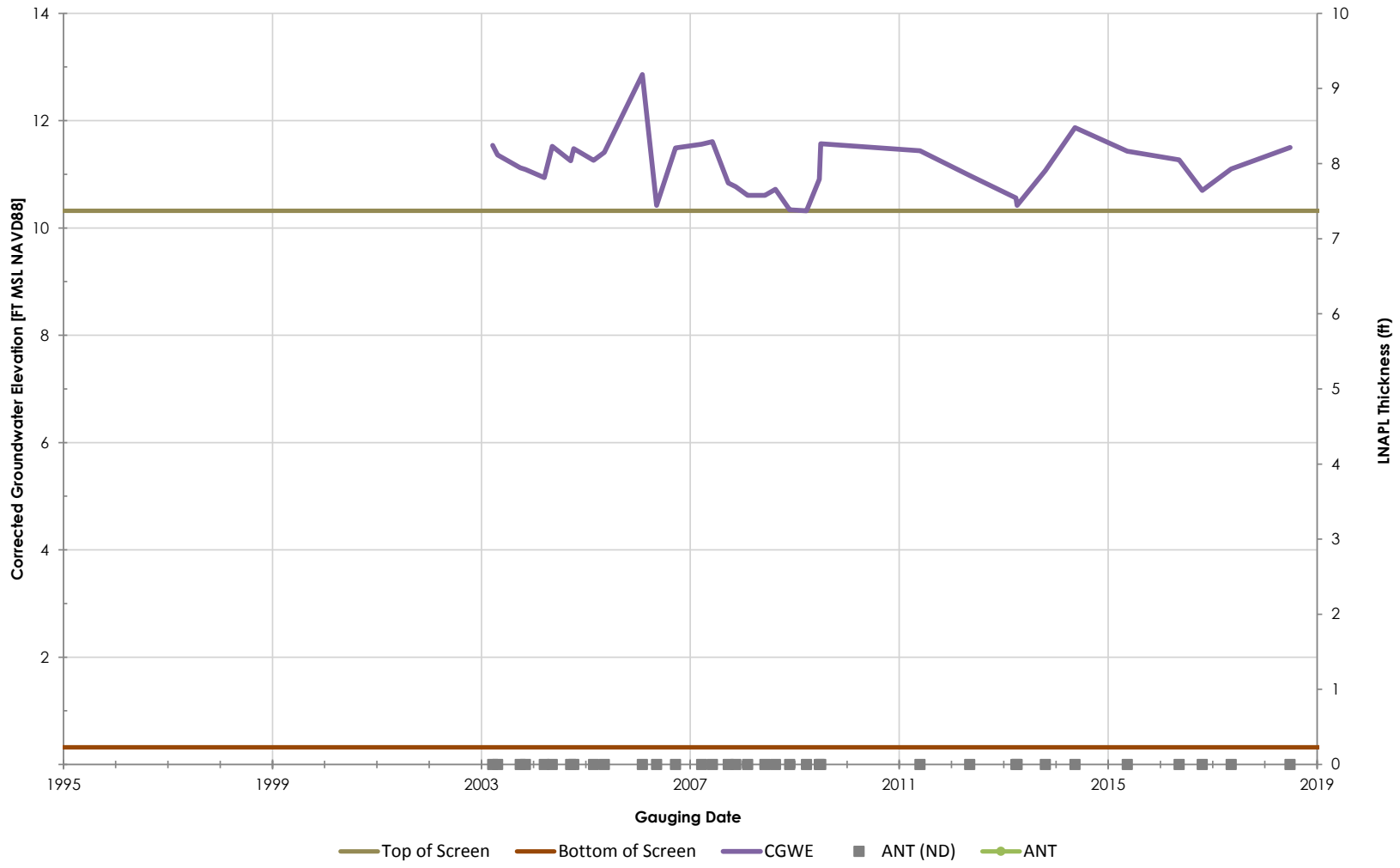
Stantec

Figure/Well No.

N-83

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

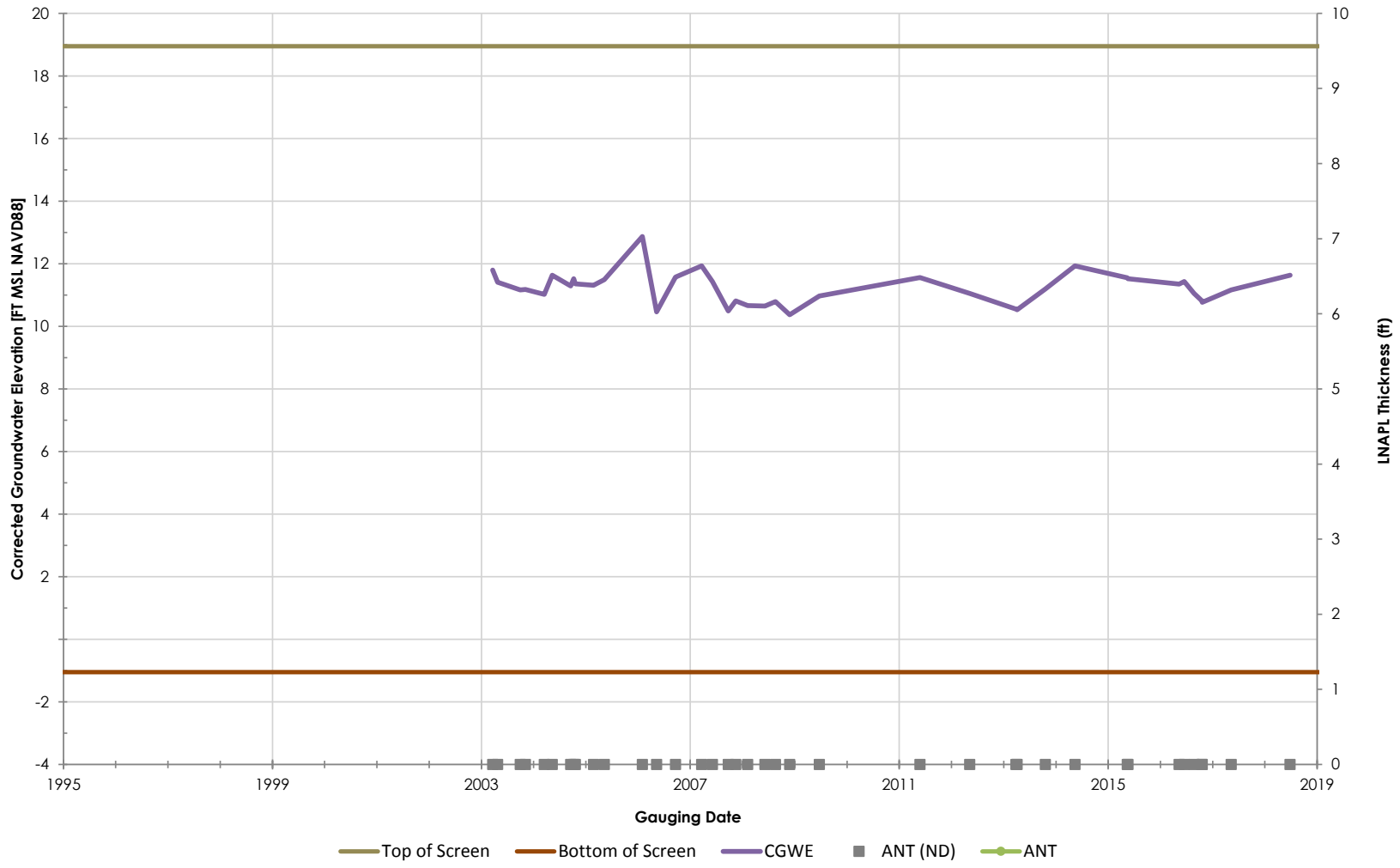
Stantec

Figure/Well No.

N-84

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

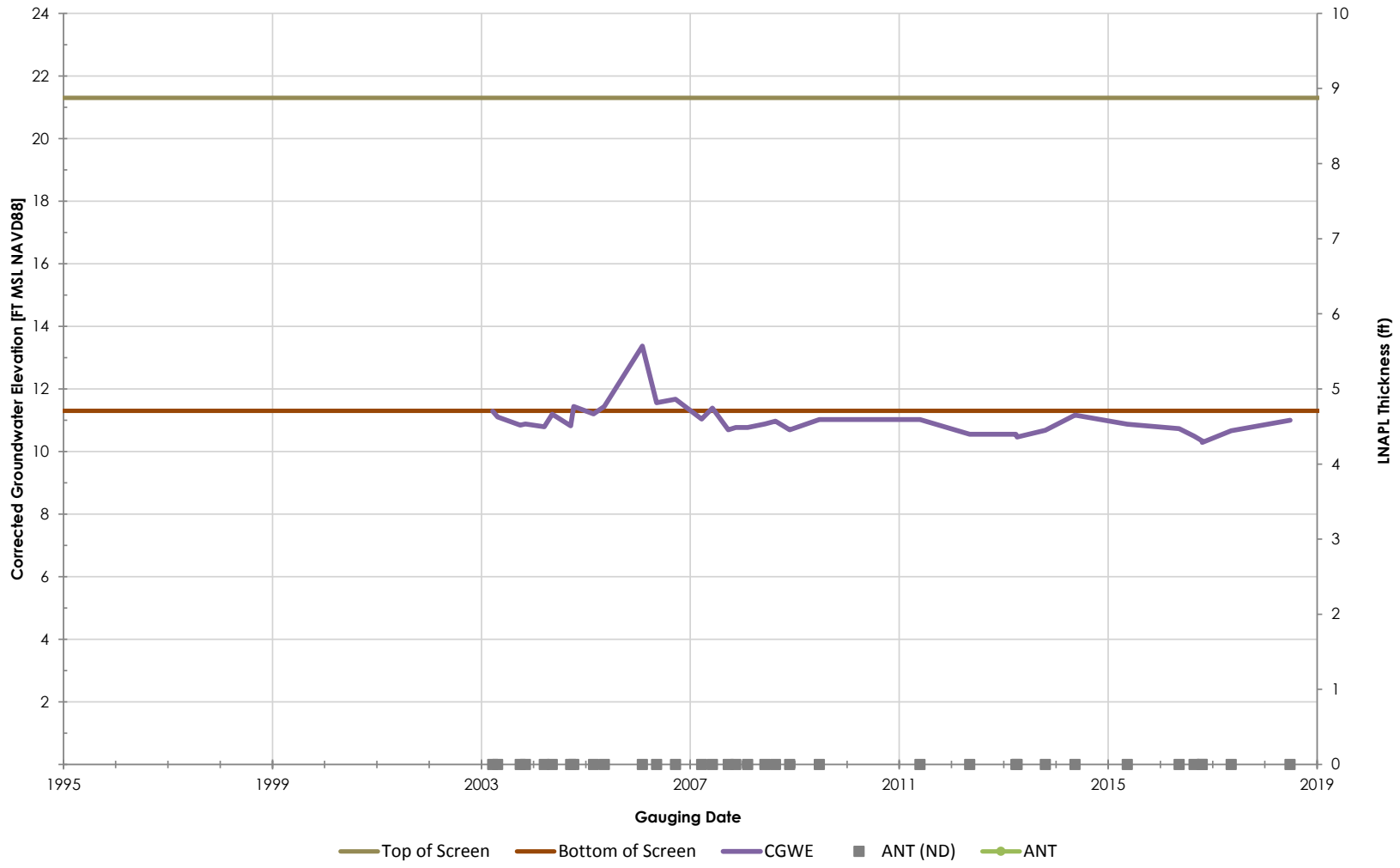
Stantec

Figure/Well No.

N-85

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

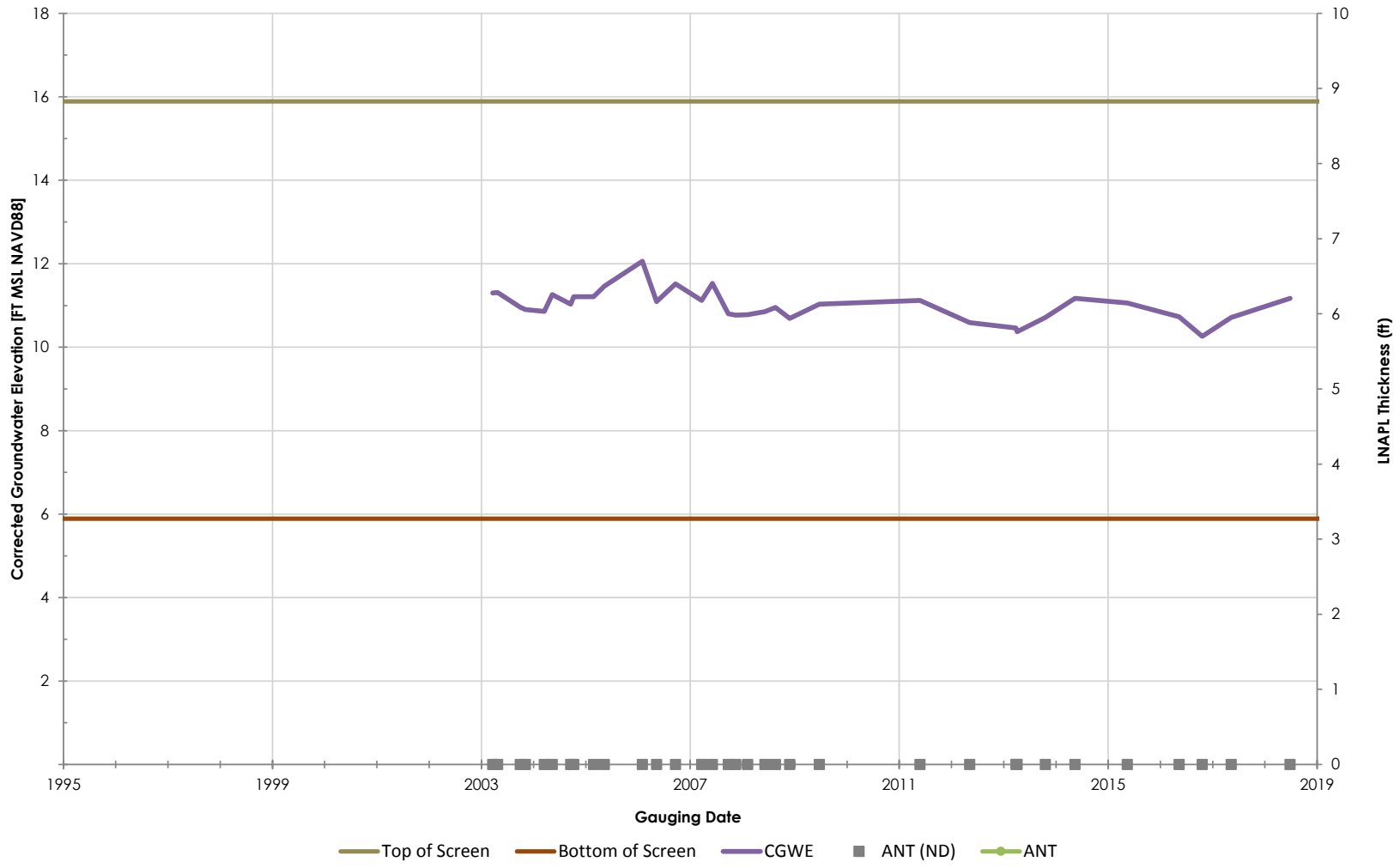
Stantec

Figure/Well No.

N-86

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

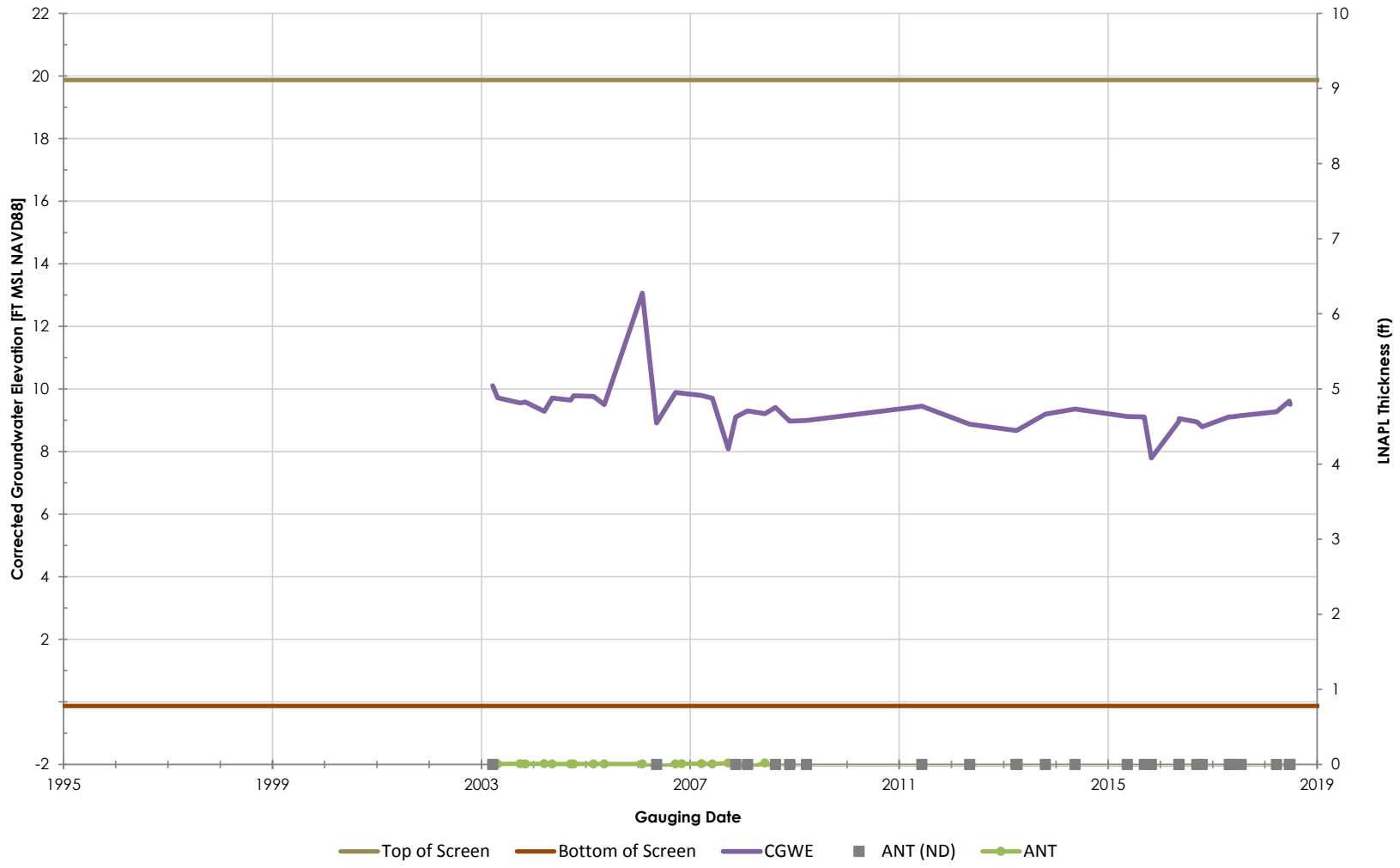
Stantec

Figure/Well No.

N-87

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

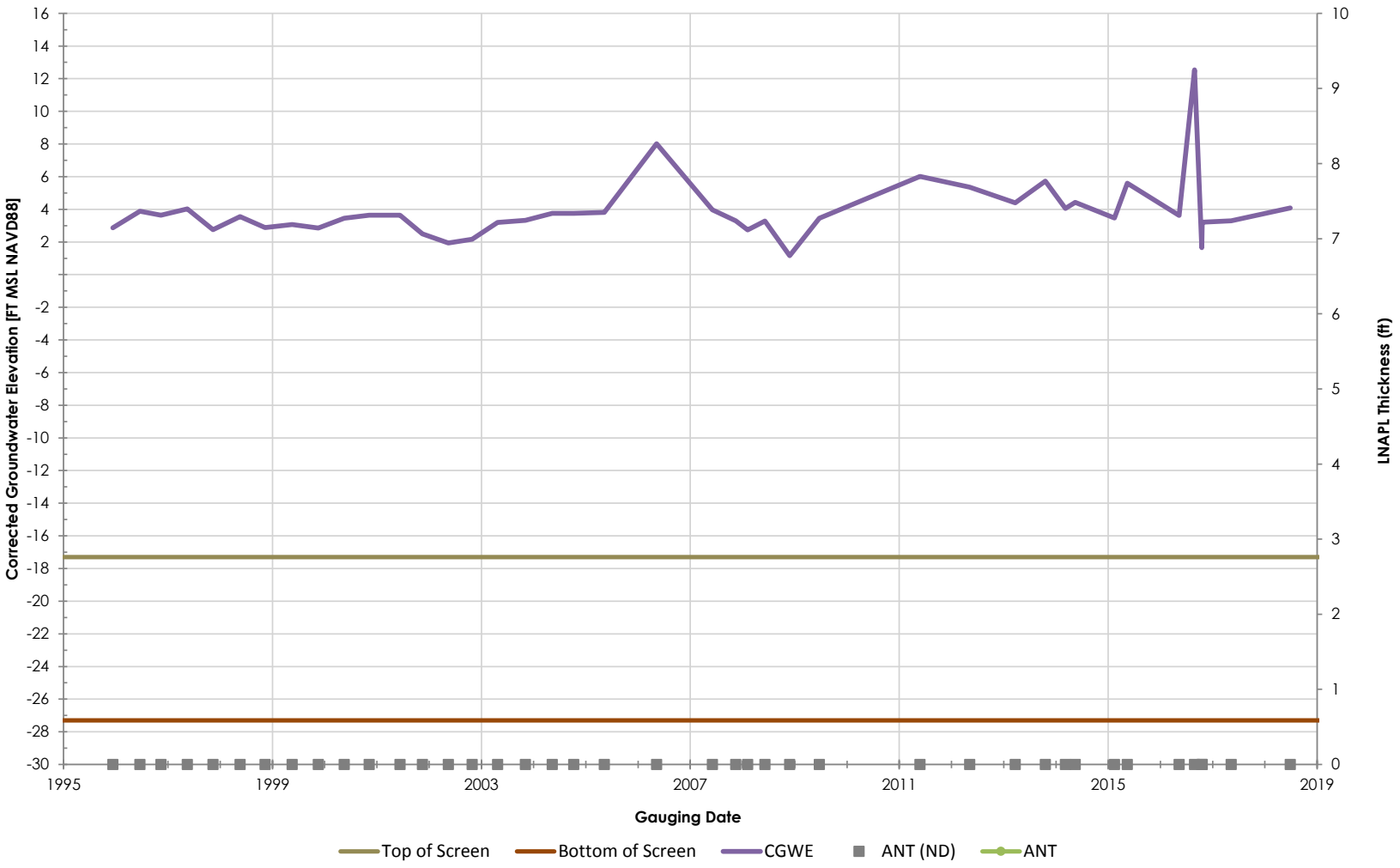
Stantec

Figure/Well No.

N-89

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

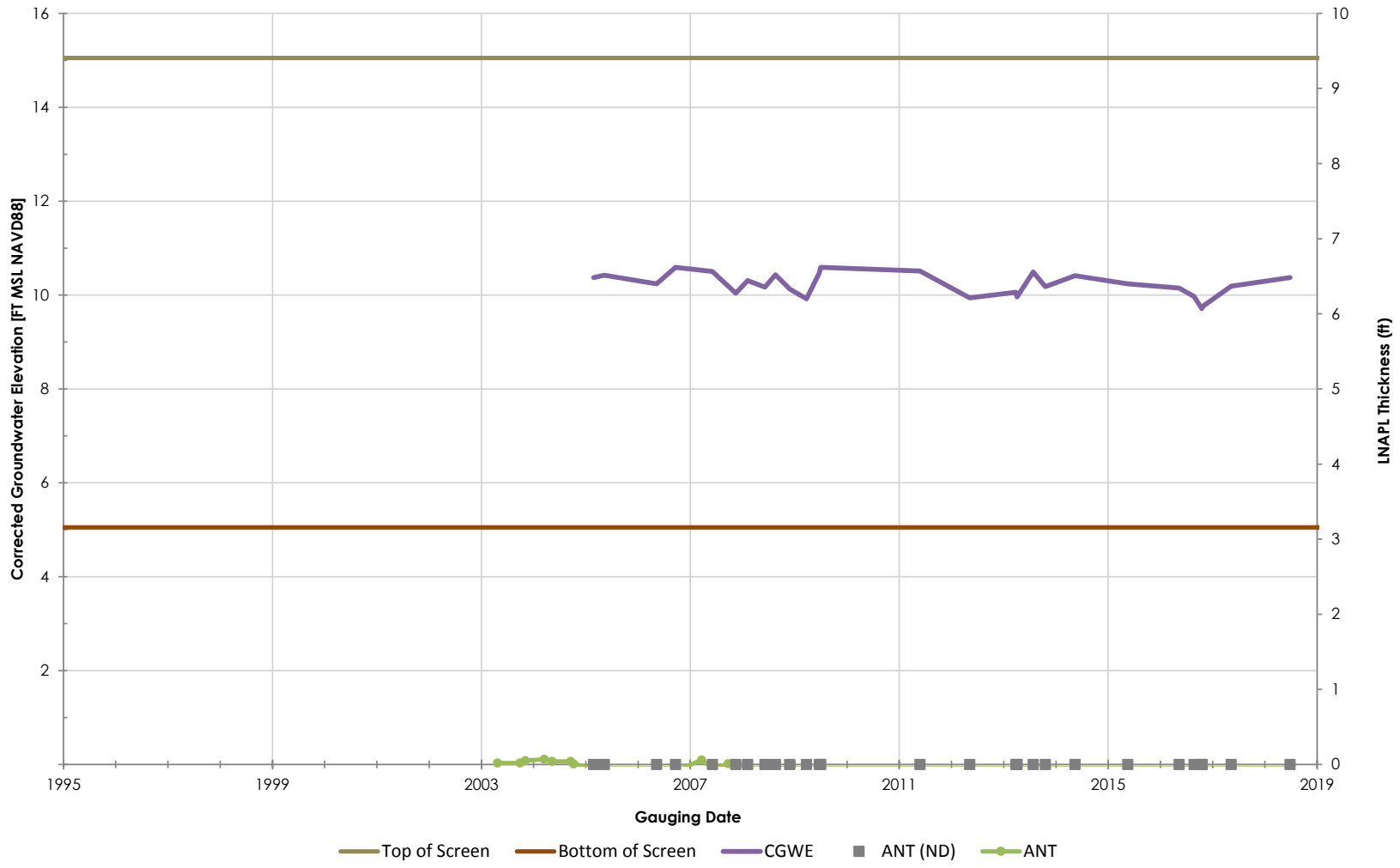
Stantec

Figure/Well No.

N-9

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

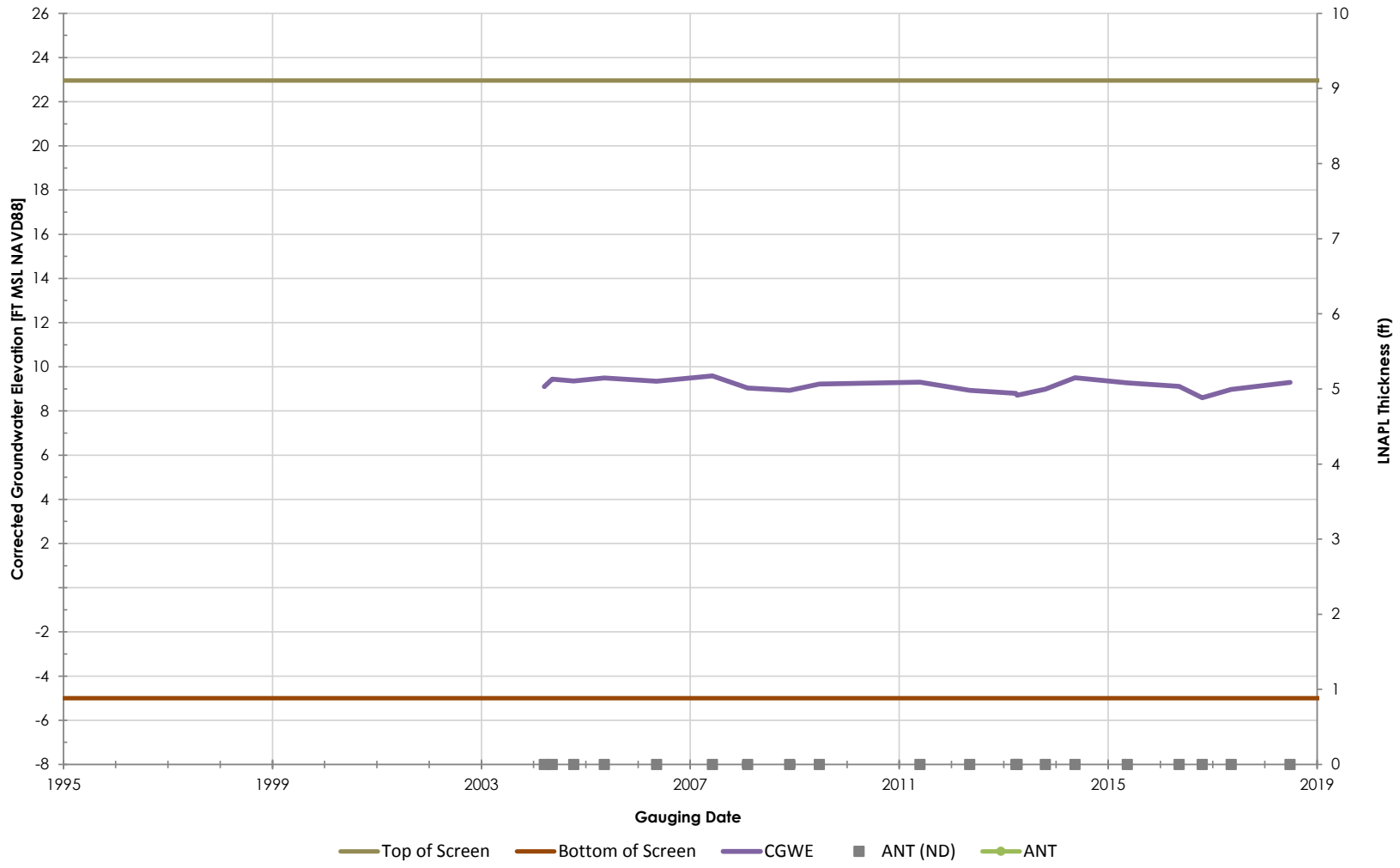
Stantec

Figure/Well No.

N-93

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

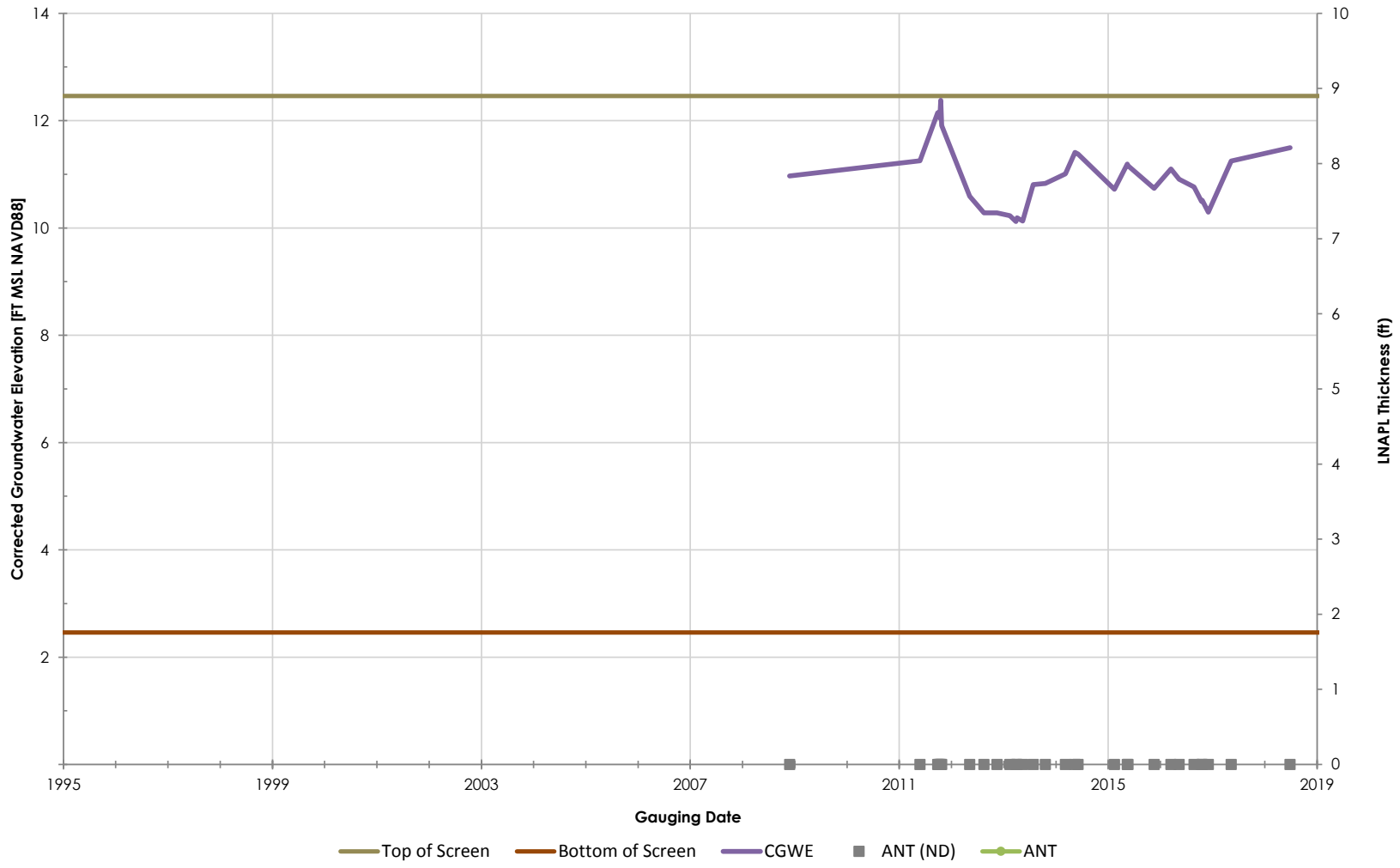
Stantec

Figure/Well No.

N-97

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

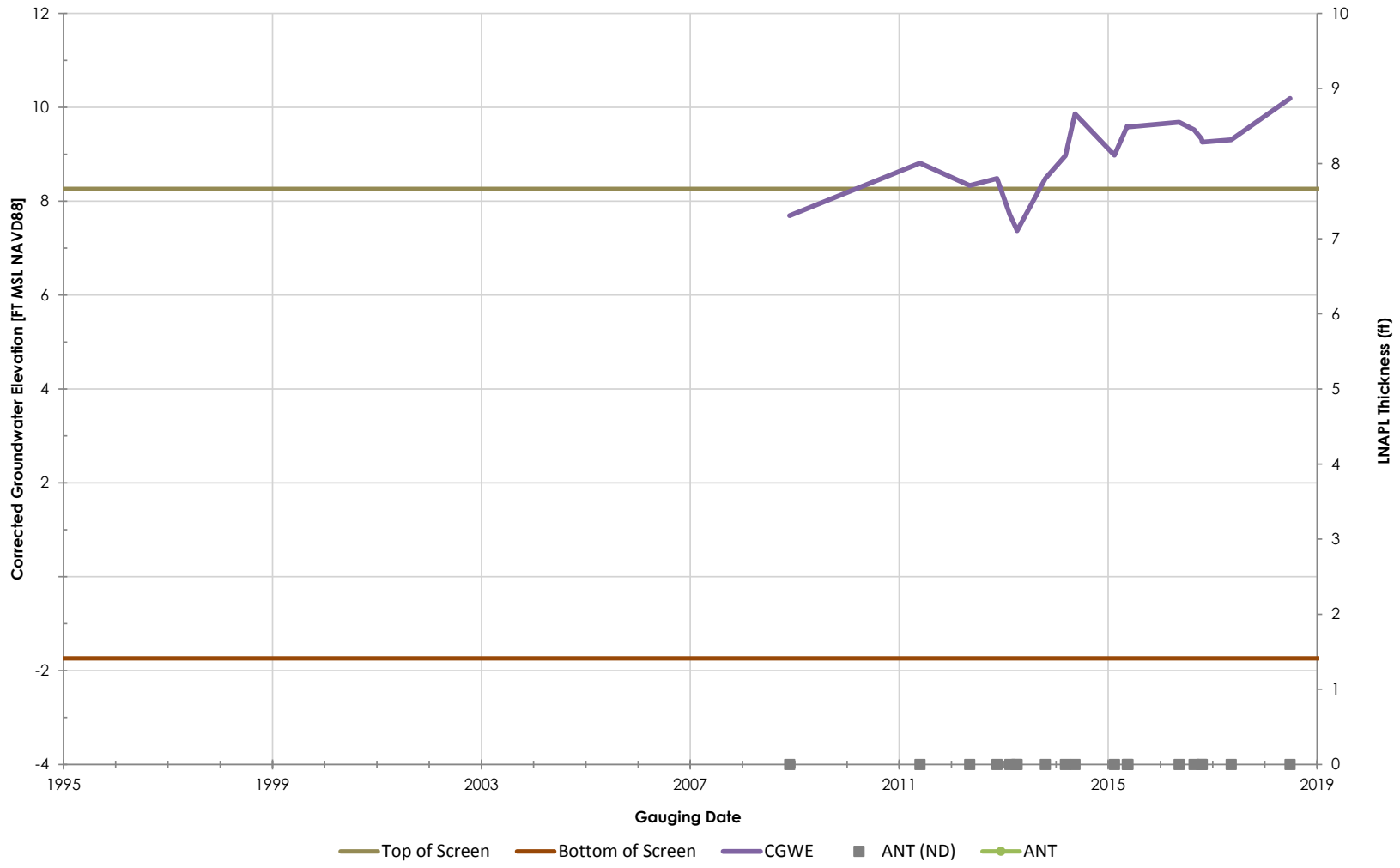
Stantec

Figure/Well No.

N-98

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

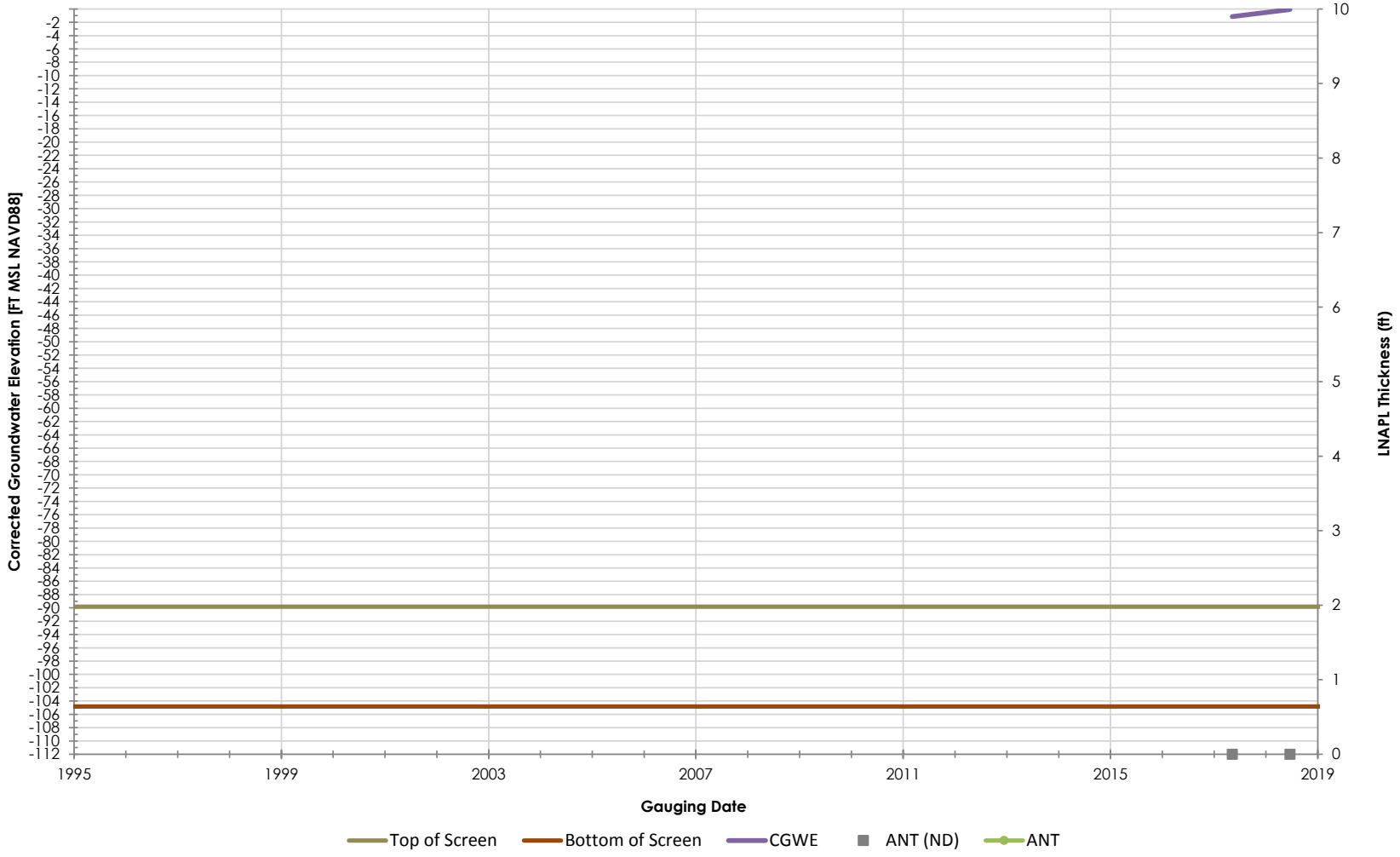
Stantec

Figure/Well No.

N-99

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

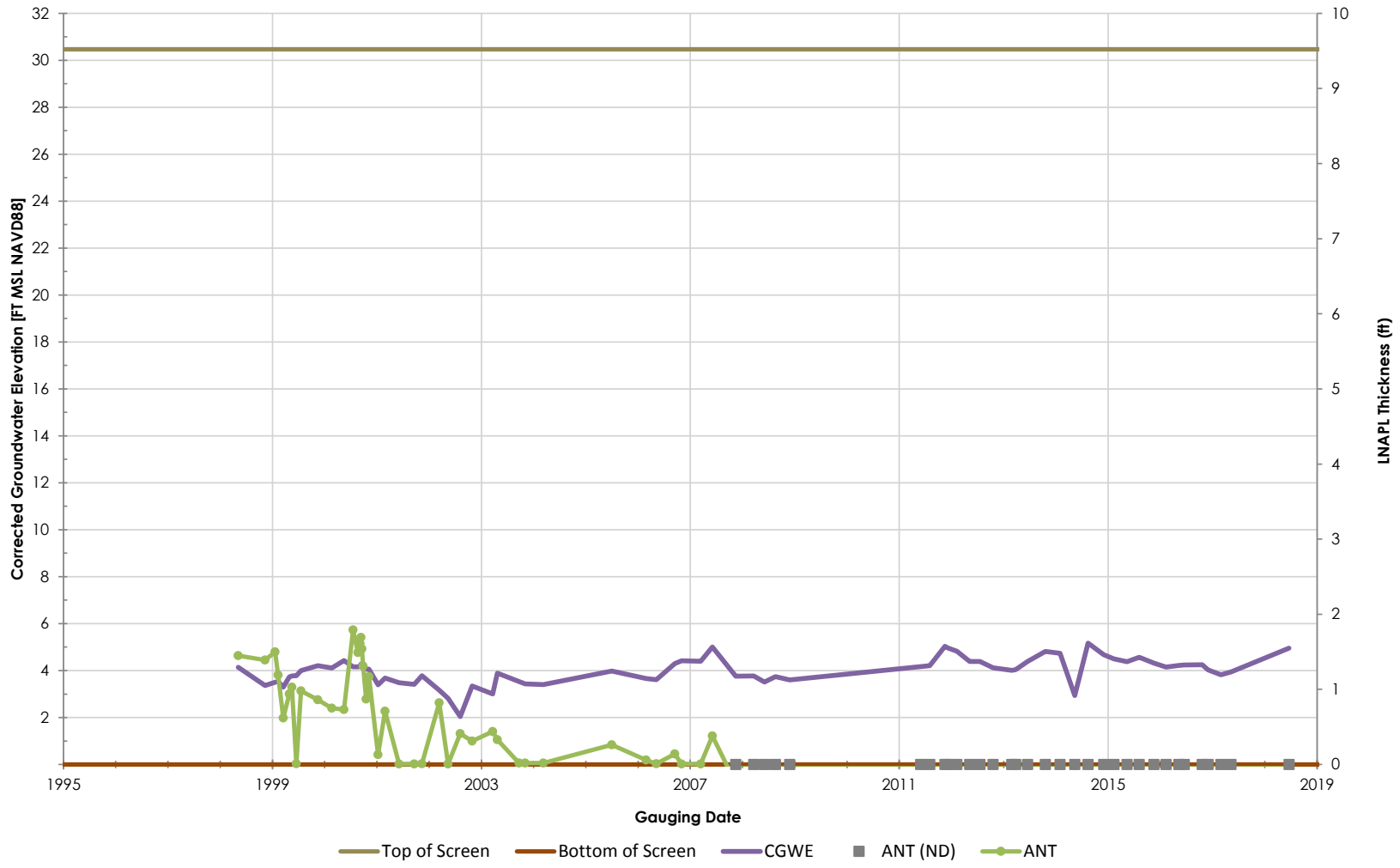
Stantec

Figure/Well No.

NOVA-DW-14

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

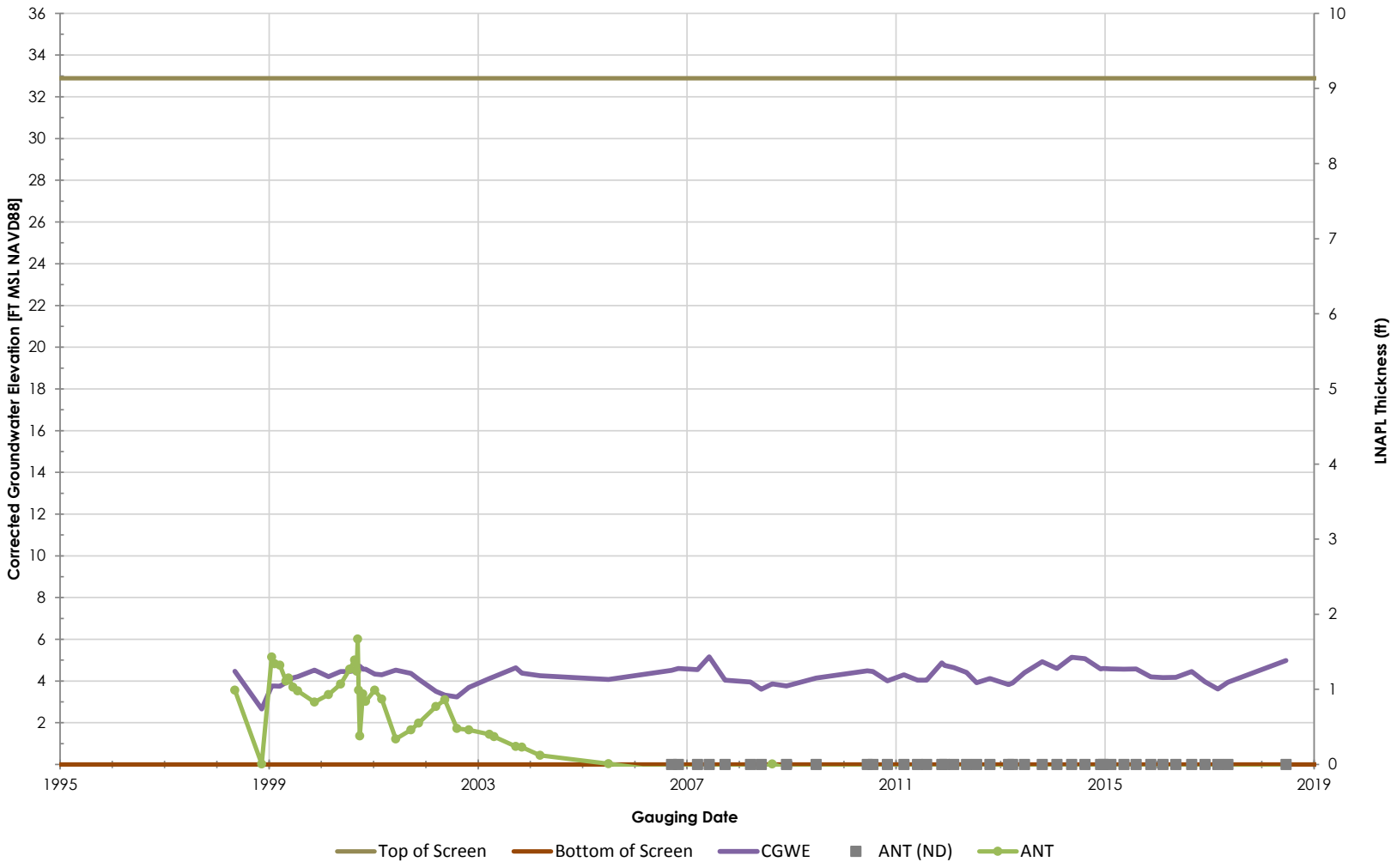
Stantec

Figure/Well No.

OW-12

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

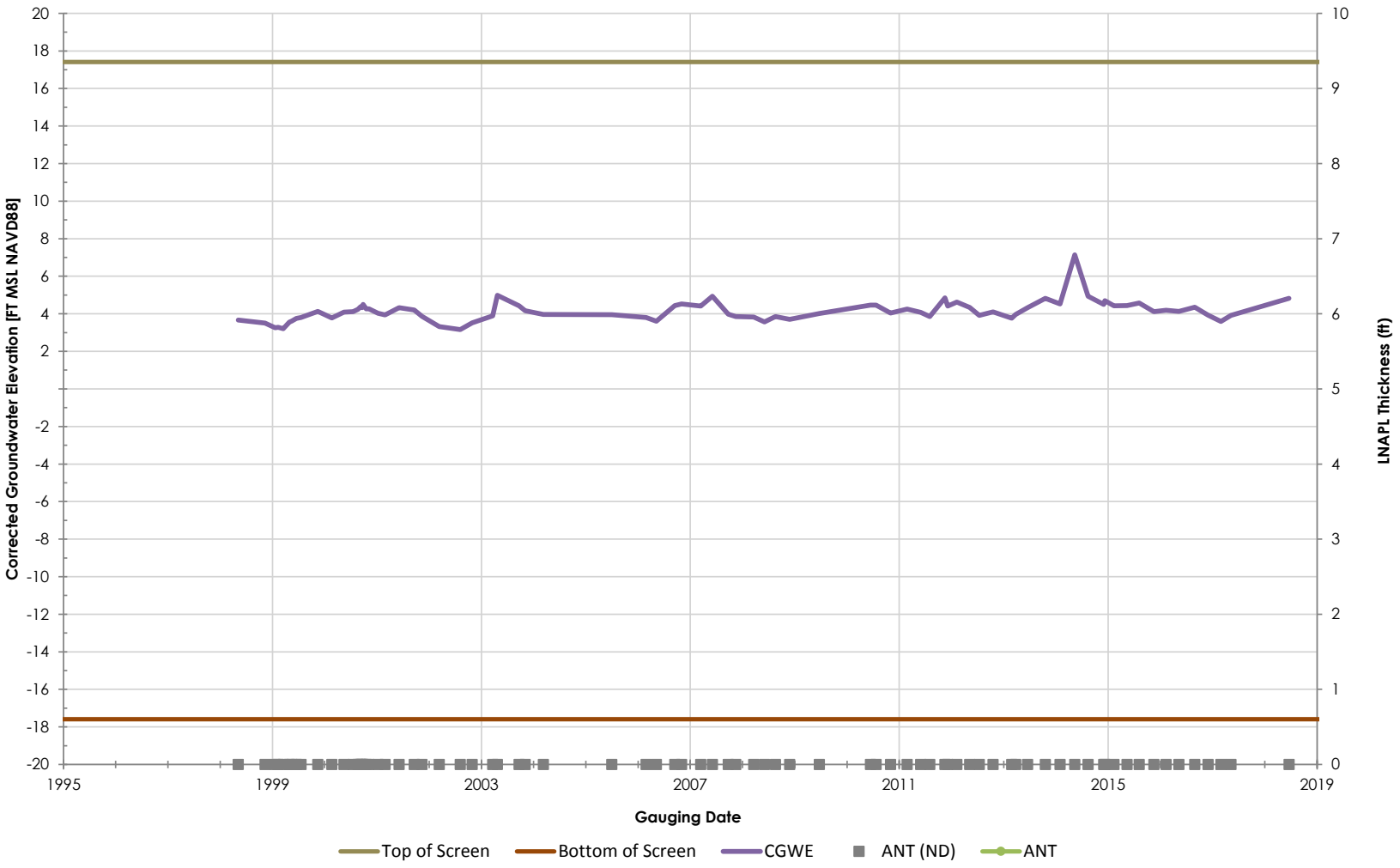
Stantec

Figure/Well No.

OW-13

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

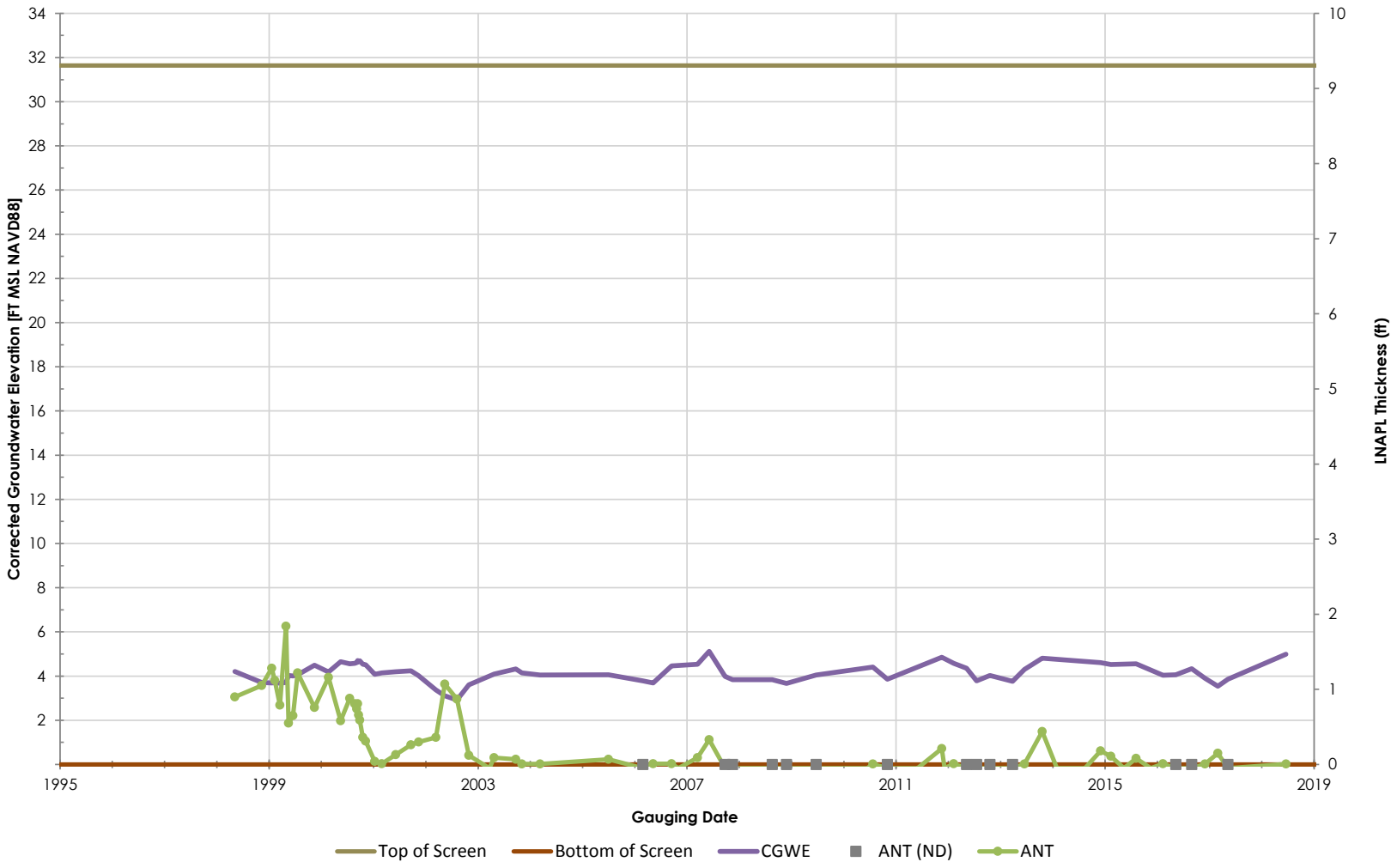
Stantec

Figure/Well No.

OW-14

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

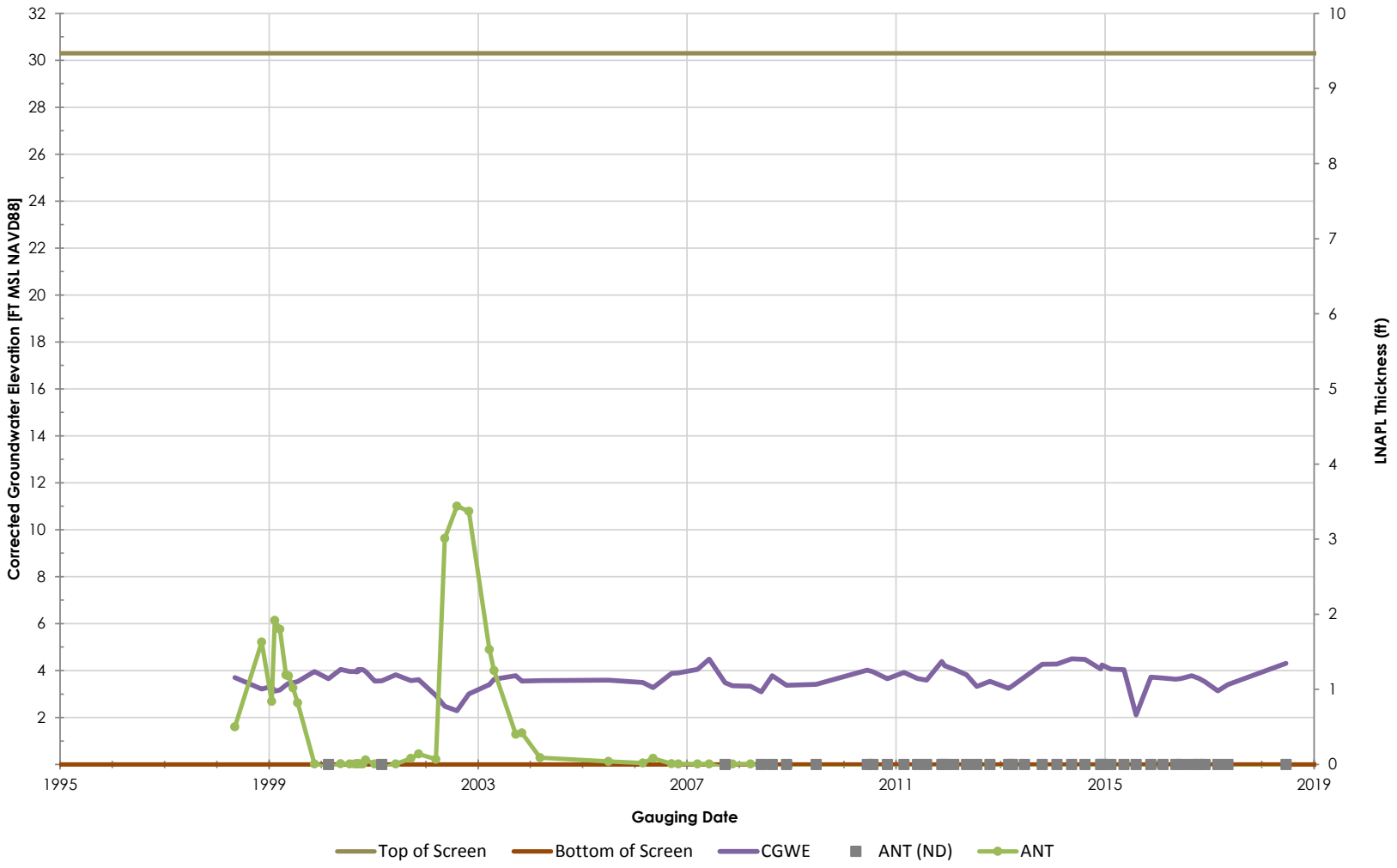
Stantec

Figure/Well No.

OW-16

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

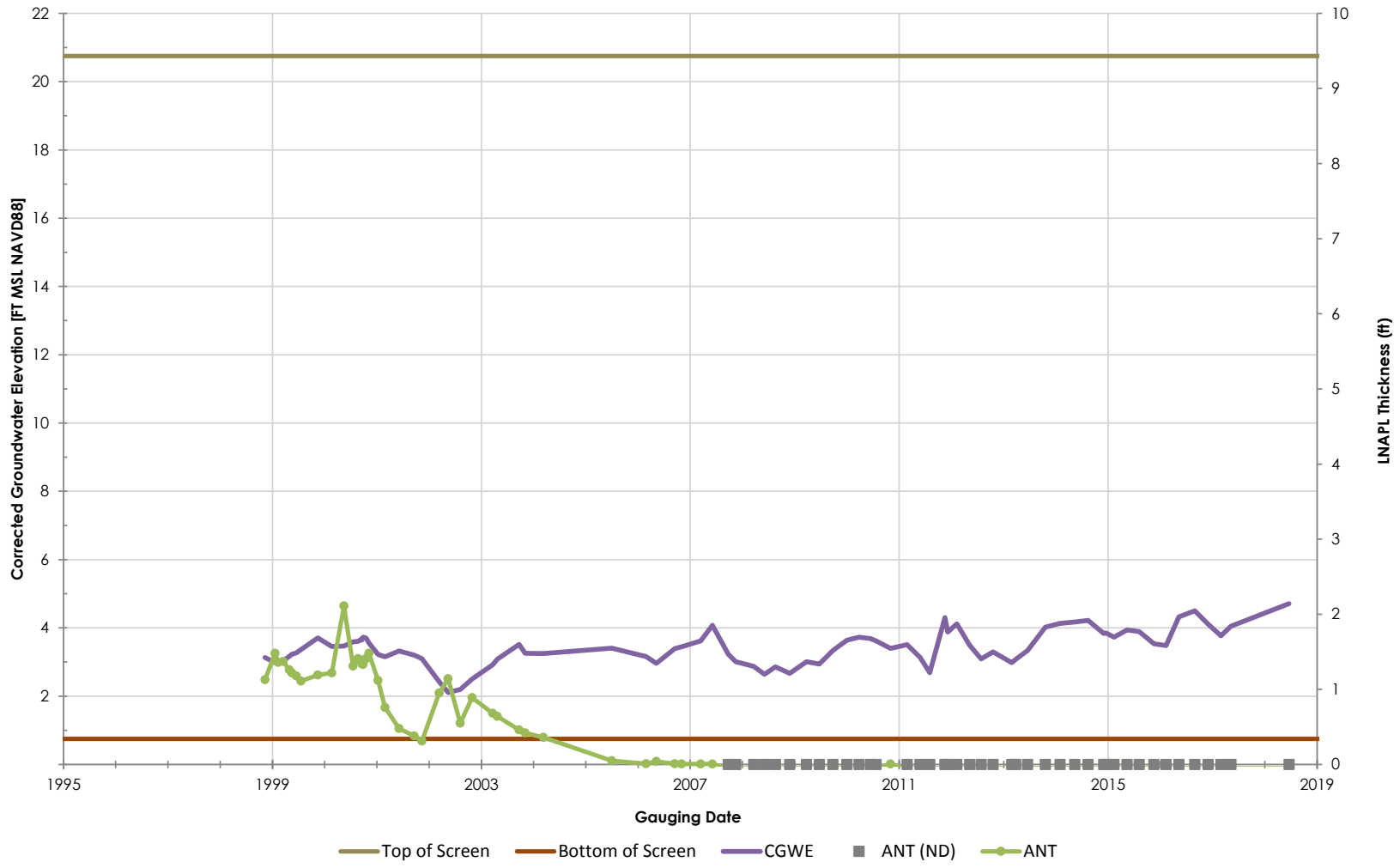
Stantec

Figure/Well No.

OW-17

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

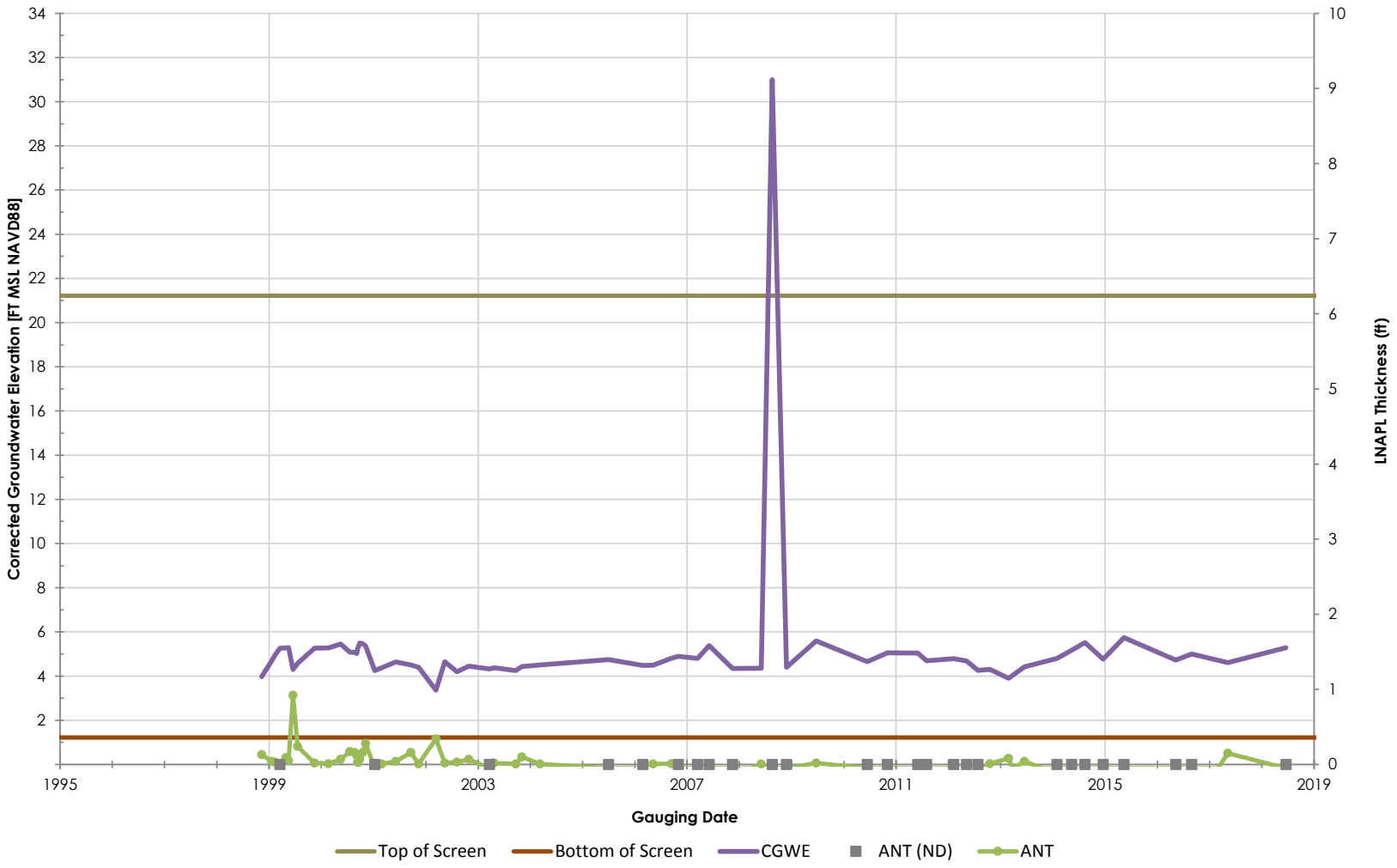
Stantec

Figure/Well No.

OW-18

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

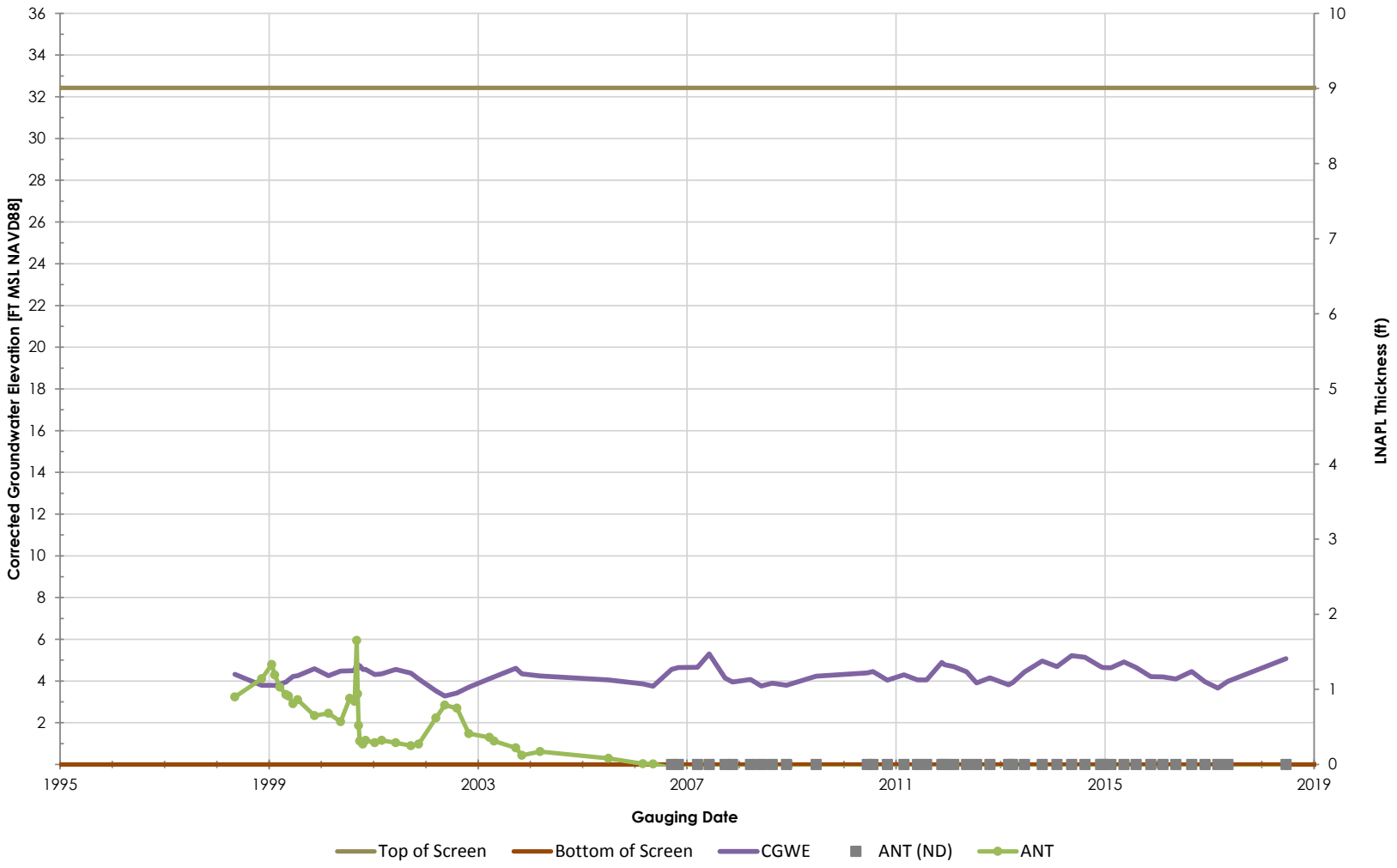
Stantec

Figure/Well No.

OW-19

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

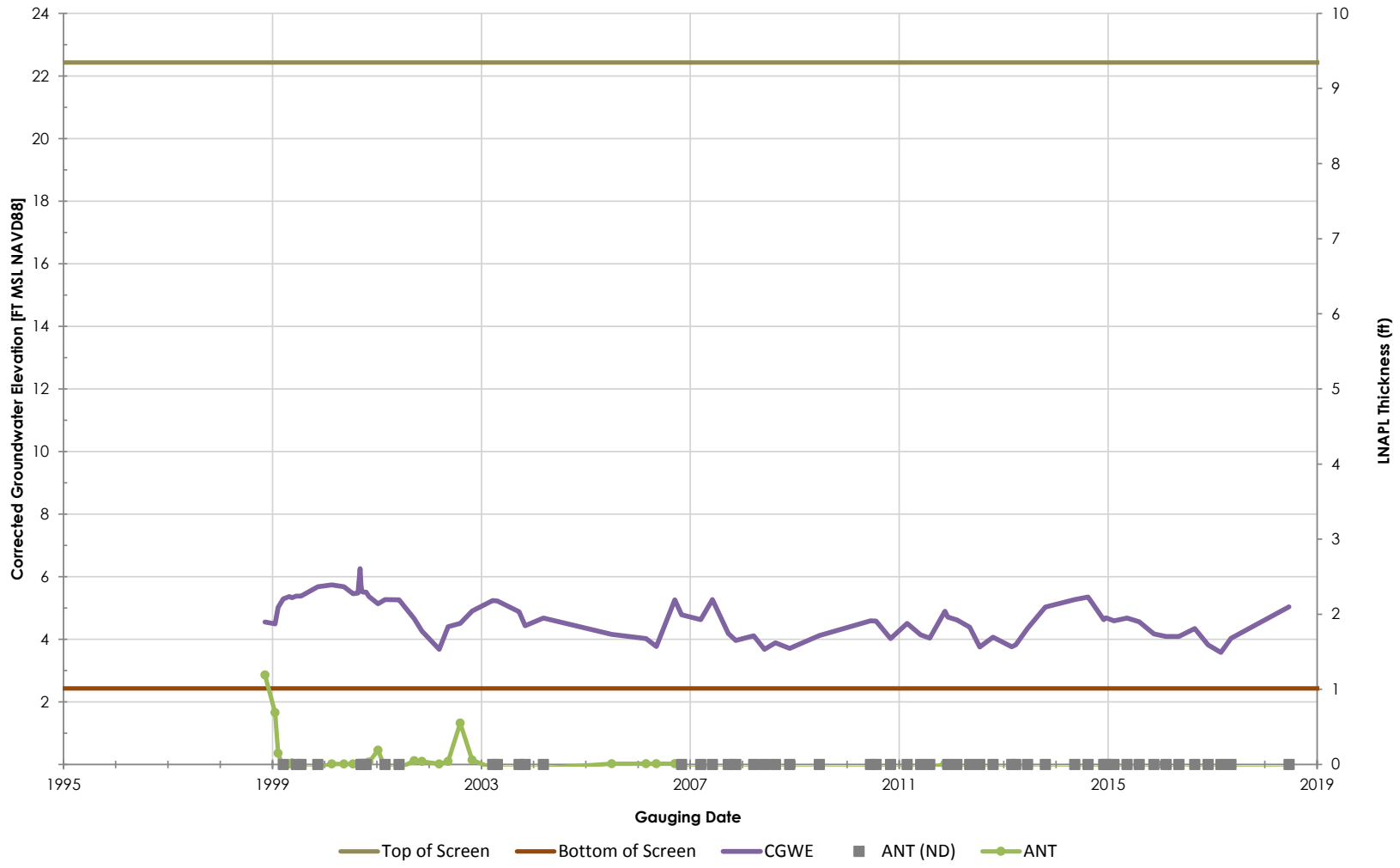
Stantec

Figure/Well No.

OW-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

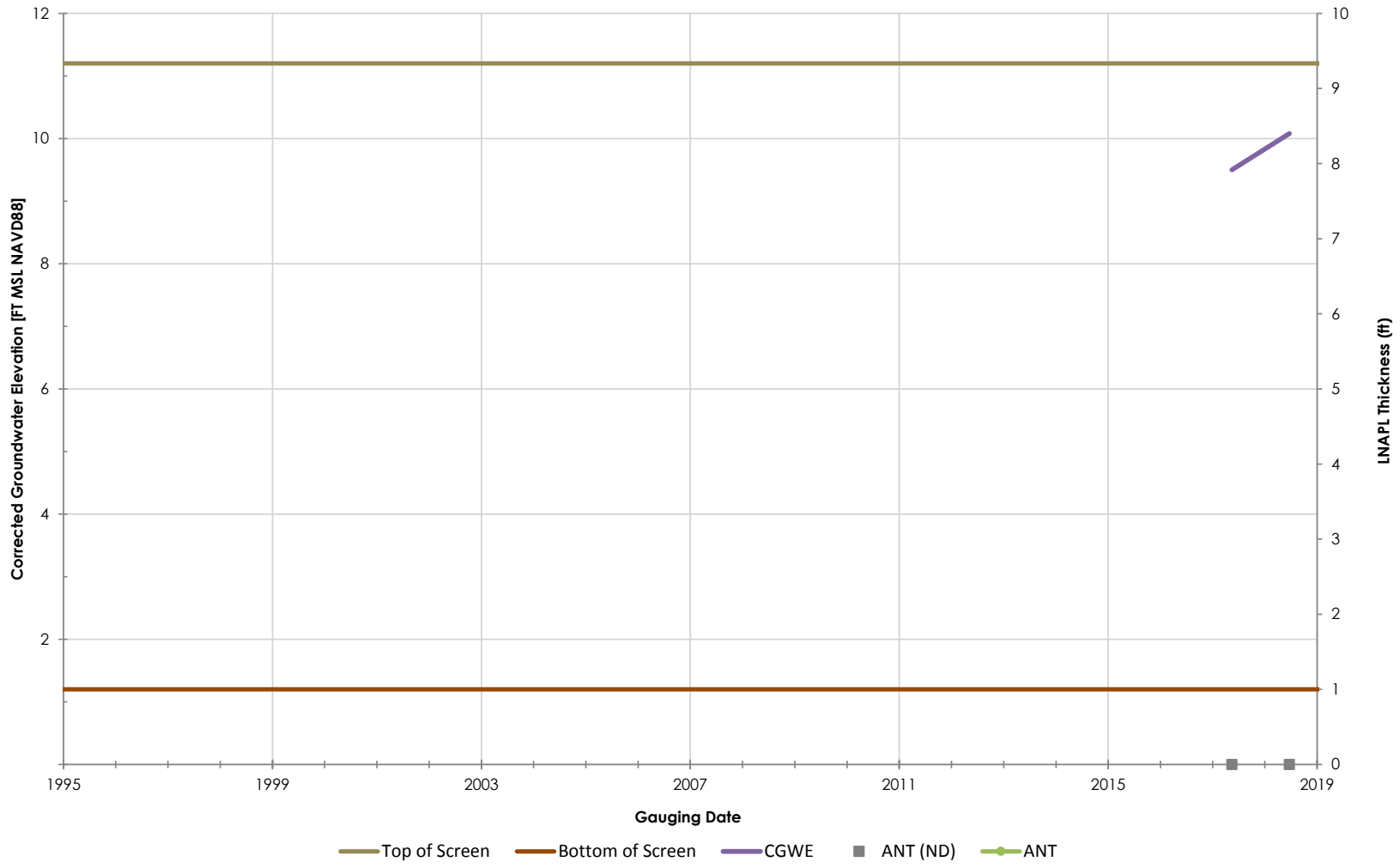
Stantec

Figure/Well No.

OW-20

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

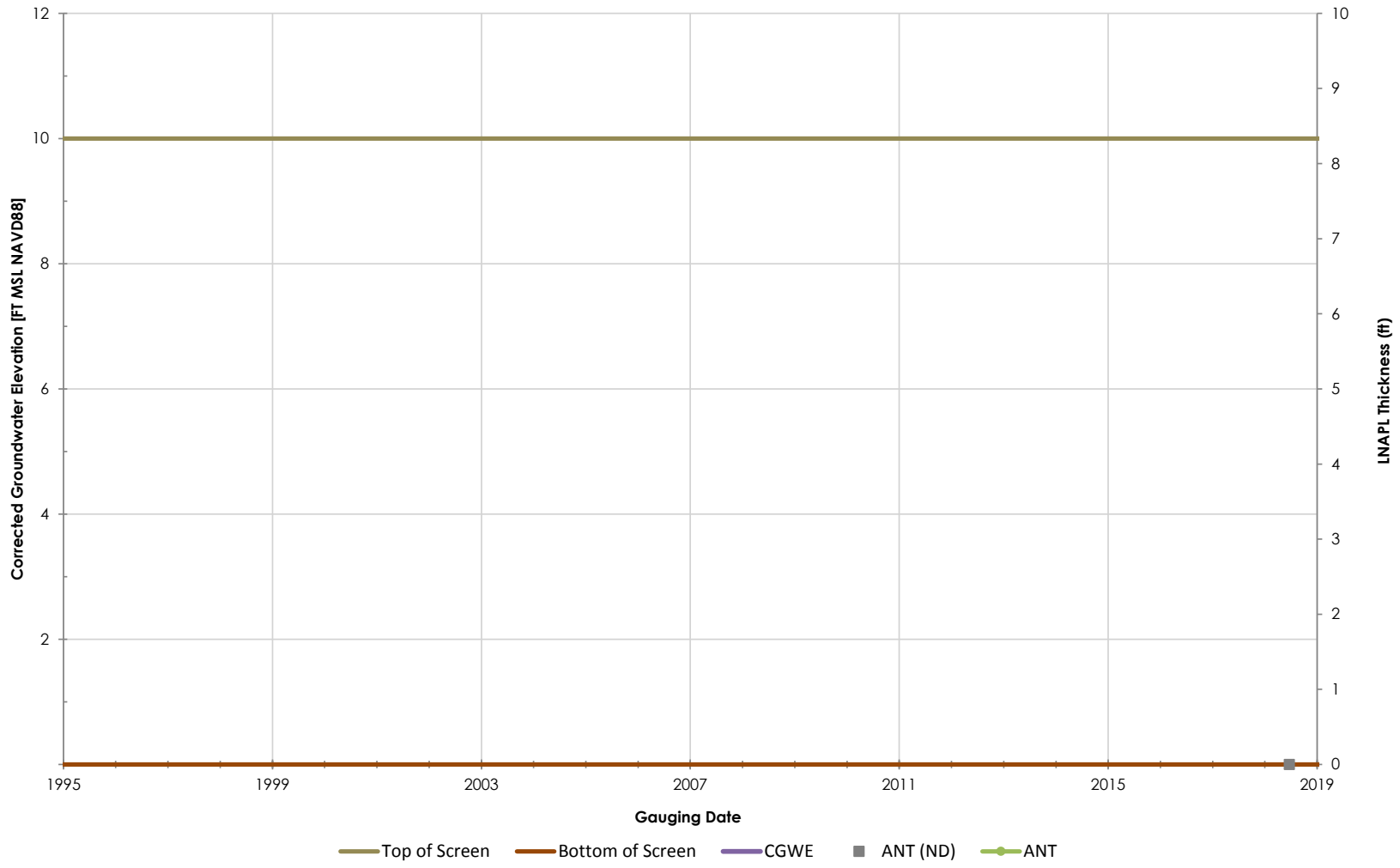
Stantec

Figure/Well No.

PGW-MW-10S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

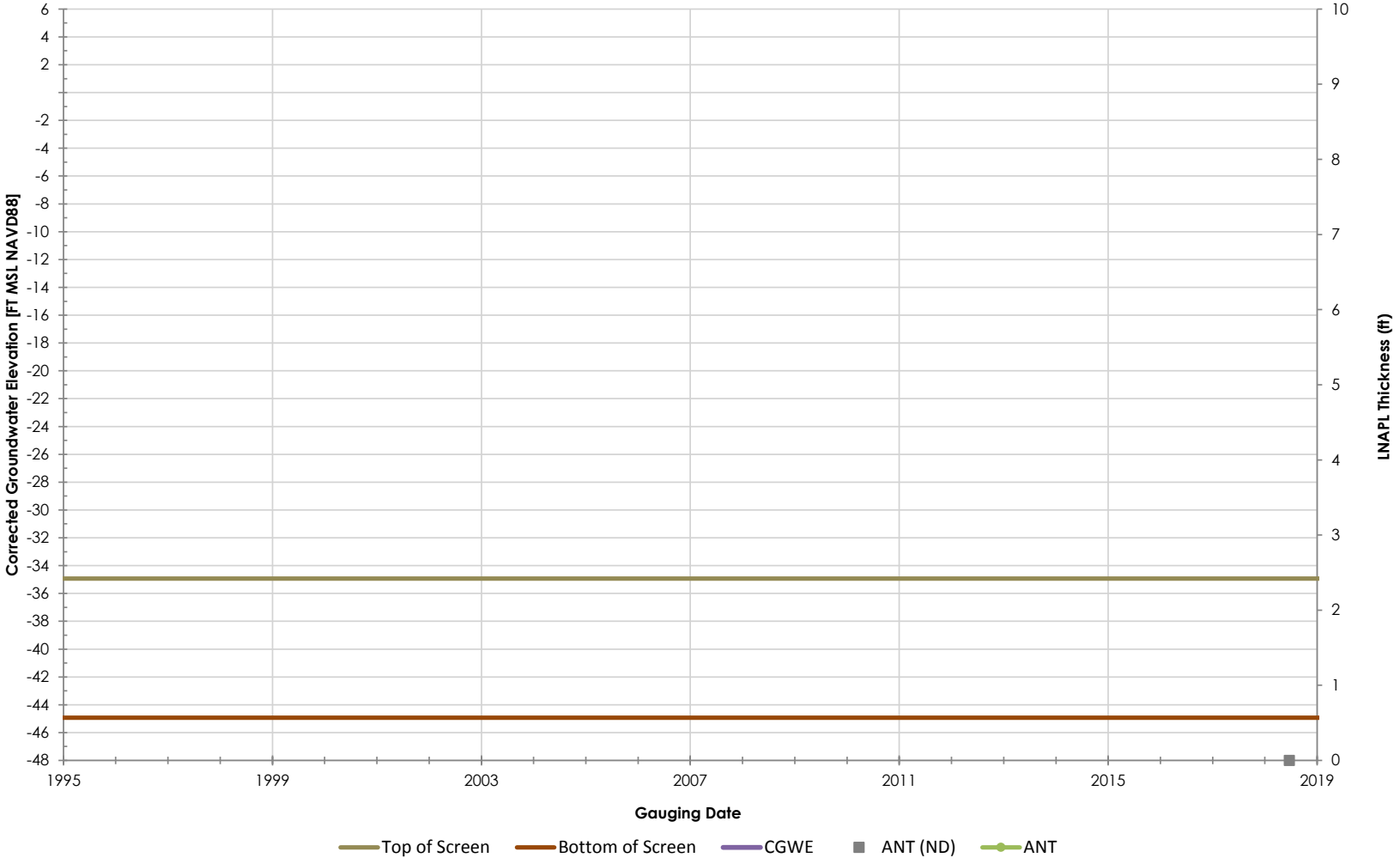
Stantec

Figure/Well No.

PGW-MW-11S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

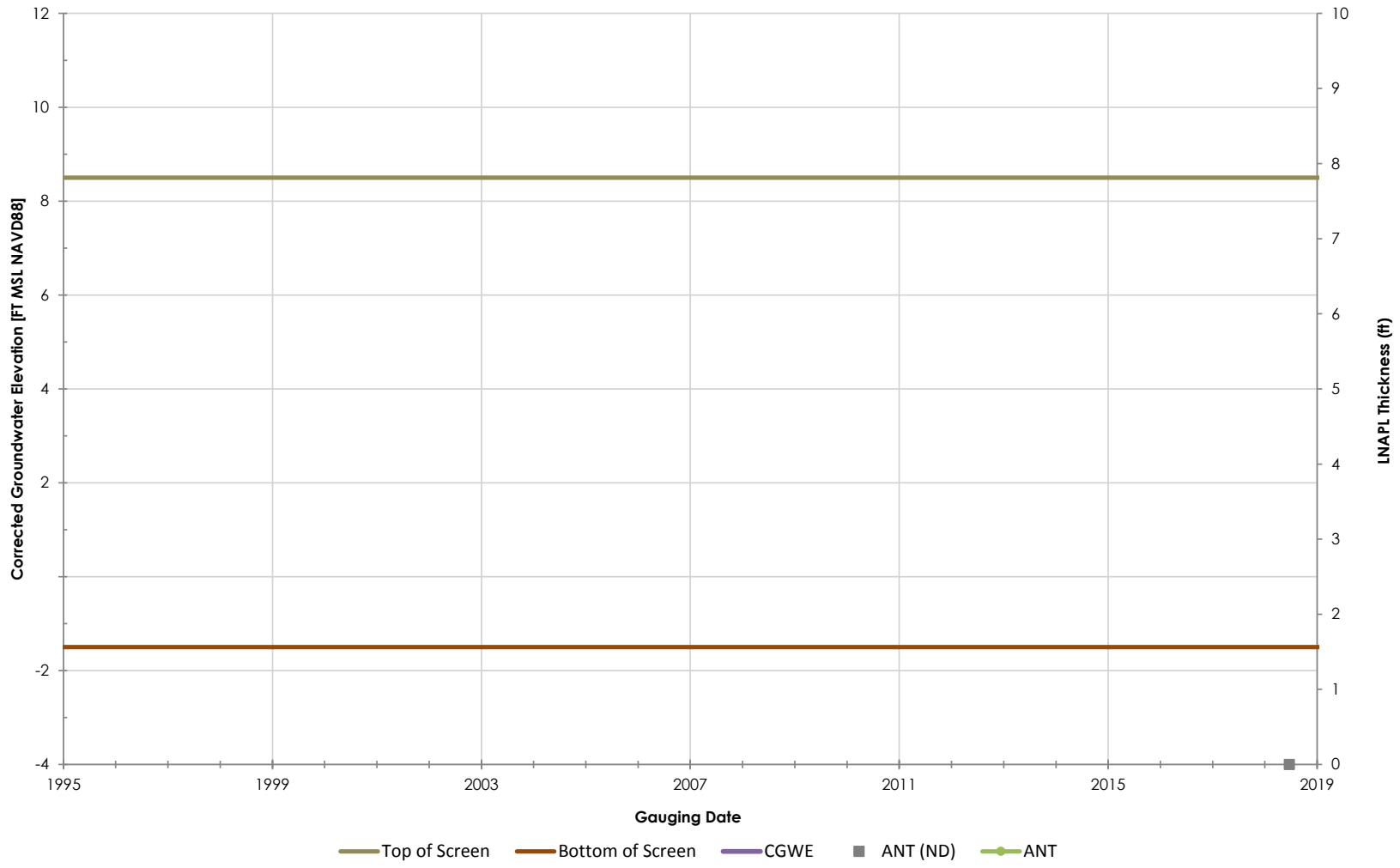
Stantec

Figure/Well No.

PGW-MW-12D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

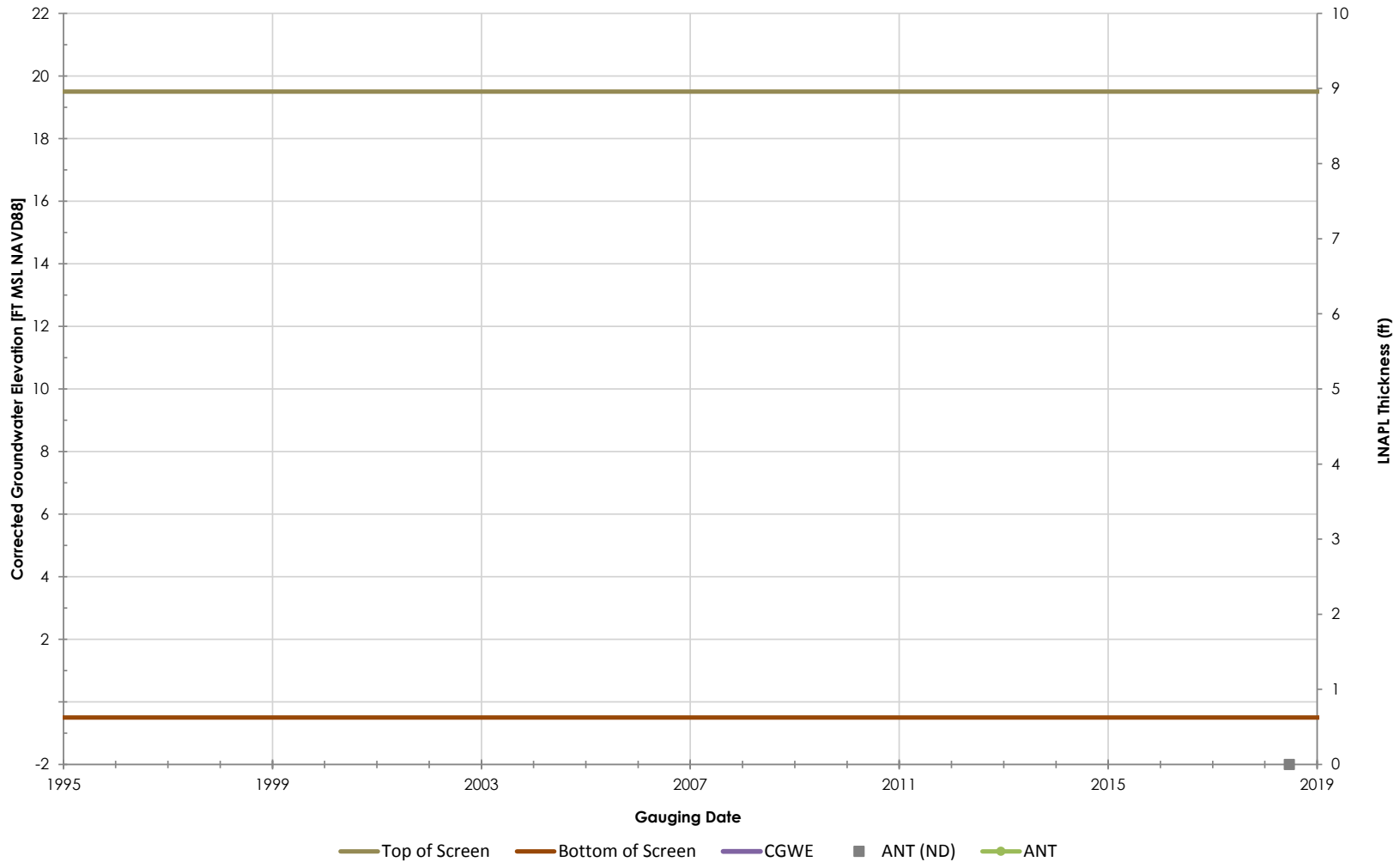
Stantec

Figure/Well No.

PGW-MW-12S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

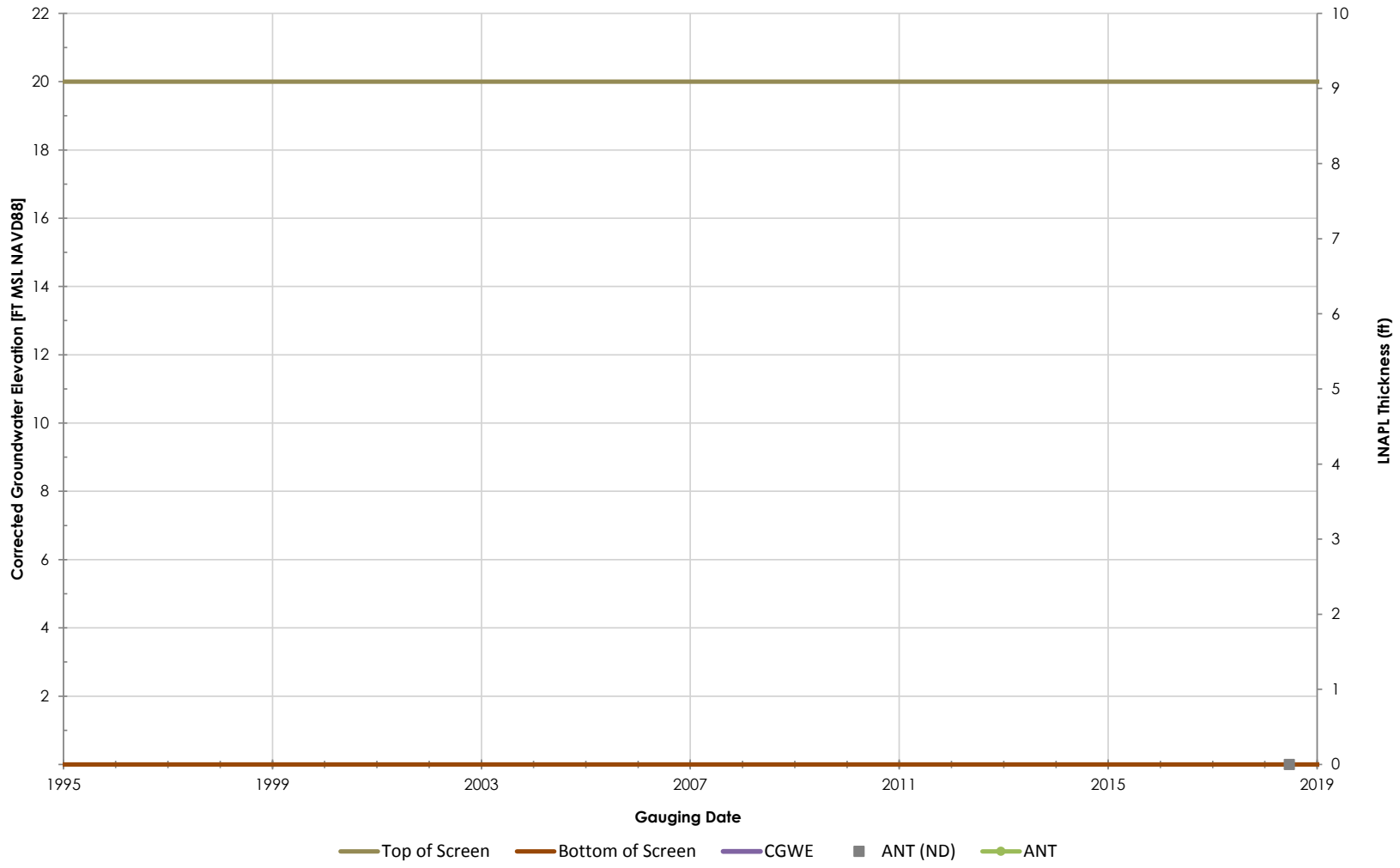
Stantec

Figure/Well No.

PGW-MW-13S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

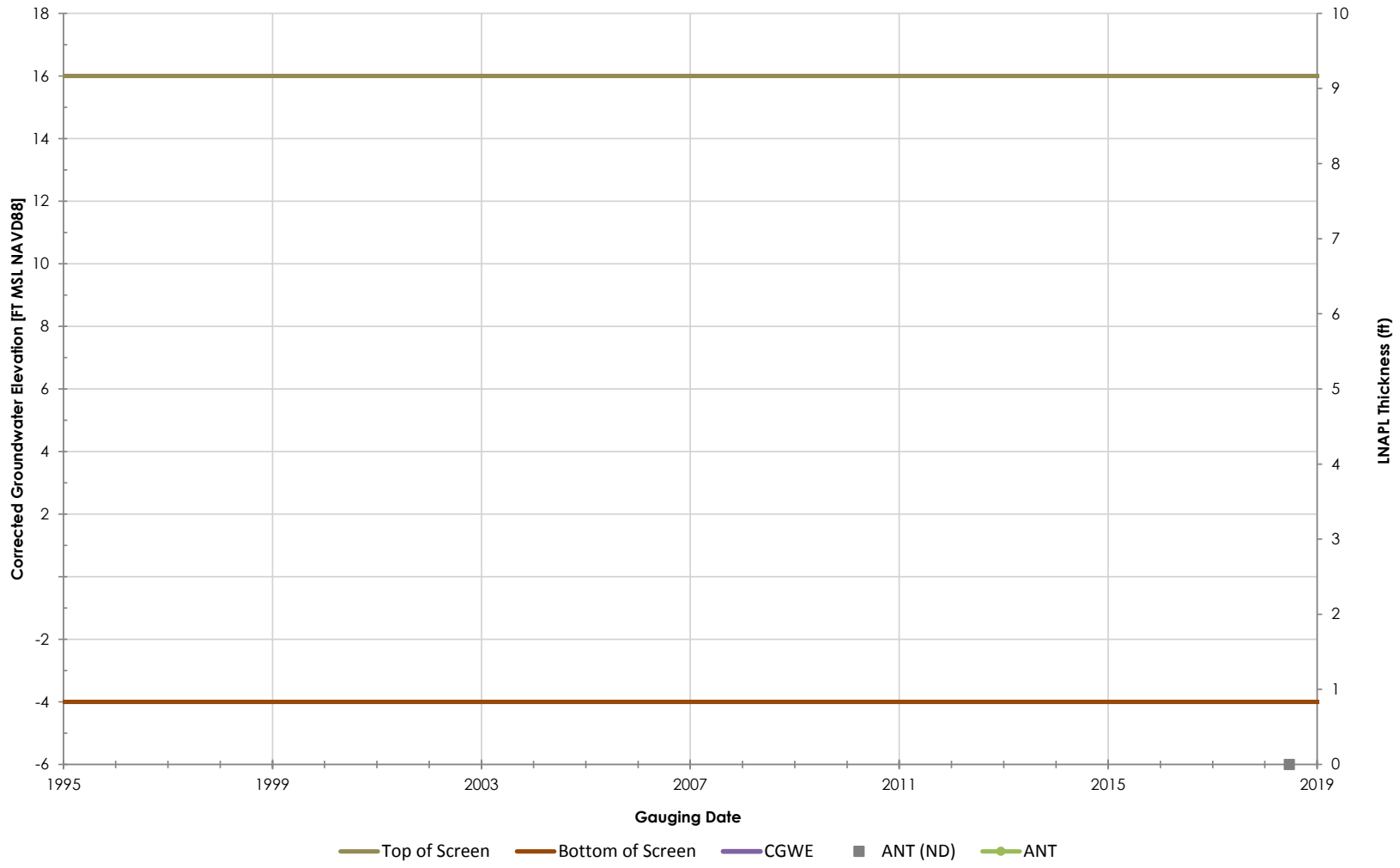
Stantec

Figure/Well No.

PGW-MW-14S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

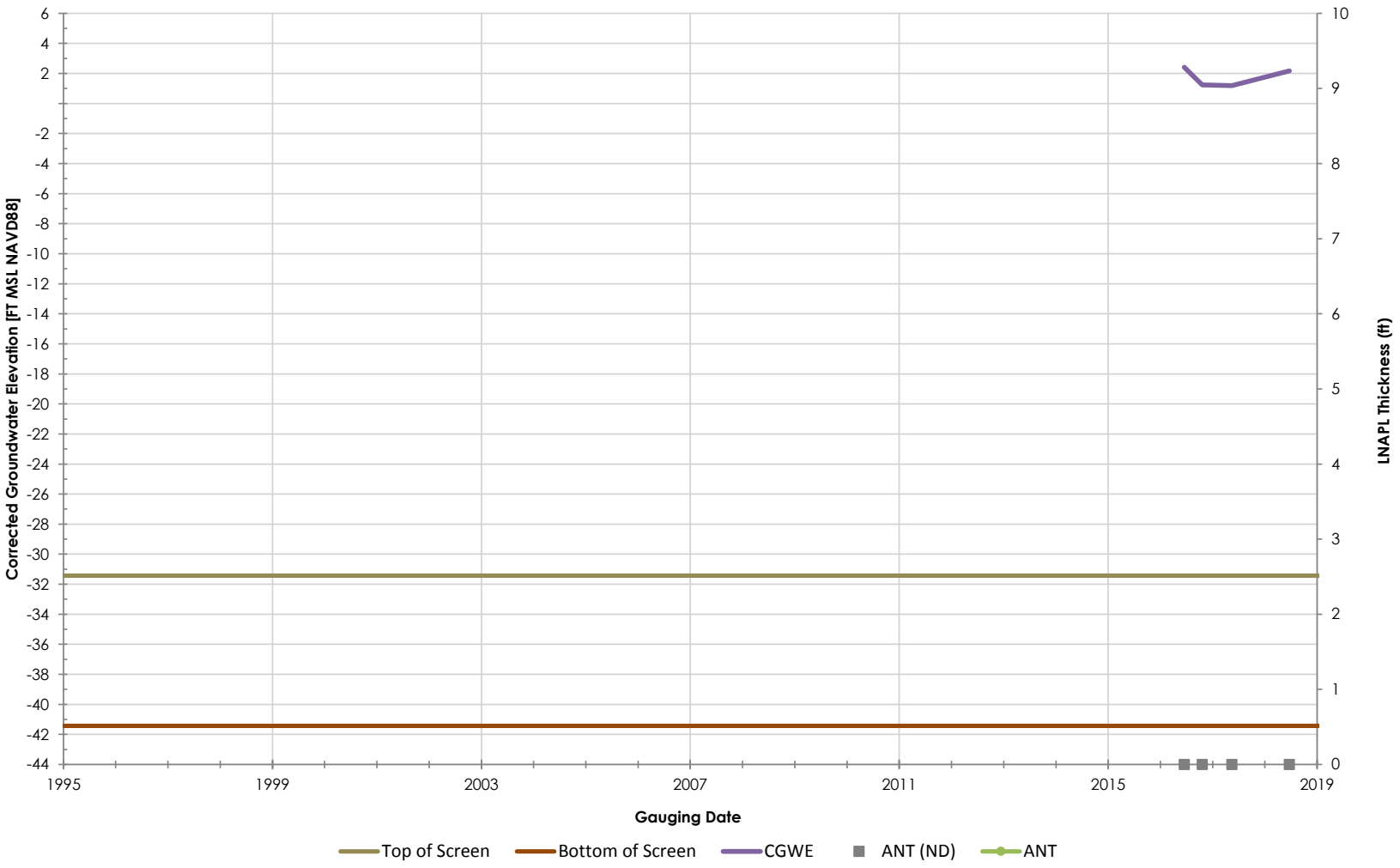
Stantec

Figure/Well No.

PGW-MW-15S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

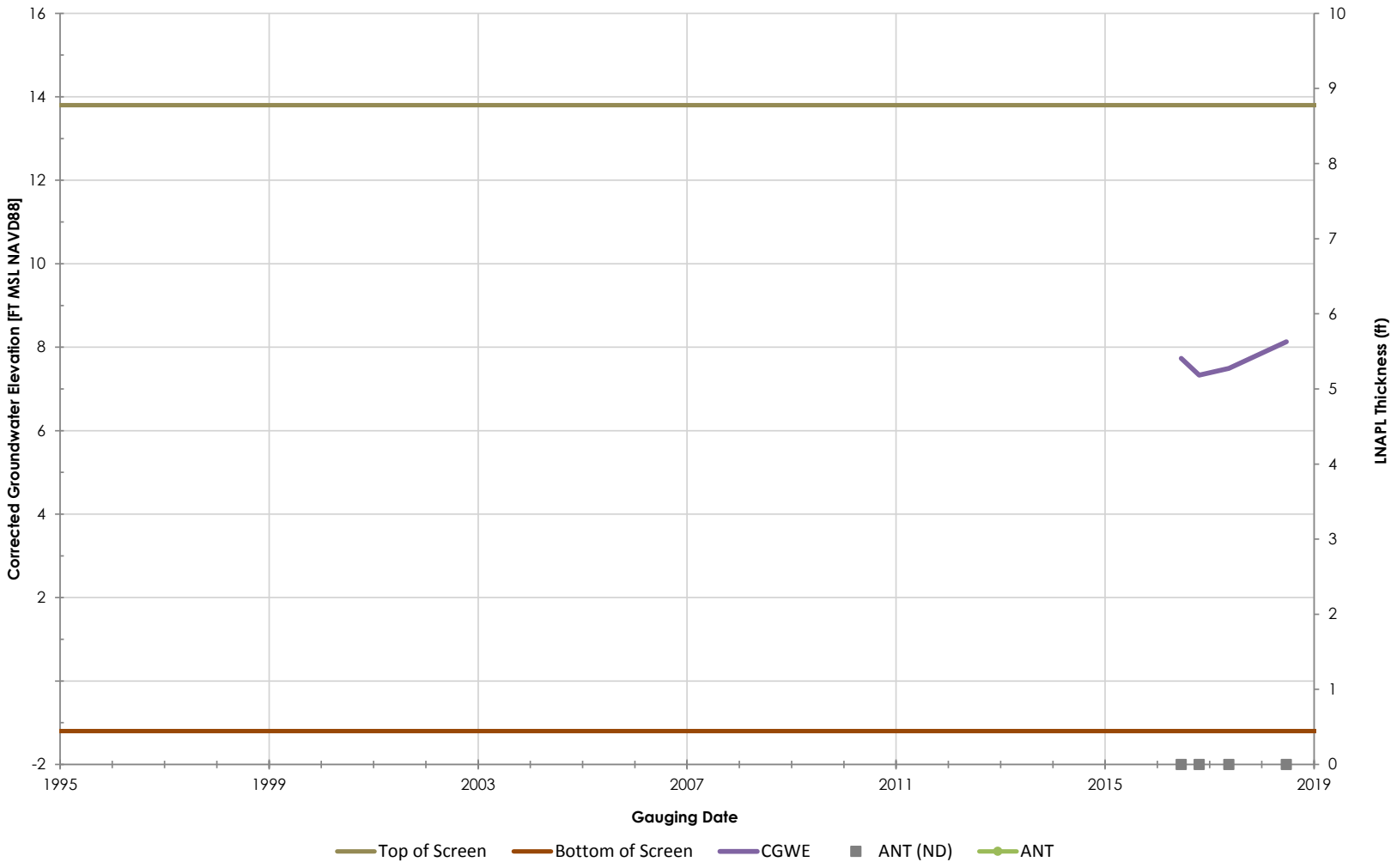
Stantec

Figure/Well No.

PGW-MW-1D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



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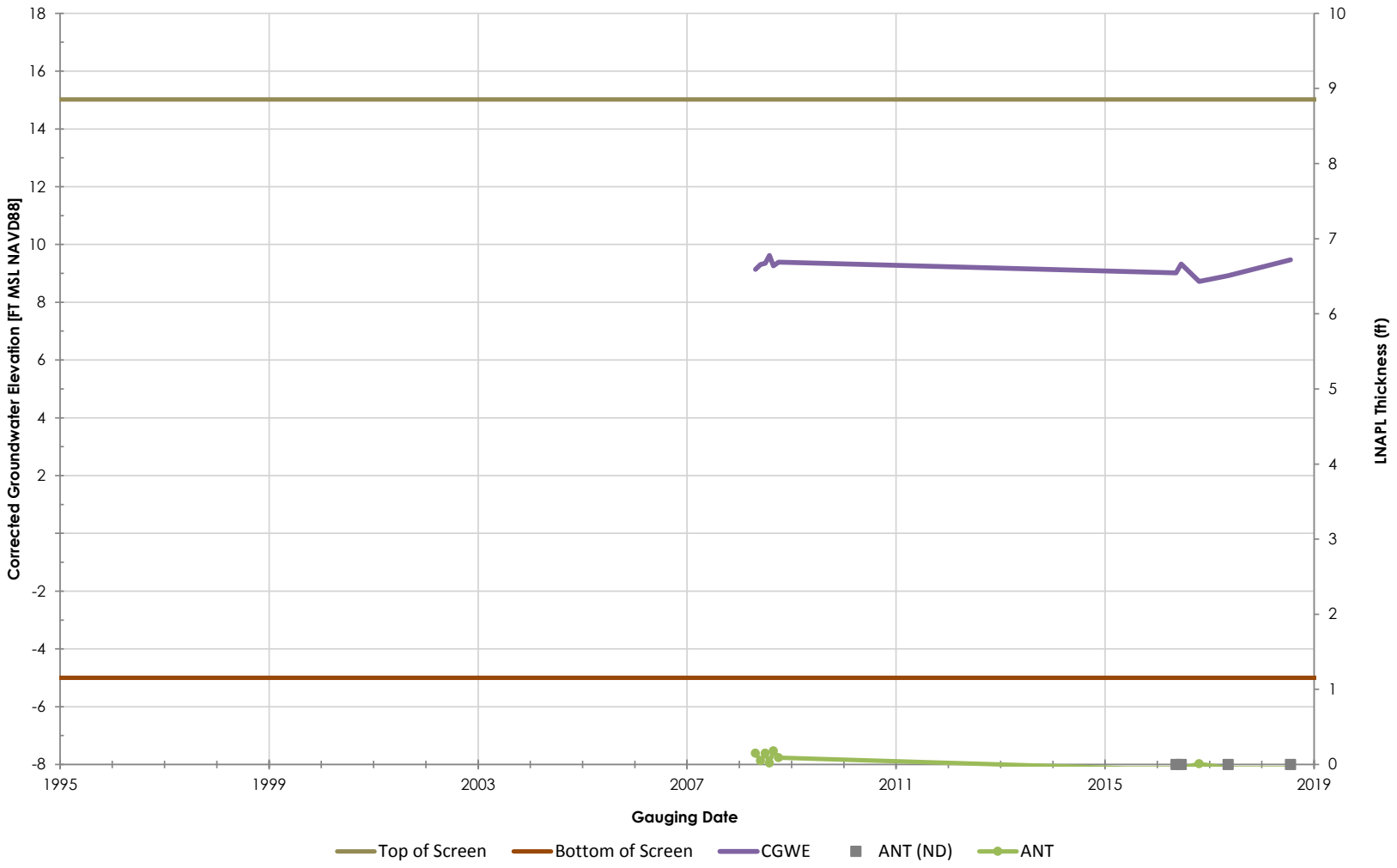
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

PGW-MW-1S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

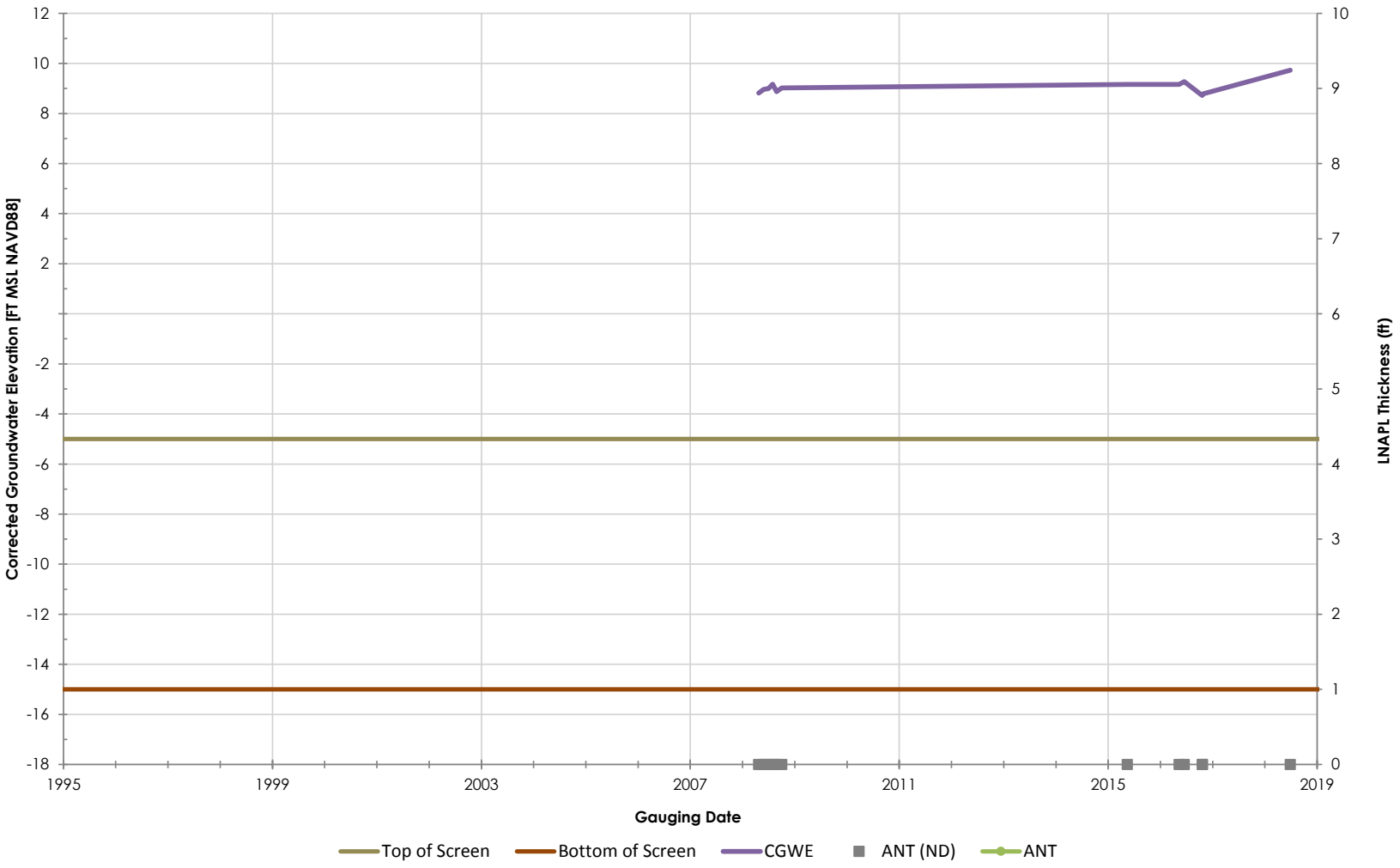
Stantec

Figure/Well No.

PGW-MW-20

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

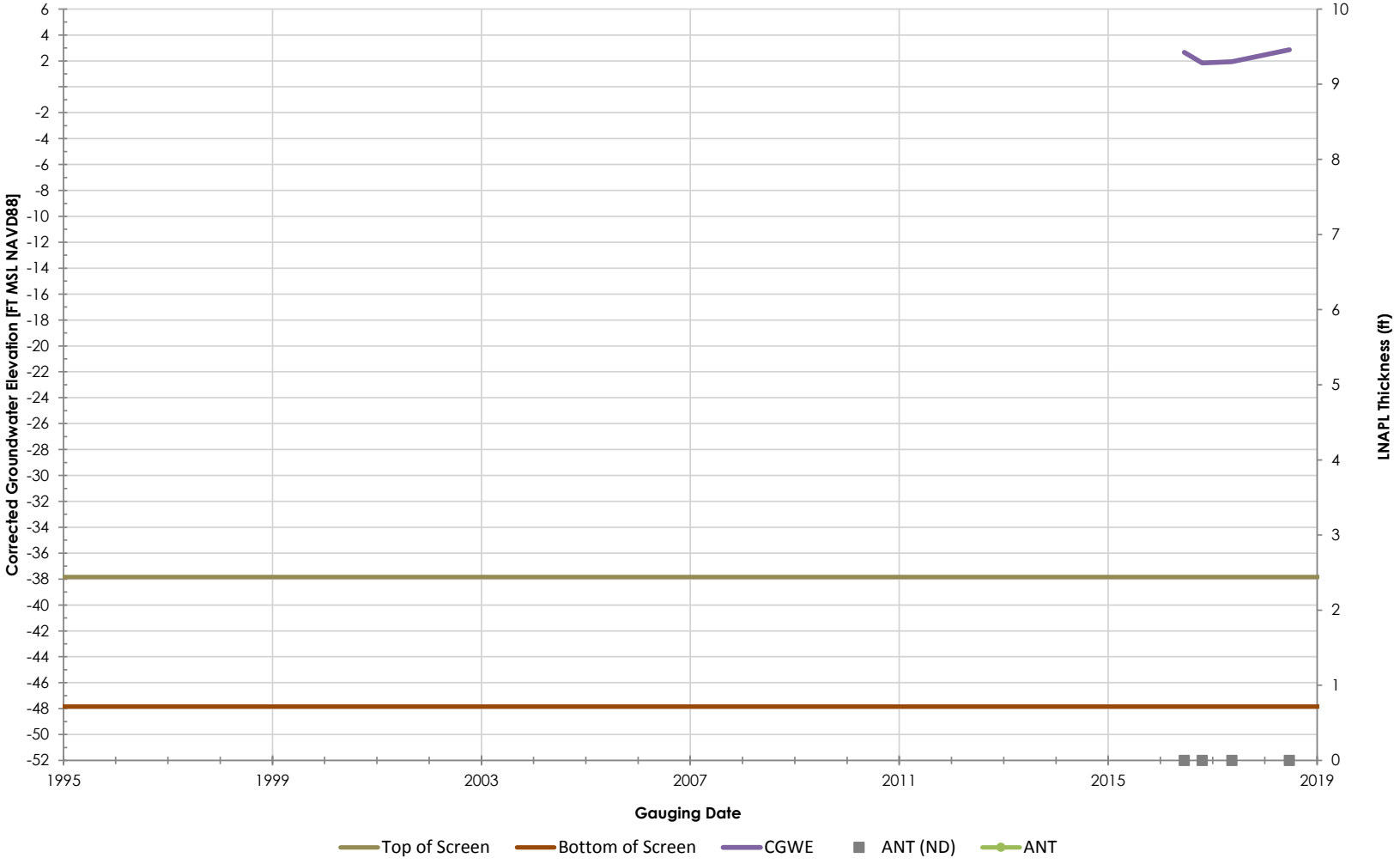
Stantec

Figure/Well No.

PGW-MW-21

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

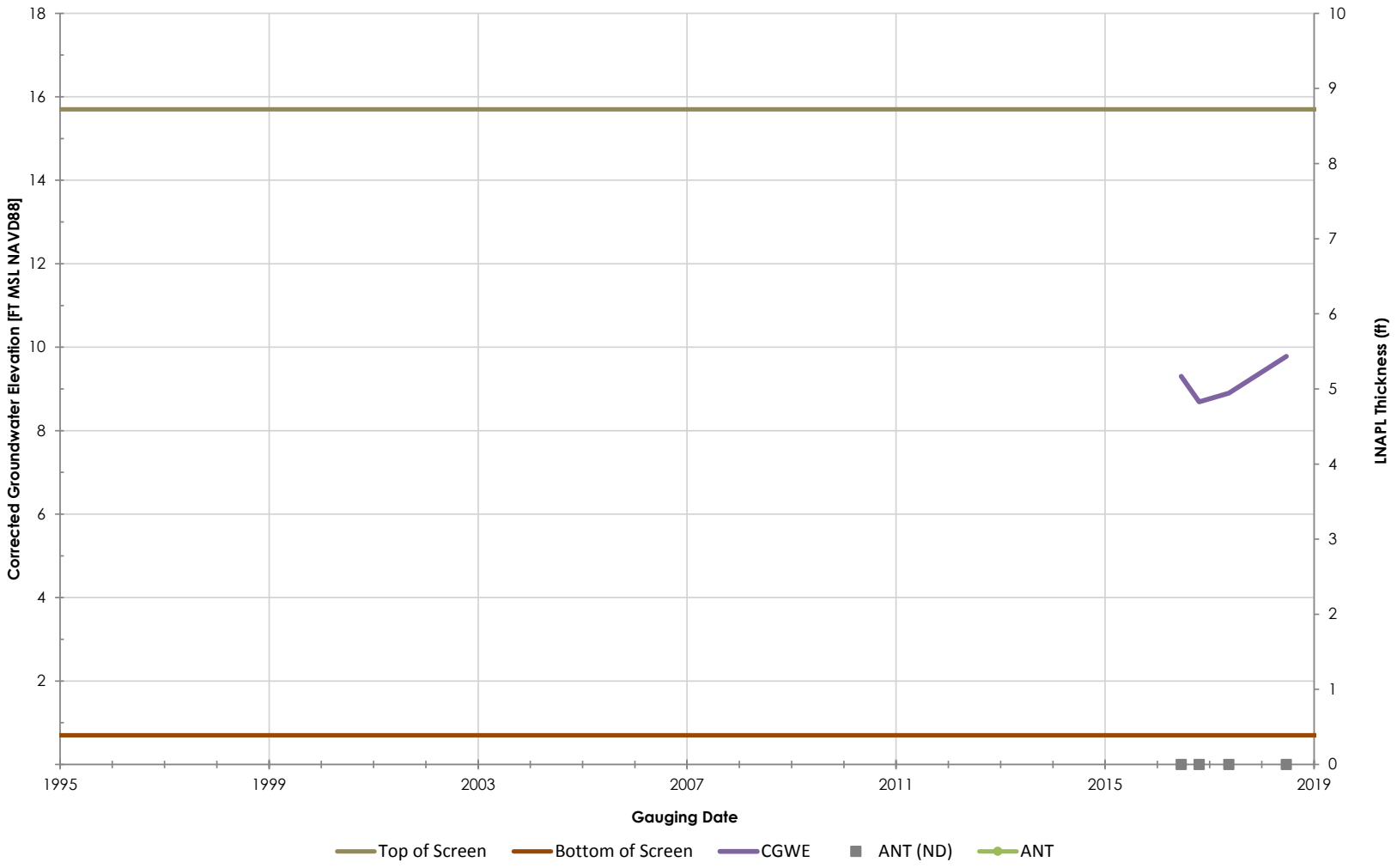
Stantec

Figure/Well No.

PGW-MW-2D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

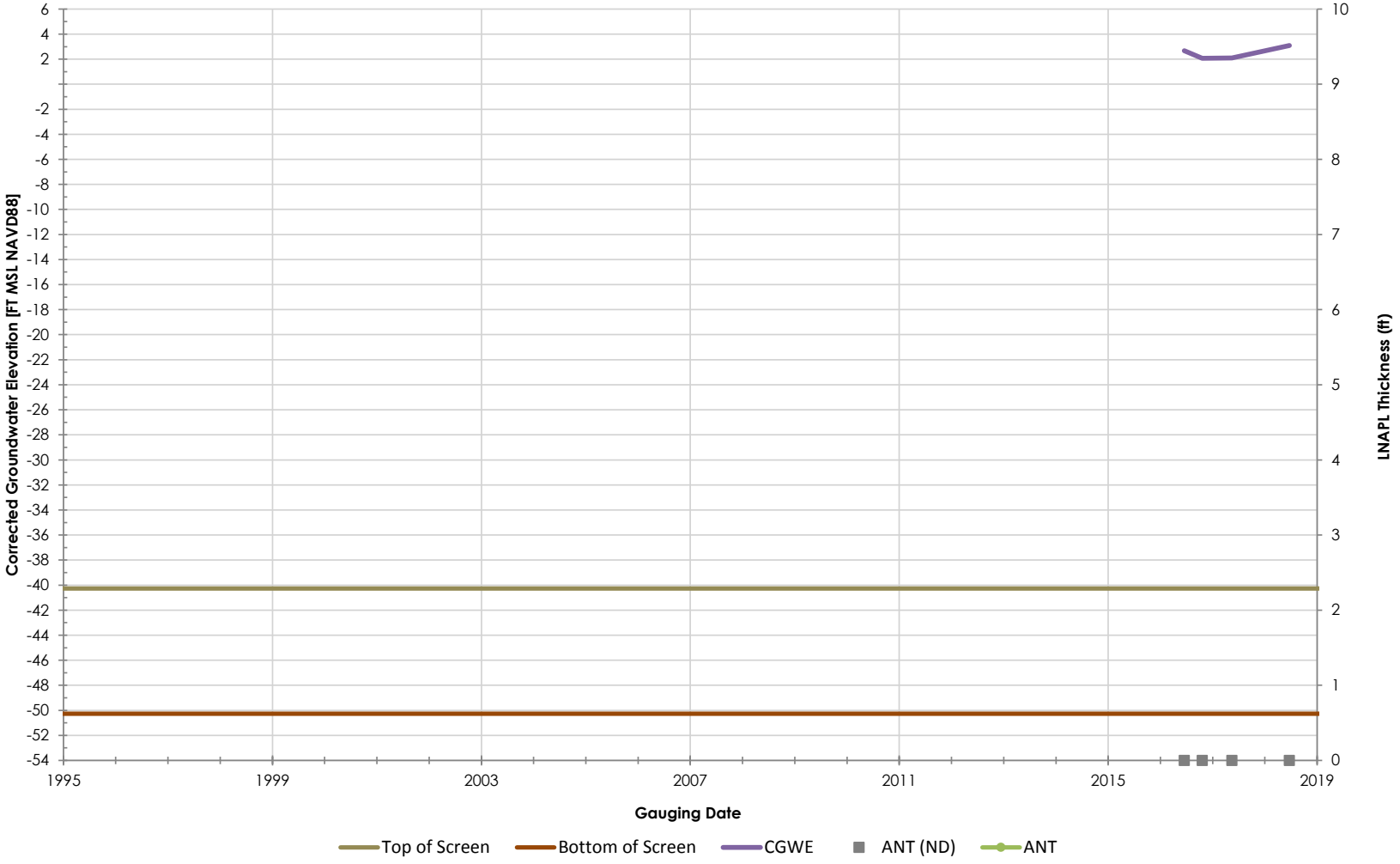
Stantec

Figure/Well No.

PGW-MW-2S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



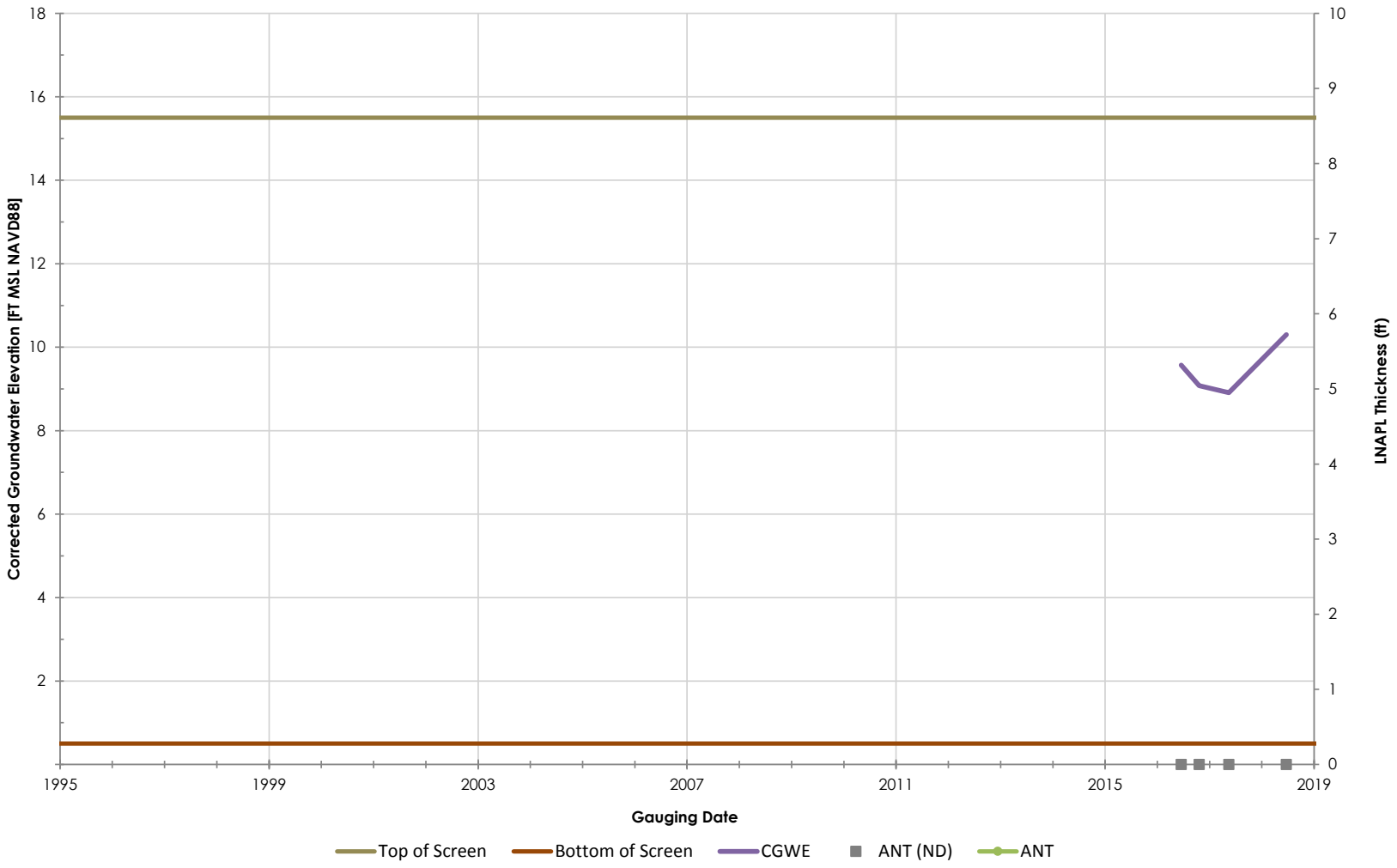
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

PGW-MW-3D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

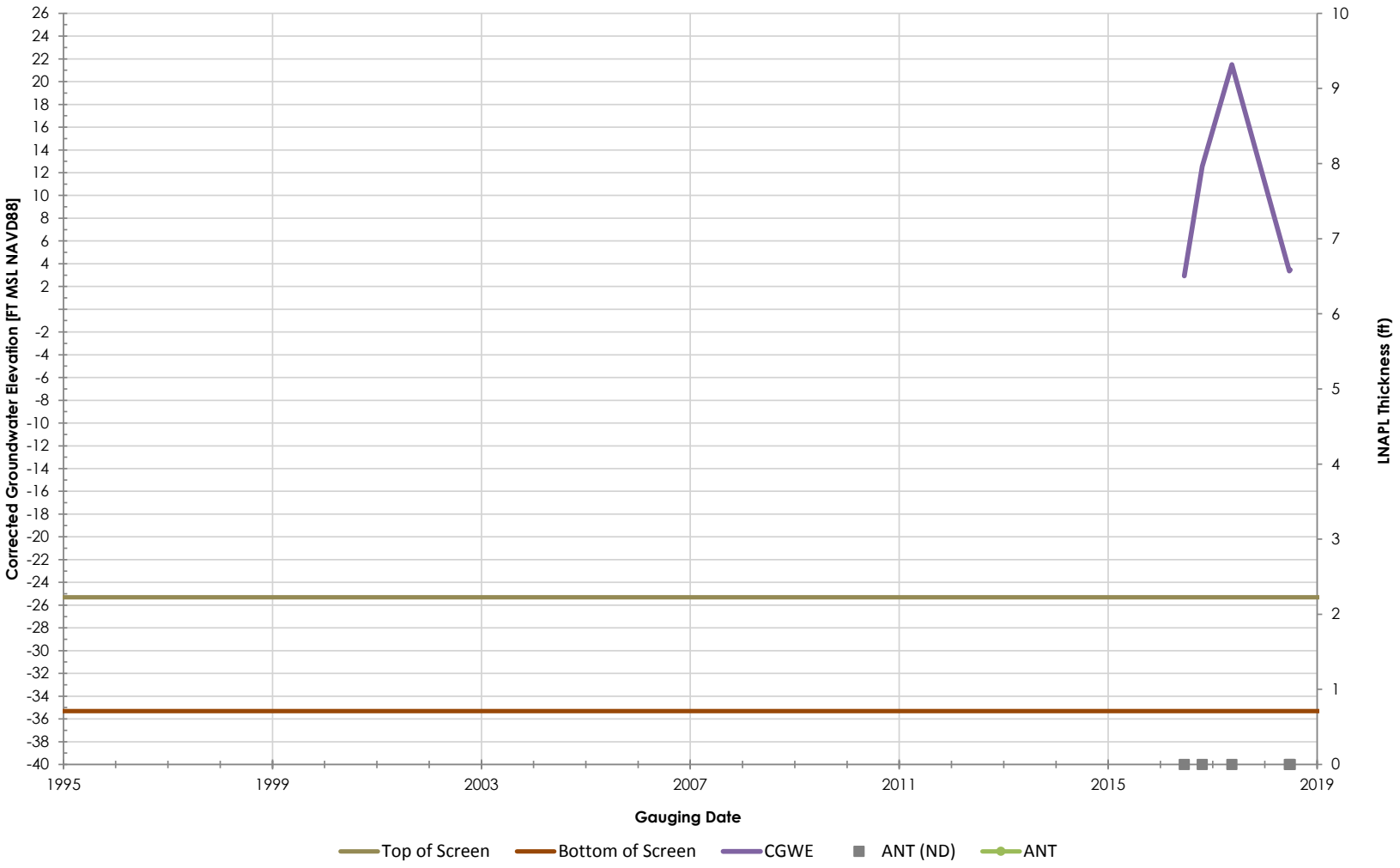
Stantec

Figure/Well No.

PGW-MW-3S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



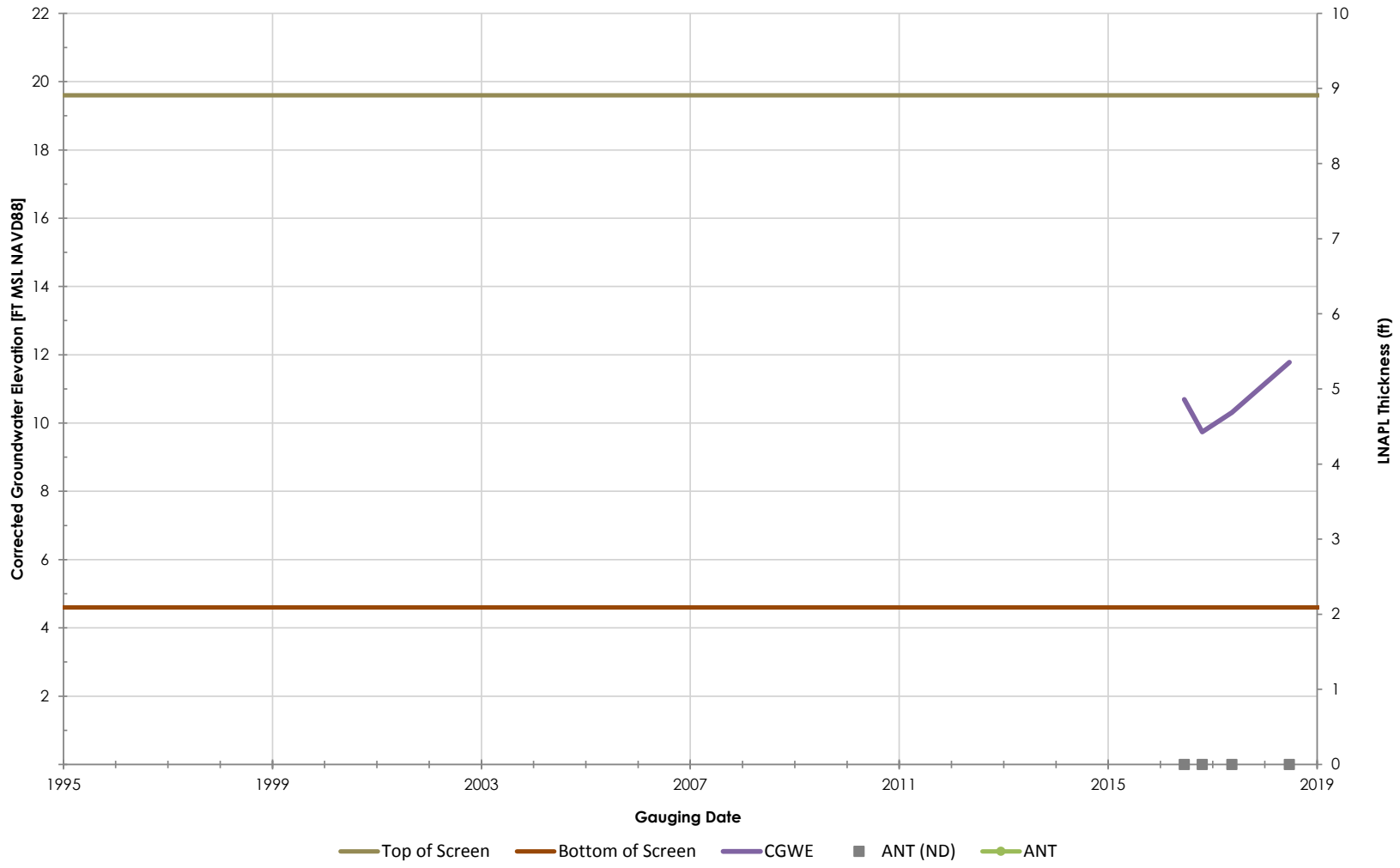
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

PGW-MW-42D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

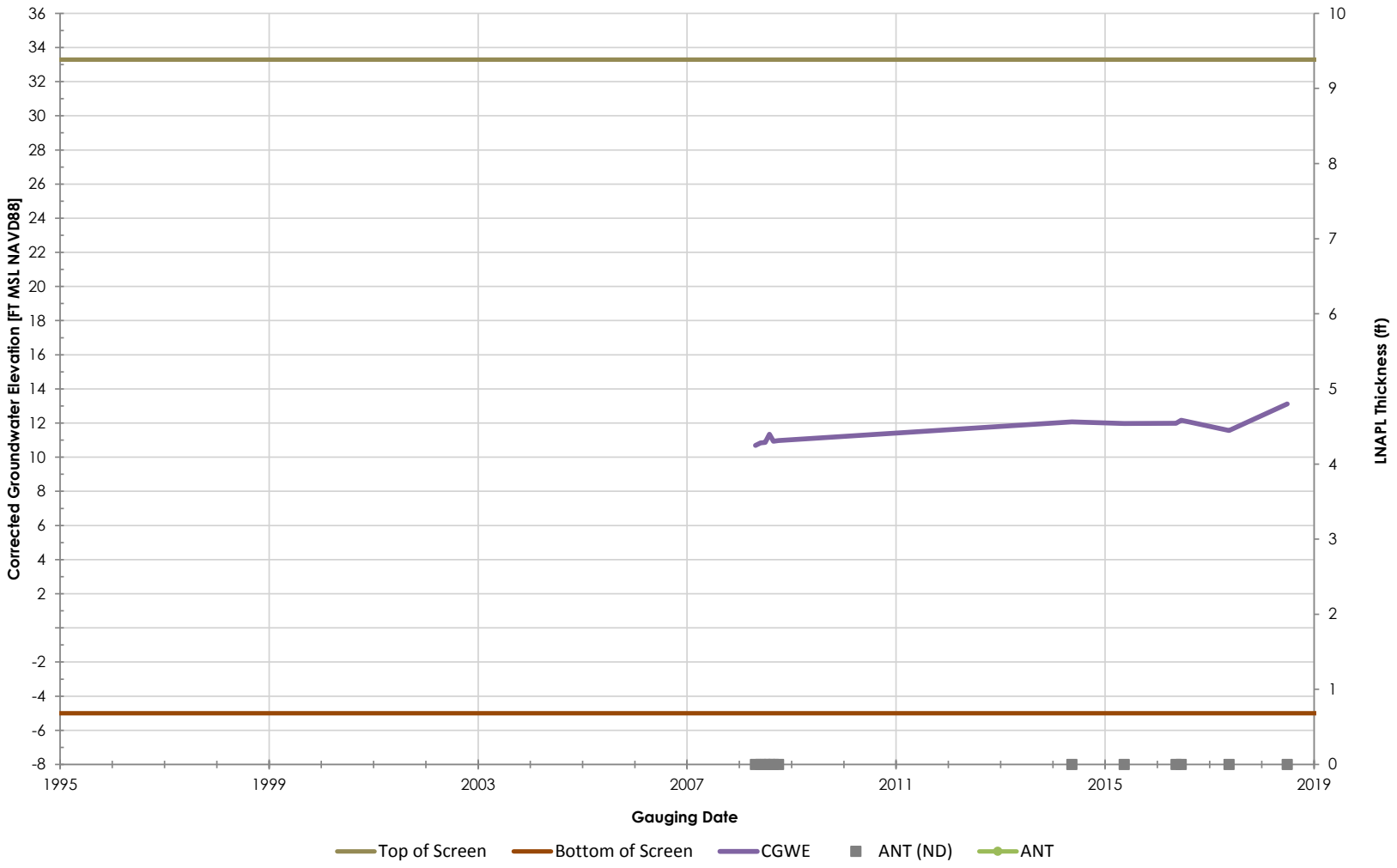
Stantec

Figure/Well No.

PGW-MW-42R

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

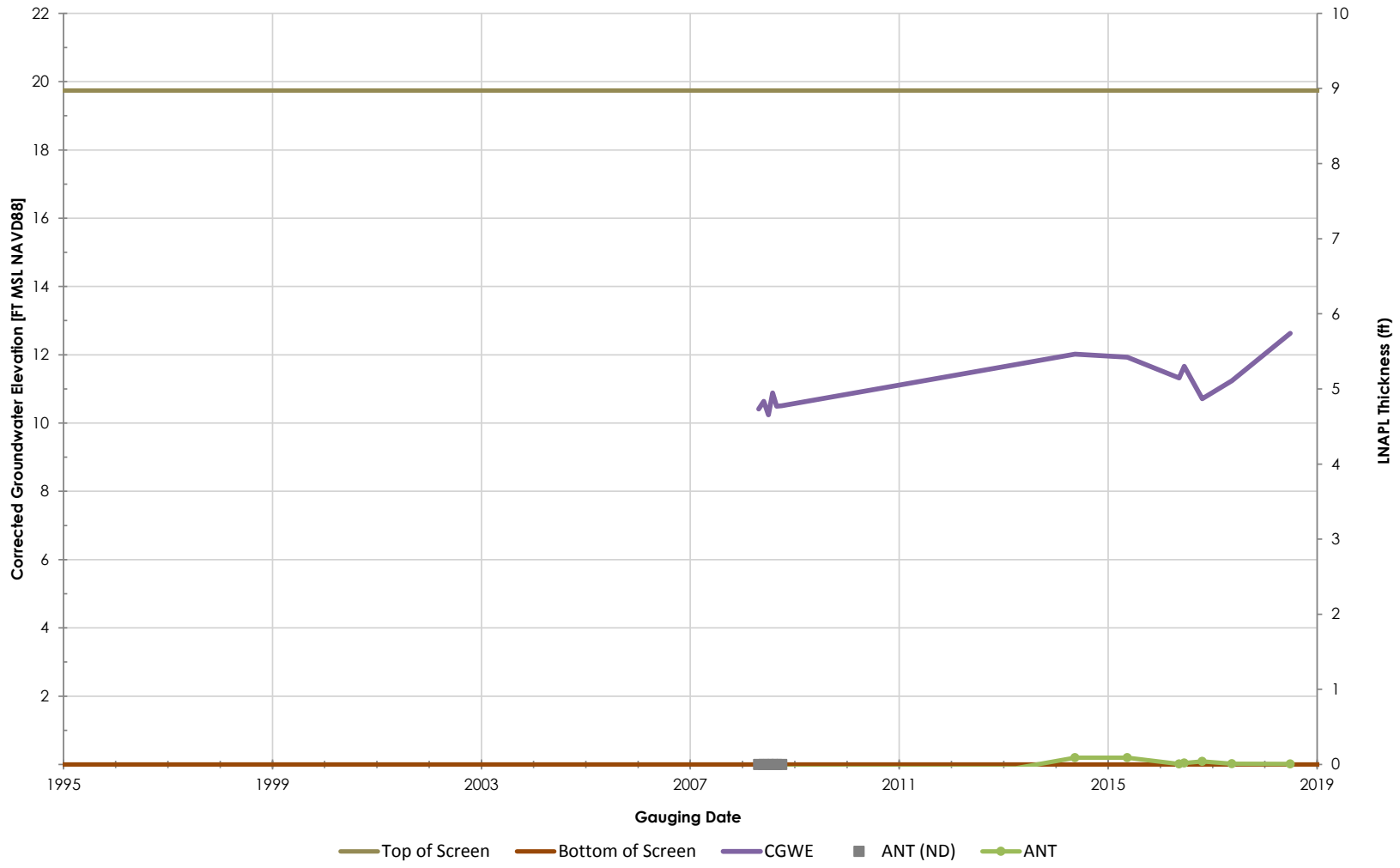
Stantec

Figure/Well No.

PGW-MW-44

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

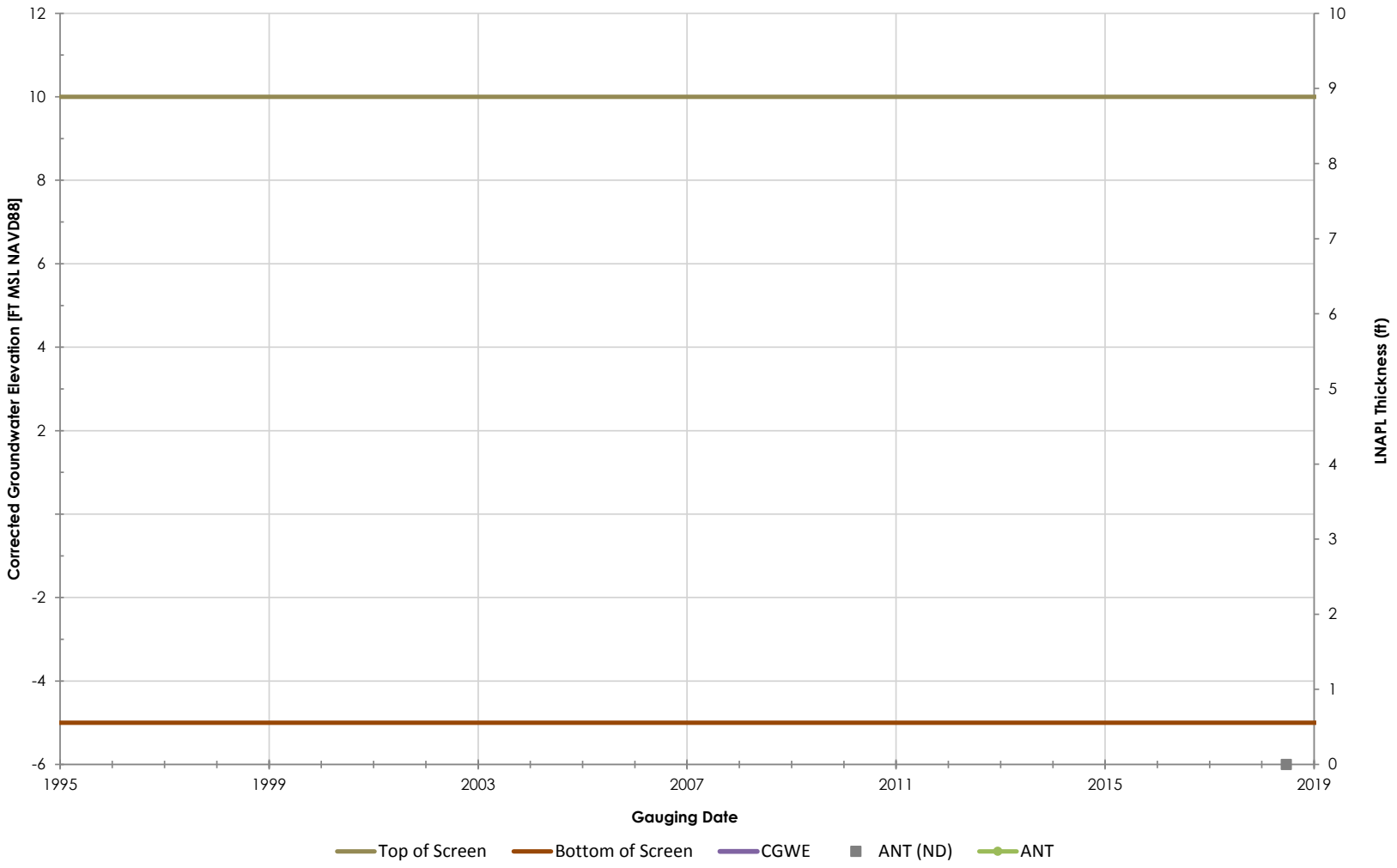
Stantec

Figure/Well No.

PGW-MW-45

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

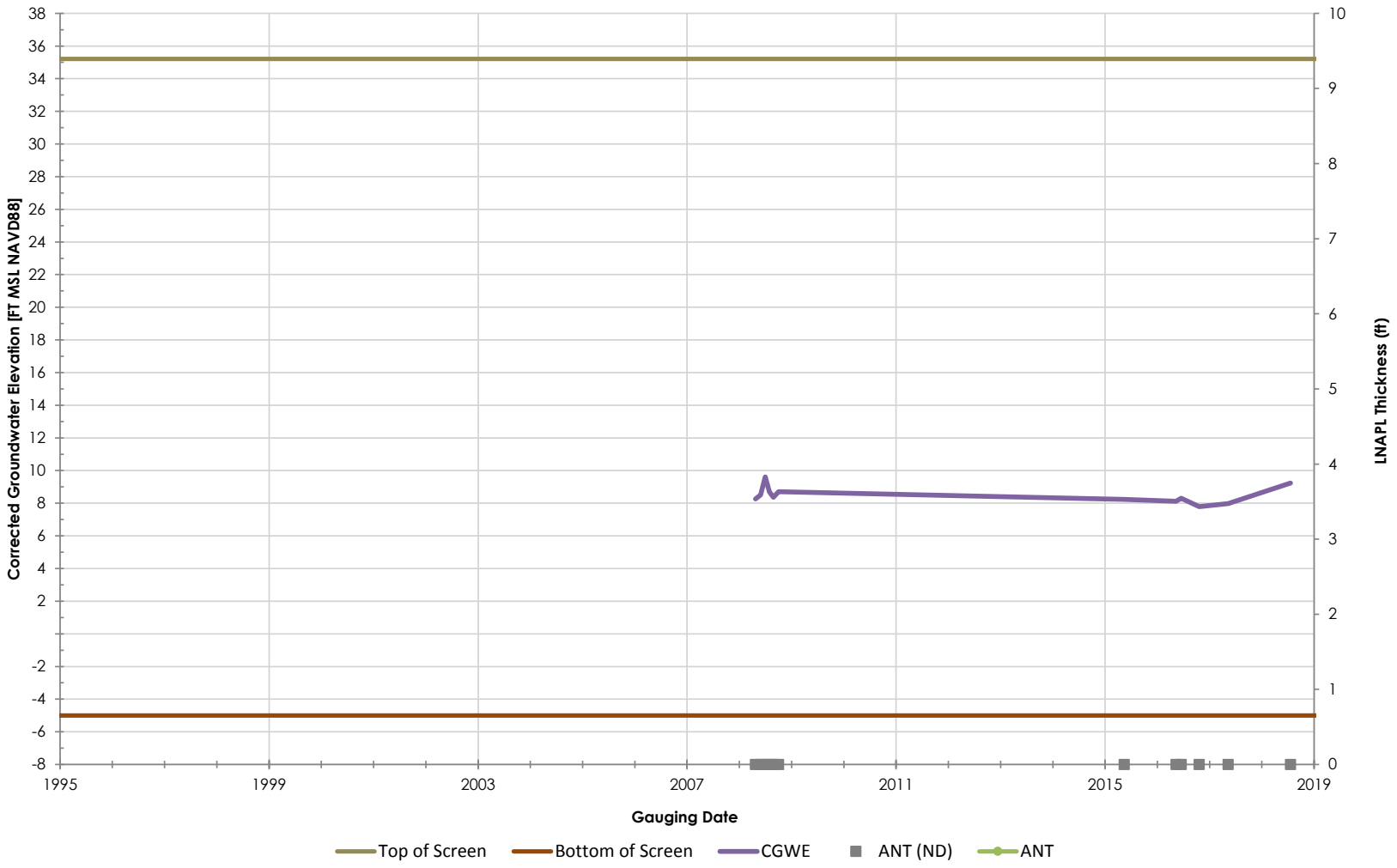
Stantec

Figure/Well No.

PGW-MW-4S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

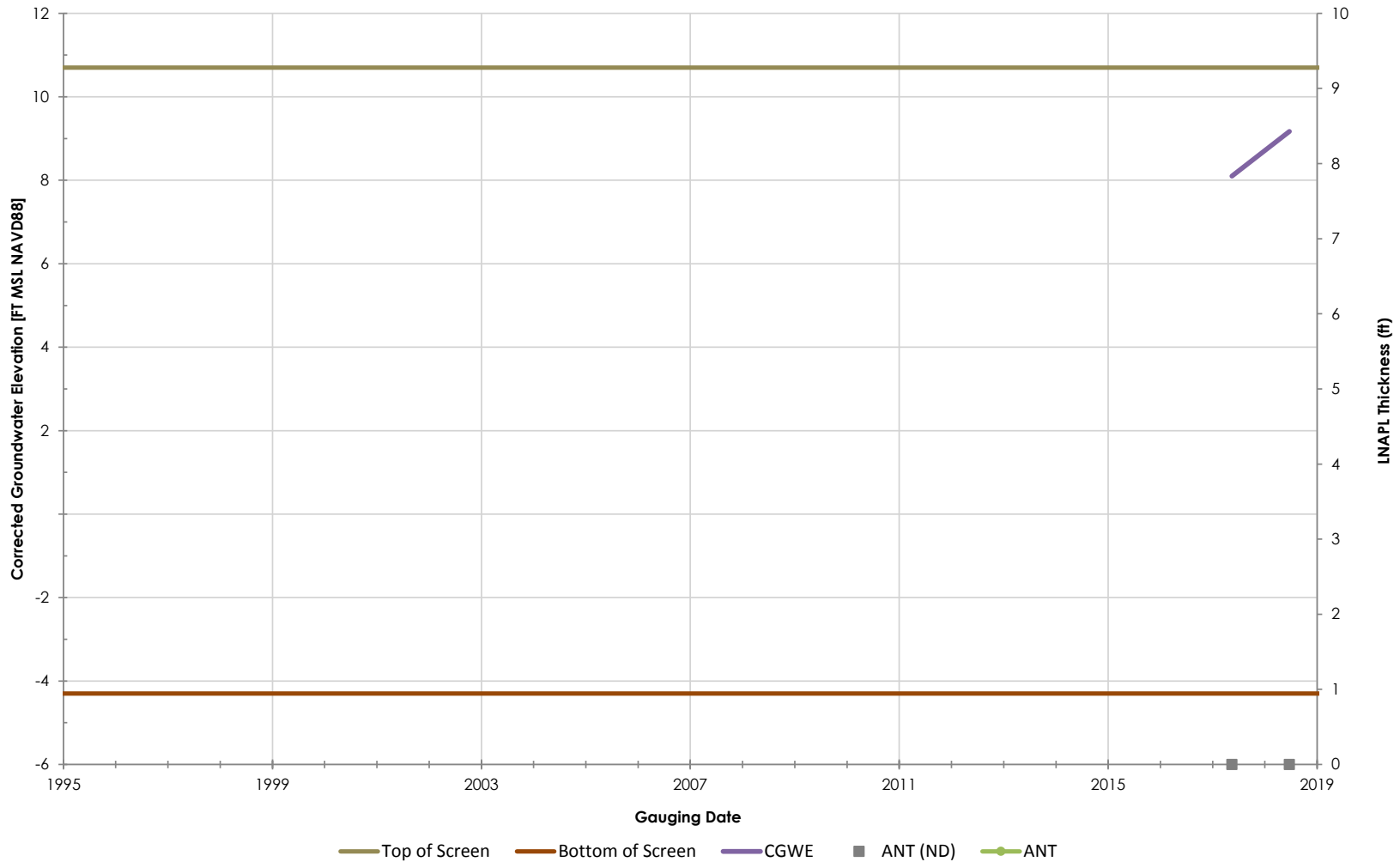
Stantec

Figure/Well No.

PGW-MW-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

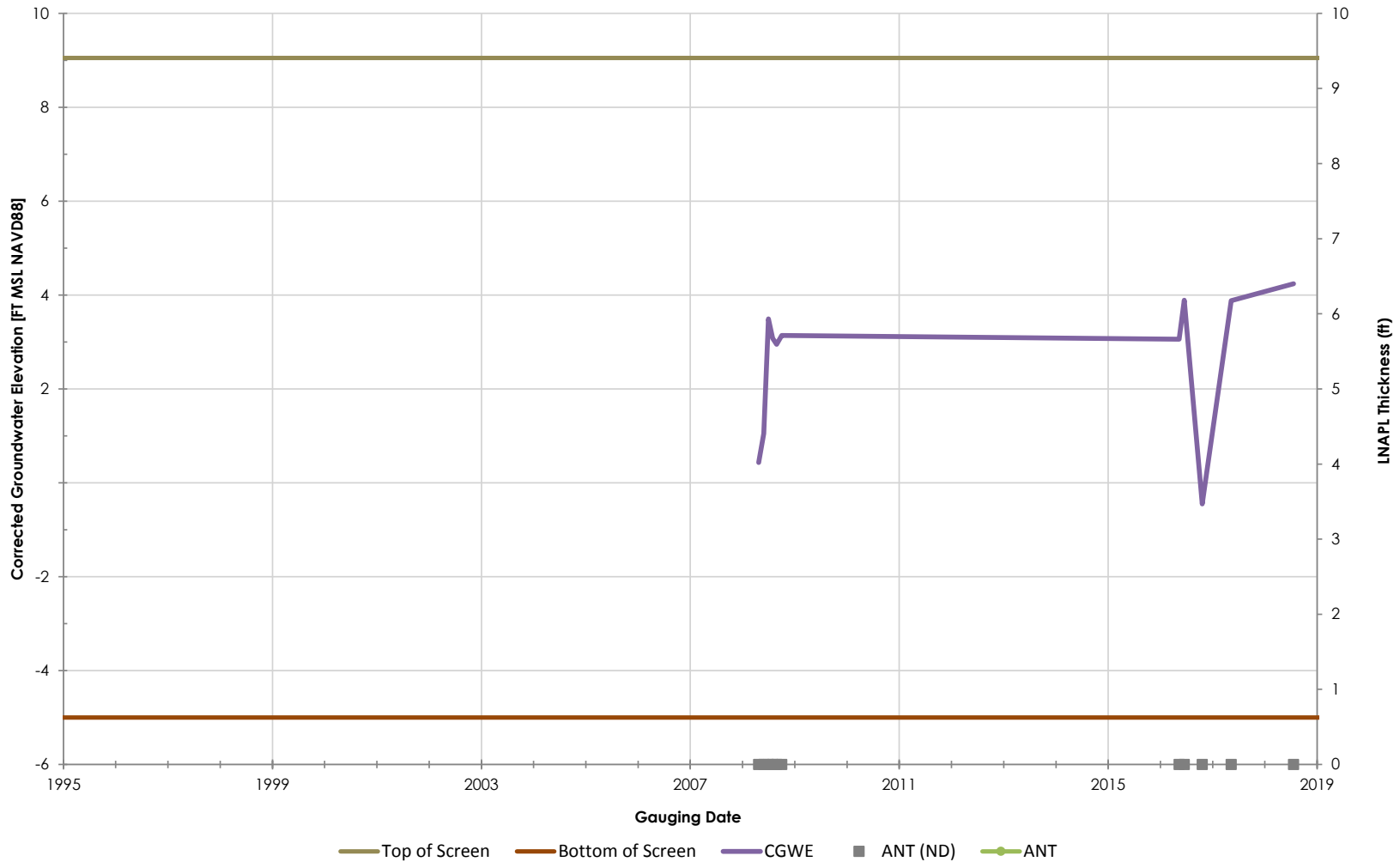
Stantec

Figure/Well No.

PGW-MW-5S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

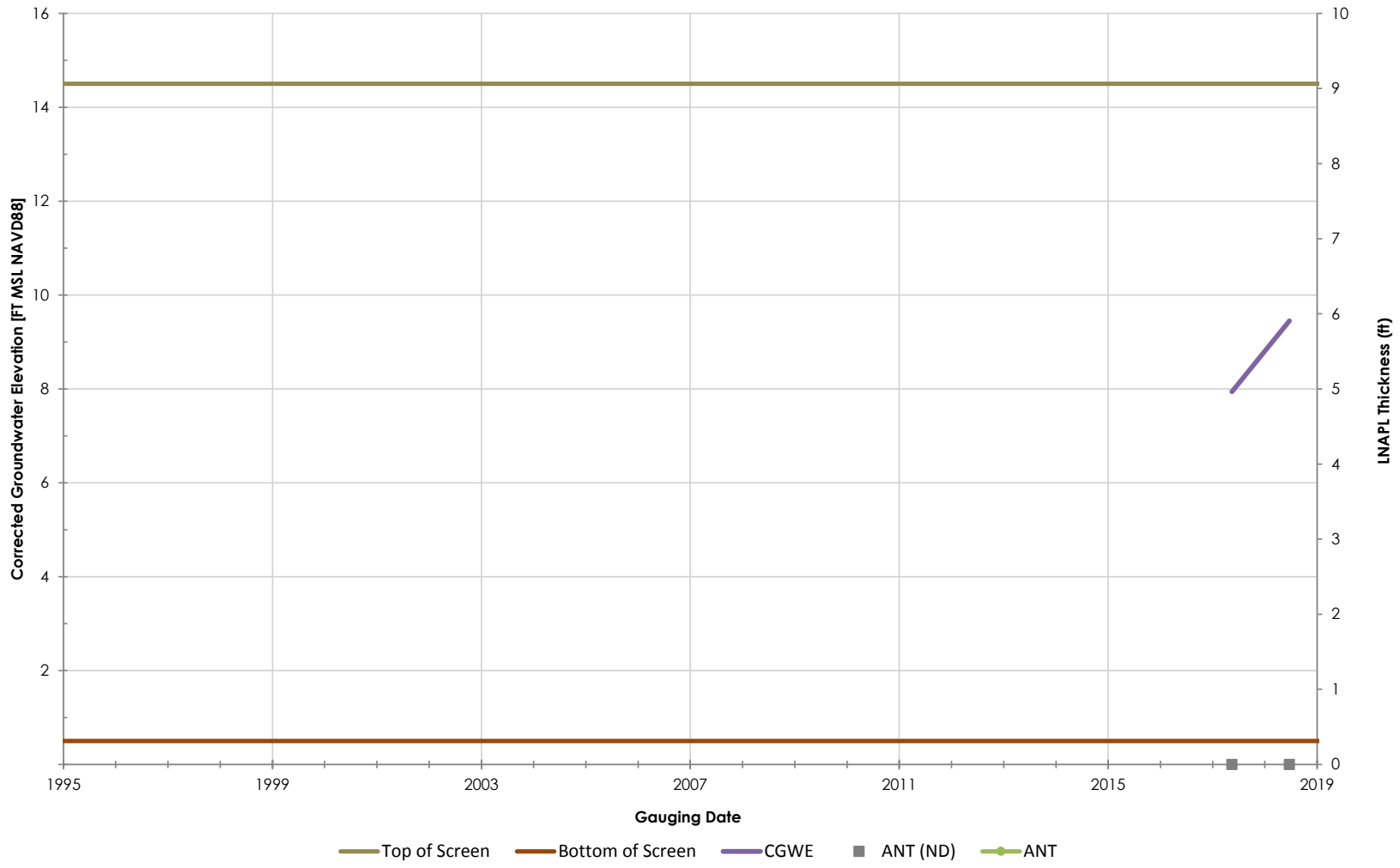
Stantec

Figure/Well No.

PGW-MW-6

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

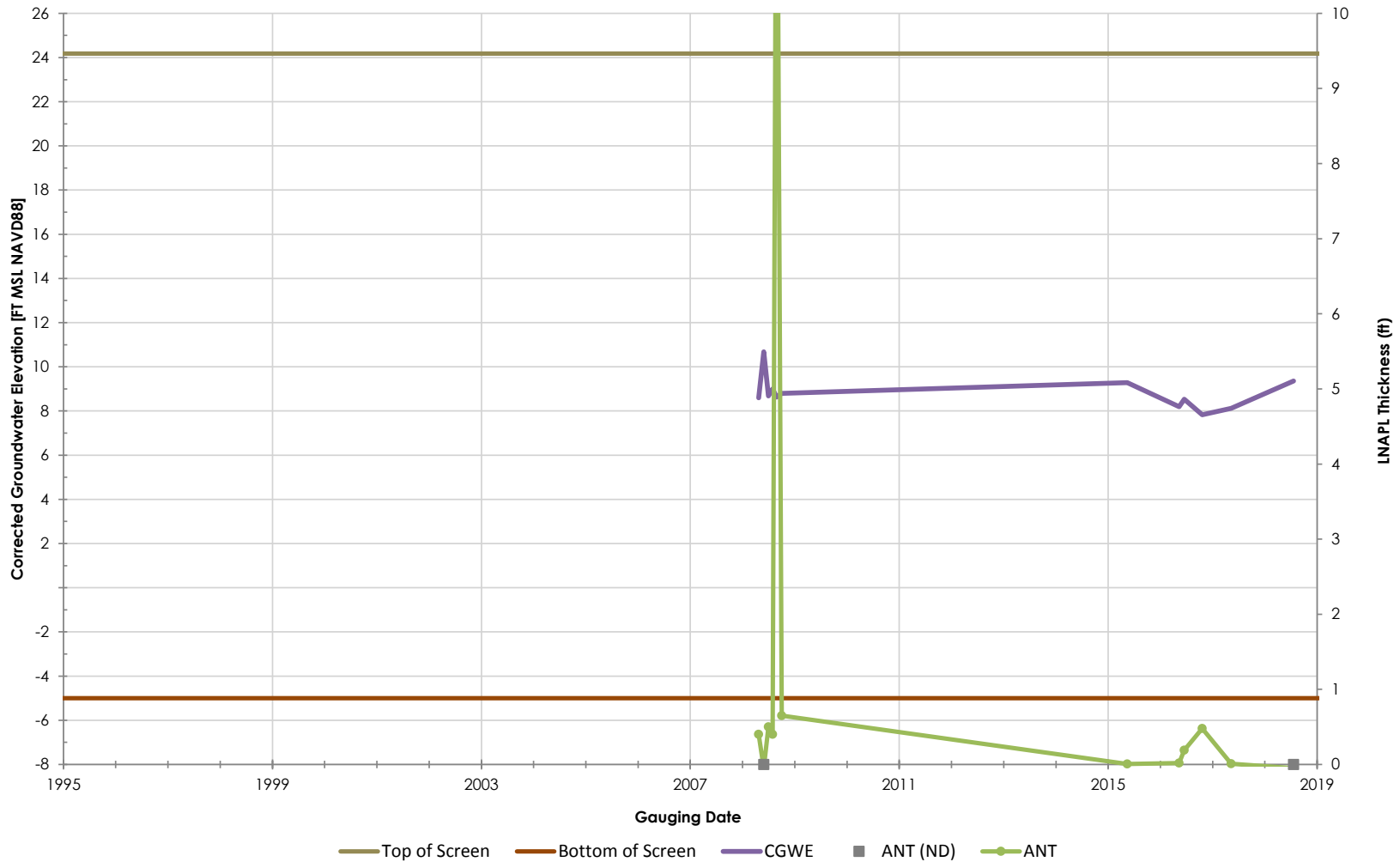
Stantec

Figure/Well No.

PGW-MW-6S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

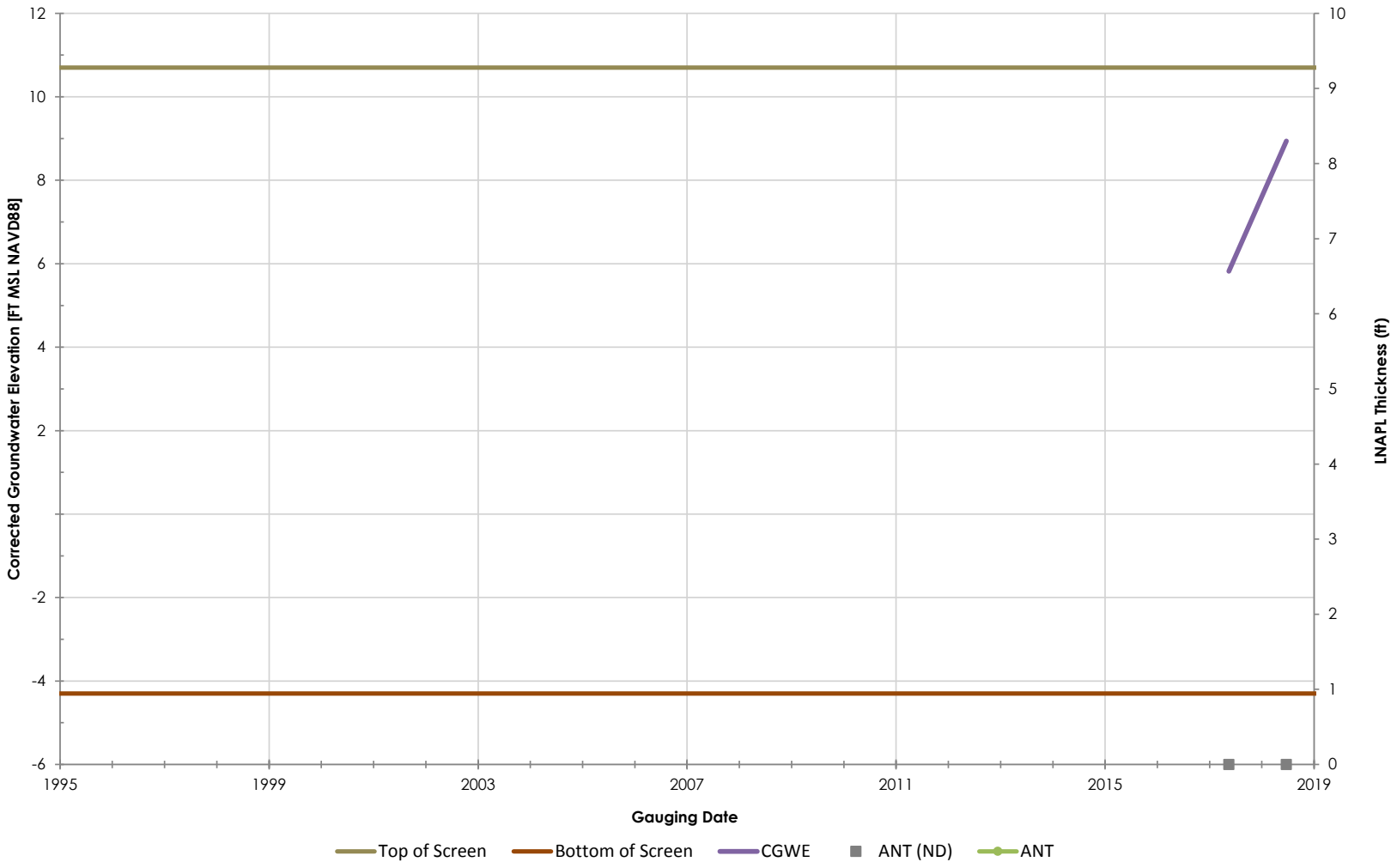
Stantec

Figure/Well No.

PGW-MW-7

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

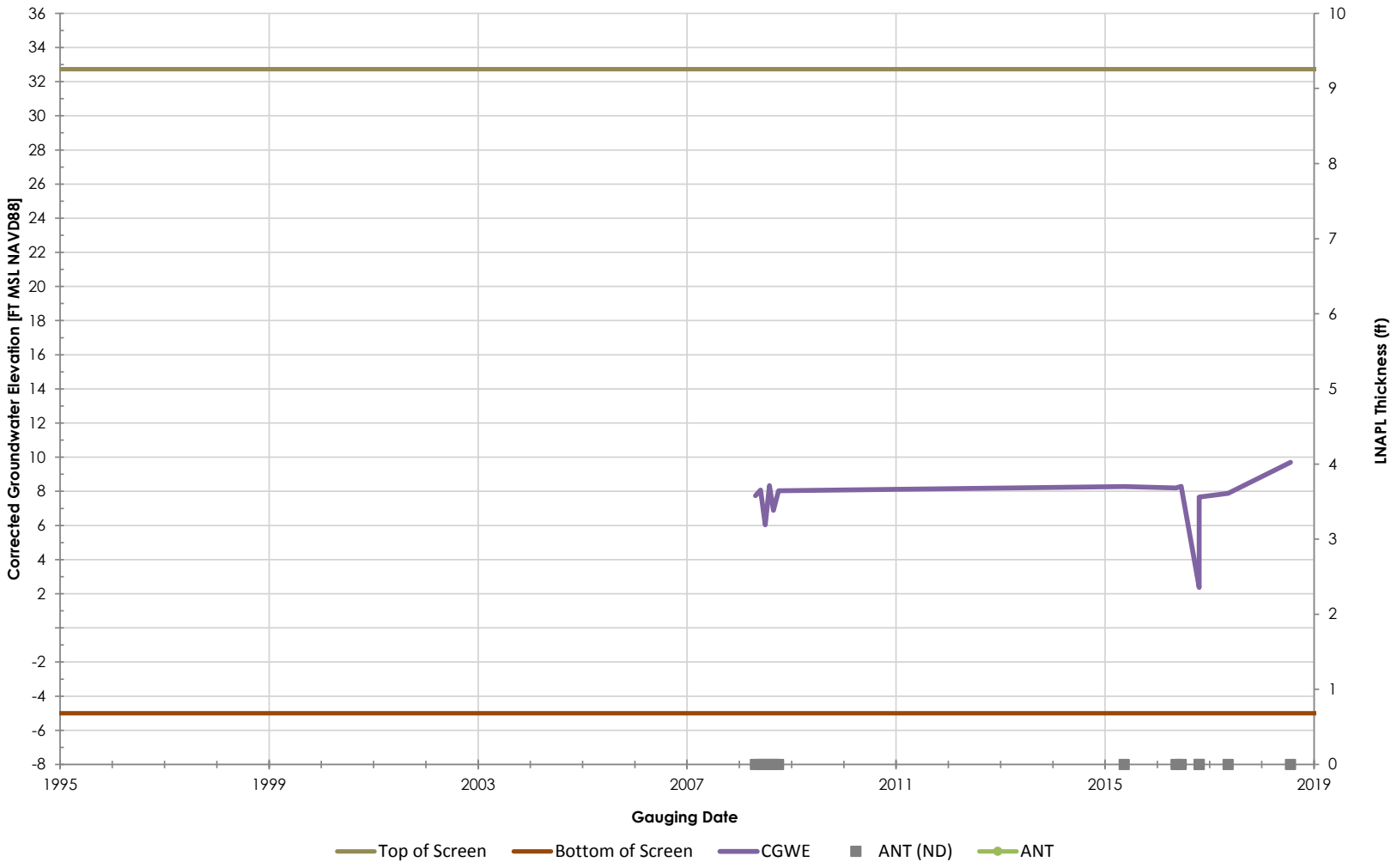
Stantec

Figure/Well No.

PGW-MW-7S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

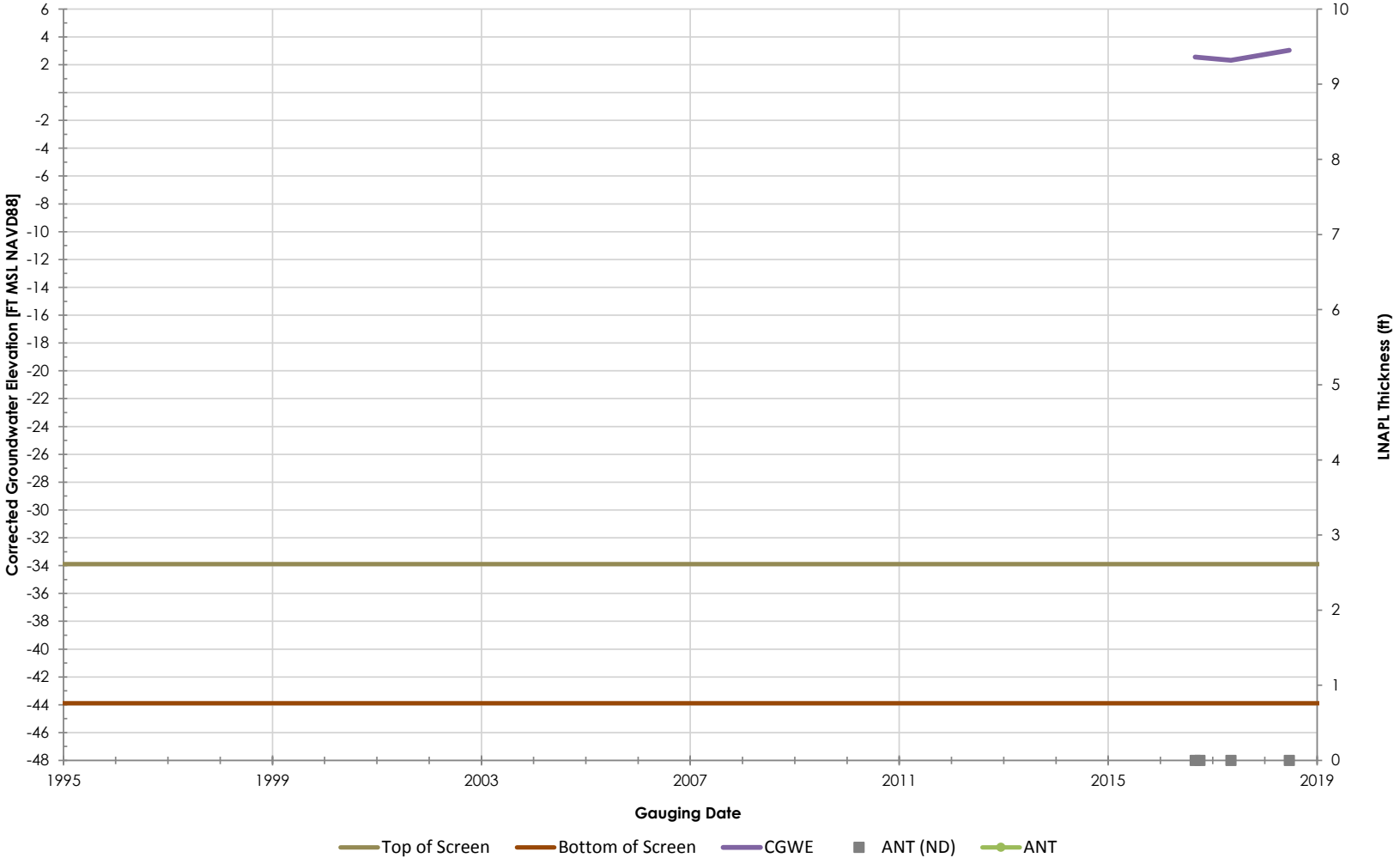
Stantec

Figure/Well No.

PGW-MW-8

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



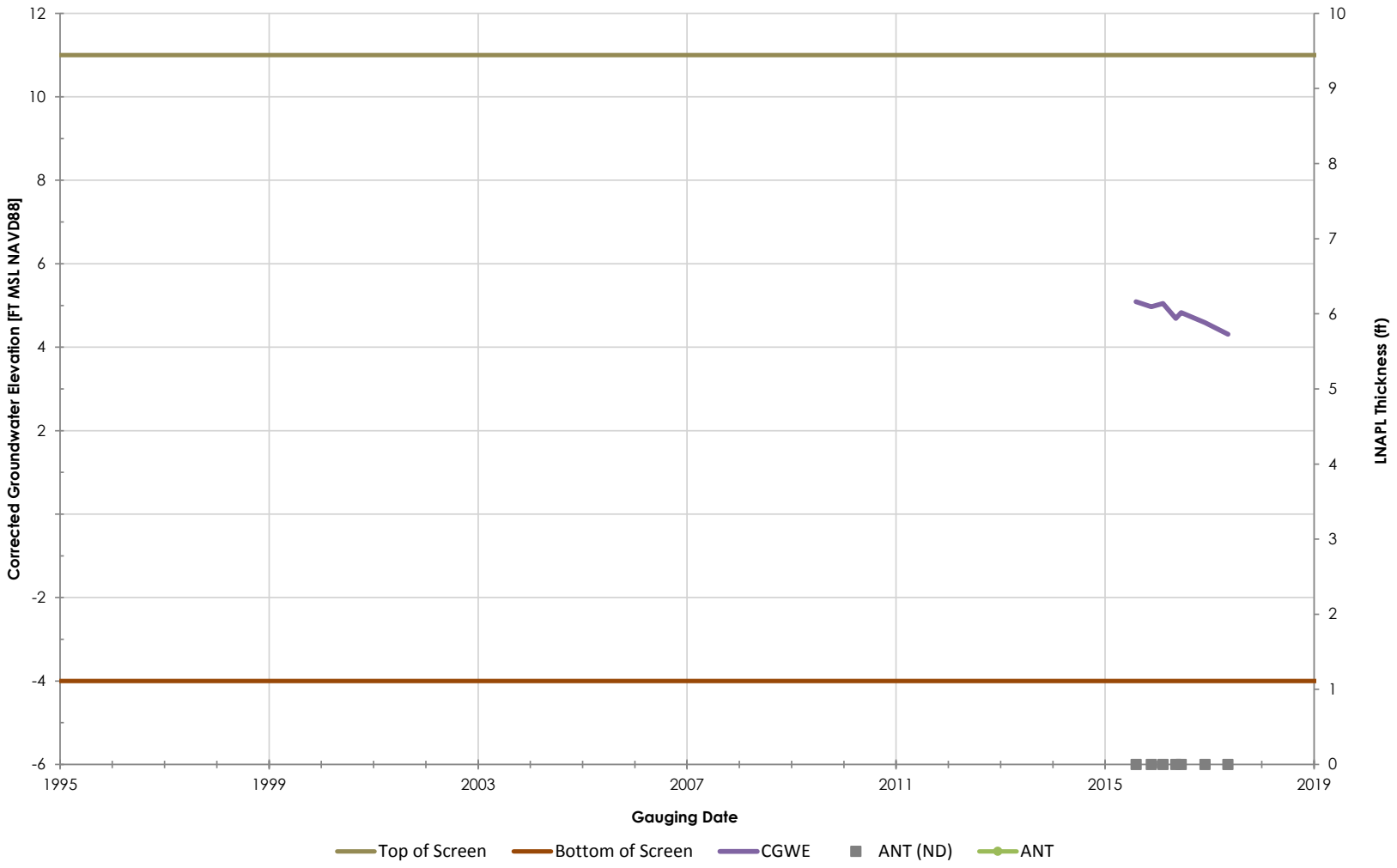
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

PGW-MW-8D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

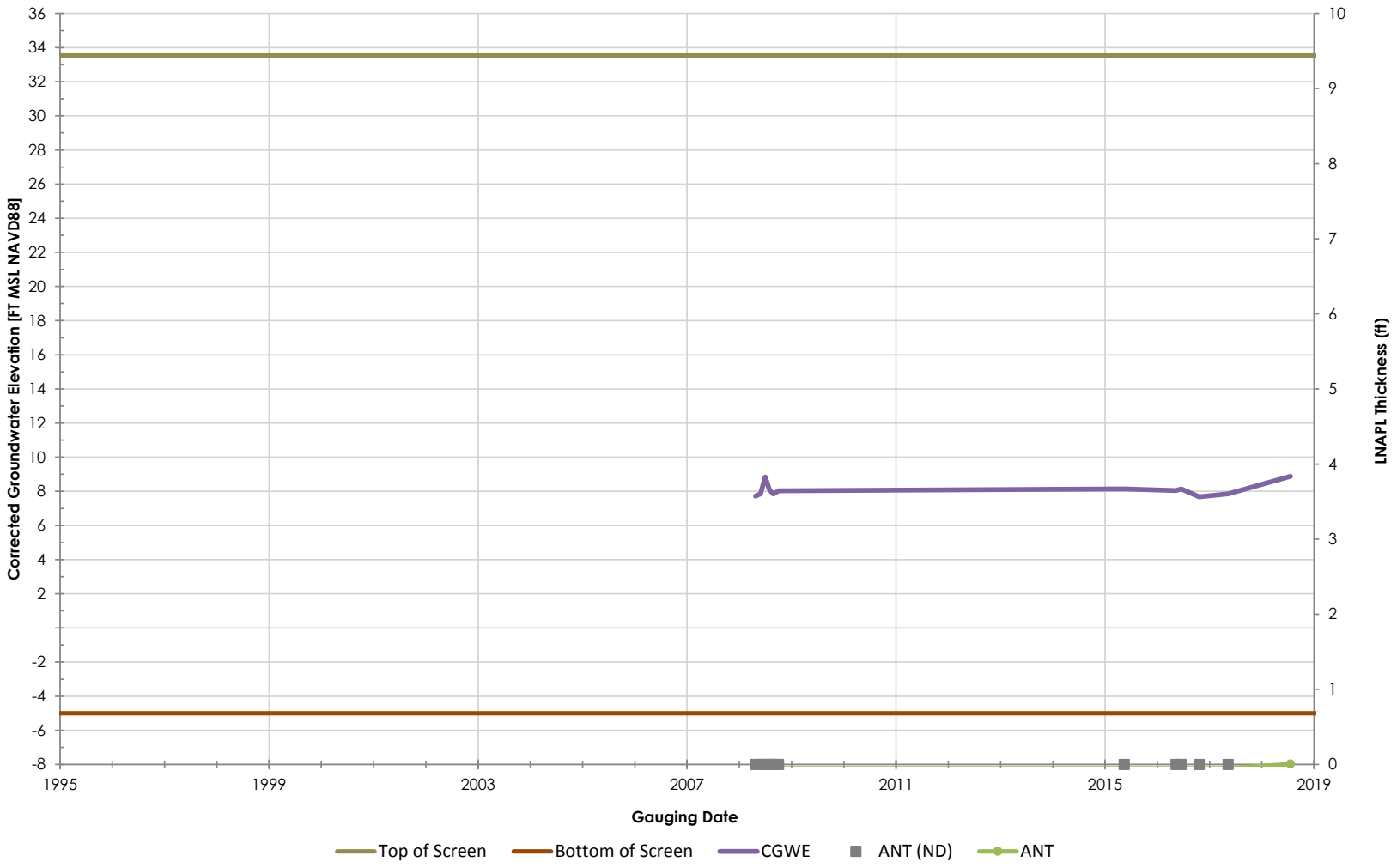
Stantec

Figure/Well No.

PGW-MW-8S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

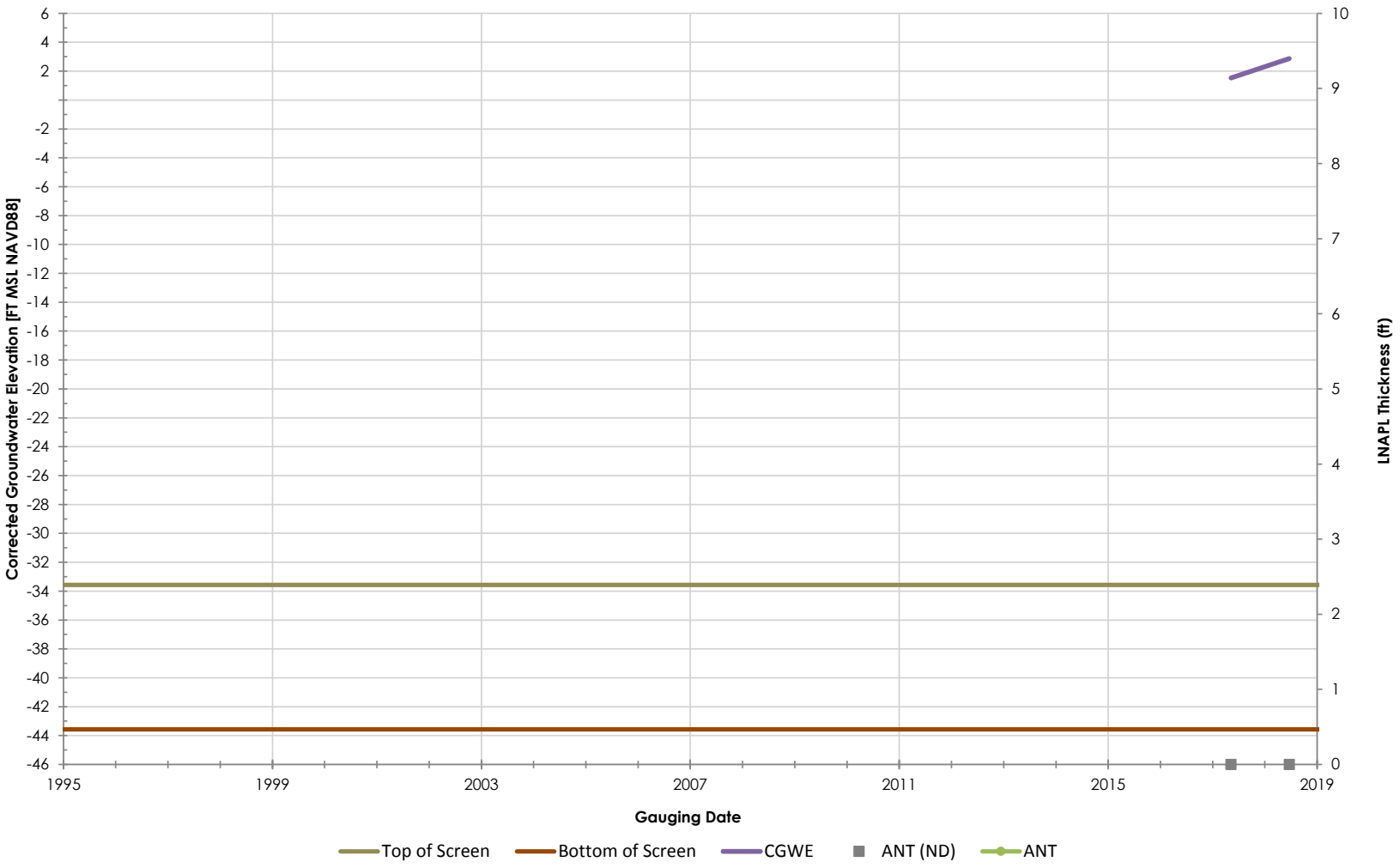
Stantec

Figure/Well No.

PGW-MW-9

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

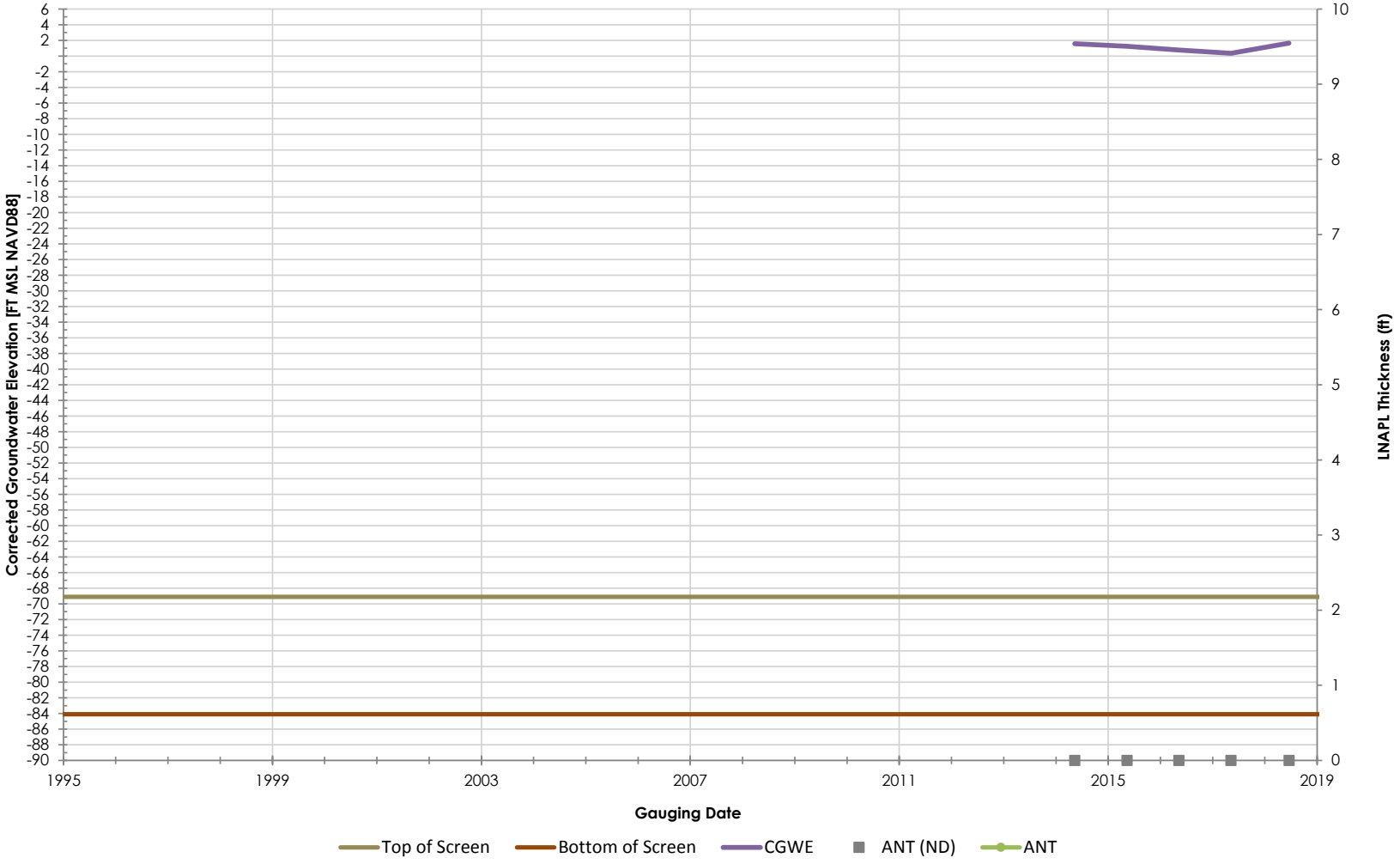
Stantec

Figure/Well No.

PGW-MW-9D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

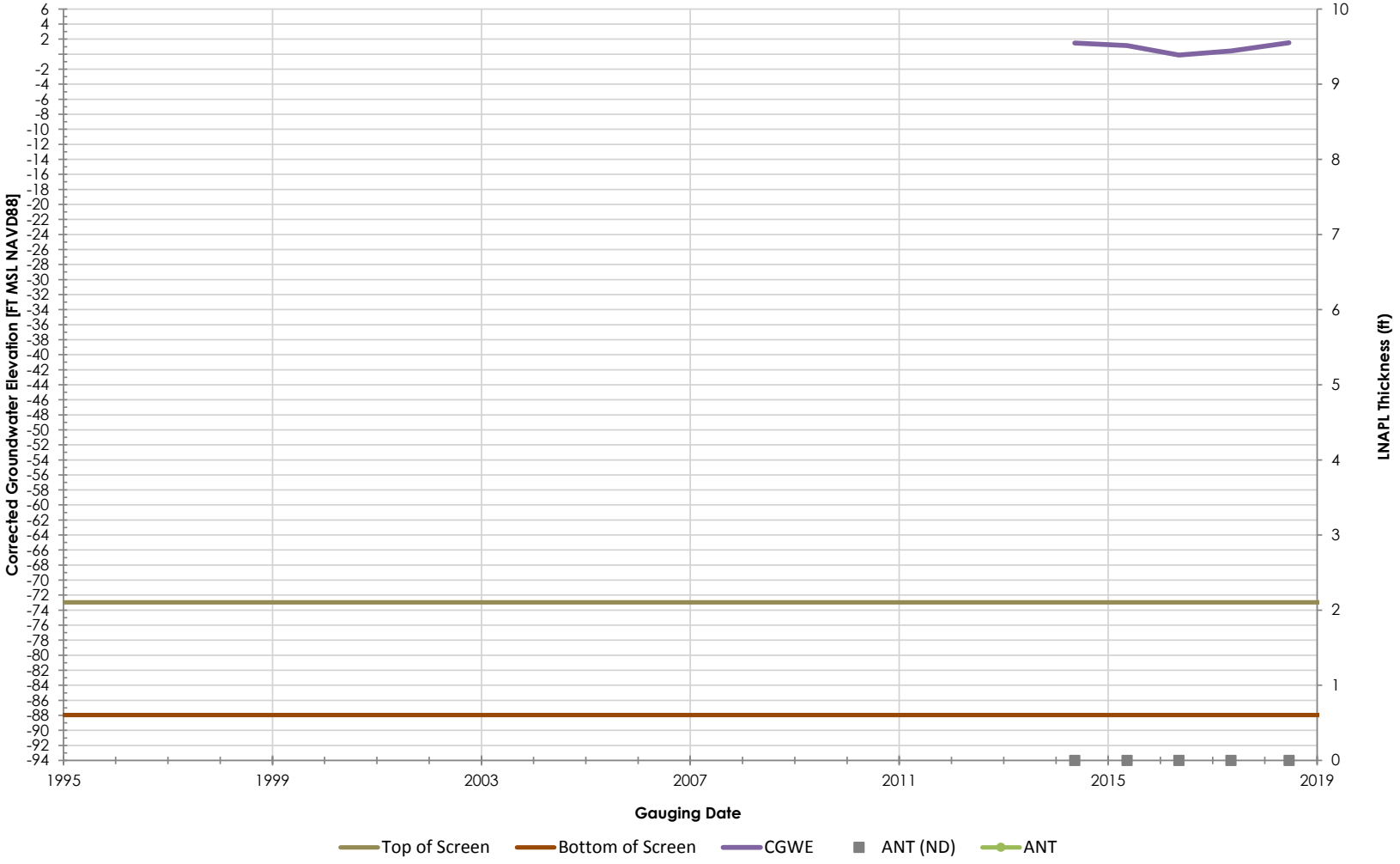
Stantec

Figure/Well No.

PH-DW-10

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

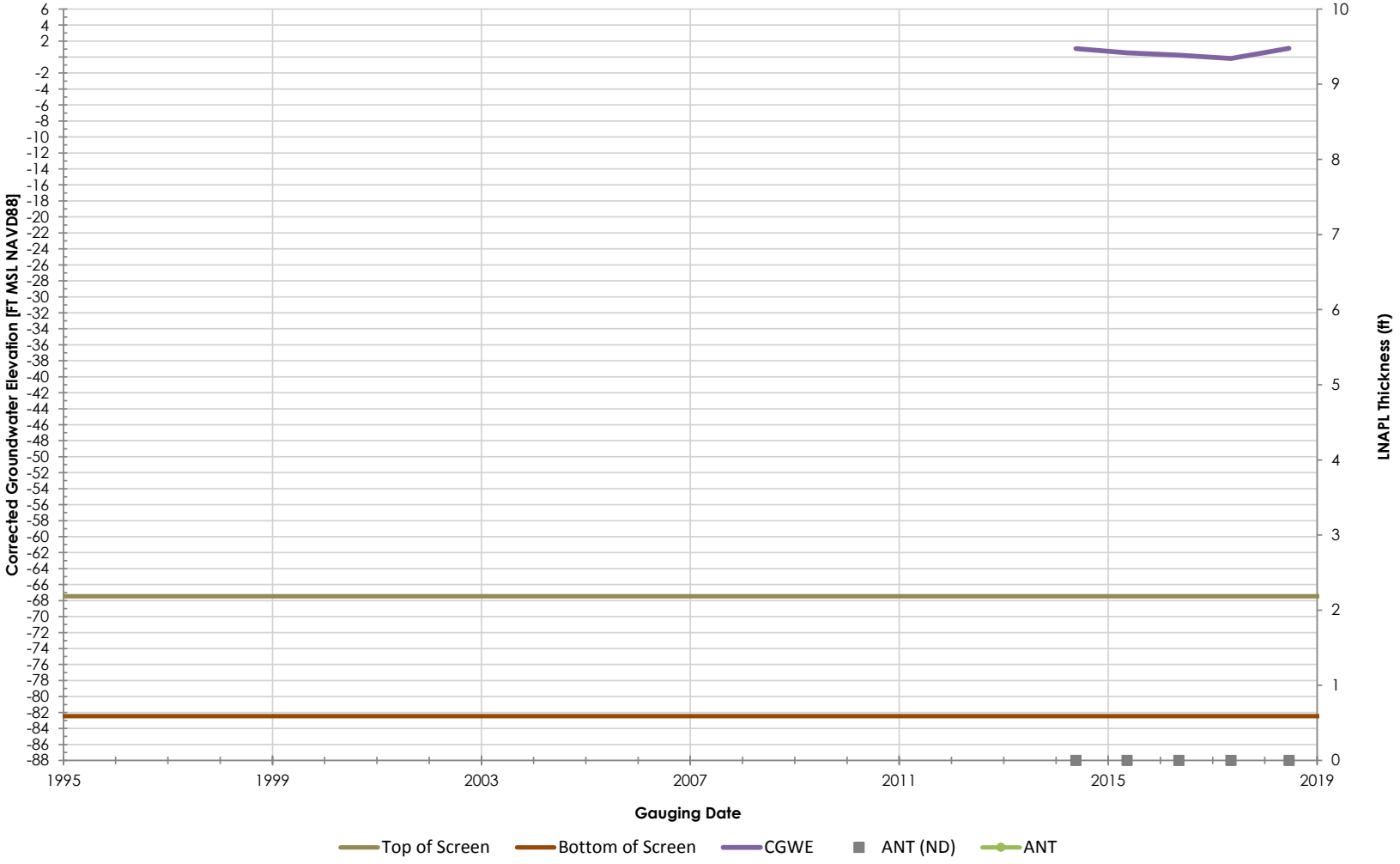
Stantec

Figure/Well No.

PH-DW-11

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



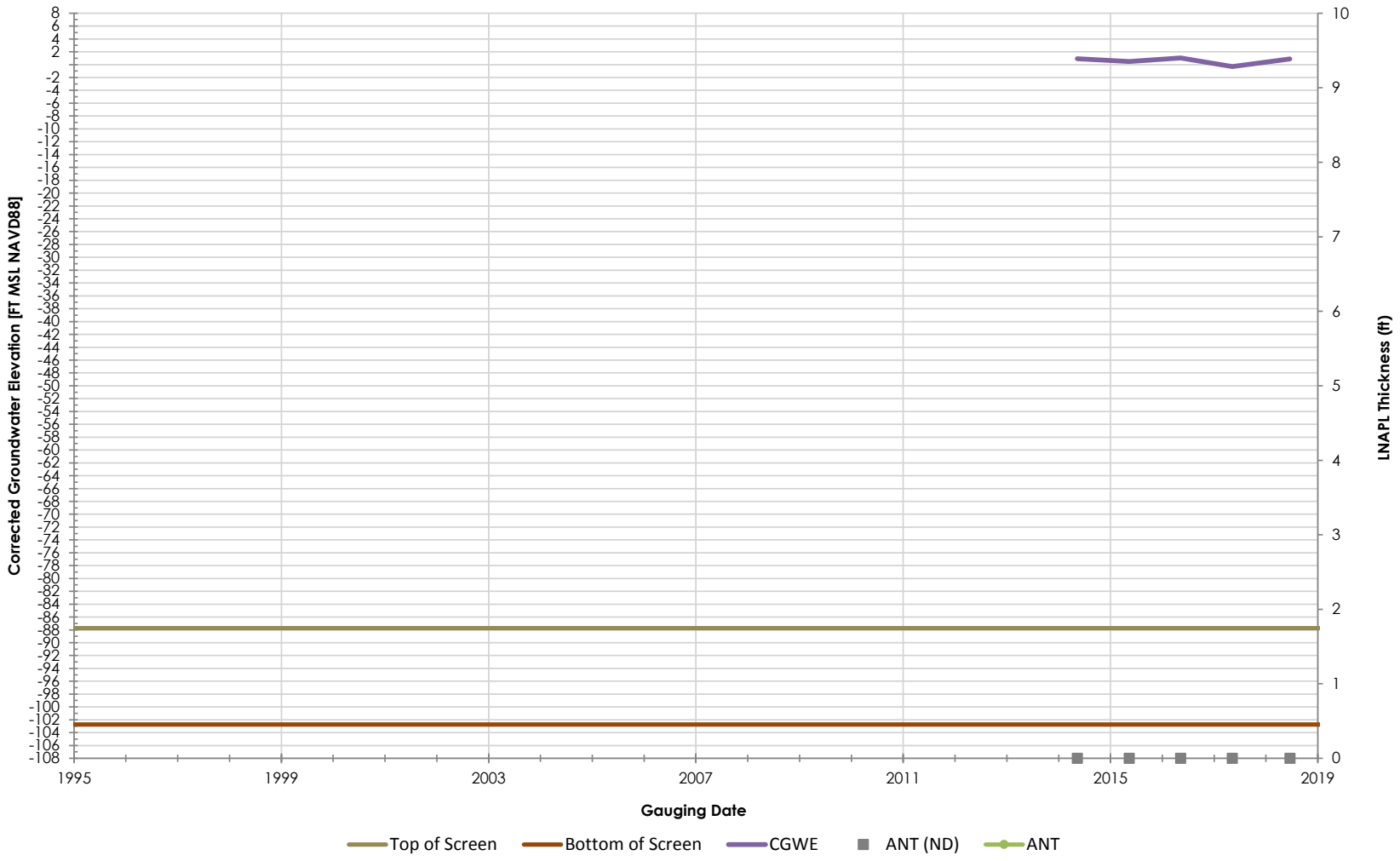
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

PH-DW-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

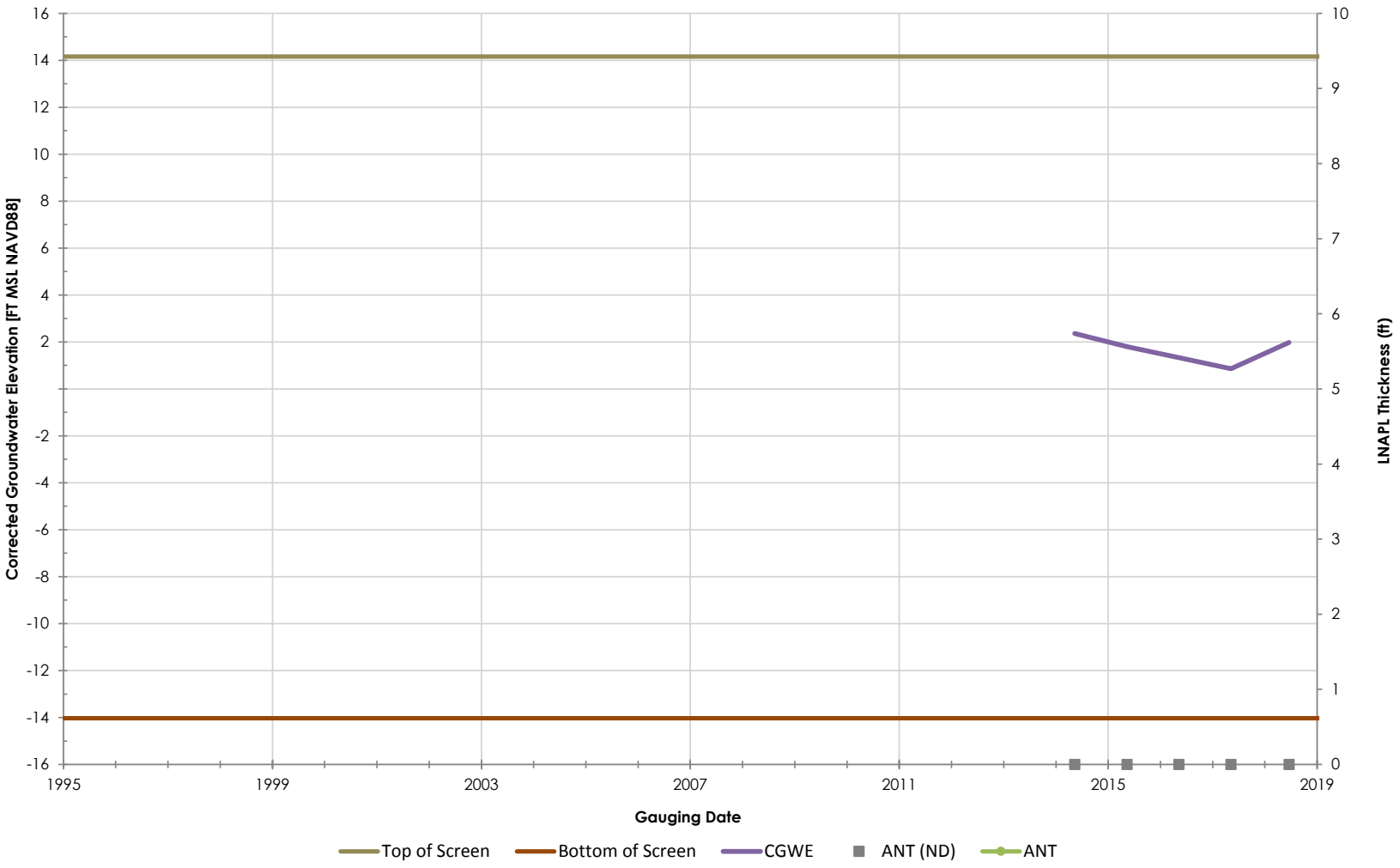
Stantec

Figure/Well No.

PH-DW-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

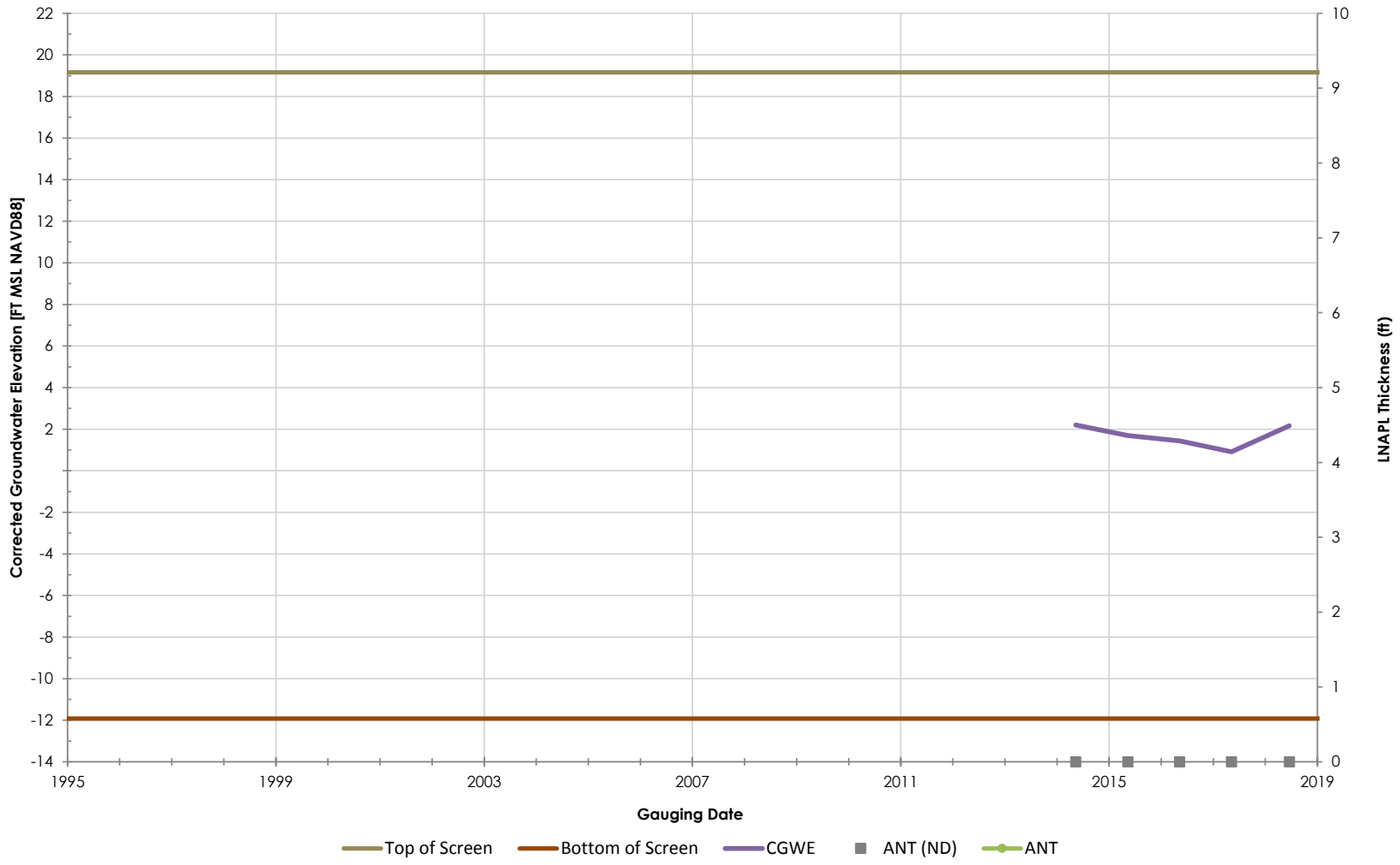
Stantec

Figure/Well No.

PH-MW-40

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

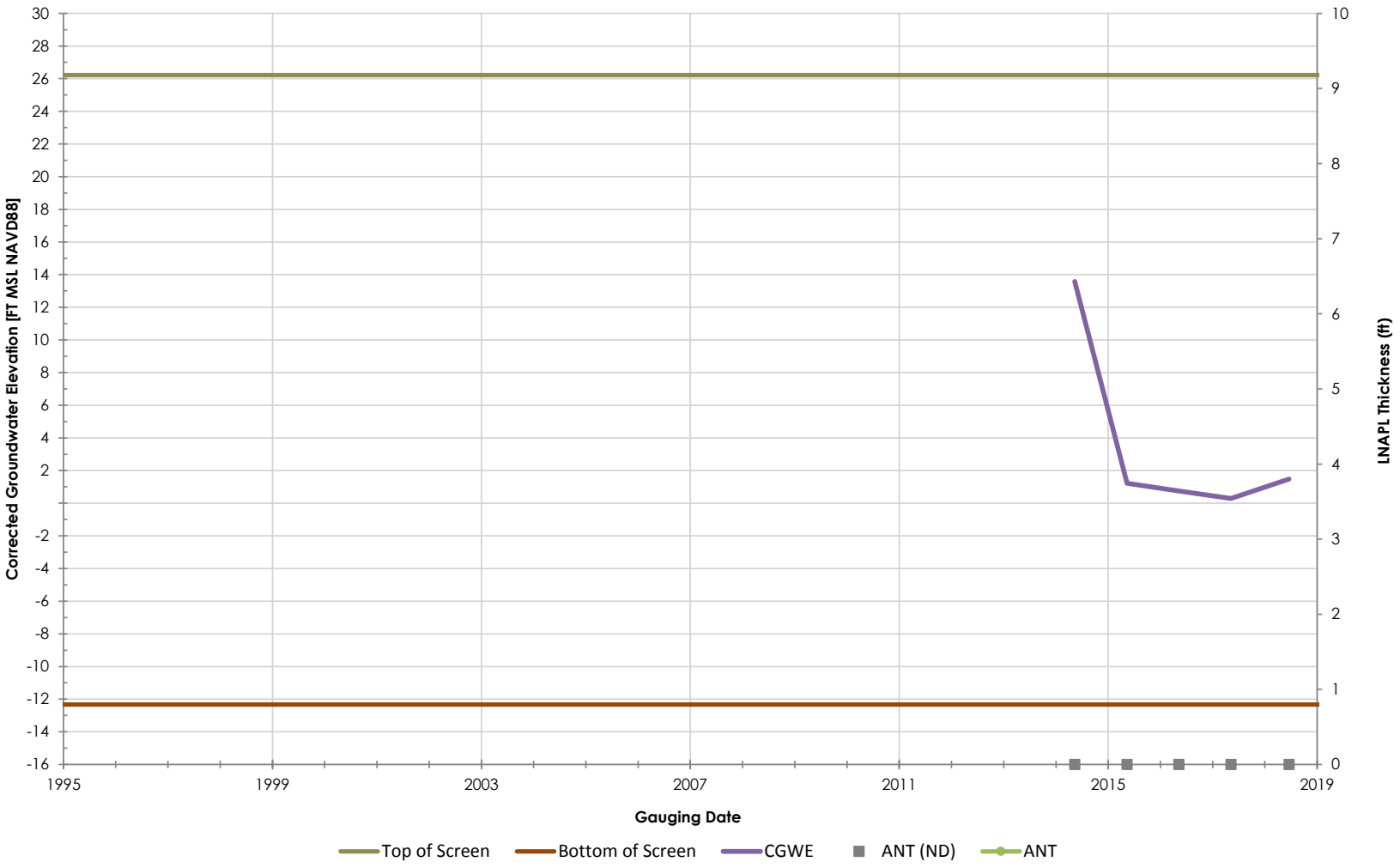
Stantec

Figure/Well No.

PH-MW-41

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

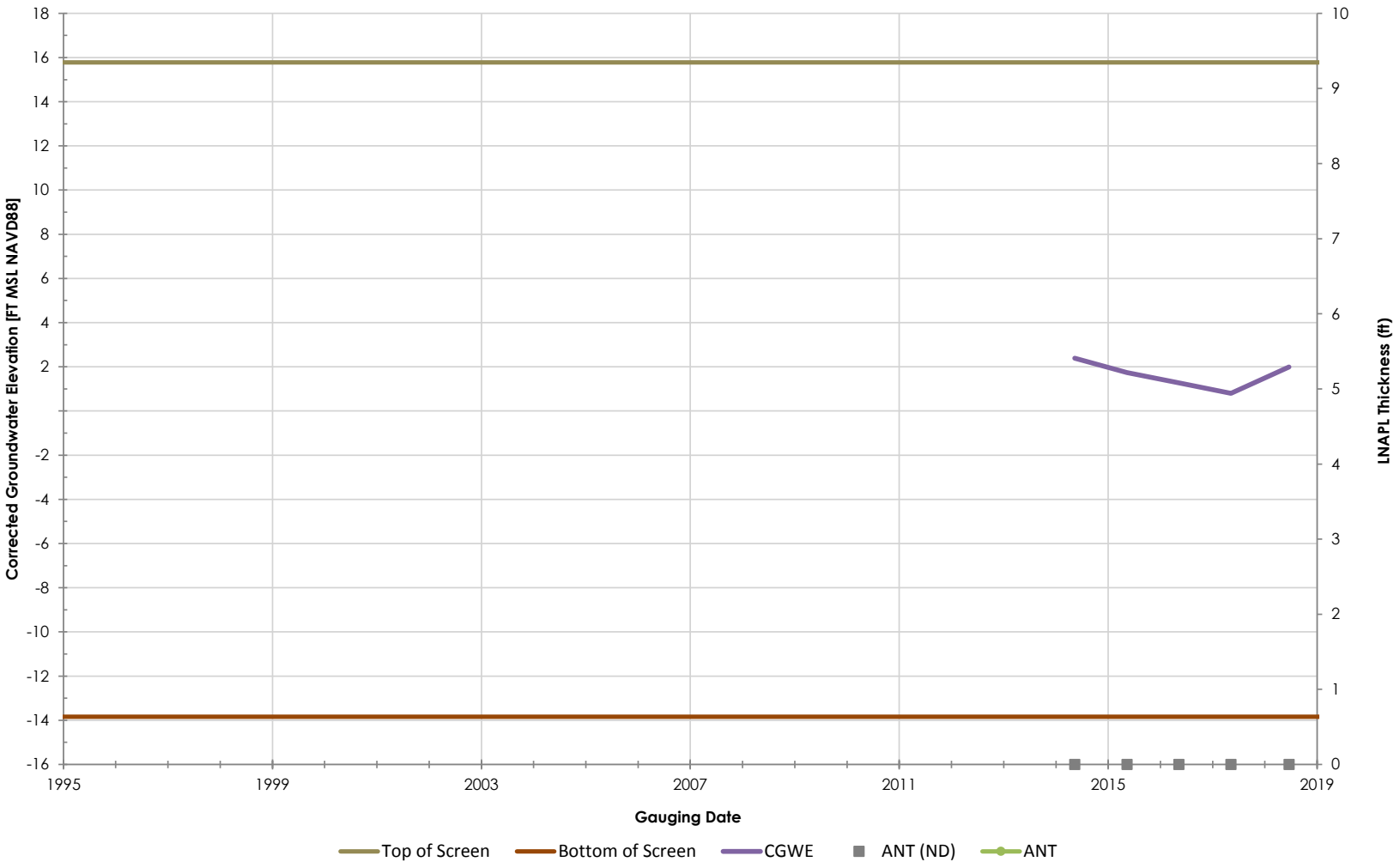
Stantec

Figure/Well No.

PH-MW-43

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

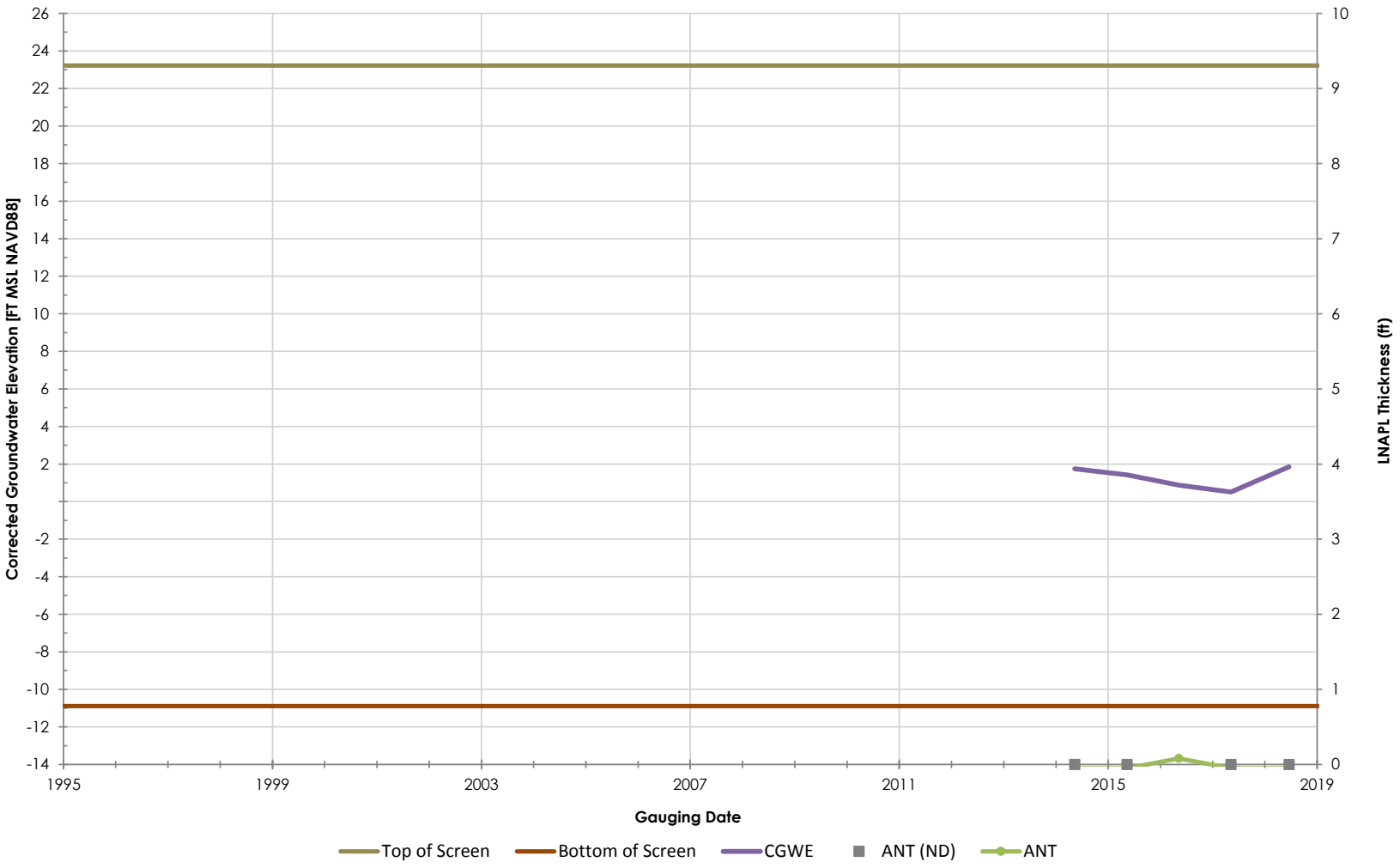
Stantec

Figure/Well No.

PH-MW-51

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

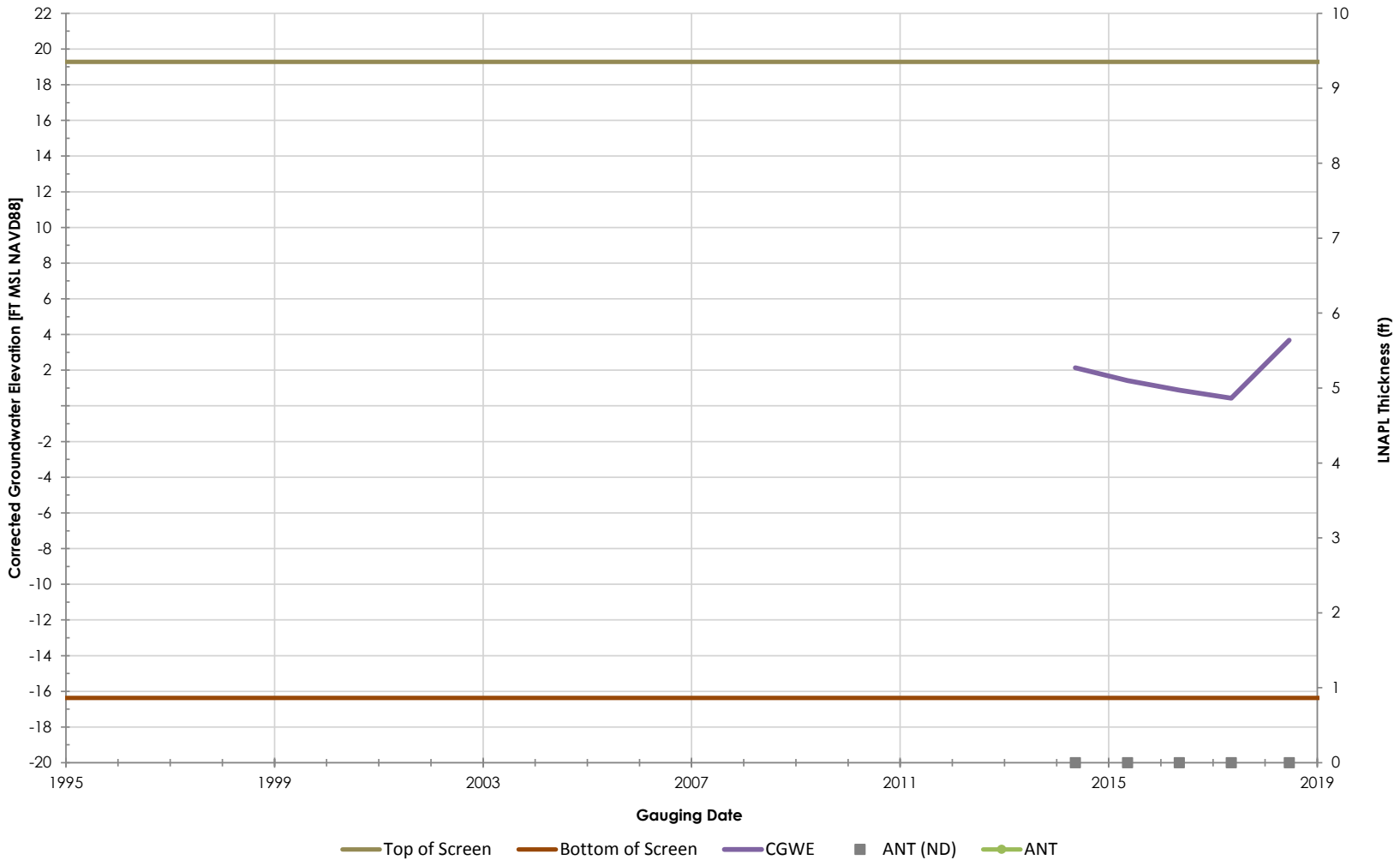
Stantec

Figure/Well No.

PH-MW-55

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

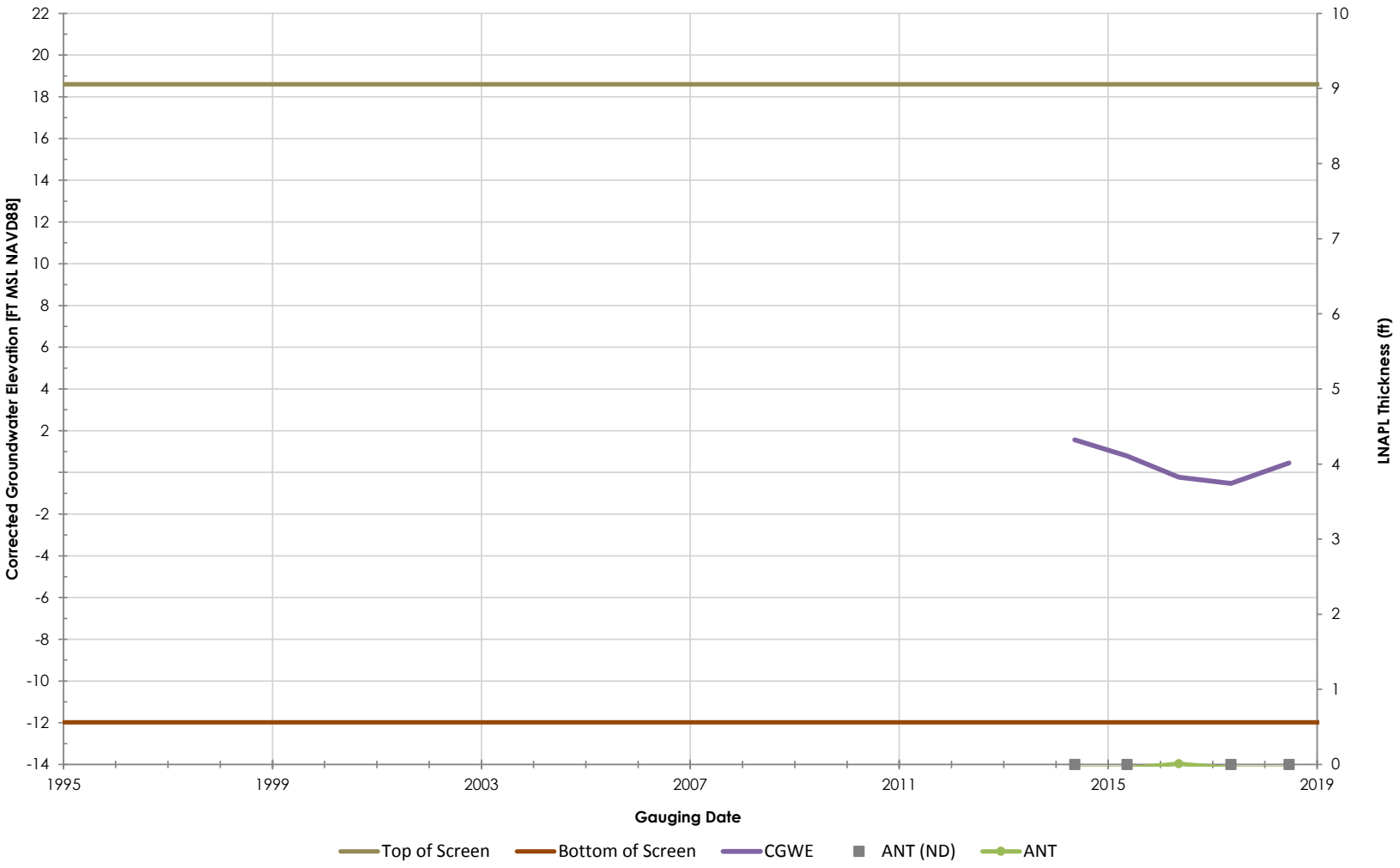
Stantec

Figure/Well No.

PH-MW-56

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

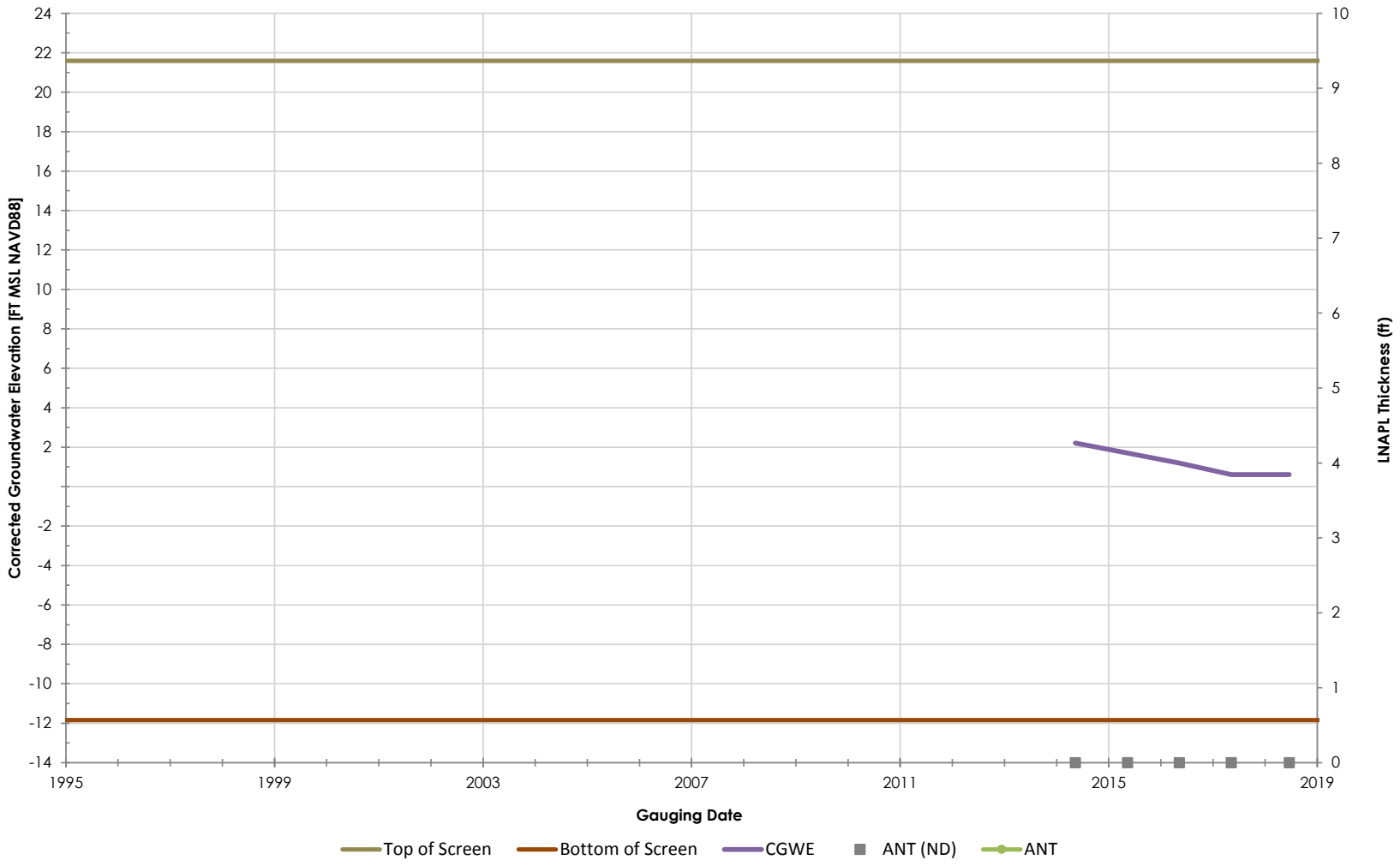
Stantec

Figure/Well No.

PH-MW-57

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

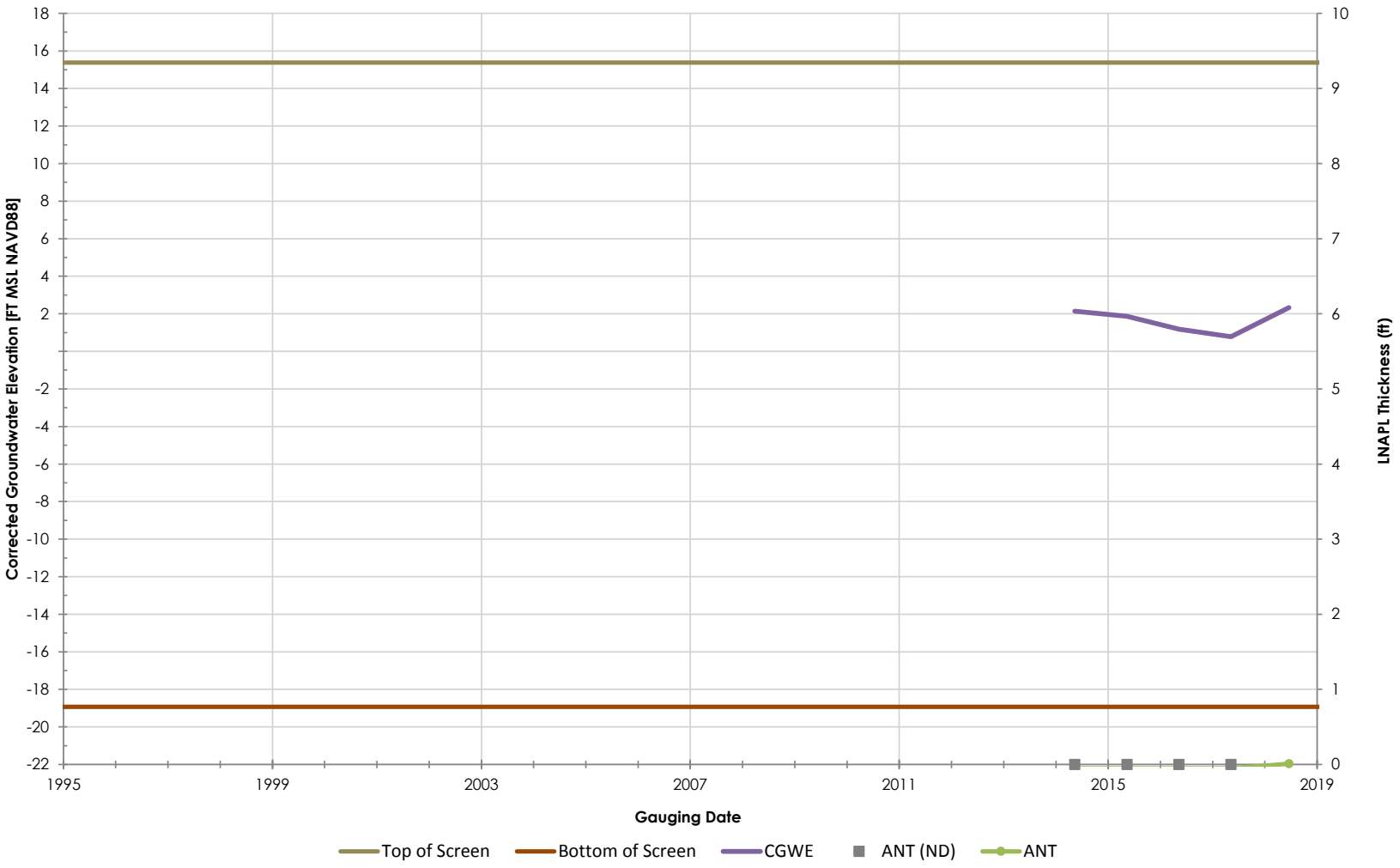
Stantec

Figure/Well No.

PH-MW-58

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

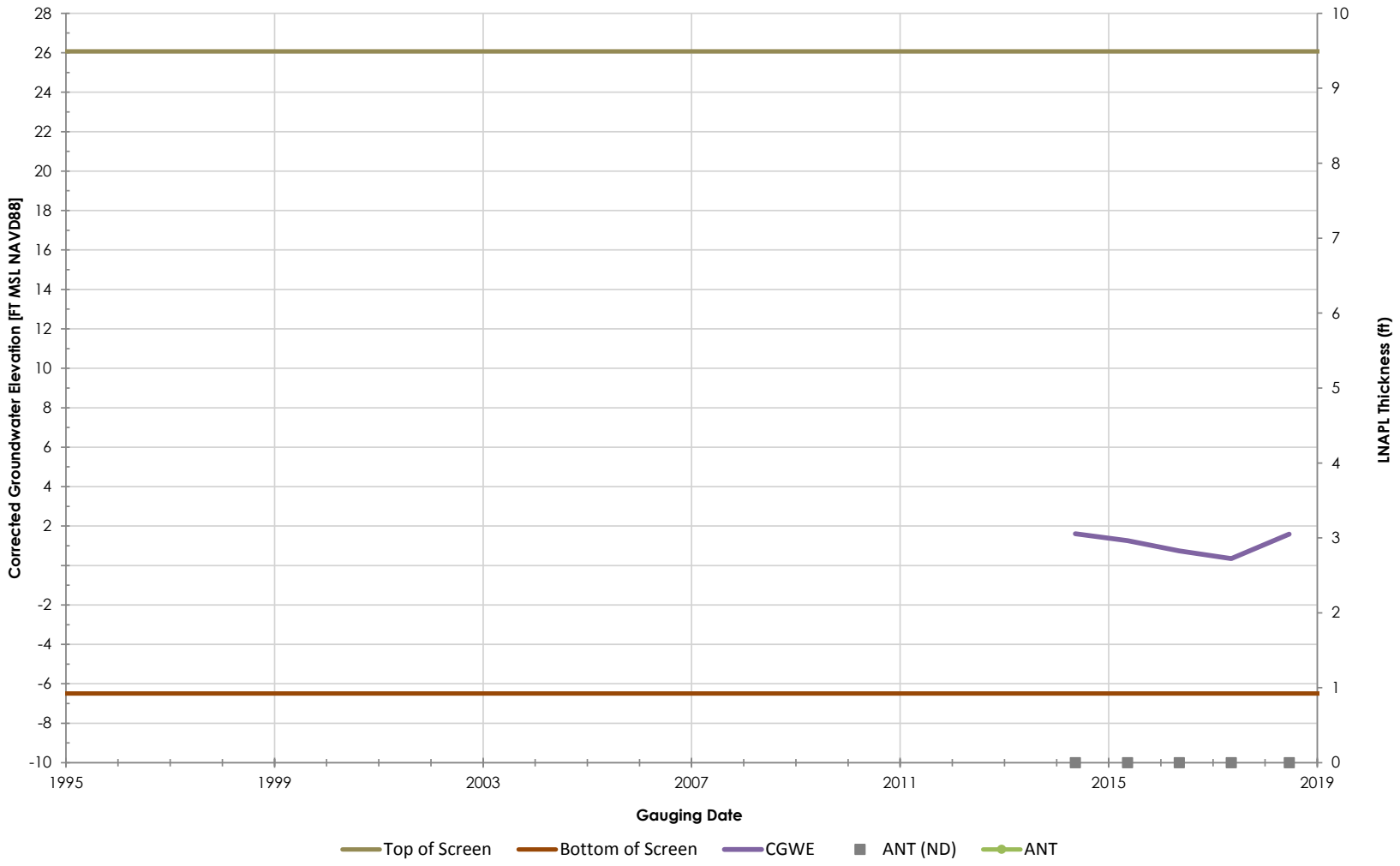
Stantec

Figure/Well No.

PH-MW-60

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



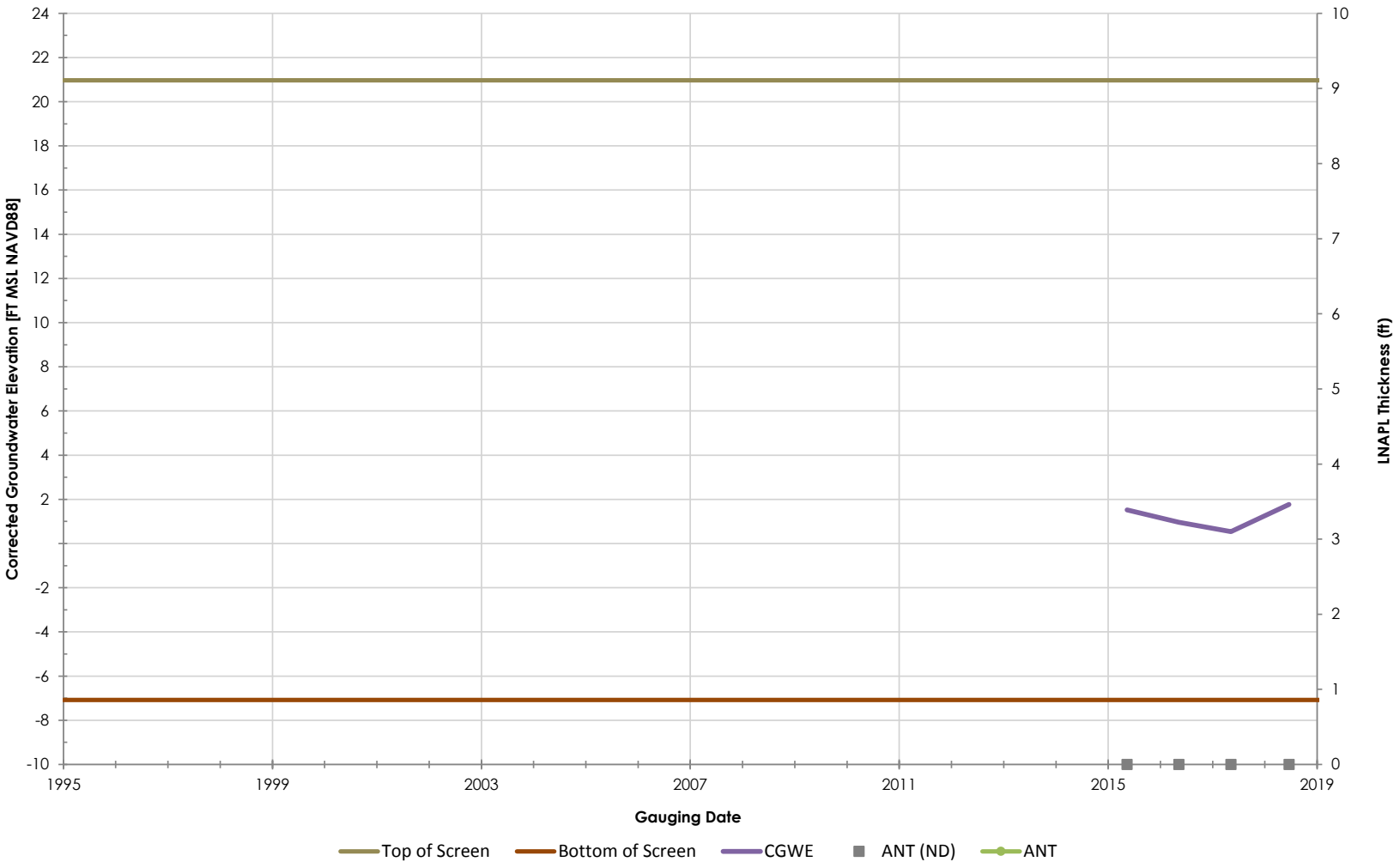
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

PH-MWS-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

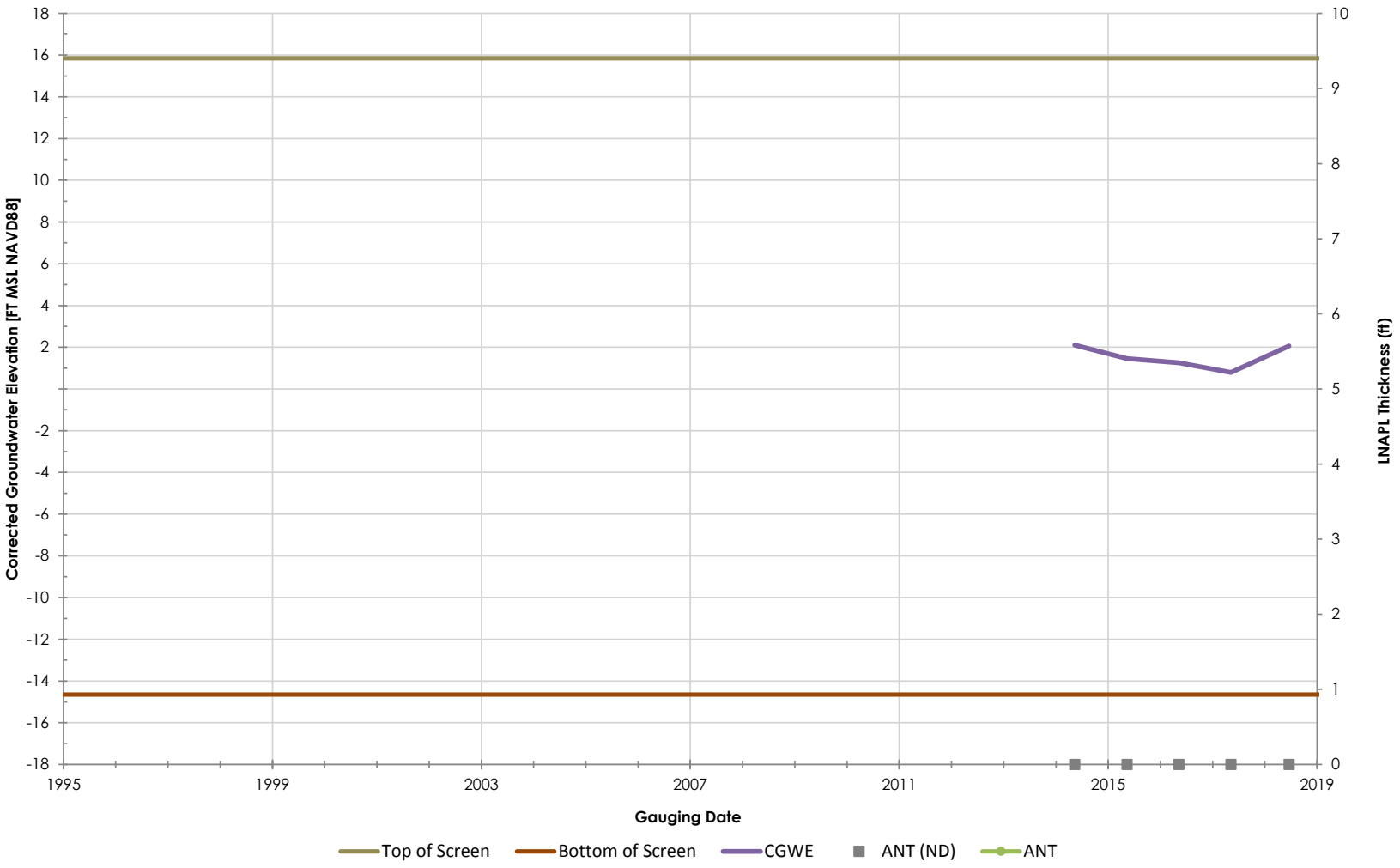
Stantec

Figure/Well No.

PH-MWS-13

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

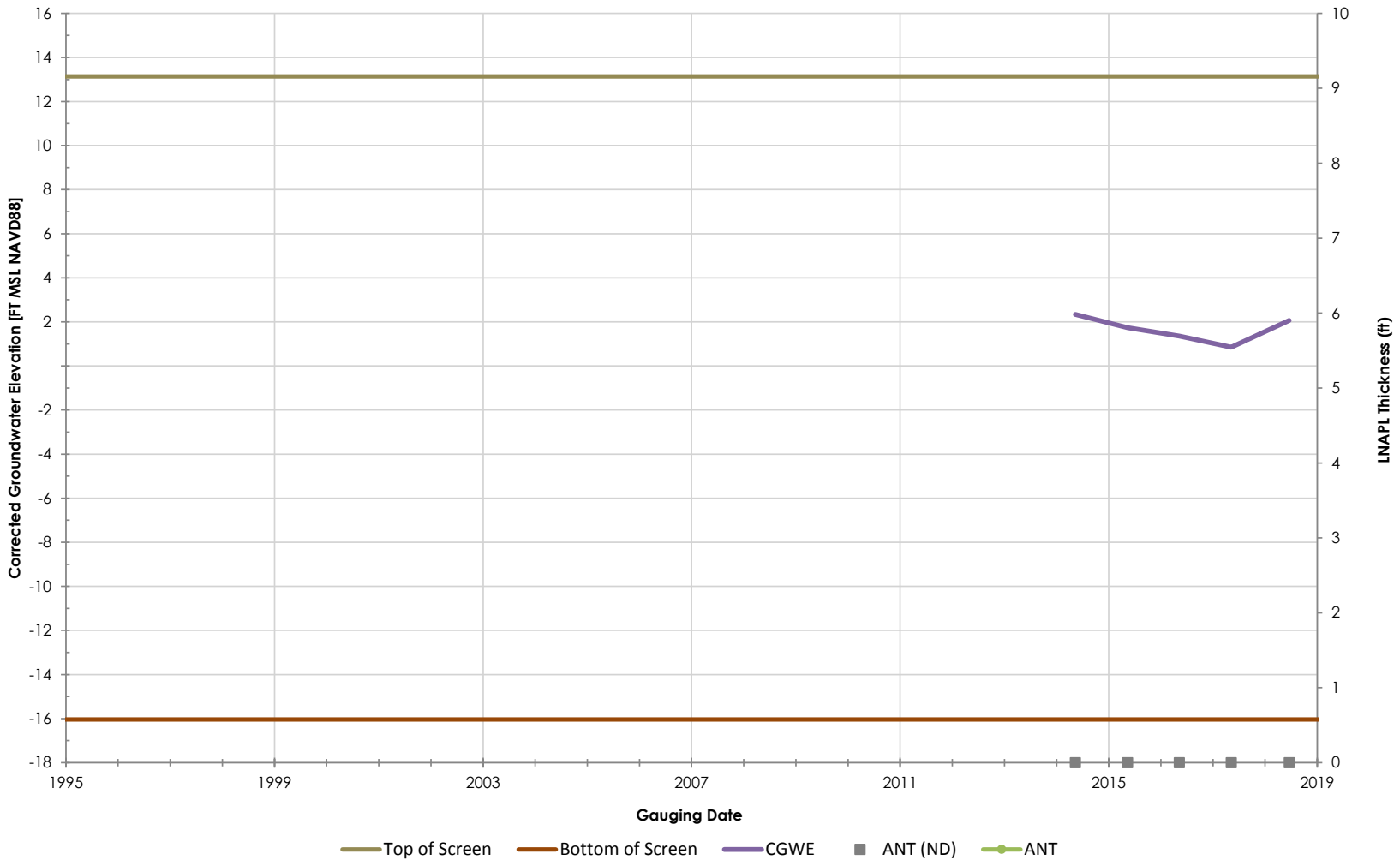
Stantec

Figure/Well No.

PH-MWS-2A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



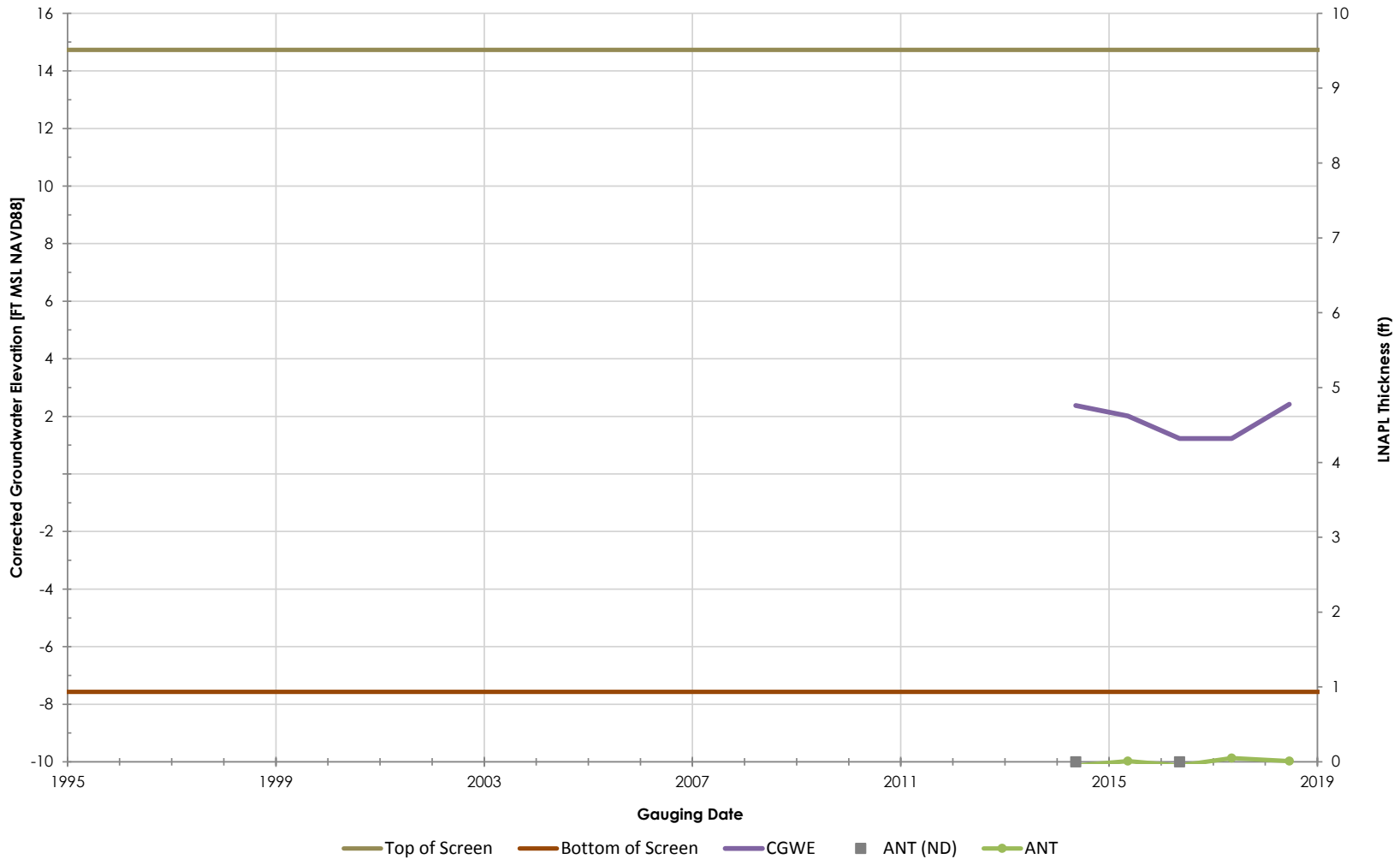
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

PH-MWS-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

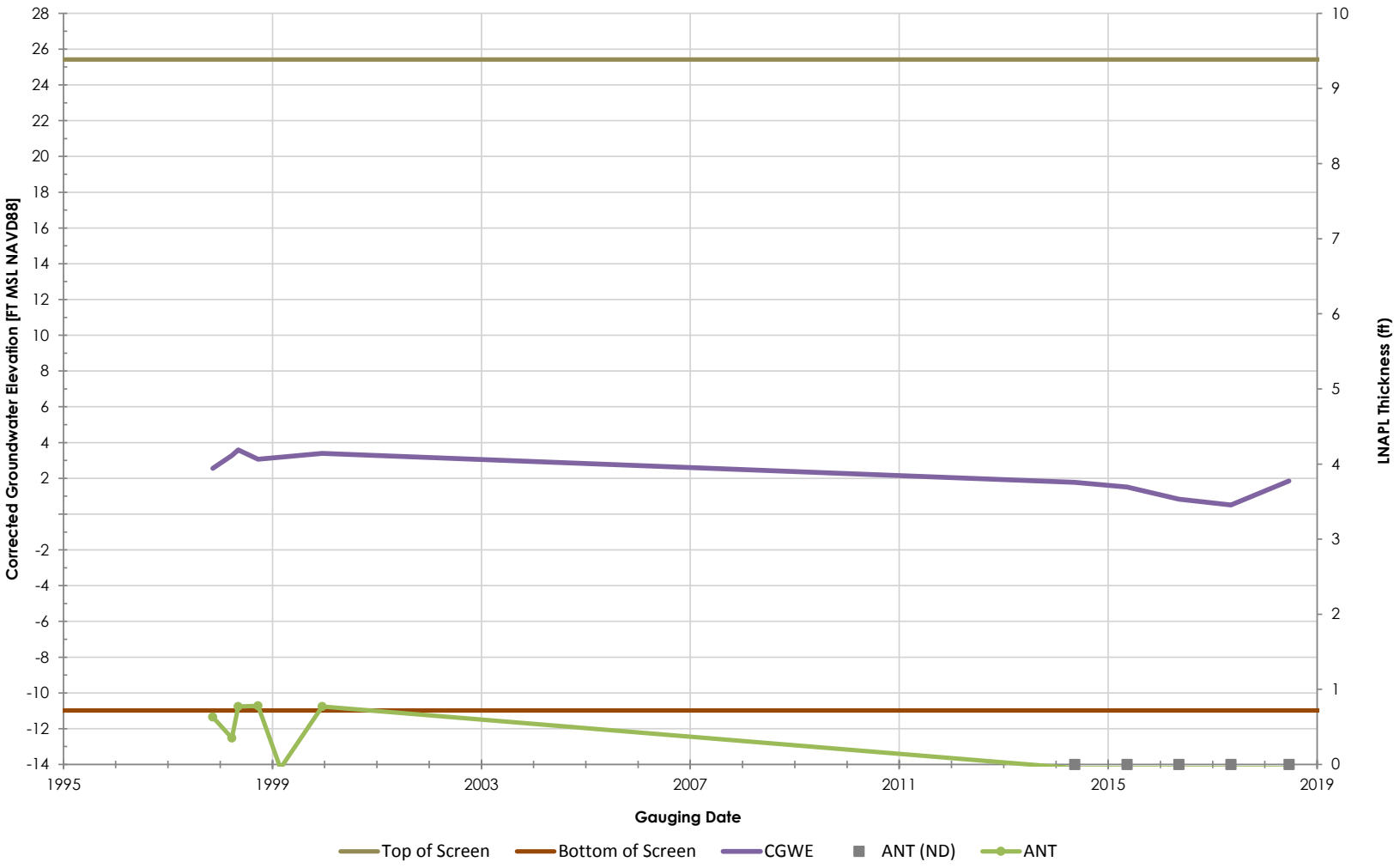
Stantec

Figure/Well No.

PH-MWS-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

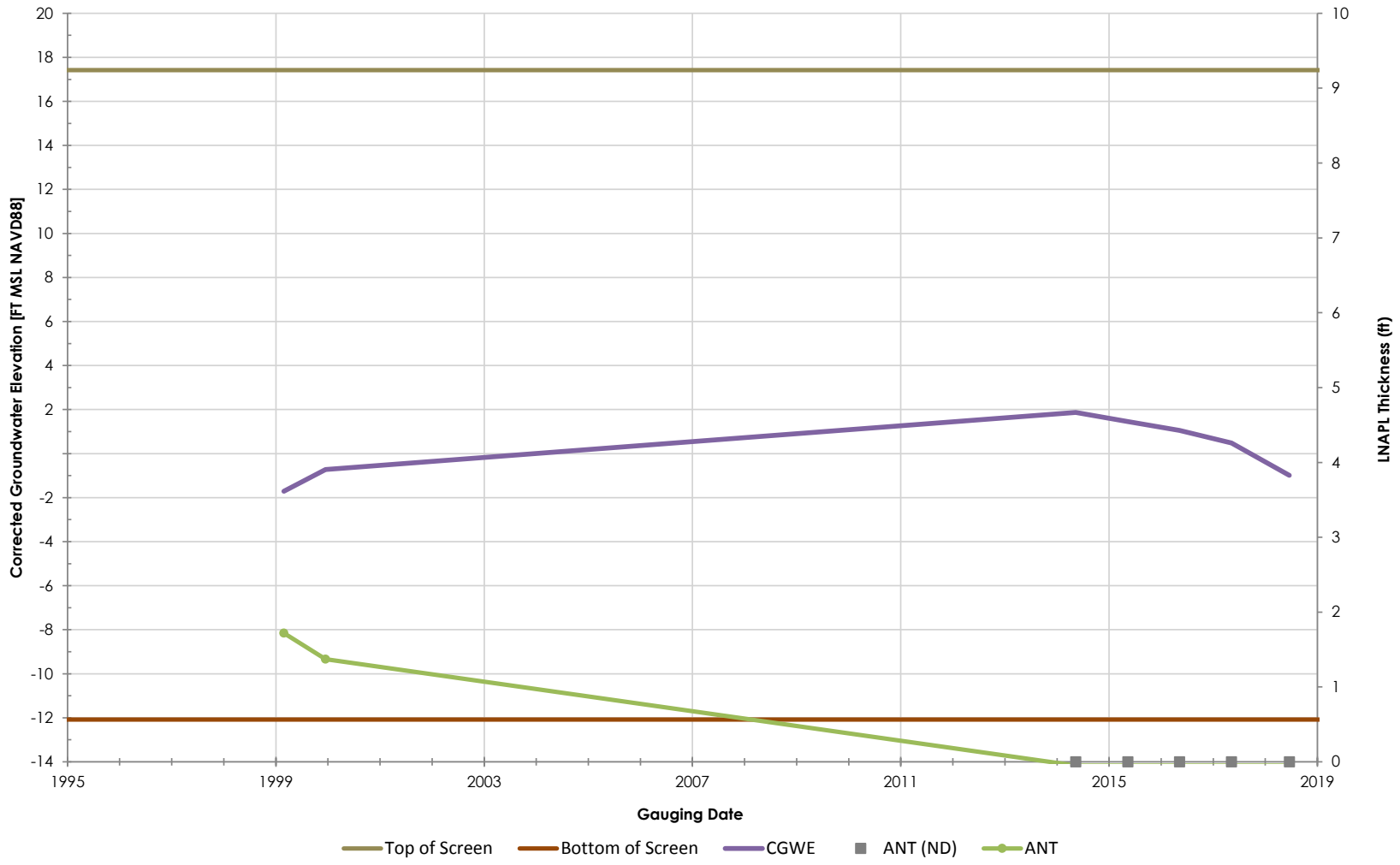
Stantec

Figure/Well No.

PH-PH-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

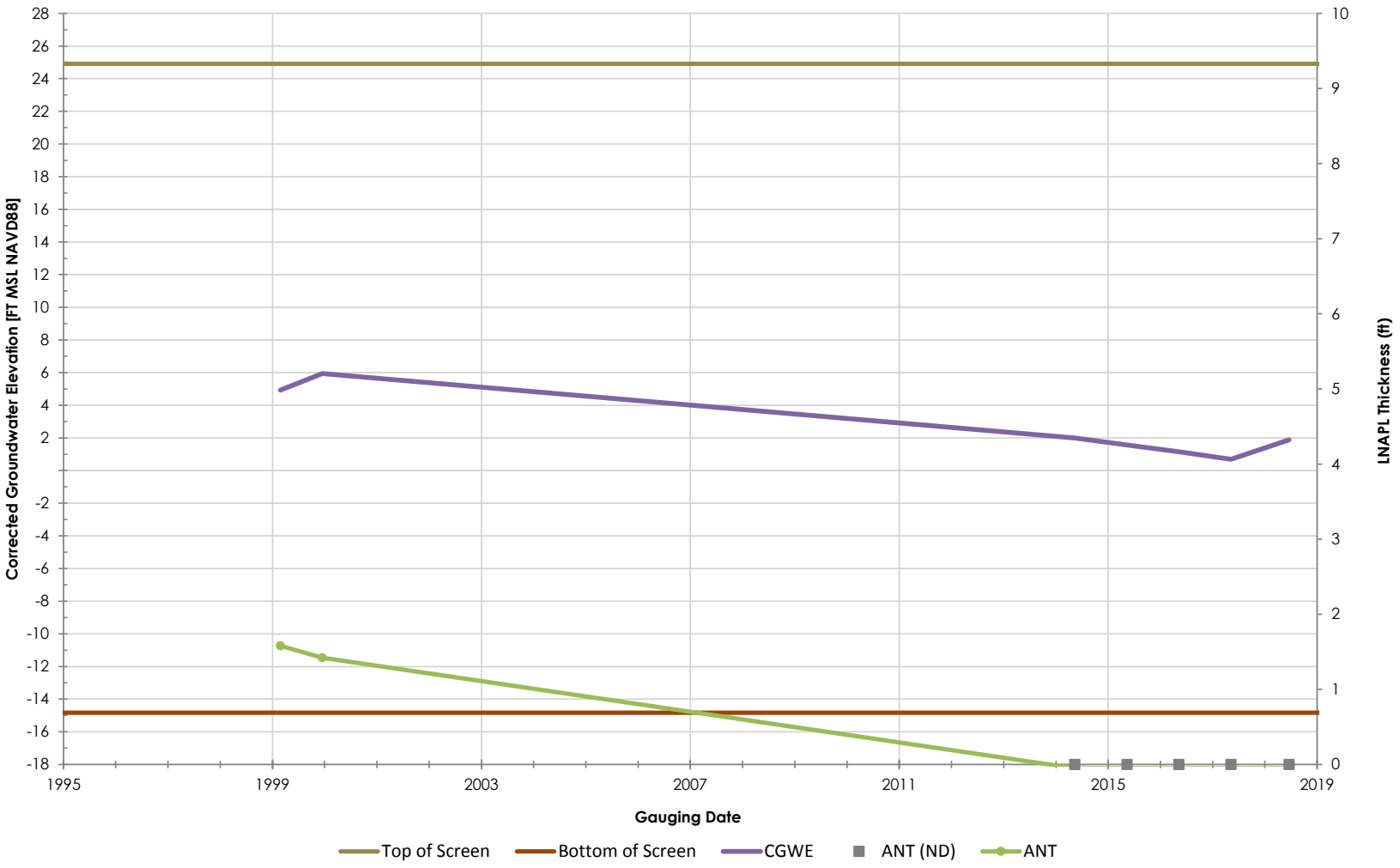
Stantec

Figure/Well No.

PH-PH-13

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

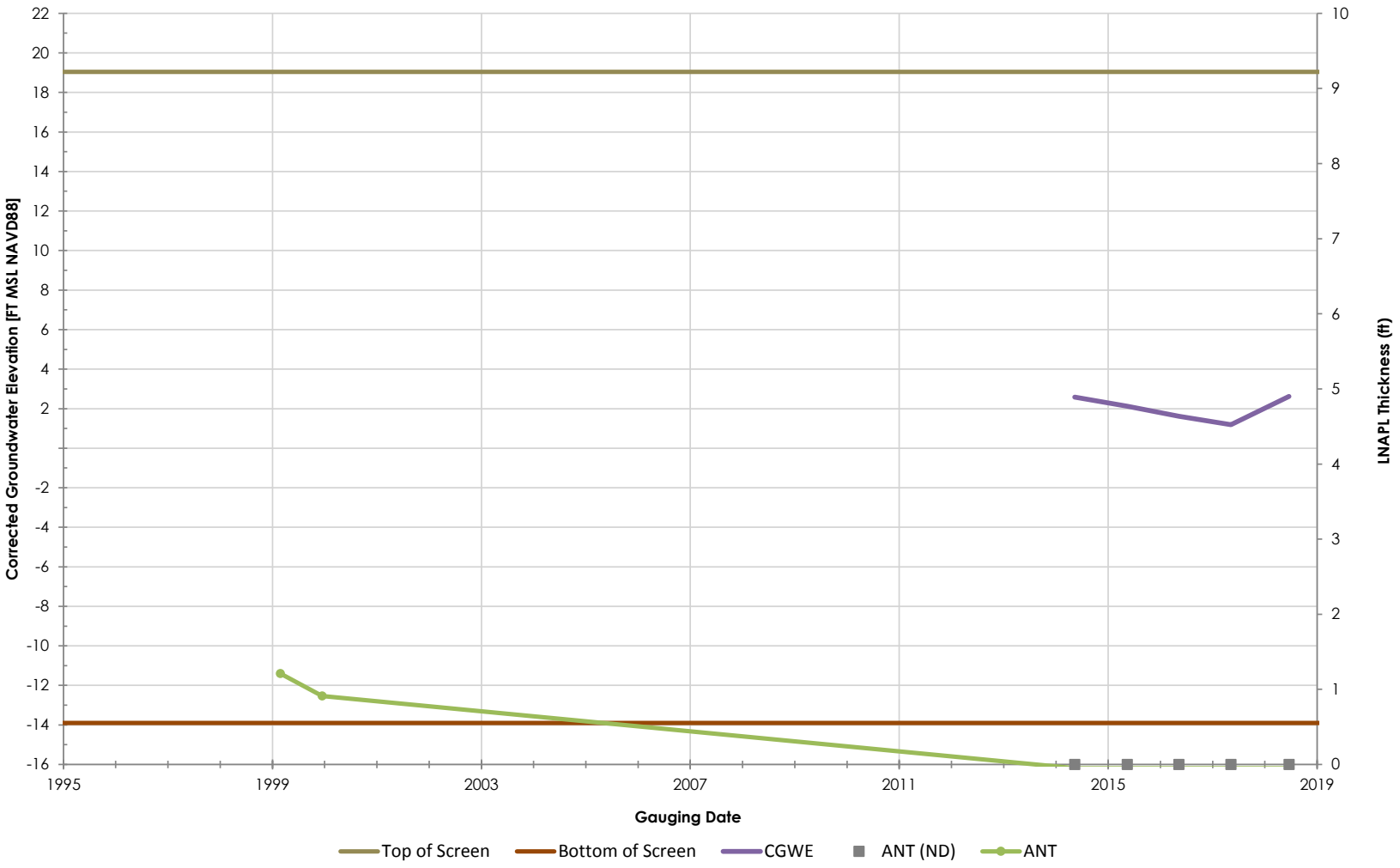
Stantec

Figure/Well No.

PH-PH-14

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

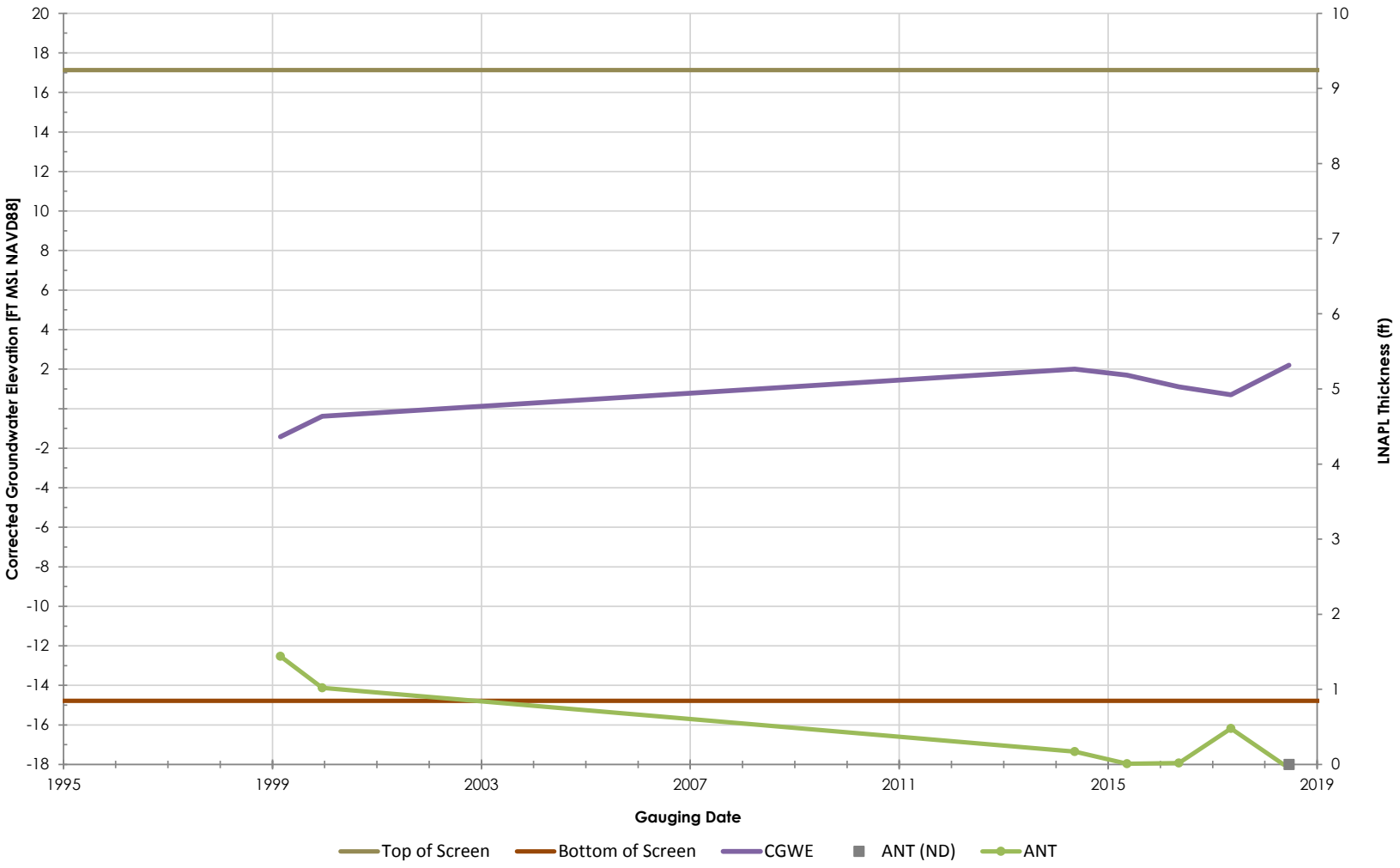
Stantec

Figure/Well No.

PH-PH-16

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

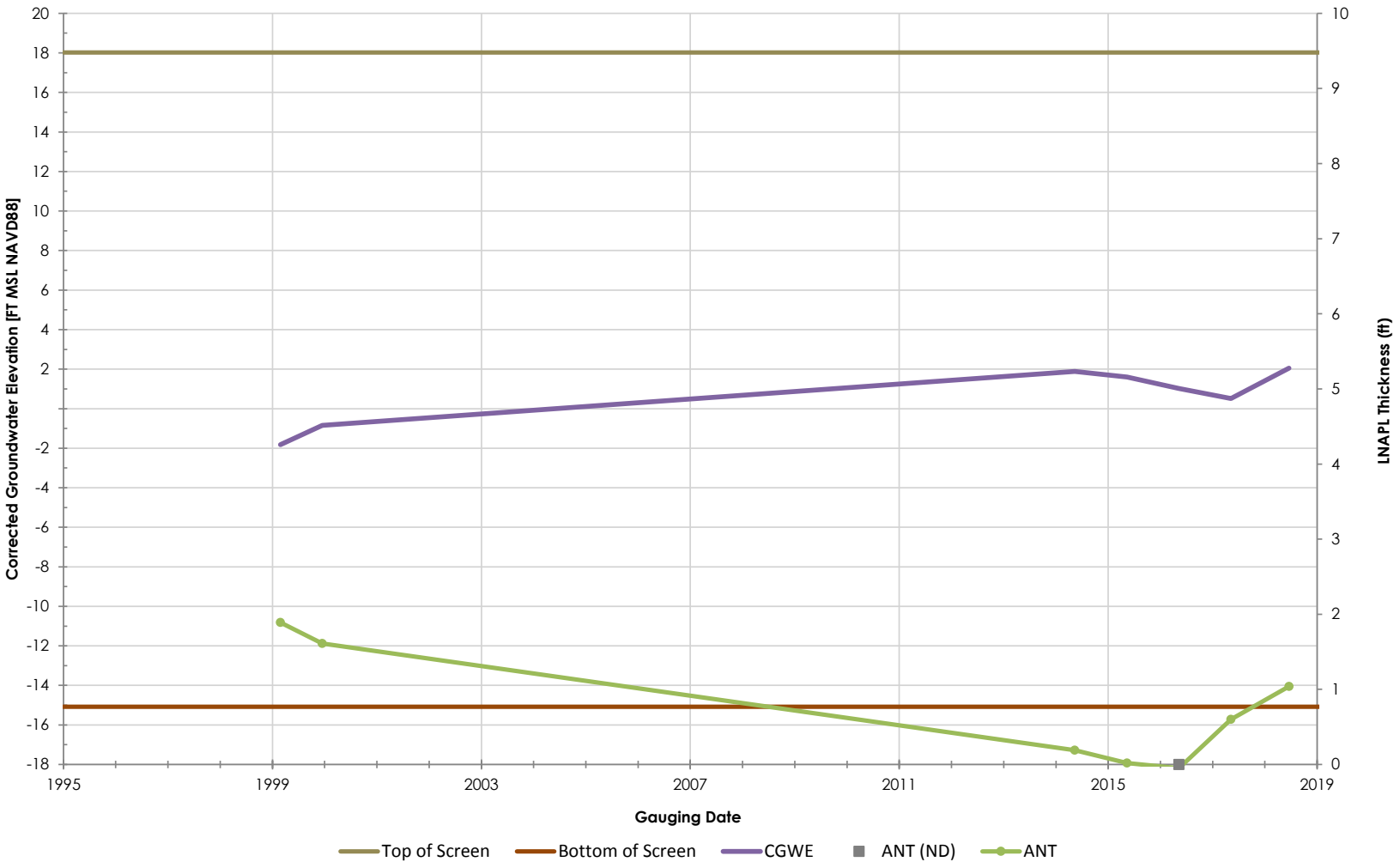
Stantec

Figure/Well No.

PH-PH-17

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

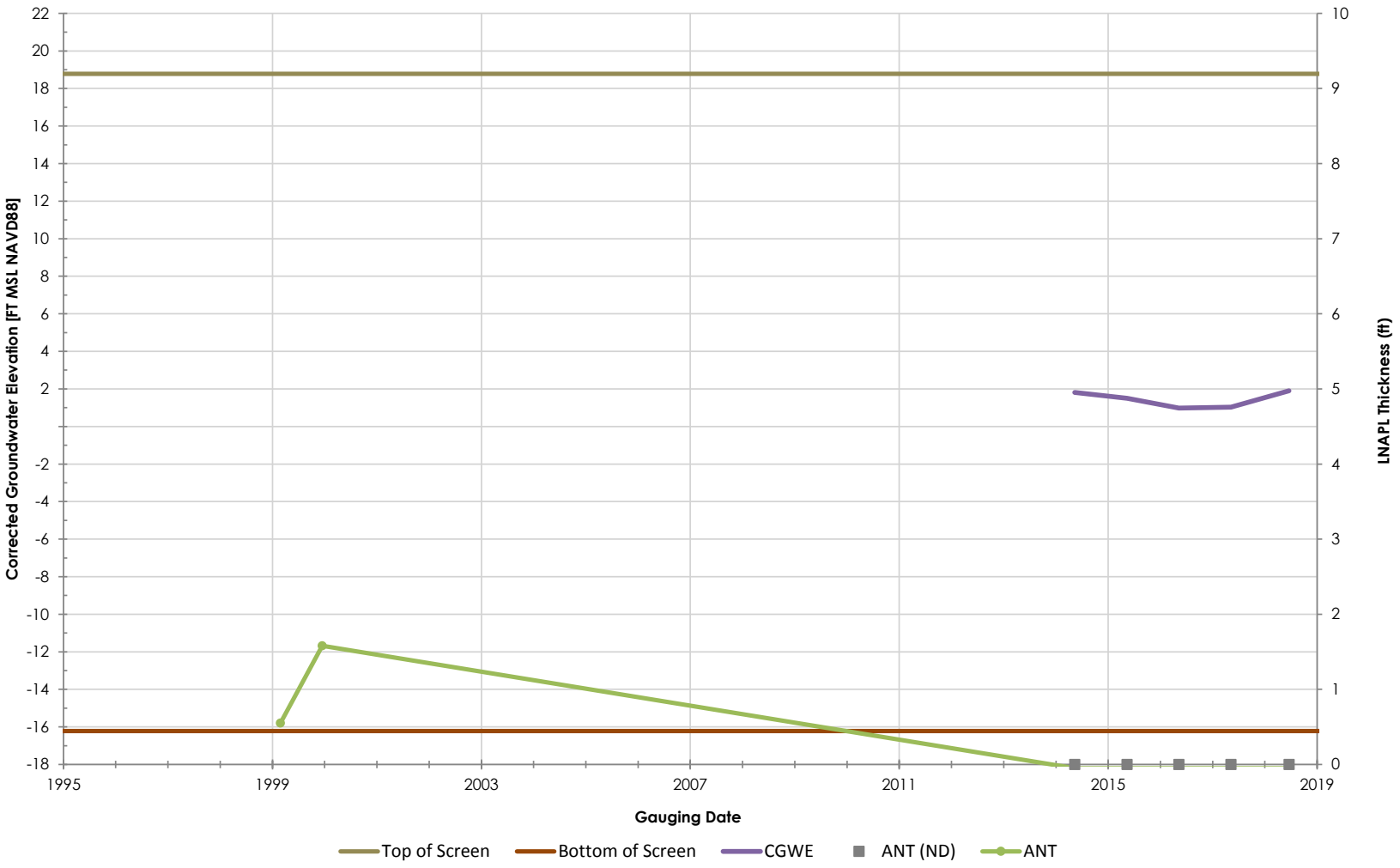
Stantec

Figure/Well No.

PH-PH-18

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

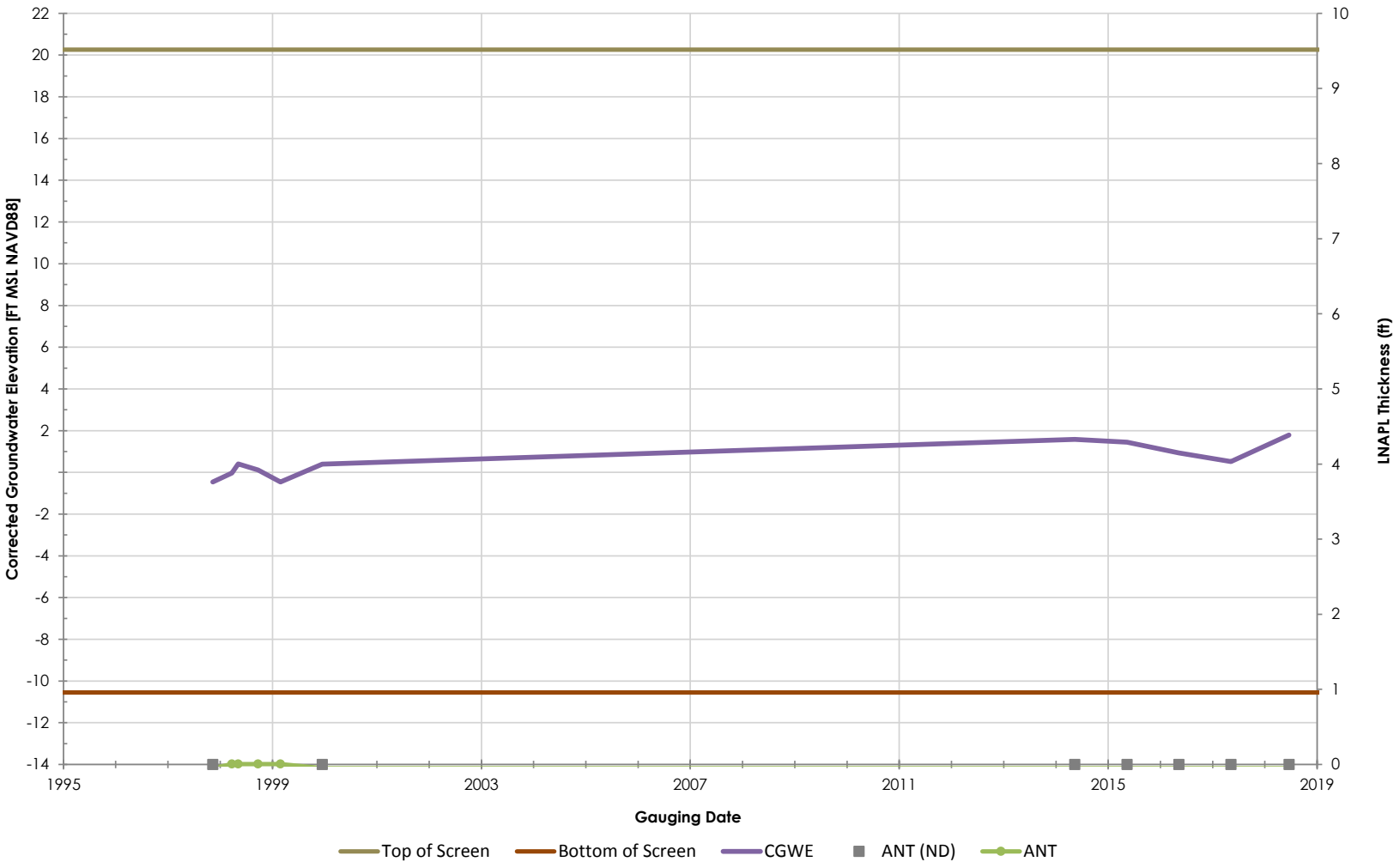
Stantec

Figure/Well No.

PH-PH-19

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

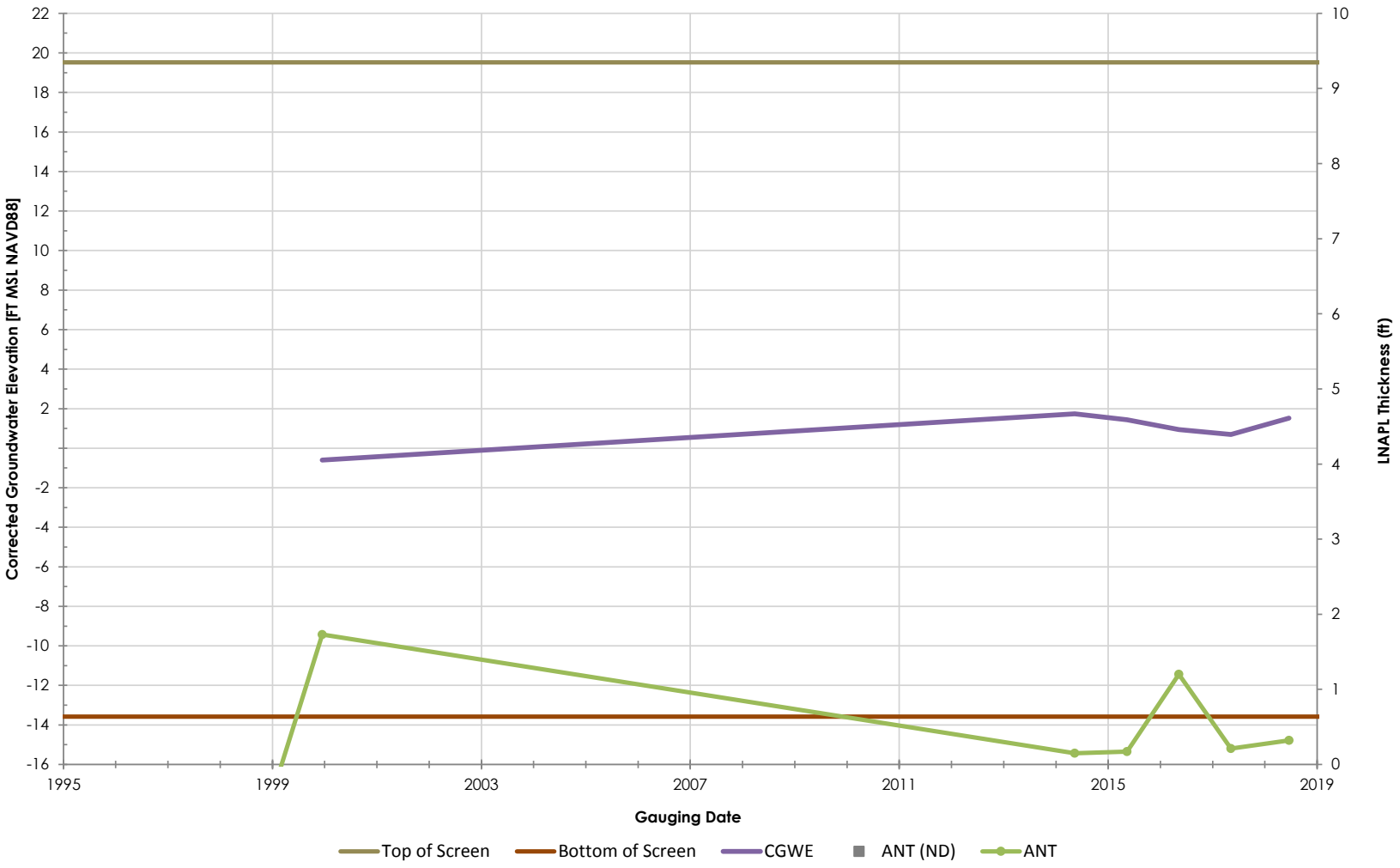
Stantec

Figure/Well No.

PH-PH-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

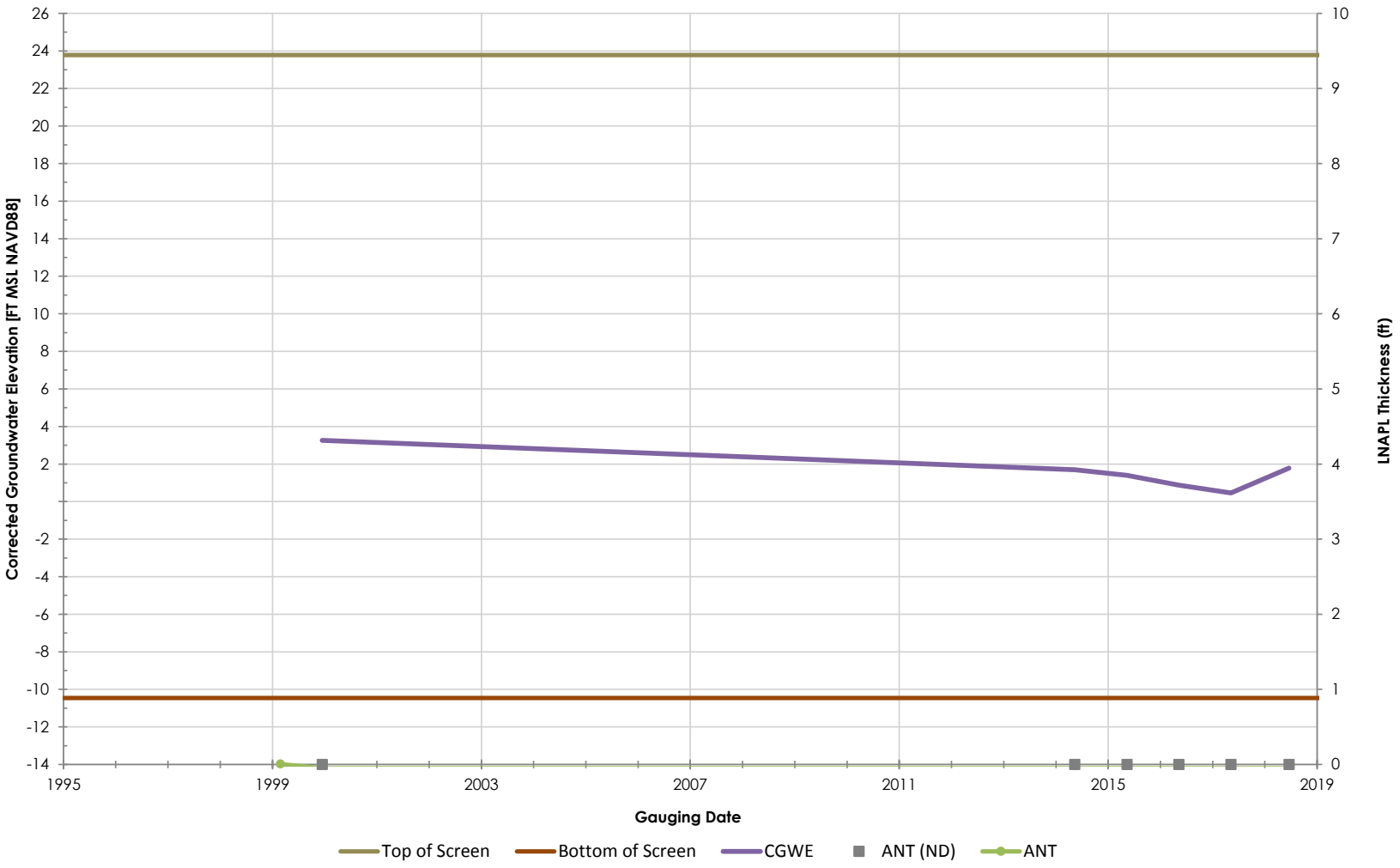
Stantec

Figure/Well No.

PH-PH-20

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

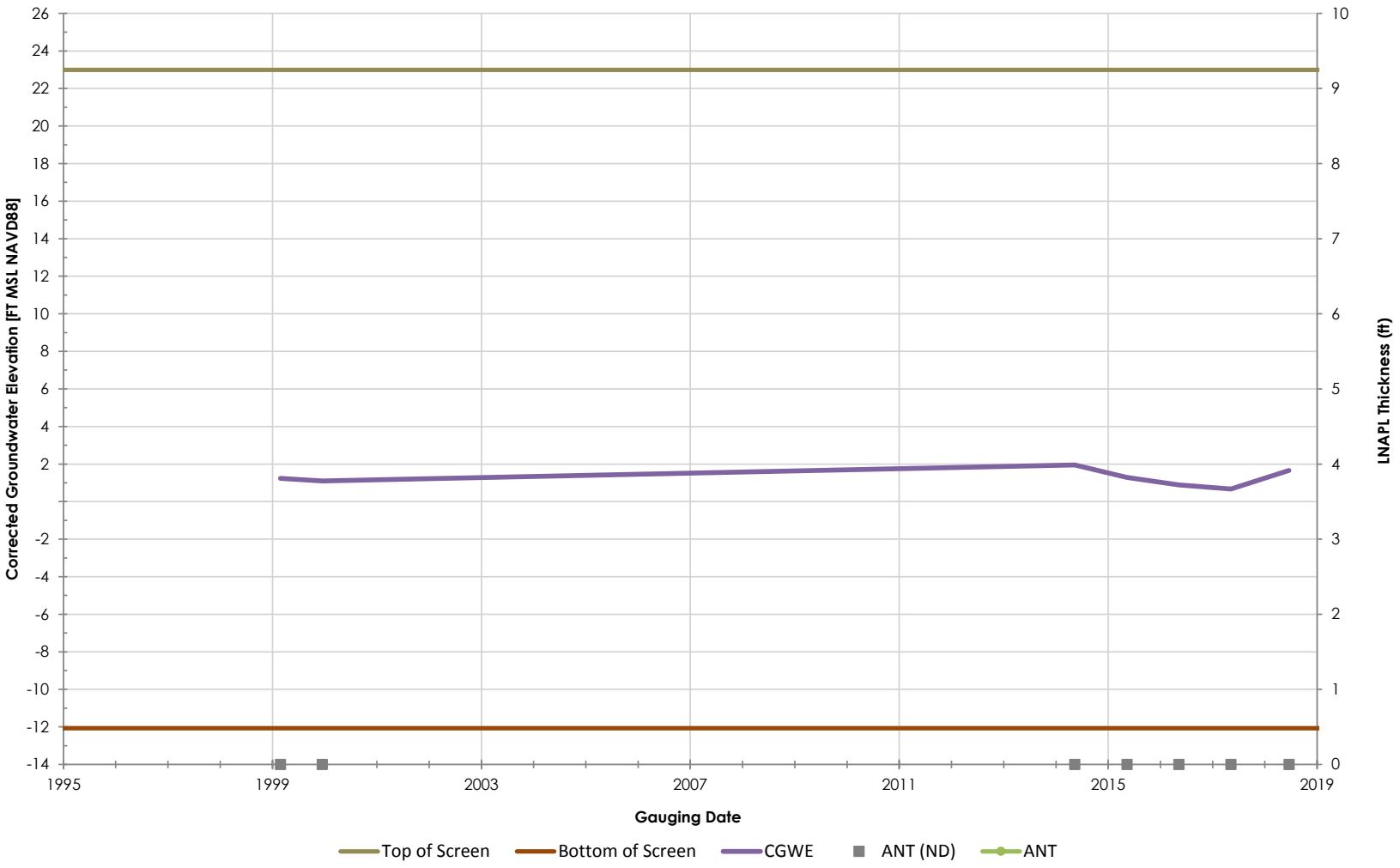
Stantec

Figure/Well No.

PH-PH-21

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

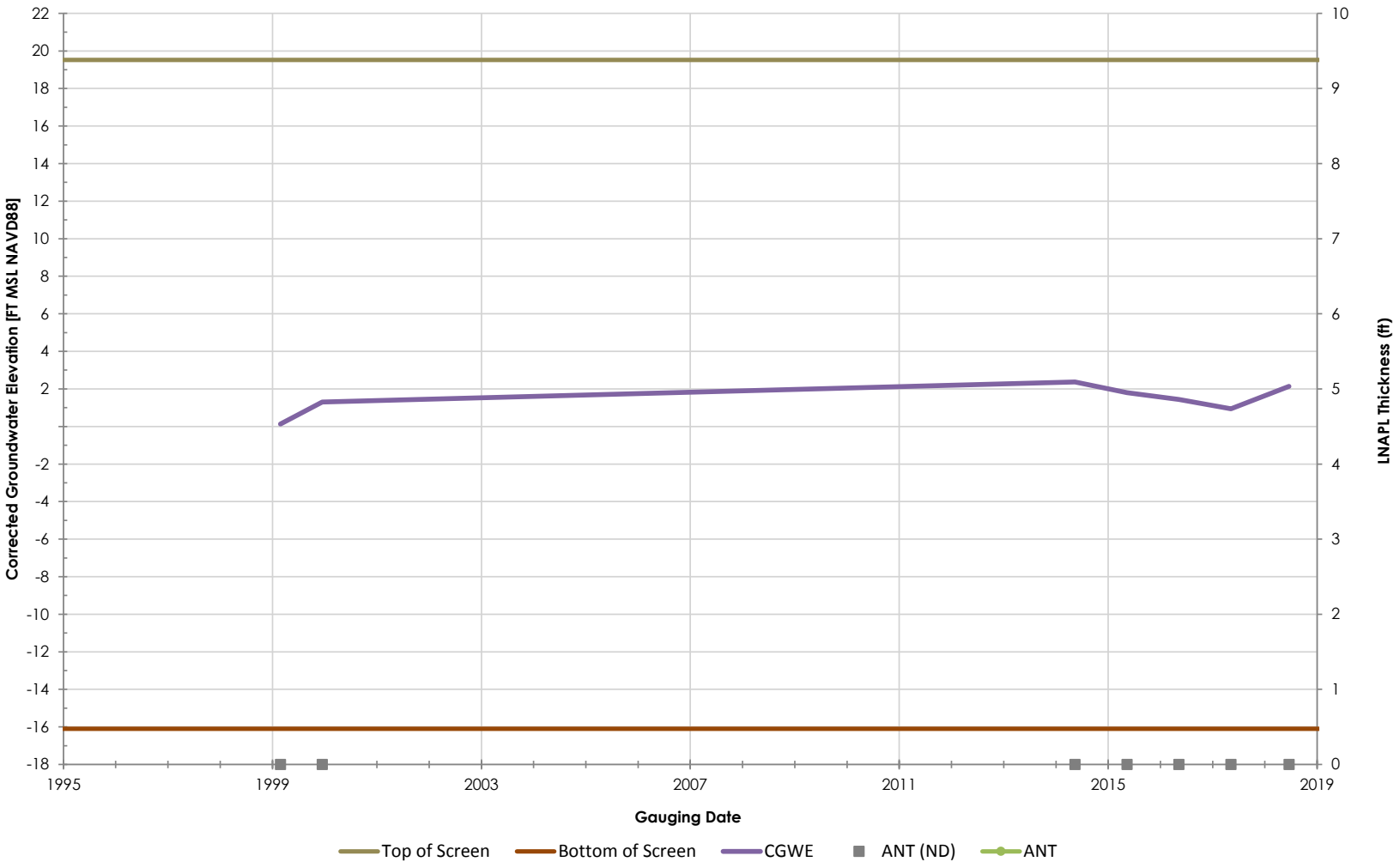
Stantec

Figure/Well No.

PH-PH-22

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

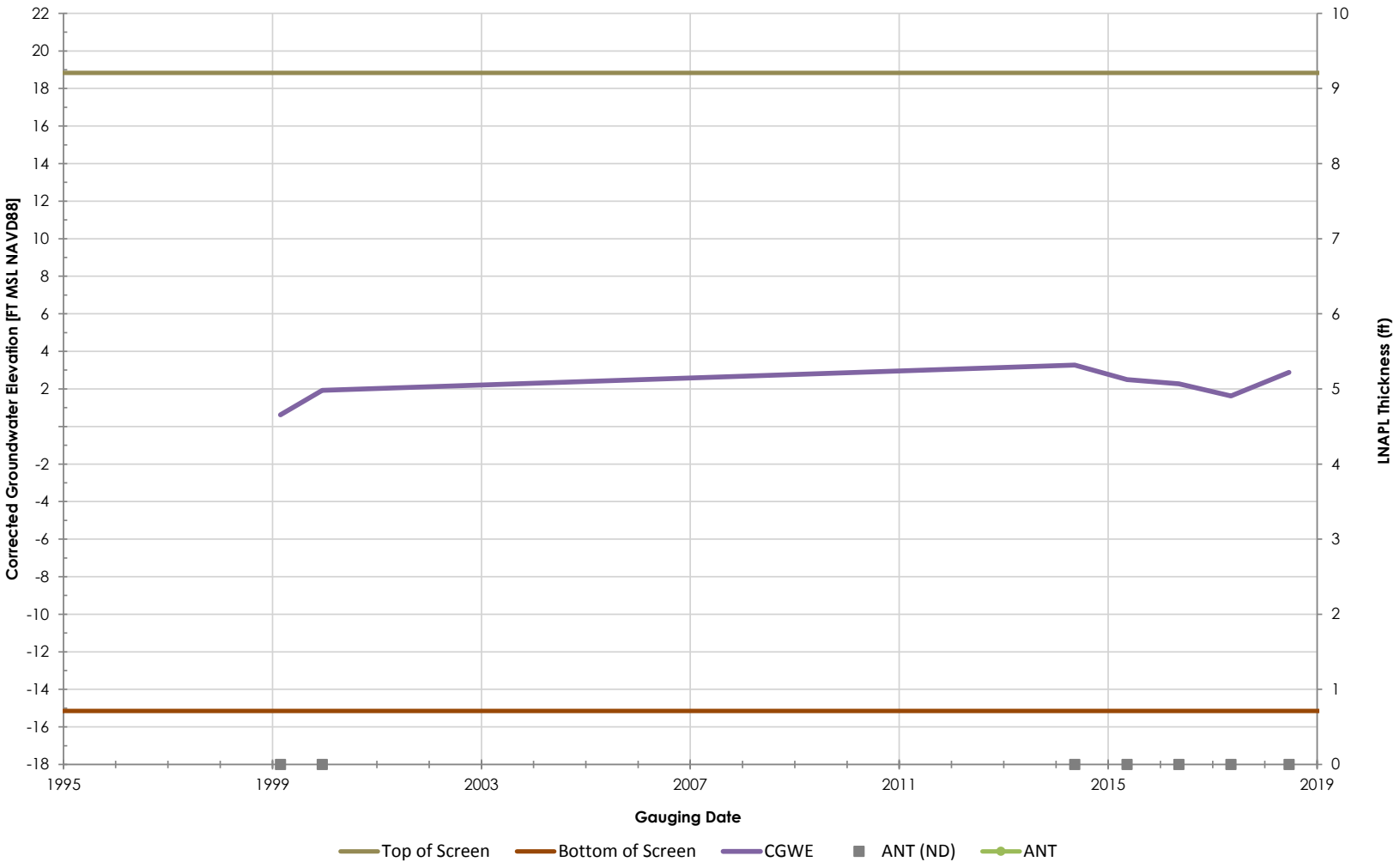
Stantec

Figure/Well No.

PH-PH-23

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

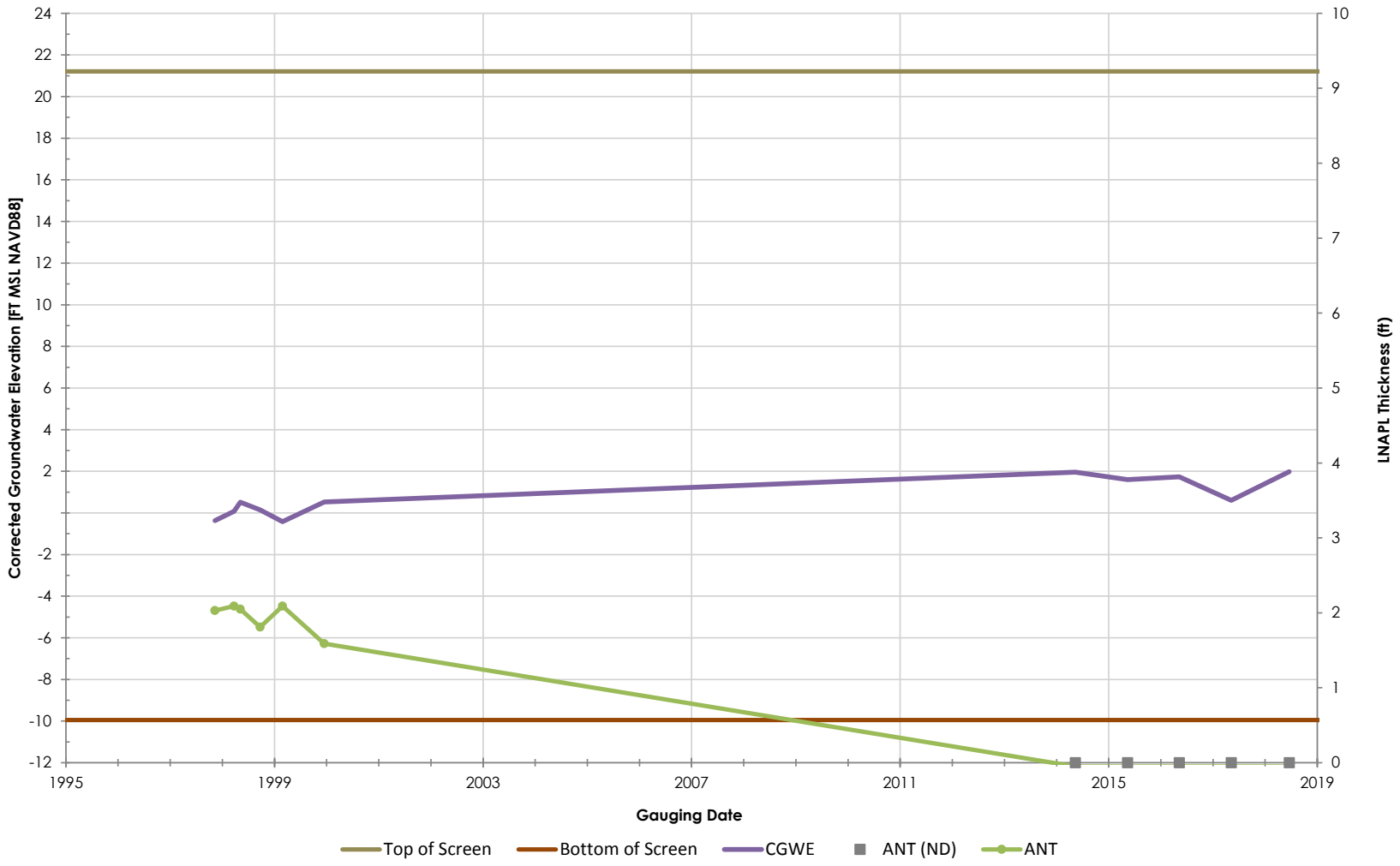
Stantec

Figure/Well No.

PH-PH-24

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

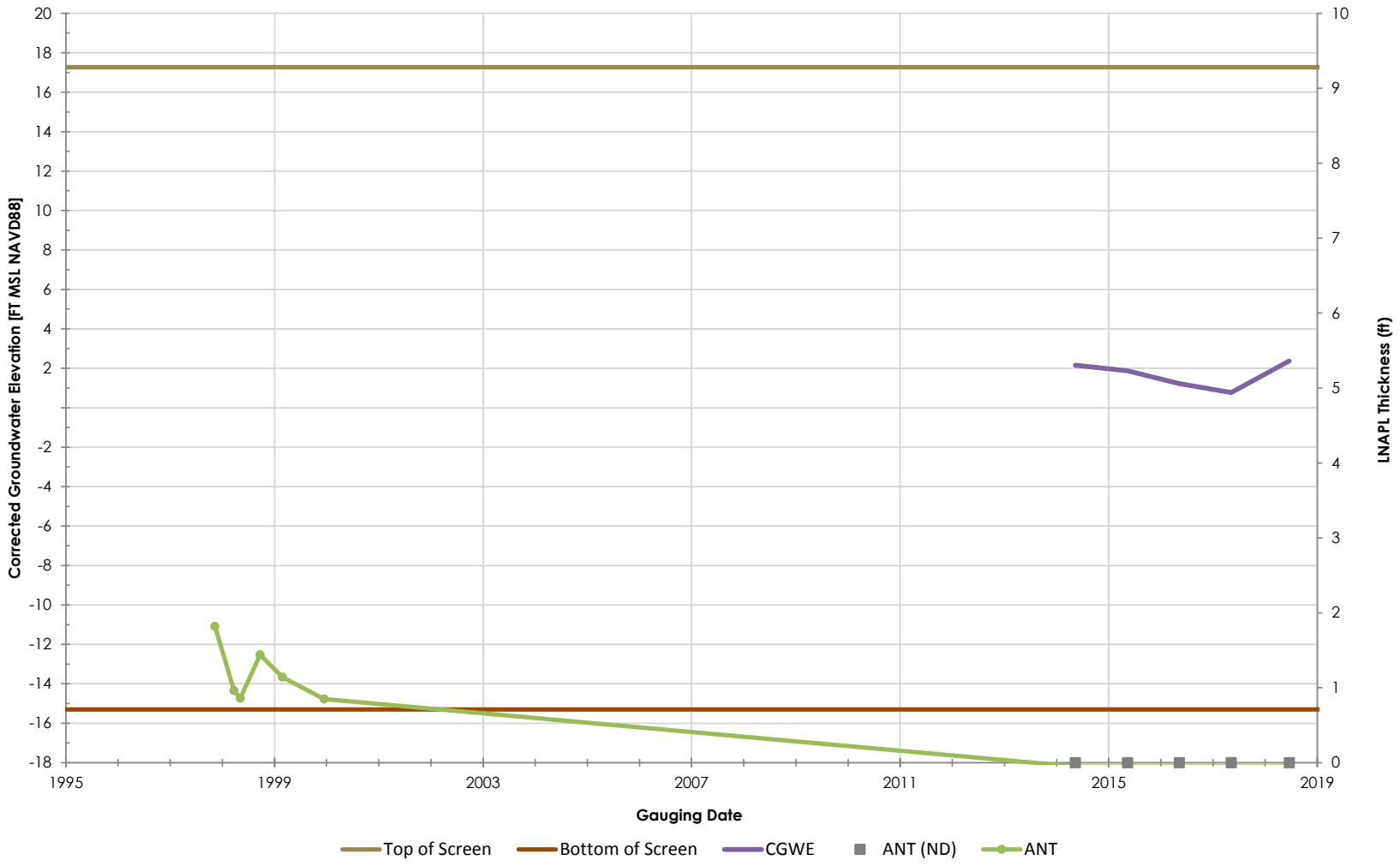
Stantec

Figure/Well No.

PH-PH-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

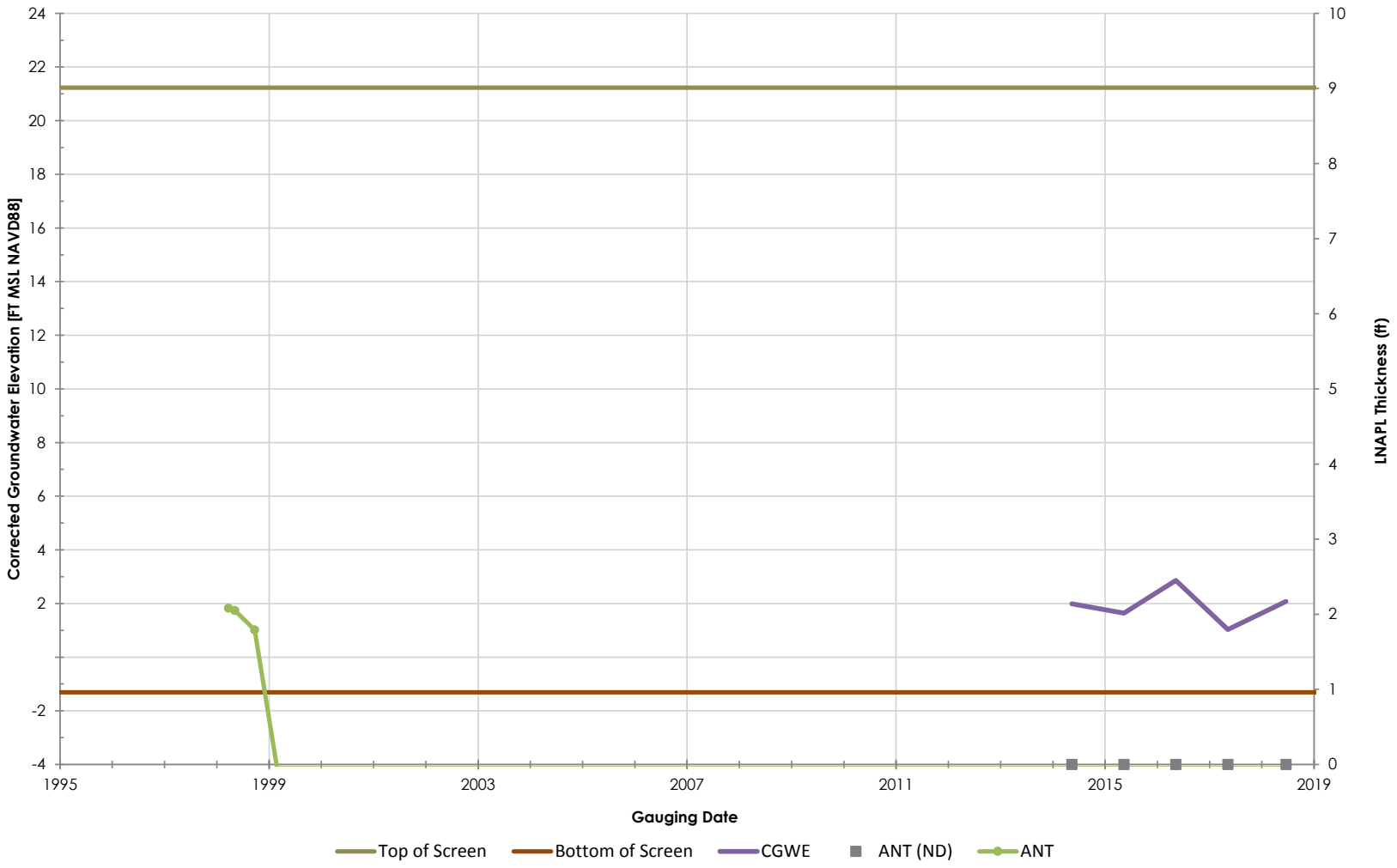
Stantec

Figure/Well No.

PH-PH-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

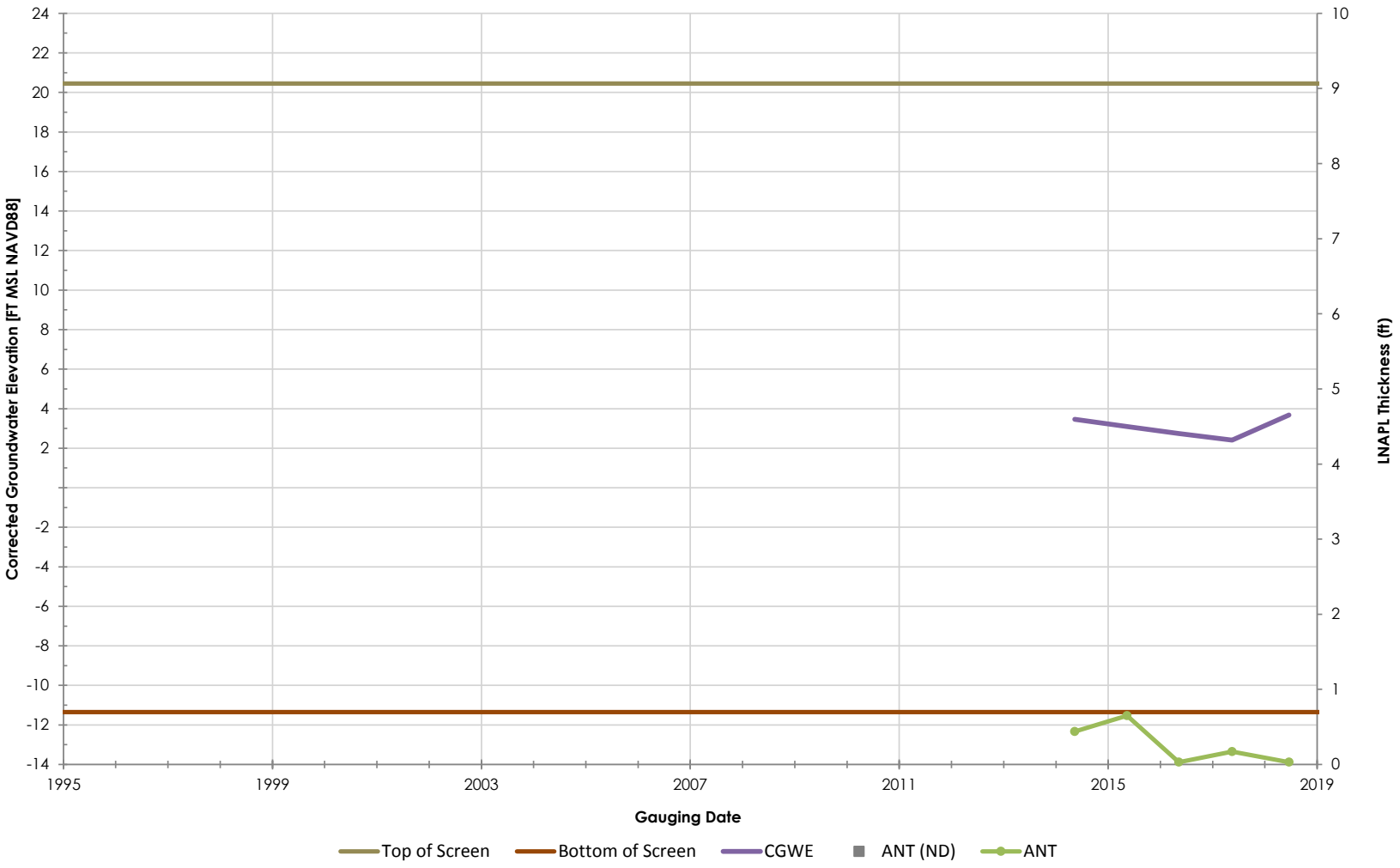
Stantec

Figure/Well No.

PH-PZ-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

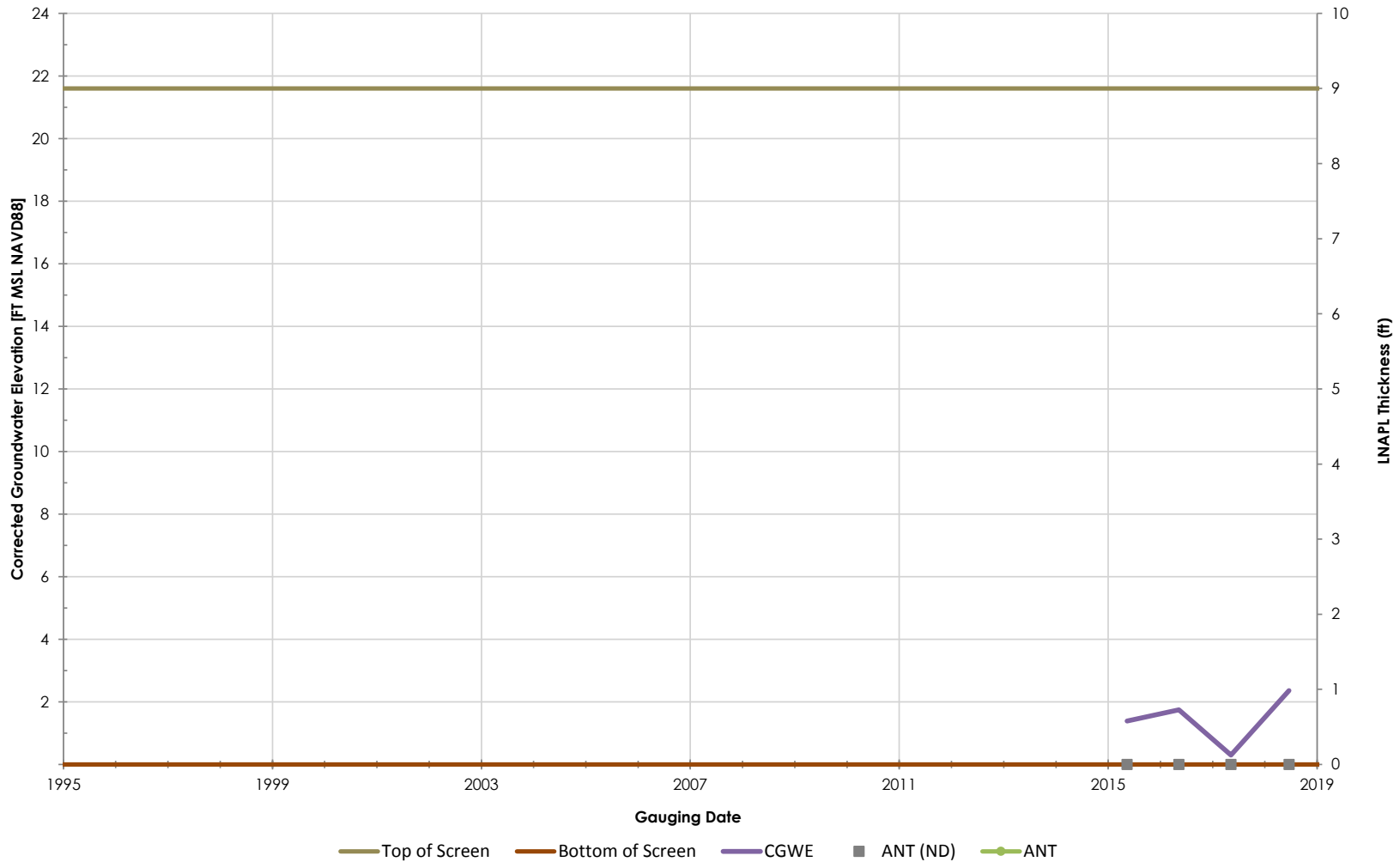
Stantec

Figure/Well No.

PH-RW-A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

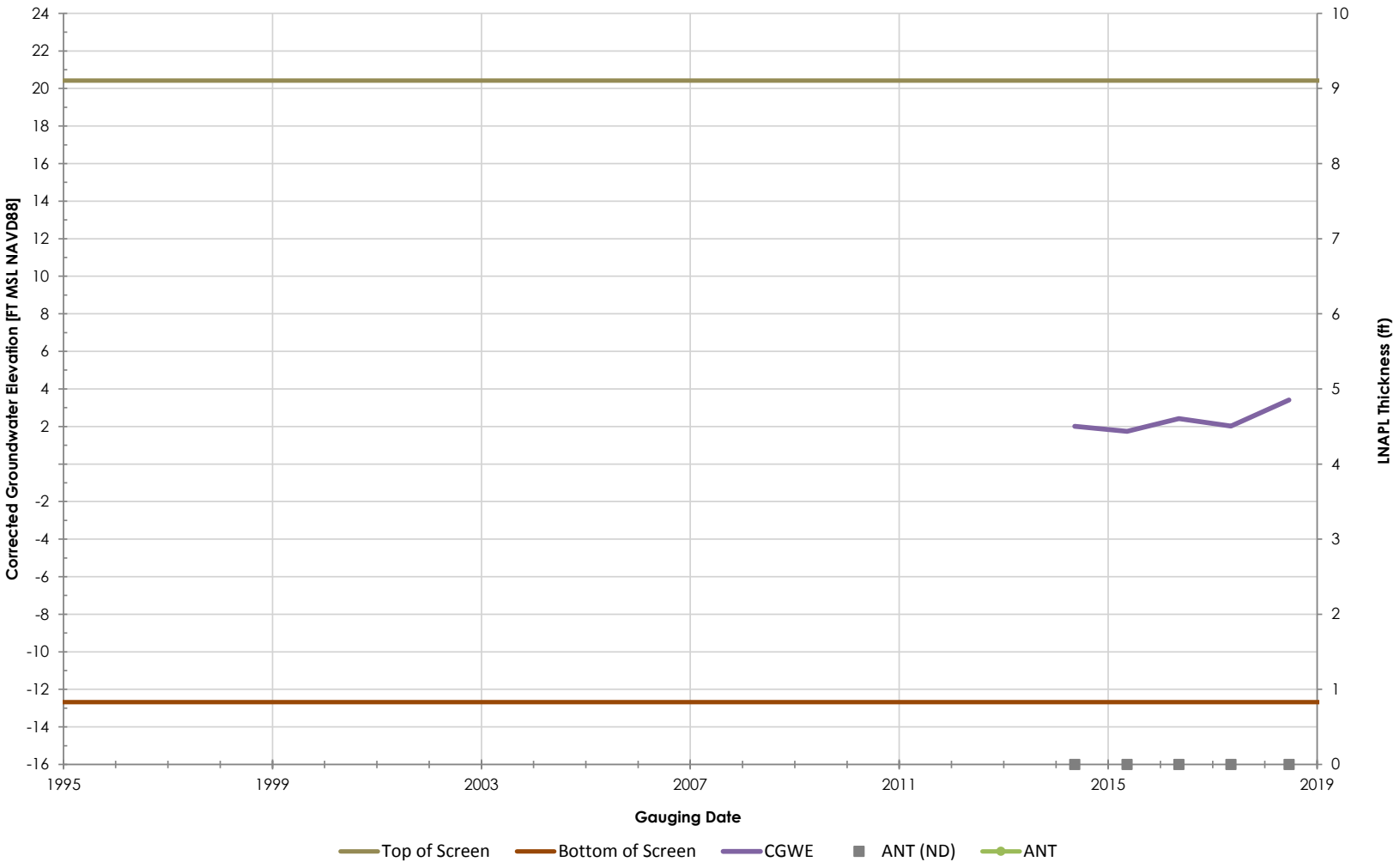
Stantec

Figure/Well No.

PH-RW-A2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

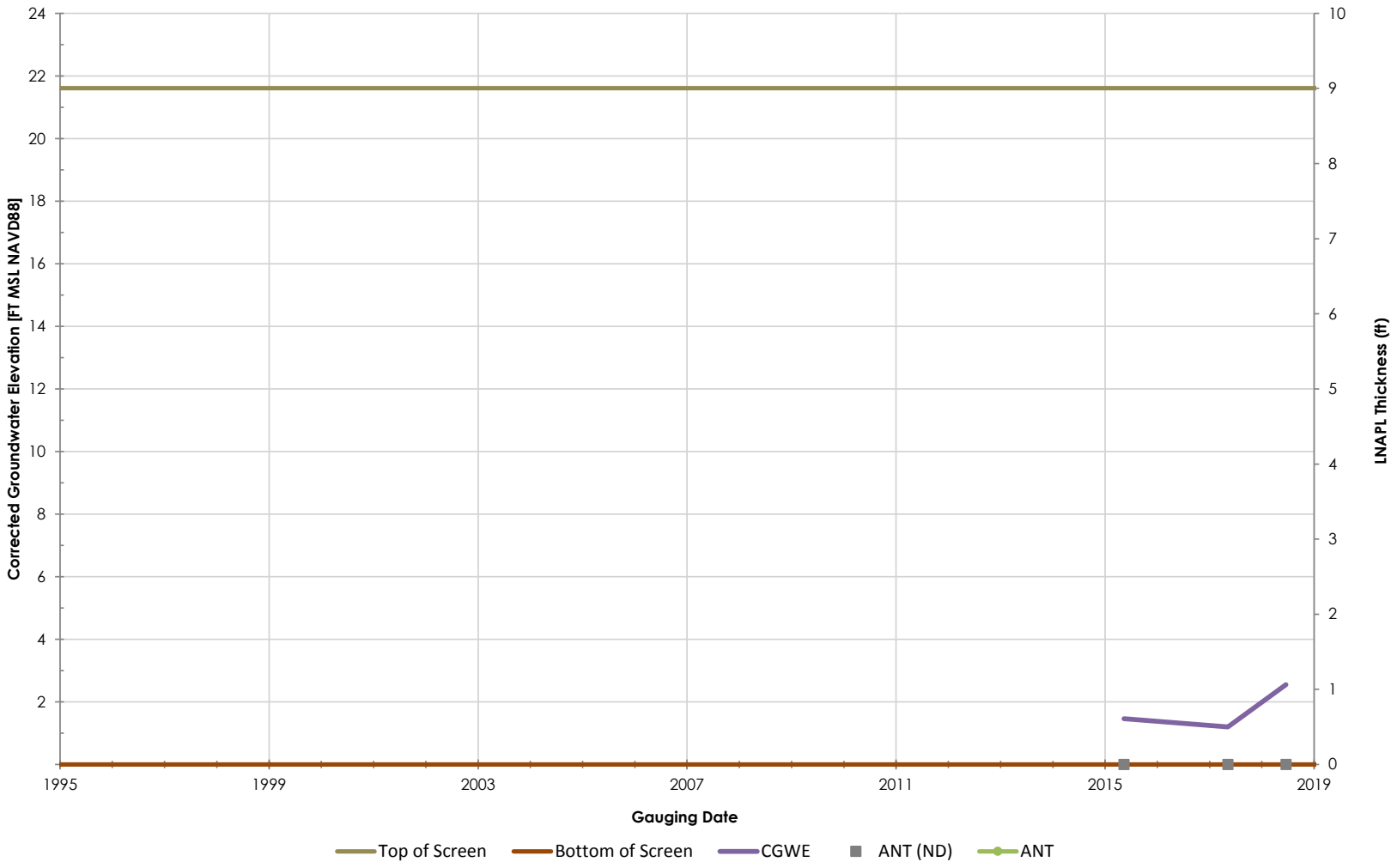
Stantec

Figure/Well No.

PH-RW-B

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

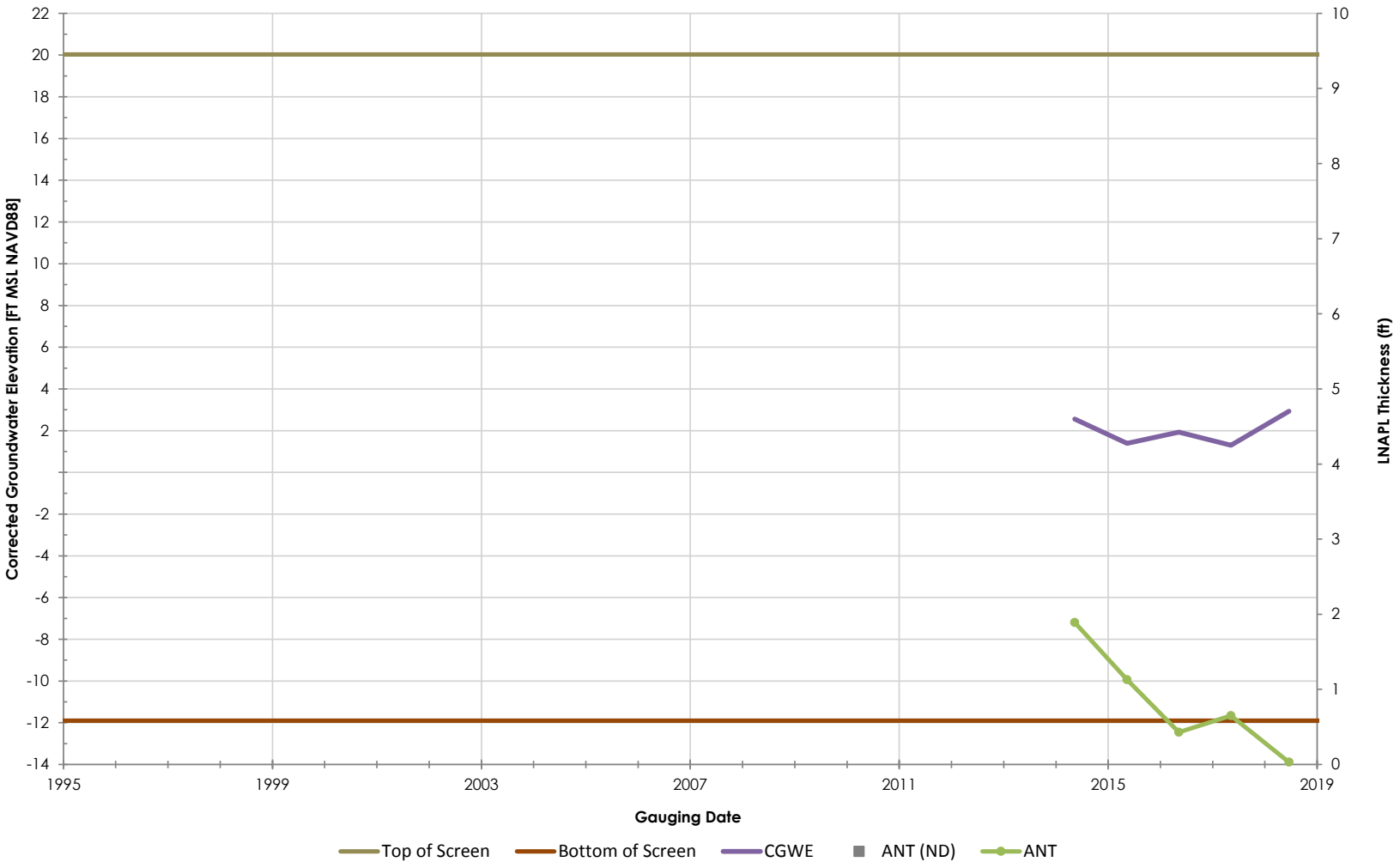
Stantec

Figure/Well No.

PH-RW-B2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

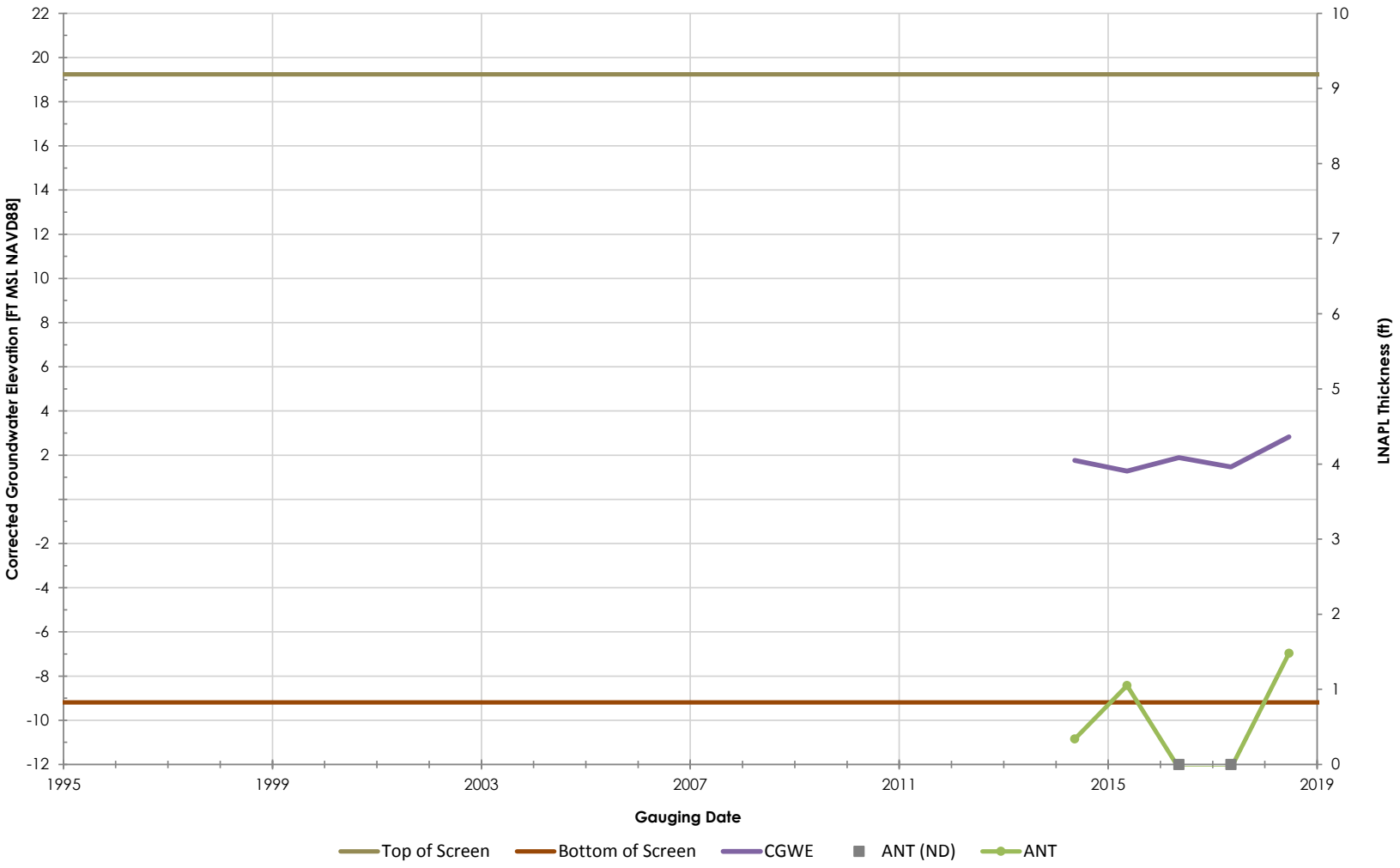
Stantec

Figure/Well No.

PH-RW-C

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

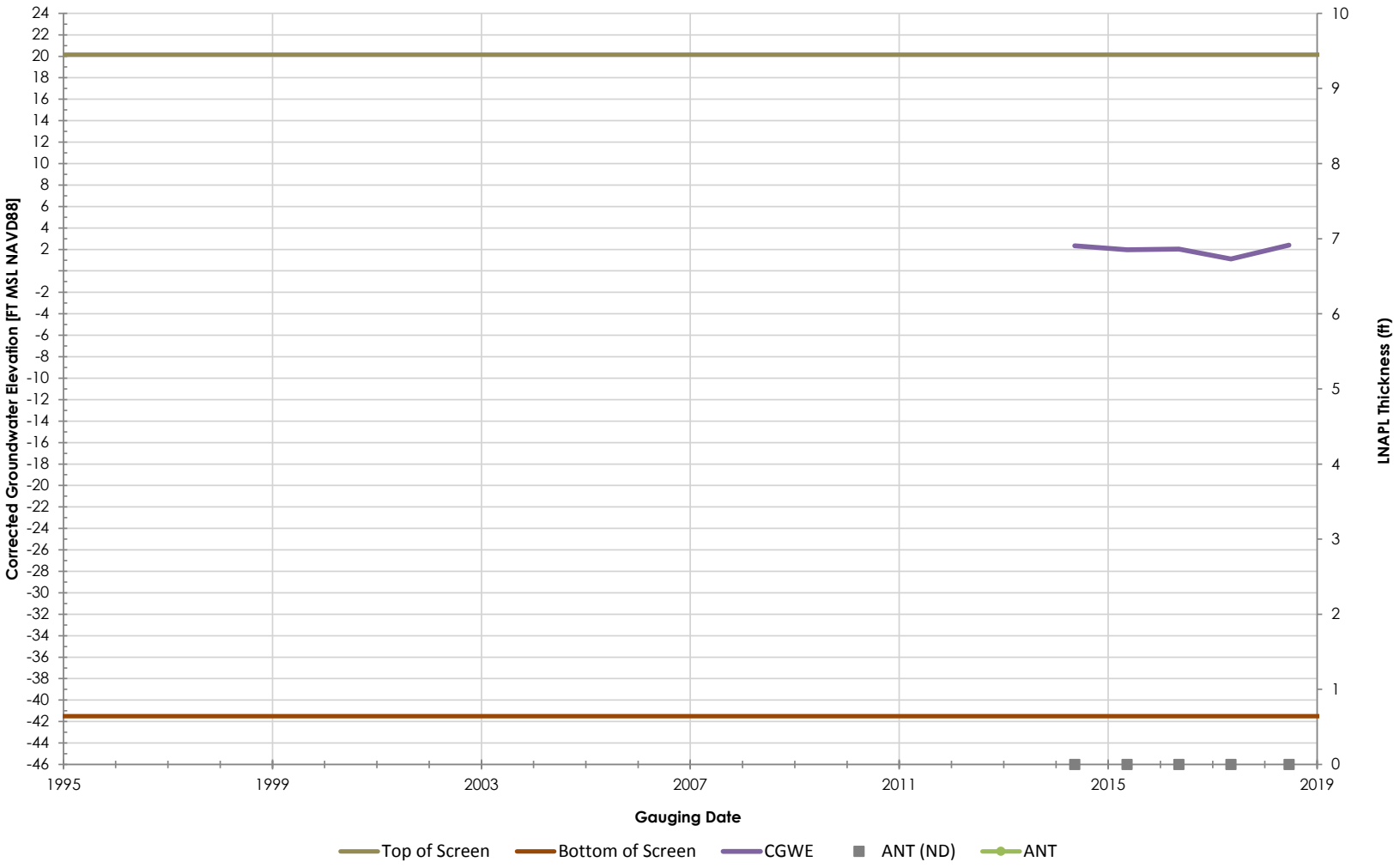
Stantec

Figure/Well No.

PH-RW-CA

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



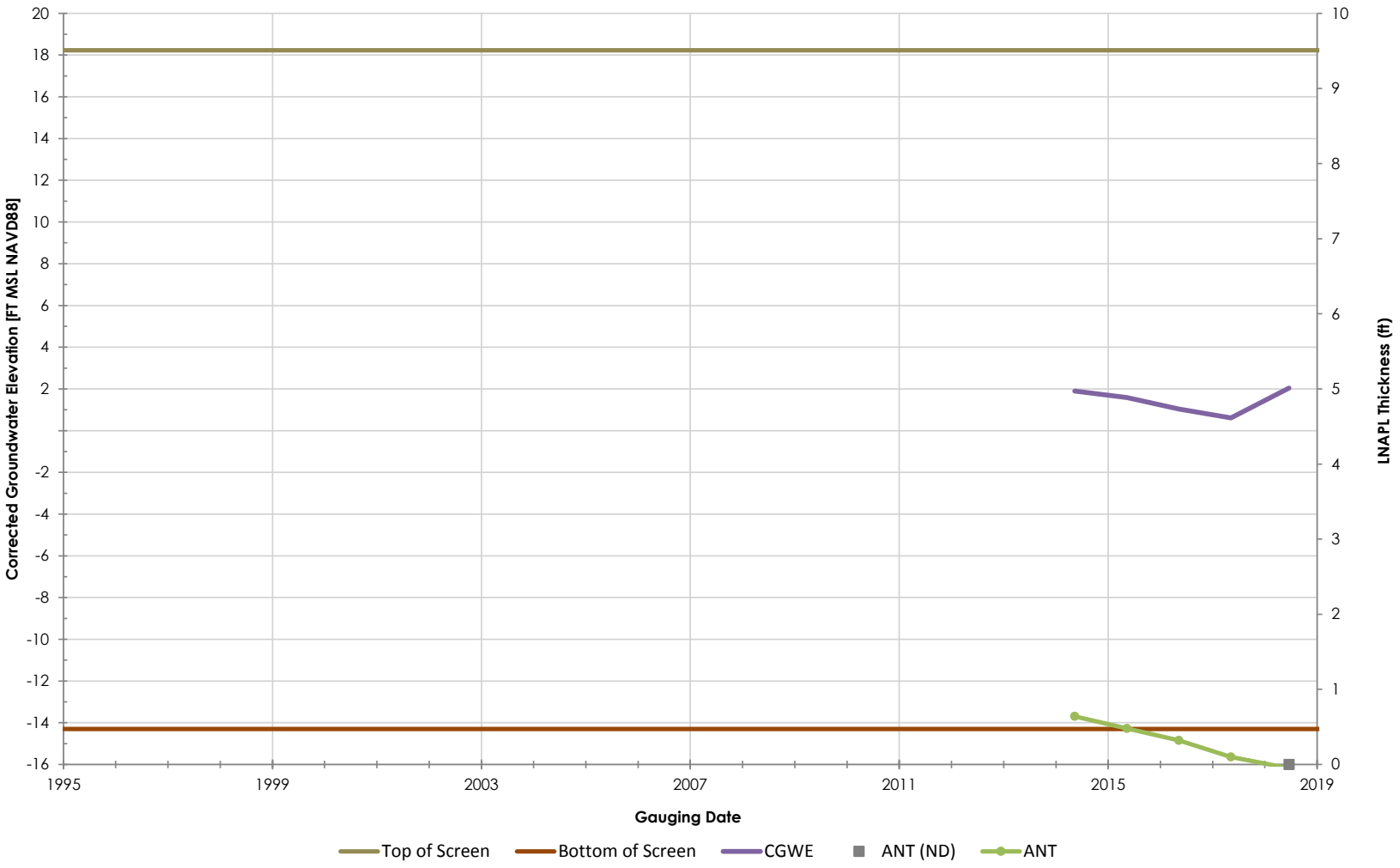
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

PH-RW-D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

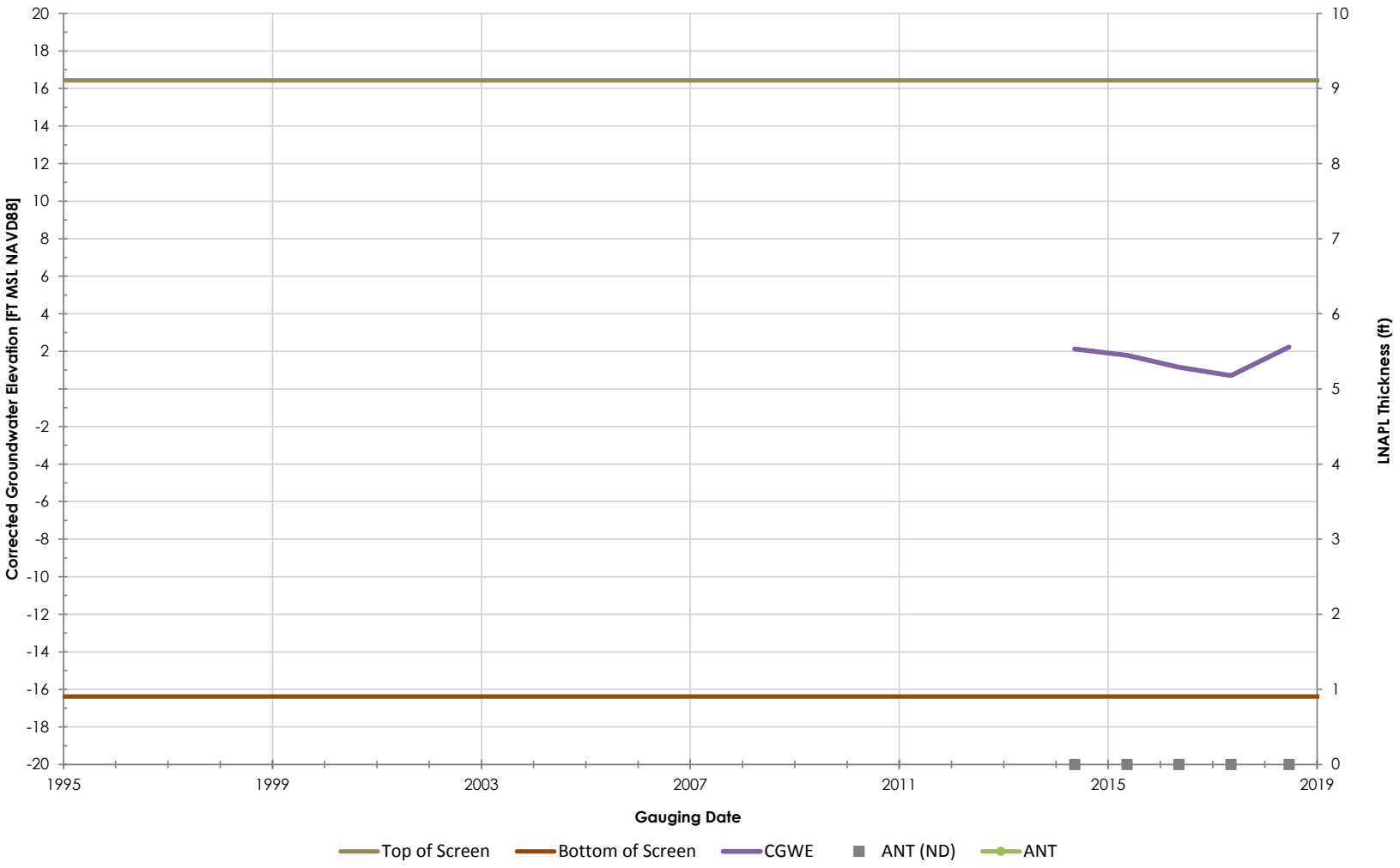
Stantec

Figure/Well No.

PH-RW-E

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

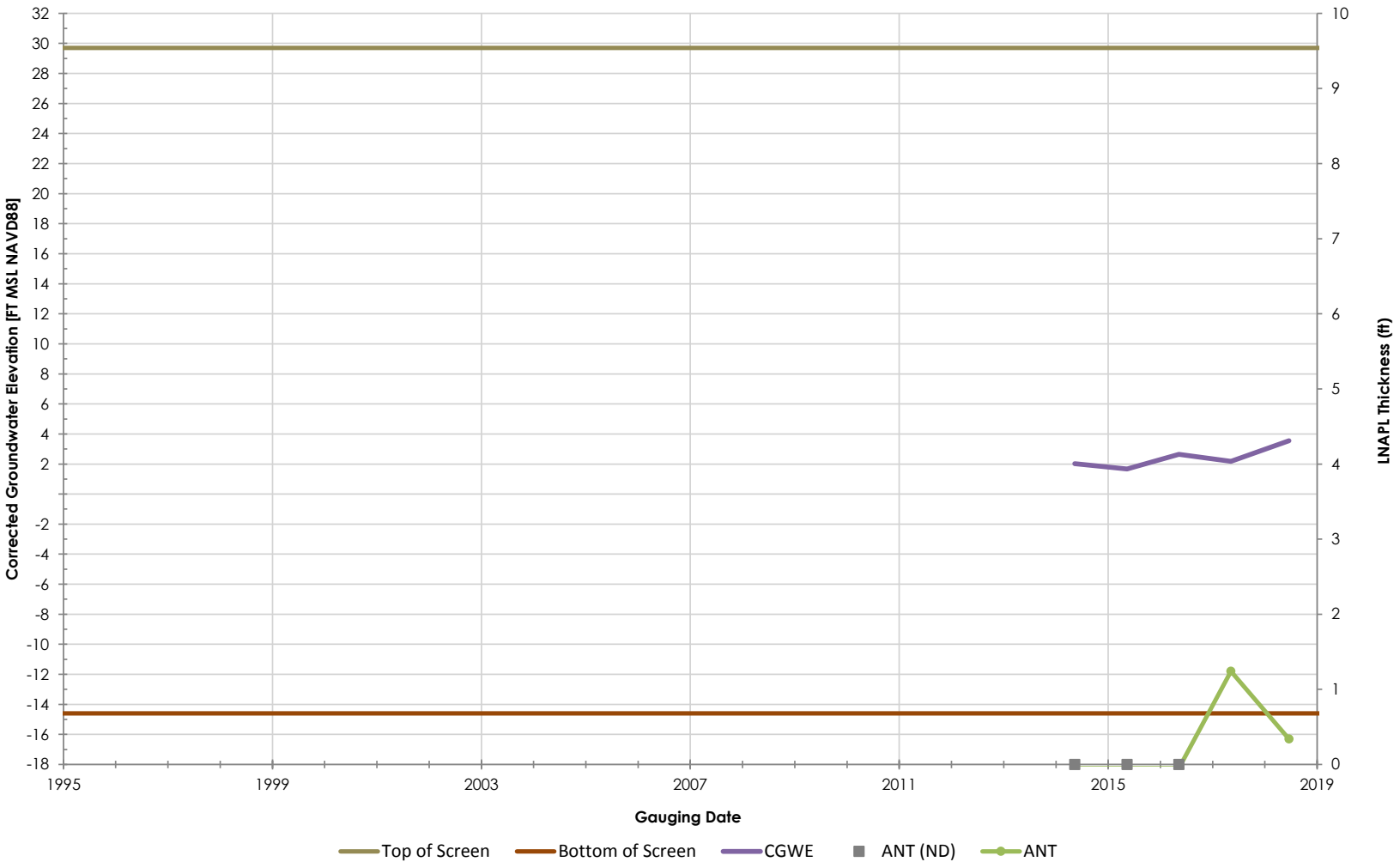
Stantec

Figure/Well No.

PH-RW-F

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



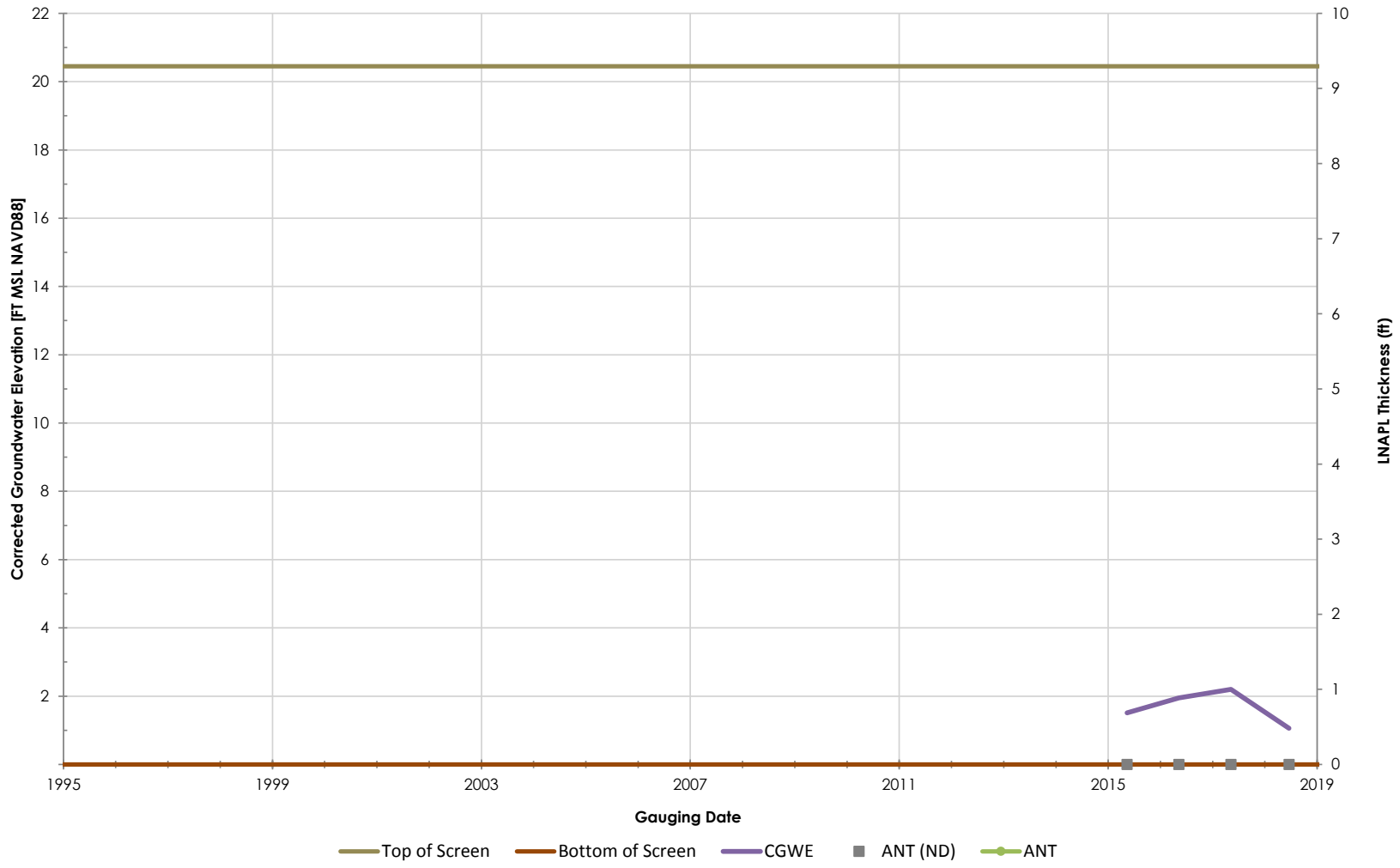
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

PH-RW-G

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

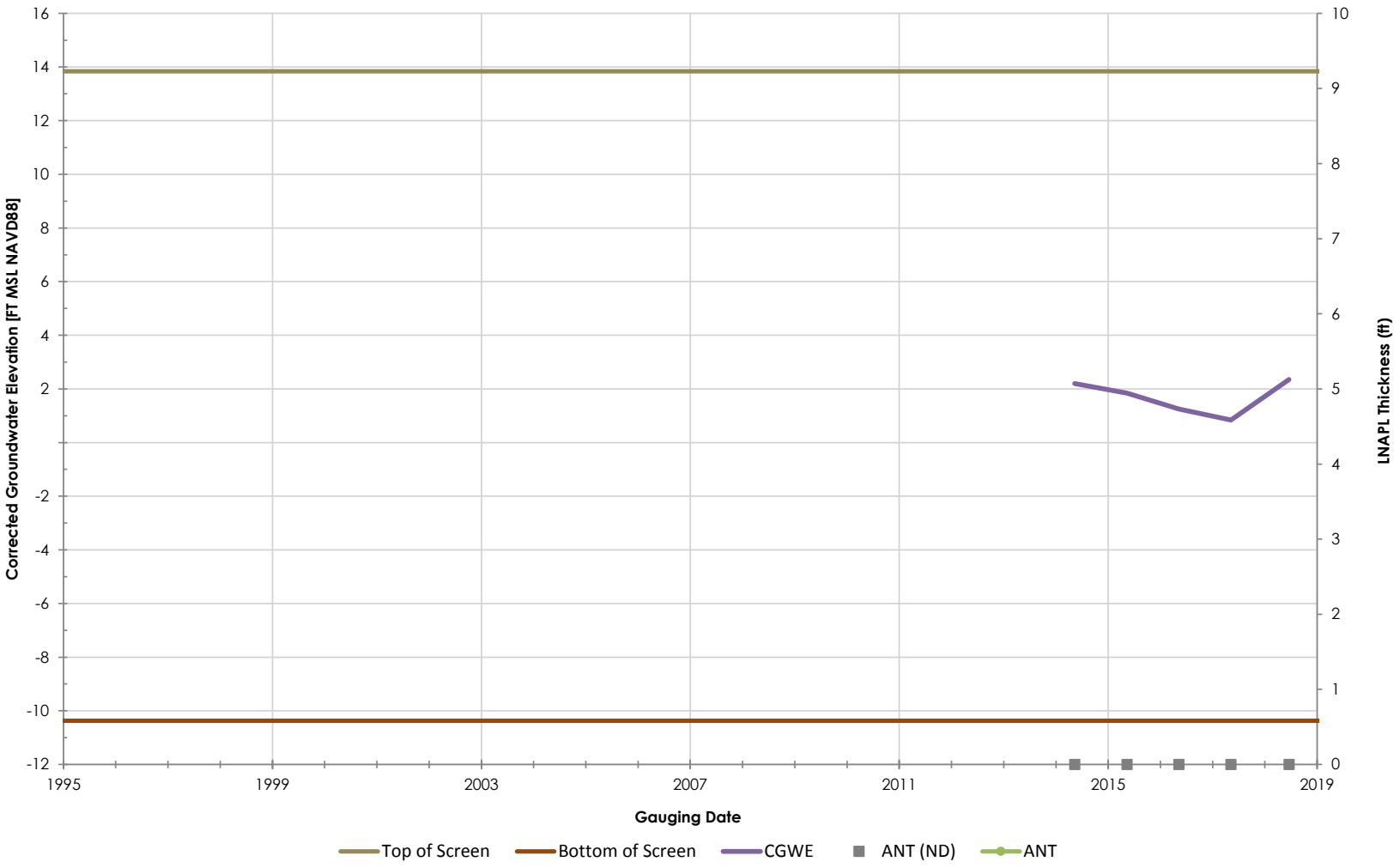
Stantec

Figure/Well No.

PH-RW-I2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

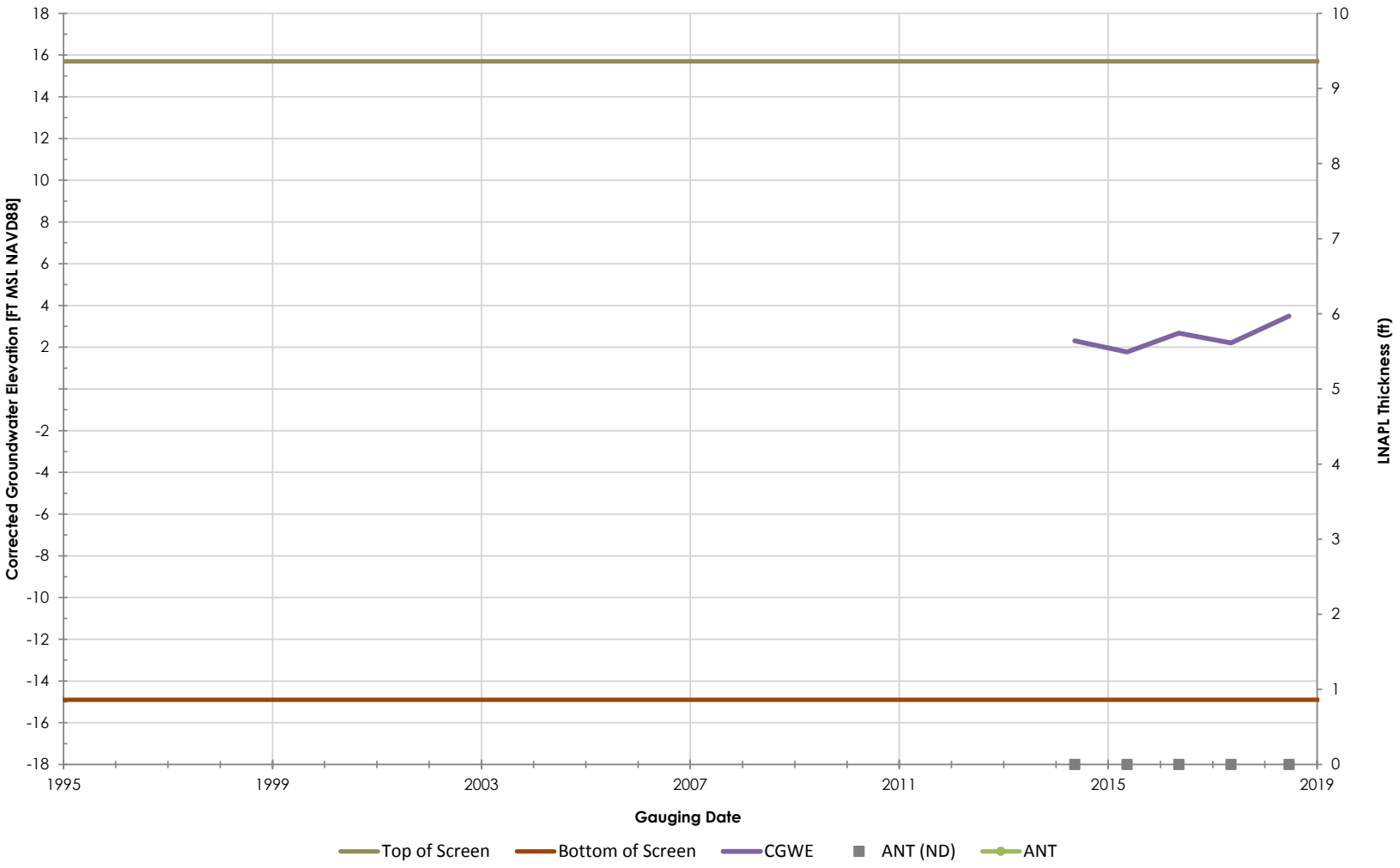
Stantec

Figure/Well No.

PH-RW-N

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

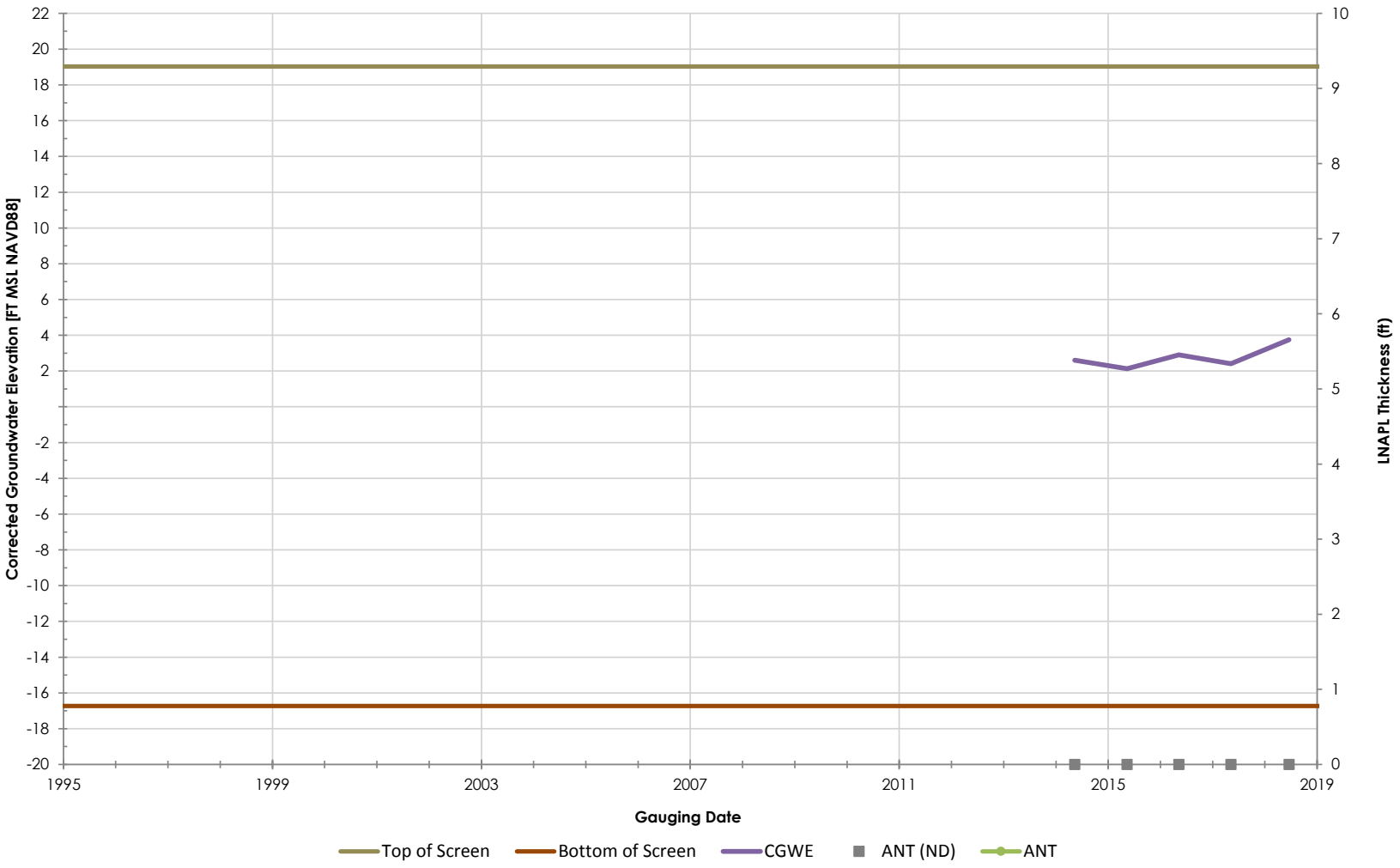
Stantec

Figure/Well No.

PH-RW-O

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

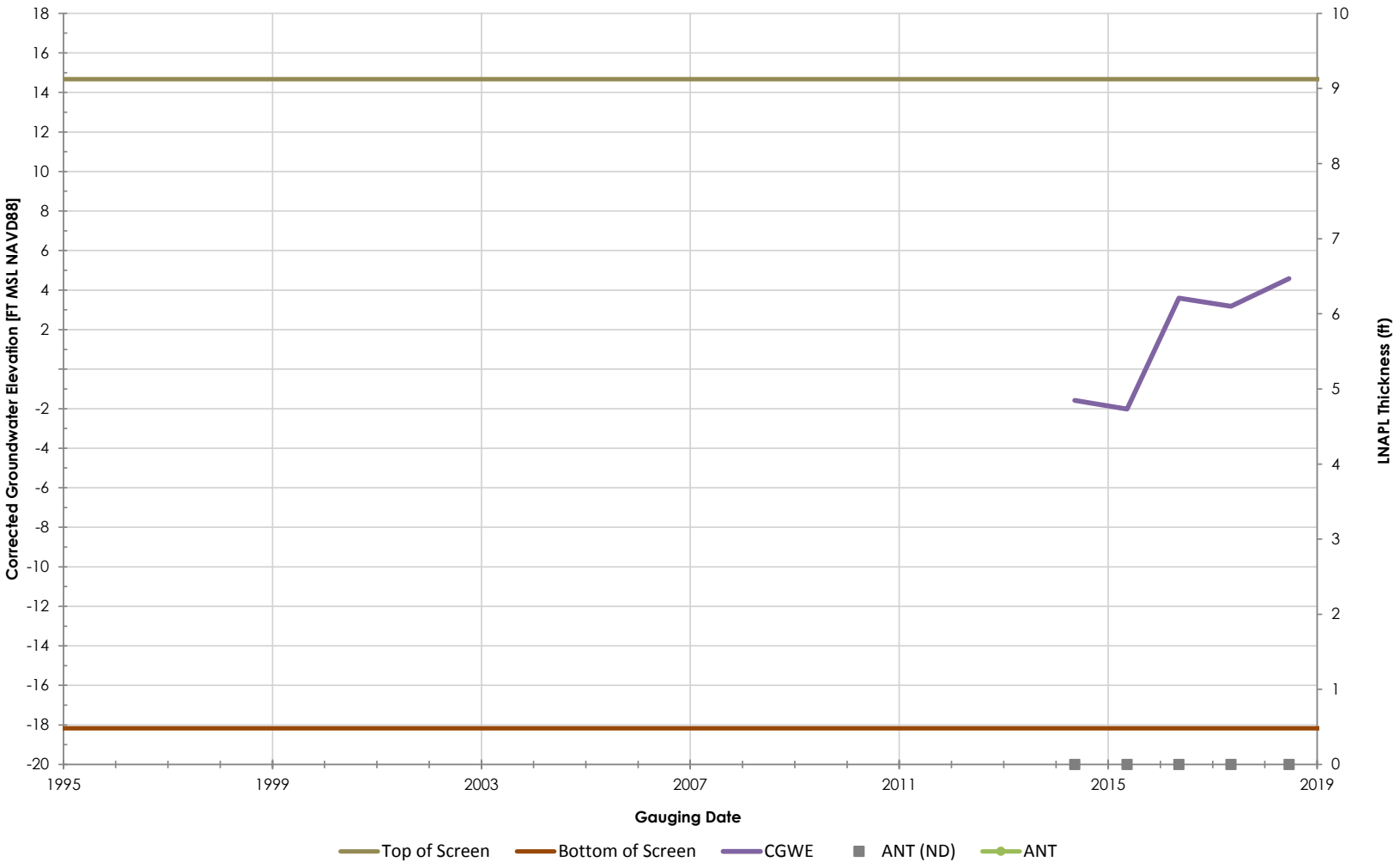
Stantec

Figure/Well No.

PH-RW-P

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

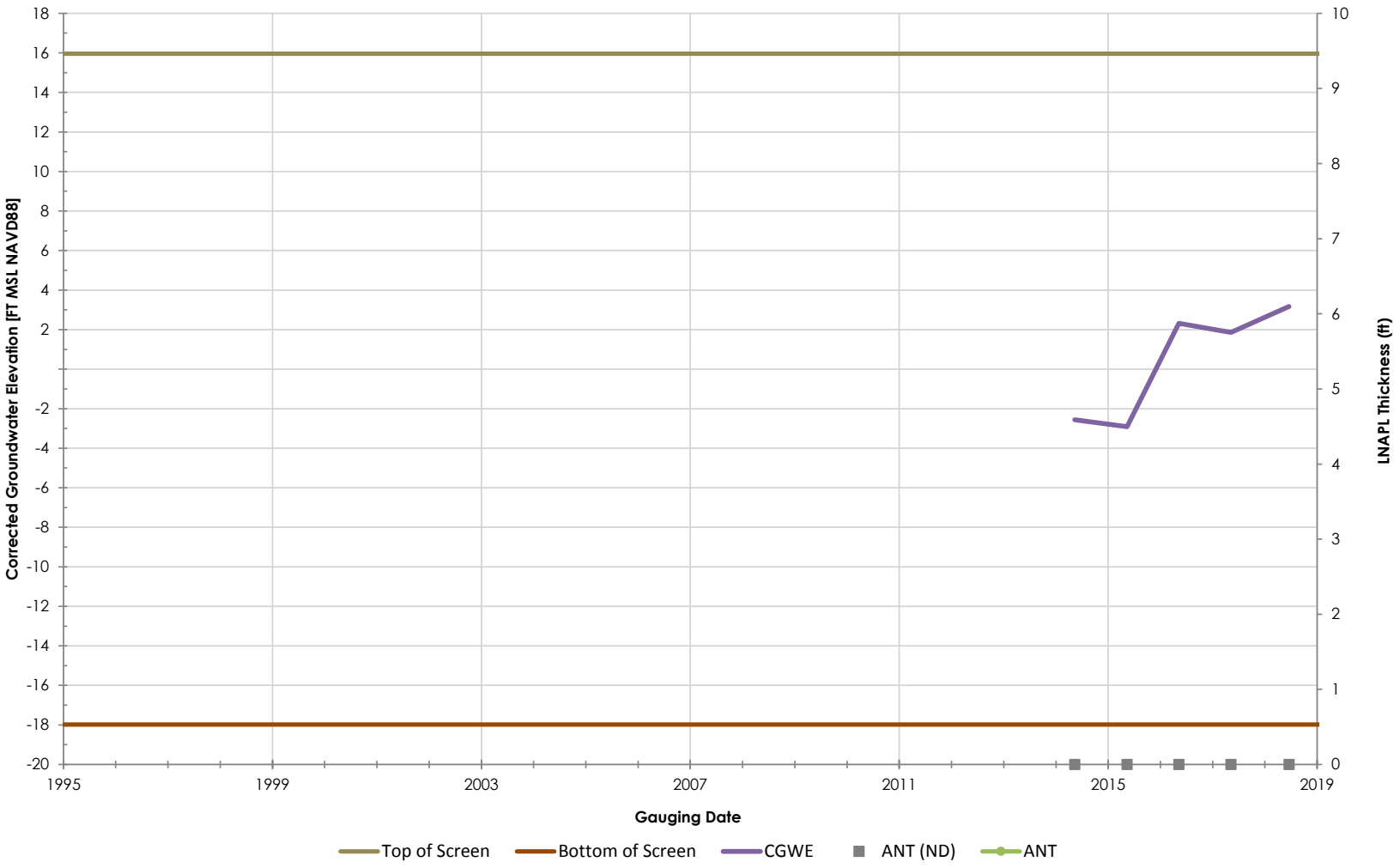
Stantec

Figure/Well No.

PH-RW-Q

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

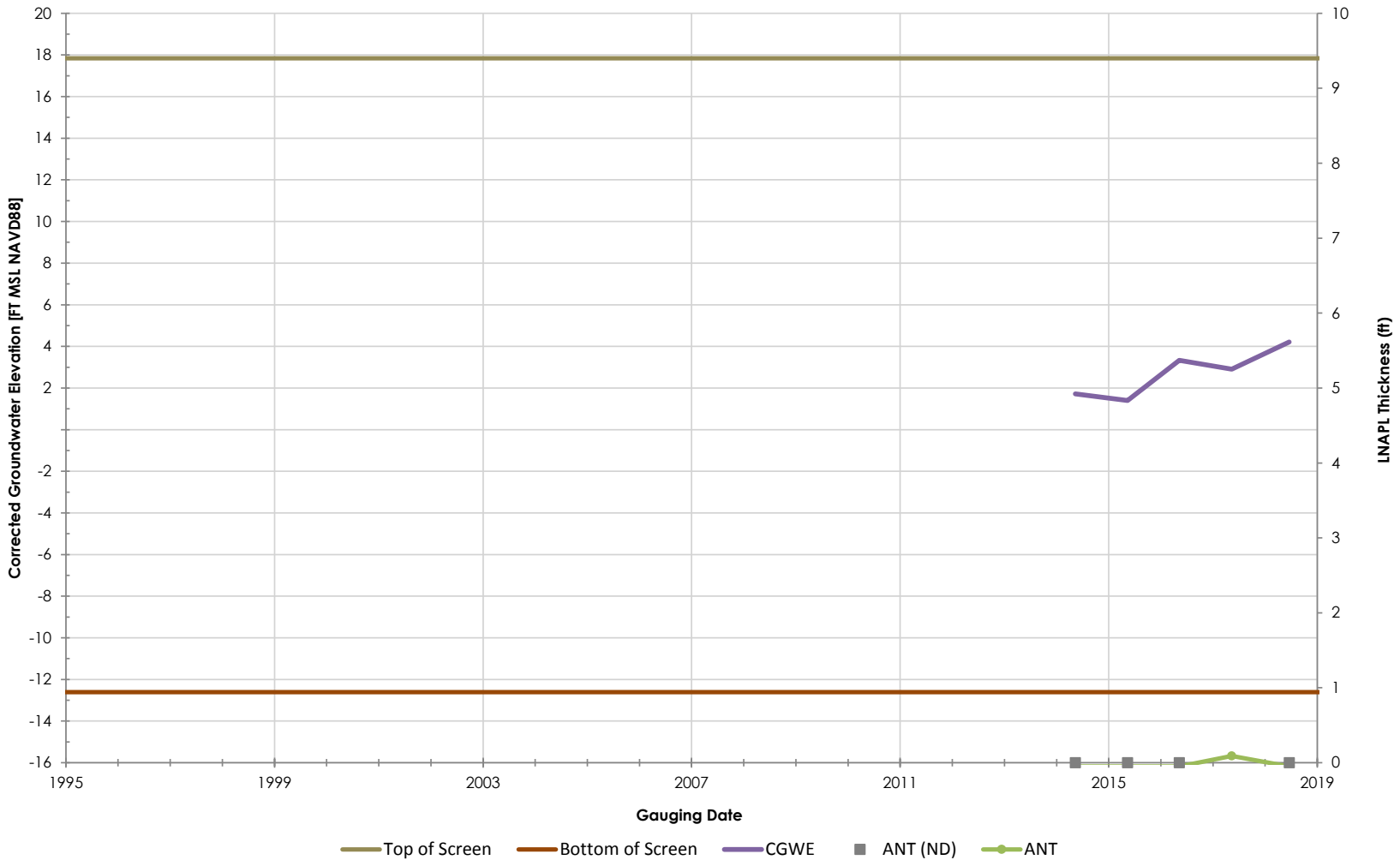
Stantec

Figure/Well No.

PH-RW-S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

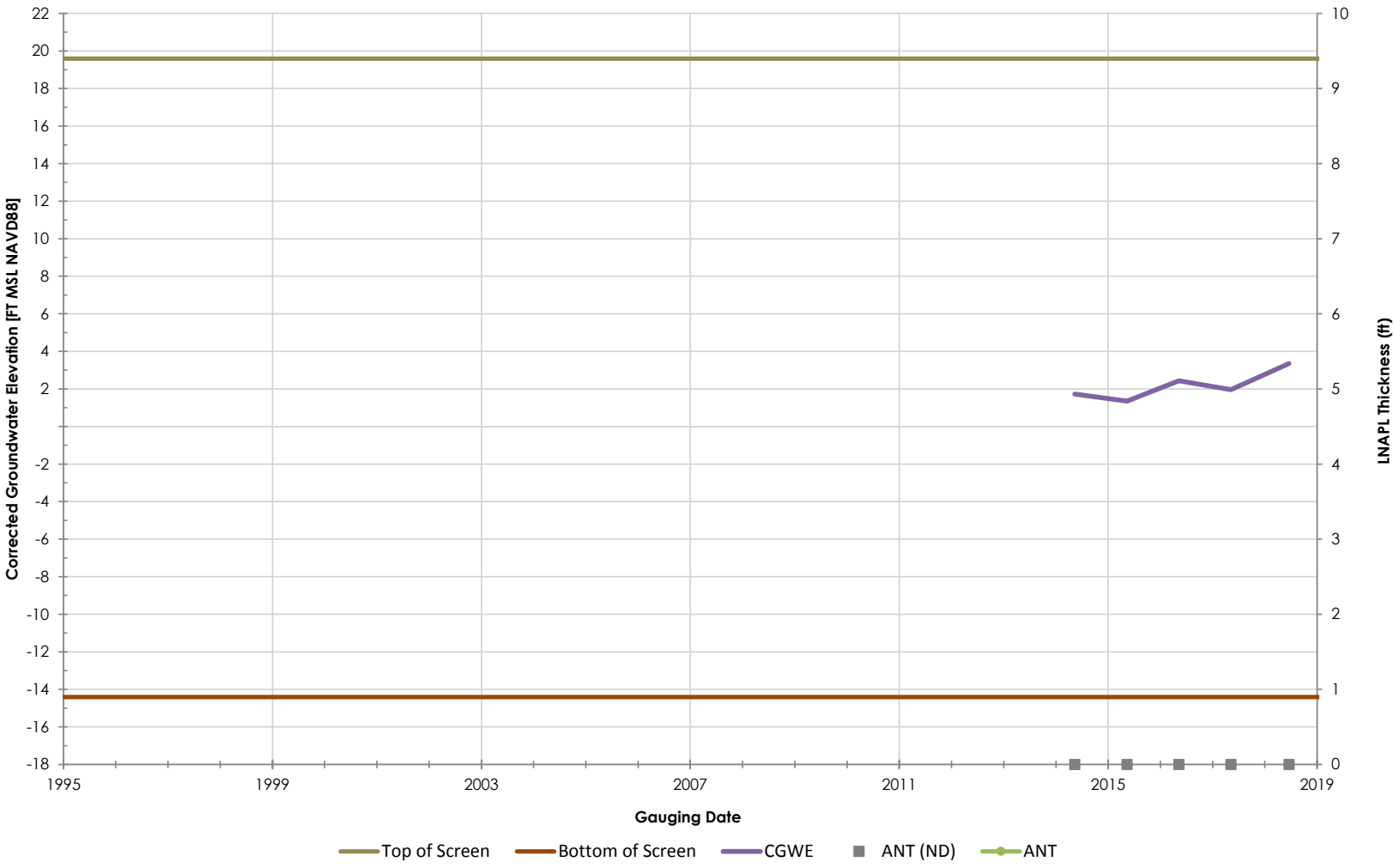
Stantec

Figure/Well No.

PH-RW-U

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

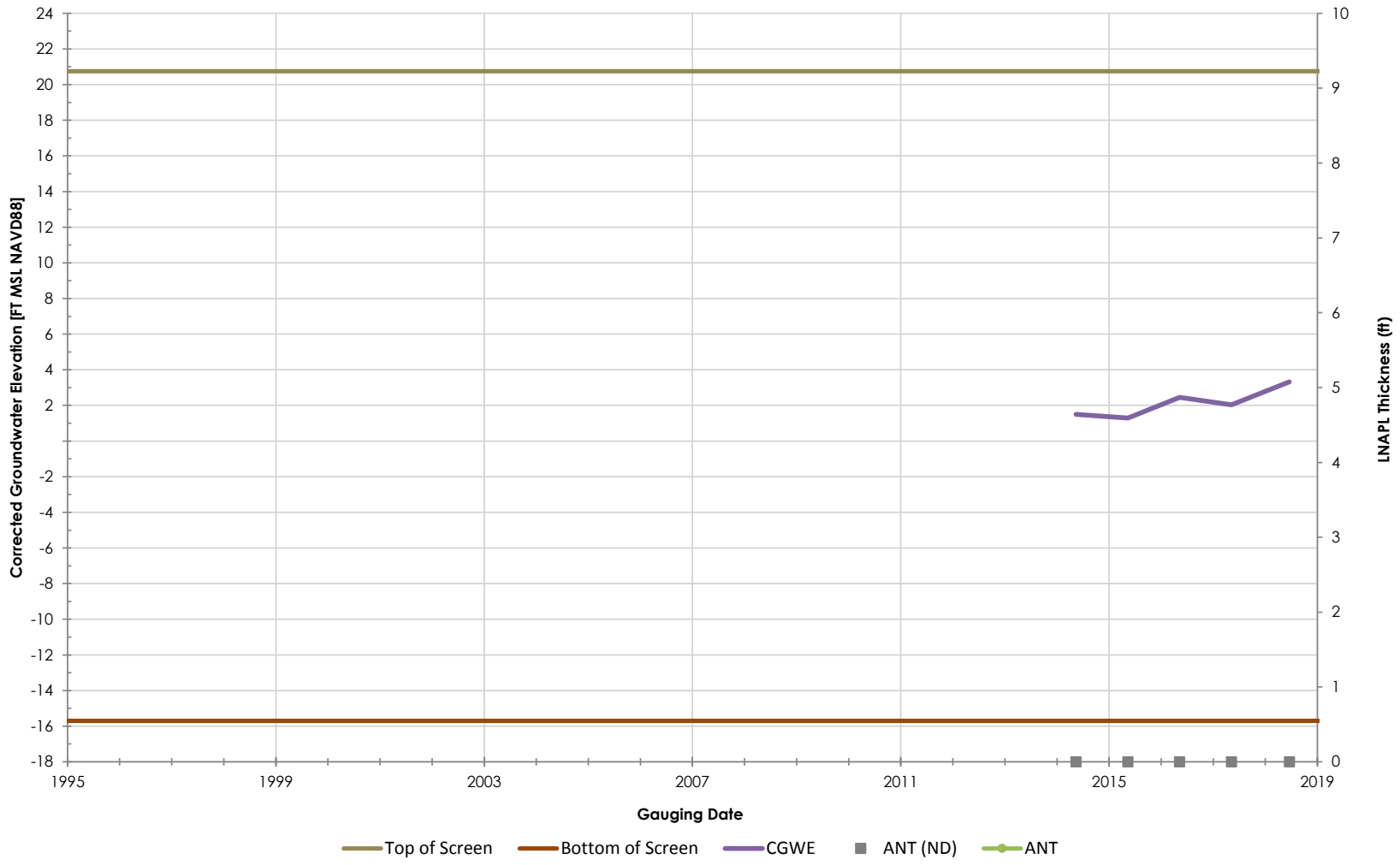
Stantec

Figure/Well No.

PH-RW-V

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

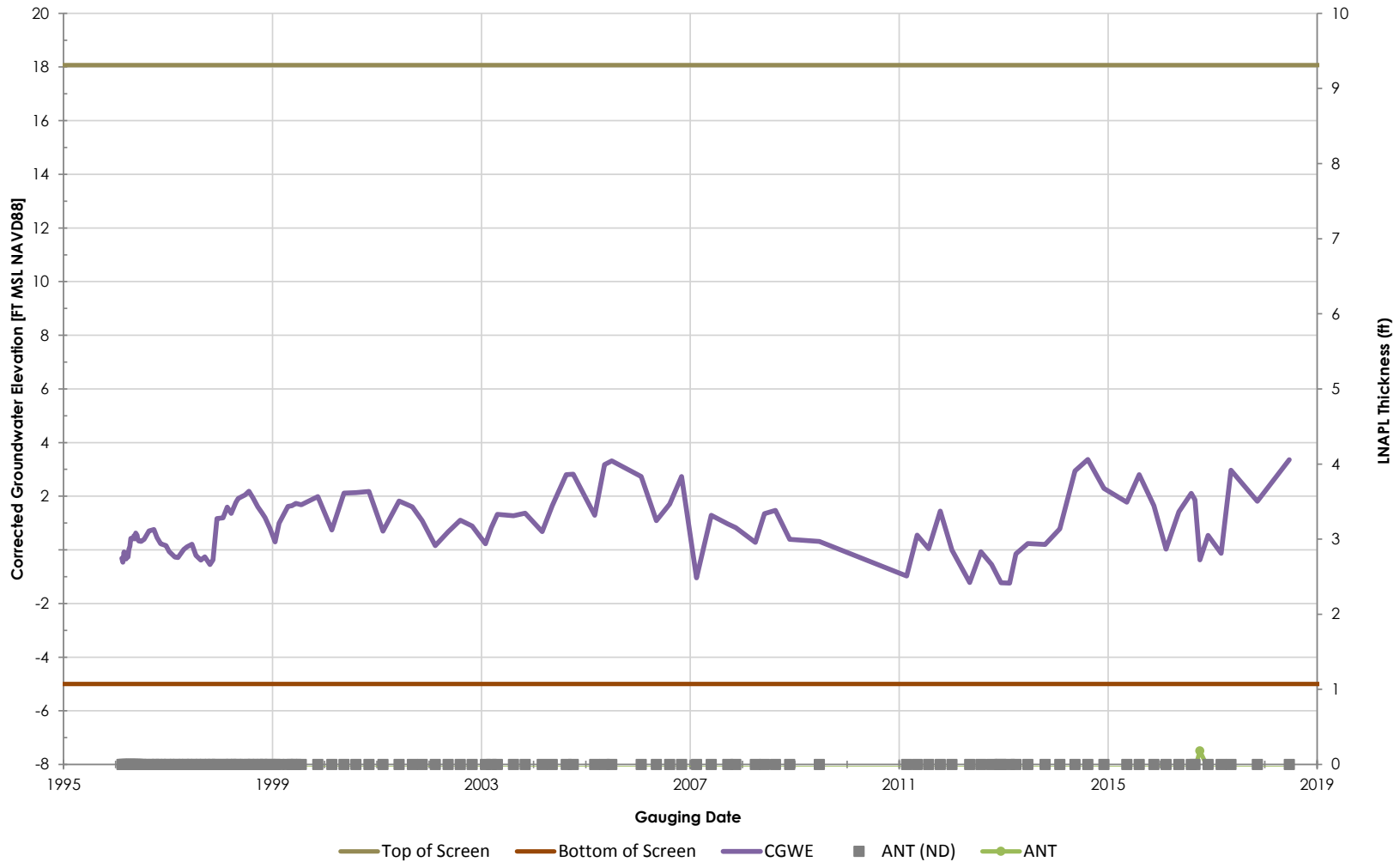
Stantec

Figure/Well No.

PH-RW-W

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

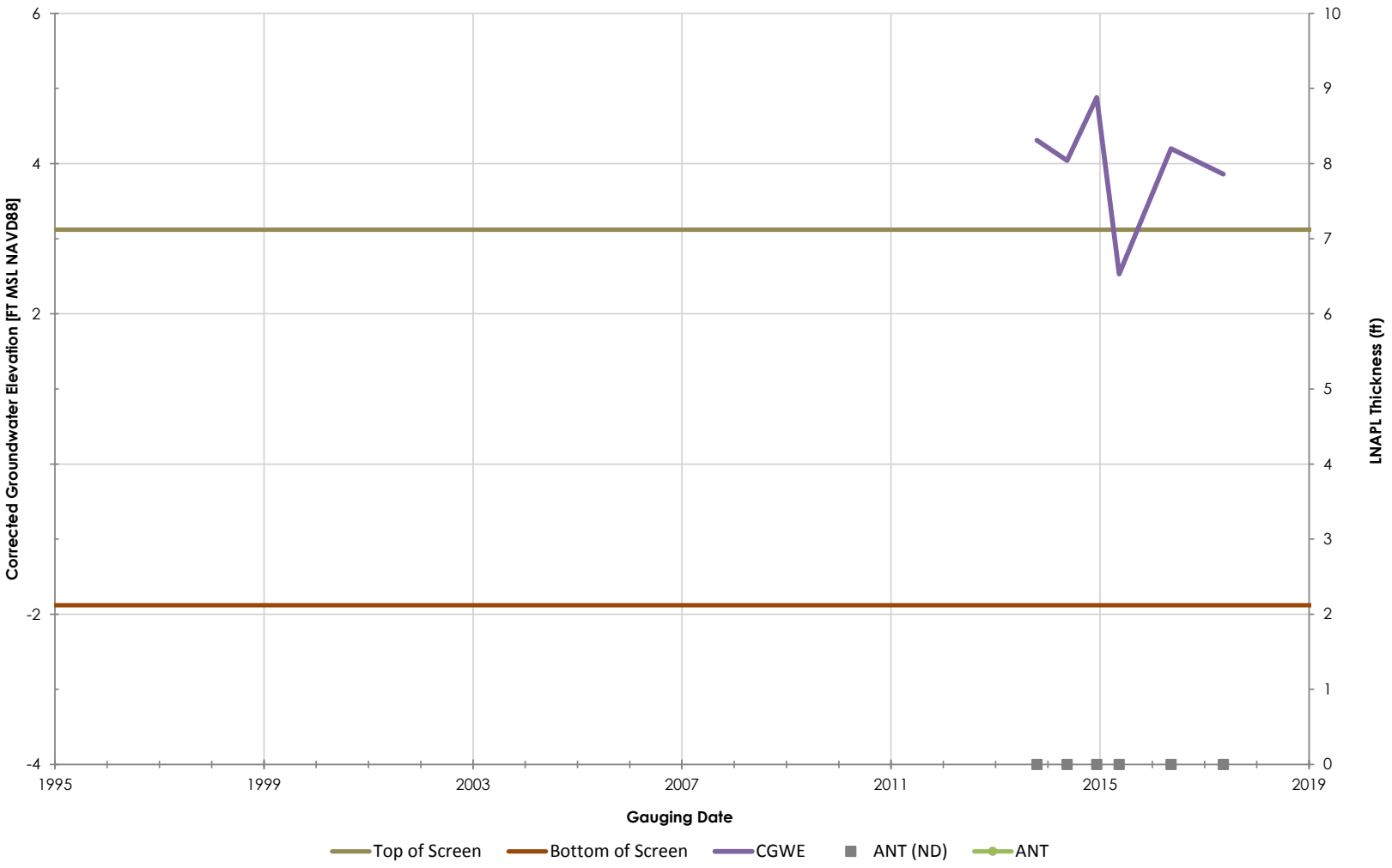
Stantec

Figure/Well No.

PZ-100

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

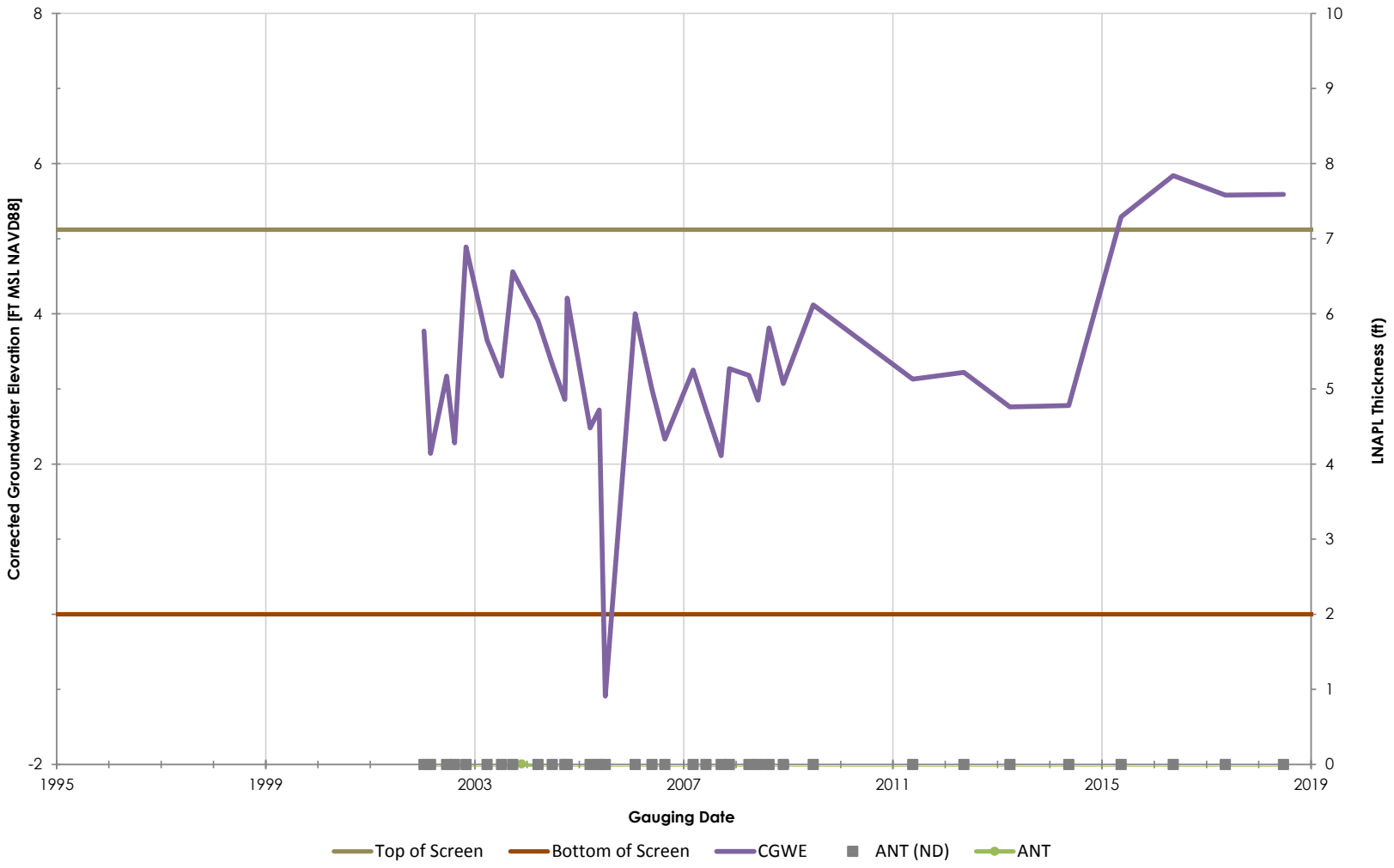
Stantec

Figure/Well No.

PZ-132A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

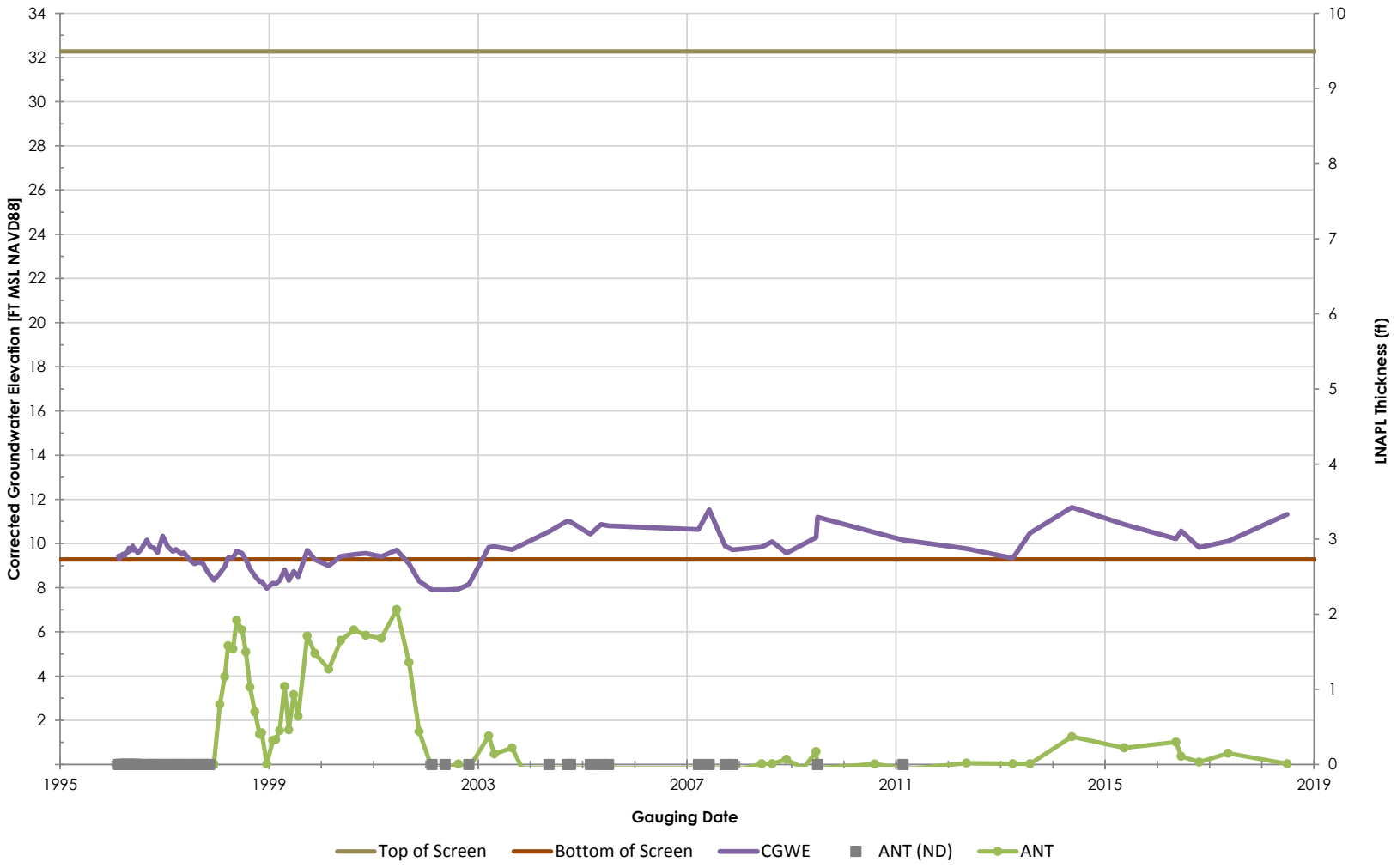
Stantec

Figure/Well No.

PZ-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

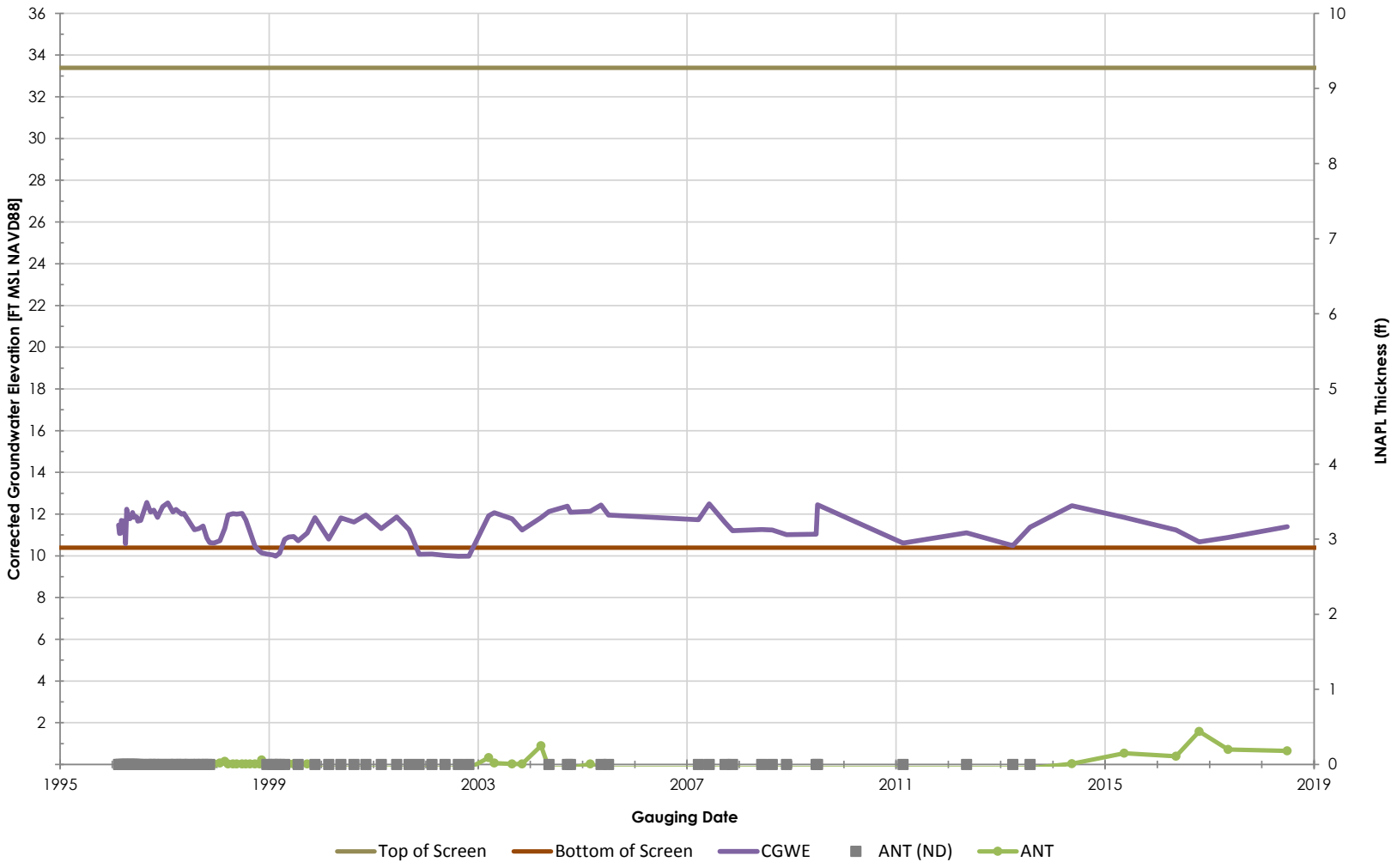
Stantec

Figure/Well No.

PZ-201

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

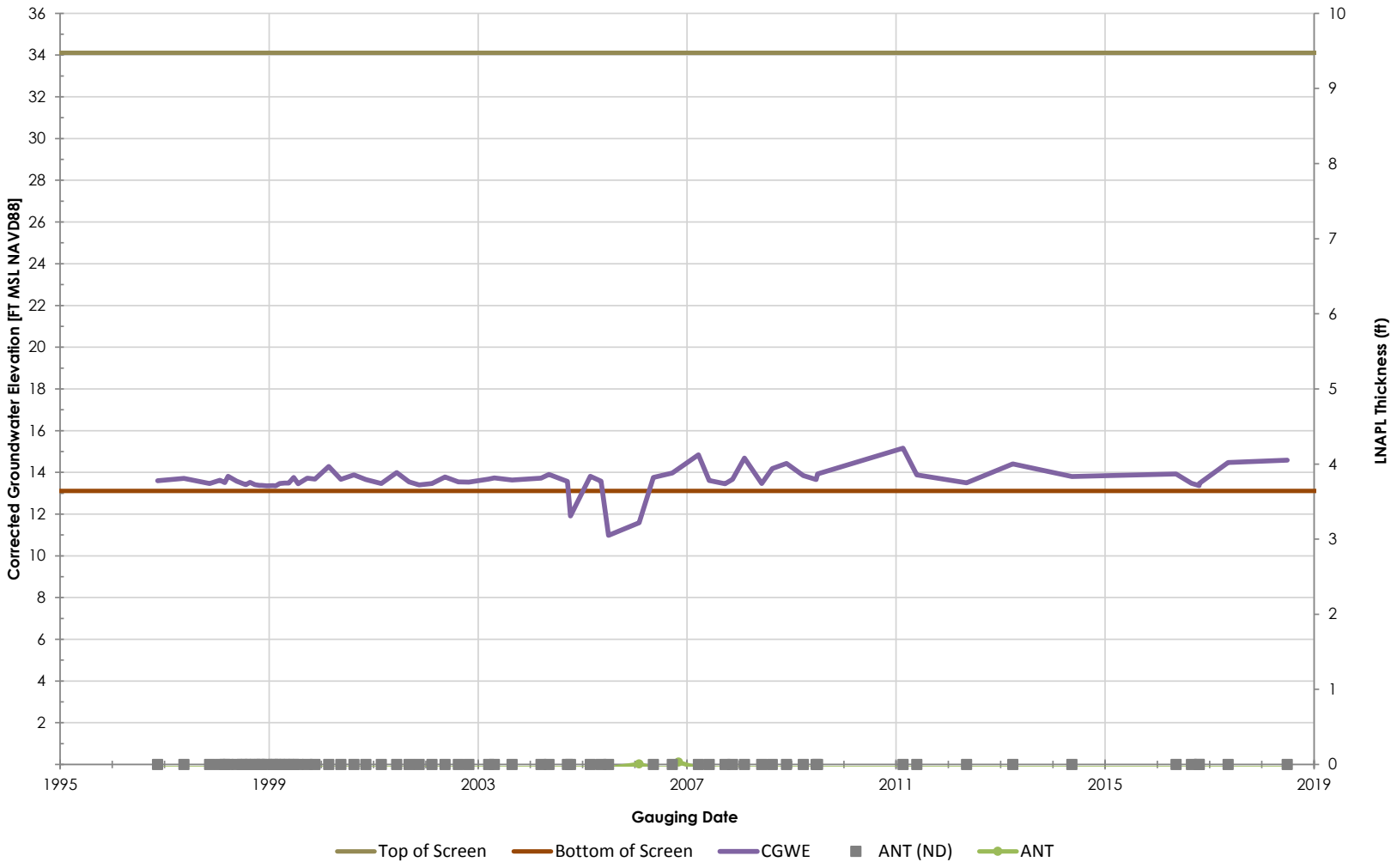
Stantec

Figure/Well No.

PZ-202

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

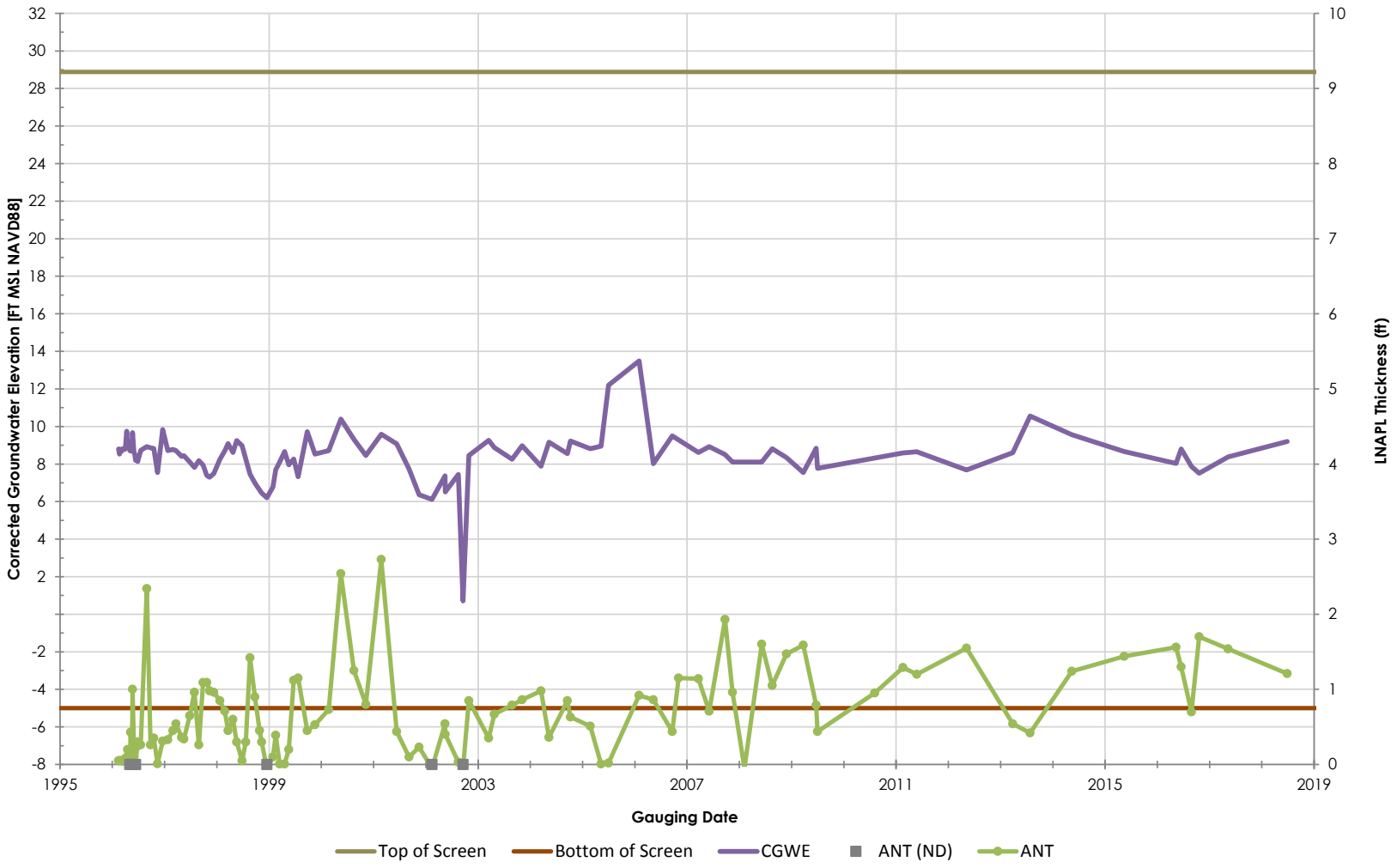
Stantec

Figure/Well No.

PZ-203

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

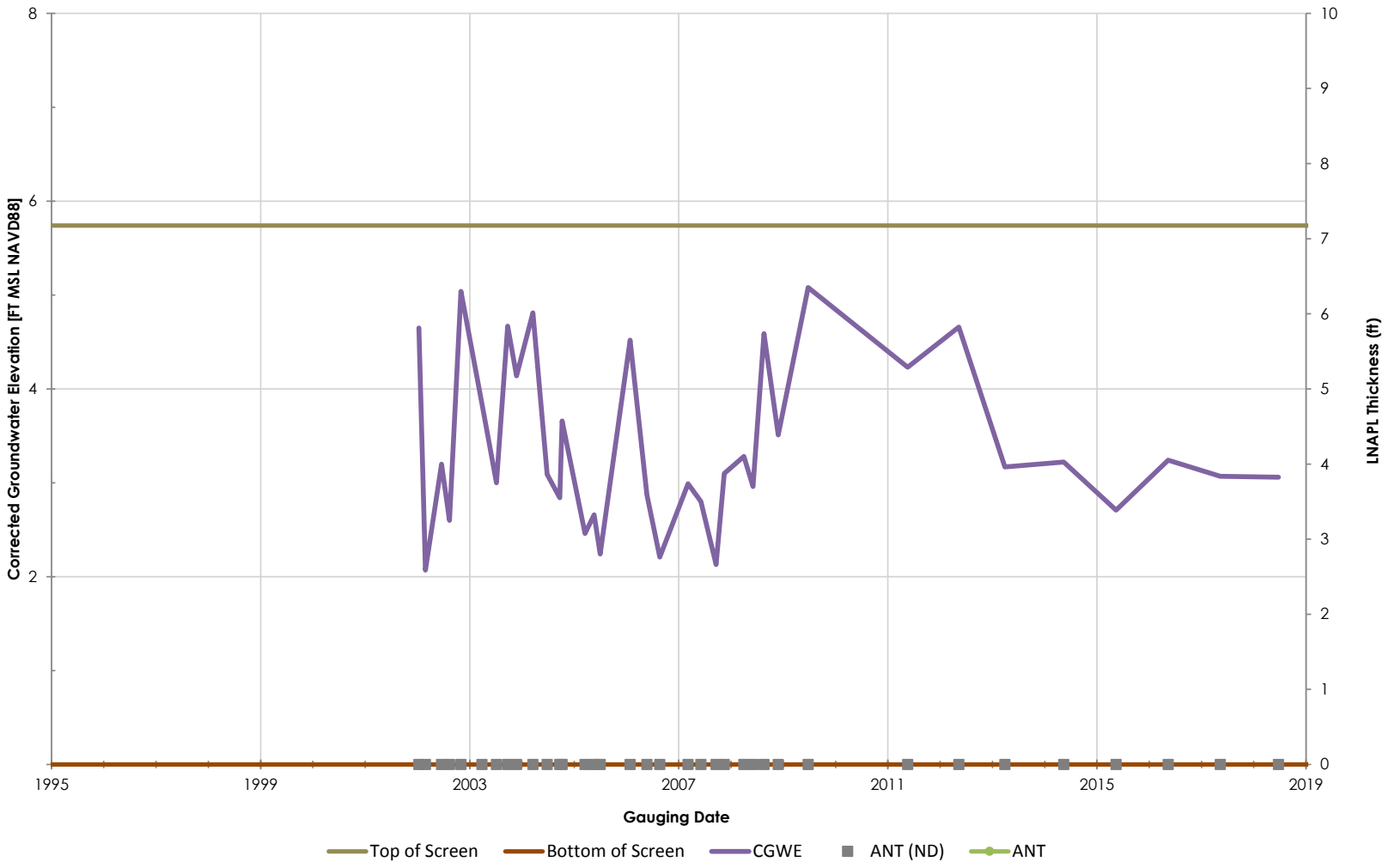
Stantec

Figure/Well No.

PZ-204

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

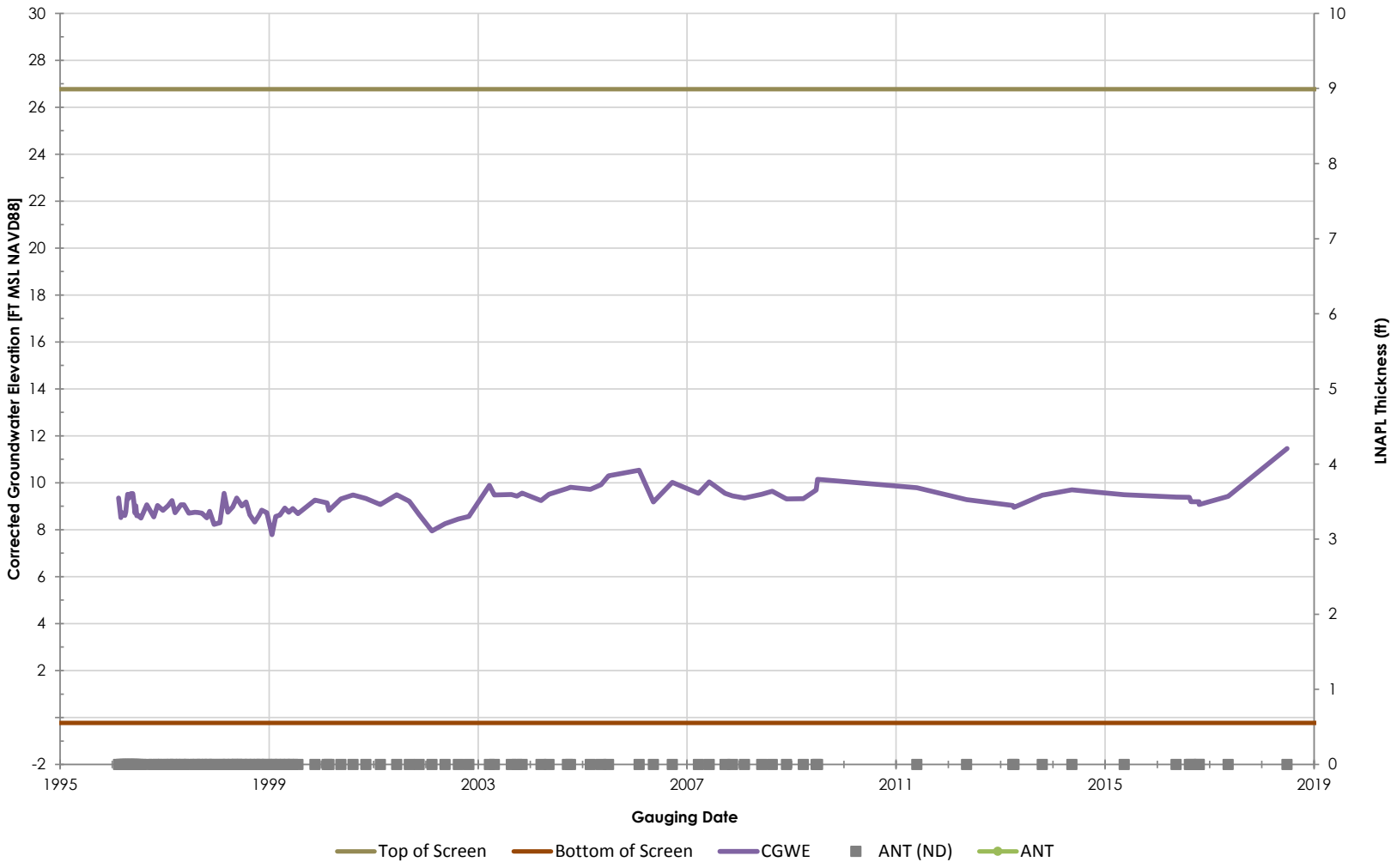
Stantec

Figure/Well No.

PZ-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

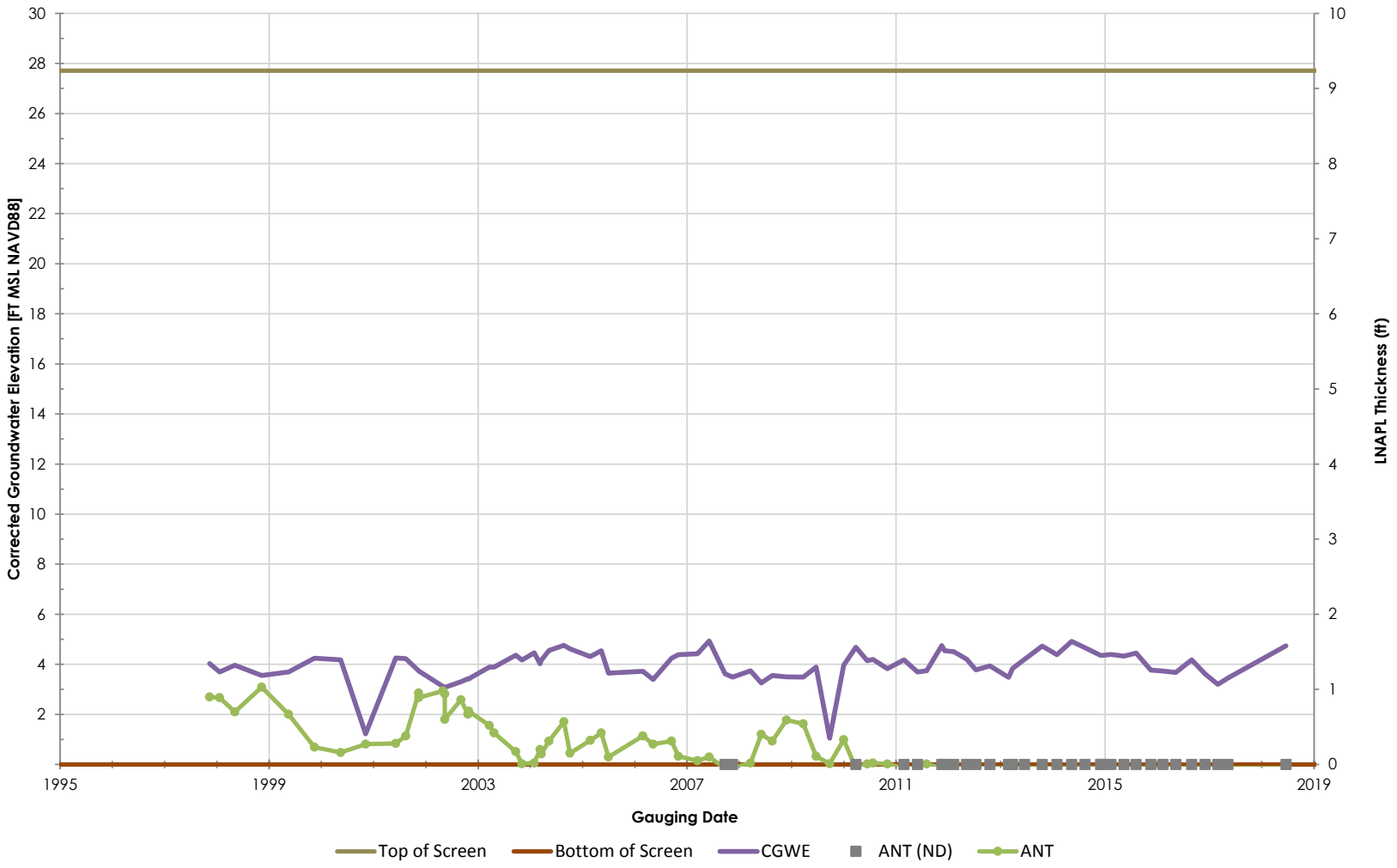
Stantec

Figure/Well No.

PZ-300

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

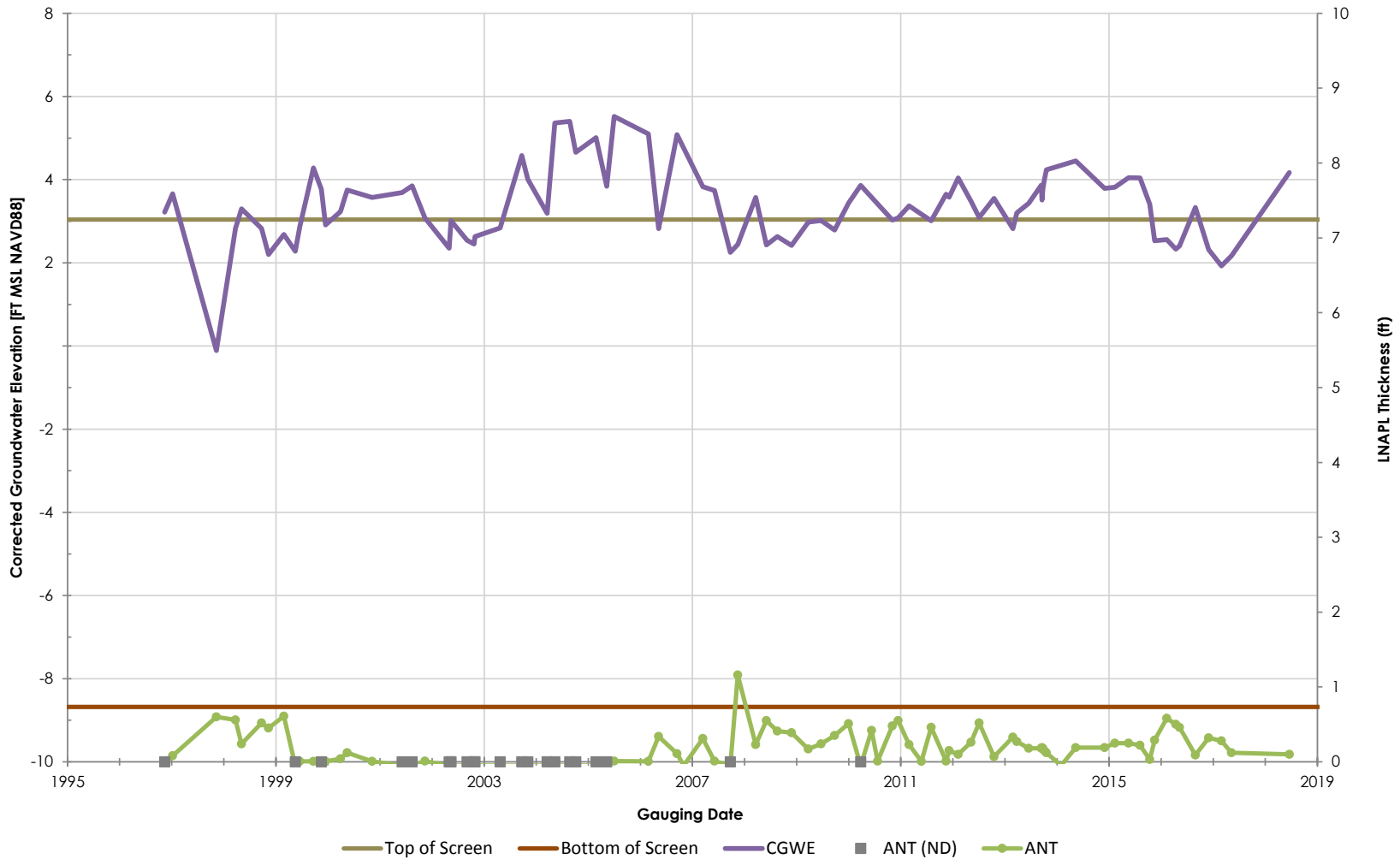
Stantec

Figure/Well No.

PZ-400

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

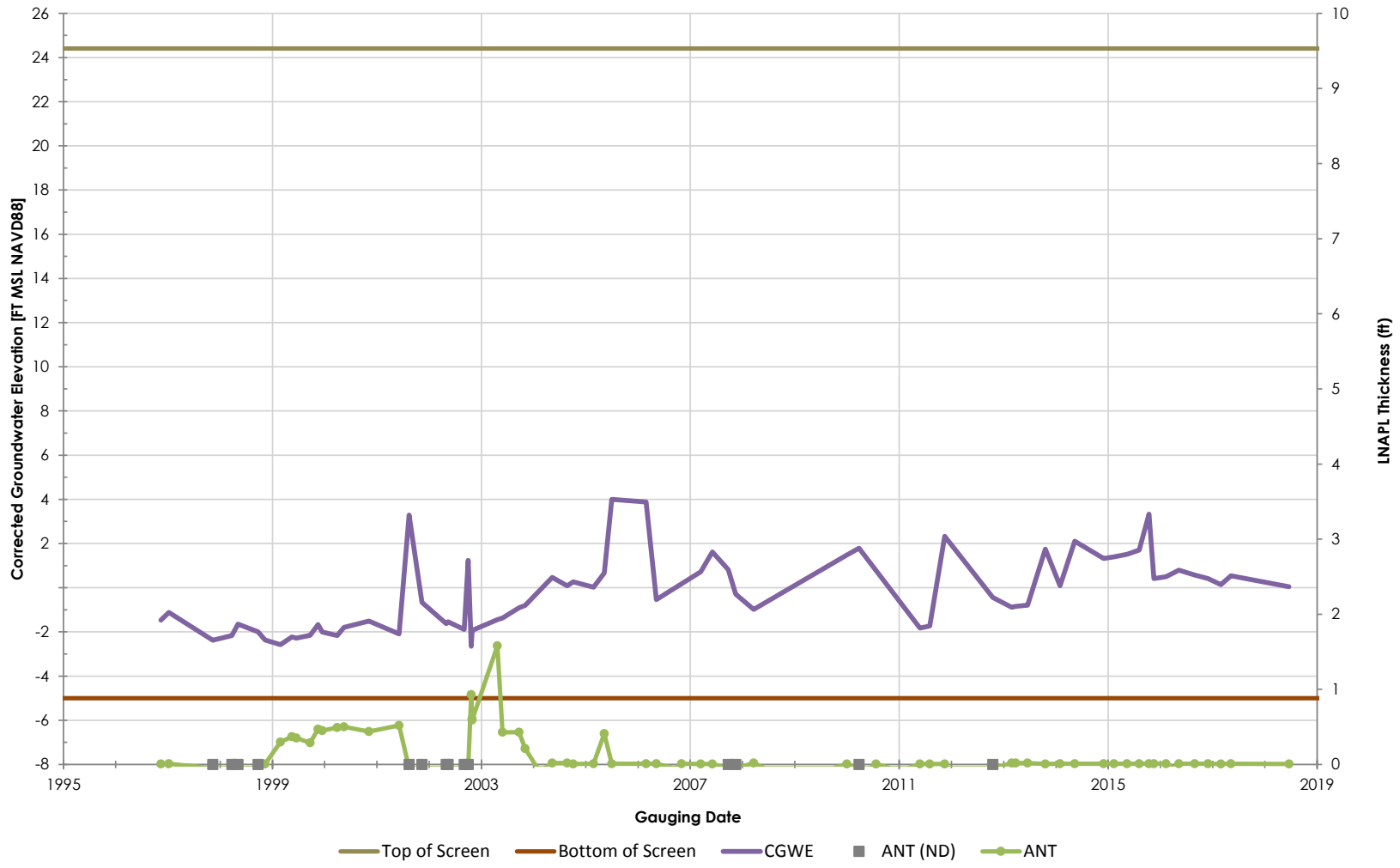
Stantec

Figure/Well No.

PZ-402

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

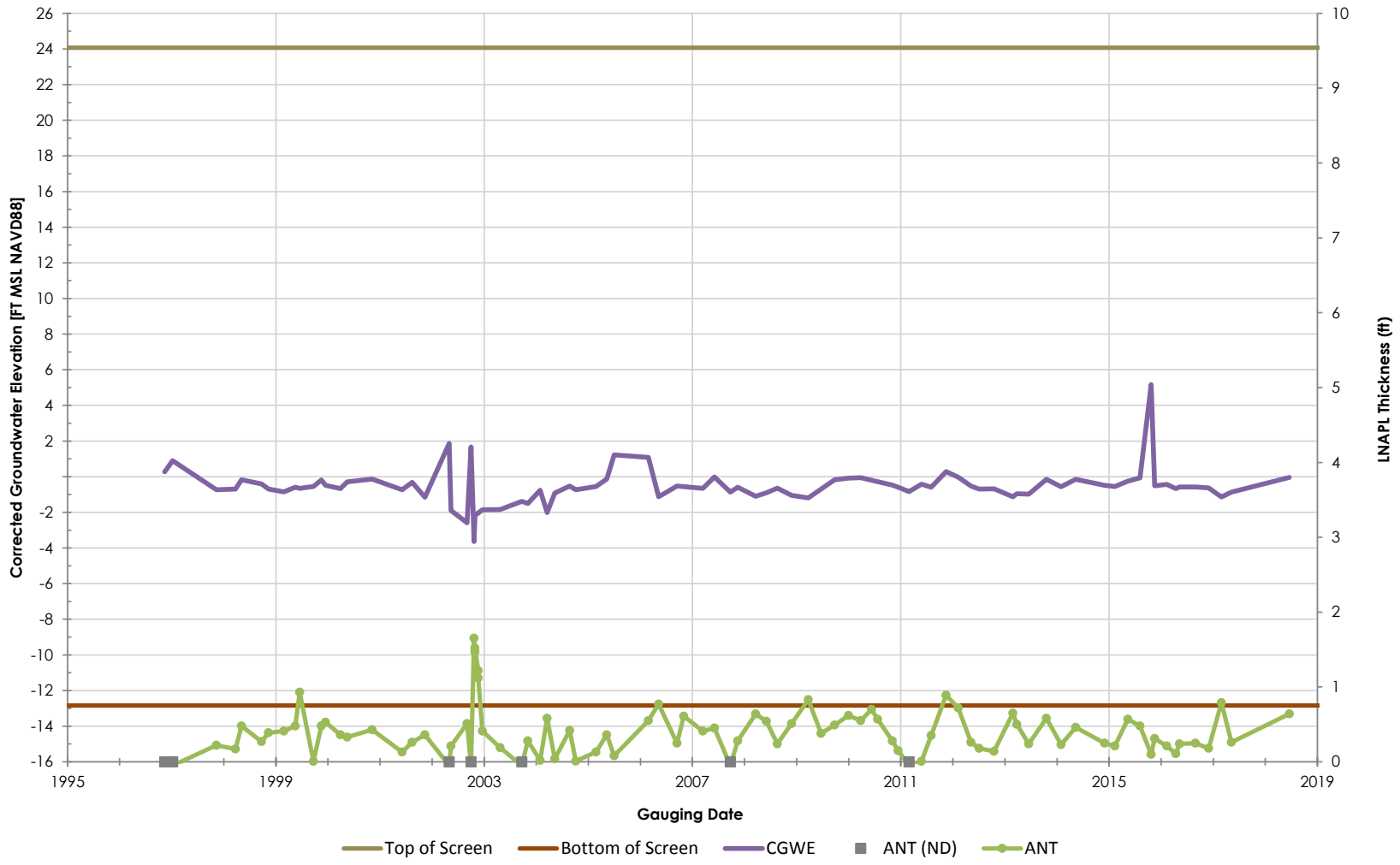
Stantec

Figure/Well No.

PZ-403

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

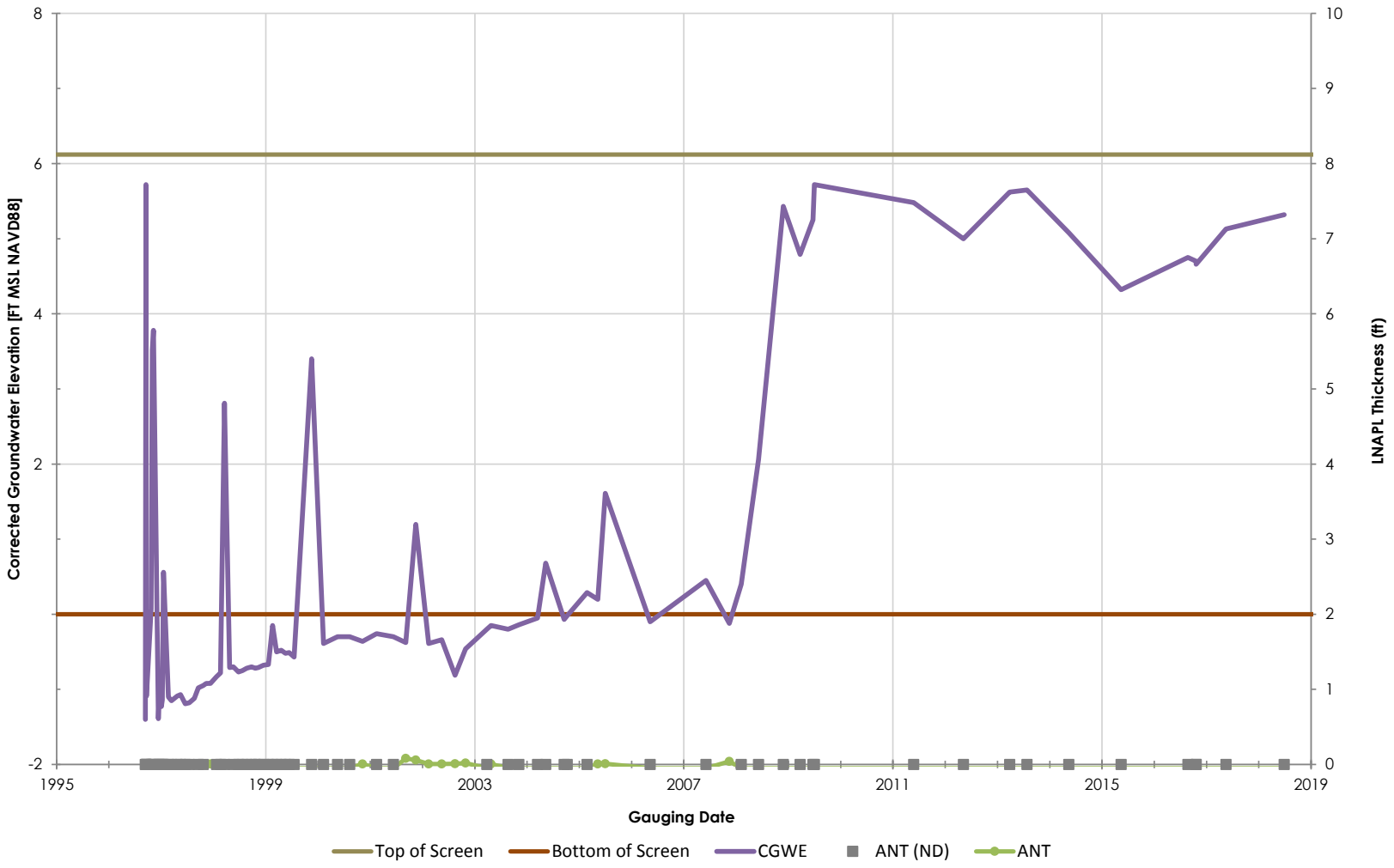
Stantec

Figure/Well No.

PZ-404

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

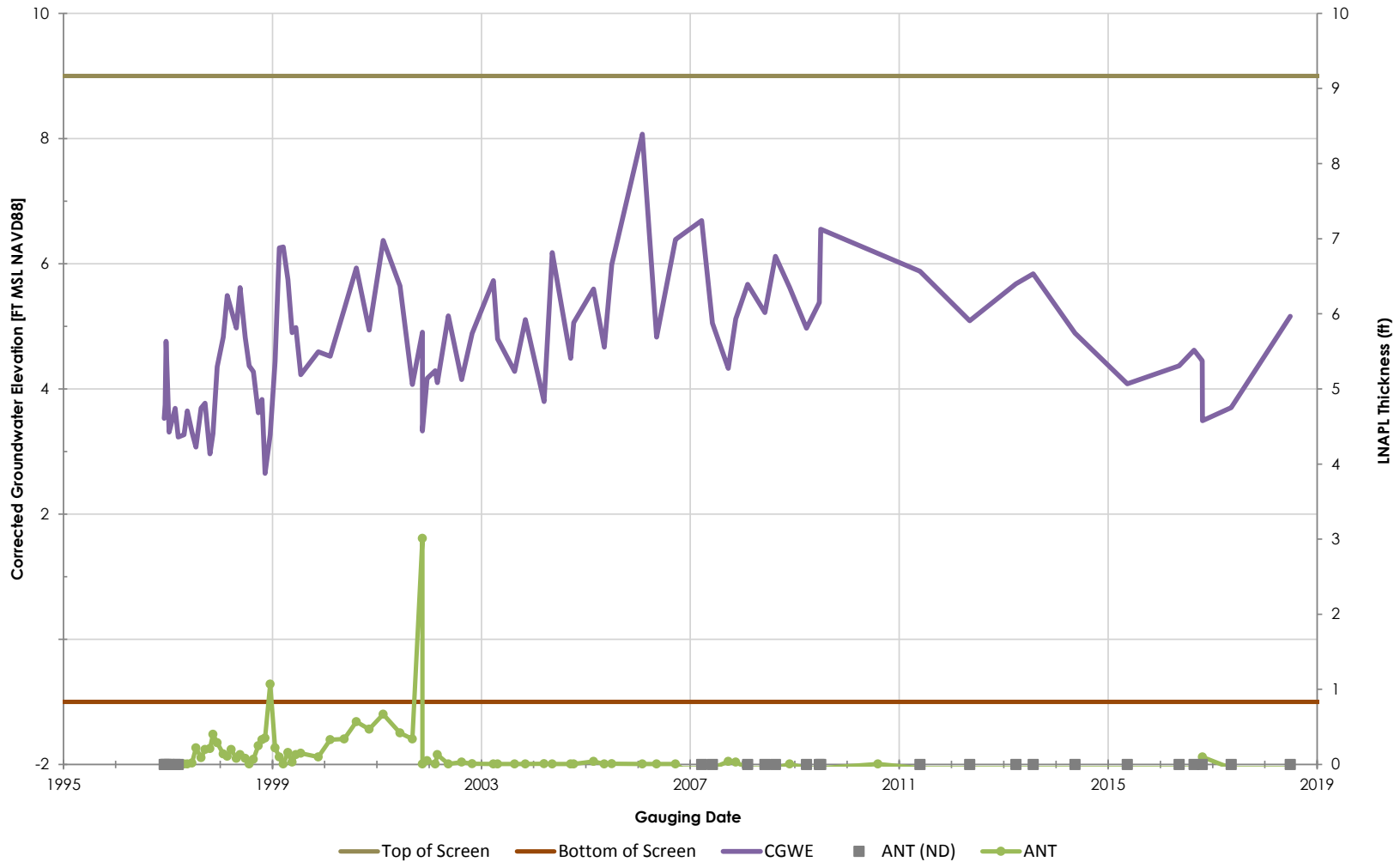
Stantec

Figure/Well No.

PZ-500

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

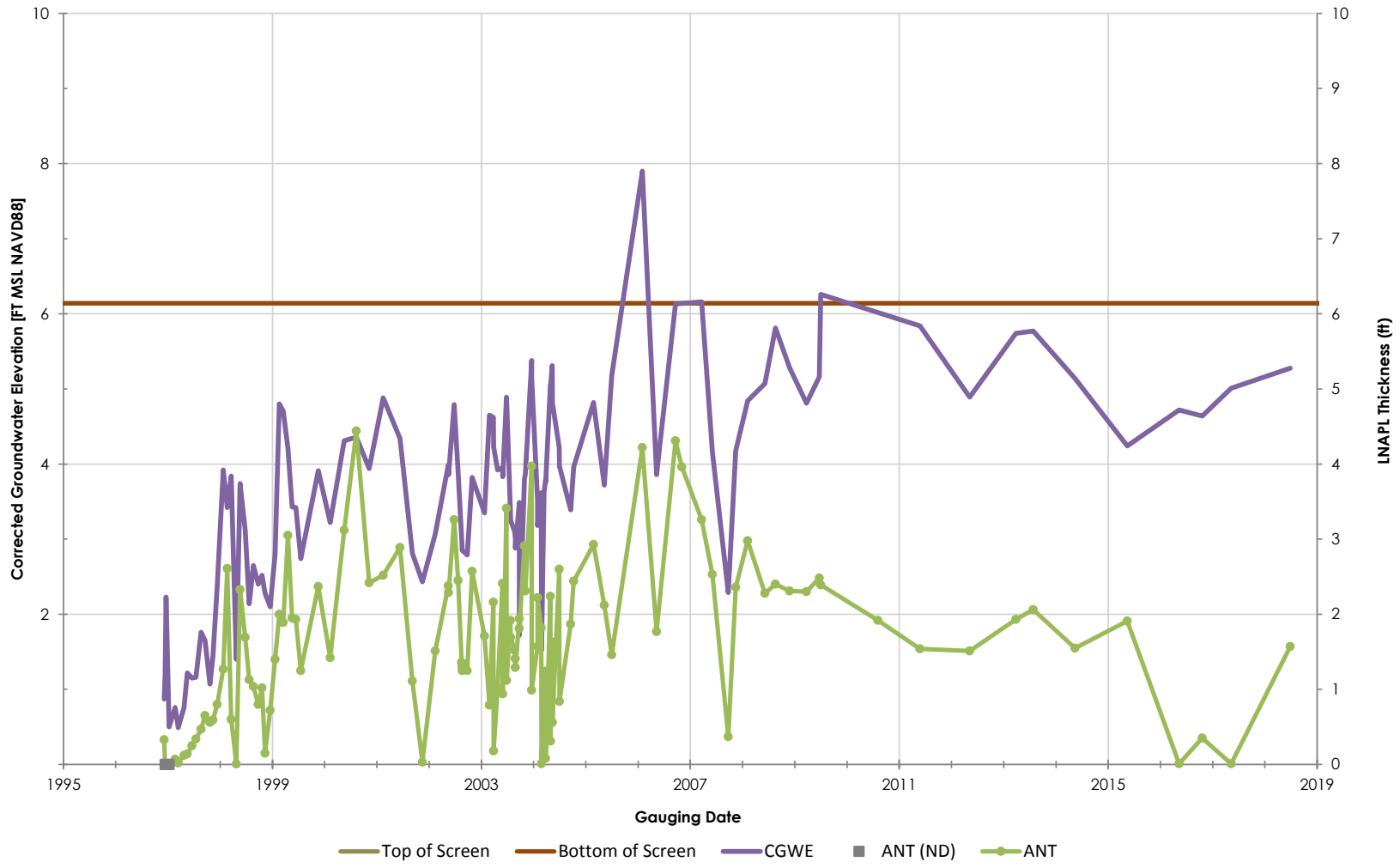
Stantec

Figure/Well No.

PZ-501

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

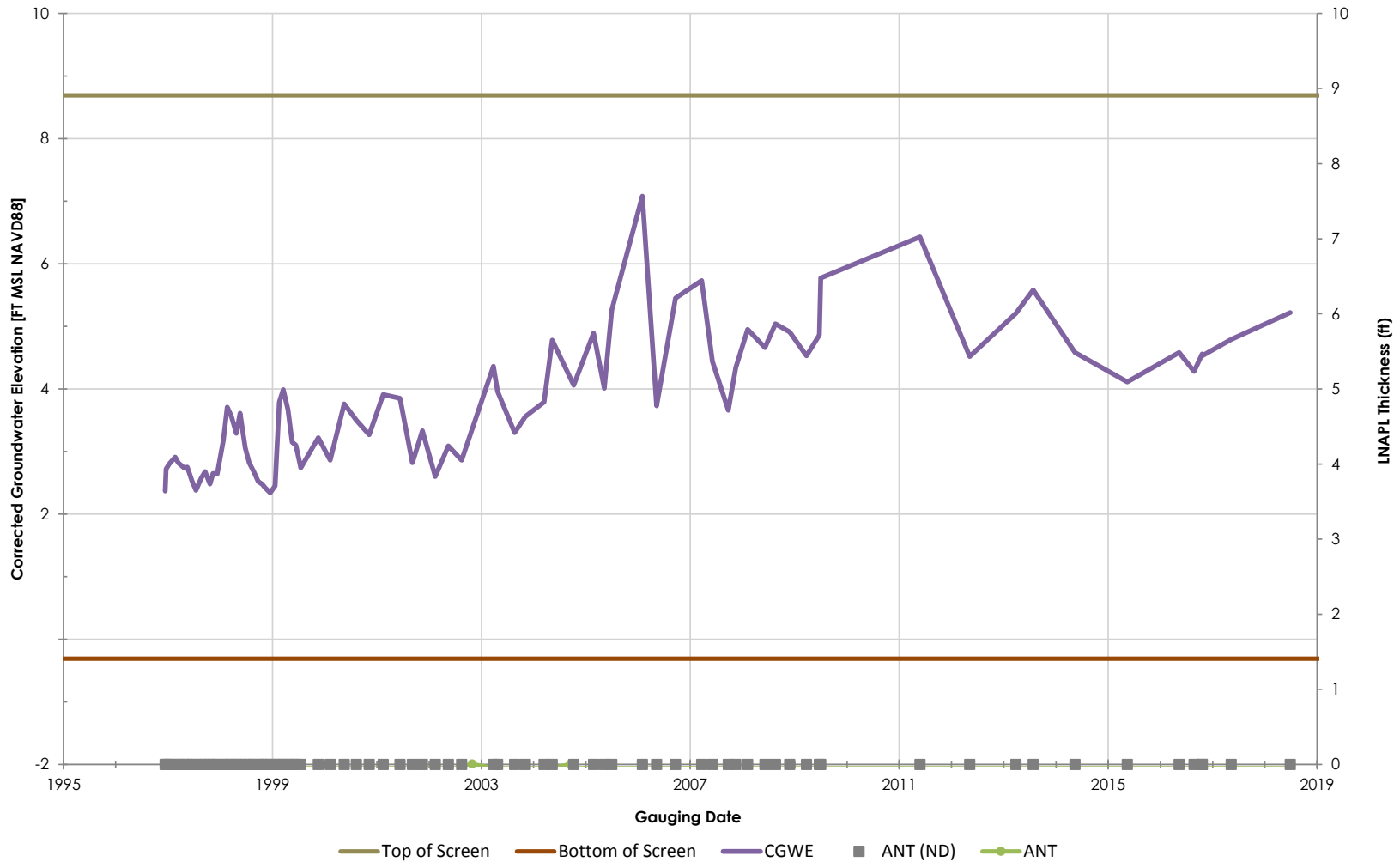
Stantec

Figure/Well No.

PZ-502

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

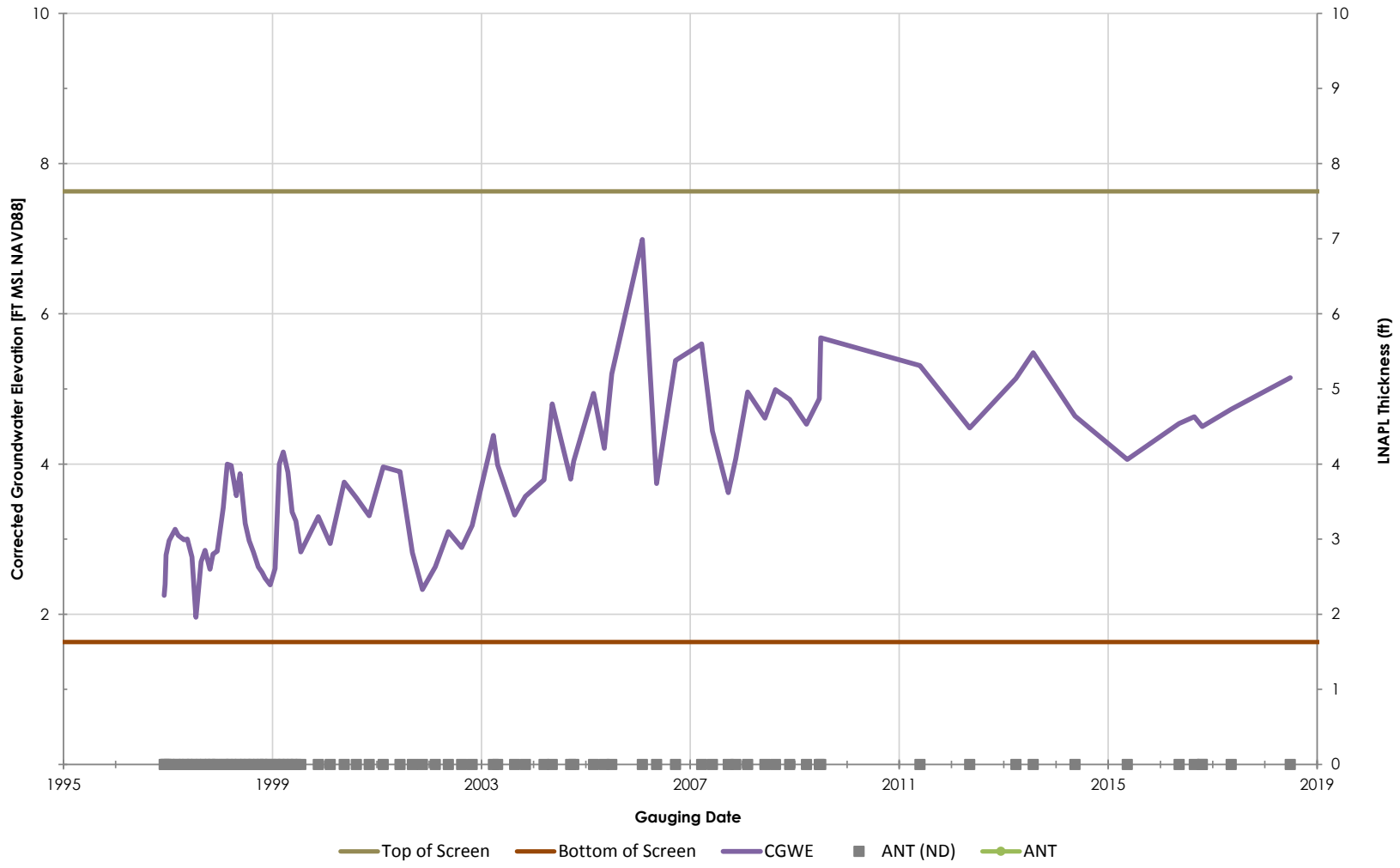
Stantec

Figure/Well No.

PZ-503

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

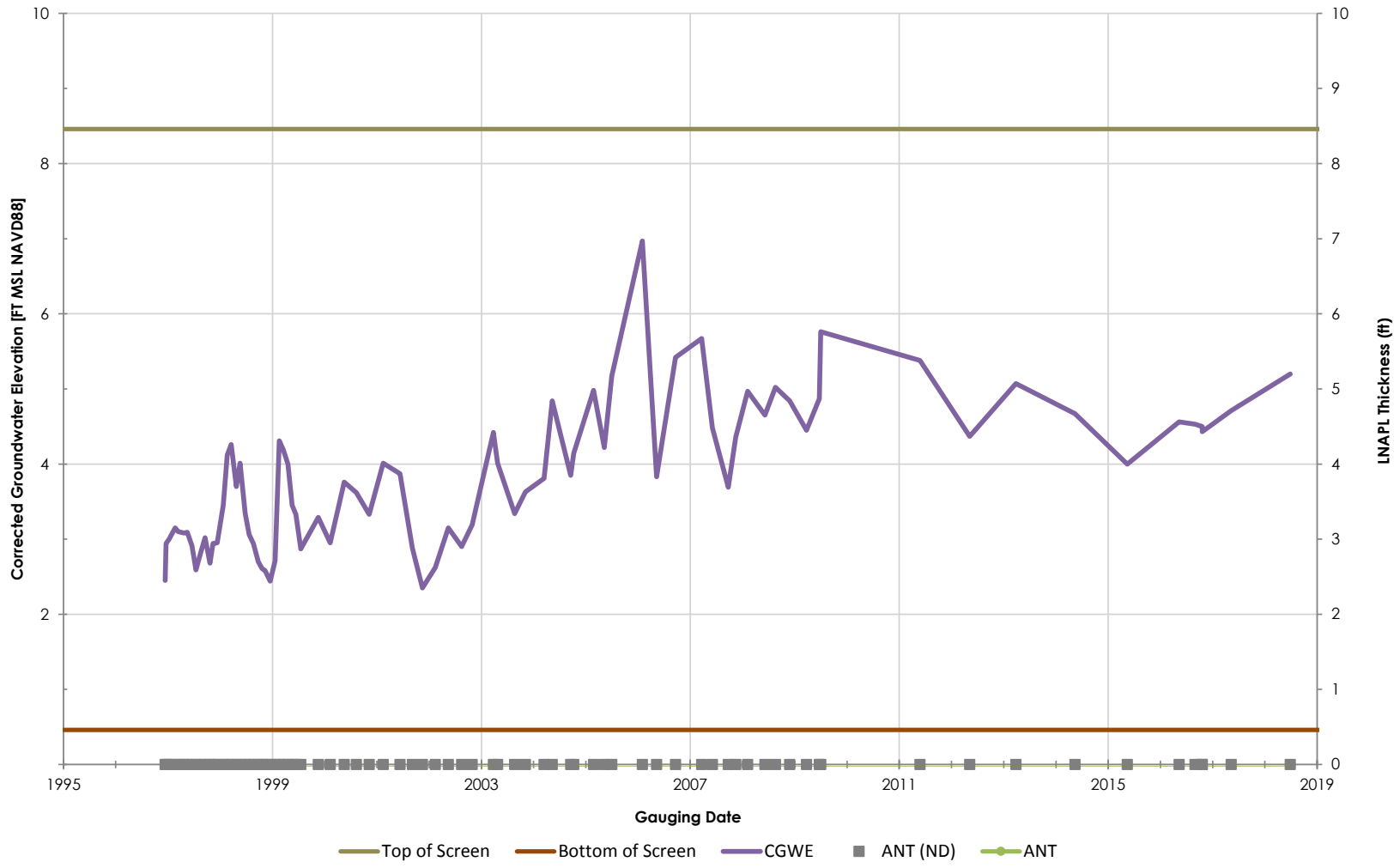
Stantec

Figure/Well No.

PZ-504

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

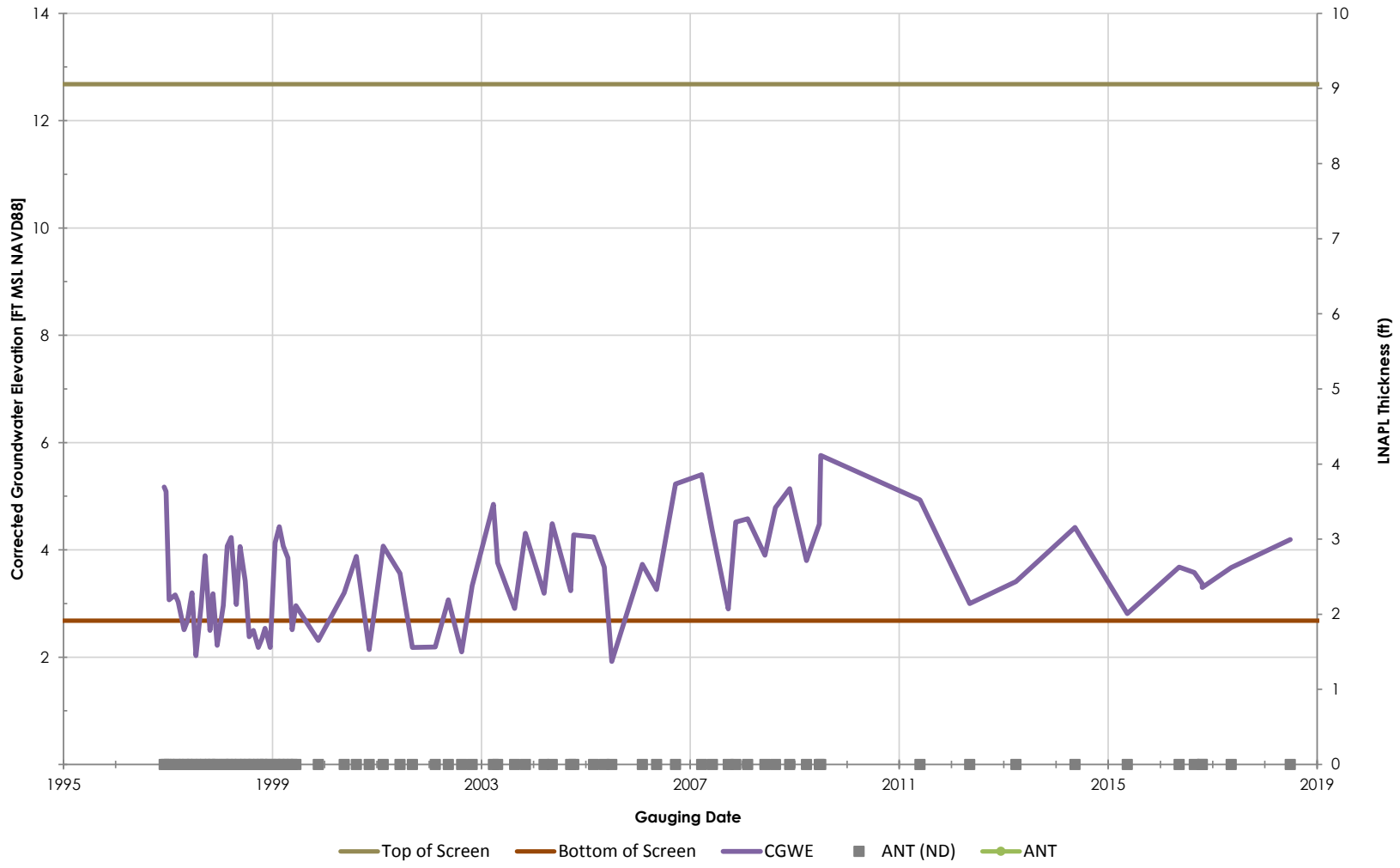
Stantec

Figure/Well No.

PZ-505

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

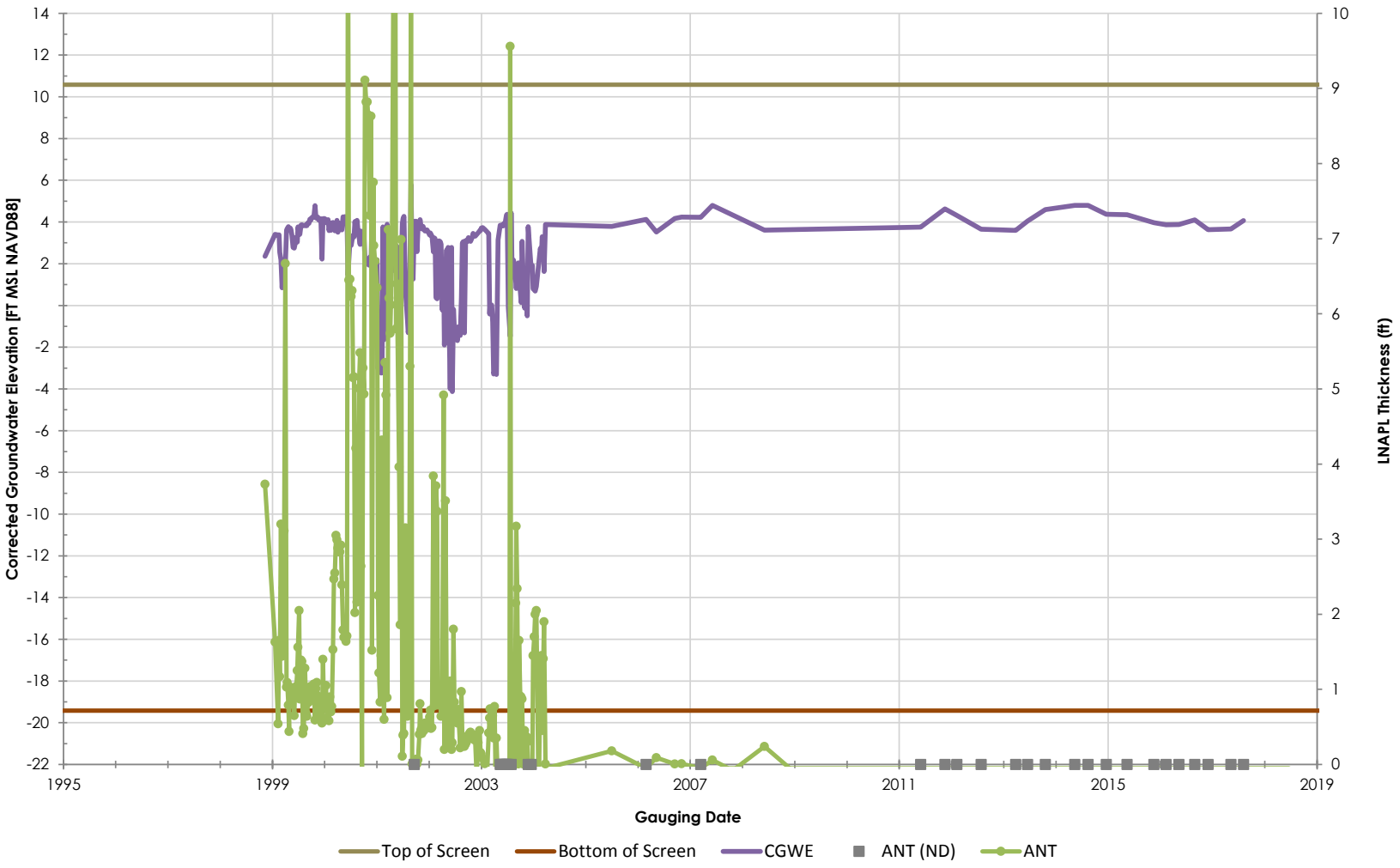
Stantec

Figure/Well No.

PZ-507

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

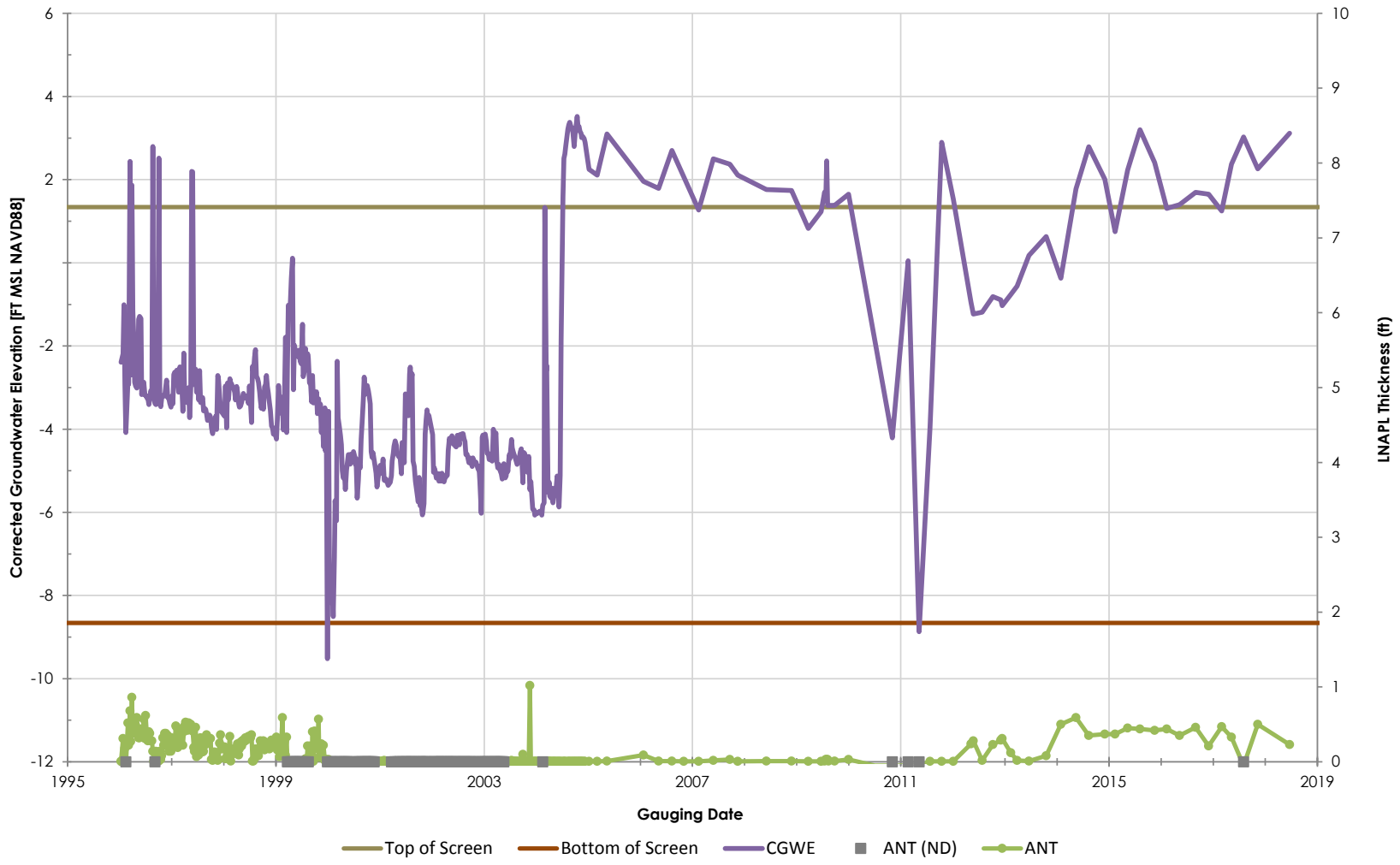
Stantec

Figure/Well No.

RW-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

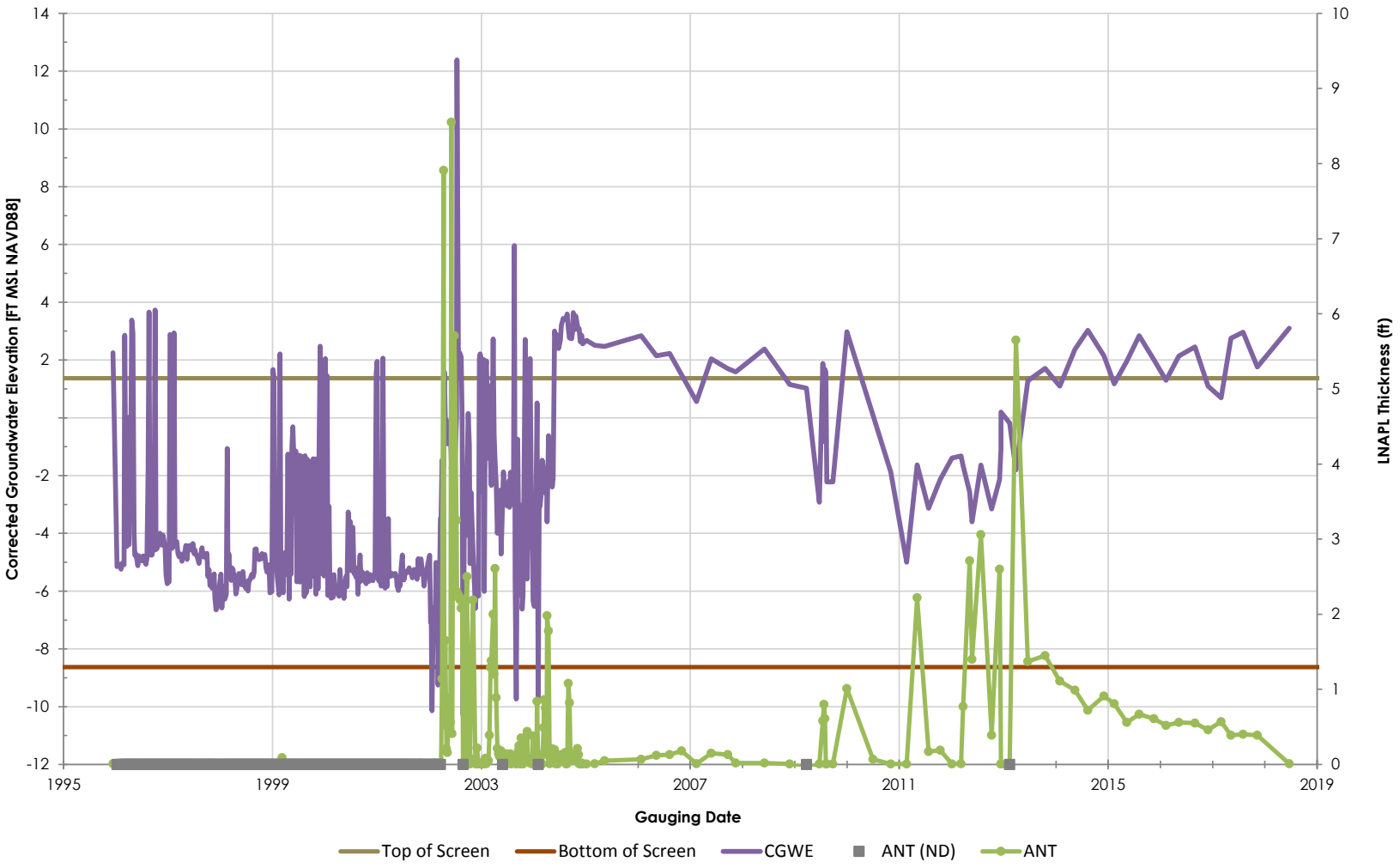
Stantec

Figure/Well No.

RW-100

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

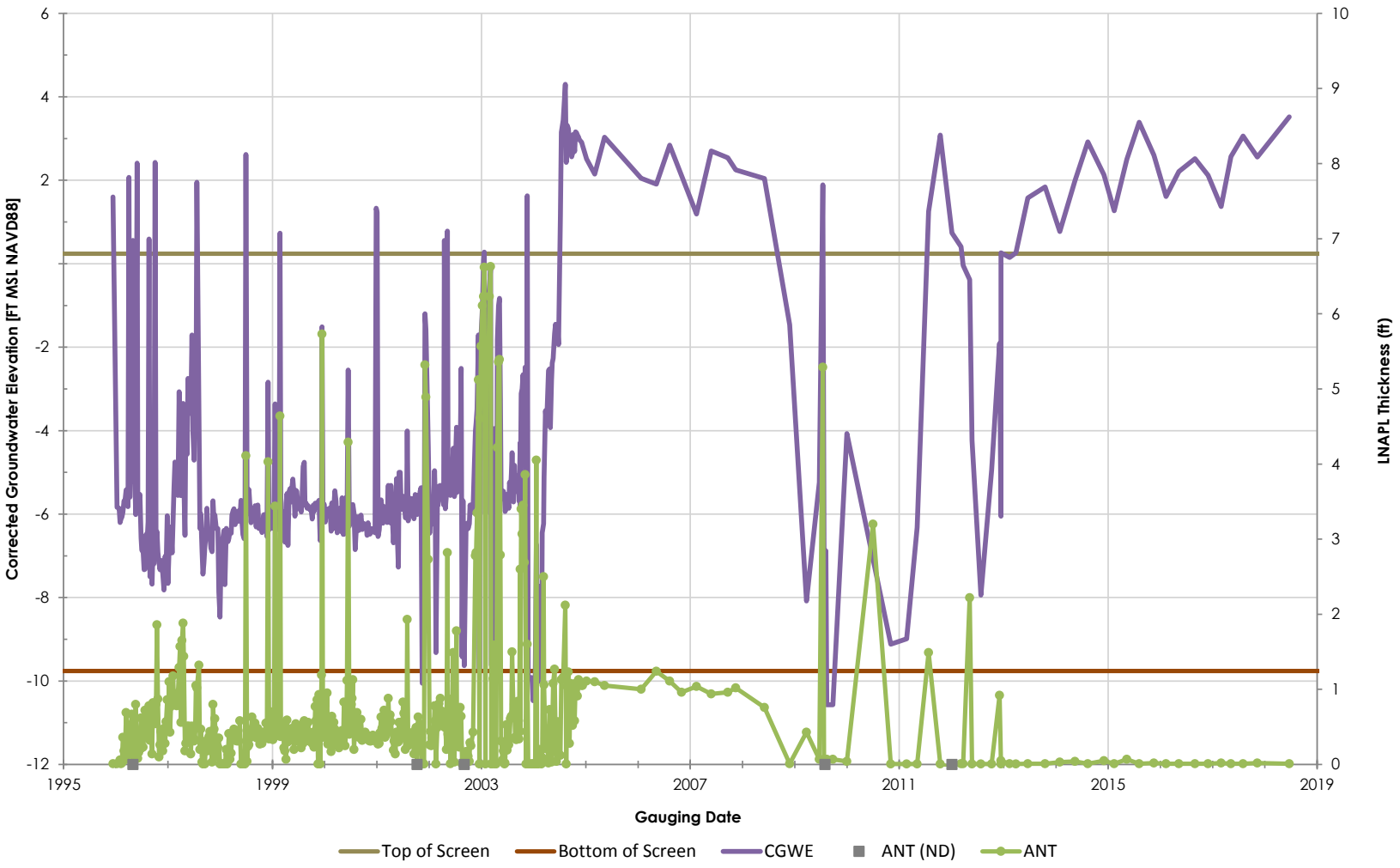
Stantec

Figure/Well No.

RW-101

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

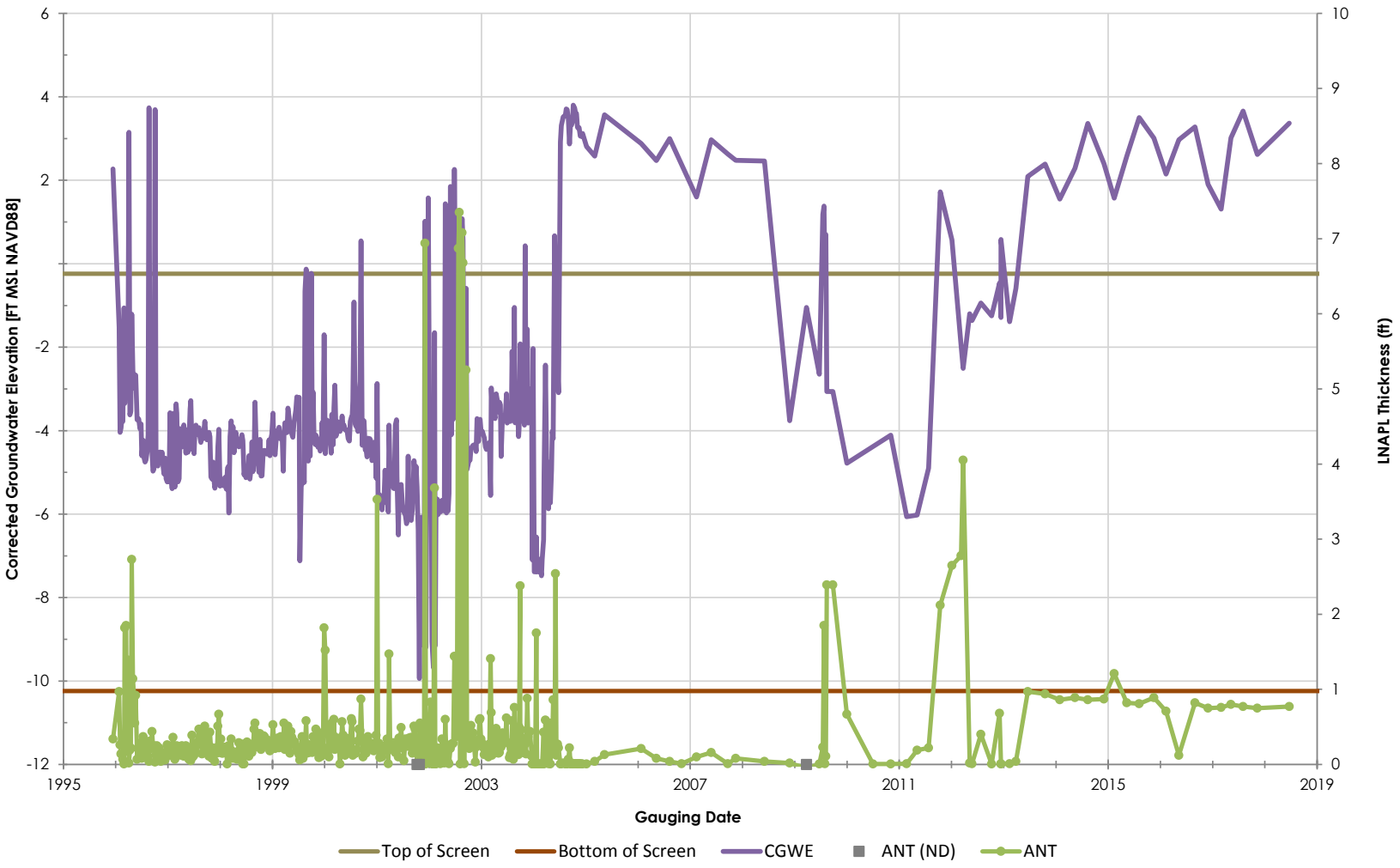
Stantec

Figure/Well No.

RW-102

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

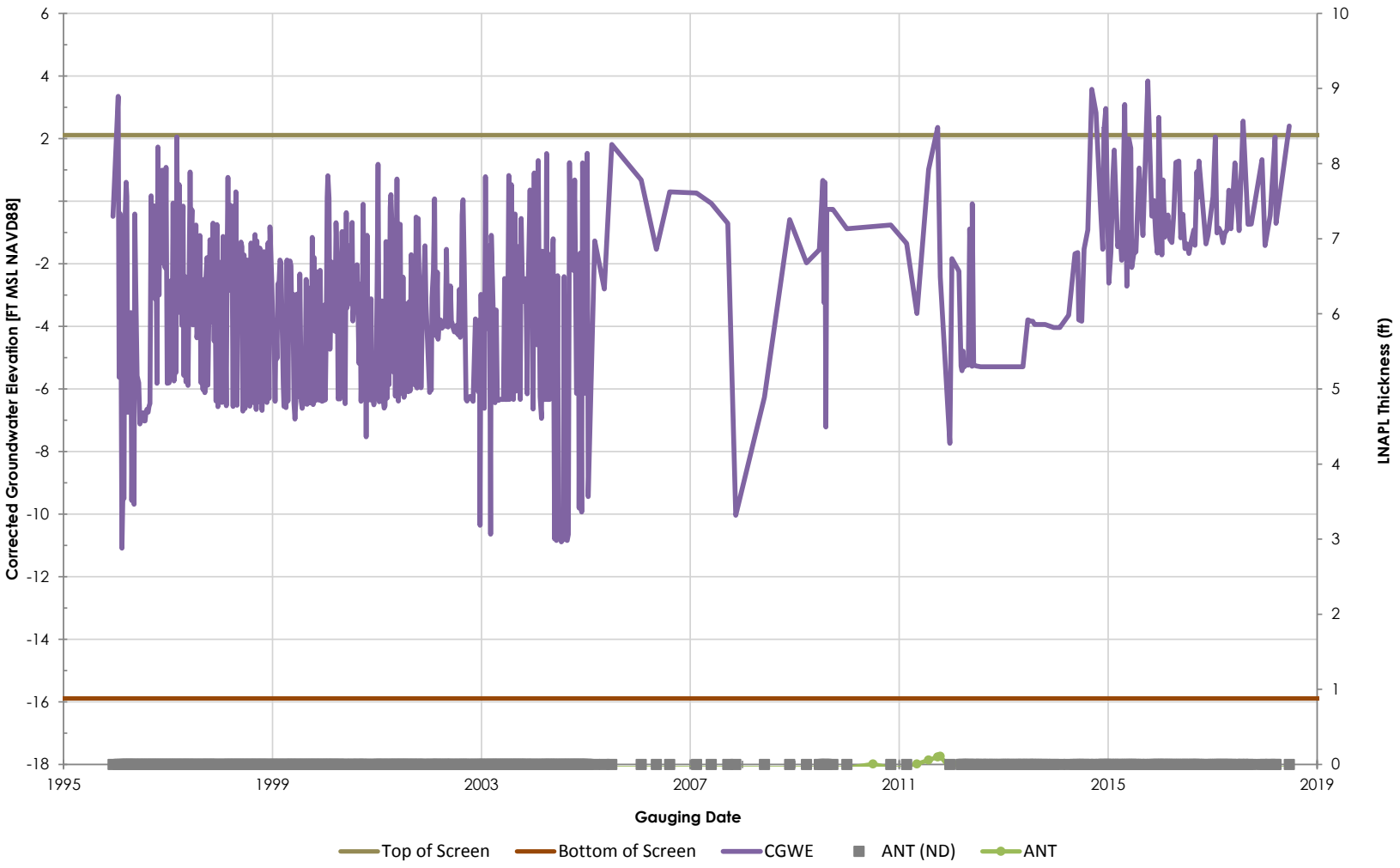
Stantec

Figure/Well No.

RW-103

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

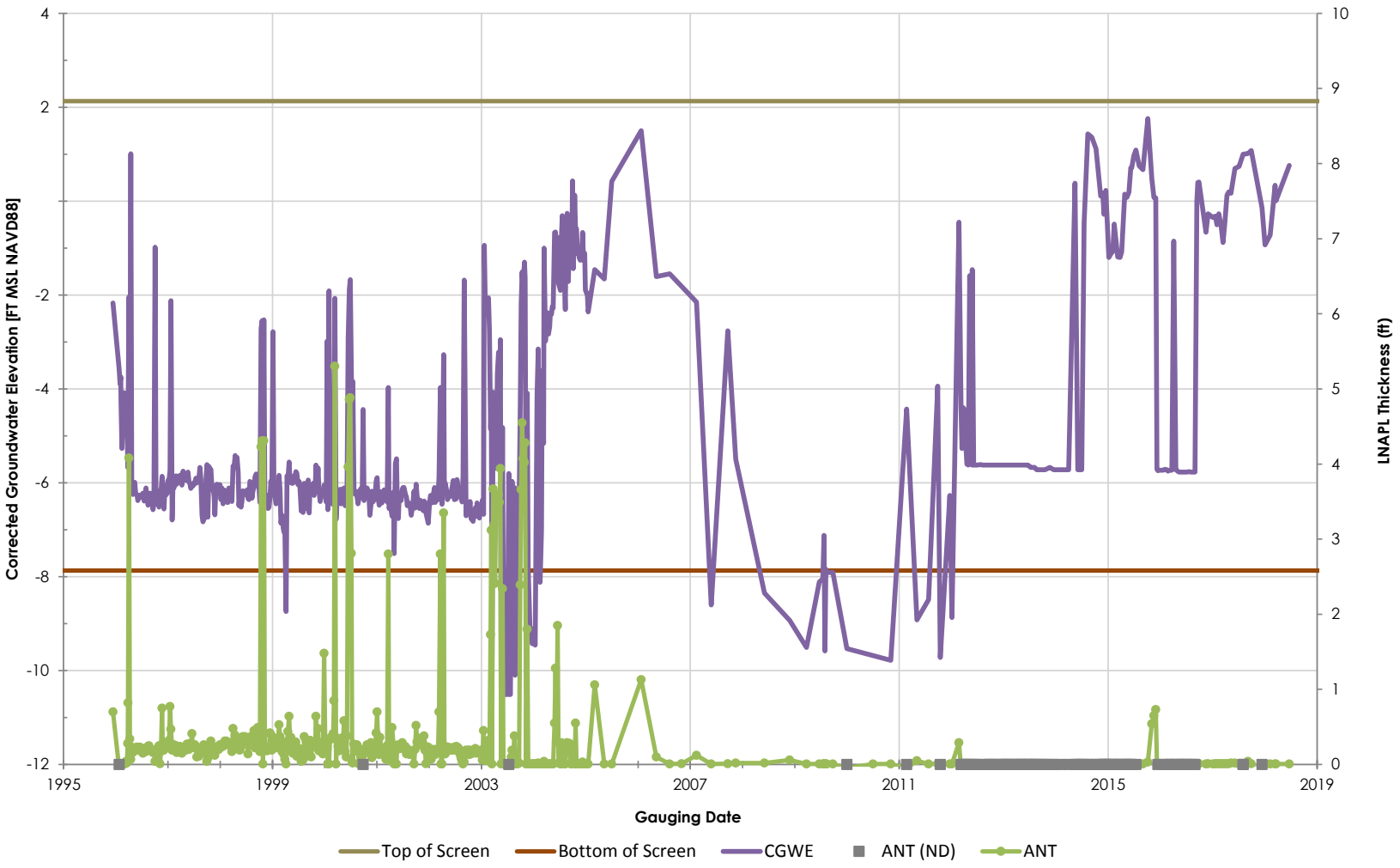
Stantec

Figure/Well No.

RW-104

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

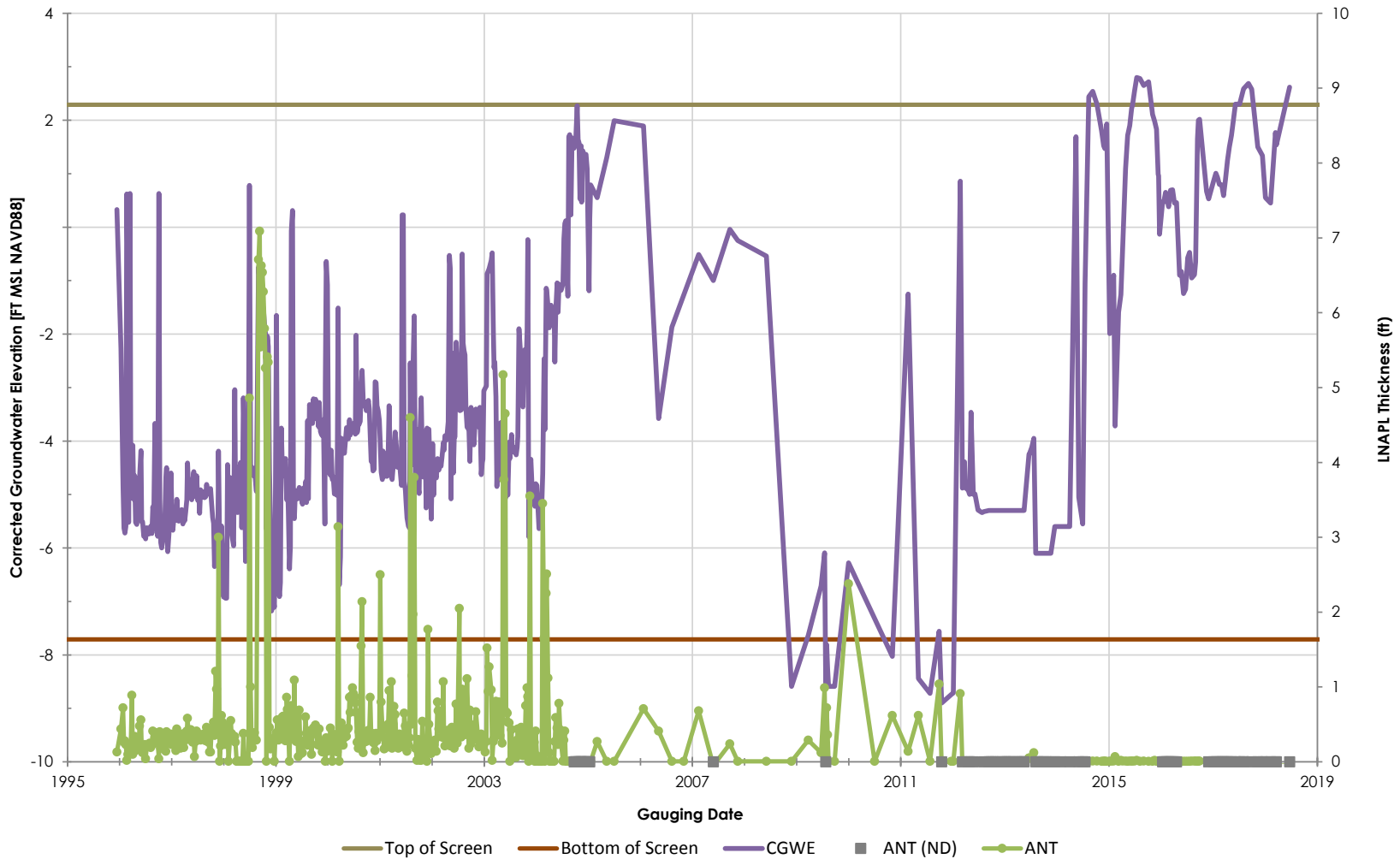
Stantec

Figure/Well No.

RW-105

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

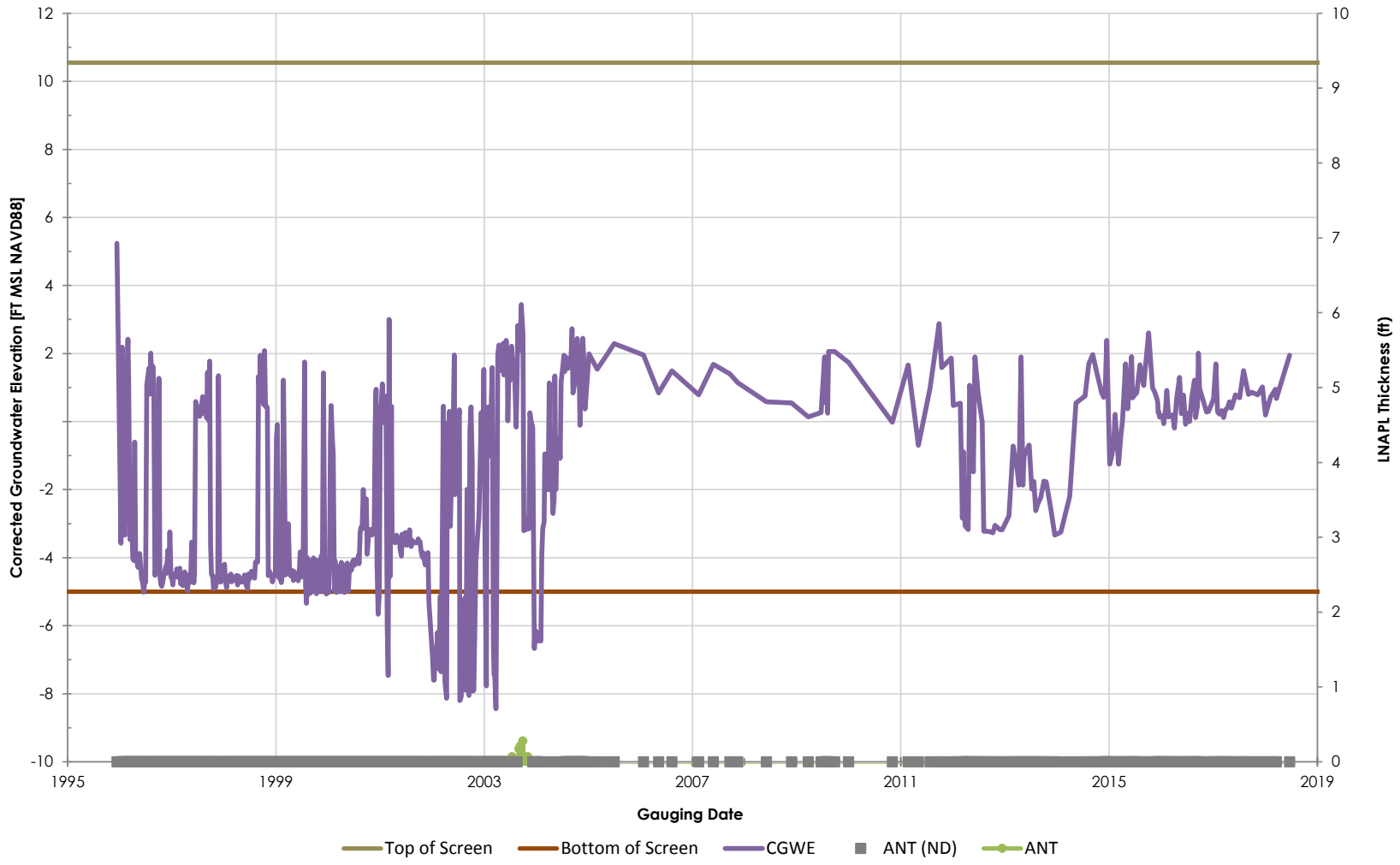
Stantec

Figure/Well No.

RW-106

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

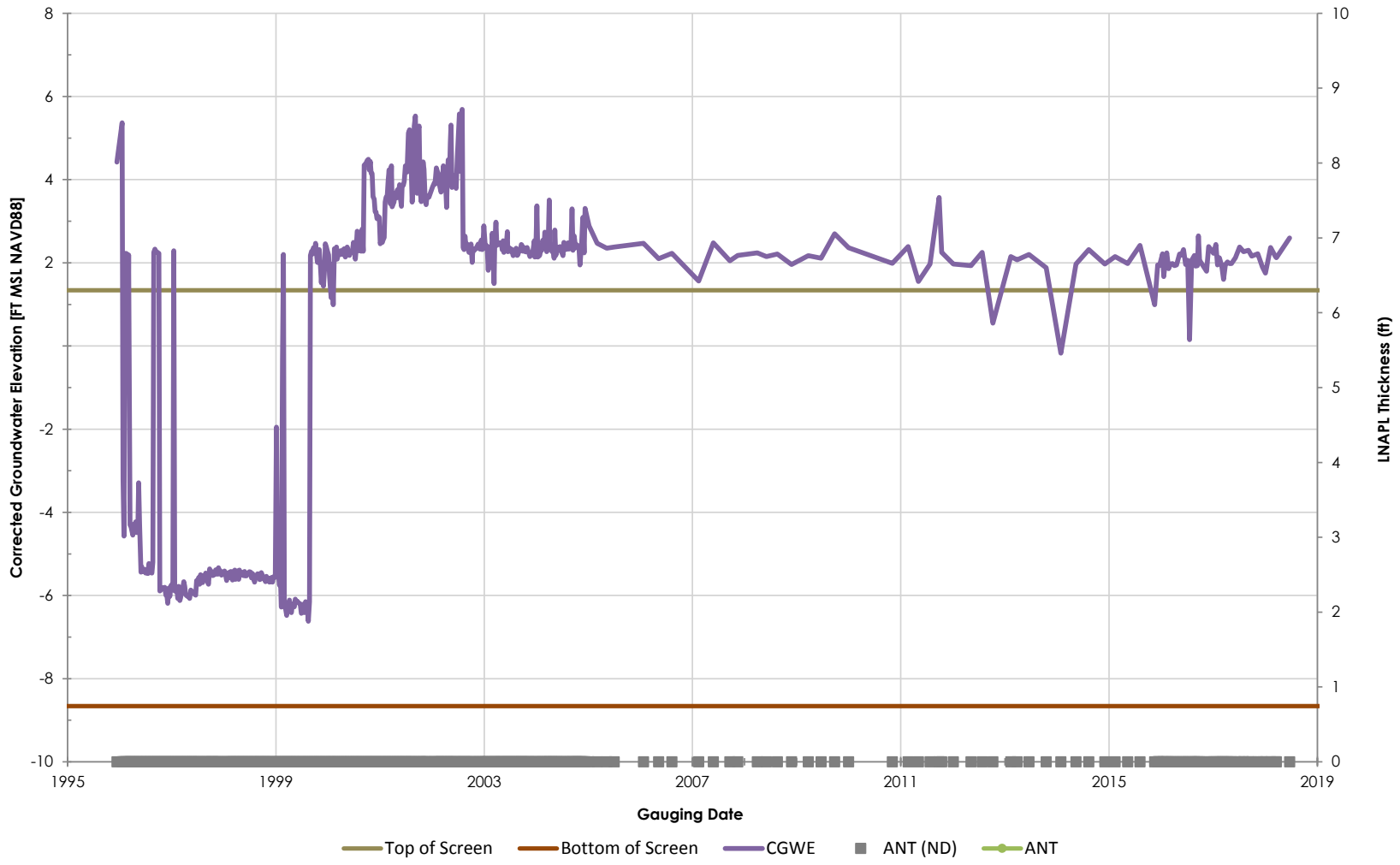
Stantec

Figure/Well No.

RW-107

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

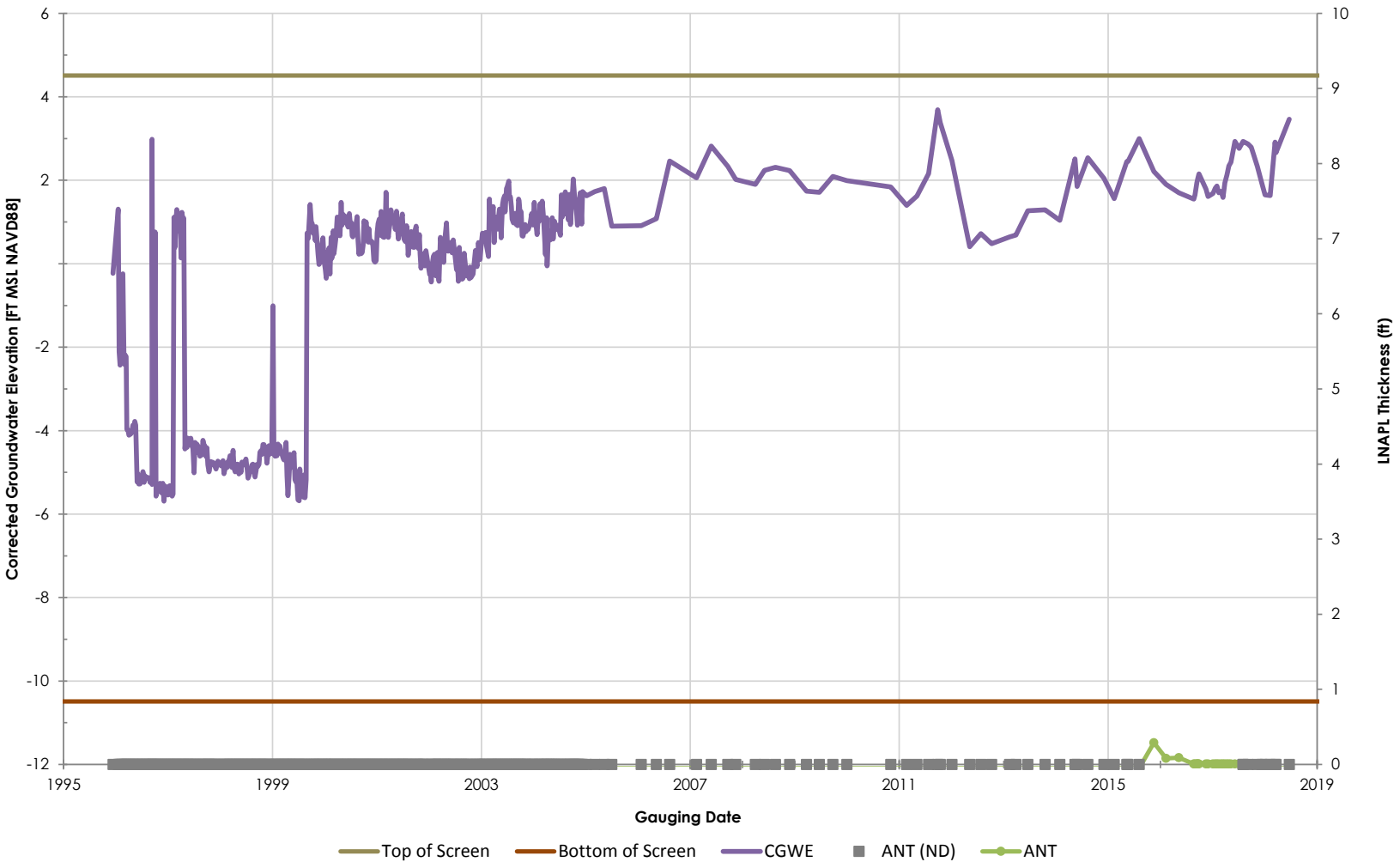
Stantec

Figure/Well No.

RW-108

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

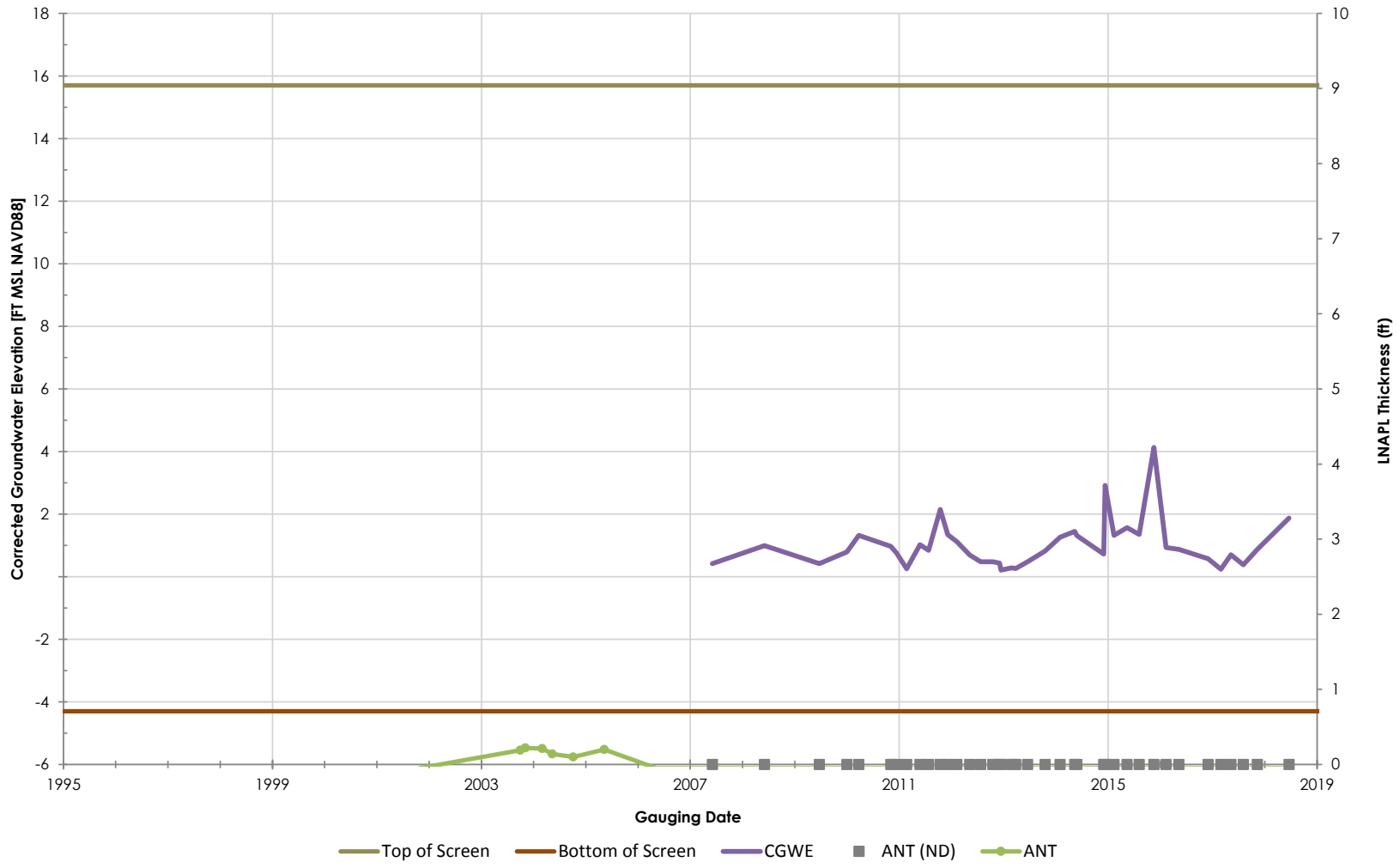
Stantec

Figure/Well No.

RW-109

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

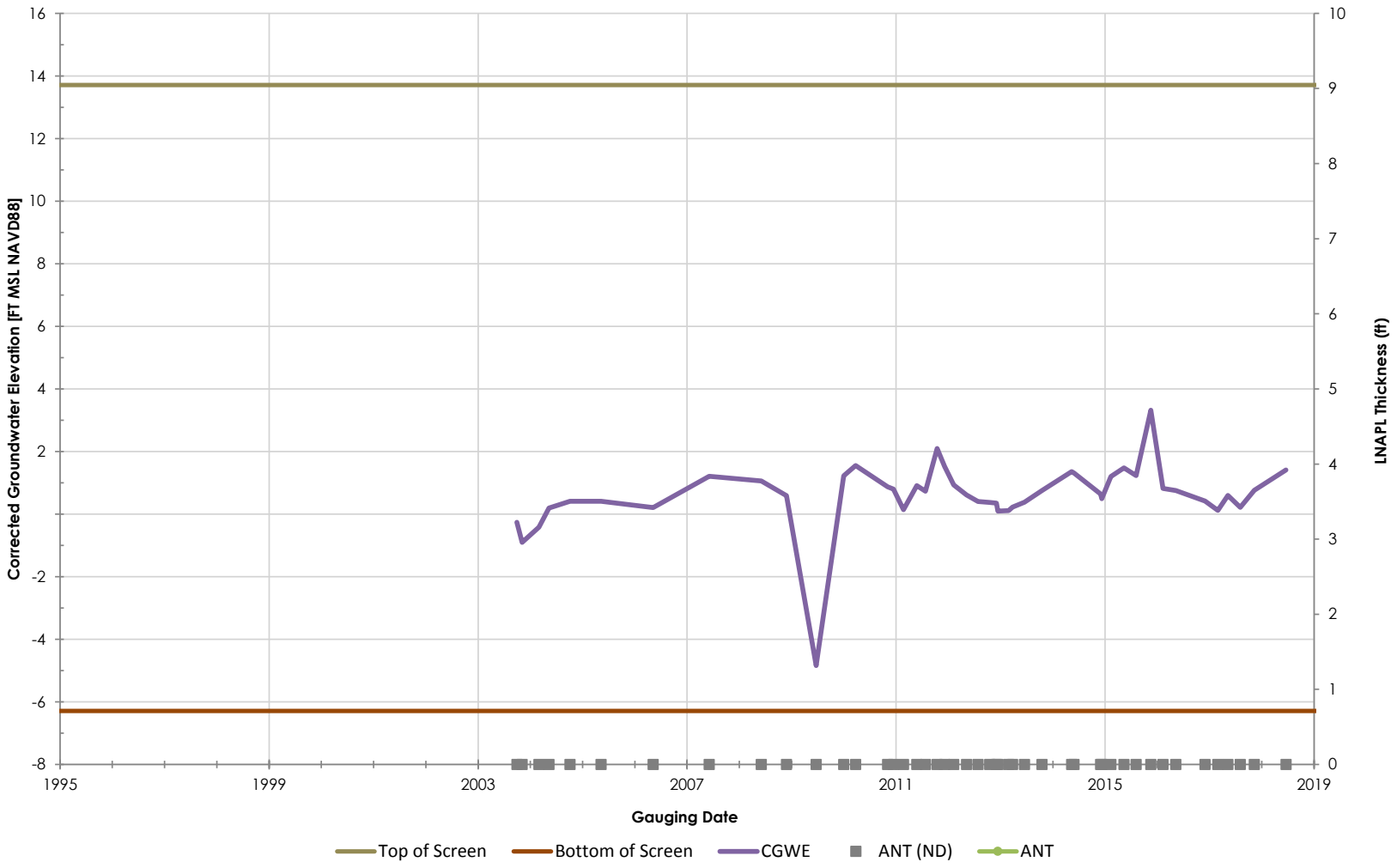
Stantec

Figure/Well No.

RW-110

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

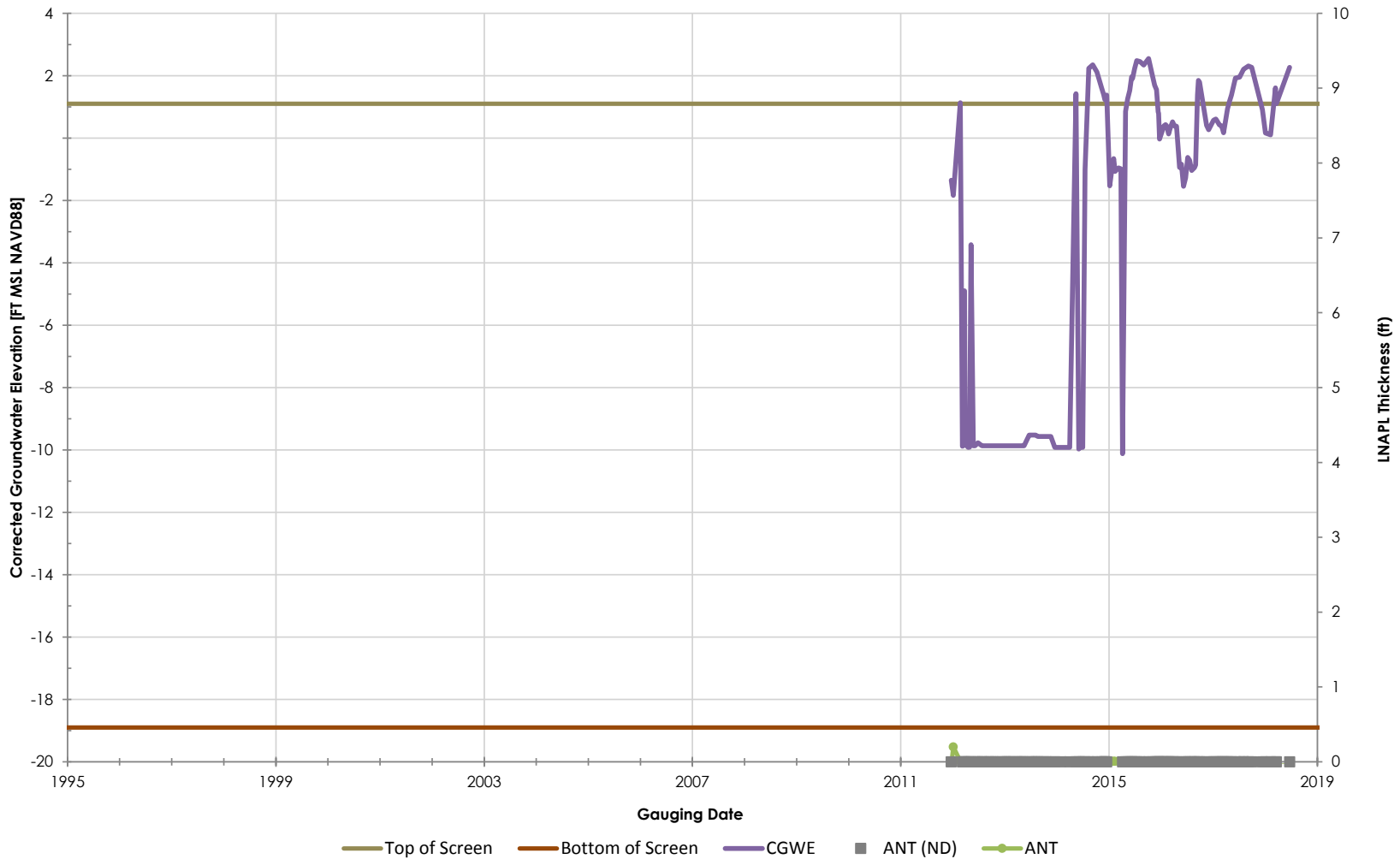
Stantec

Figure/Well No.

RW-112

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

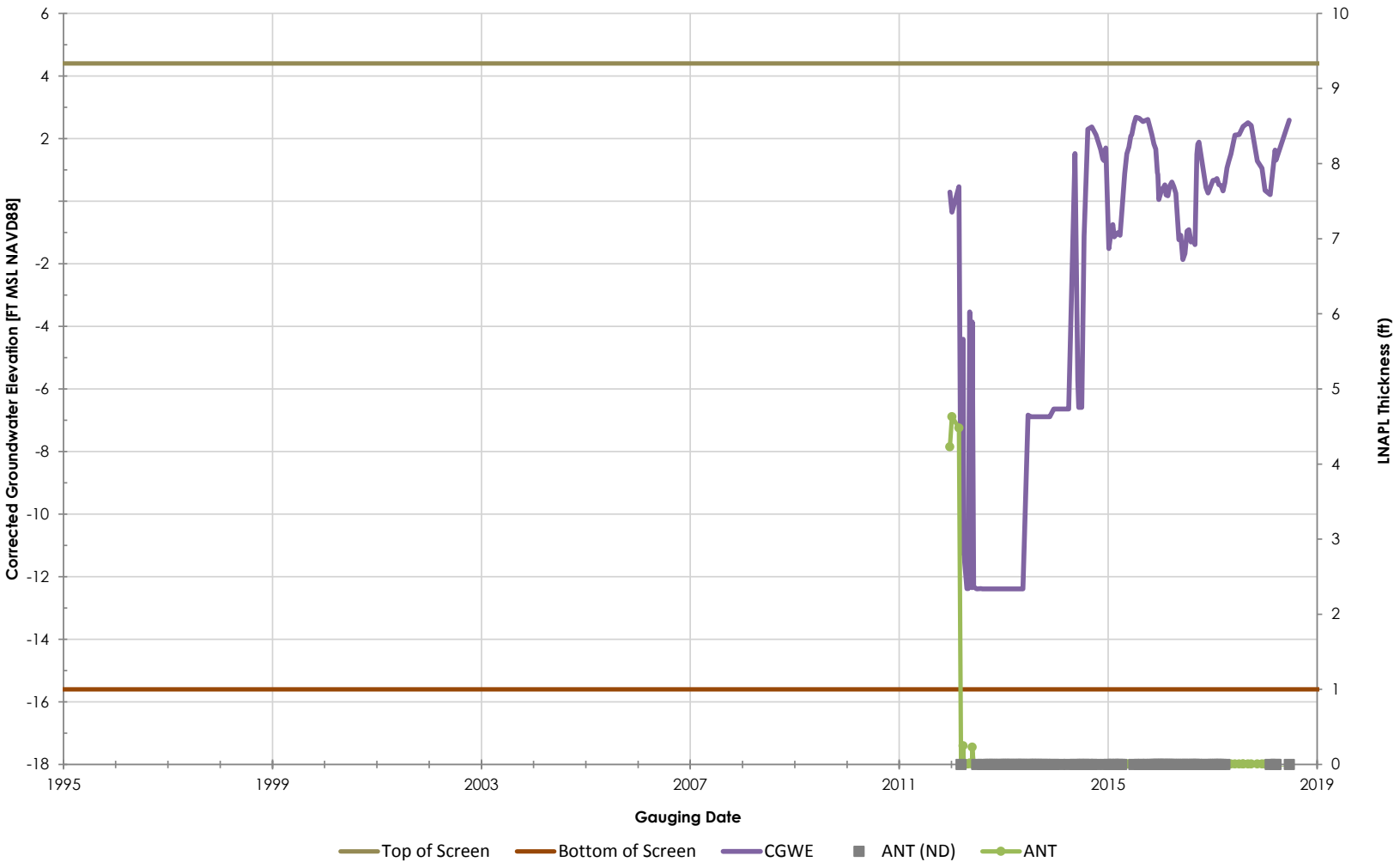
Stantec

Figure/Well No.

RW-113

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

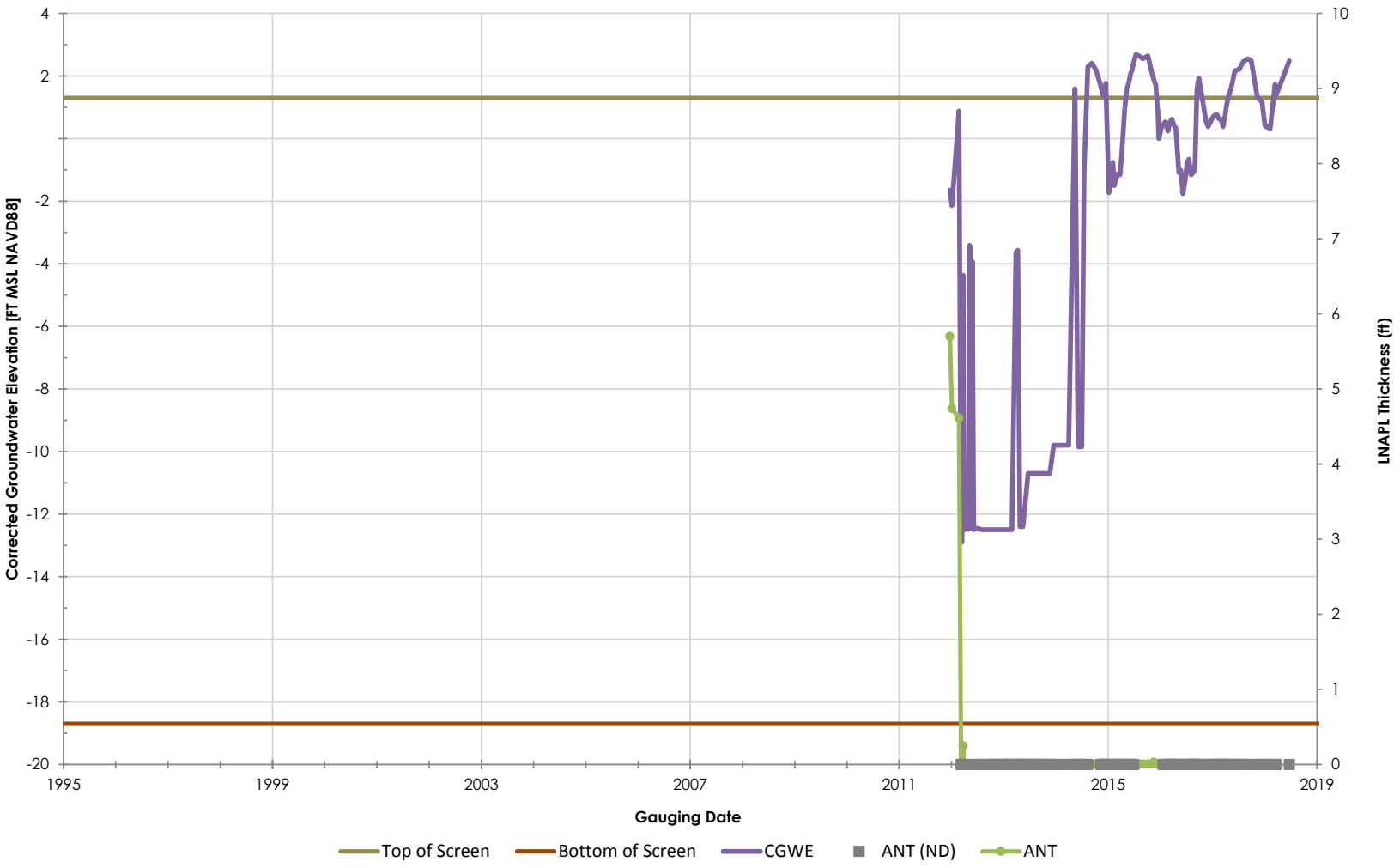
Stantec

Figure/Well No.

RW-114

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

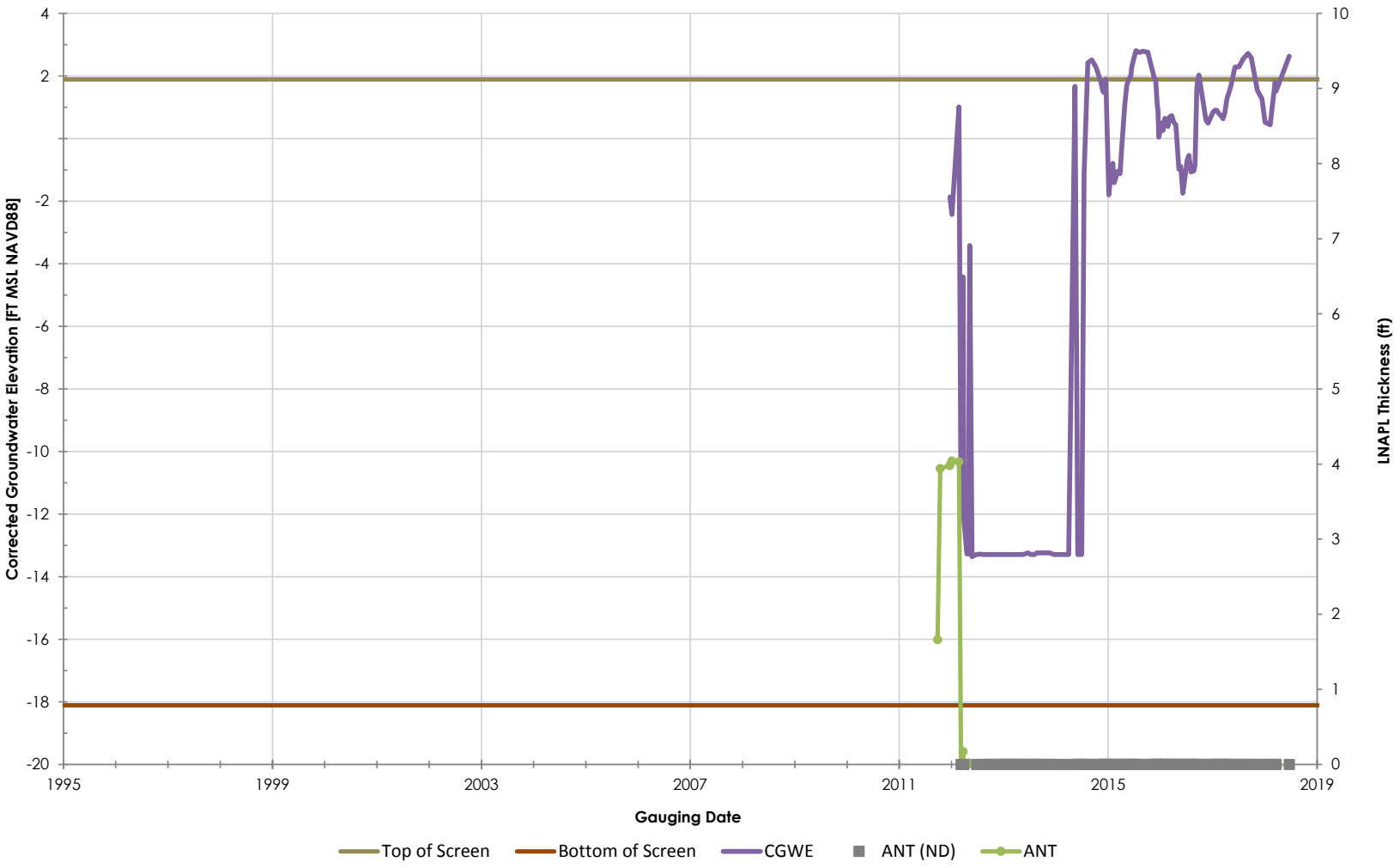
Stantec

Figure/Well No.

RW-115

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

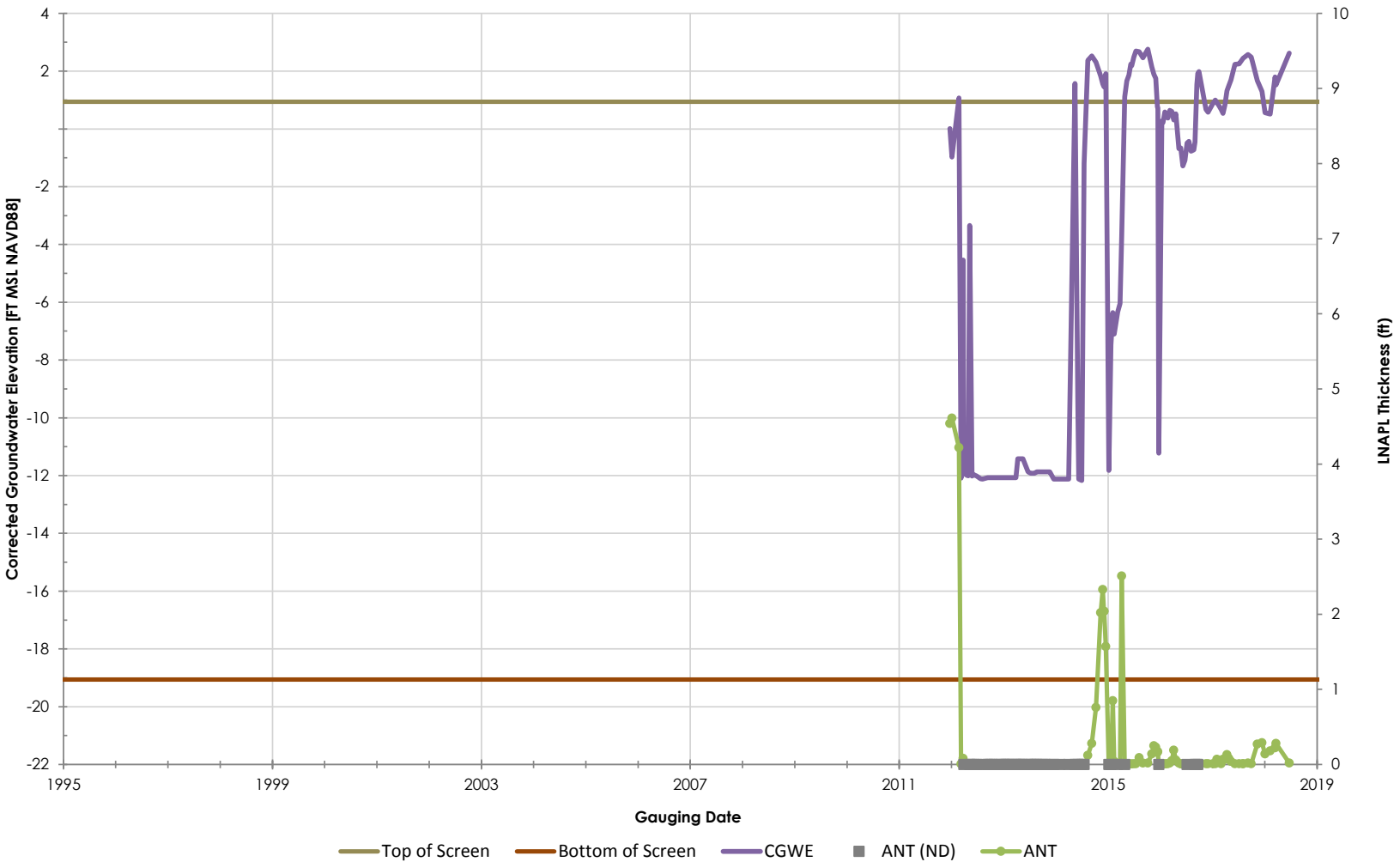
Stantec

Figure/Well No.

RW-116

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

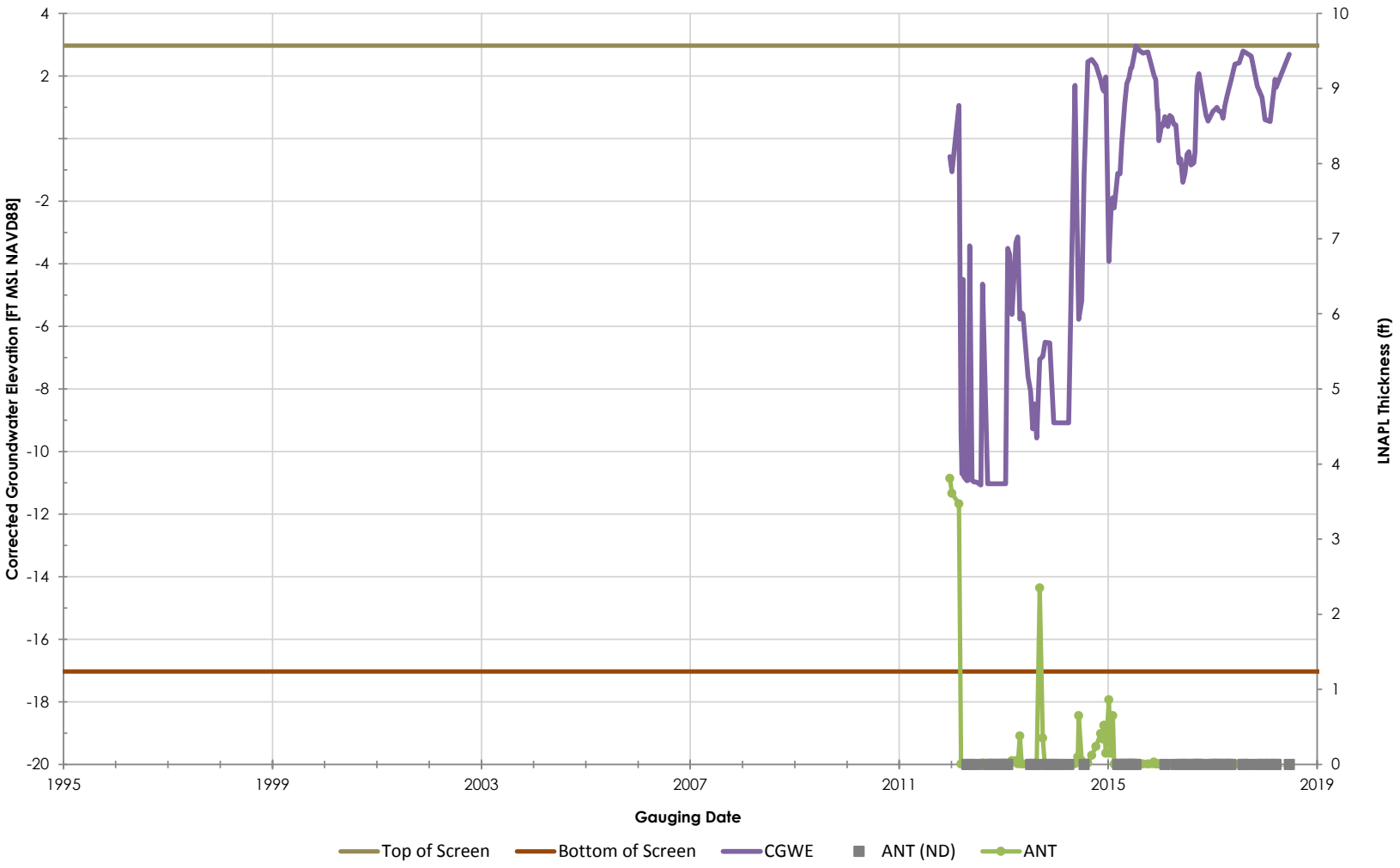
Stantec

Figure/Well No.

RW-117

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

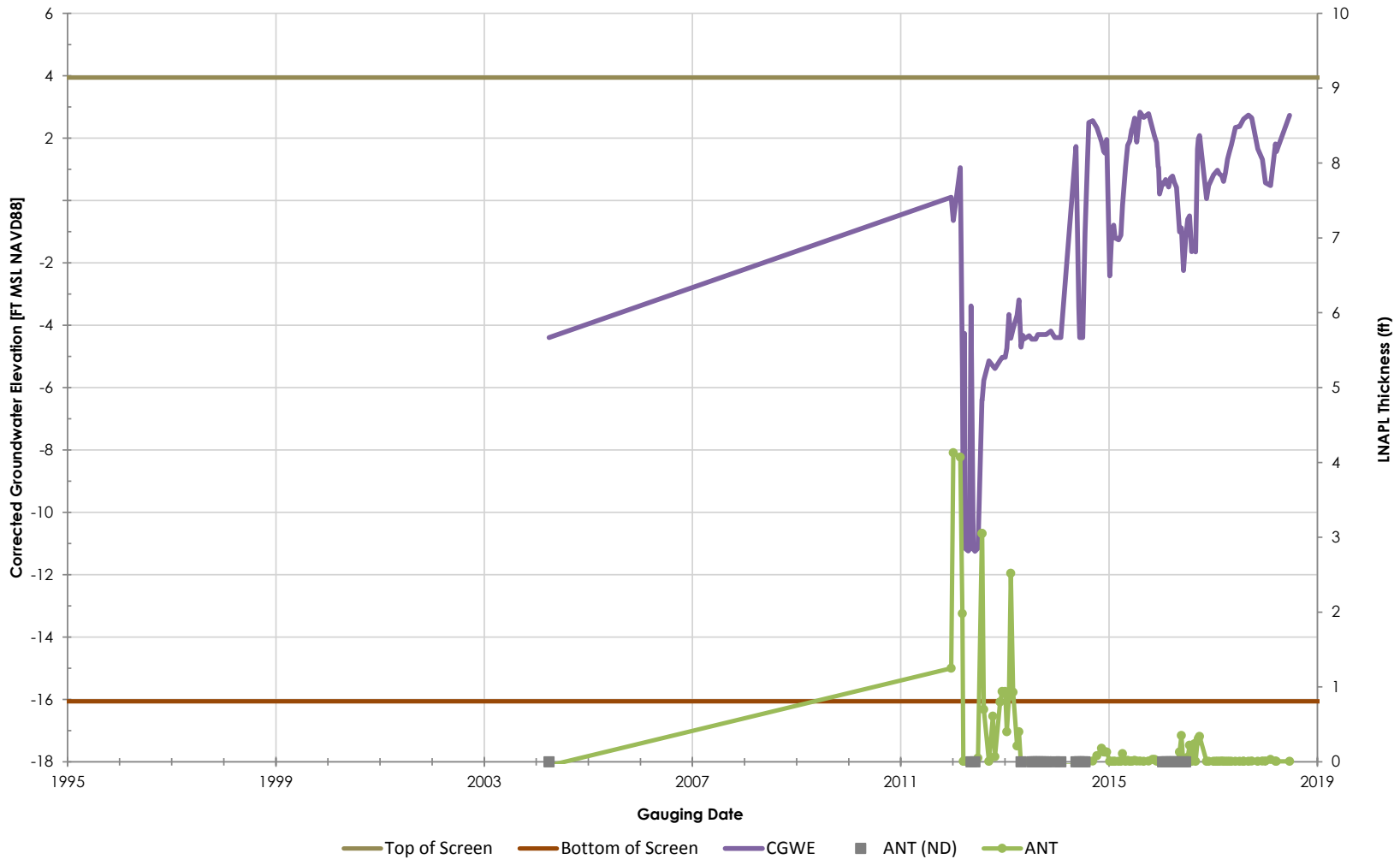
Stantec

Figure/Well No.

RW-118

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

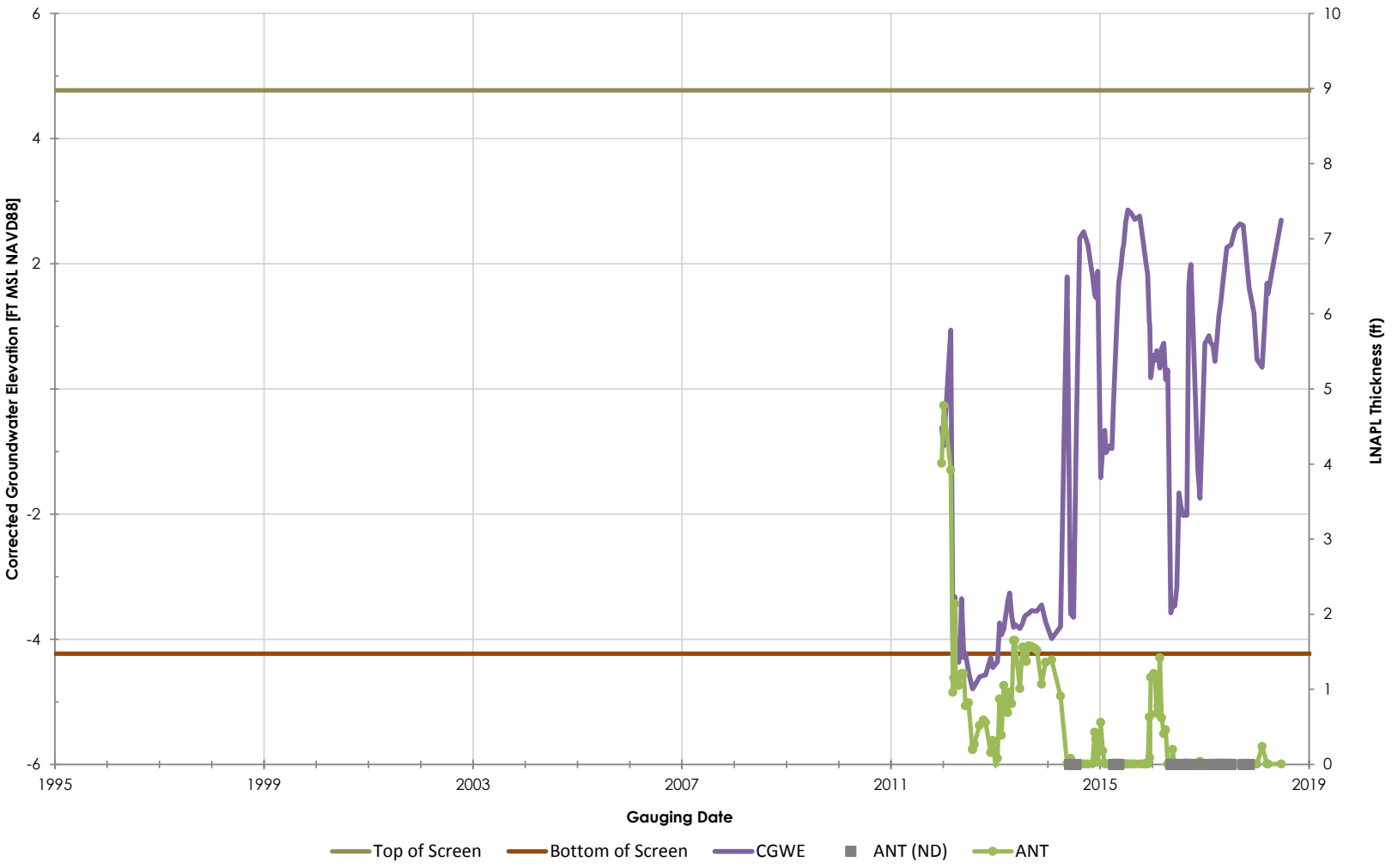
Stantec

Figure/Well No.

RW-119

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

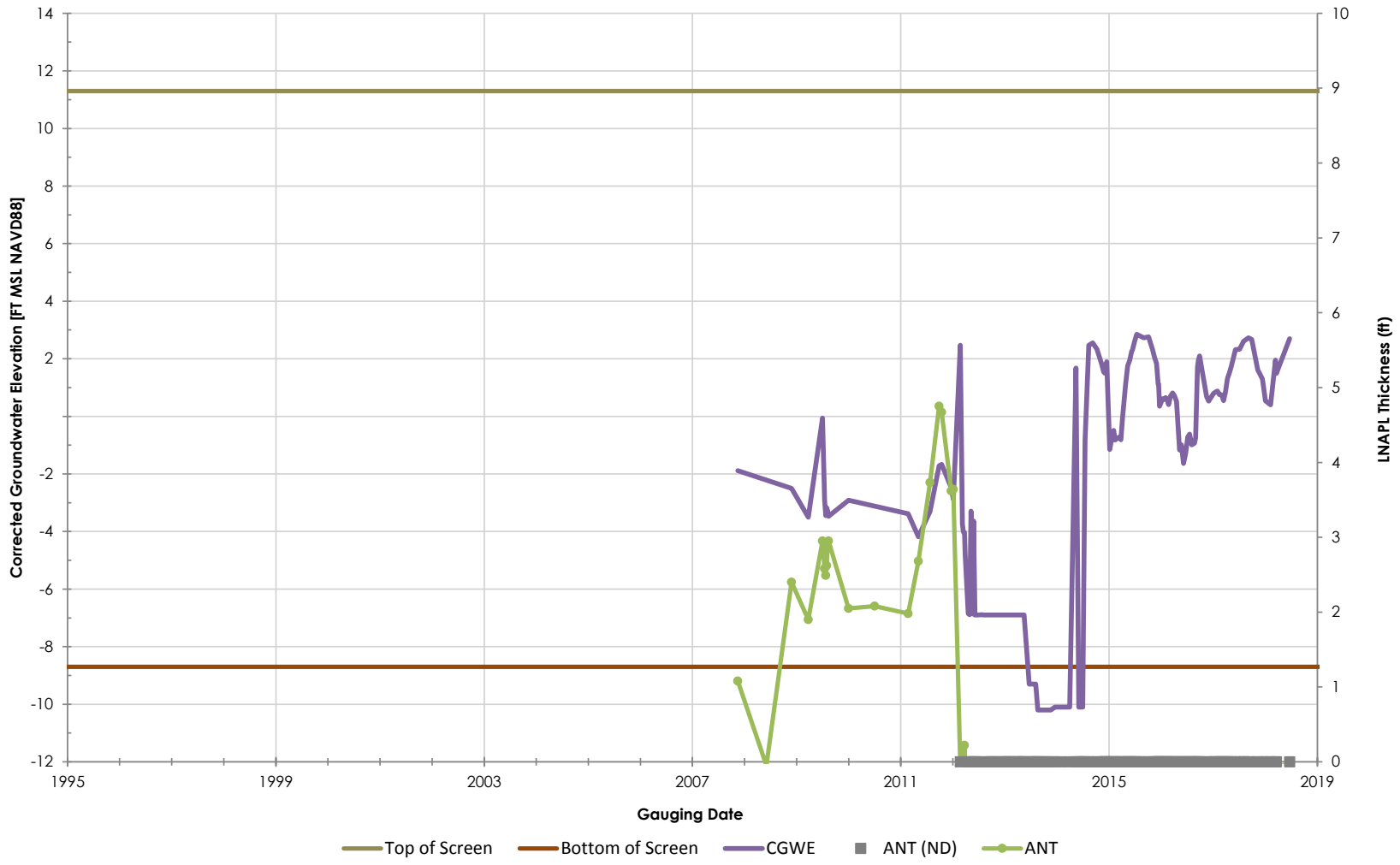
Stantec

Figure/Well No.

RW-120

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

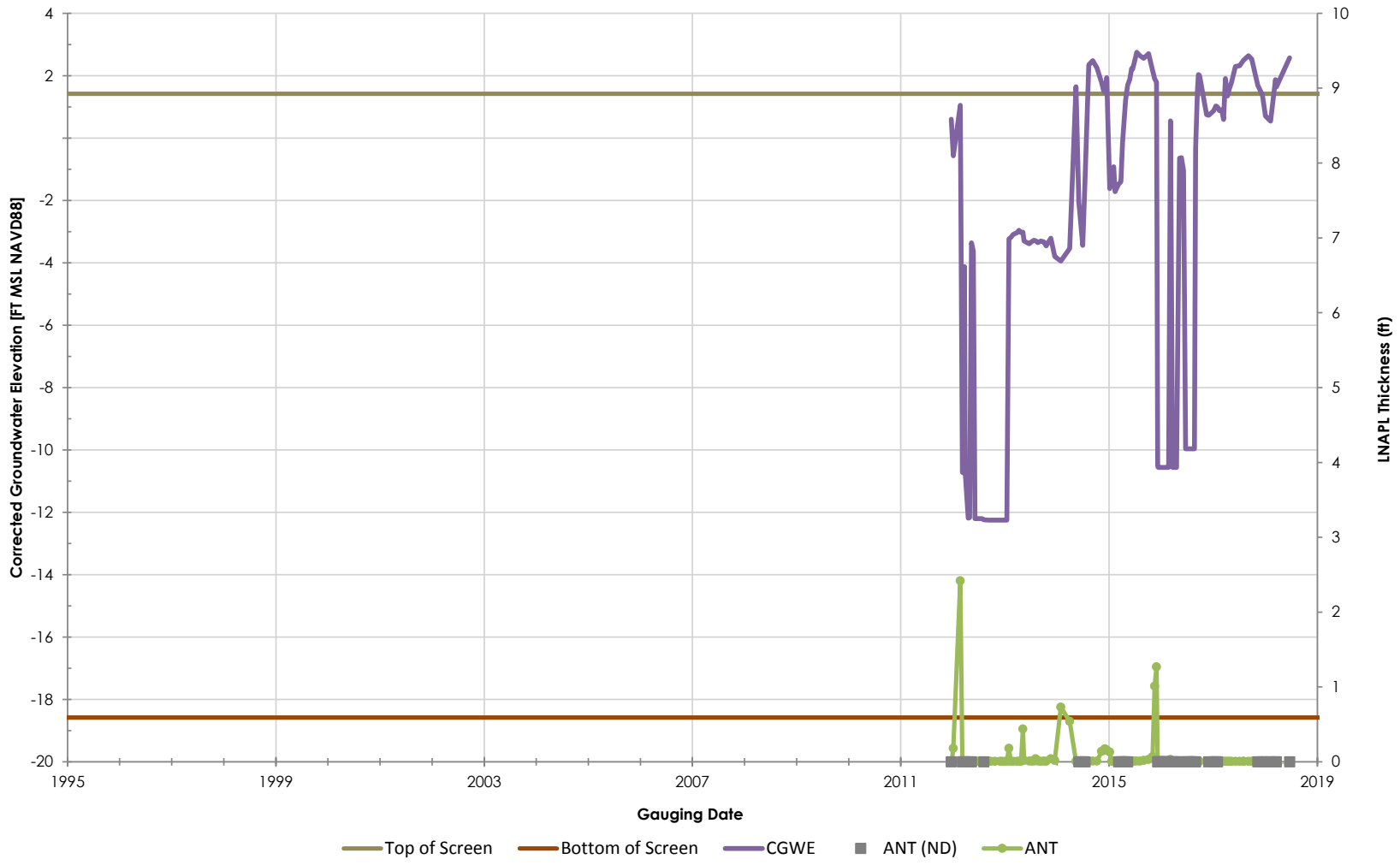
Stantec

Figure/Well No.

RW-121

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

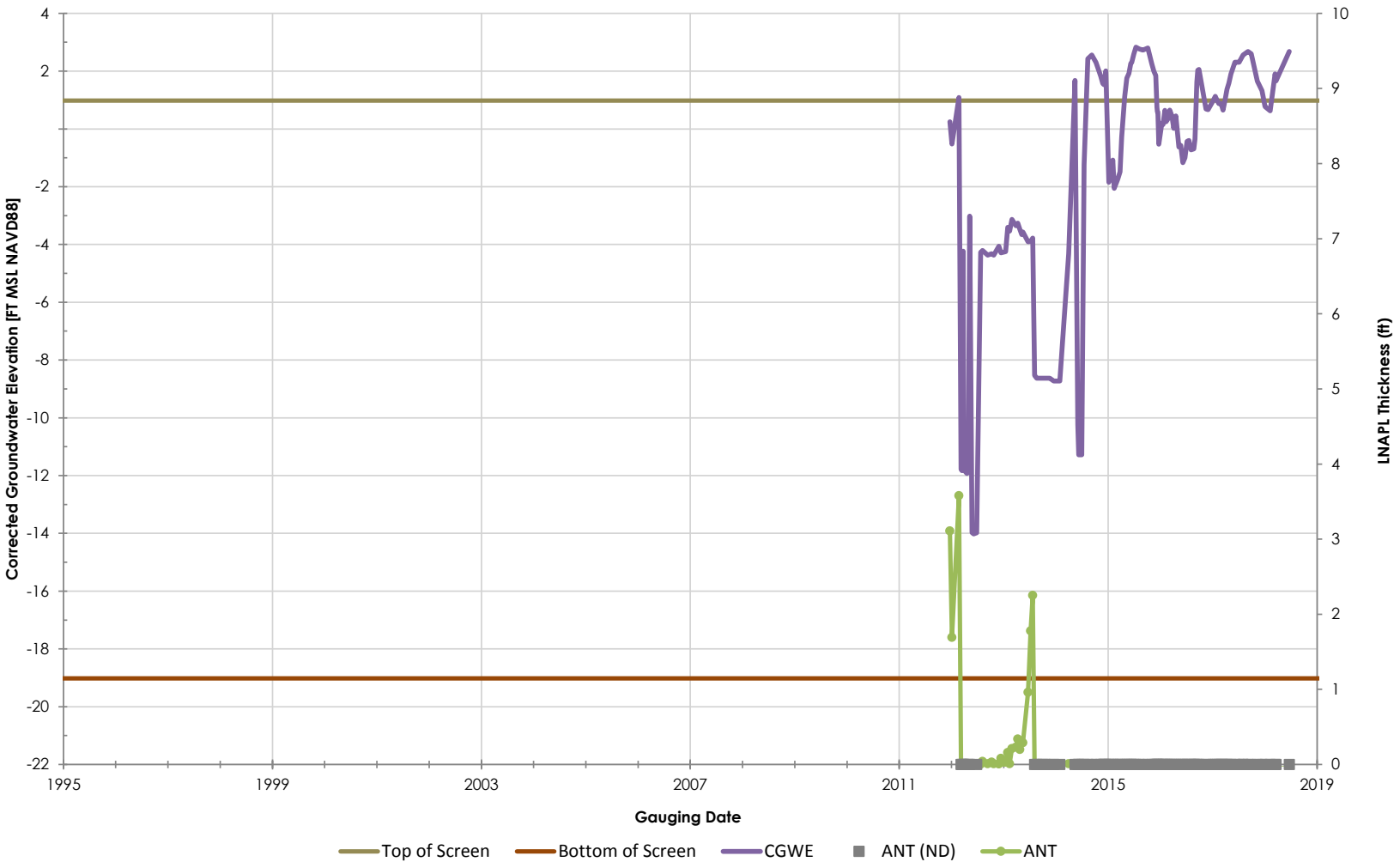
Stantec

Figure/Well No.

RW-122

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

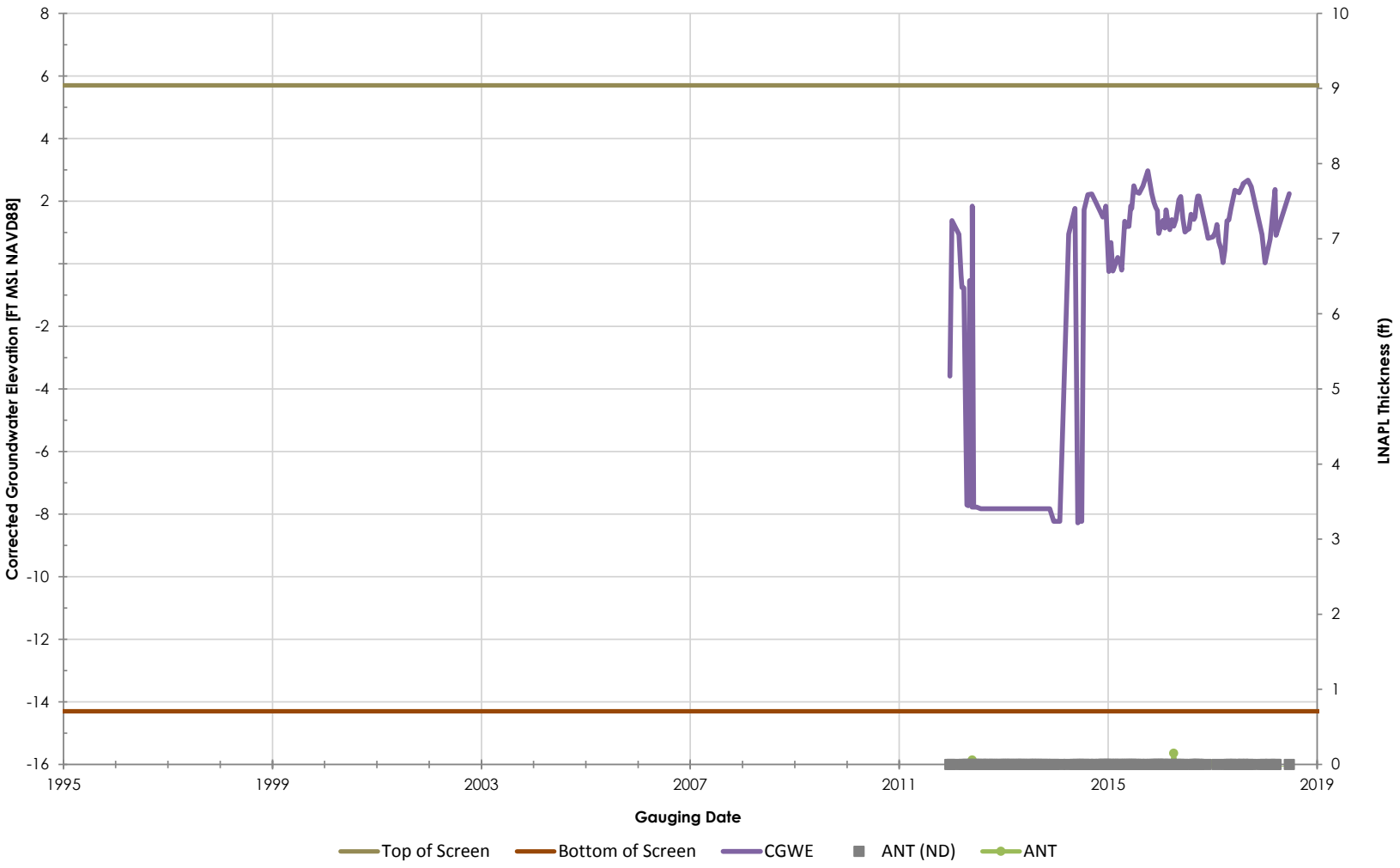
Stantec

Figure/Well No.

RW-123

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

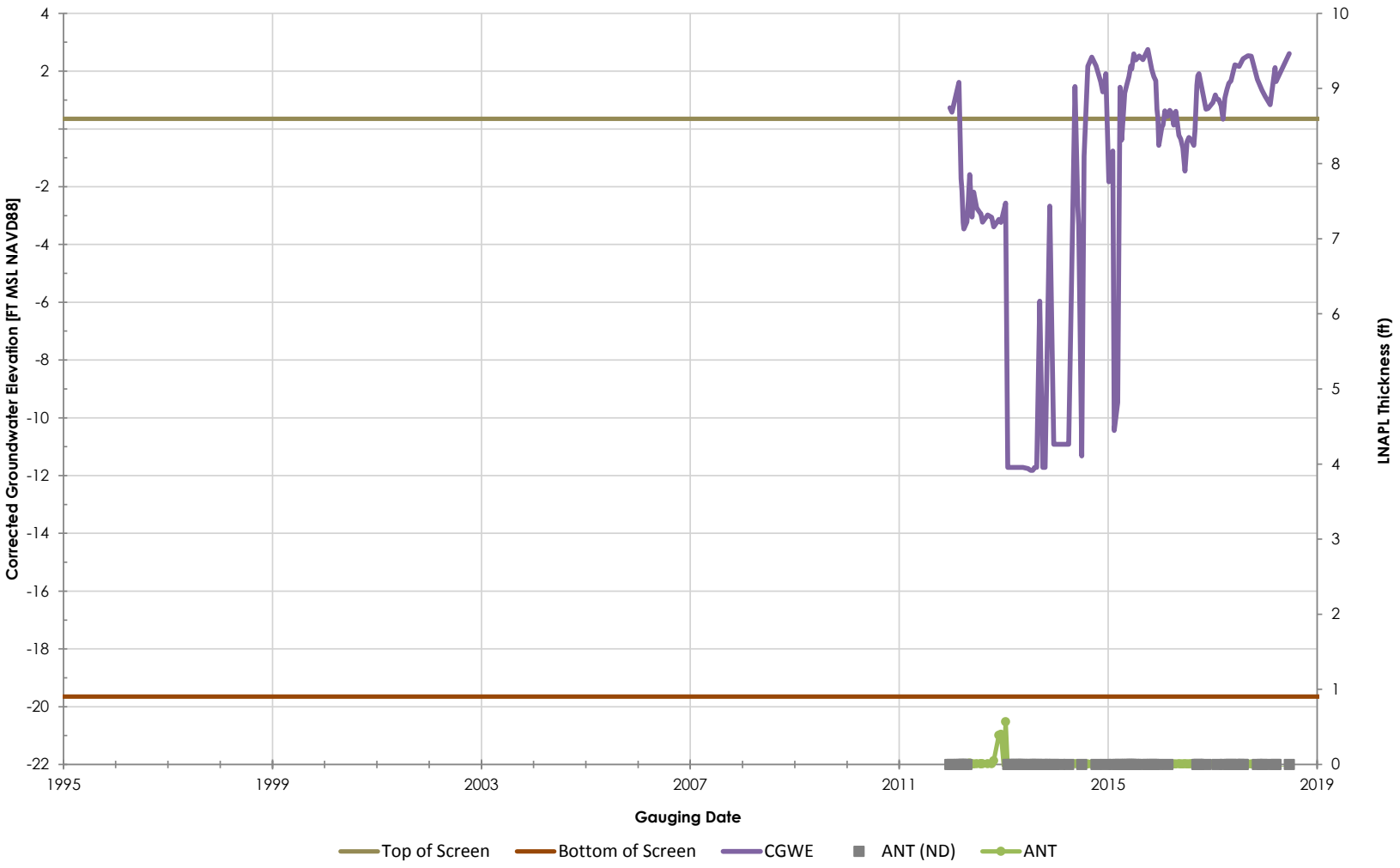
Stantec

Figure/Well No.

RW-125

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

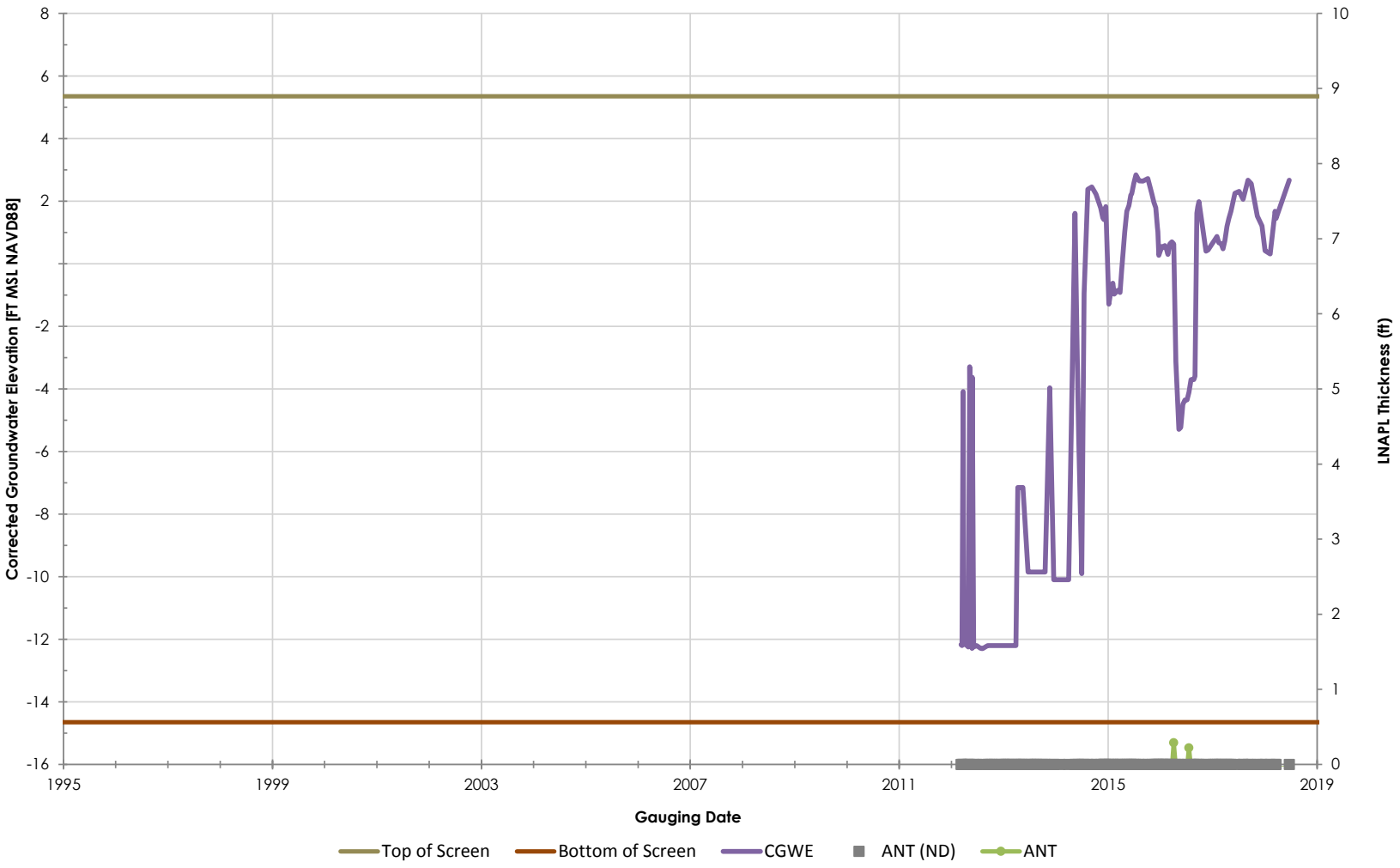
Stantec

Figure/Well No.

RW-126

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

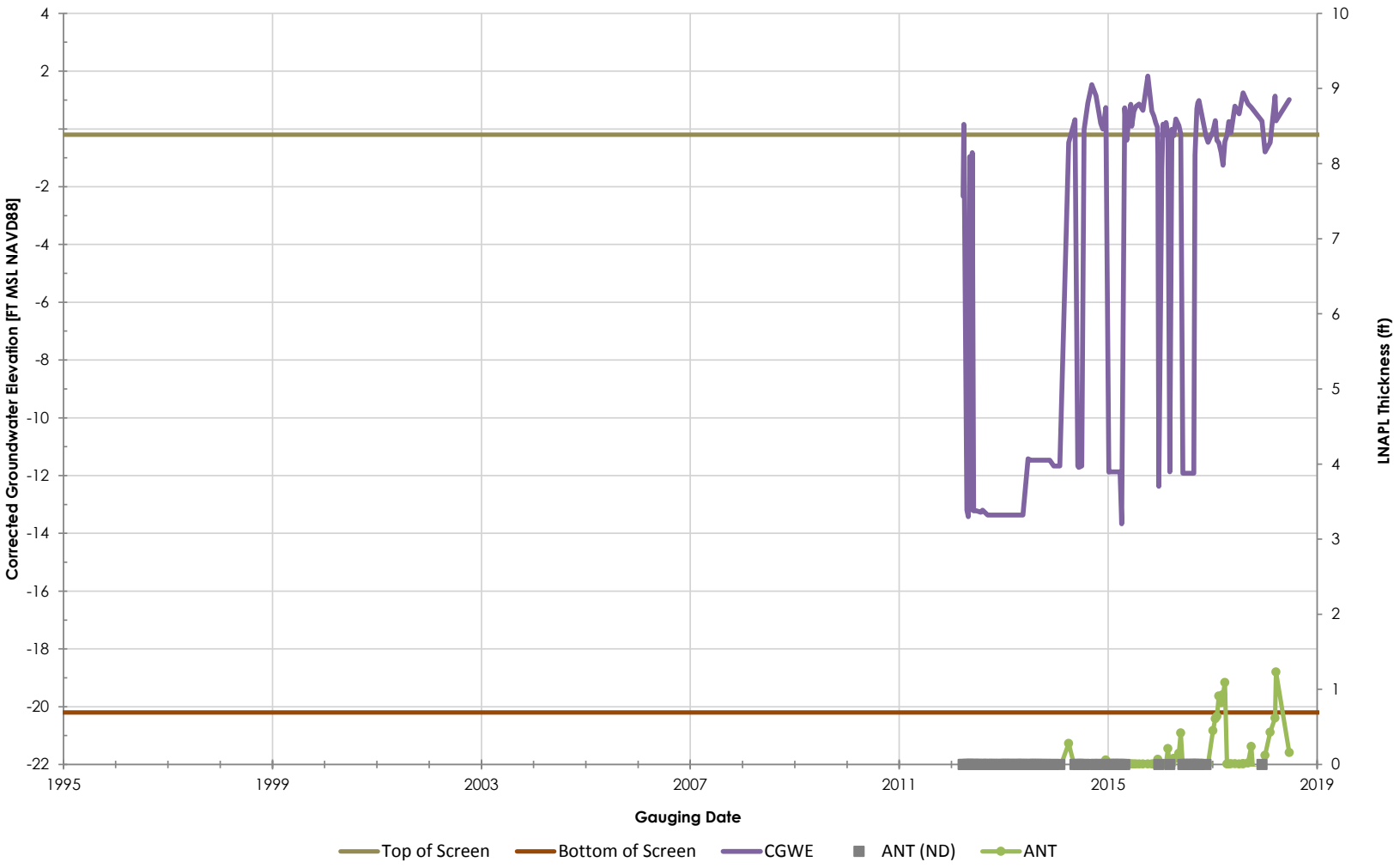
Stantec

Figure/Well No.

RW-127

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

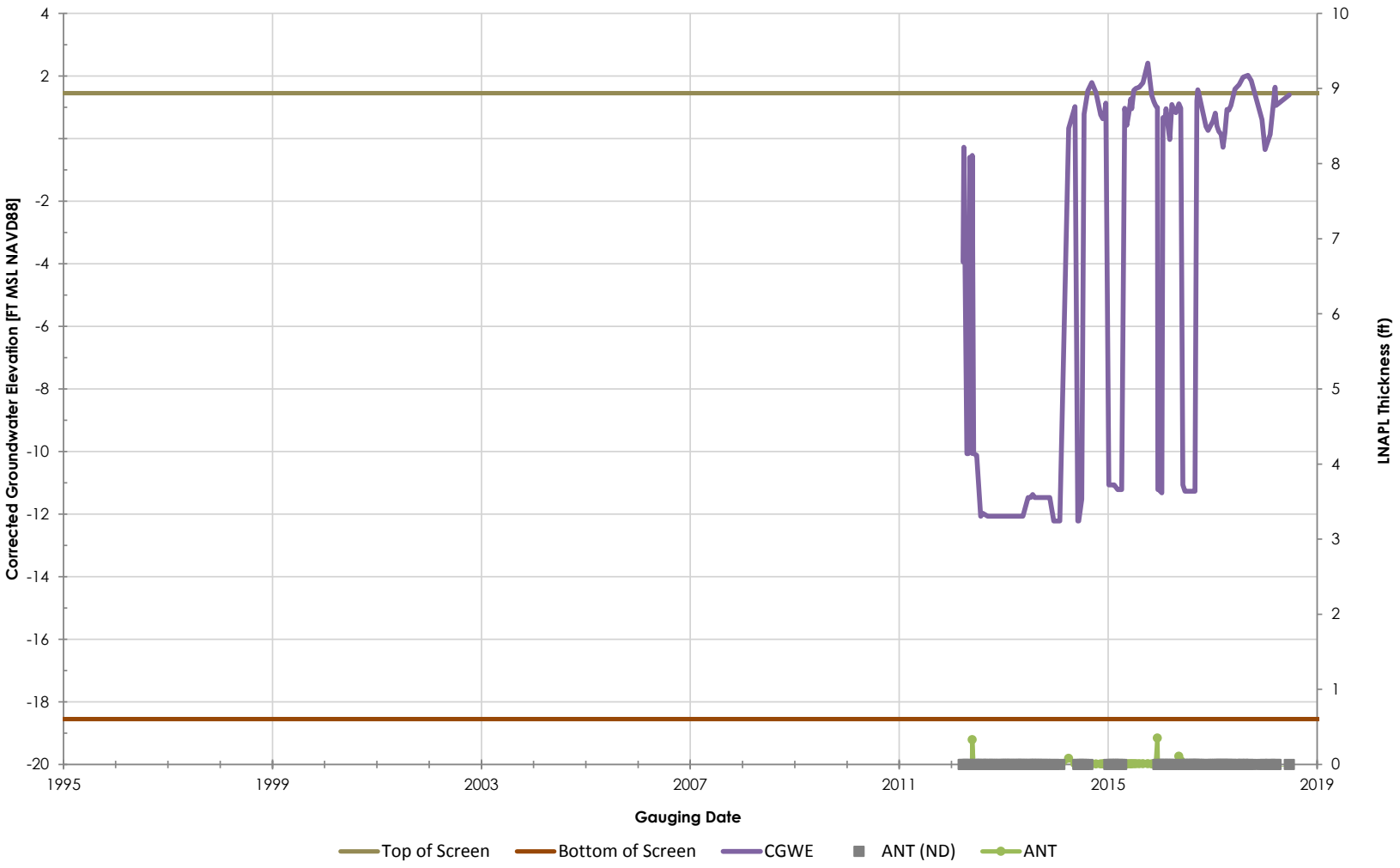
Stantec

Figure/Well No.

RW-128

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

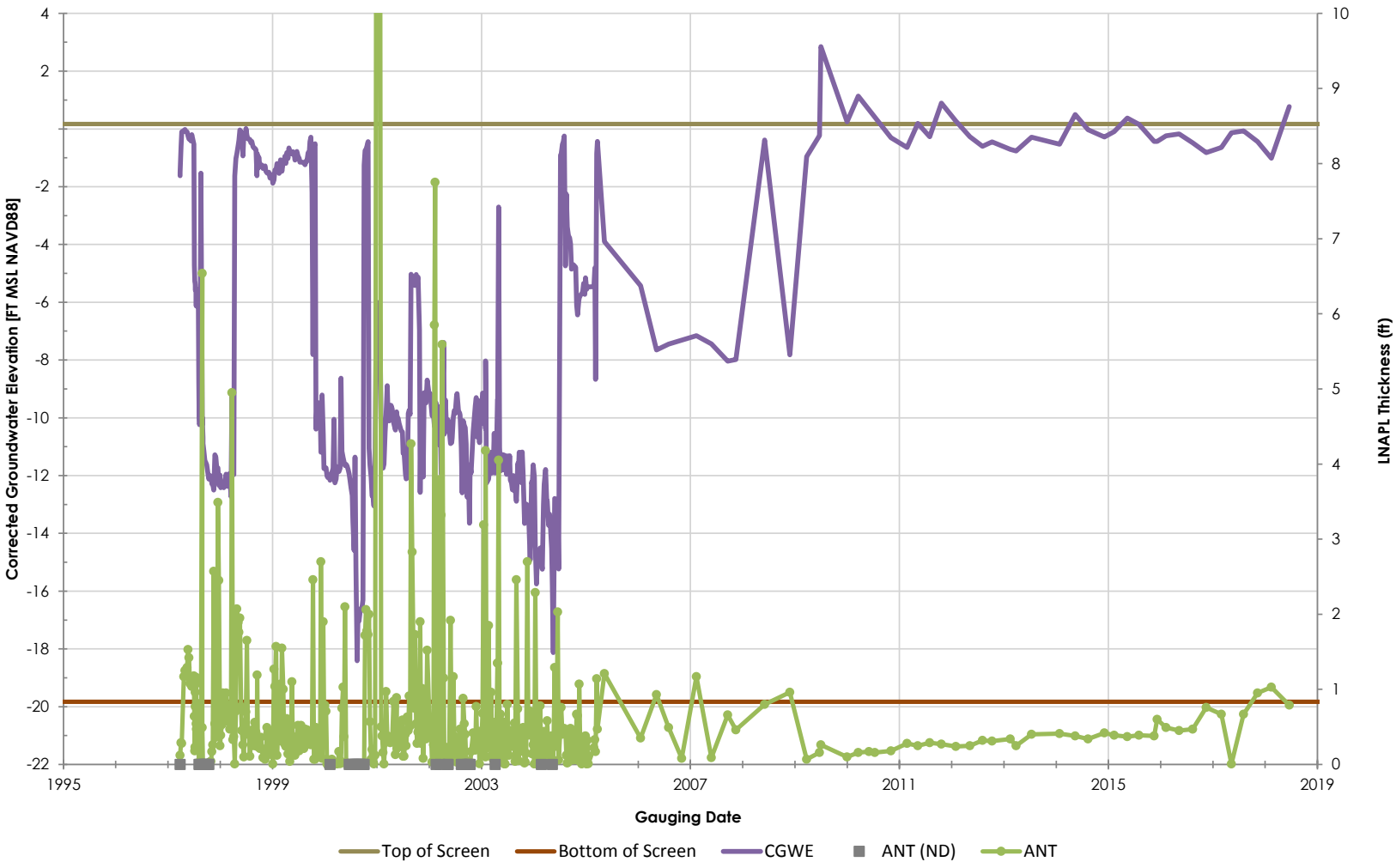
Stantec

Figure/Well No.

RW-129

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

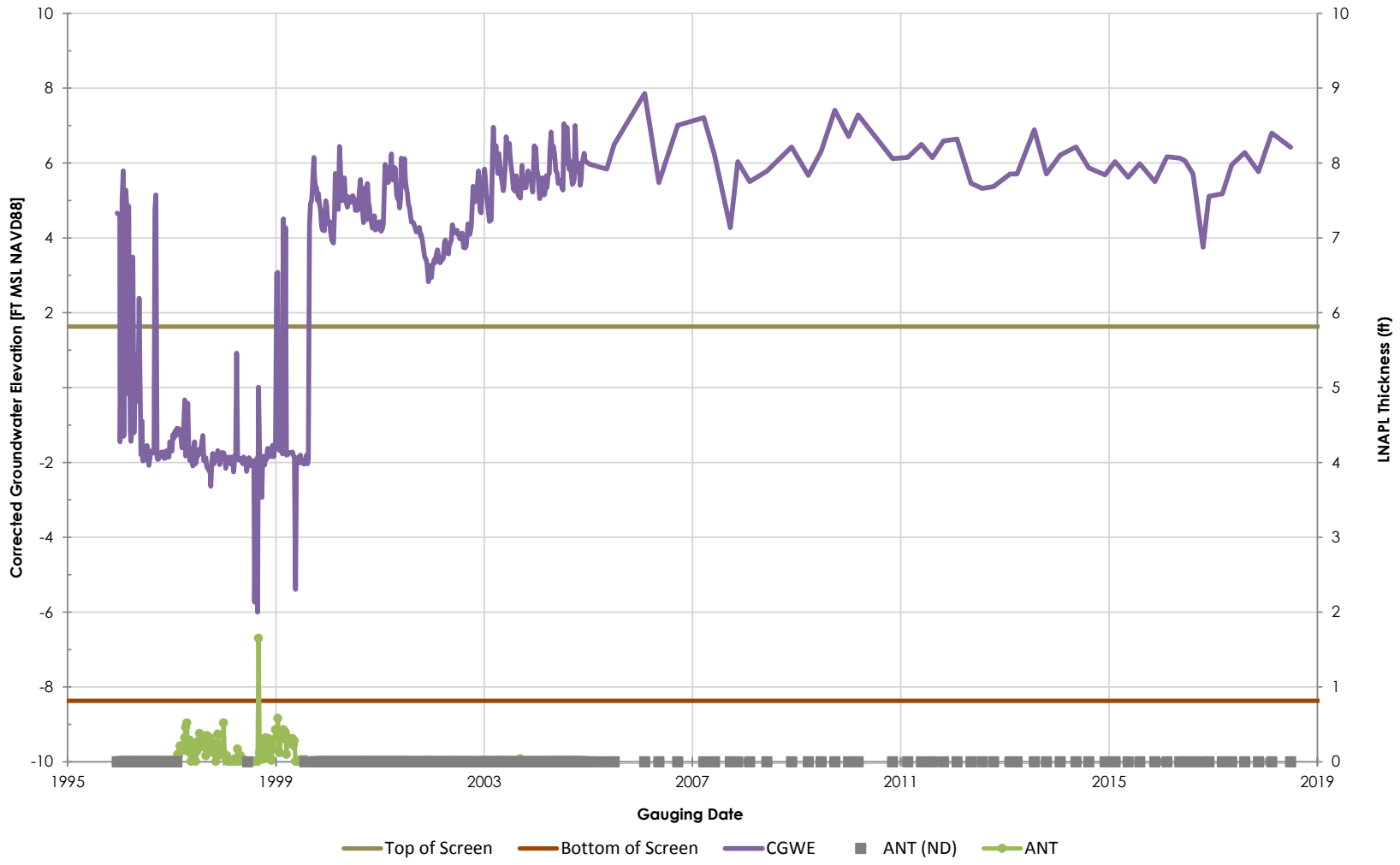
Stantec

Figure/Well No.

RW-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

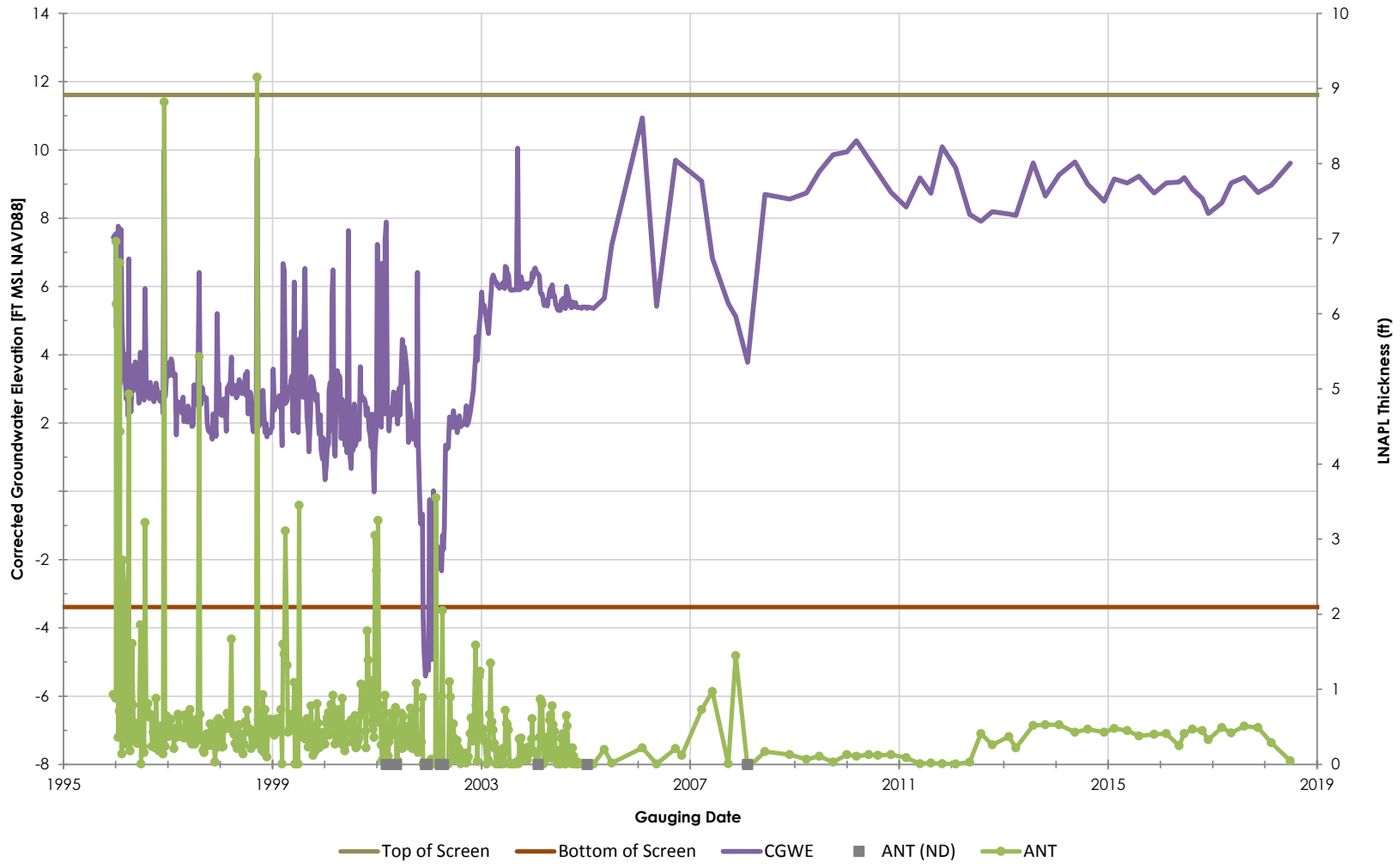
Stantec

Figure/Well No.

RW-200

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

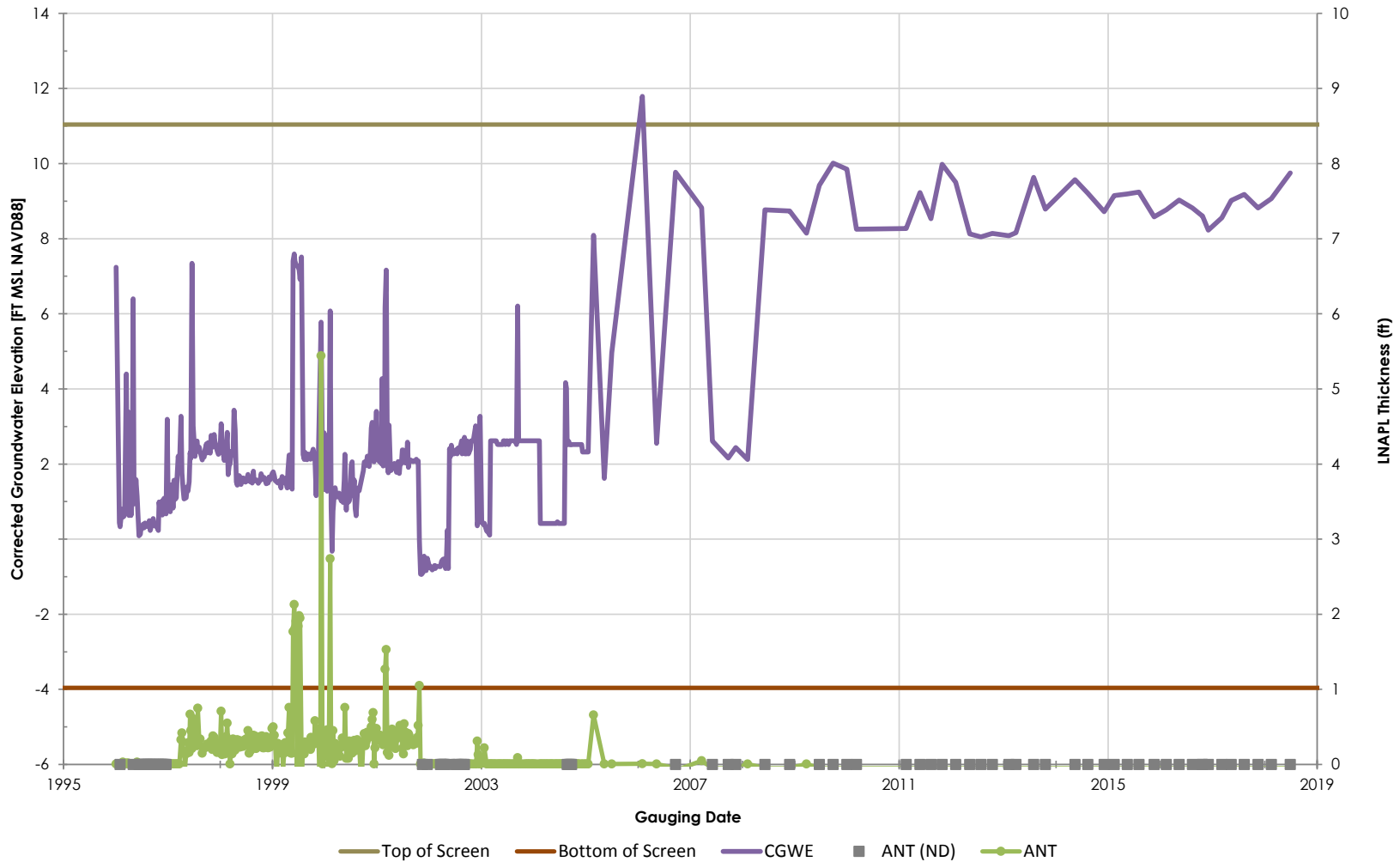
Stantec

Figure/Well No.

RW-201

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

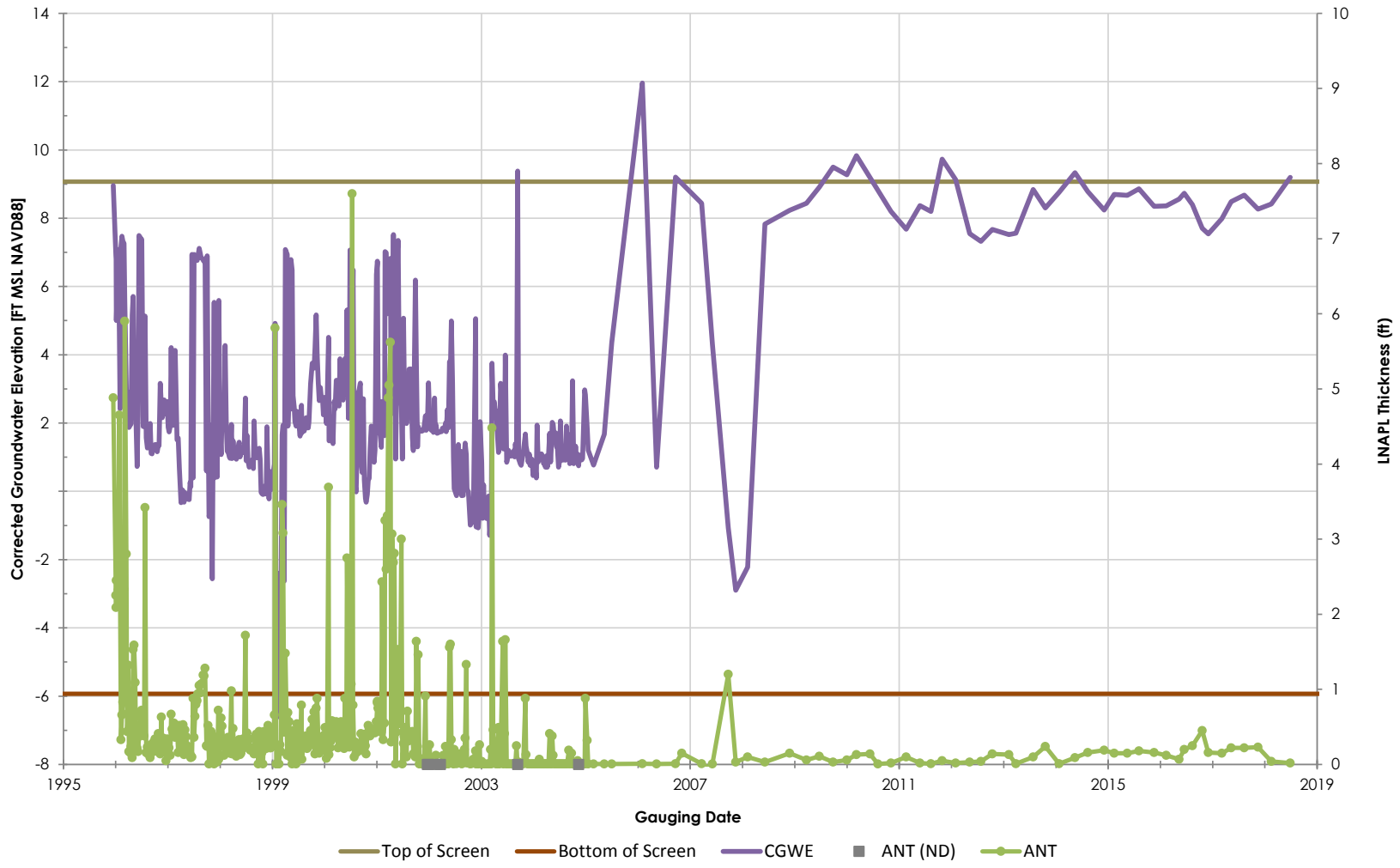
Stantec

Figure/Well No.

RW-202

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

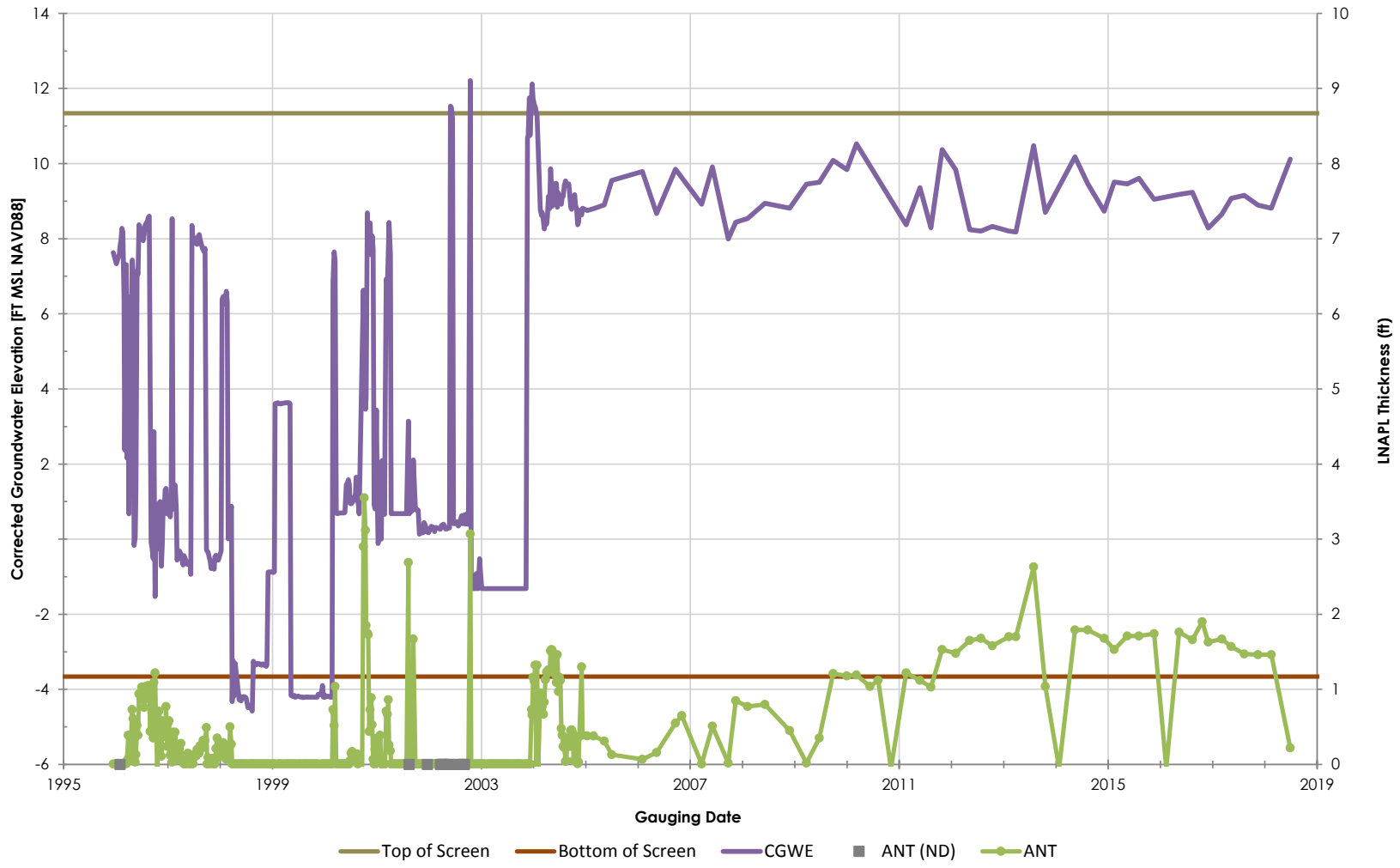
Stantec

Figure/Well No.

RW-203

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

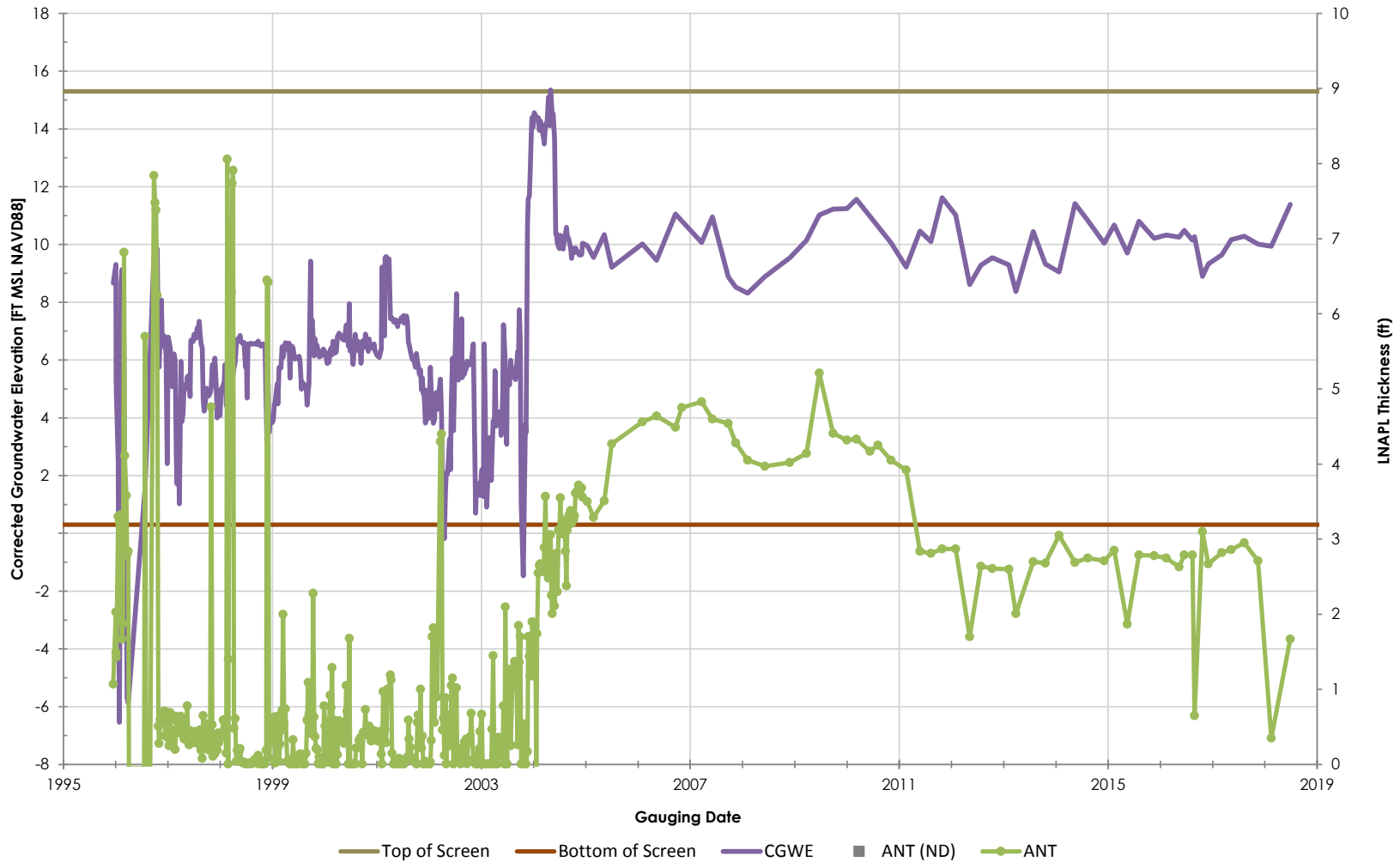
Stantec

Figure/Well No.

RW-204

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

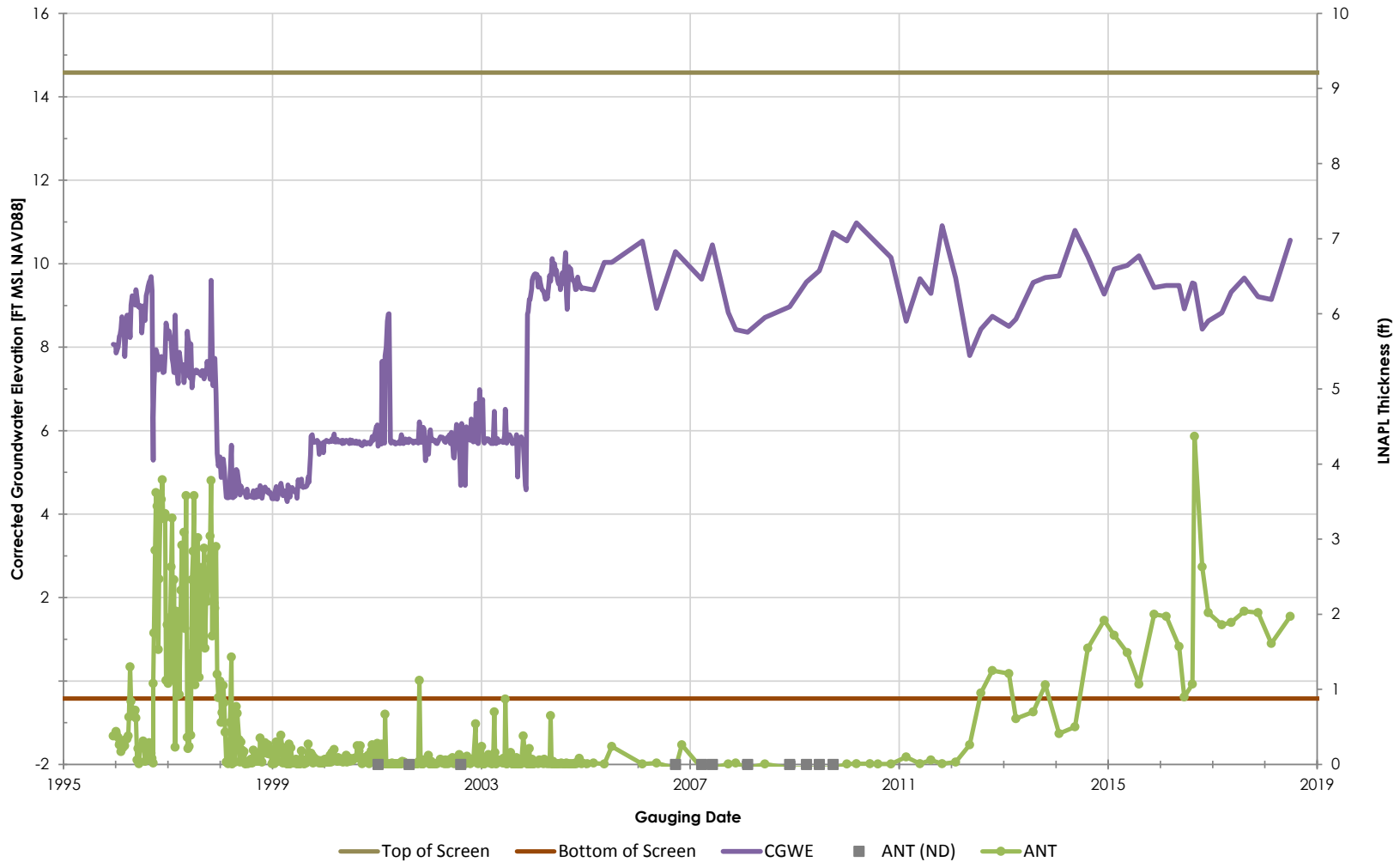
Stantec

Figure/Well No.

RW-205

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

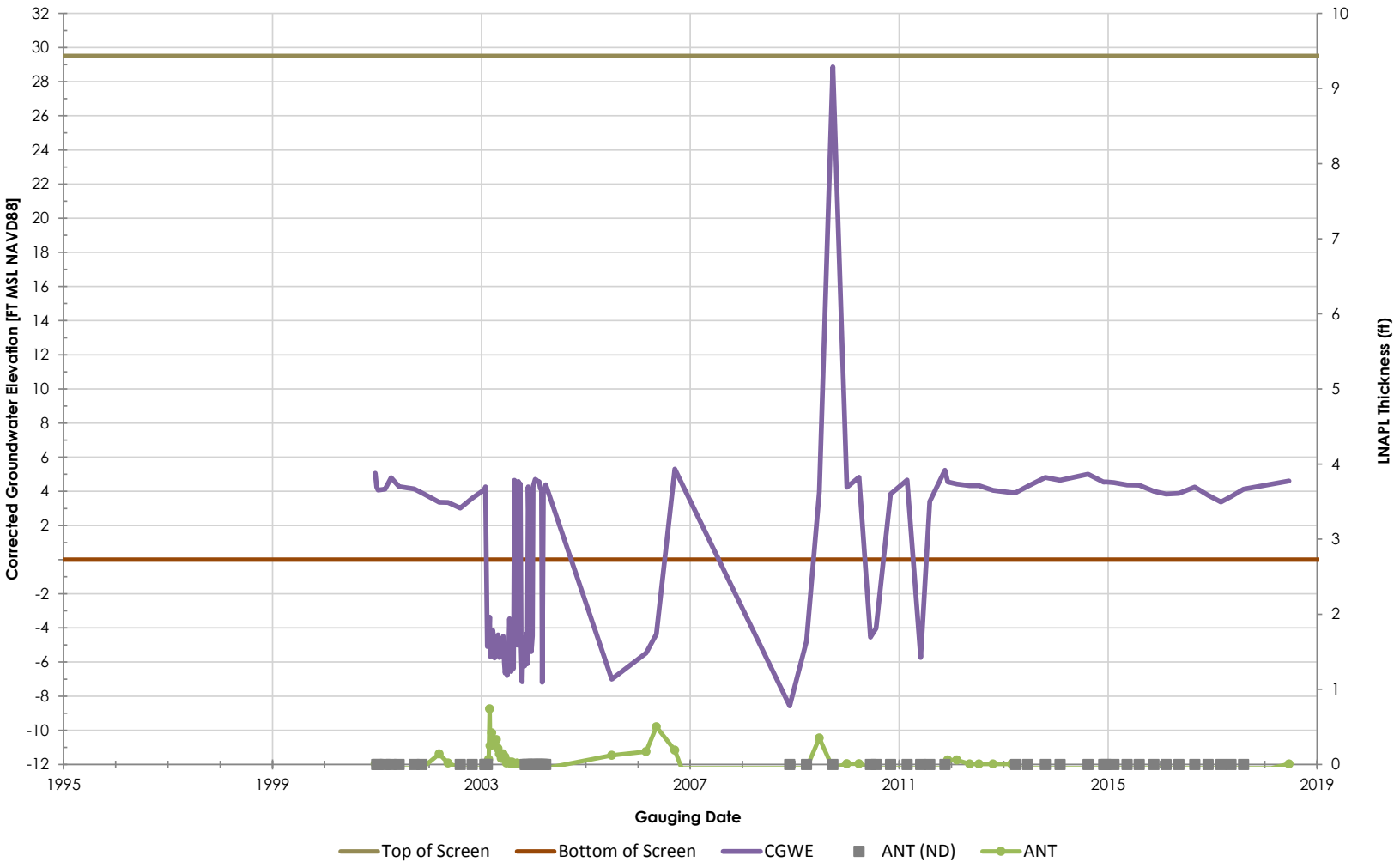
Stantec

Figure/Well No.

RW-206

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

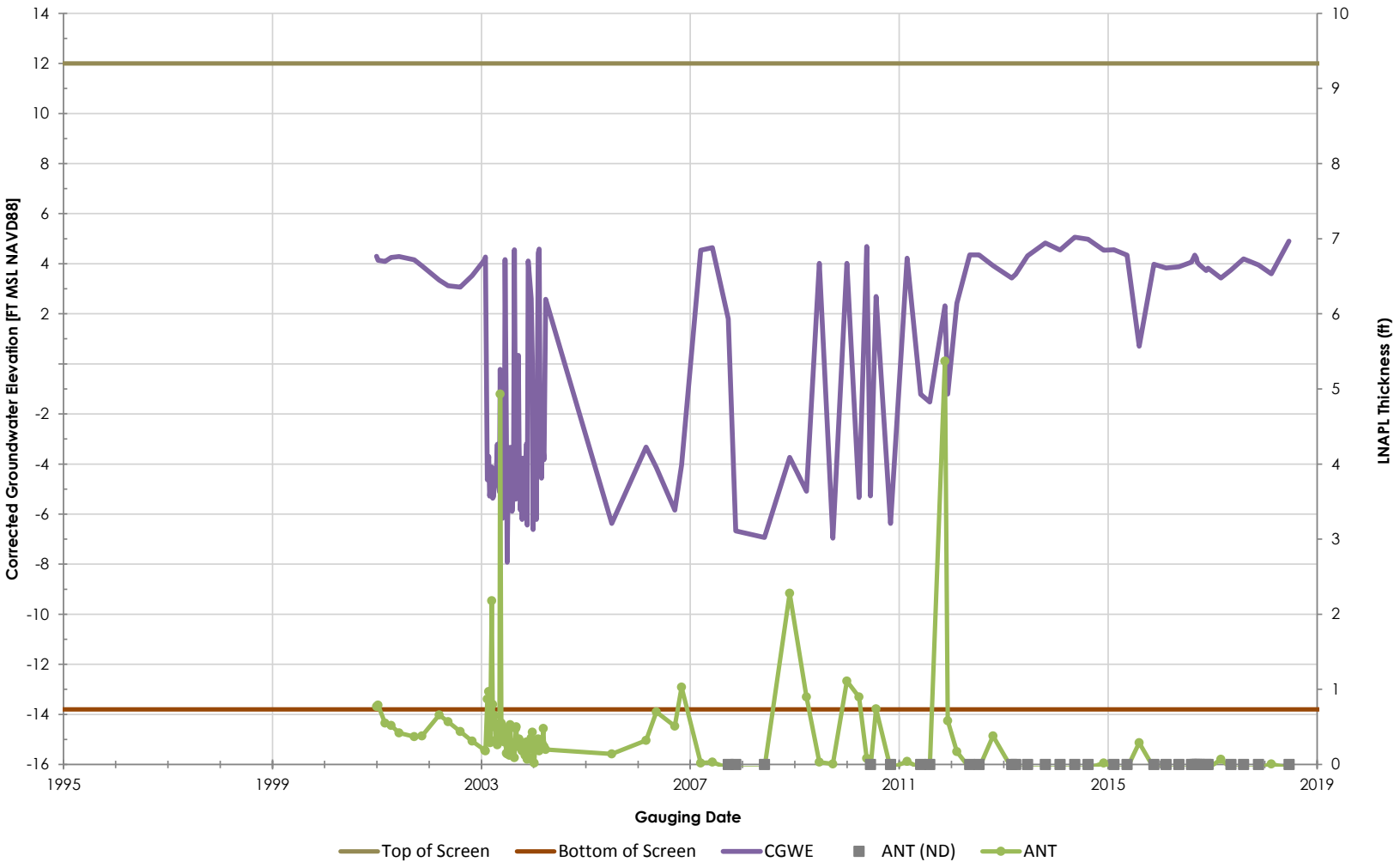
Stantec

Figure/Well No.

RW-21

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

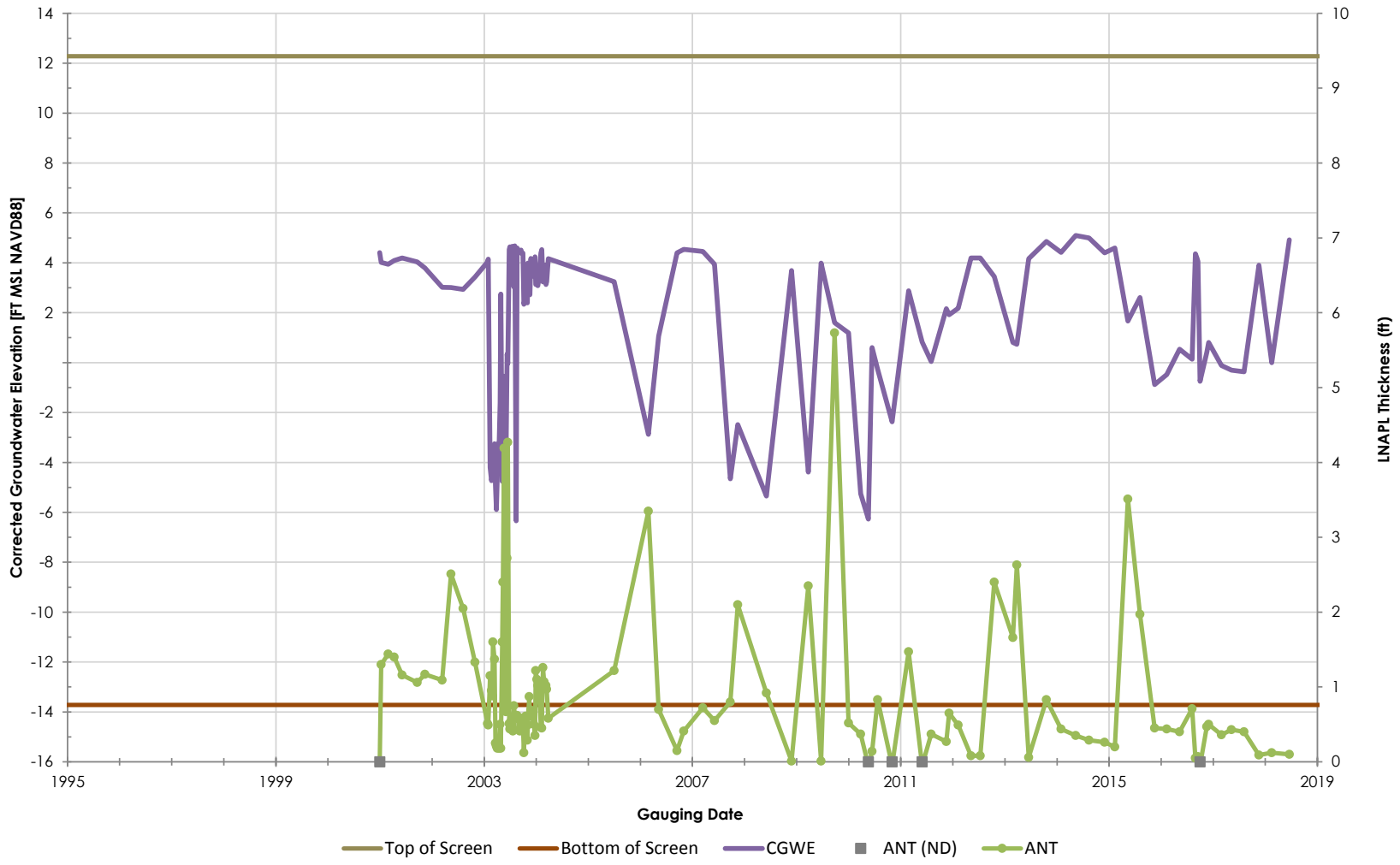
Stantec

Figure/Well No.

RW-22

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

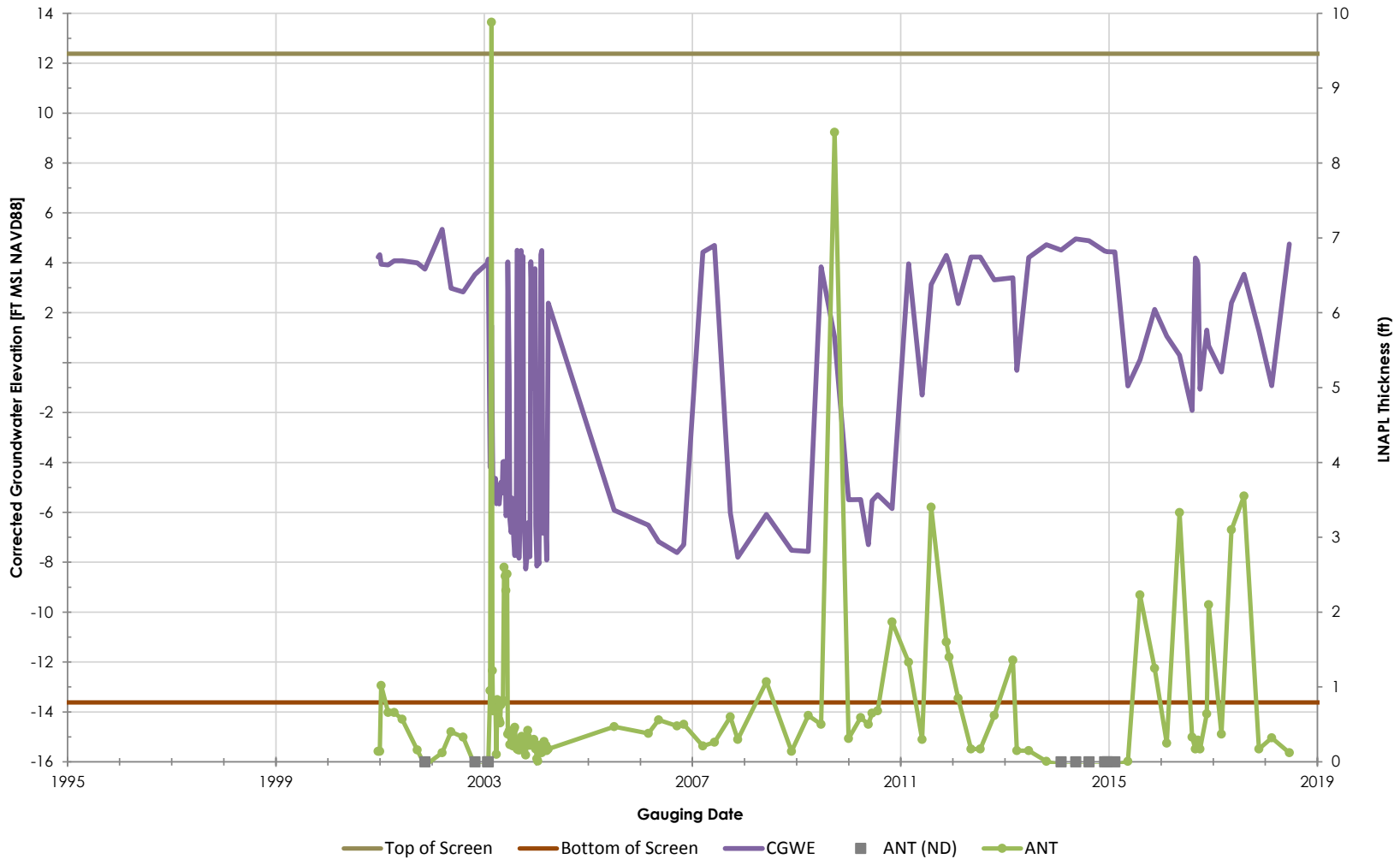
Stantec

Figure/Well No.

RW-23

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

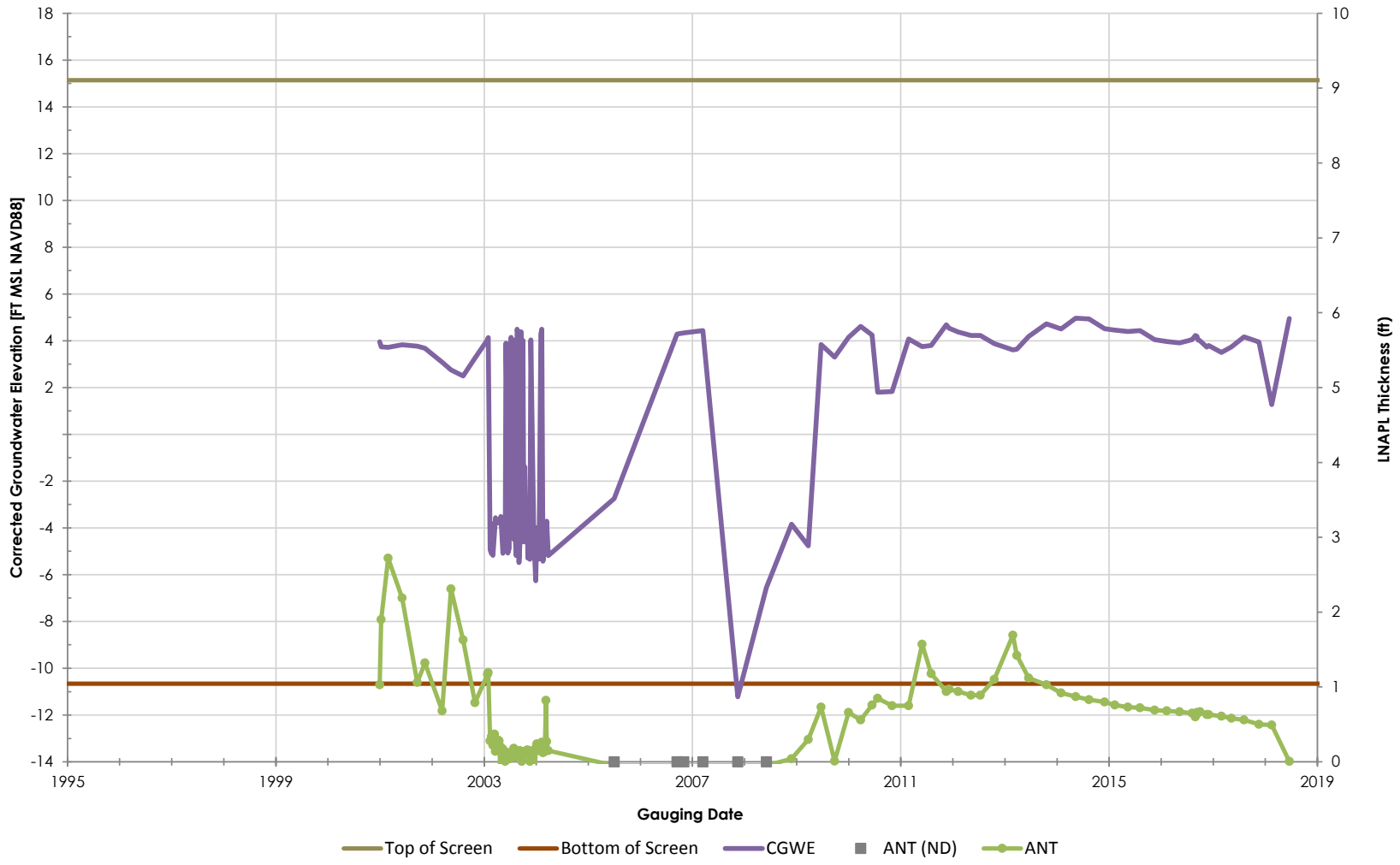
Stantec

Figure/Well No.

RW-24

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

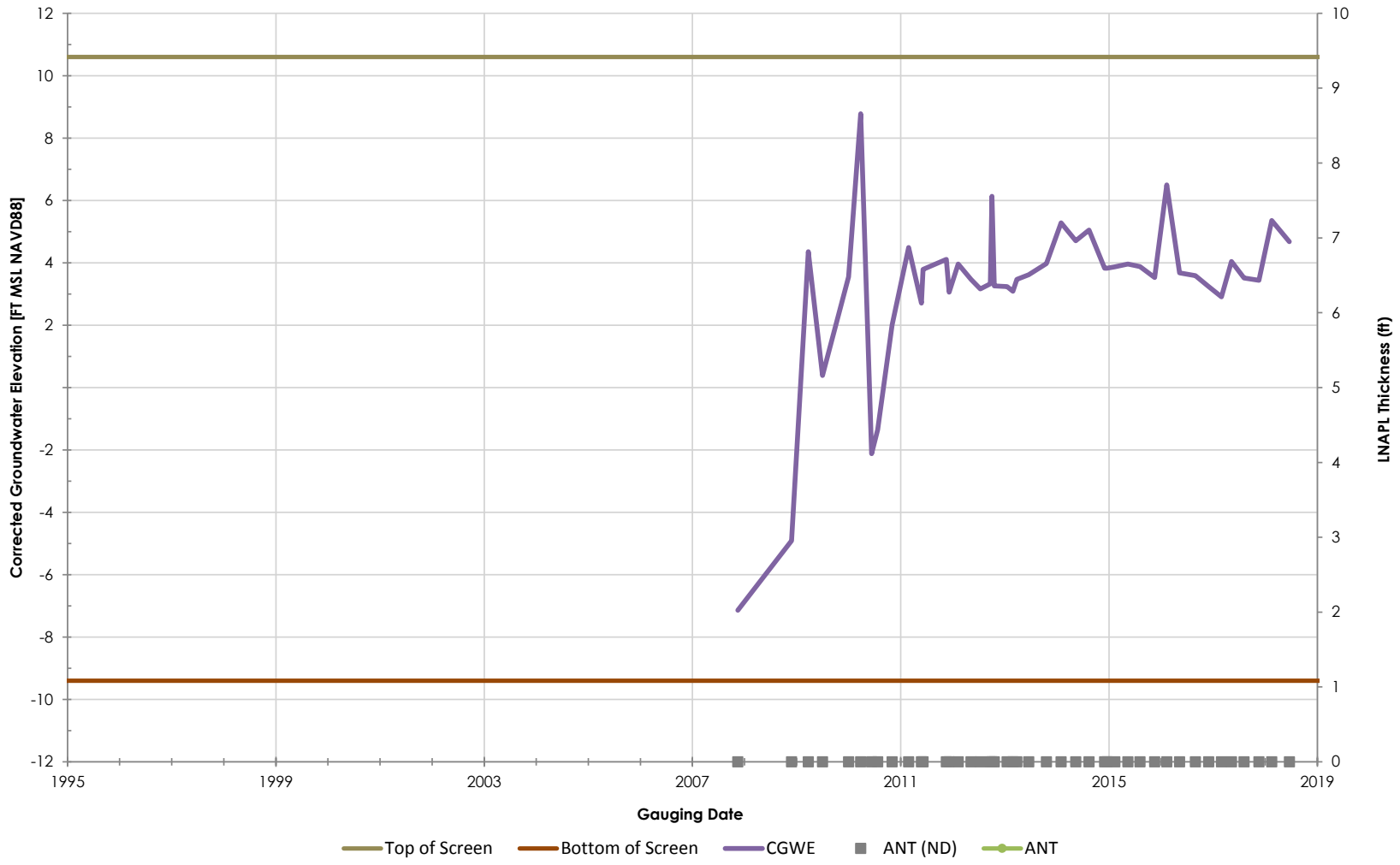
Stantec

Figure/Well No.

RW-25

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

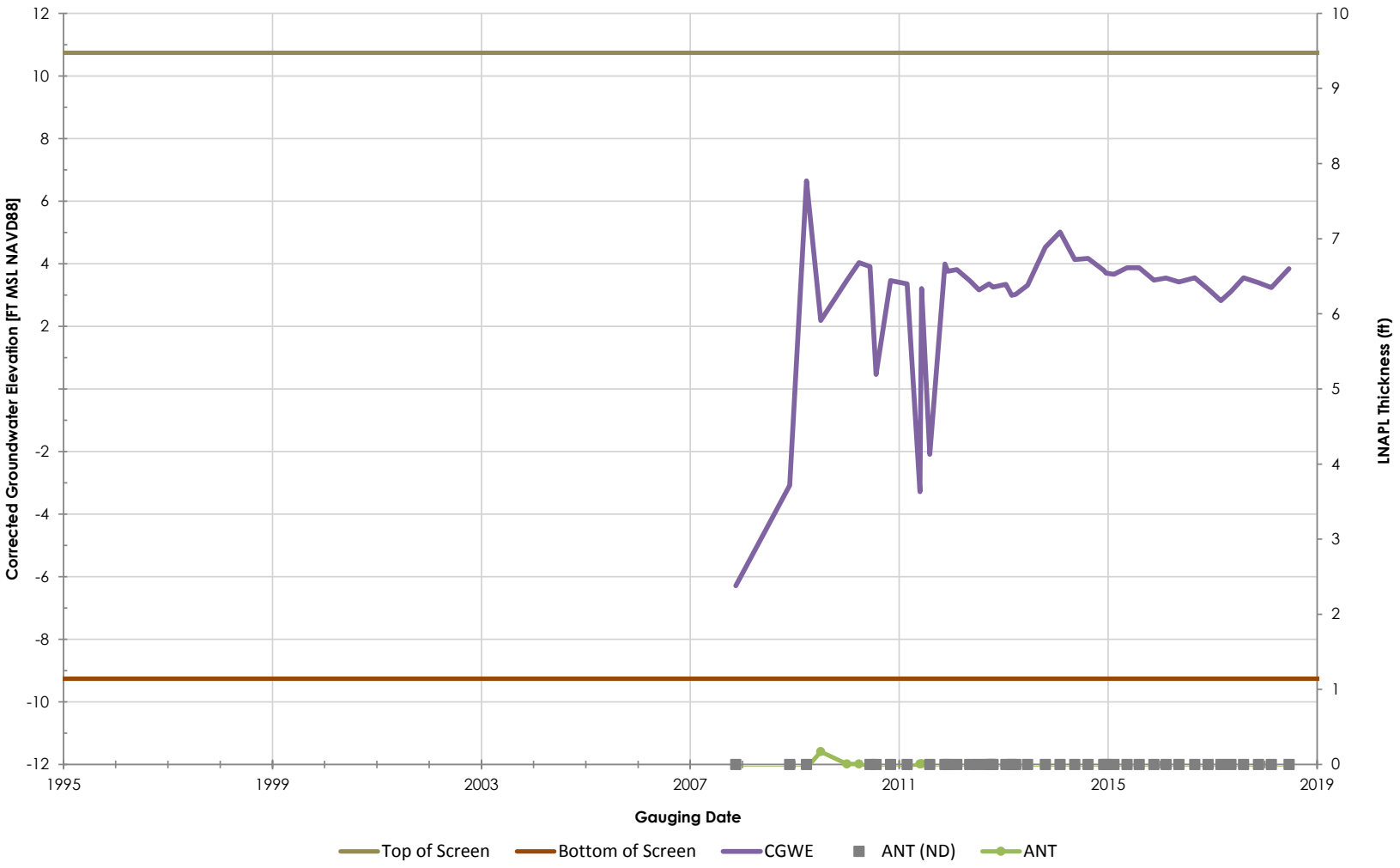
Stantec

Figure/Well No.

RW-26

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

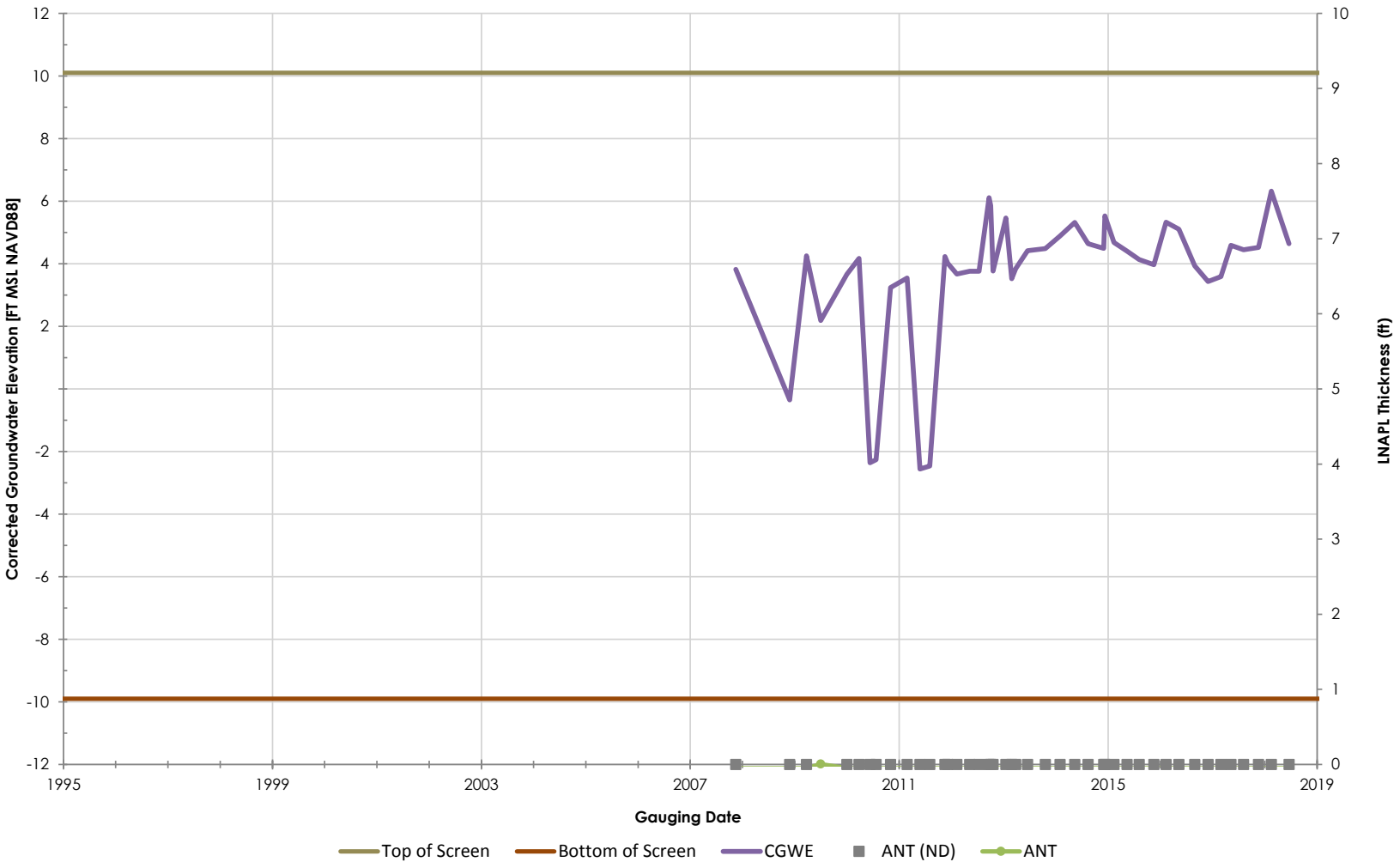
Stantec

Figure/Well No.

RW-27

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

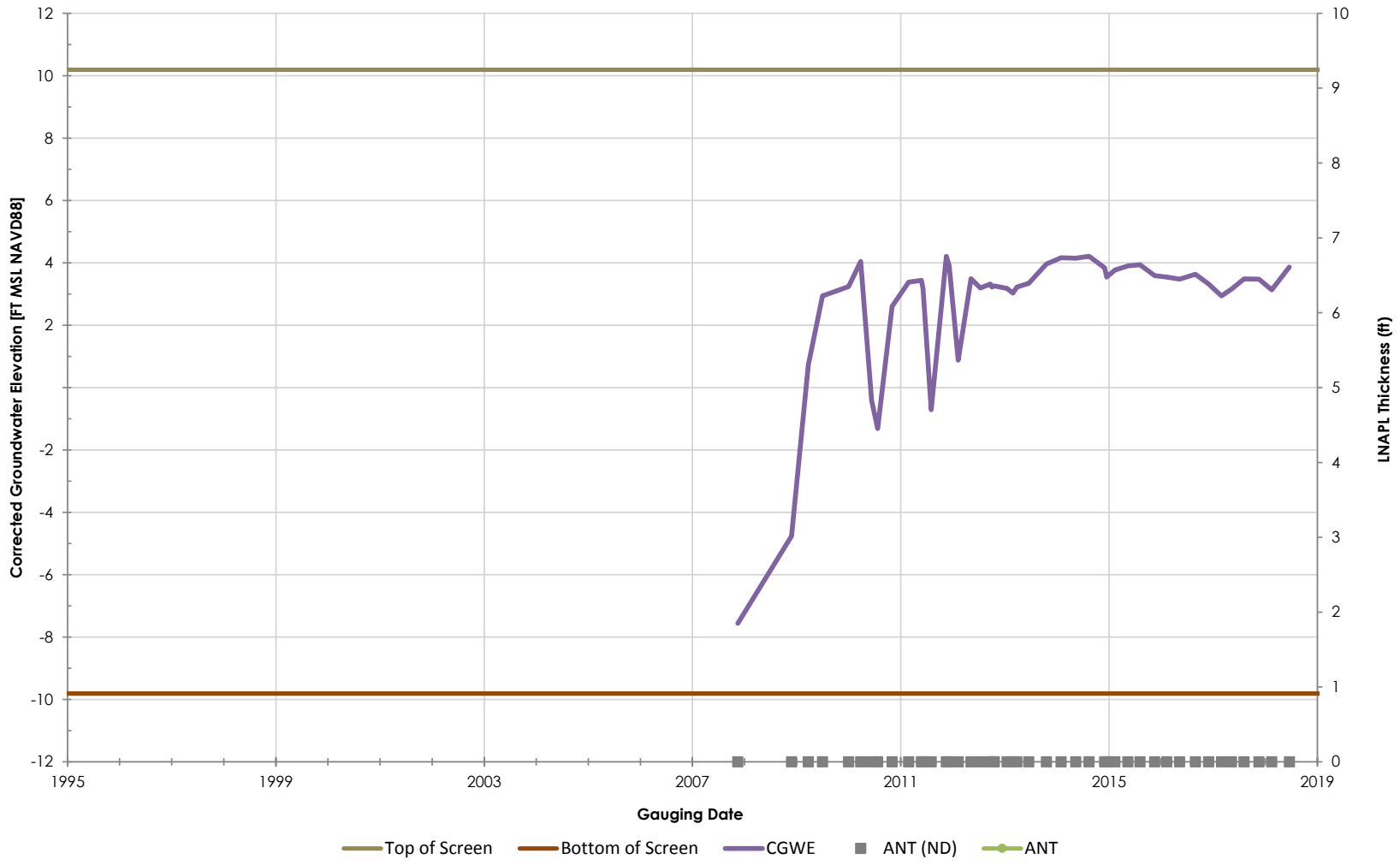
Stantec

Figure/Well No.

RW-28

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

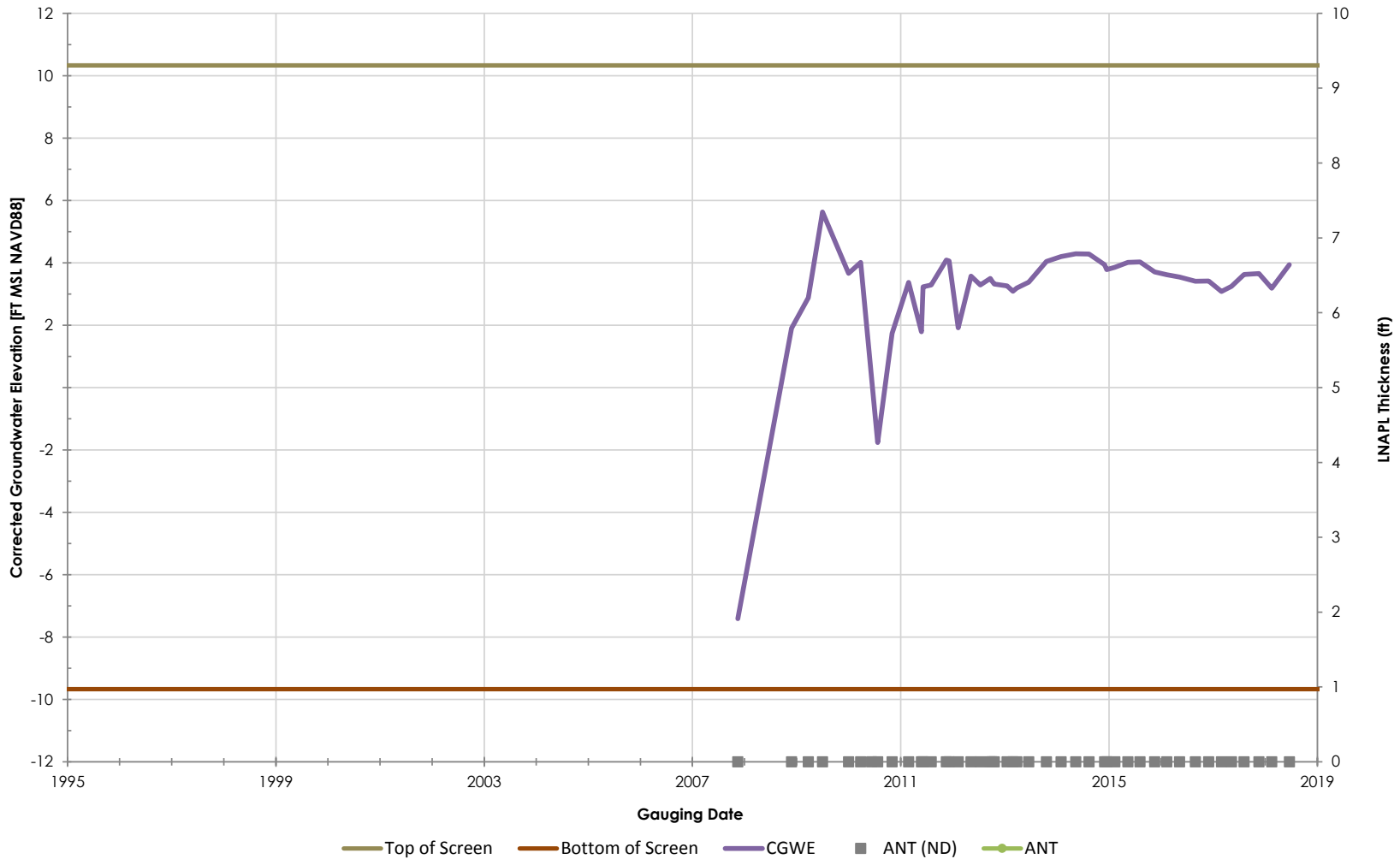
Stantec

Figure/Well No.

RW-29

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

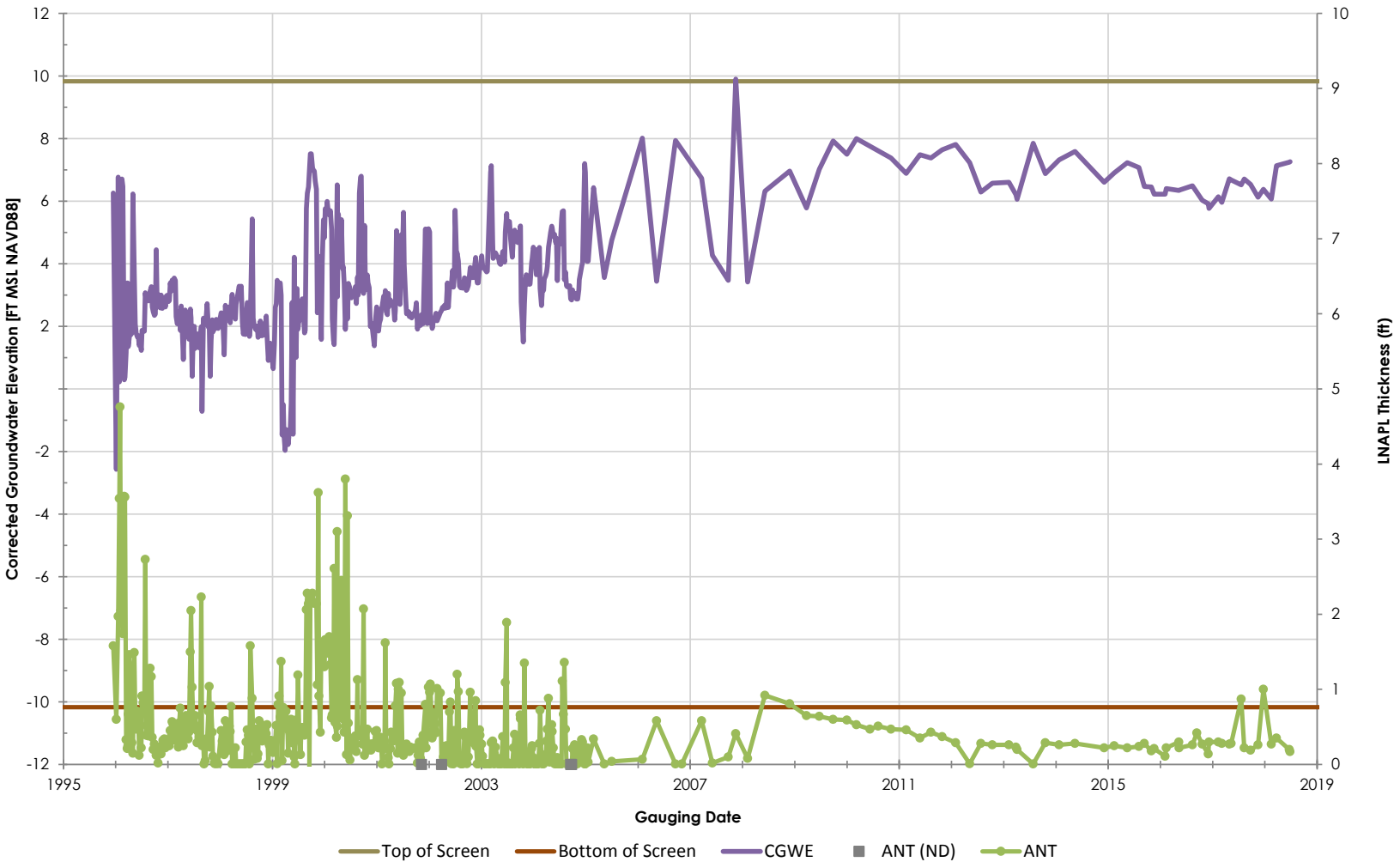
Stantec

Figure/Well No.

RW-30

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

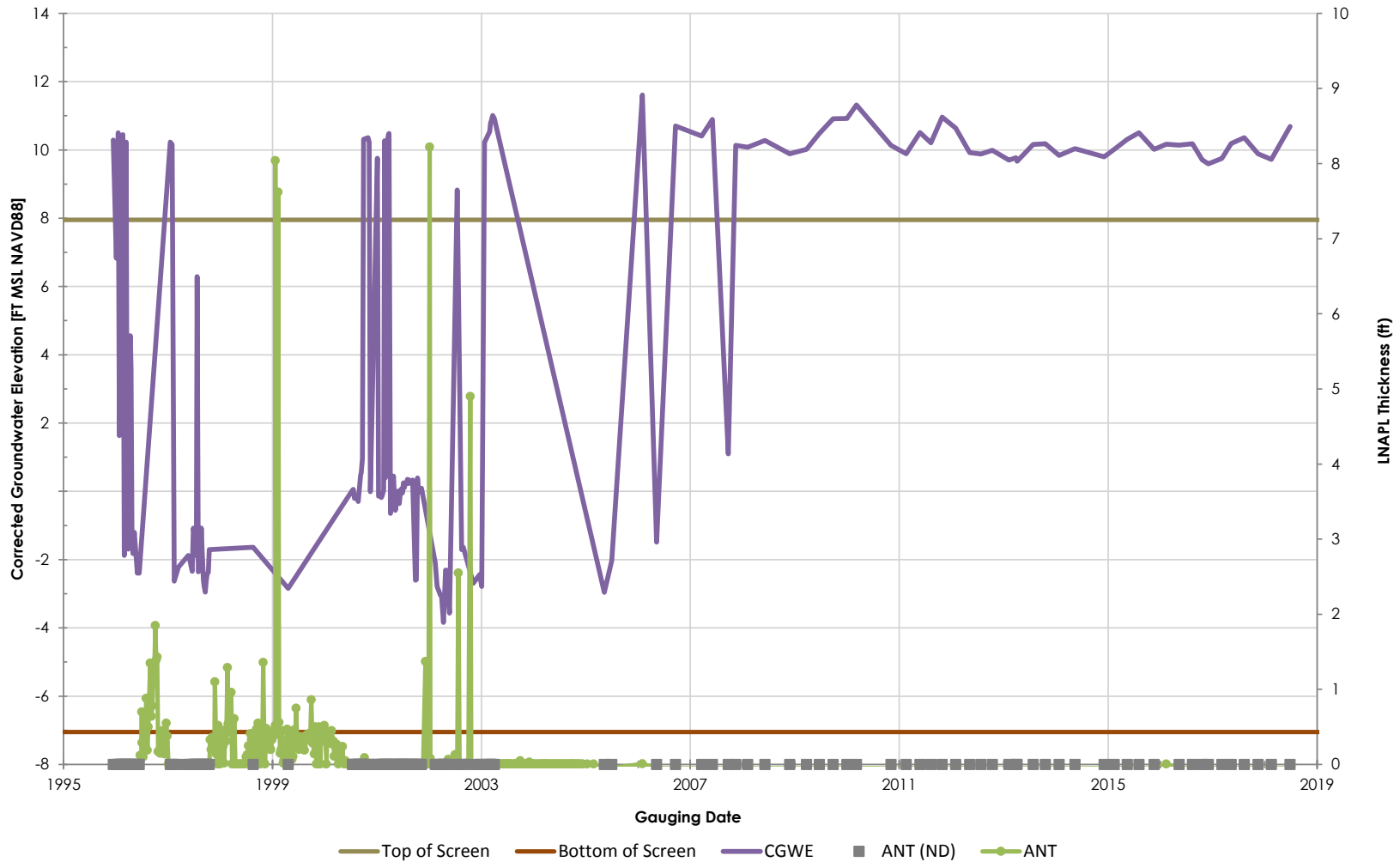
Stantec

Figure/Well No.

RW-300

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

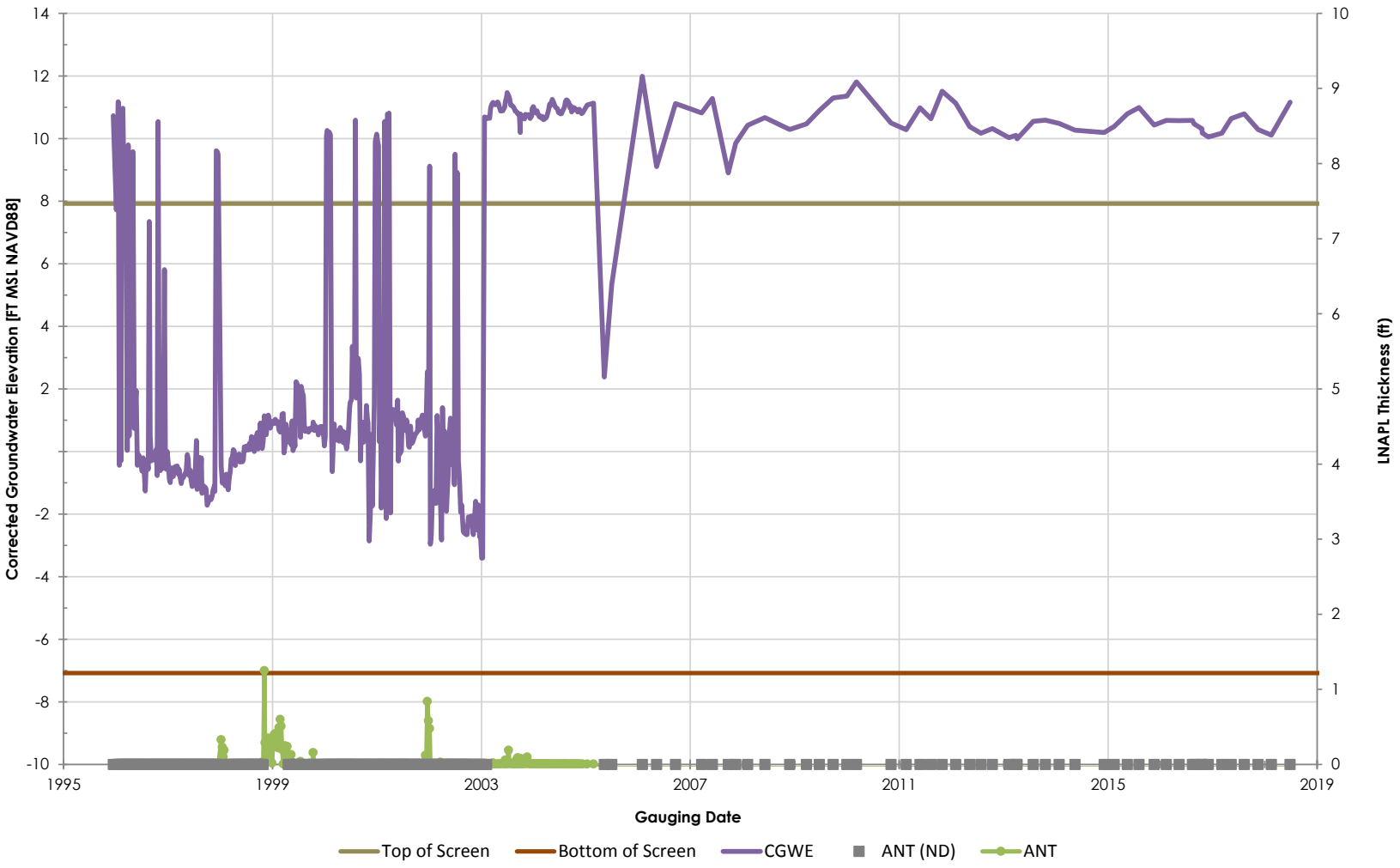
Stantec

Figure/Well No.

RW-301

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

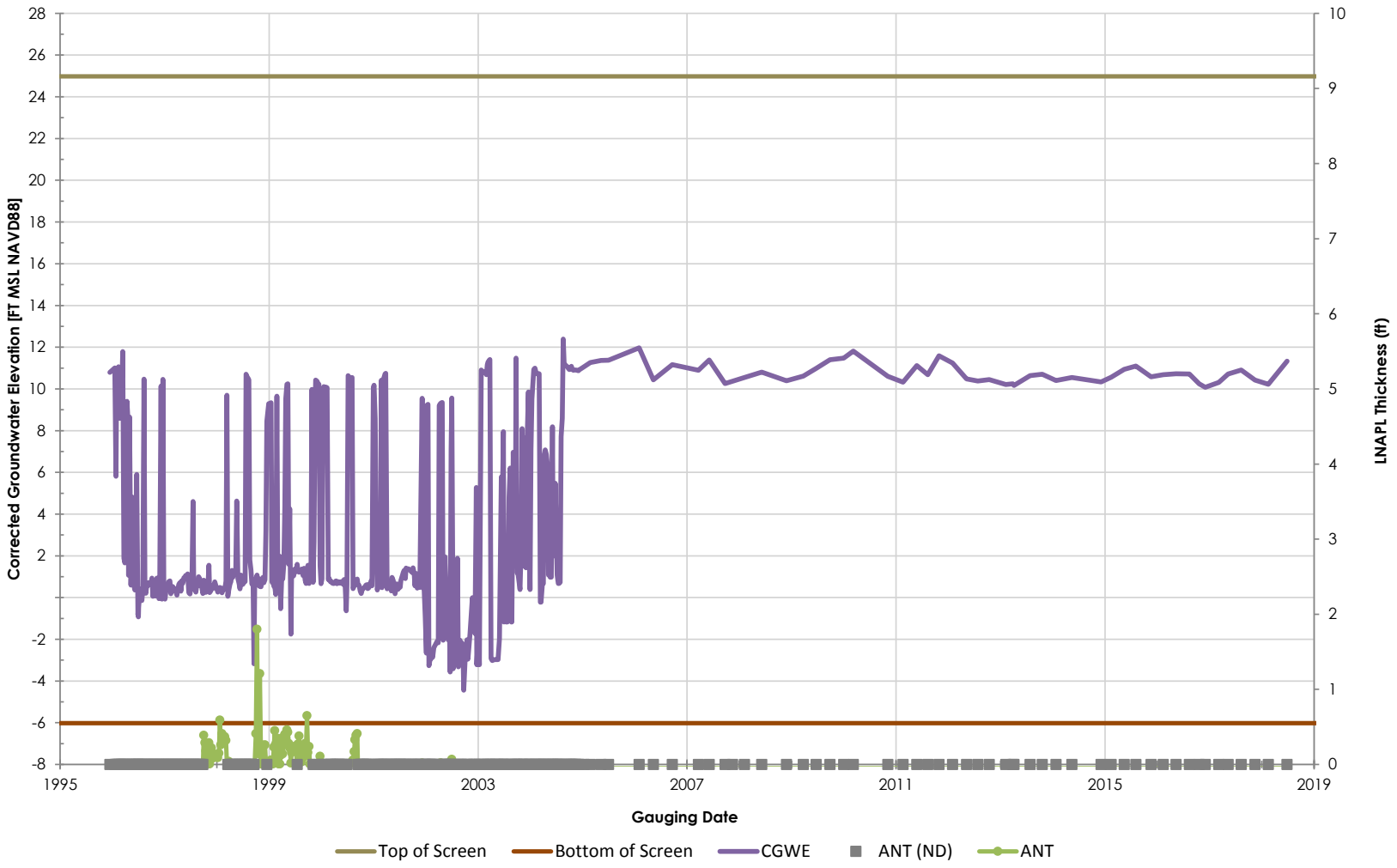
Stantec

Figure/Well No.

RW-302

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

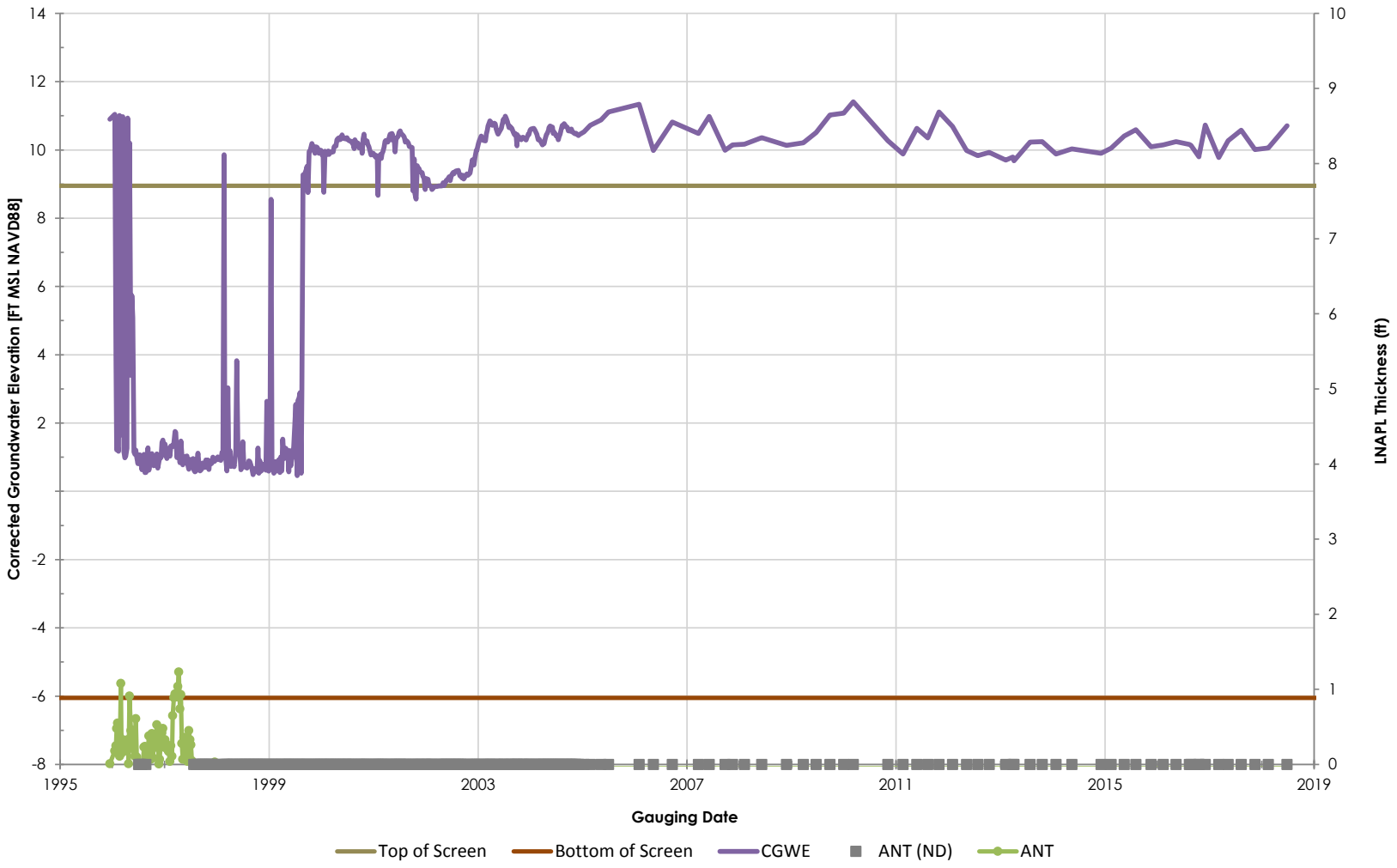
Stantec

Figure/Well No.

RW-303

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

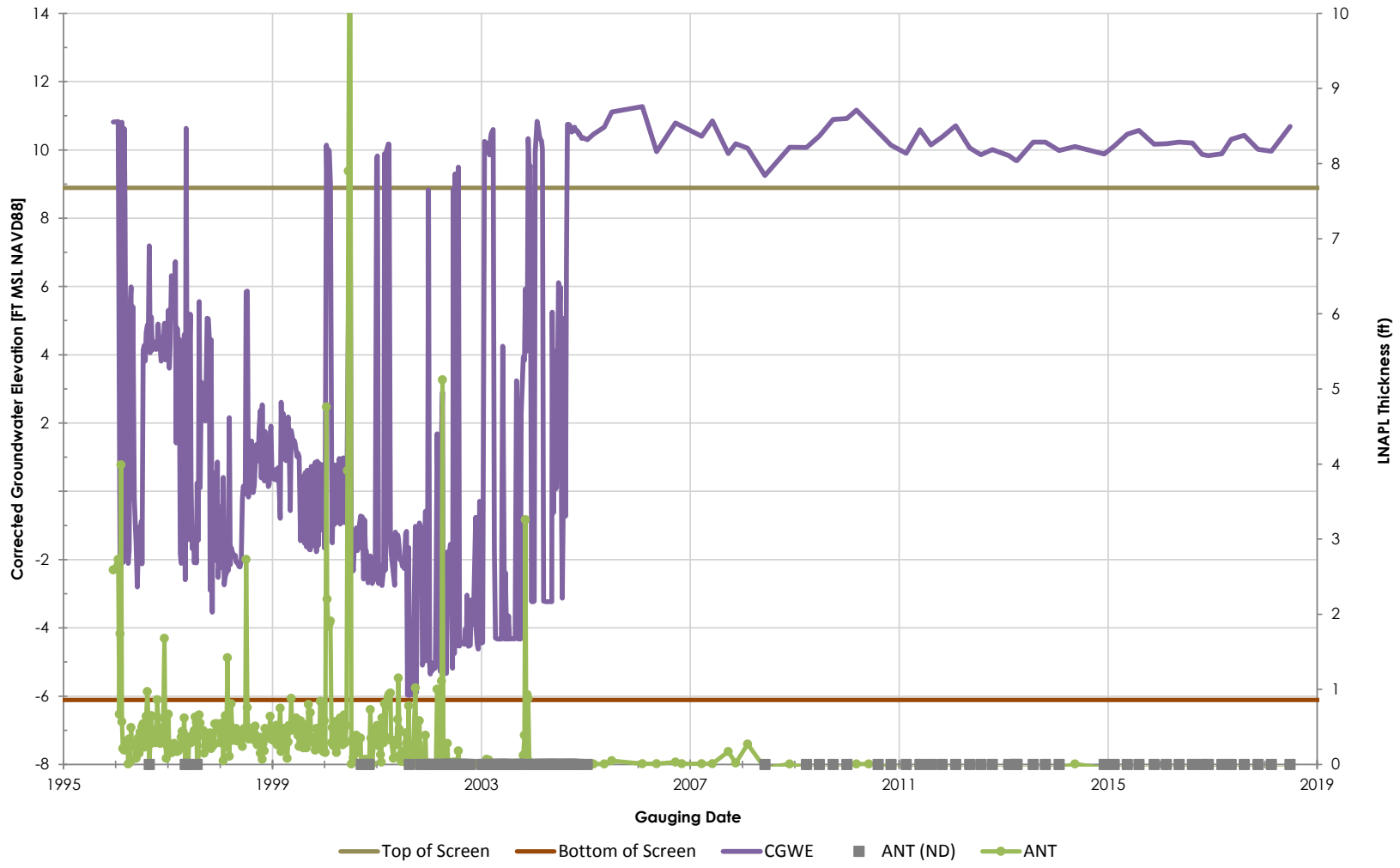
Stantec

Figure/Well No.

RW-304

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

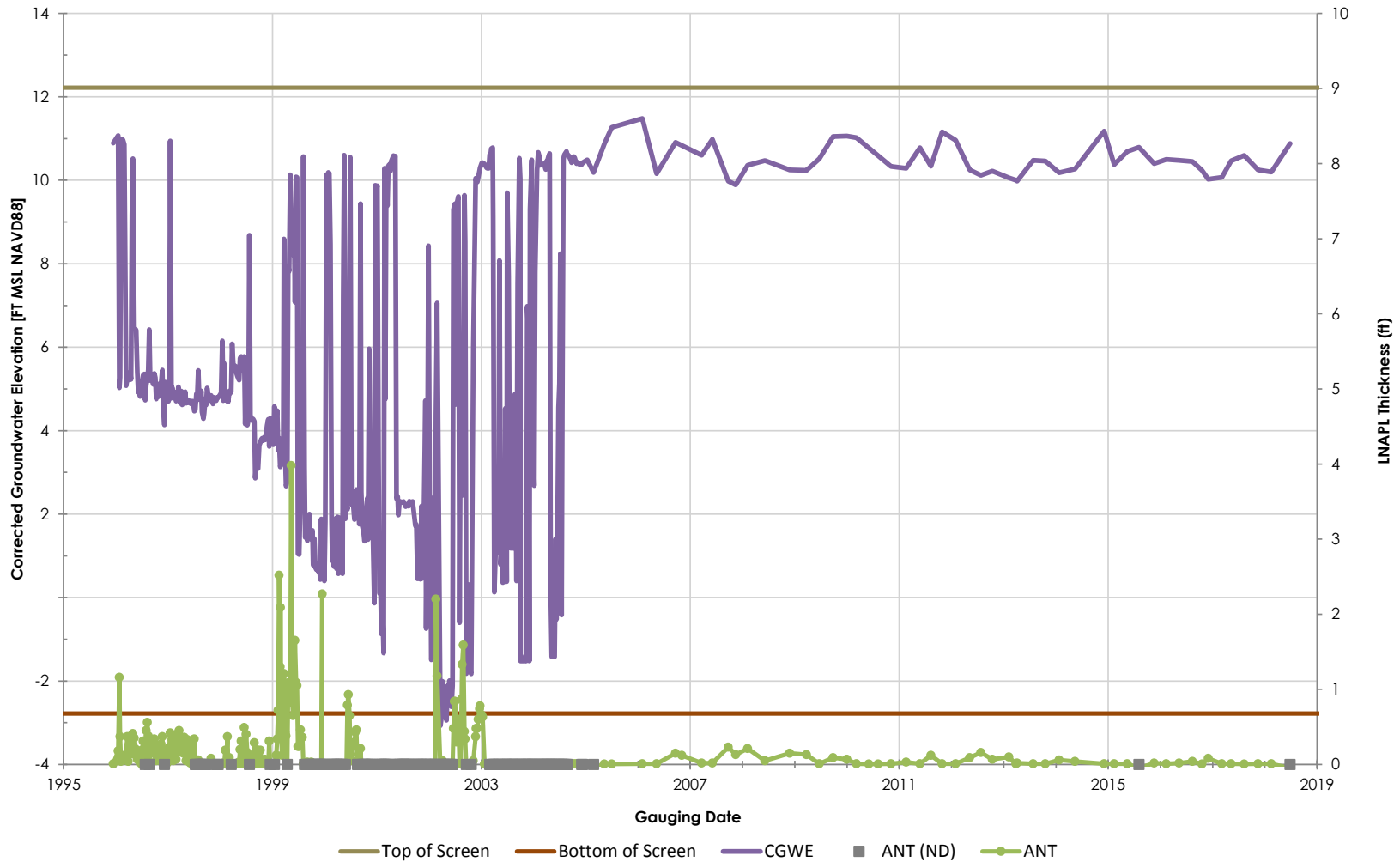
Stantec

Figure/Well No.

RW-305

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

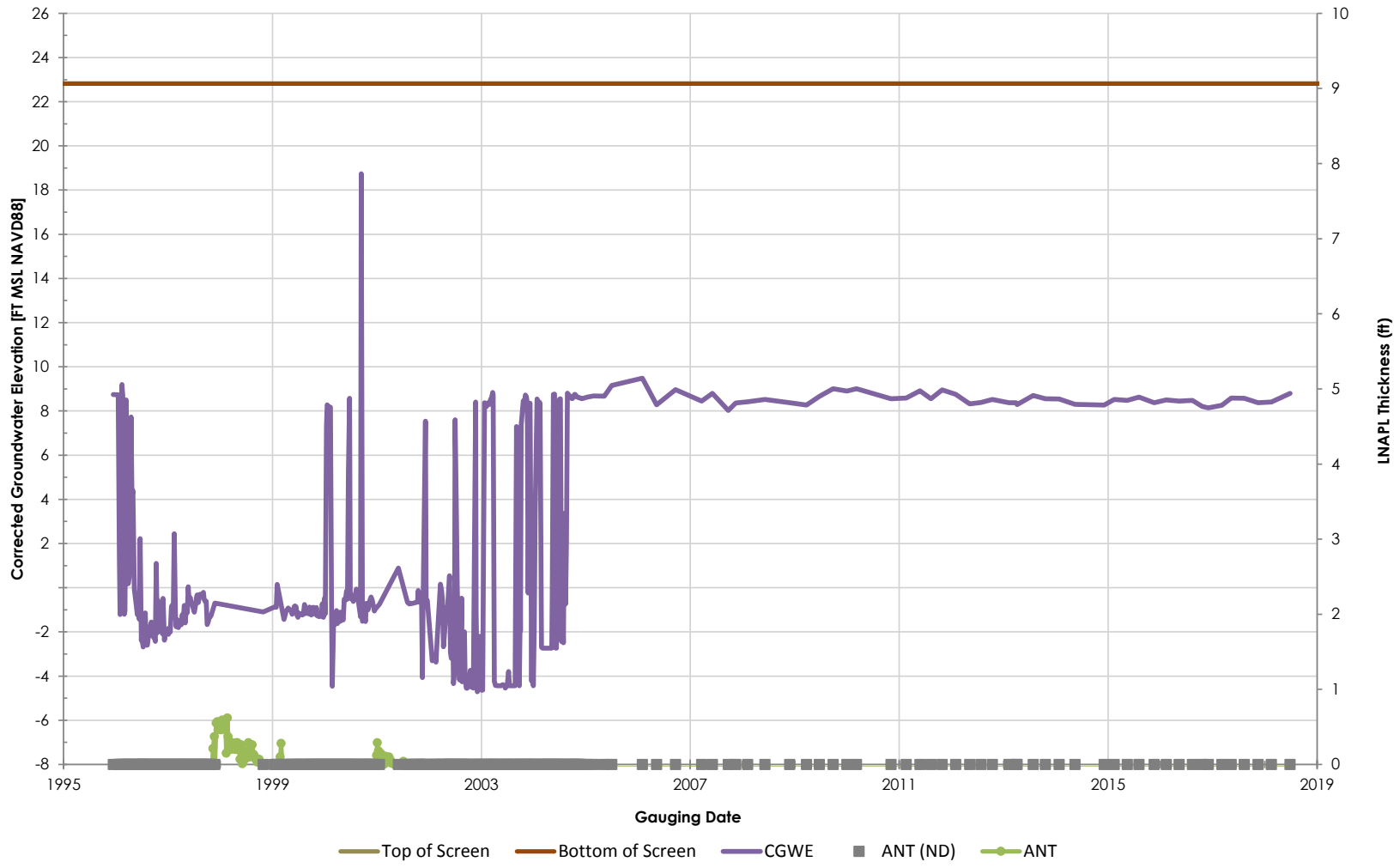
Stantec

Figure/Well No.

RW-306

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

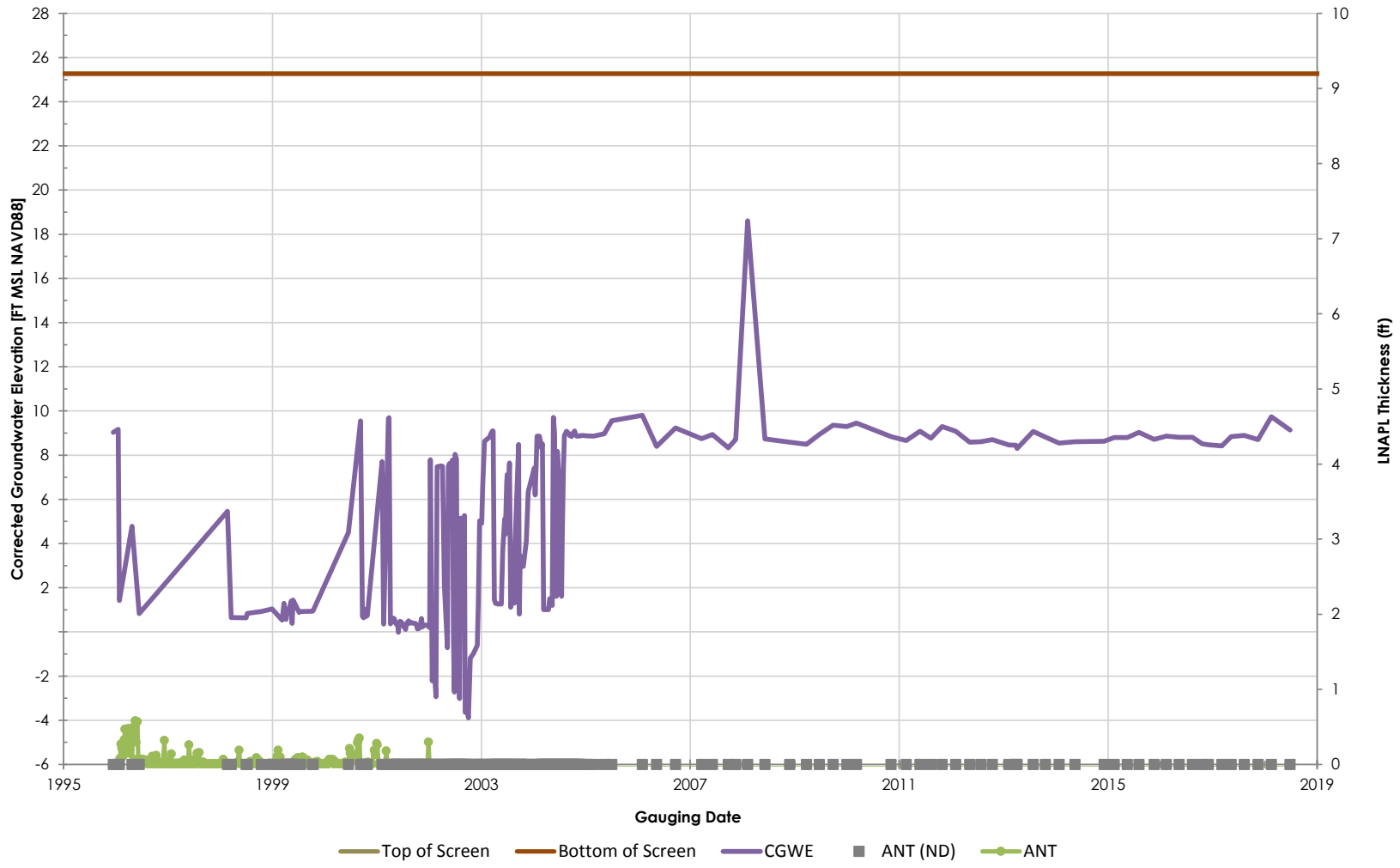
Stantec

Figure/Well No.

RW-307

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

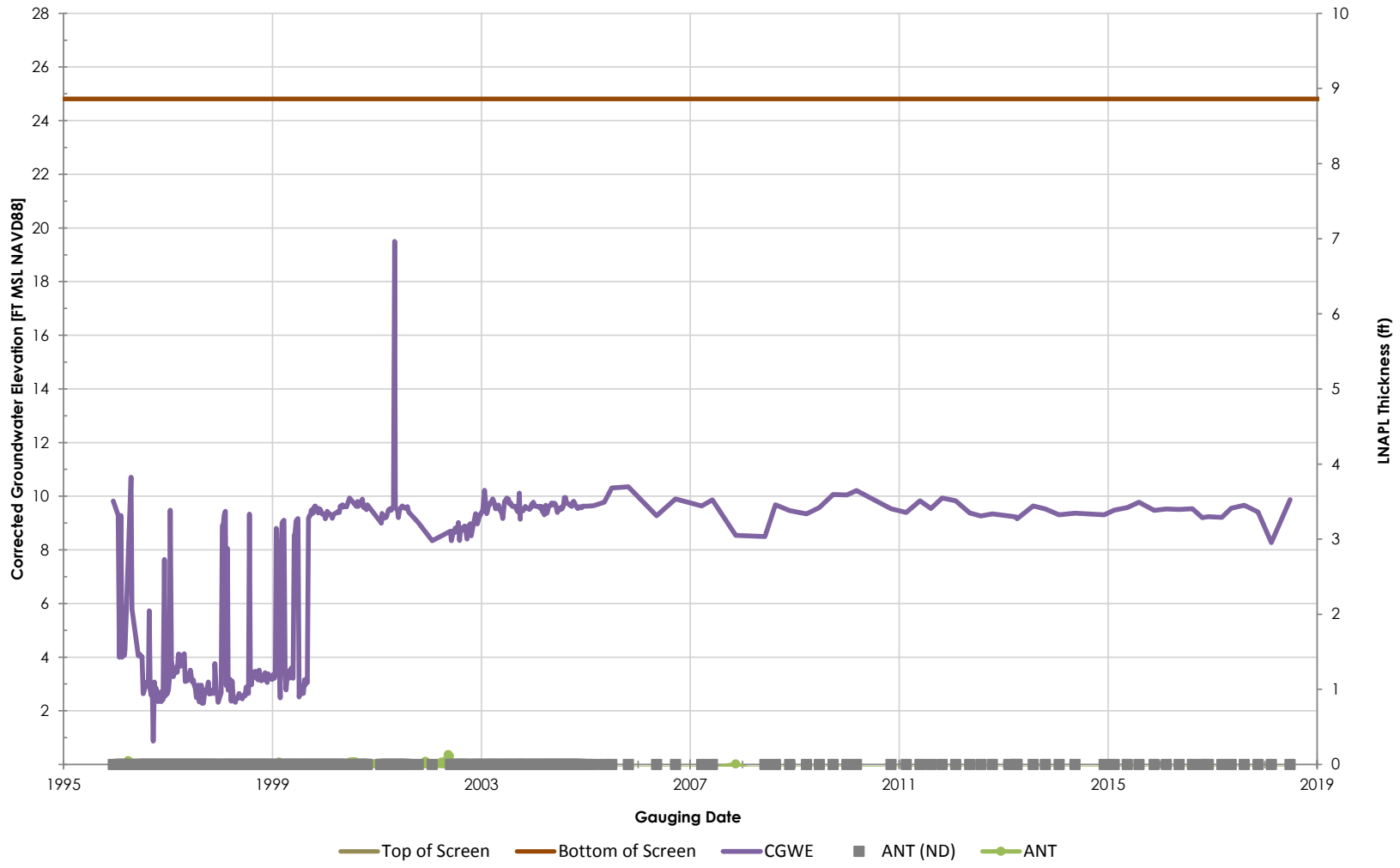
Stantec

Figure/Well No.

RW-308

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

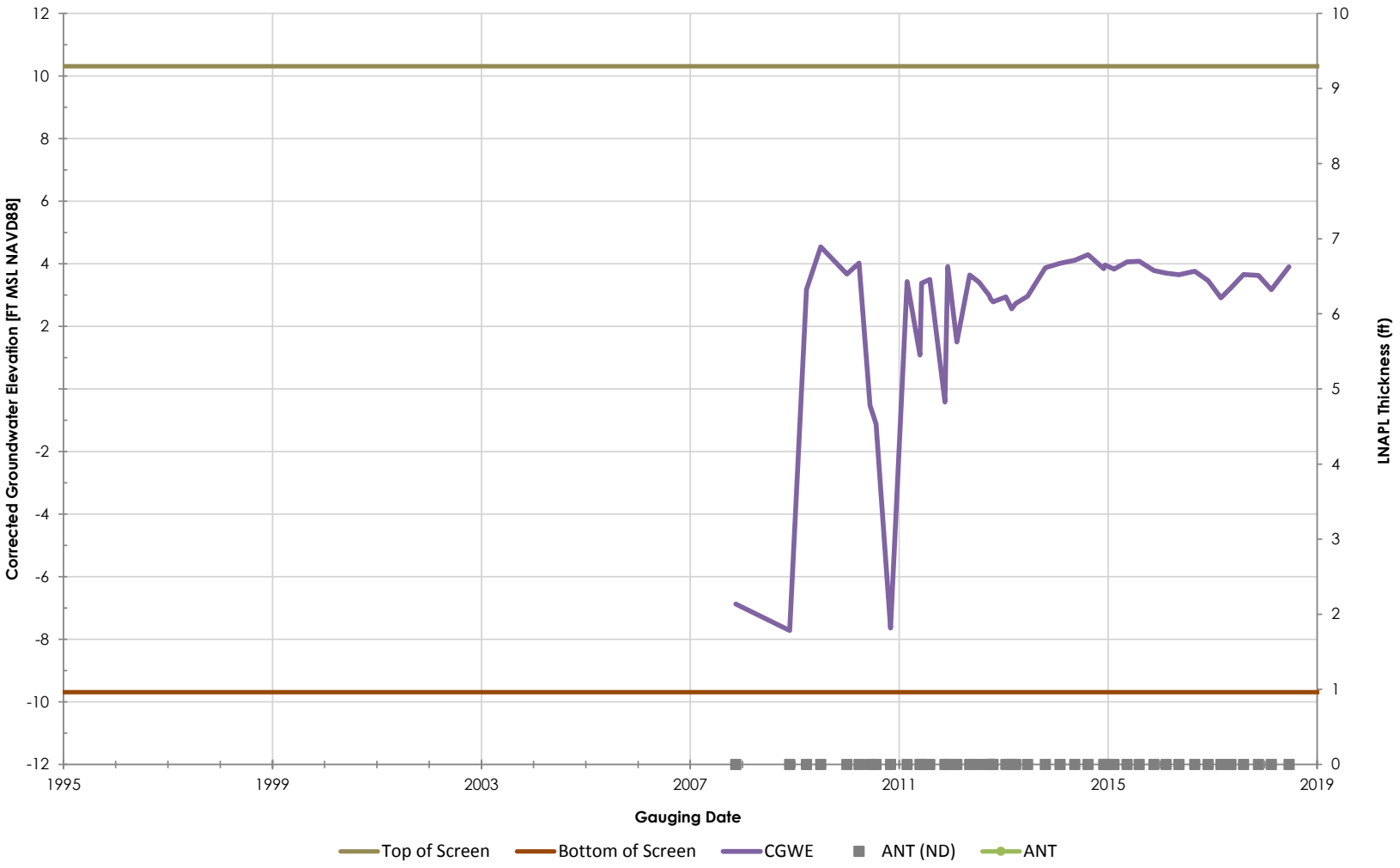
Stantec

Figure/Well No.

RW-309

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

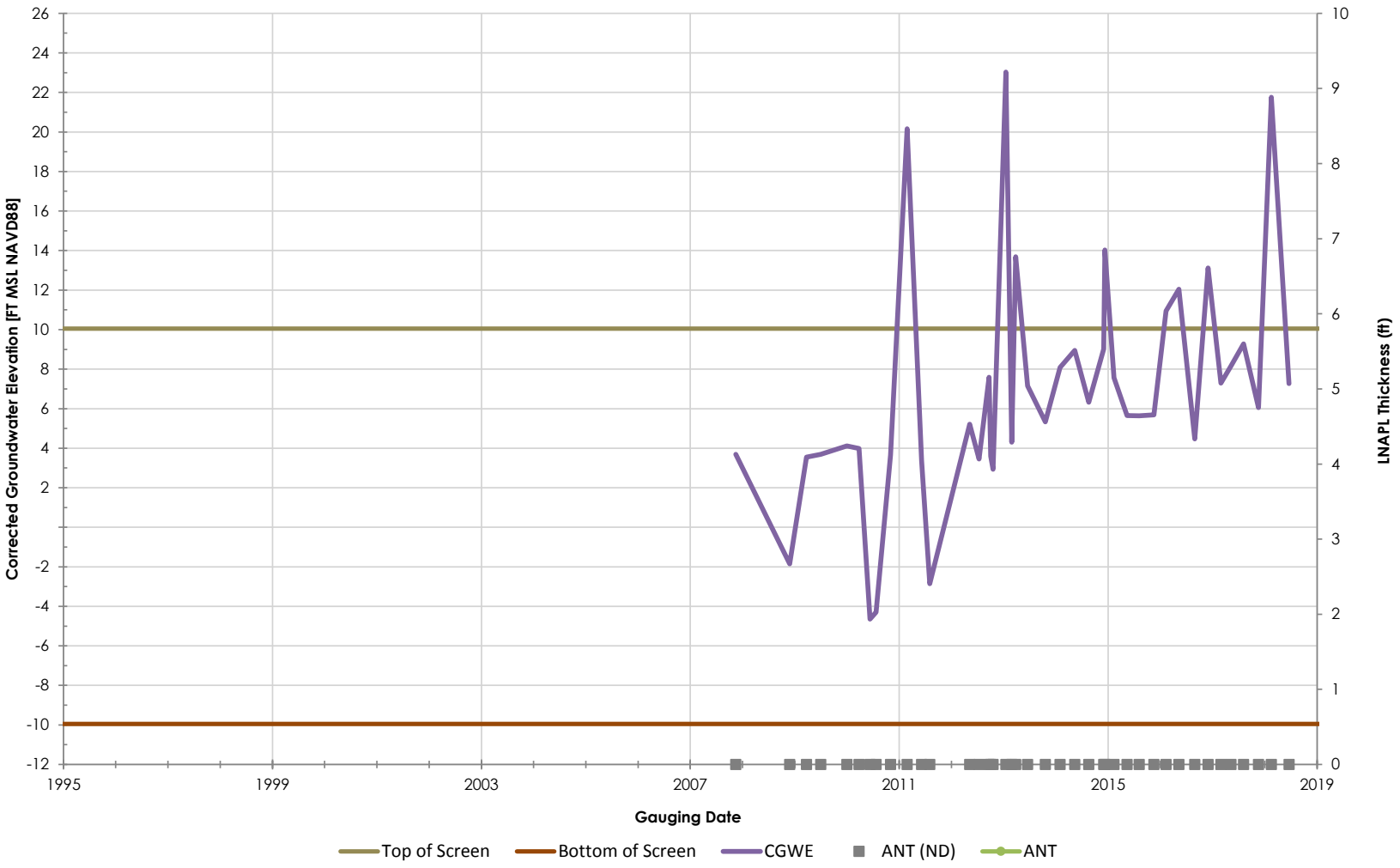
Stantec

Figure/Well No.

RW-31

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

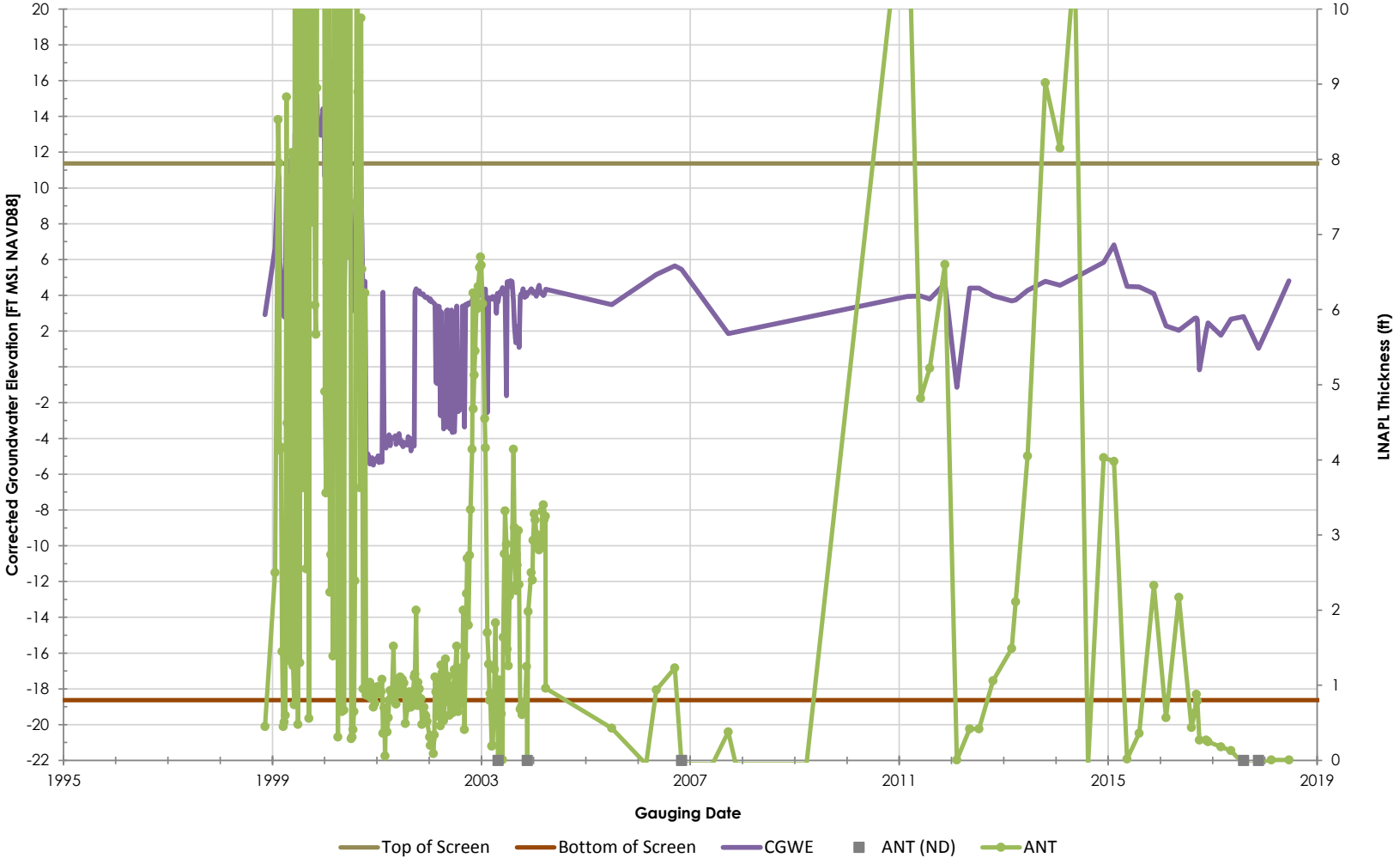
Stantec

Figure/Well No.

RW-32

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

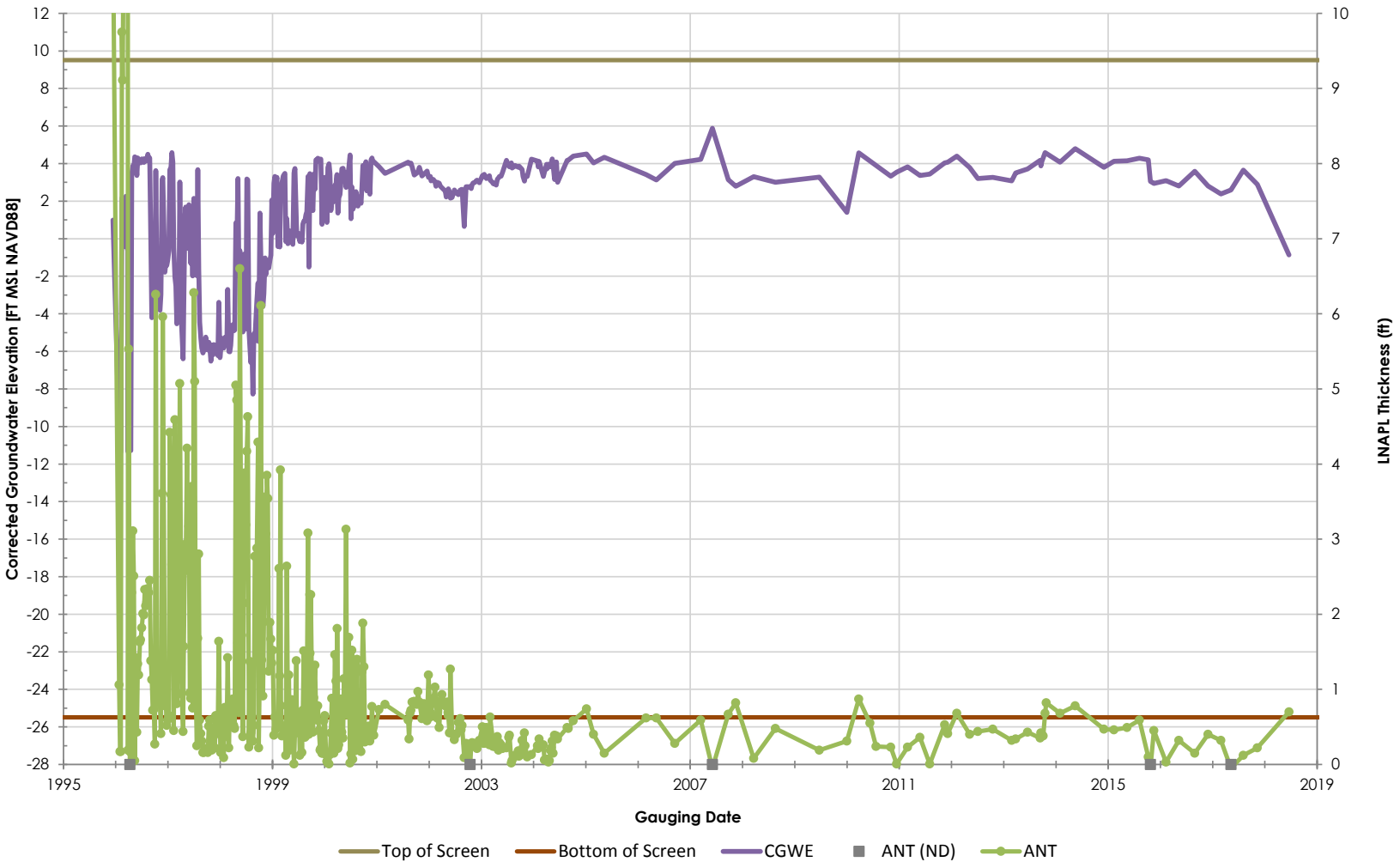
Stantec

Figure/Well No.

RW-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

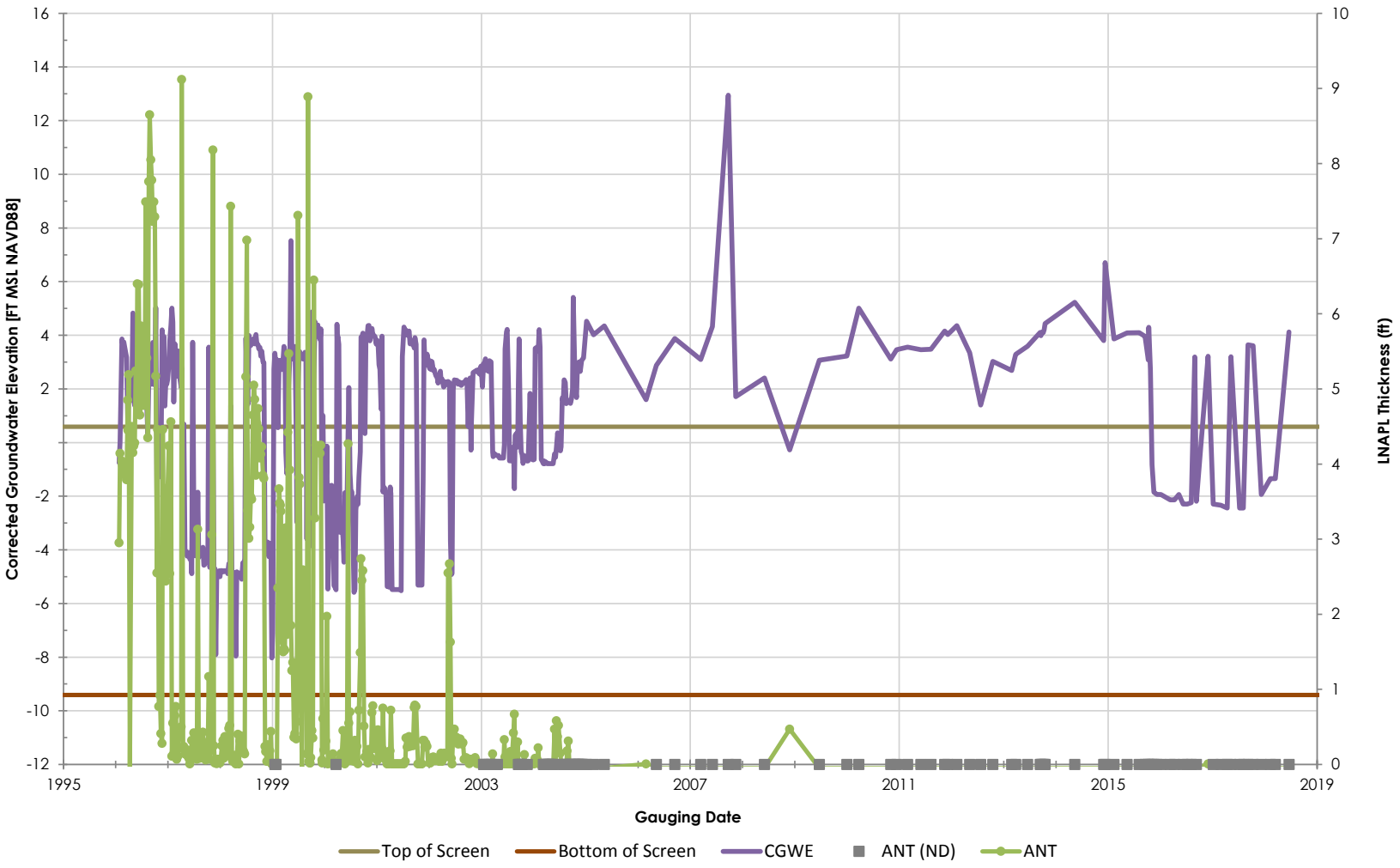
Stantec

Figure/Well No.

RW-401

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

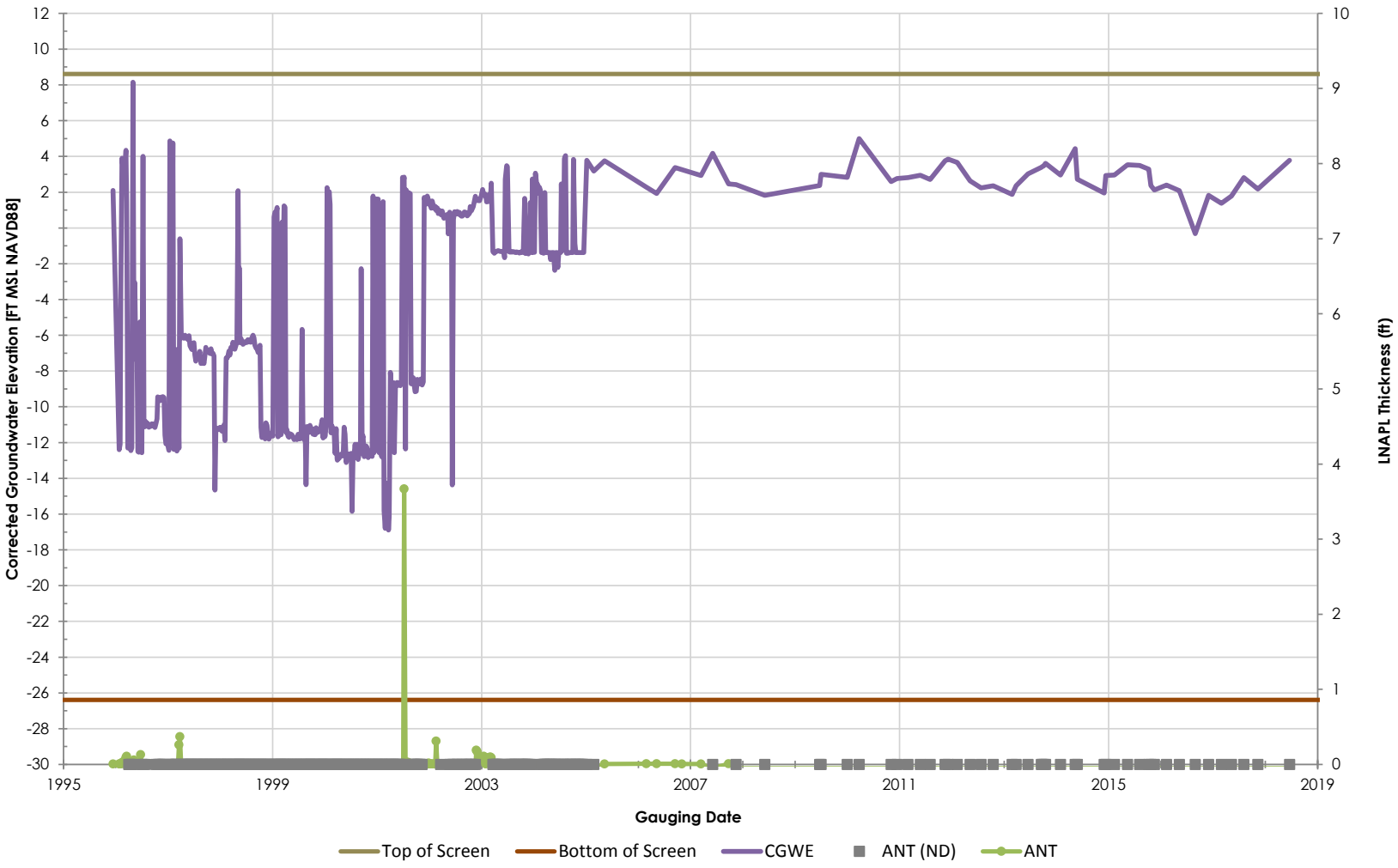
Stantec

Figure/Well No.

RW-402

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

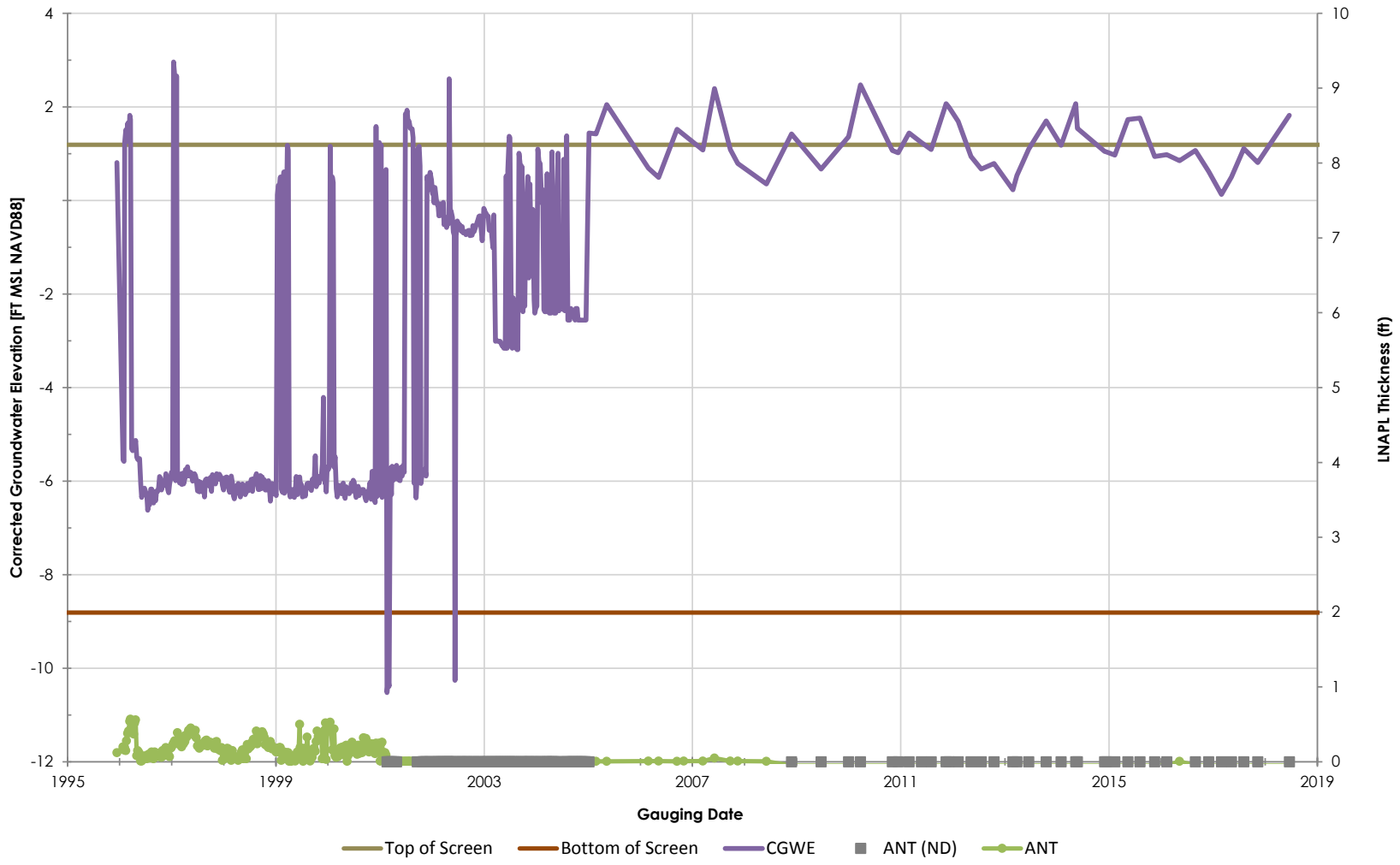
Stantec

Figure/Well No.

RW-403

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

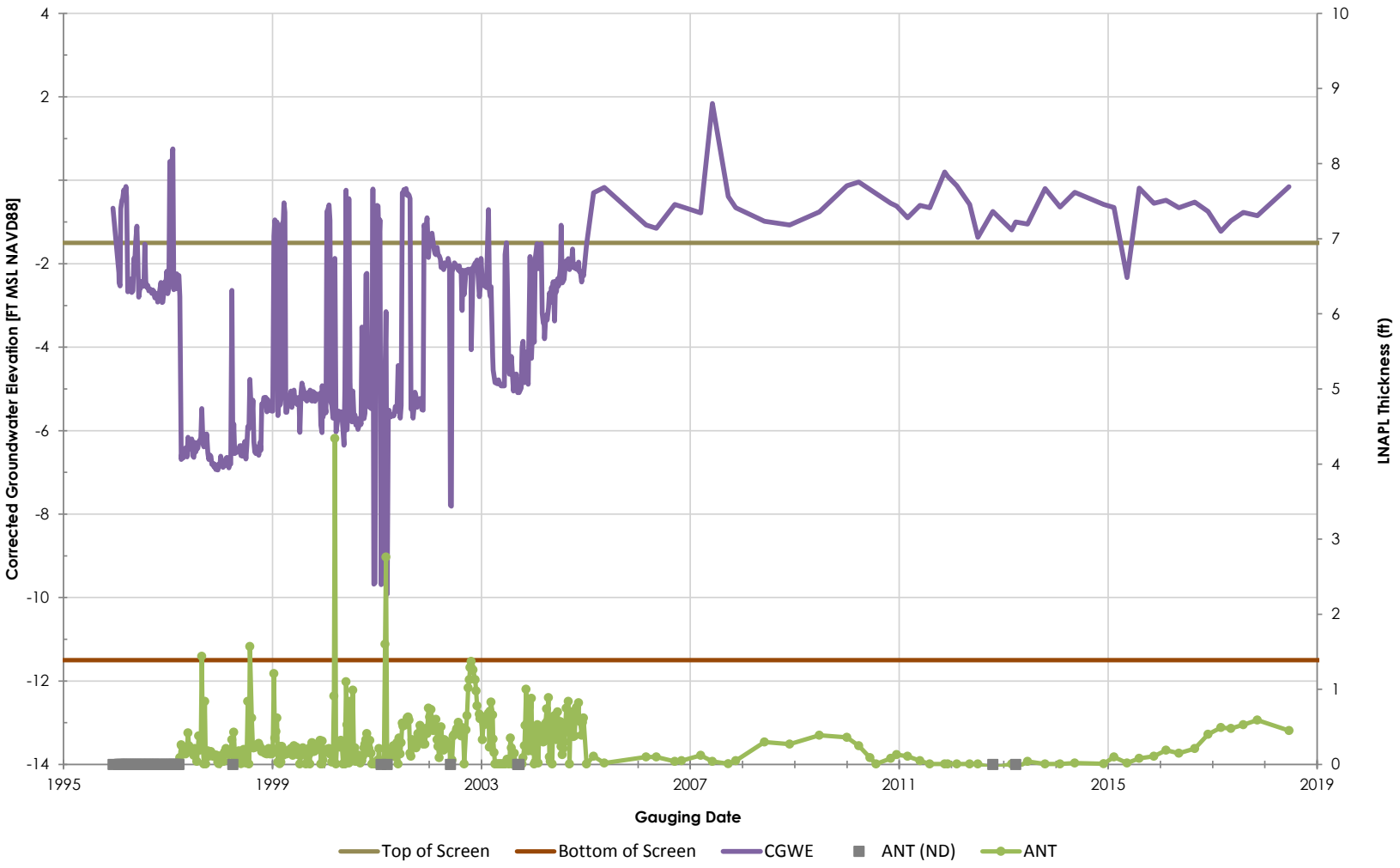
Stantec

Figure/Well No.

RW-404

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

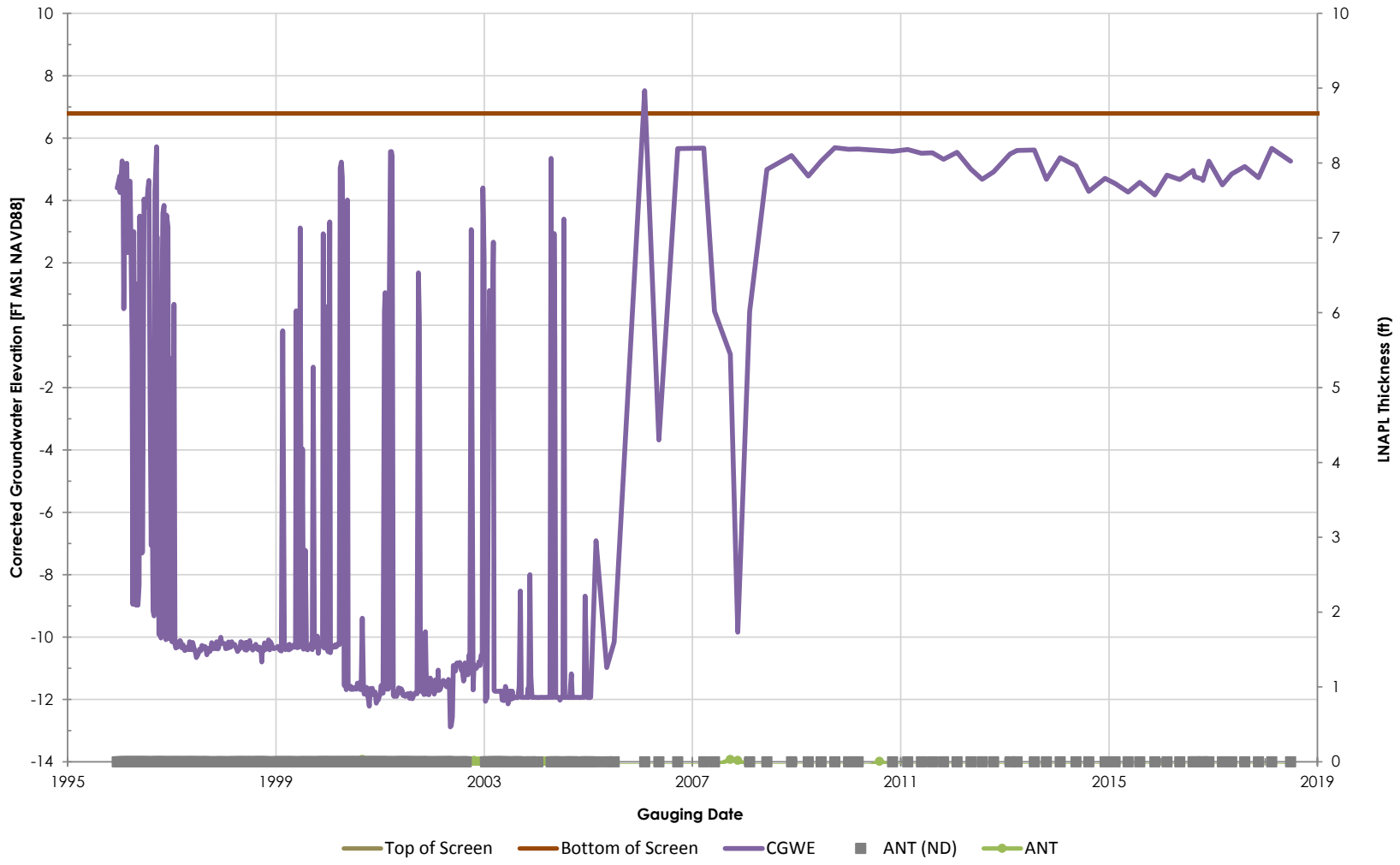
Stantec

Figure/Well No.

RW-405

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

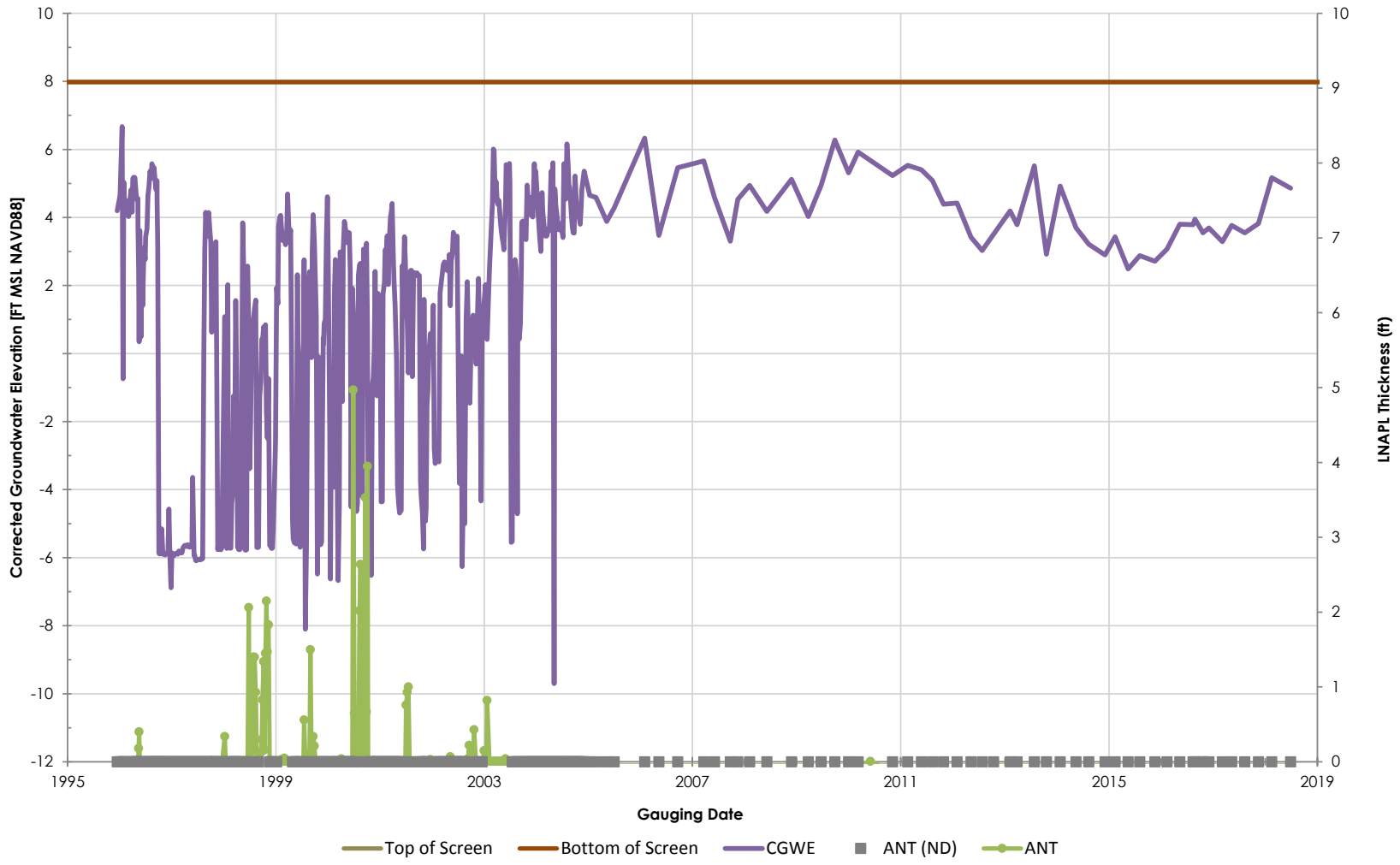
Stantec

Figure/Well No.

RW-500

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

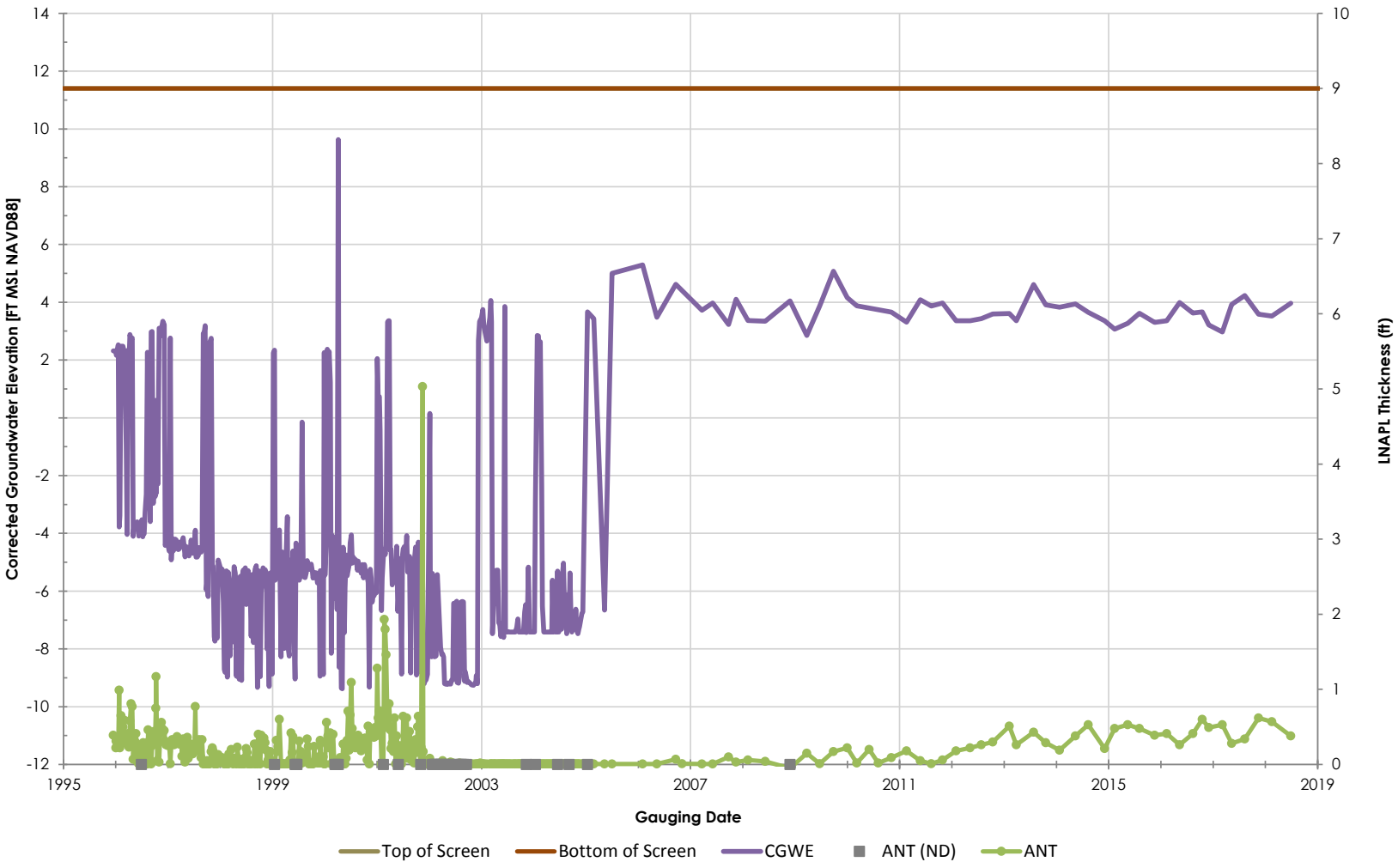
Stantec

Figure/Well No.

RW-501

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

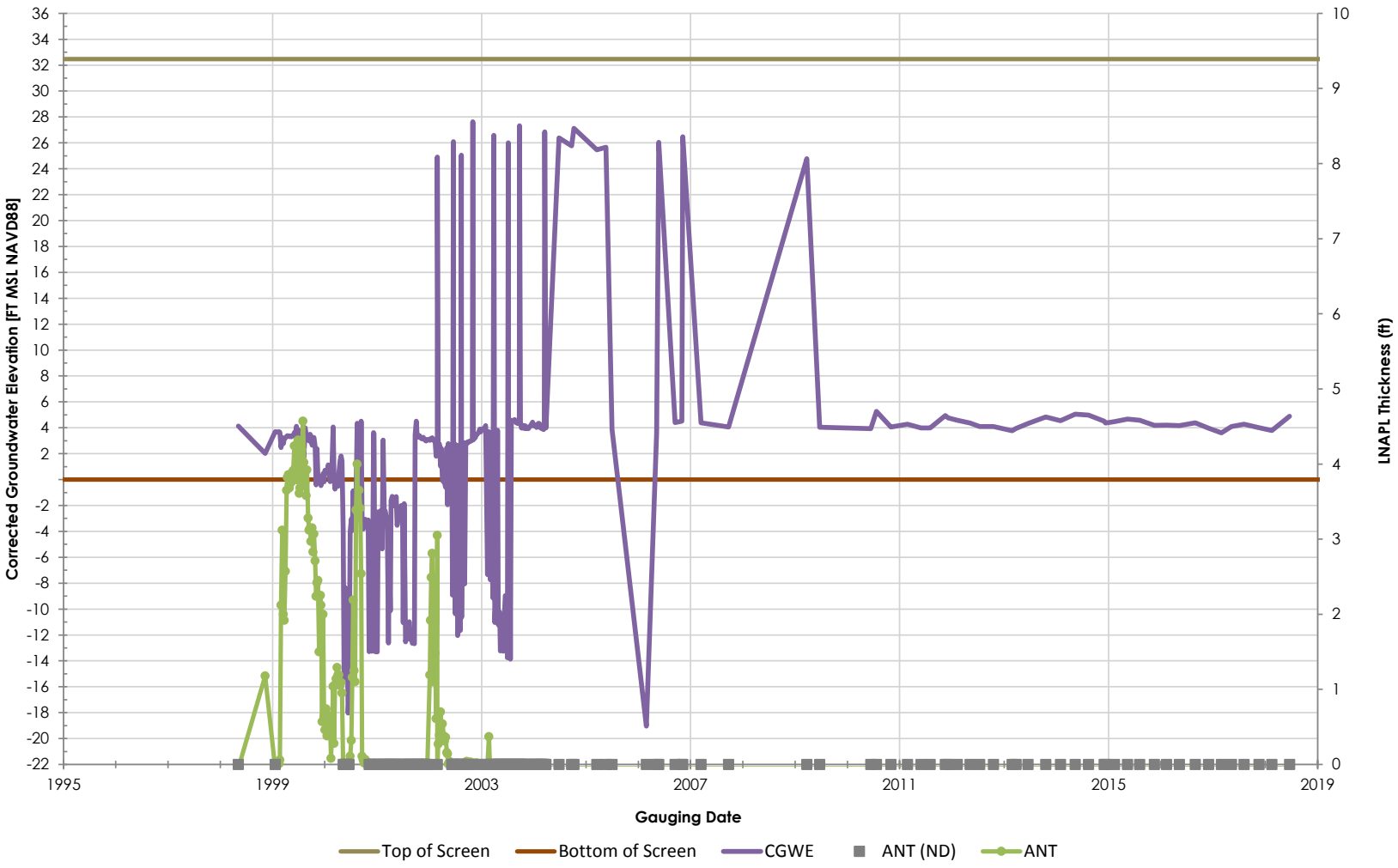
Stantec

Figure/Well No.

RW-502

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

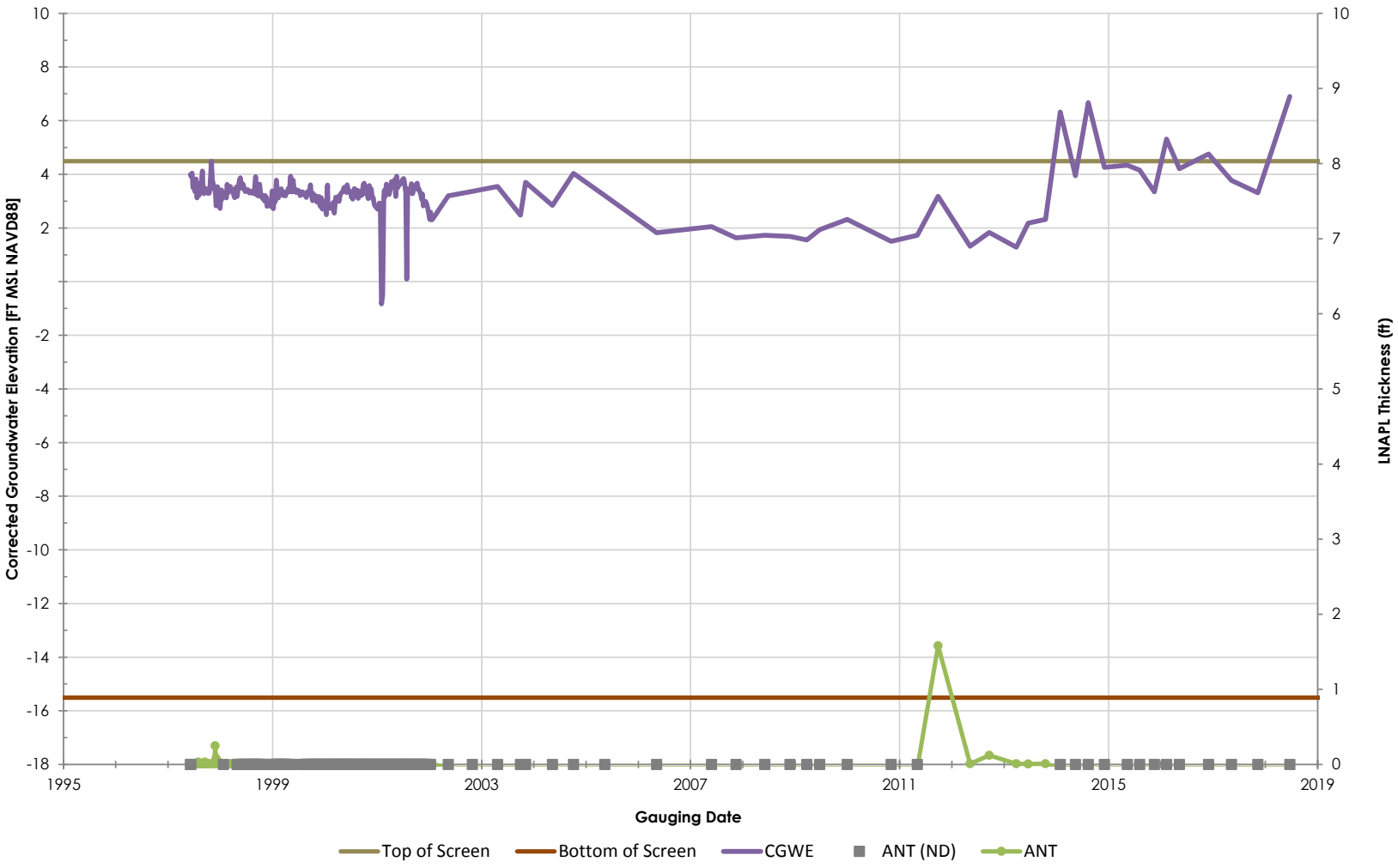
Stantec

Figure/Well No.

RW-6

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

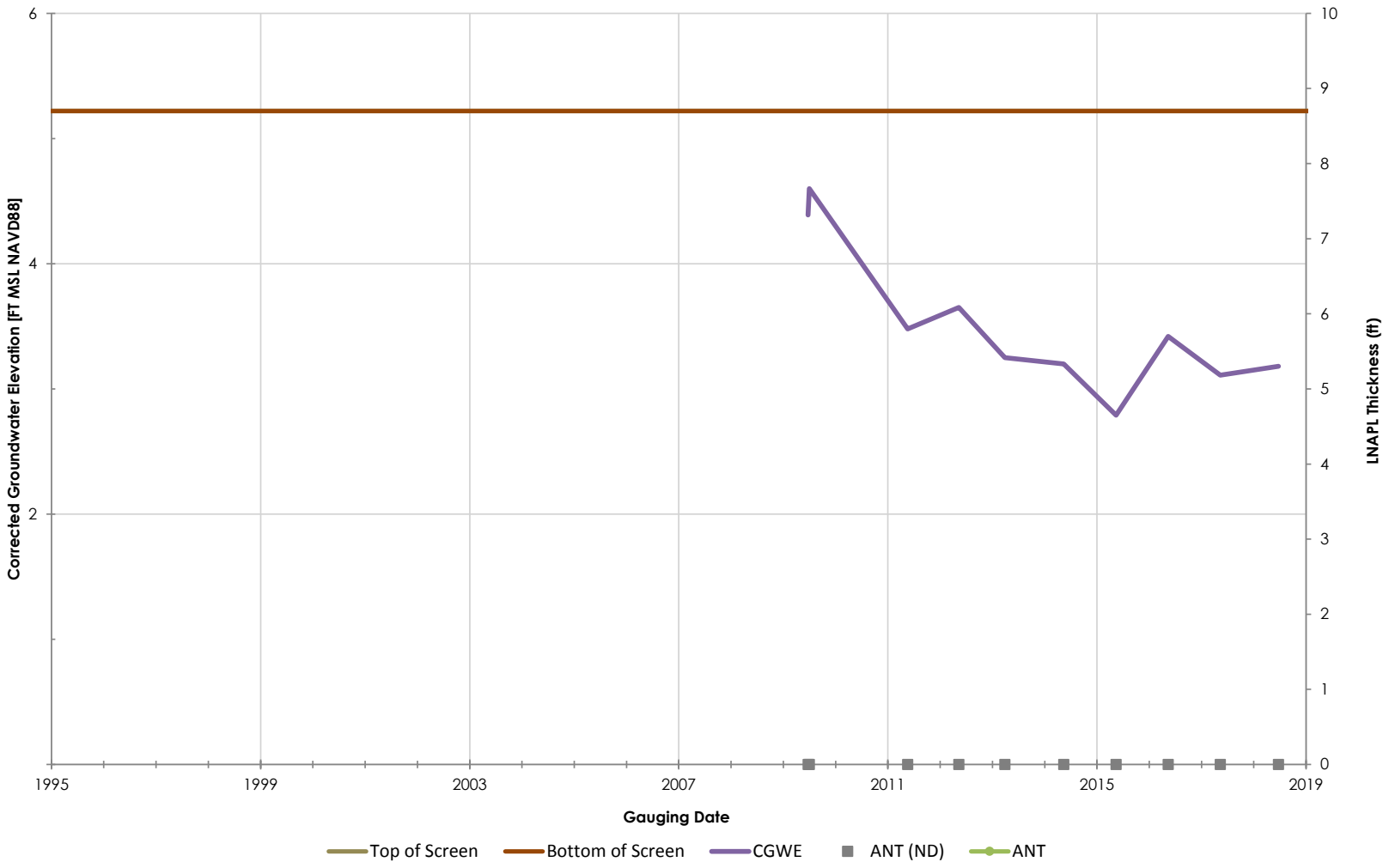
Stantec

Figure/Well No.

RW-600

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

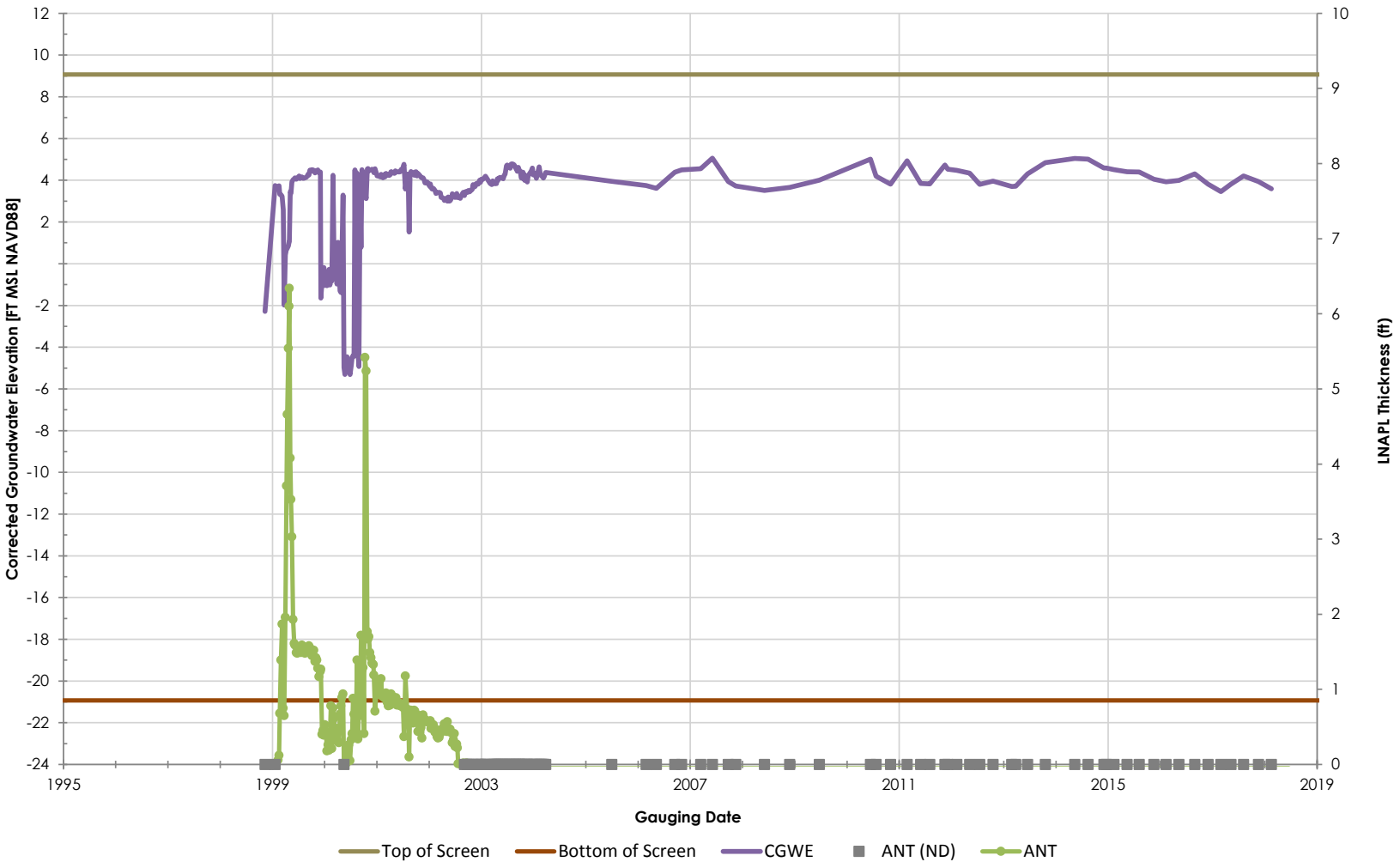
Stantec

Figure/Well No.

RW-6S

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

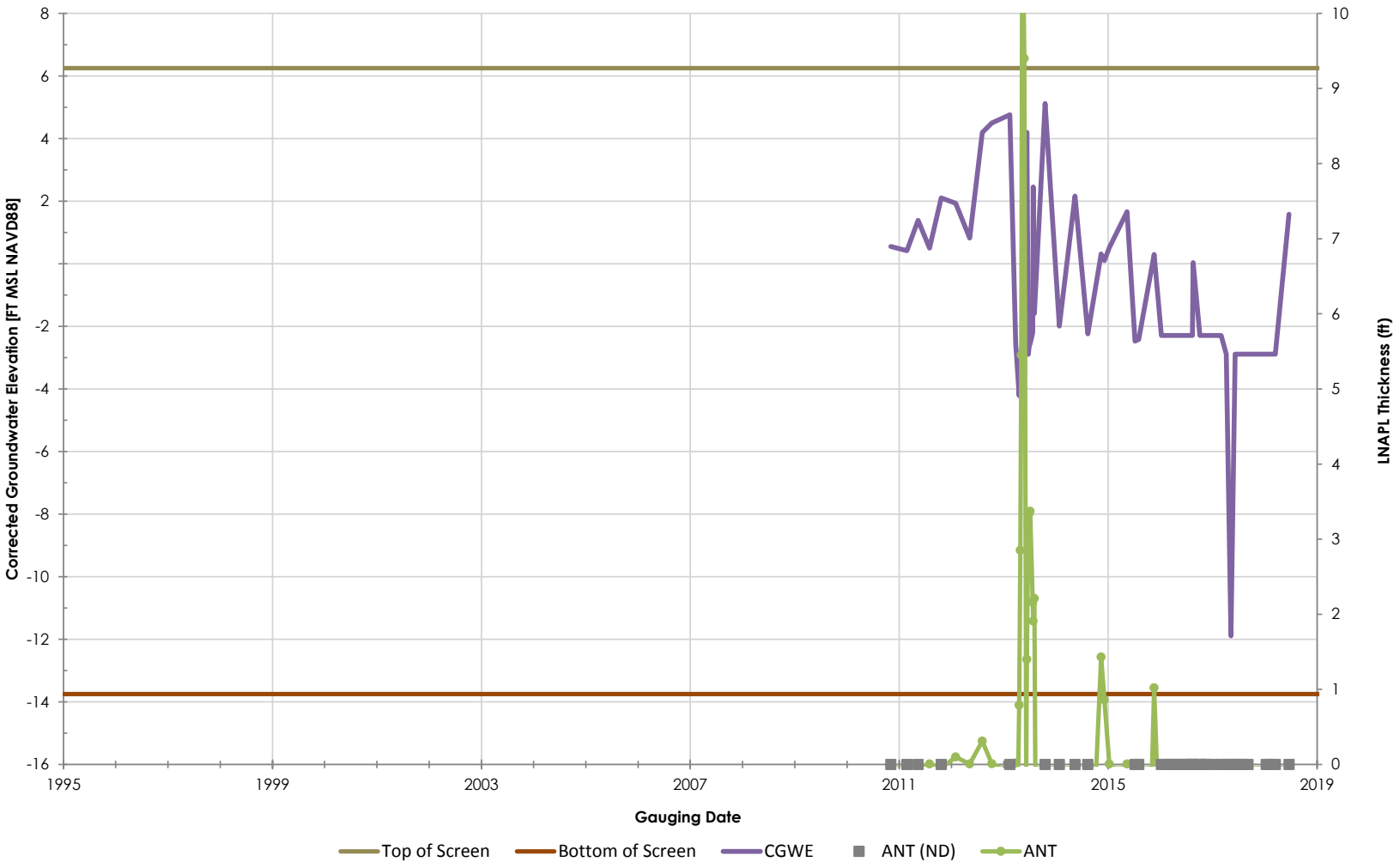
Stantec

Figure/Well No.

RW-7

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

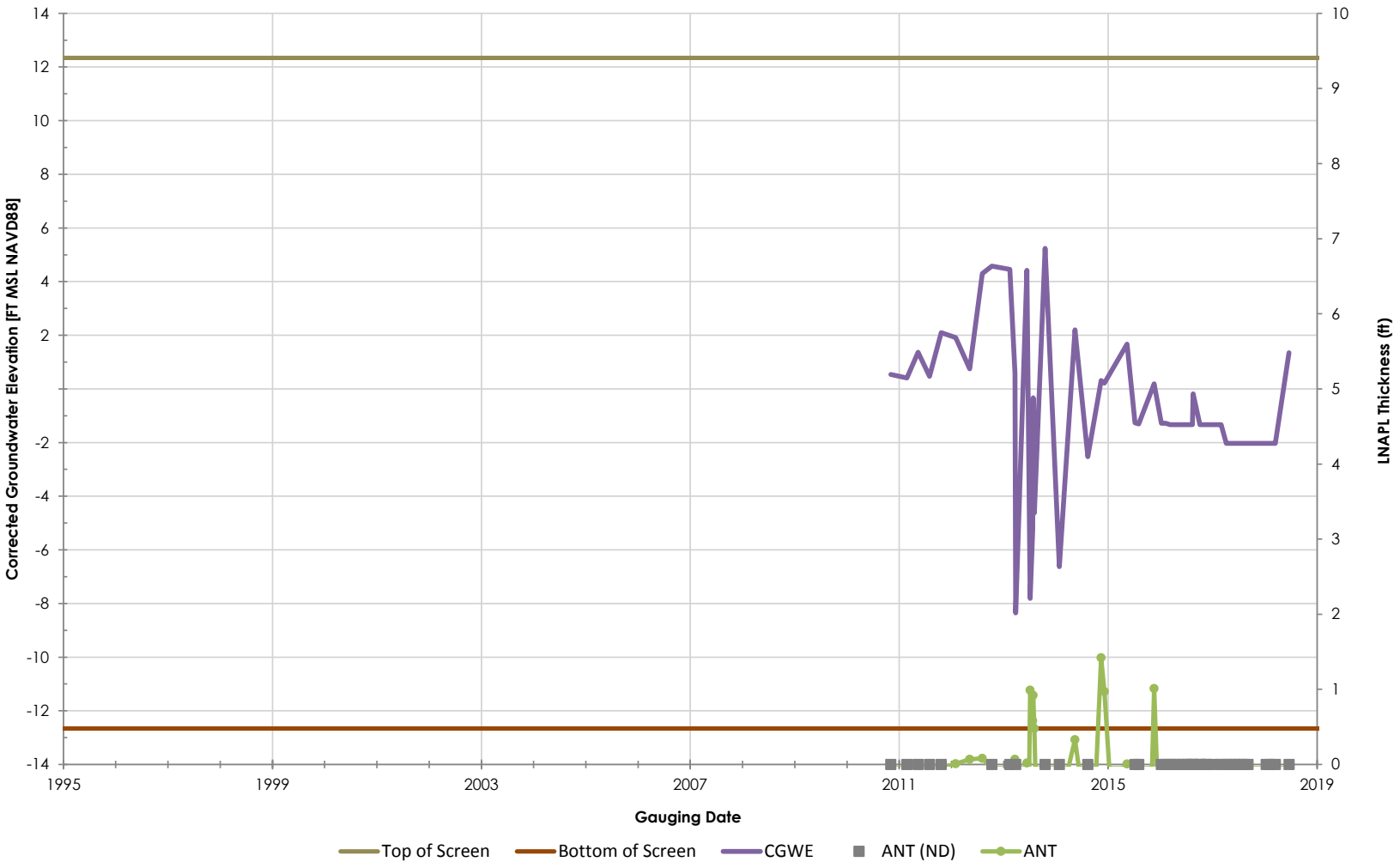
Stantec

Figure/Well No.

RW-700

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

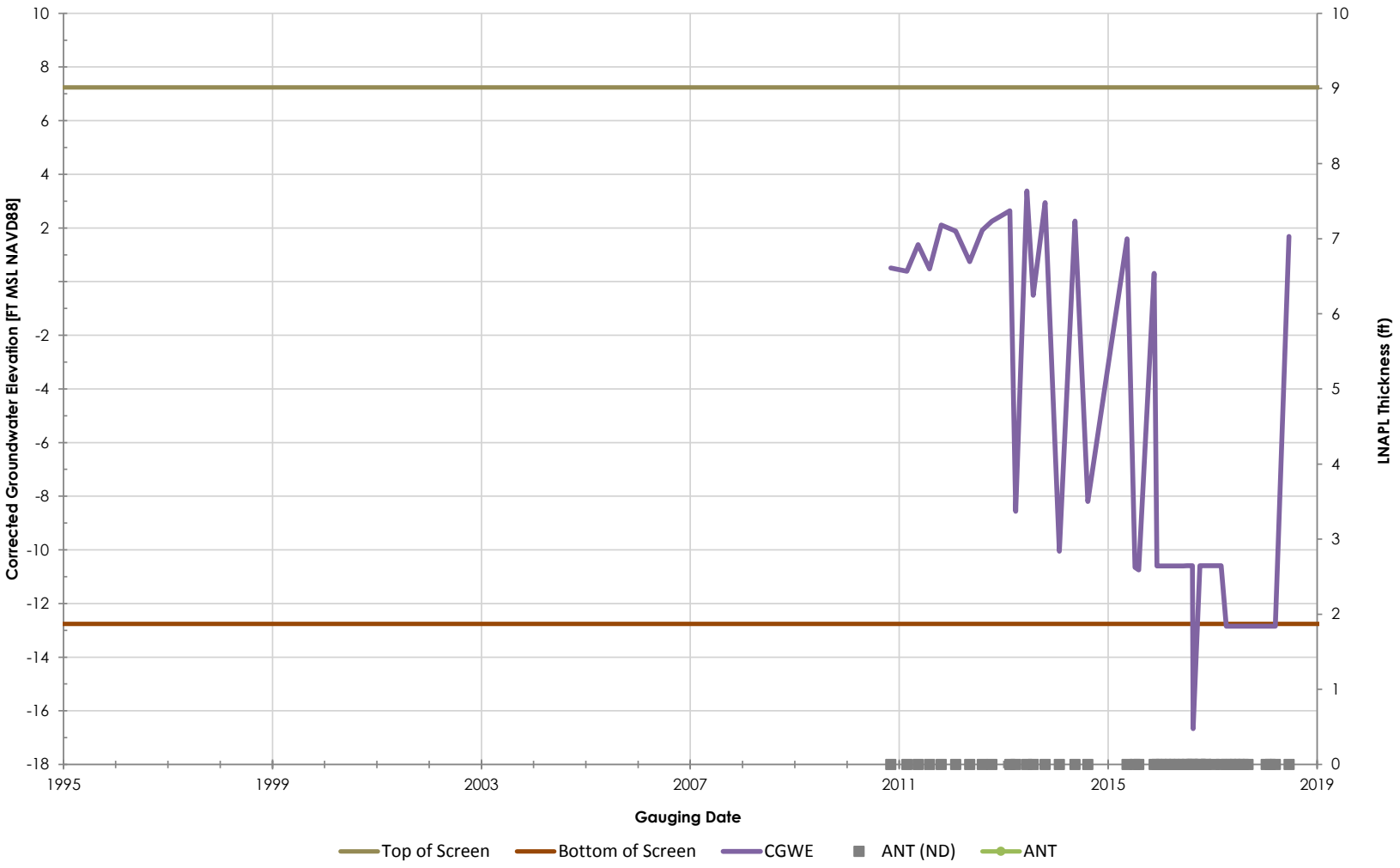
Stantec

Figure/Well No.

RW-701

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

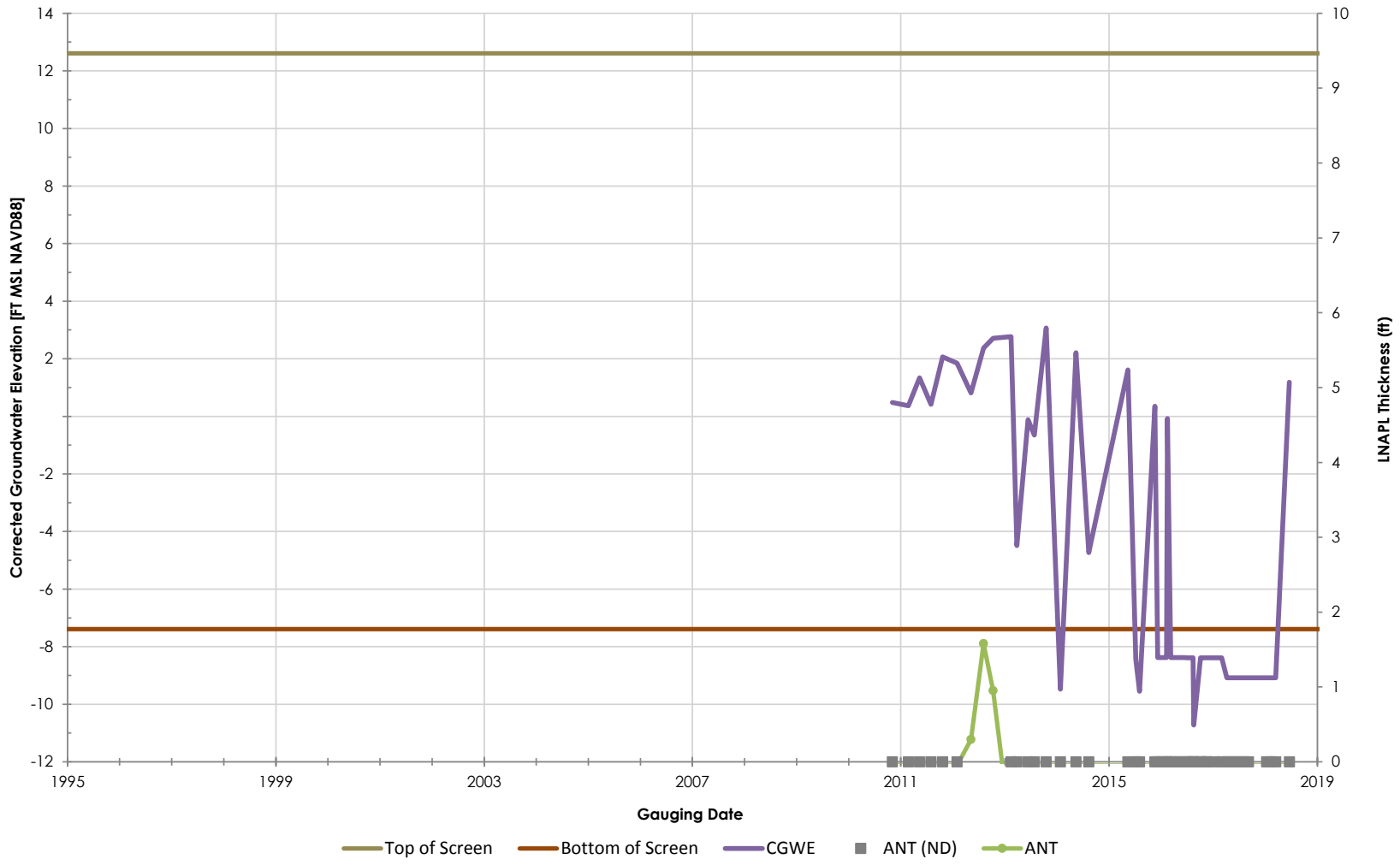
Stantec

Figure/Well No.

RW-702

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

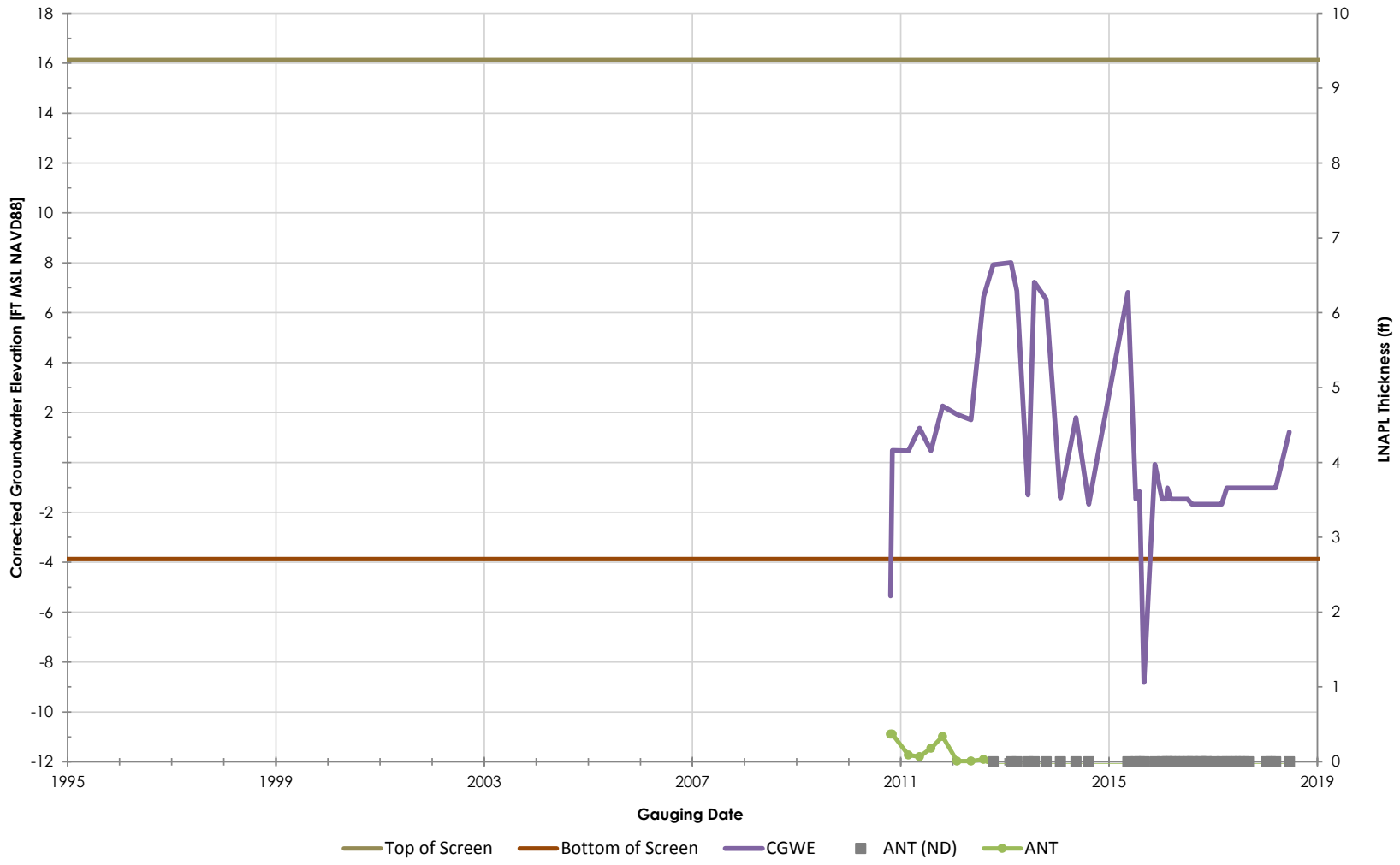
Stantec

Figure/Well No.

RW-703

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

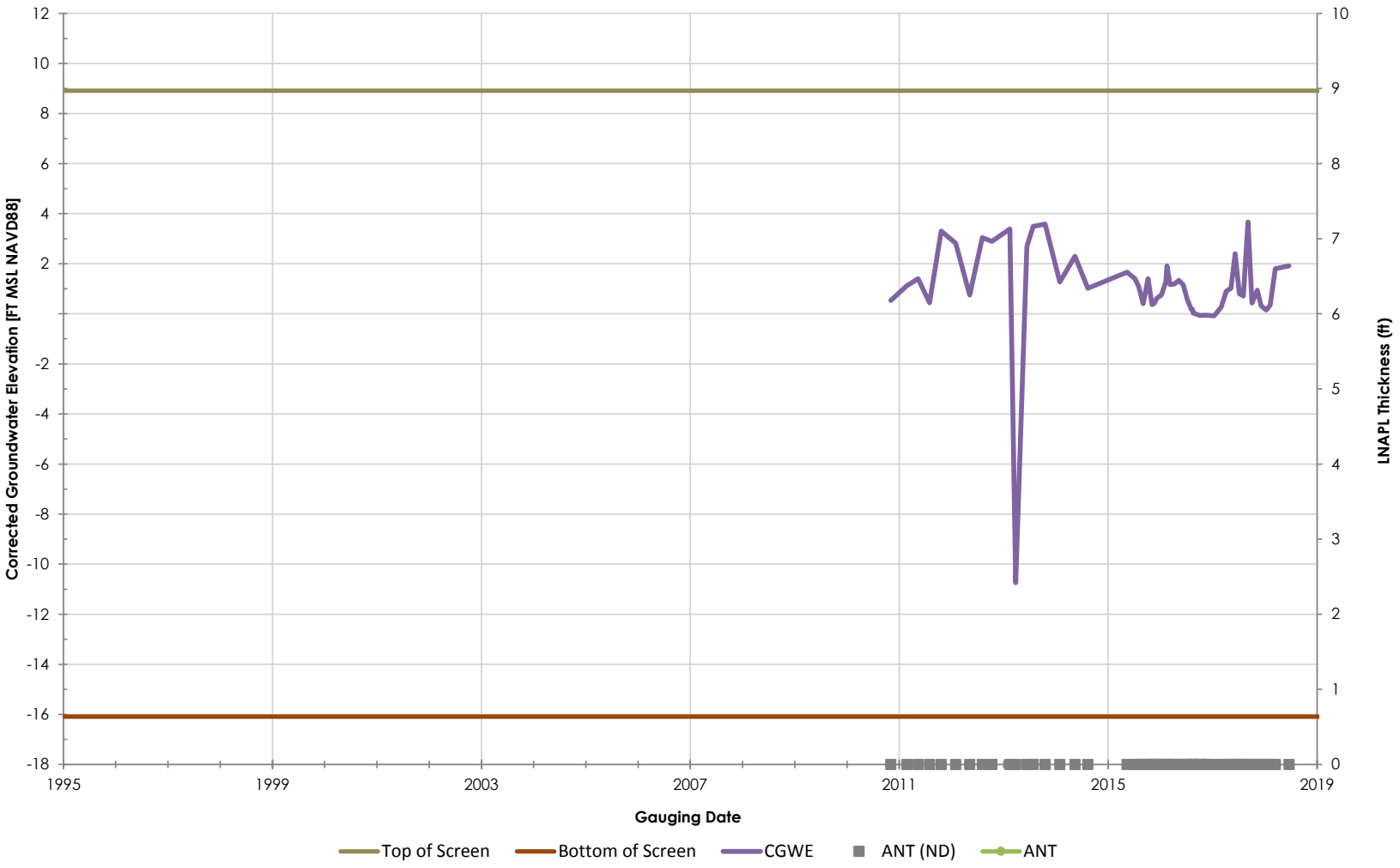
Stantec

Figure/Well No.

RW-704

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

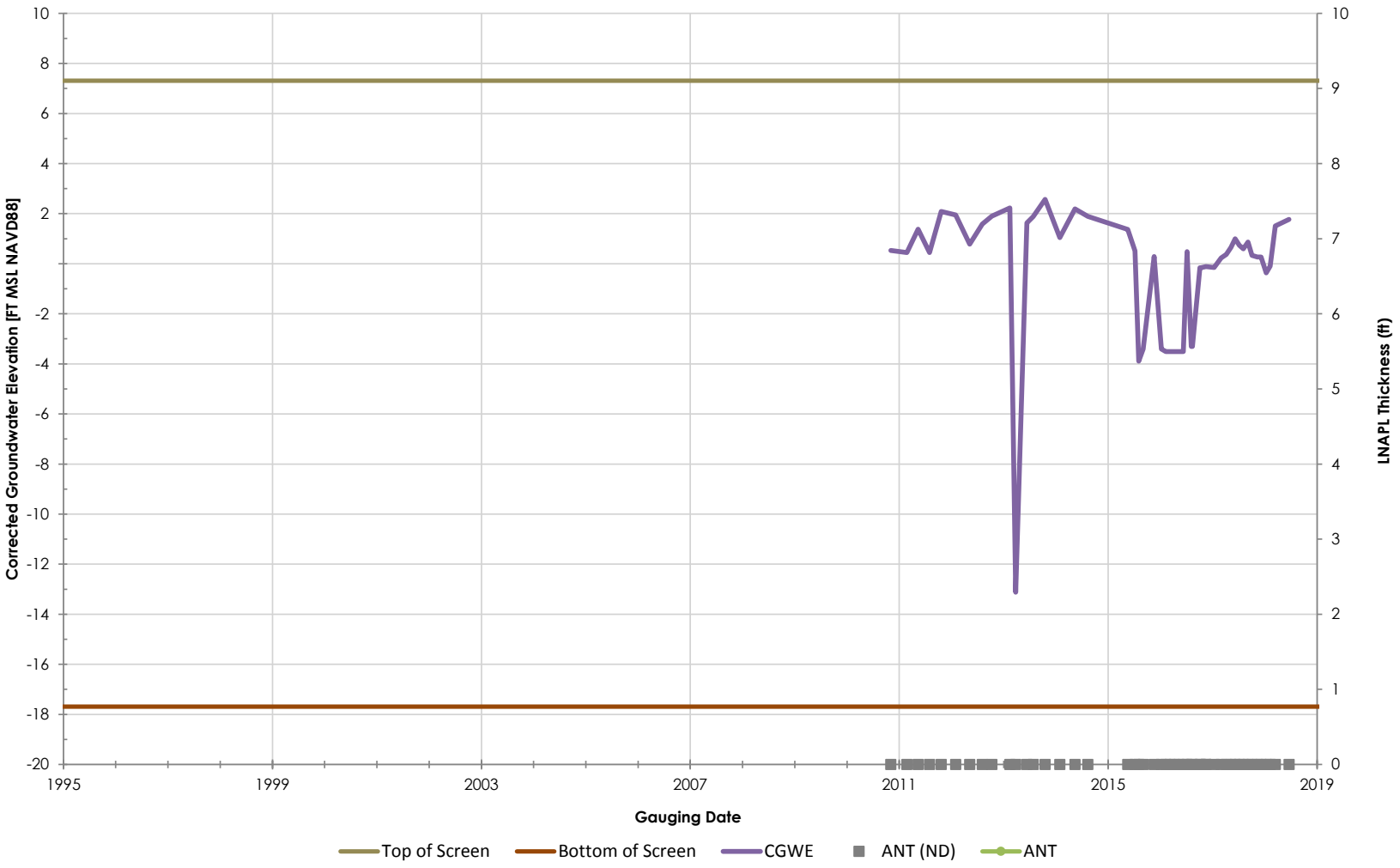
Stantec

Figure/Well No.

RW-705

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

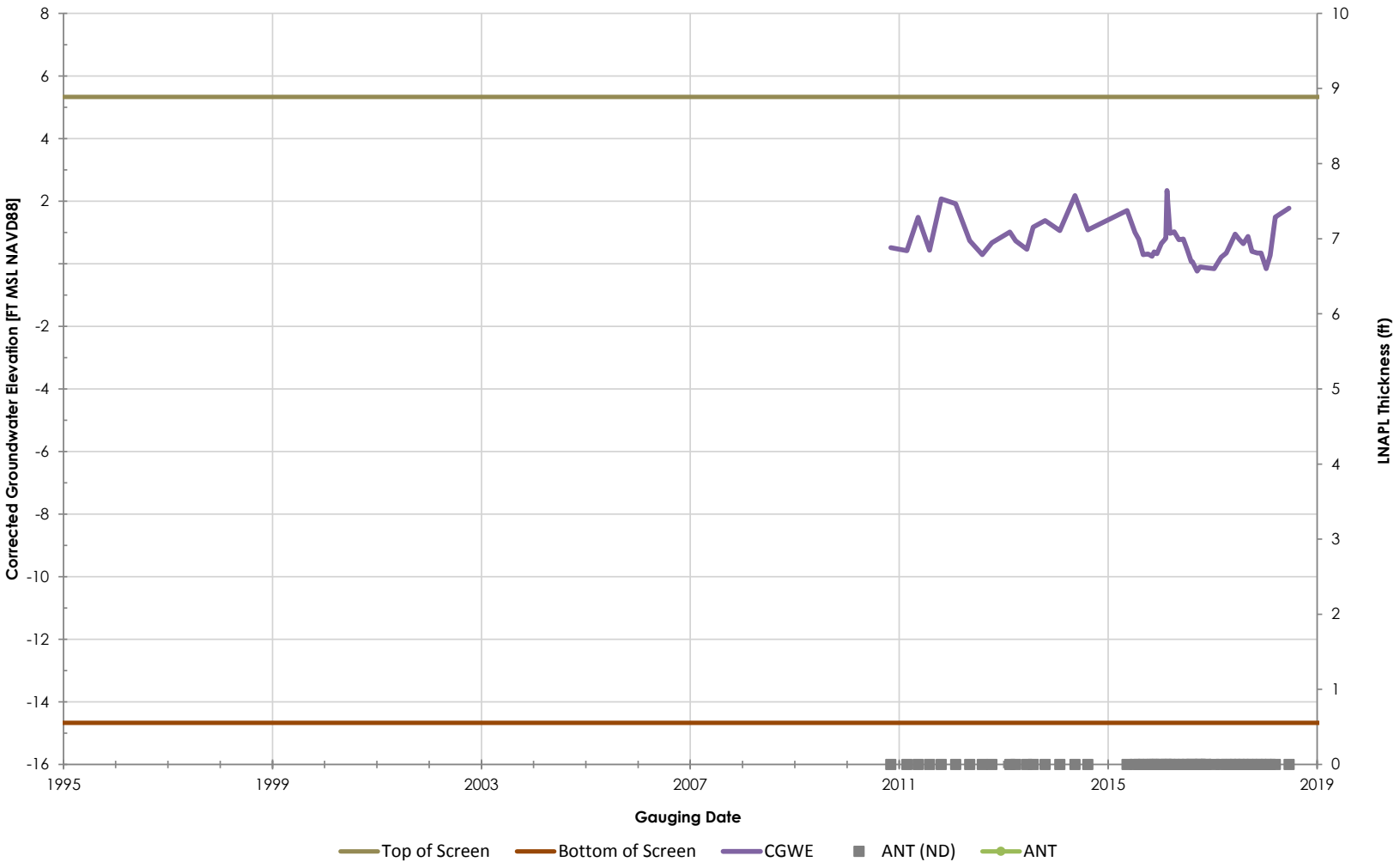
Stantec

Figure/Well No.

RW-706

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

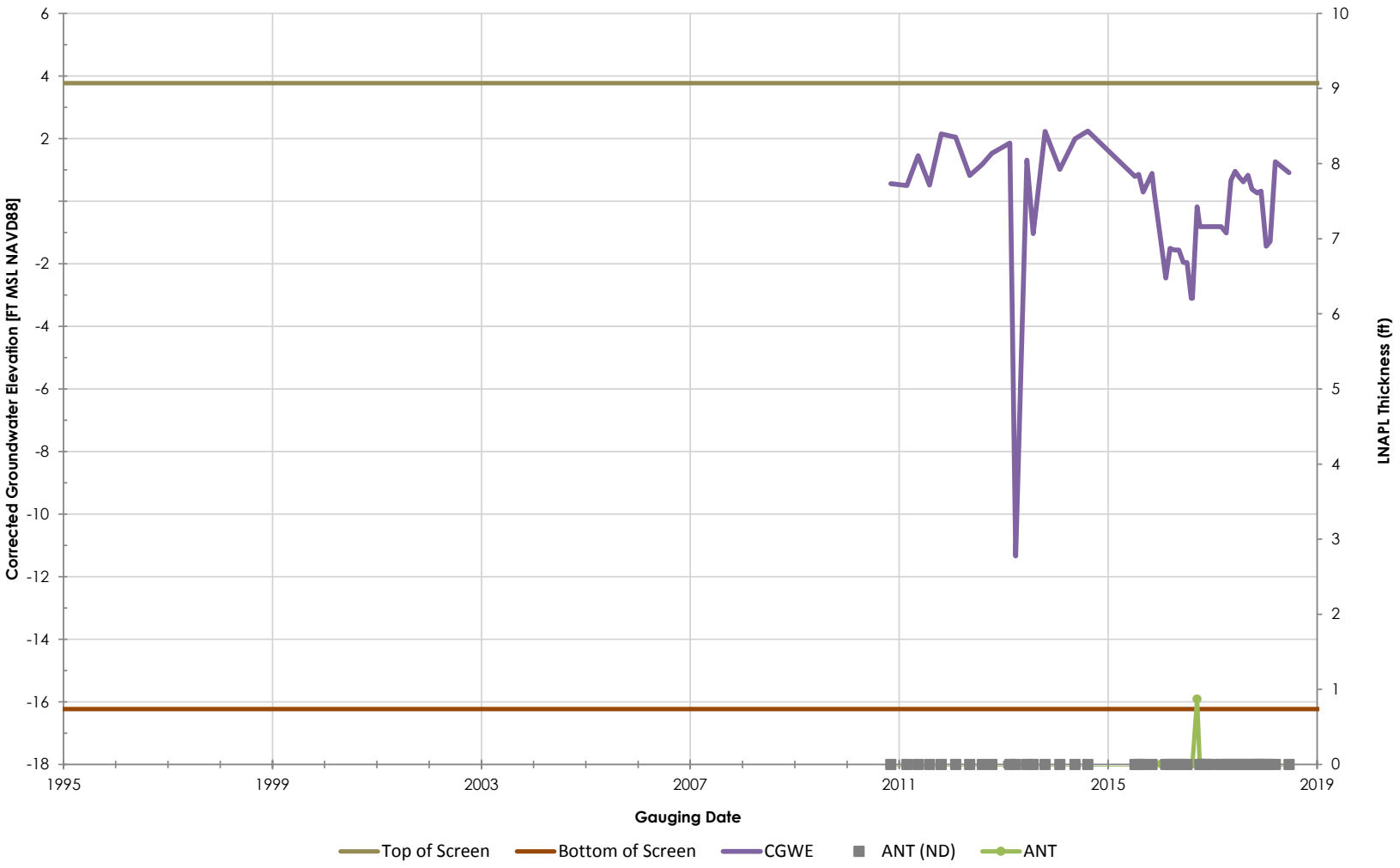
Stantec

Figure/Well No.

RW-707

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

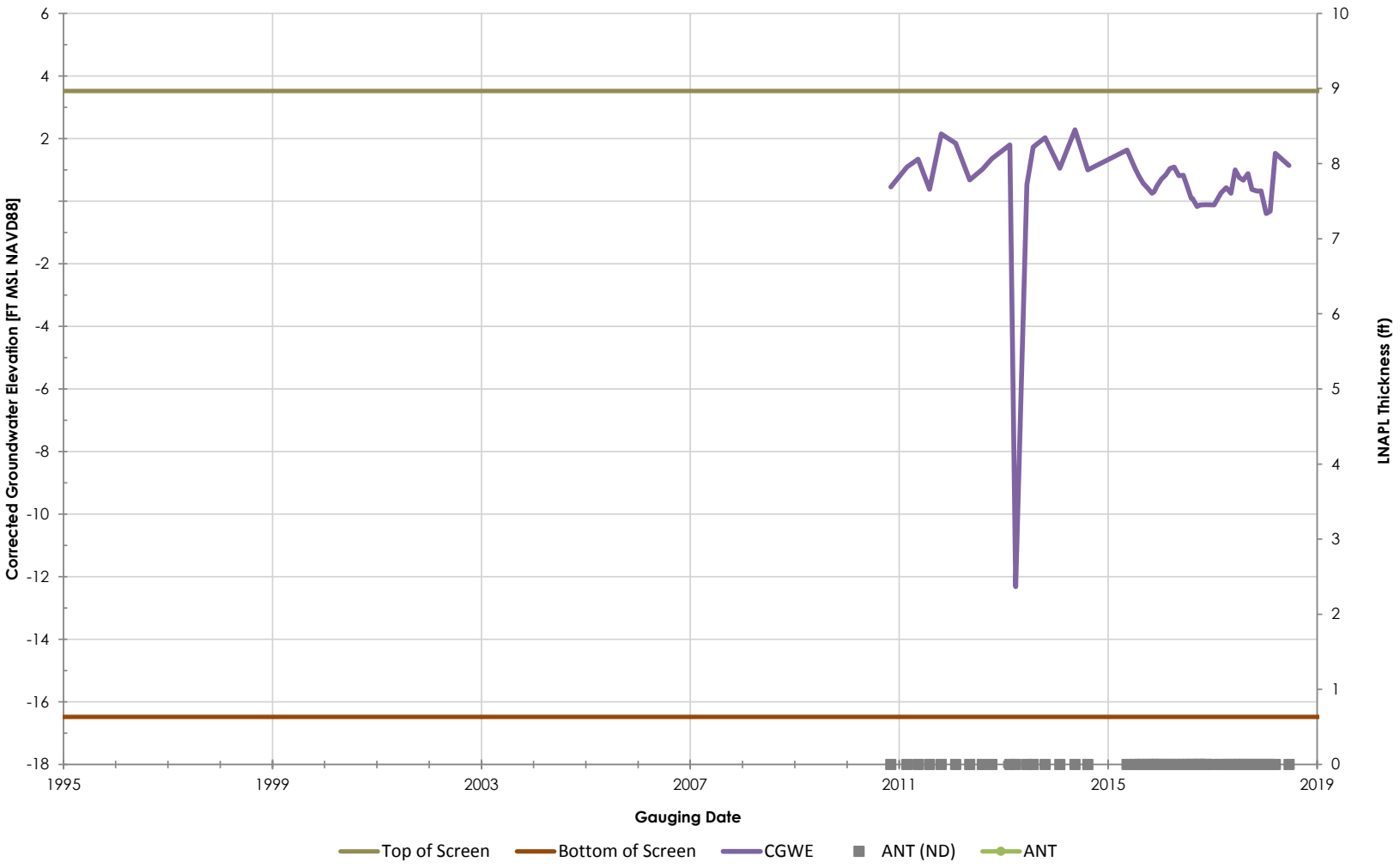
Stantec

Figure/Well No.

RW-708

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

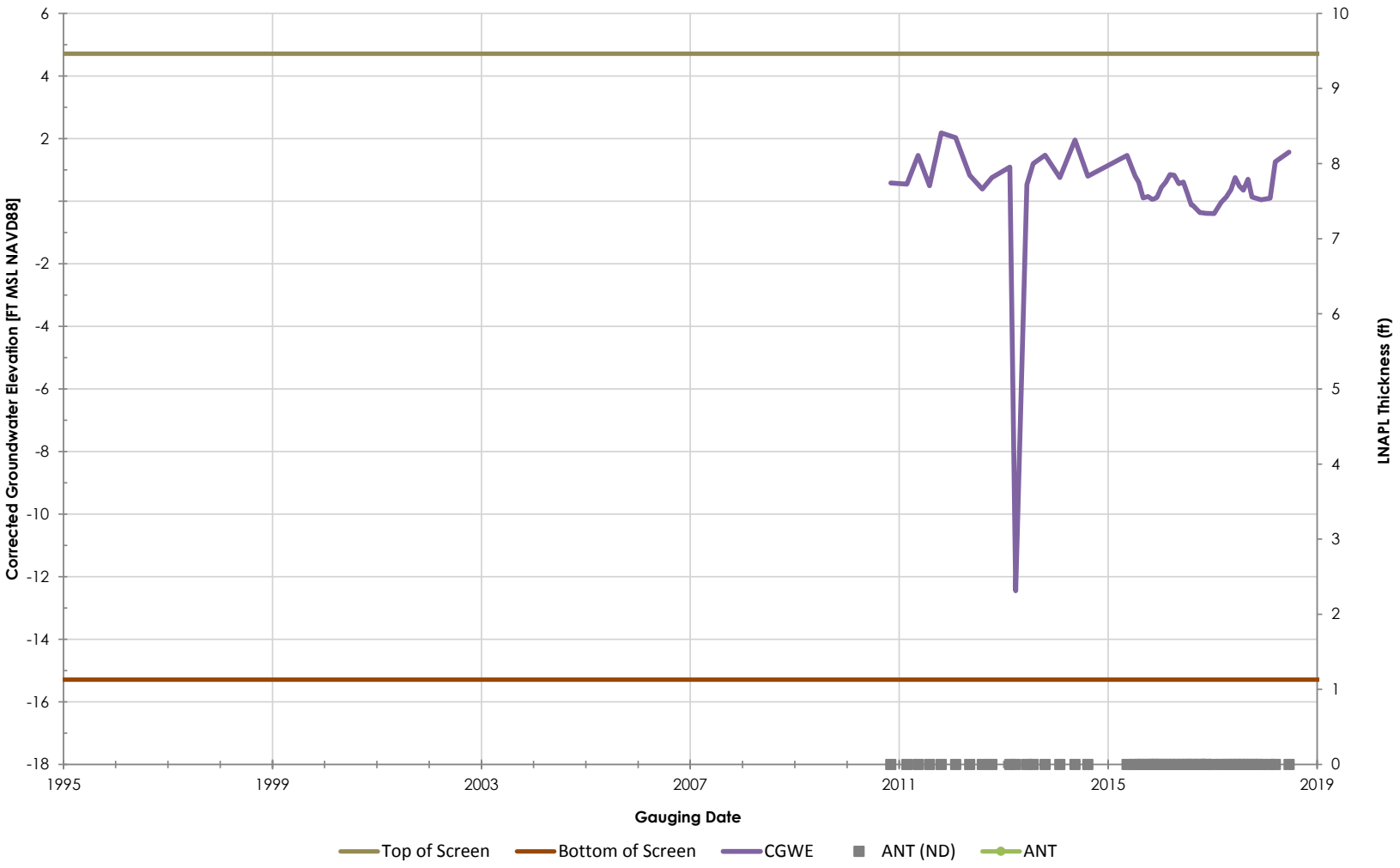
Stantec

Figure/Well No.

RW-709

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

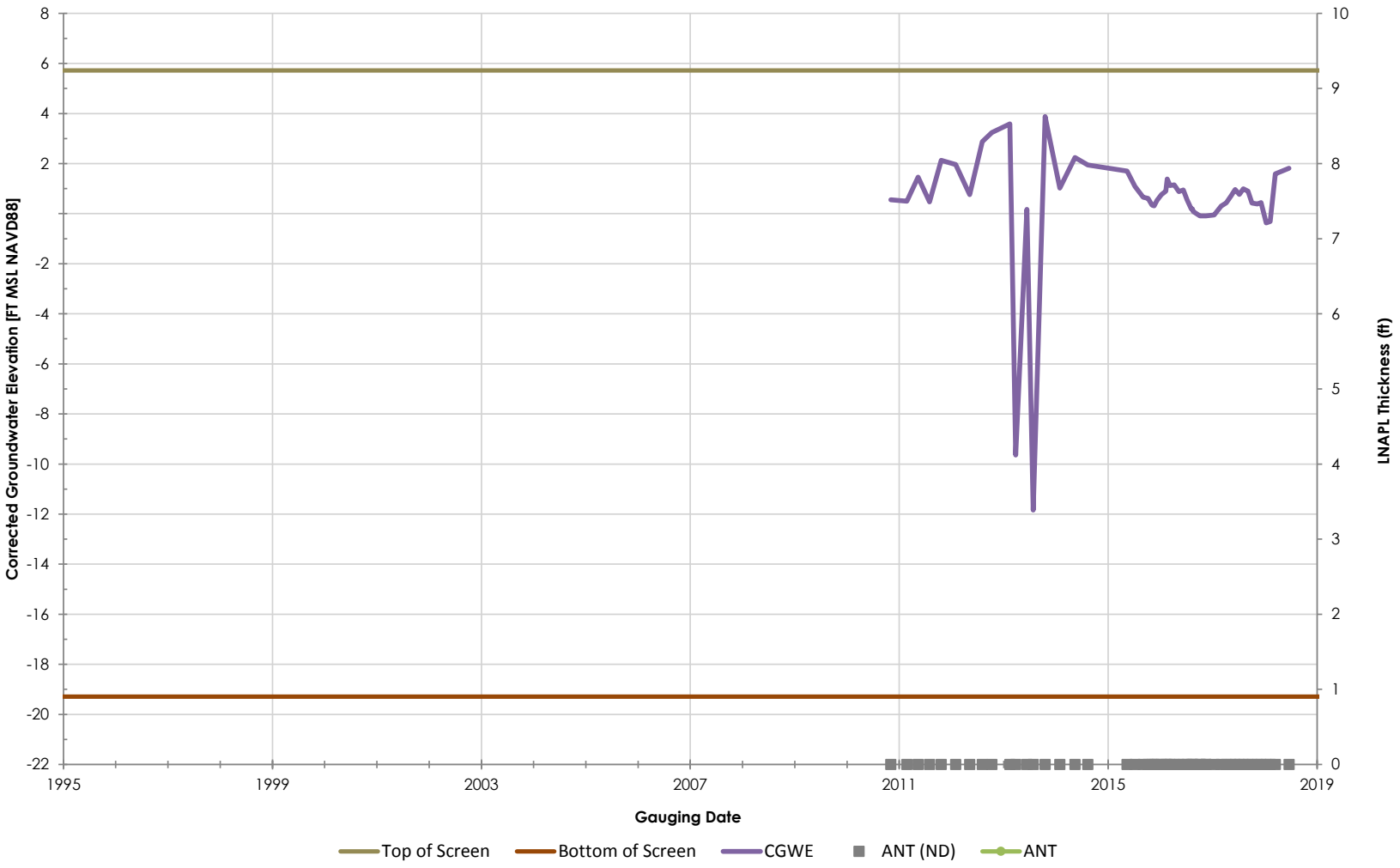
Stantec

Figure/Well No.

RW-710

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

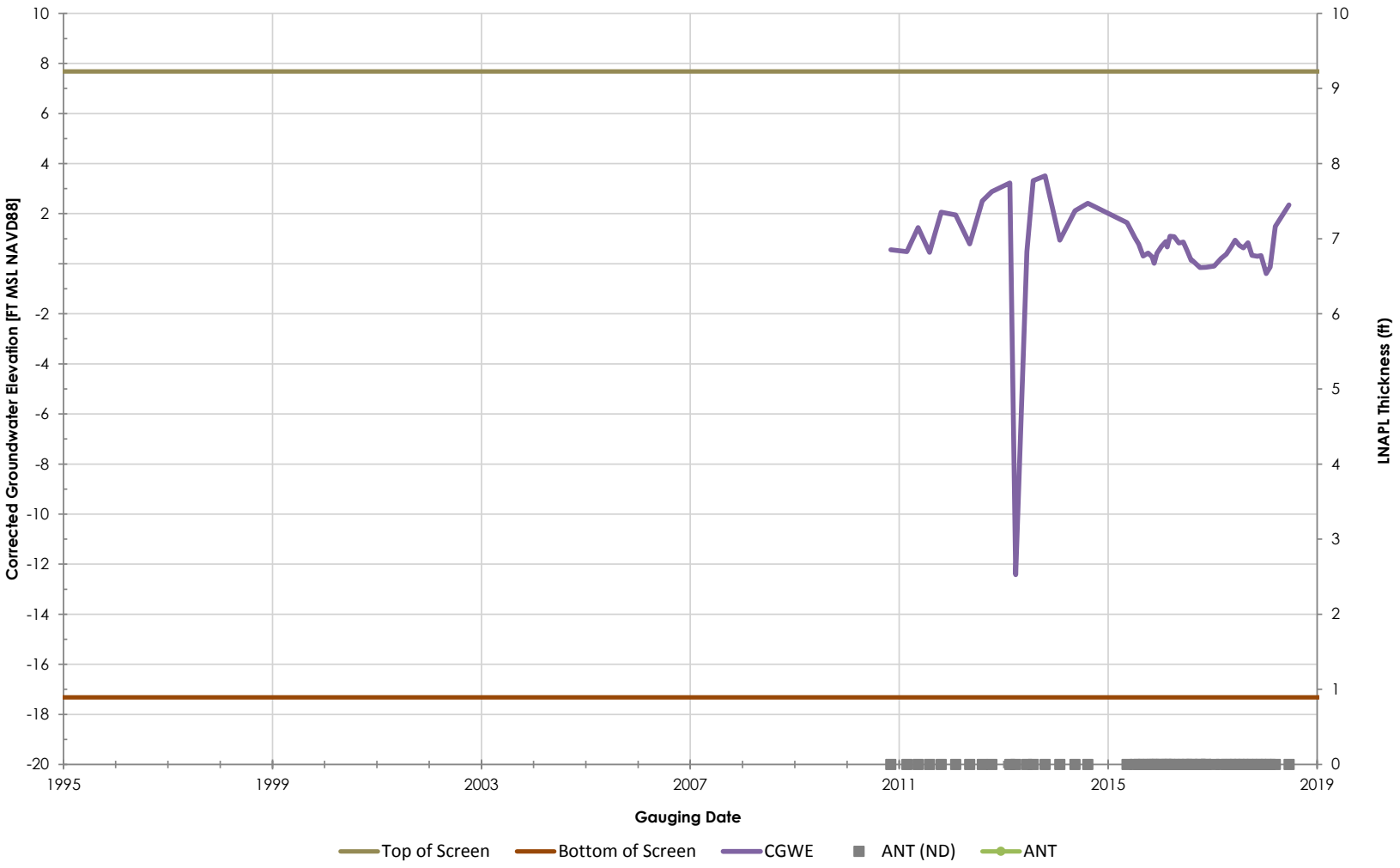
Stantec

Figure/Well No.

RW-711

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

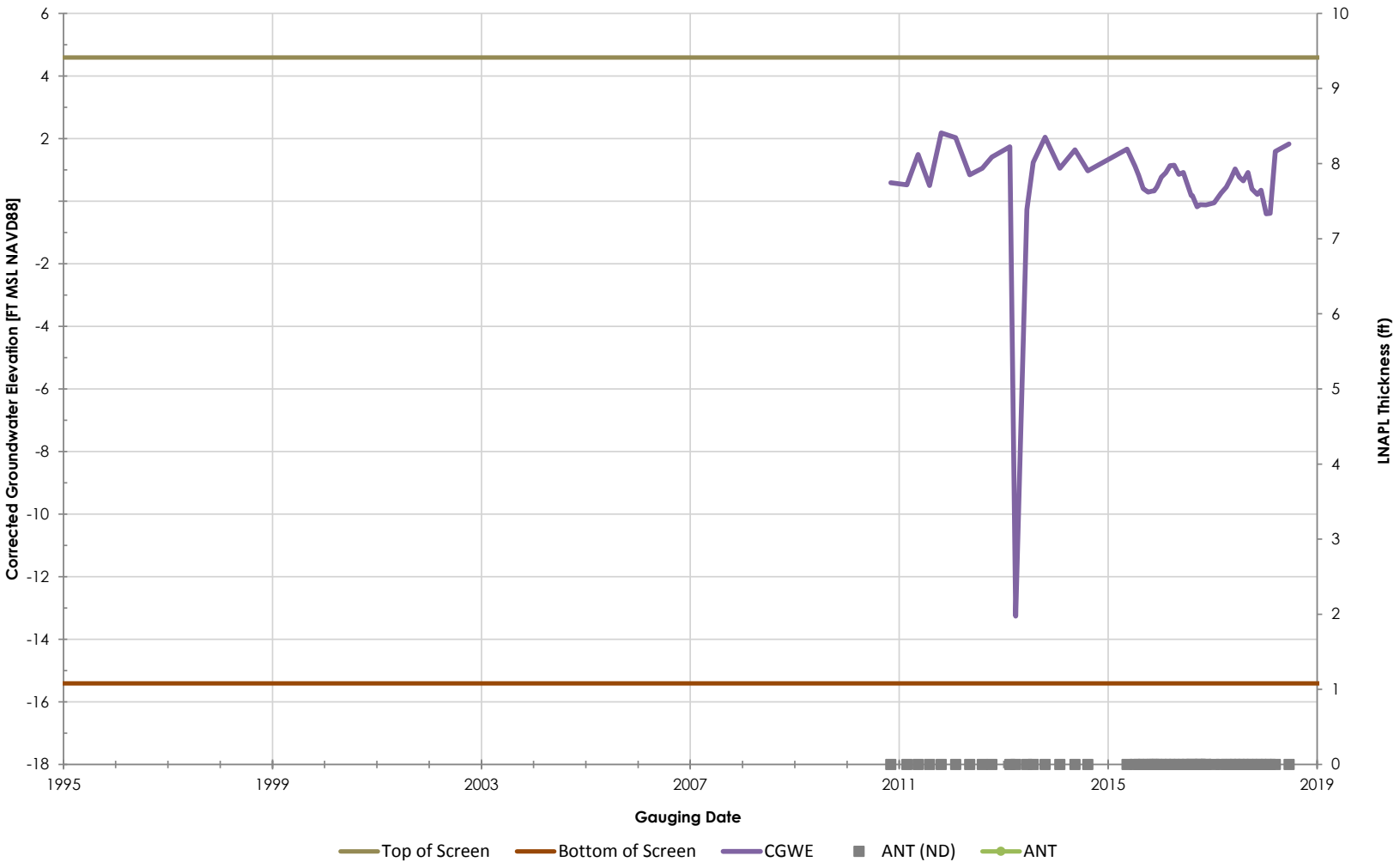
Stantec

Figure/Well No.

RW-712

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

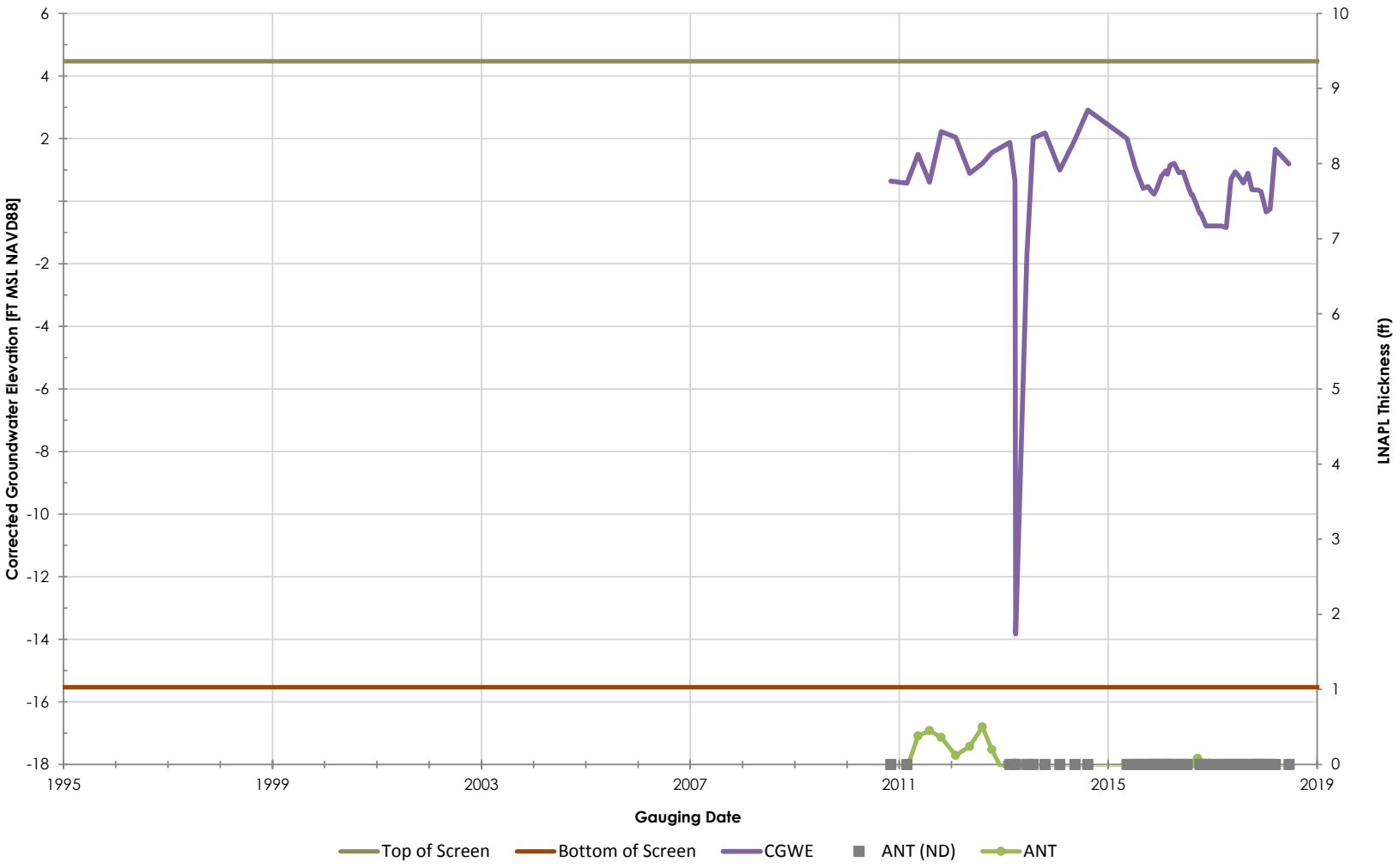
Stantec

Figure/Well No.

RW-713

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

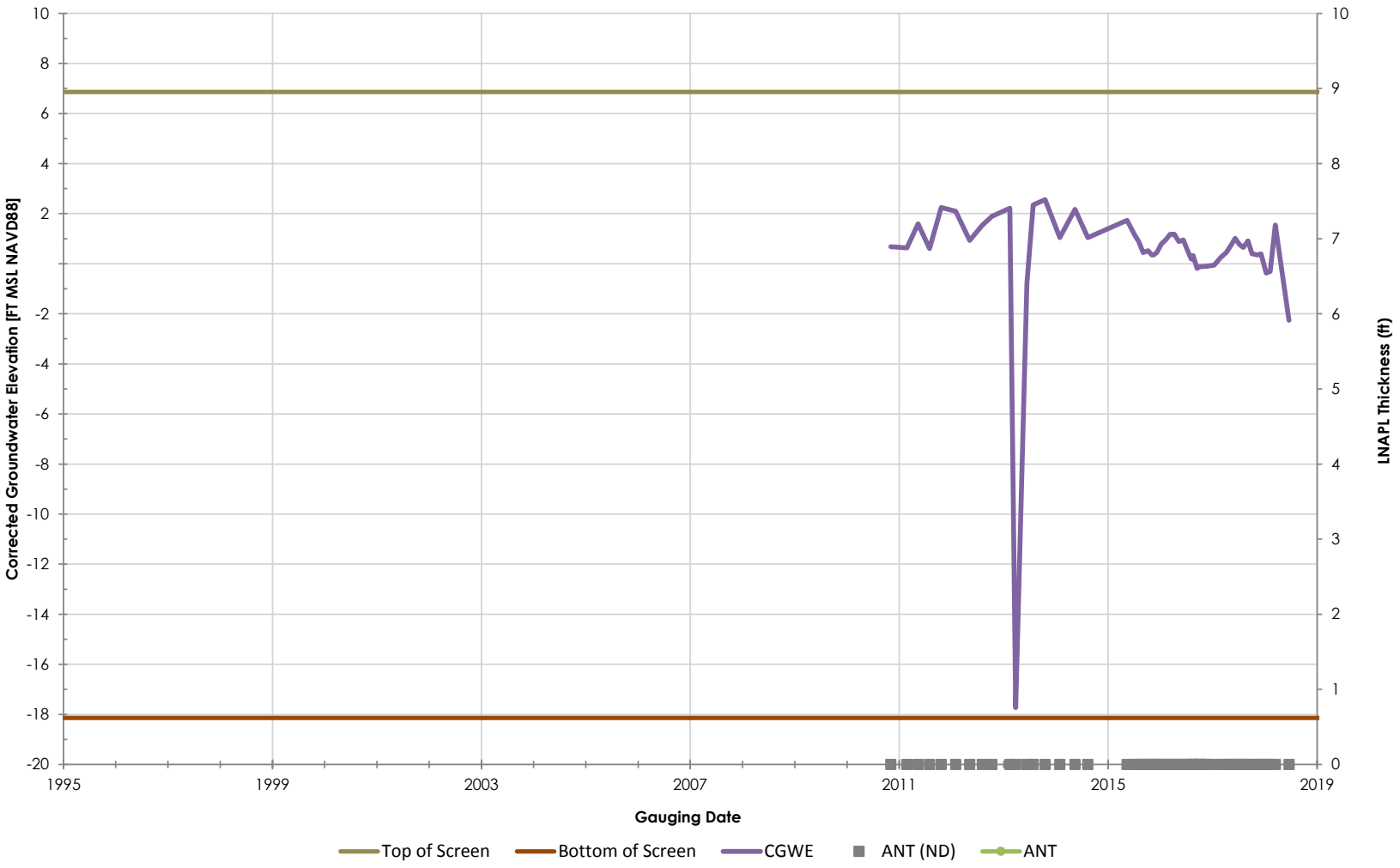
Stantec

Figure/Well No.

RW-714

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

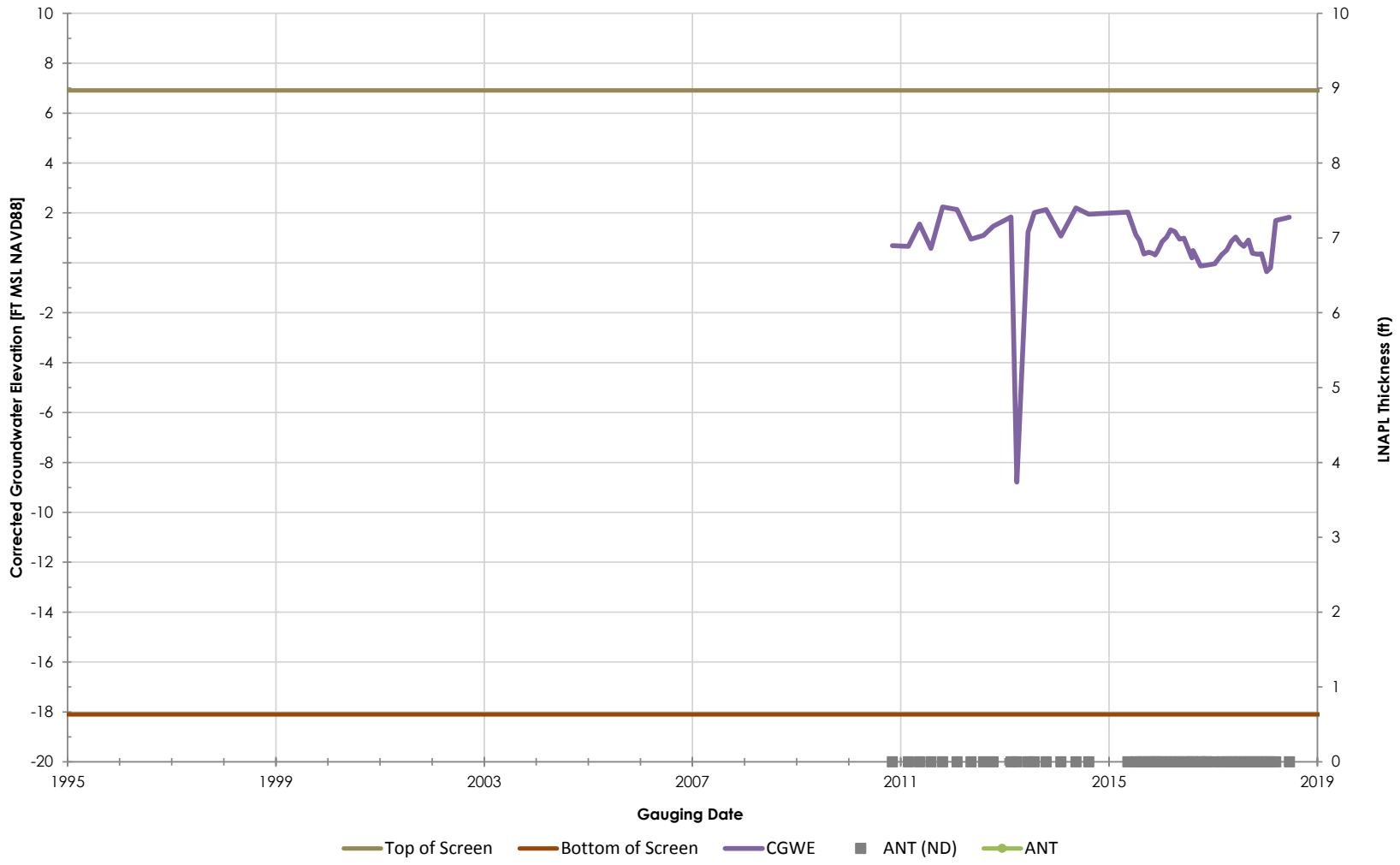
Stantec

Figure/Well No.

RW-715

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

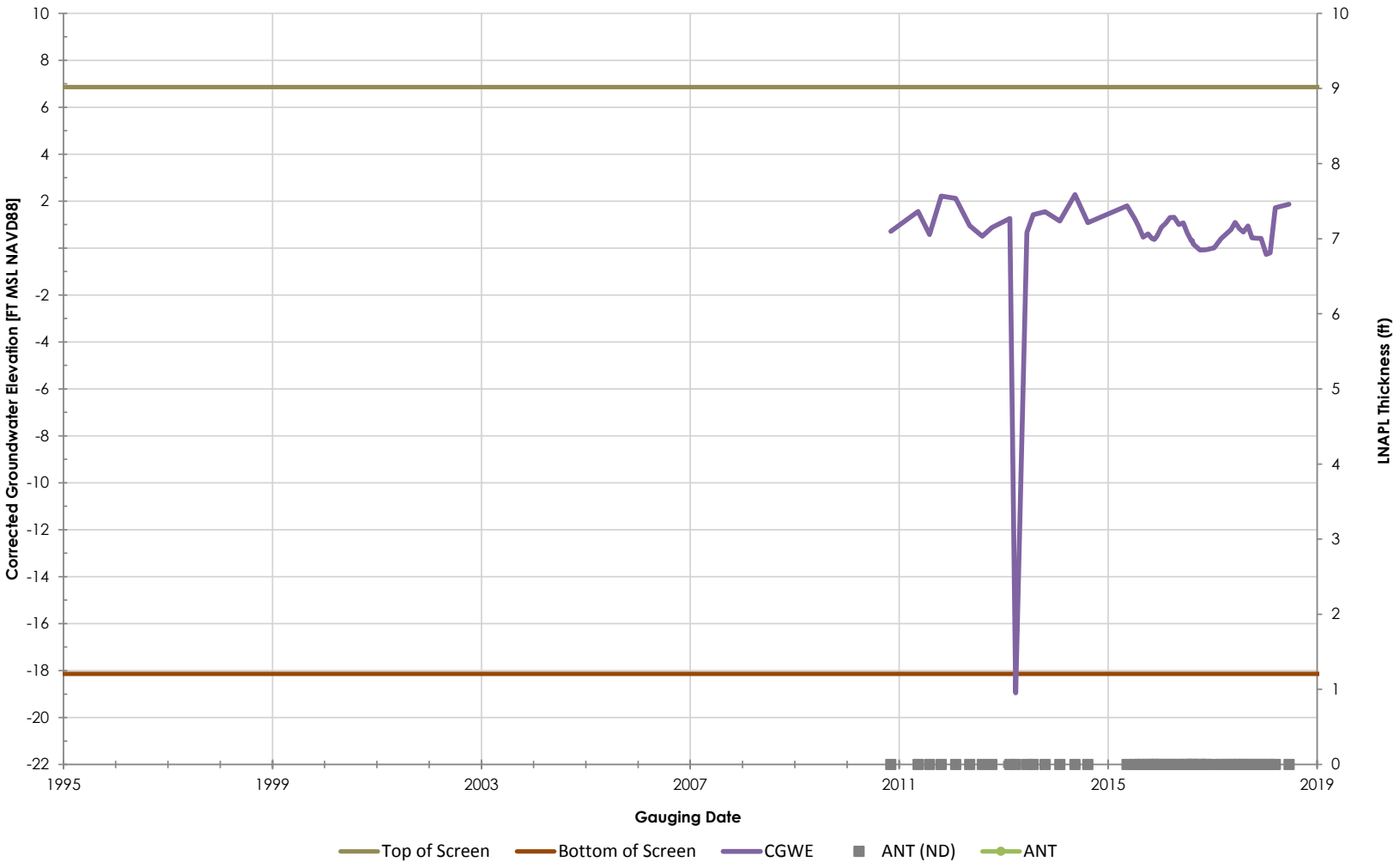
Stantec

Figure/Well No.

RW-716

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

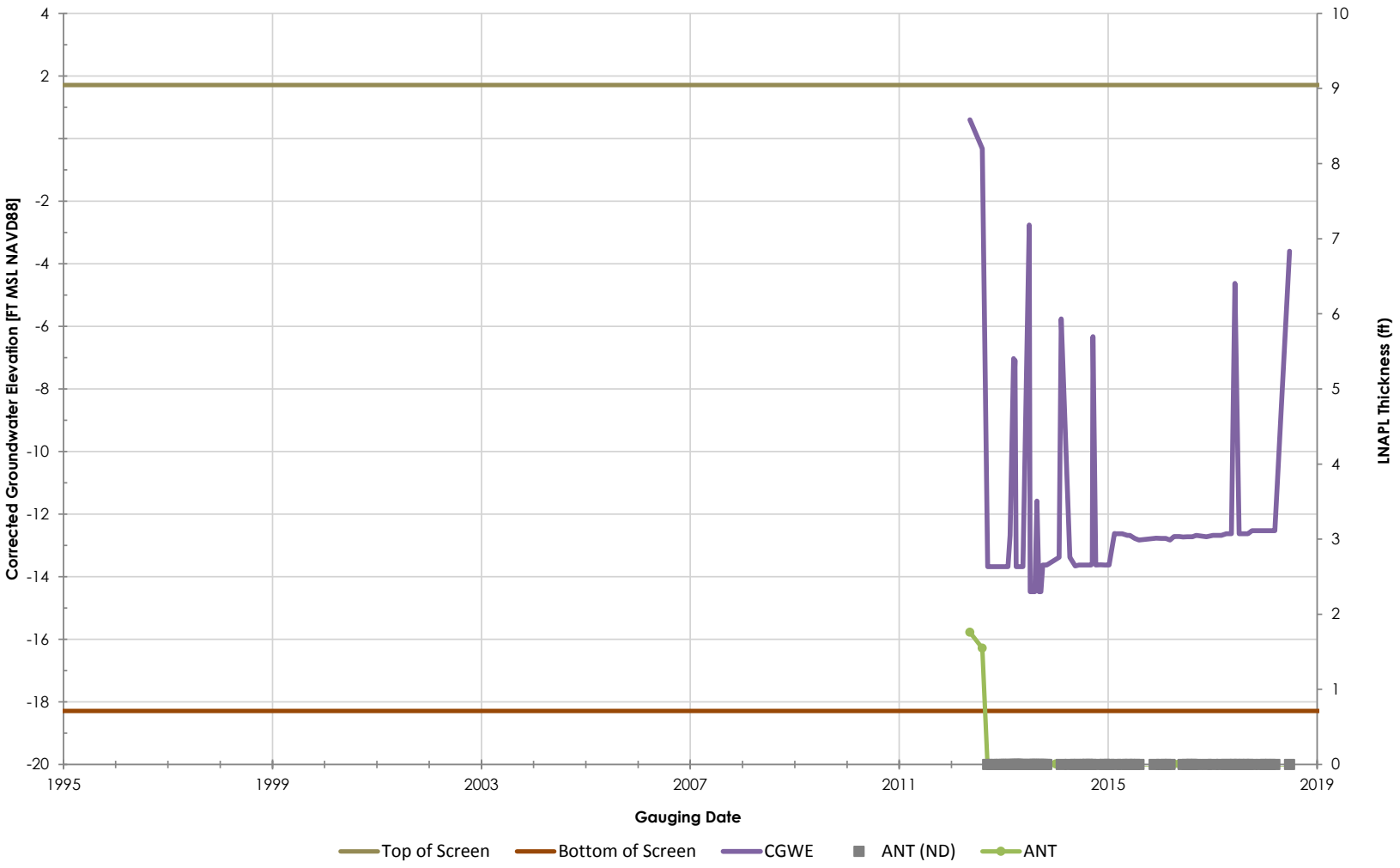
Stantec

Figure/Well No.

RW-717

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

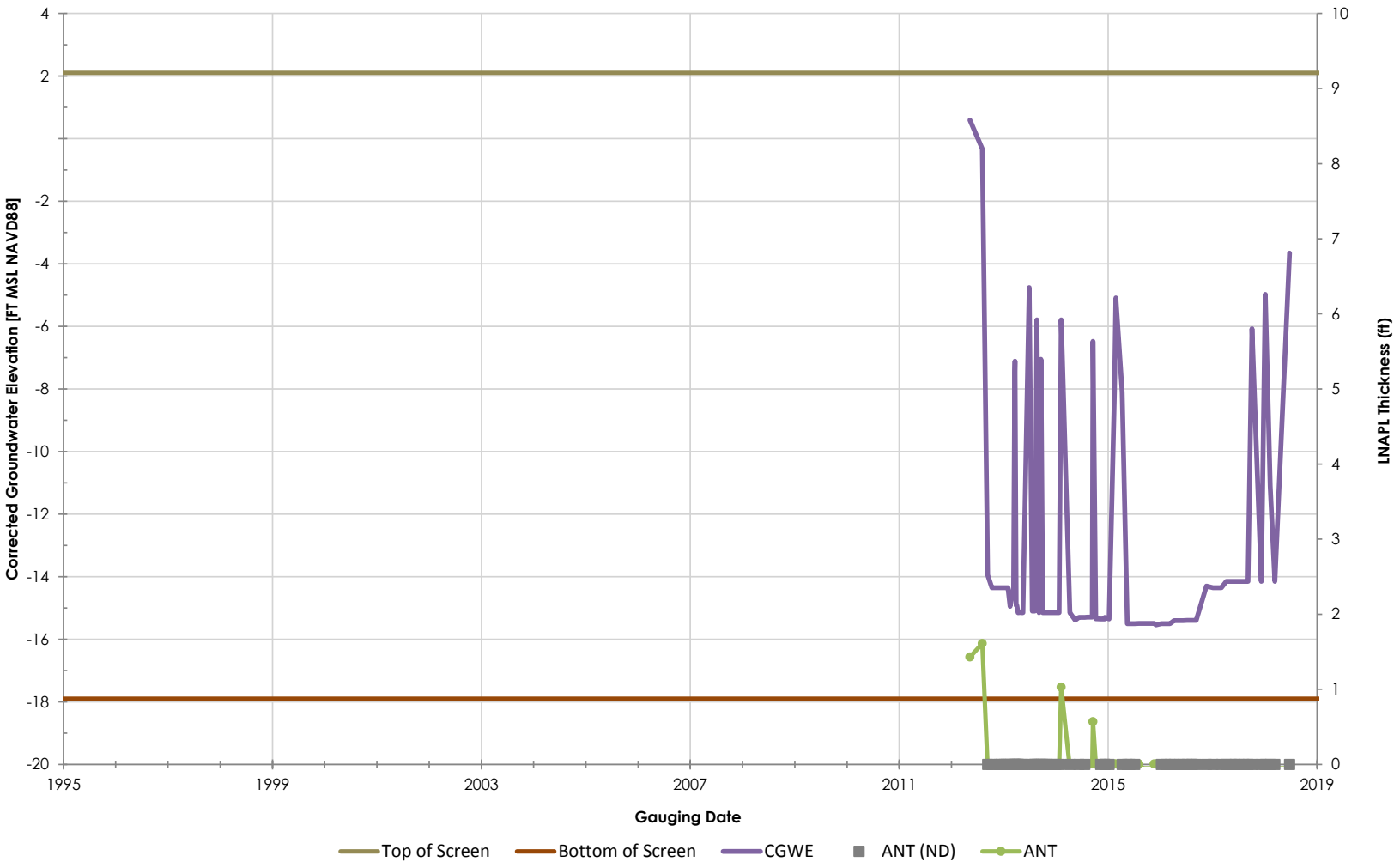
Stantec

Figure/Well No.

RW-801

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

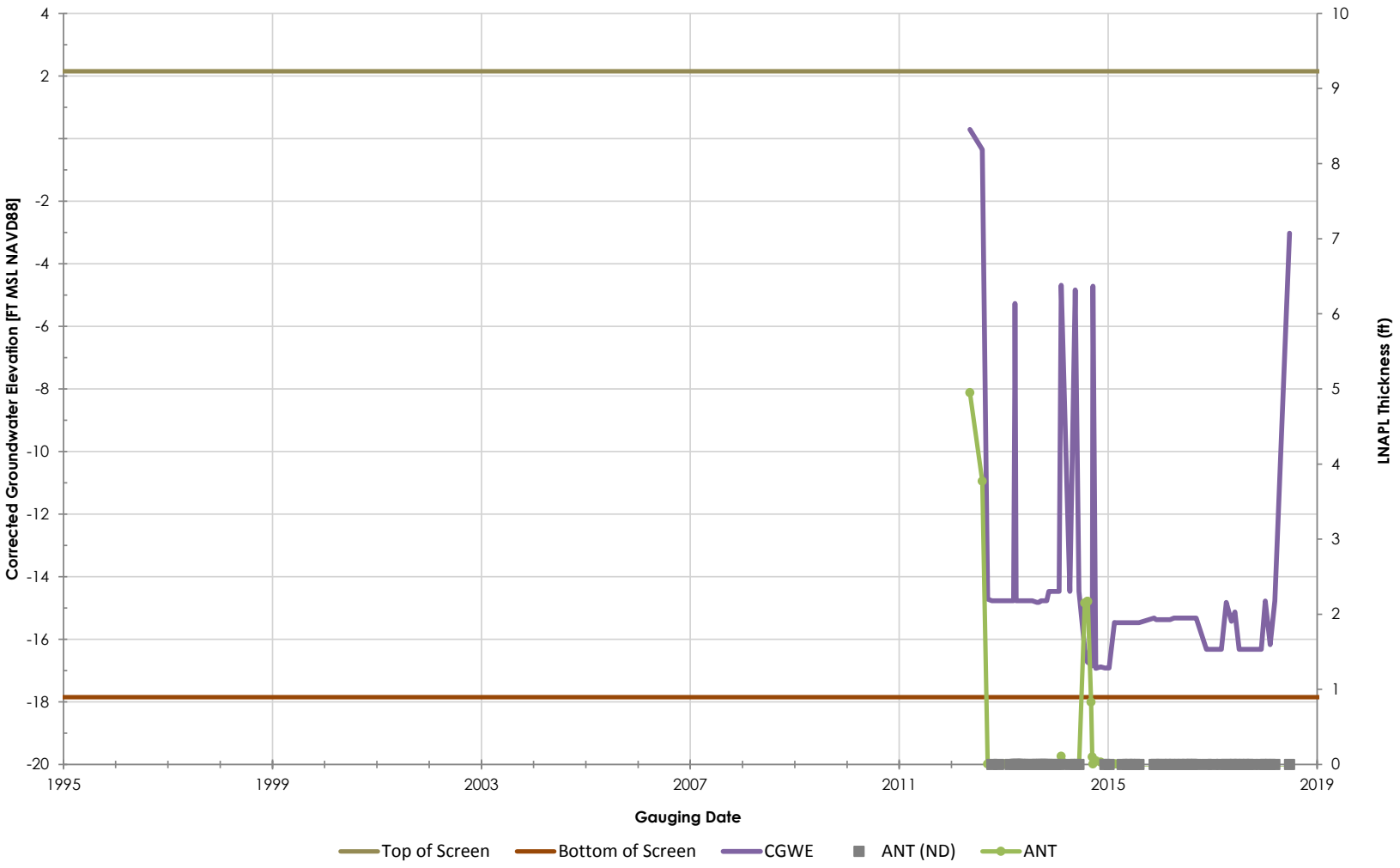
Stantec

Figure/Well No.

RW-802

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

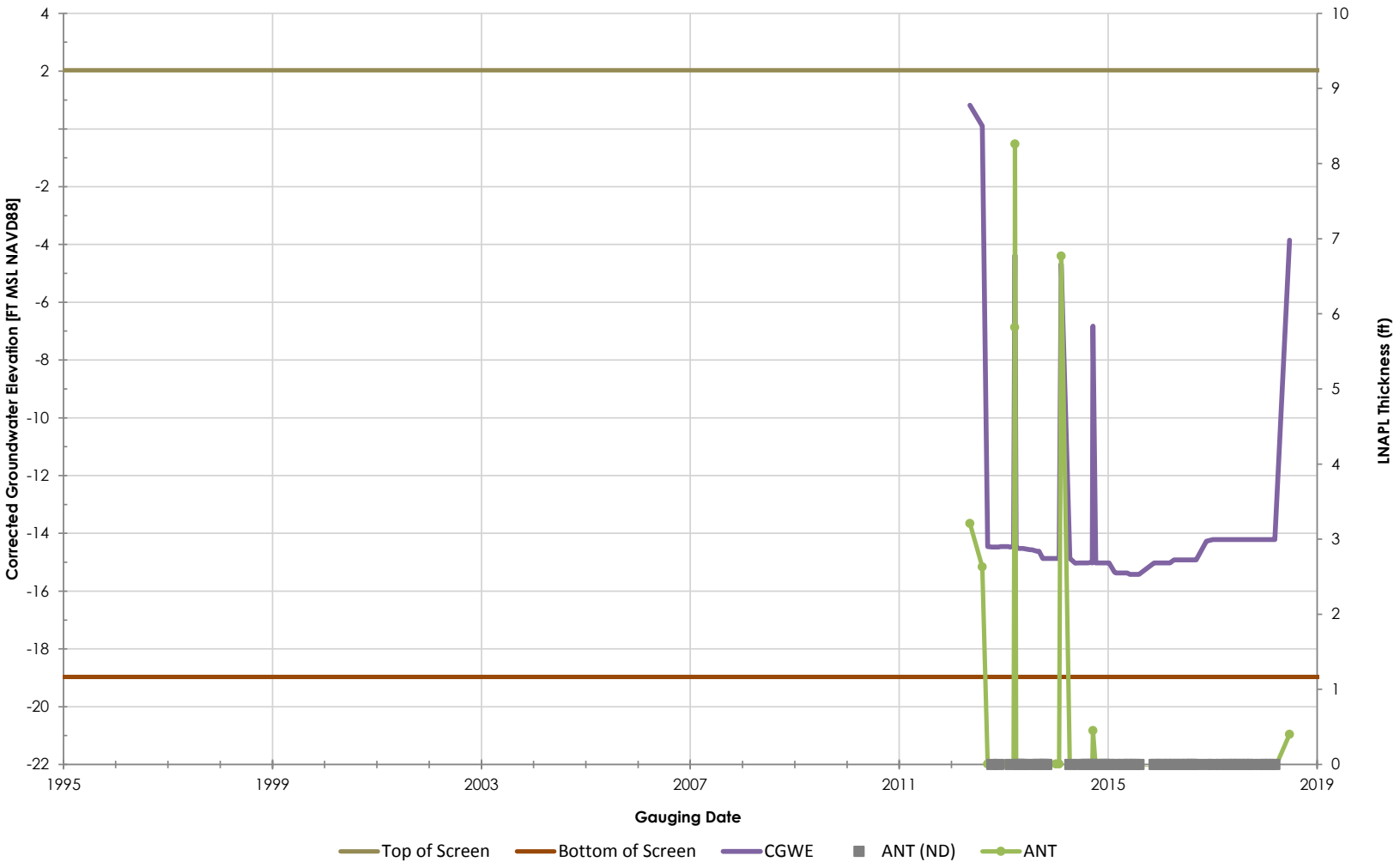
Stantec

Figure/Well No.

RW-803

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

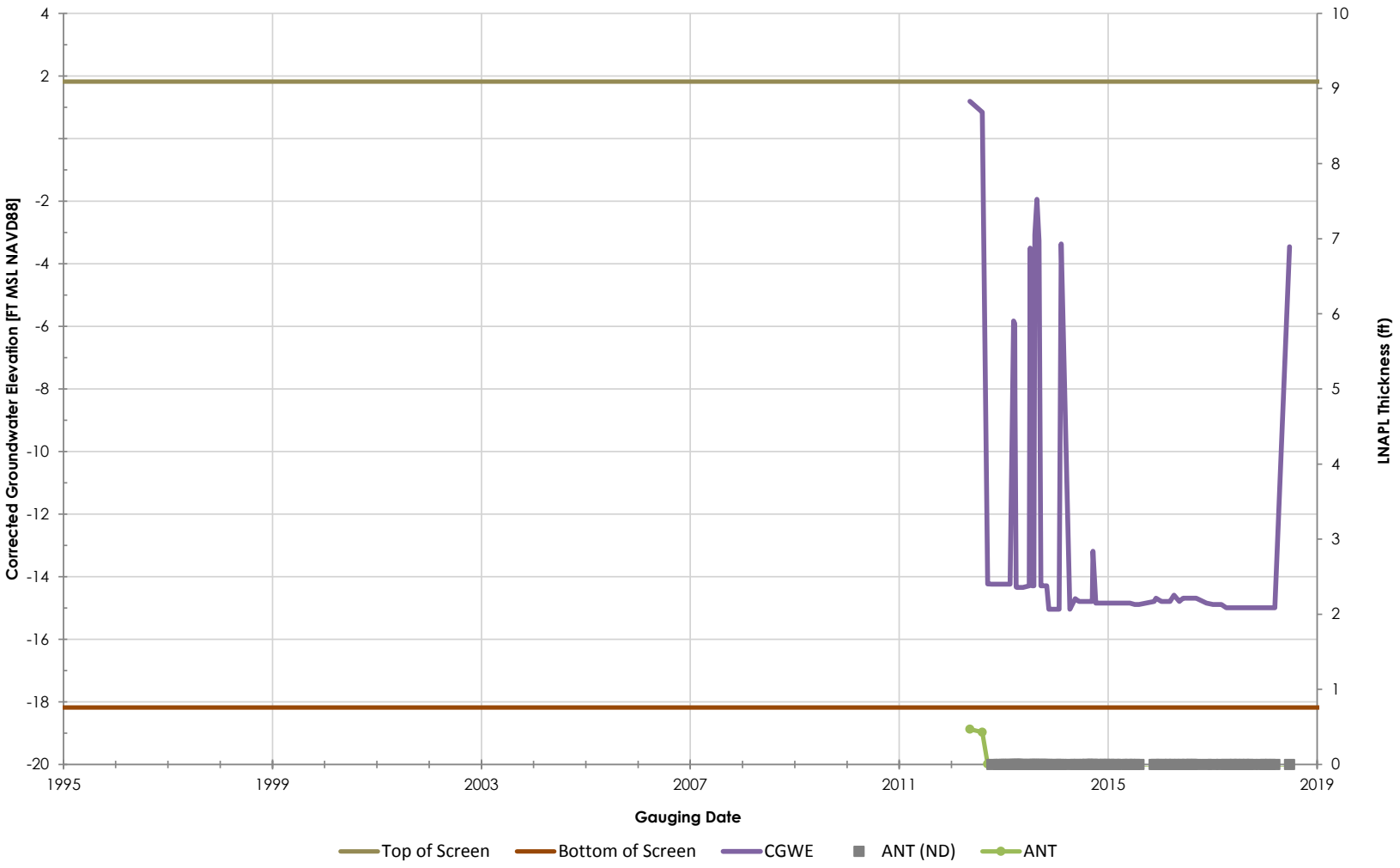
Stantec

Figure/Well No.

RW-804

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

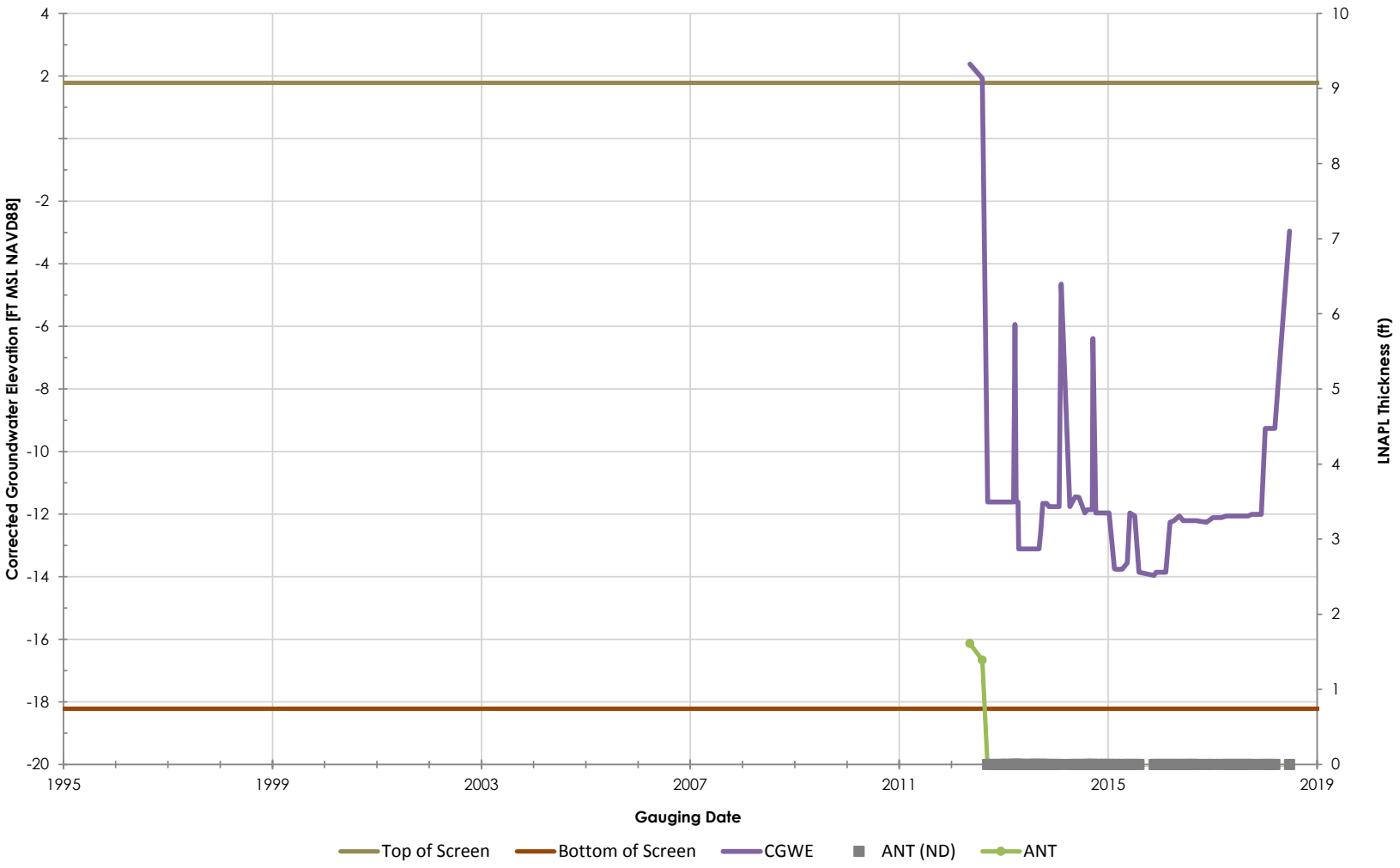
Stantec

Figure/Well No.

RW-806

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

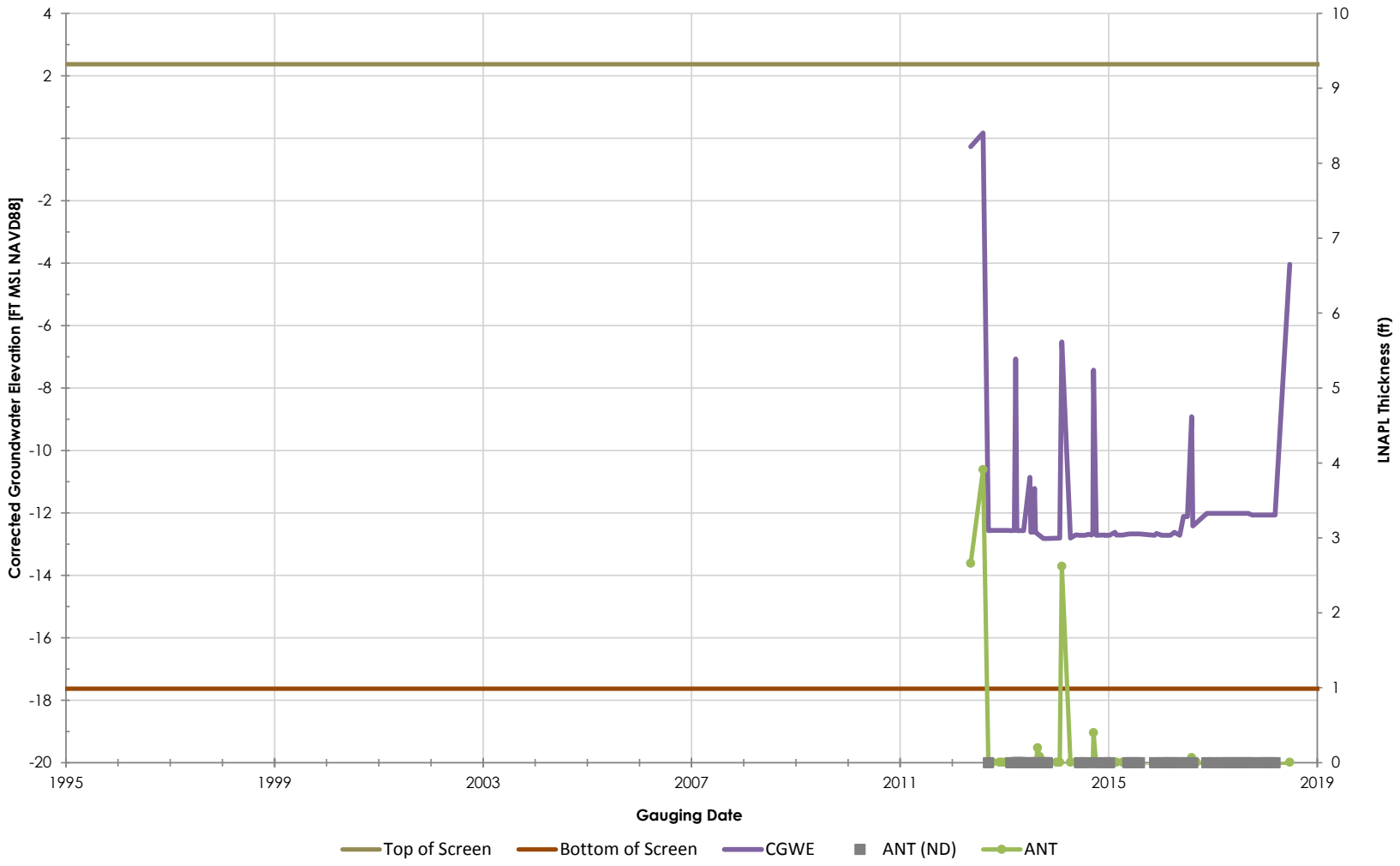
Stantec

Figure/Well No.

RW-807

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

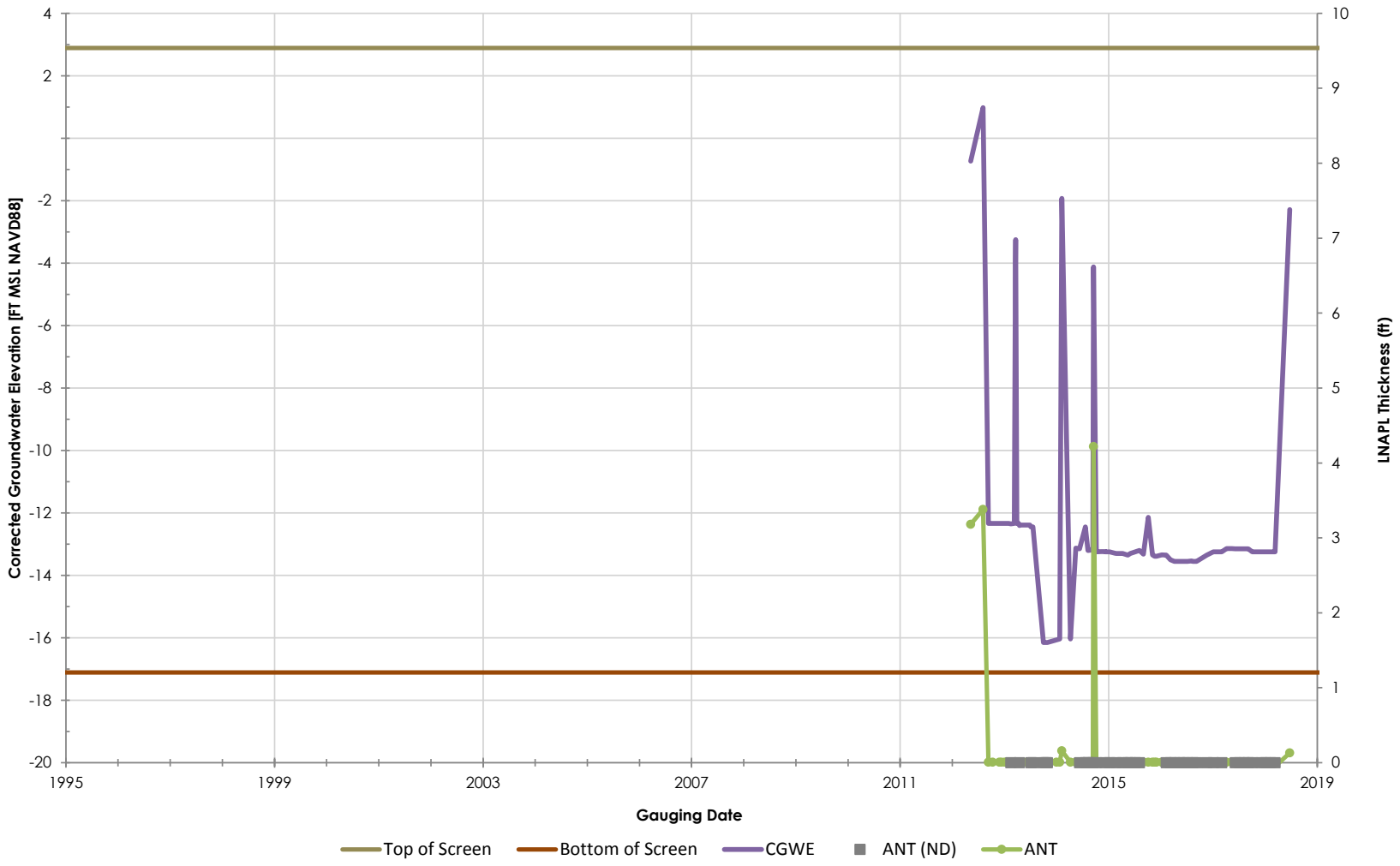
Stantec

Figure/Well No.

RW-808

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

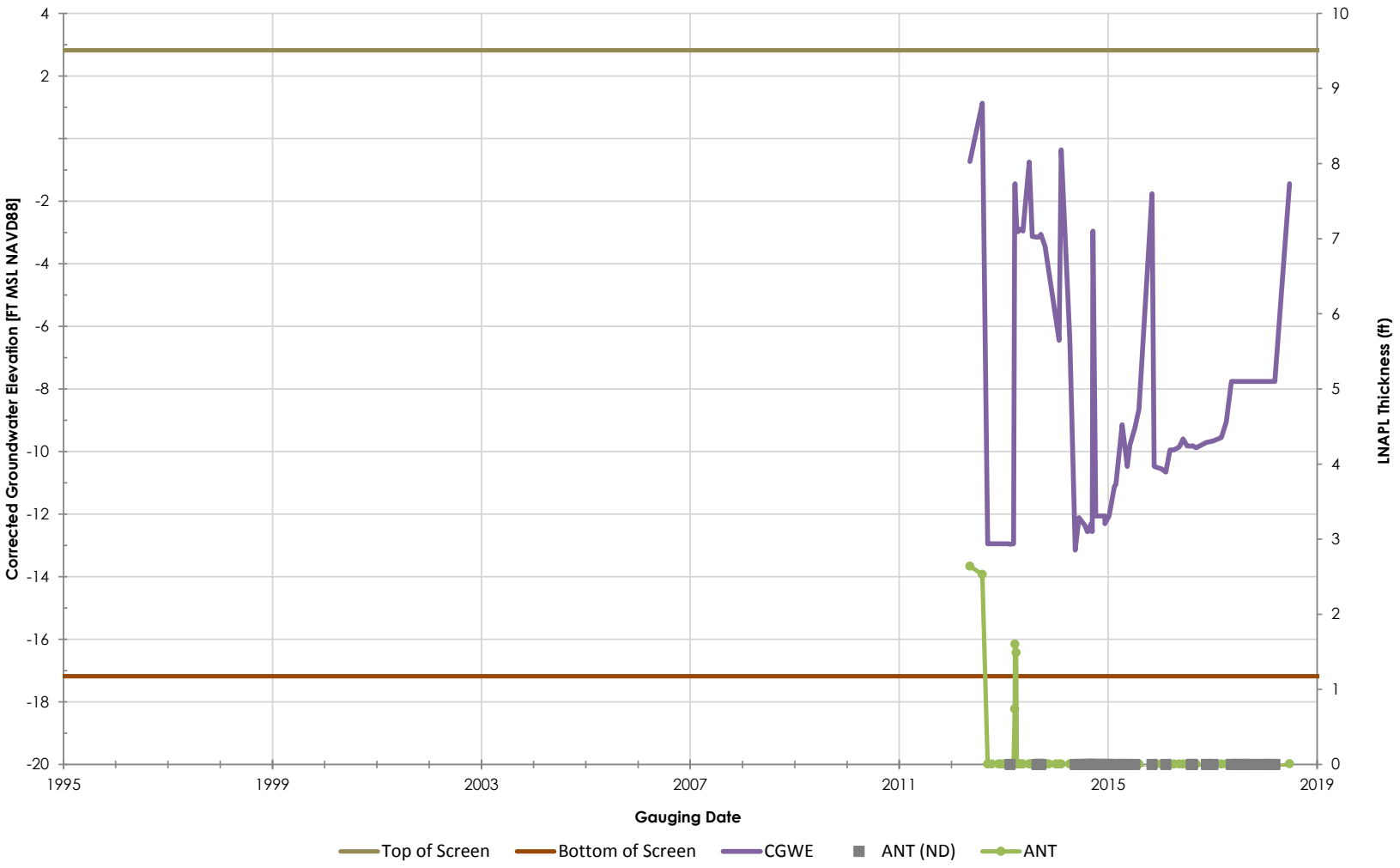
Stantec

Figure/Well No.

RW-809

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

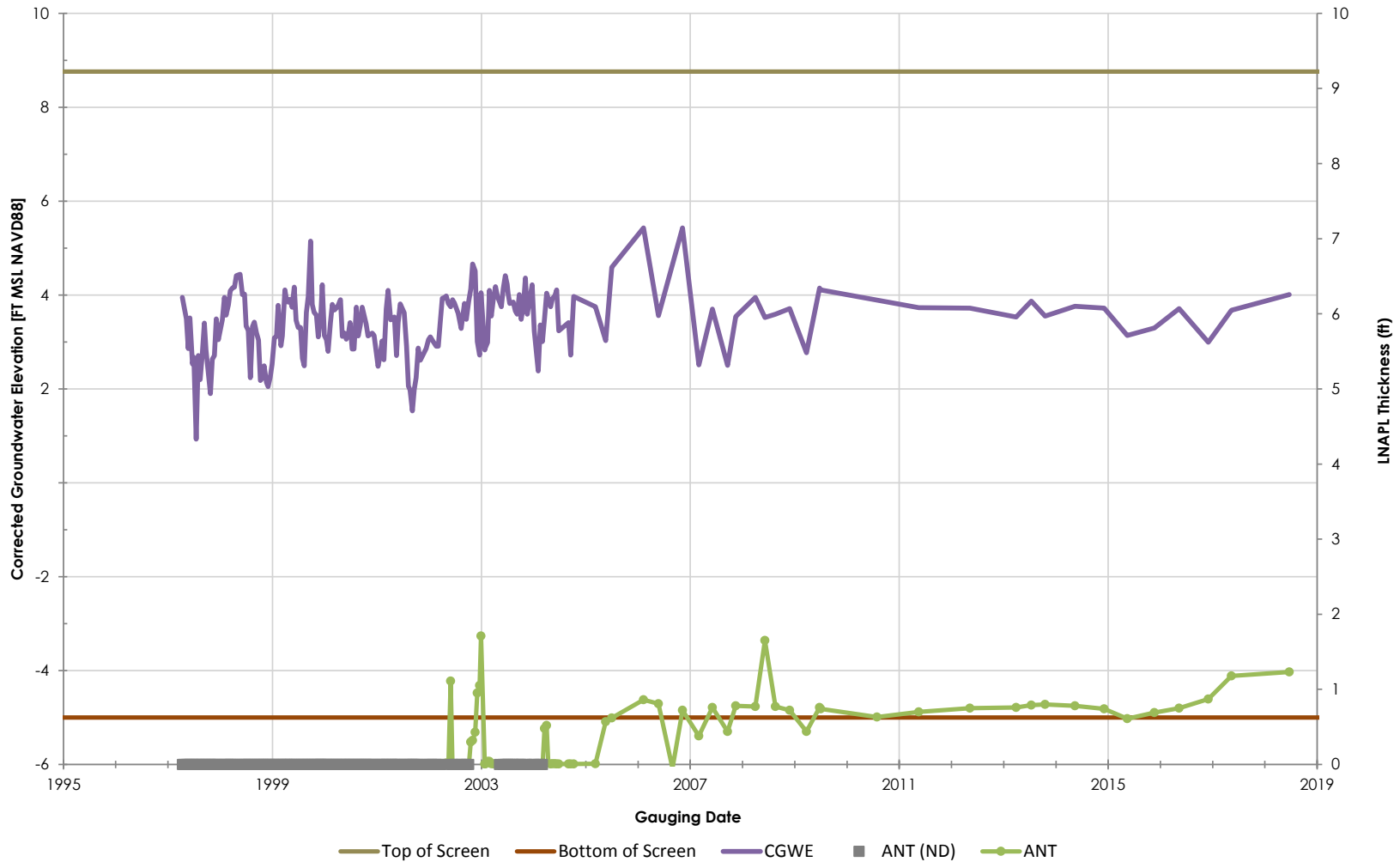
Stantec

Figure/Well No.

RW-810

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

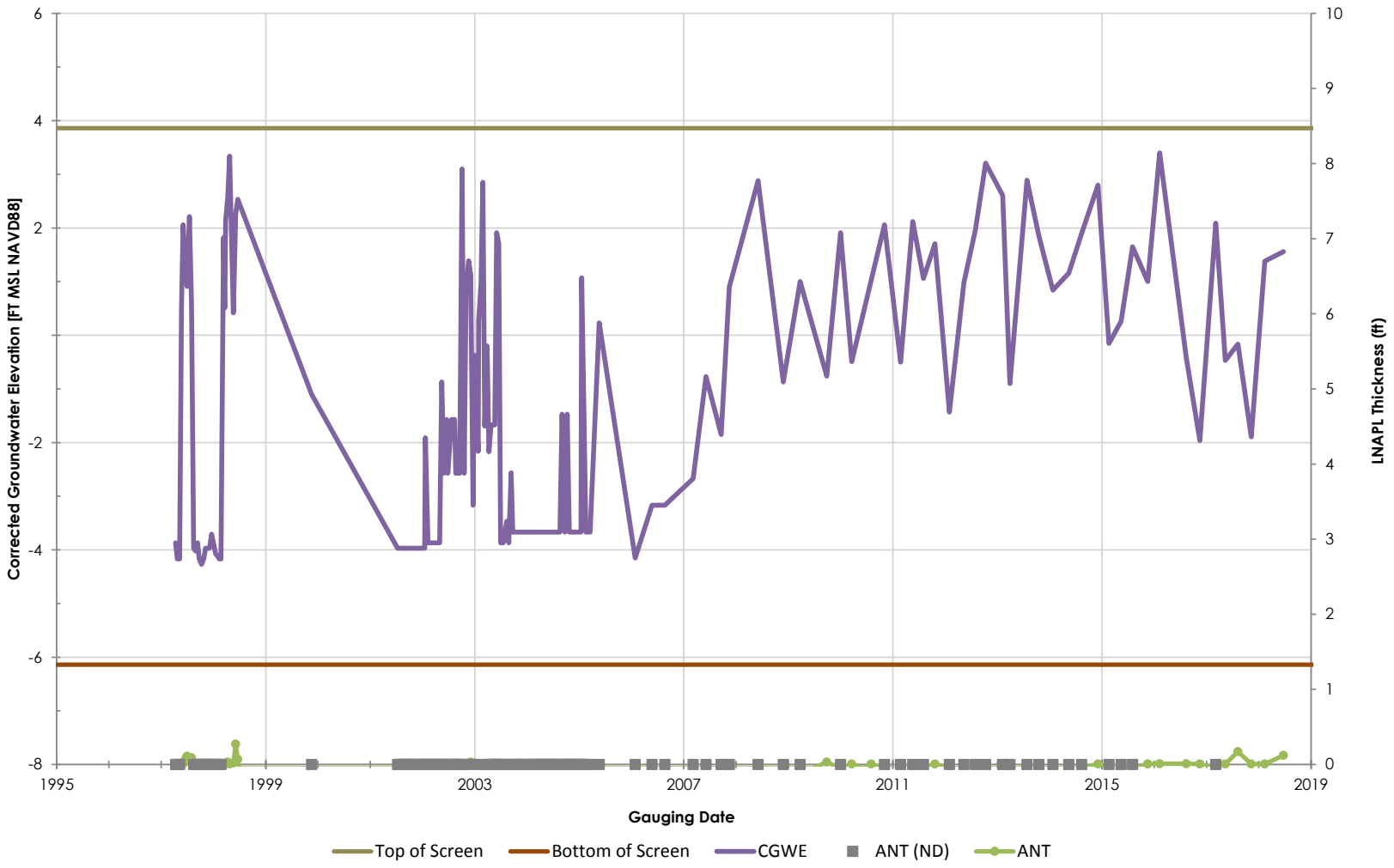
Stantec

Figure/Well No.

RW-9

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

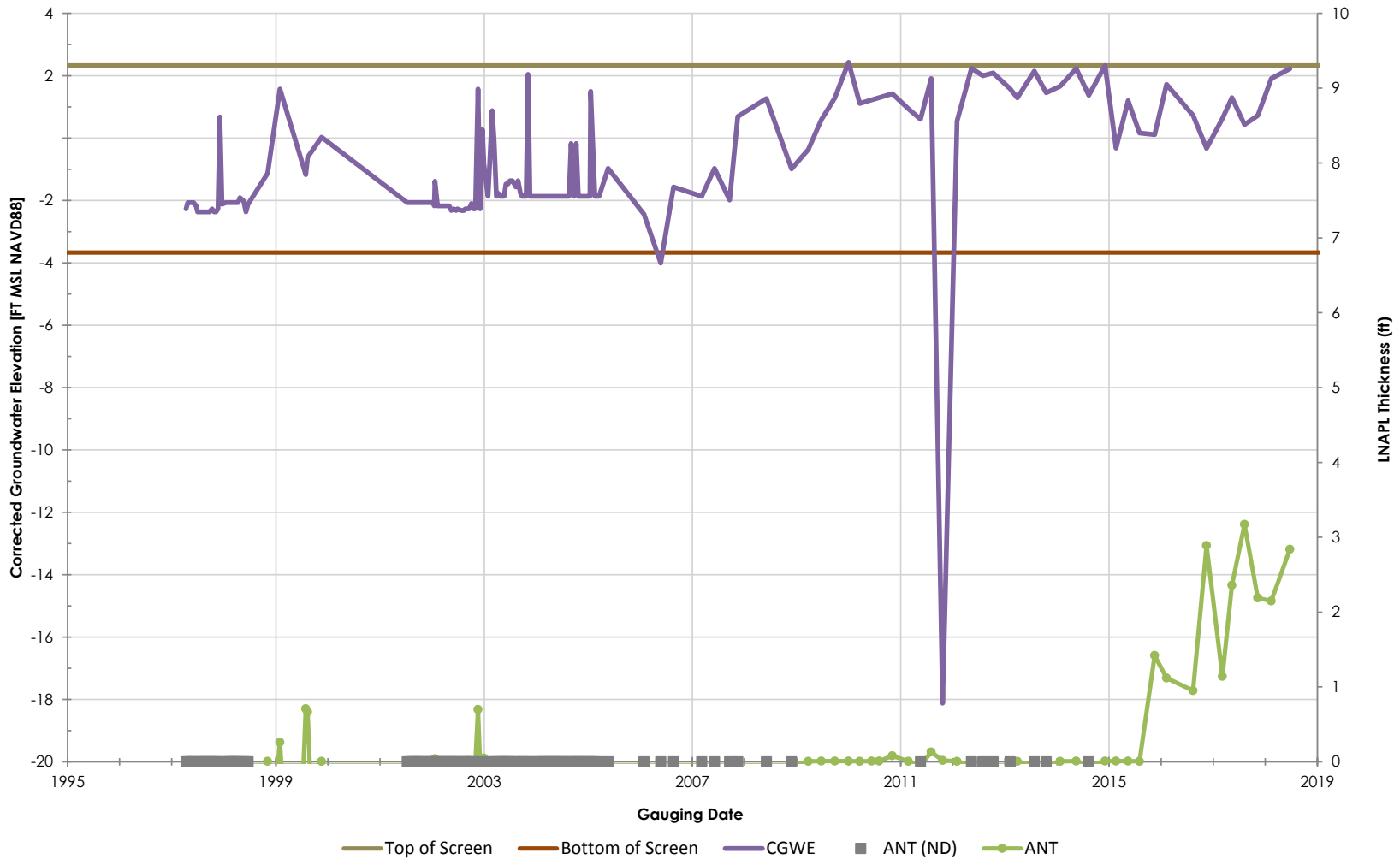
Stantec

Figure/Well No.

RWBH-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

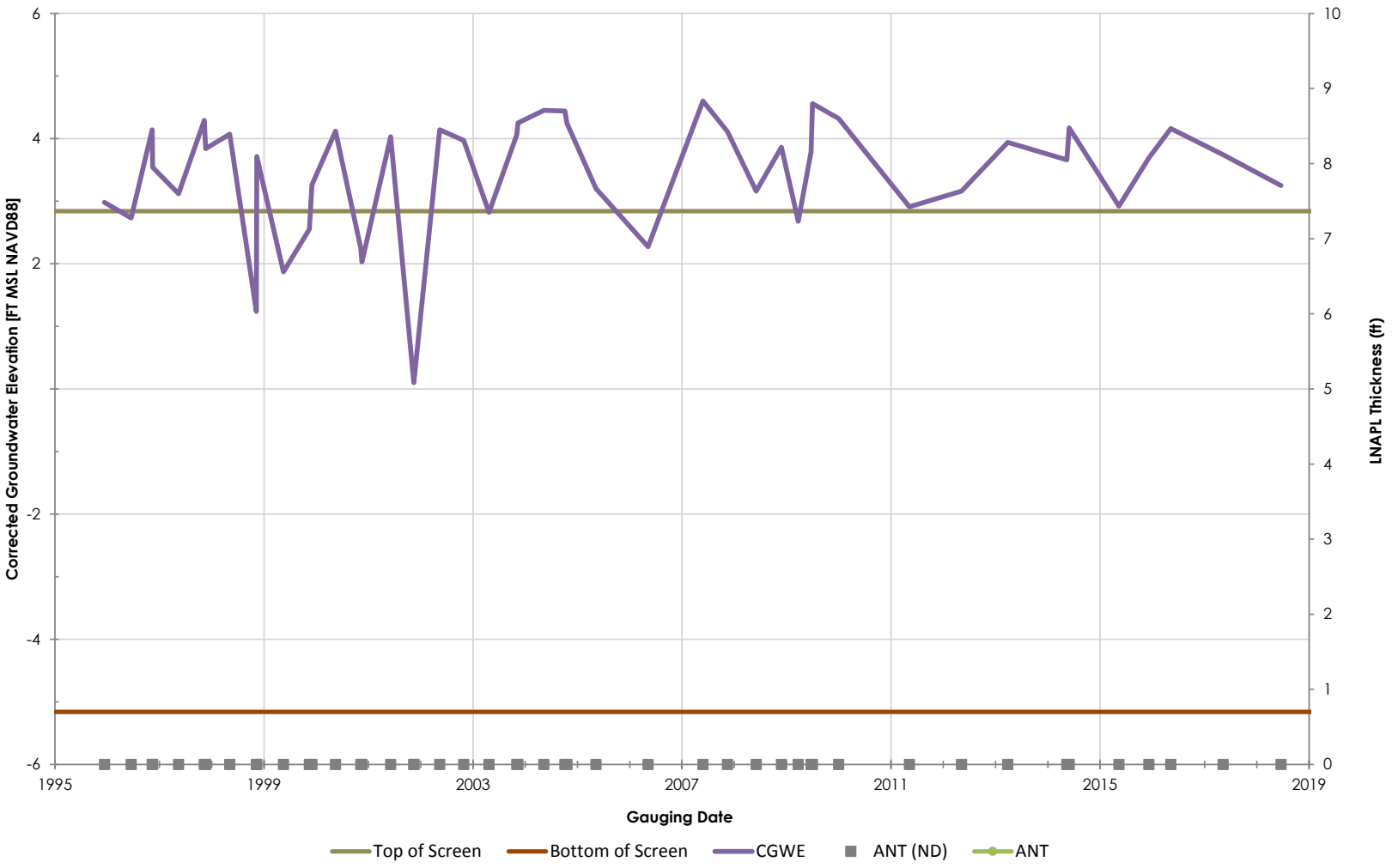
Stantec

Figure/Well No.

RWBH-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

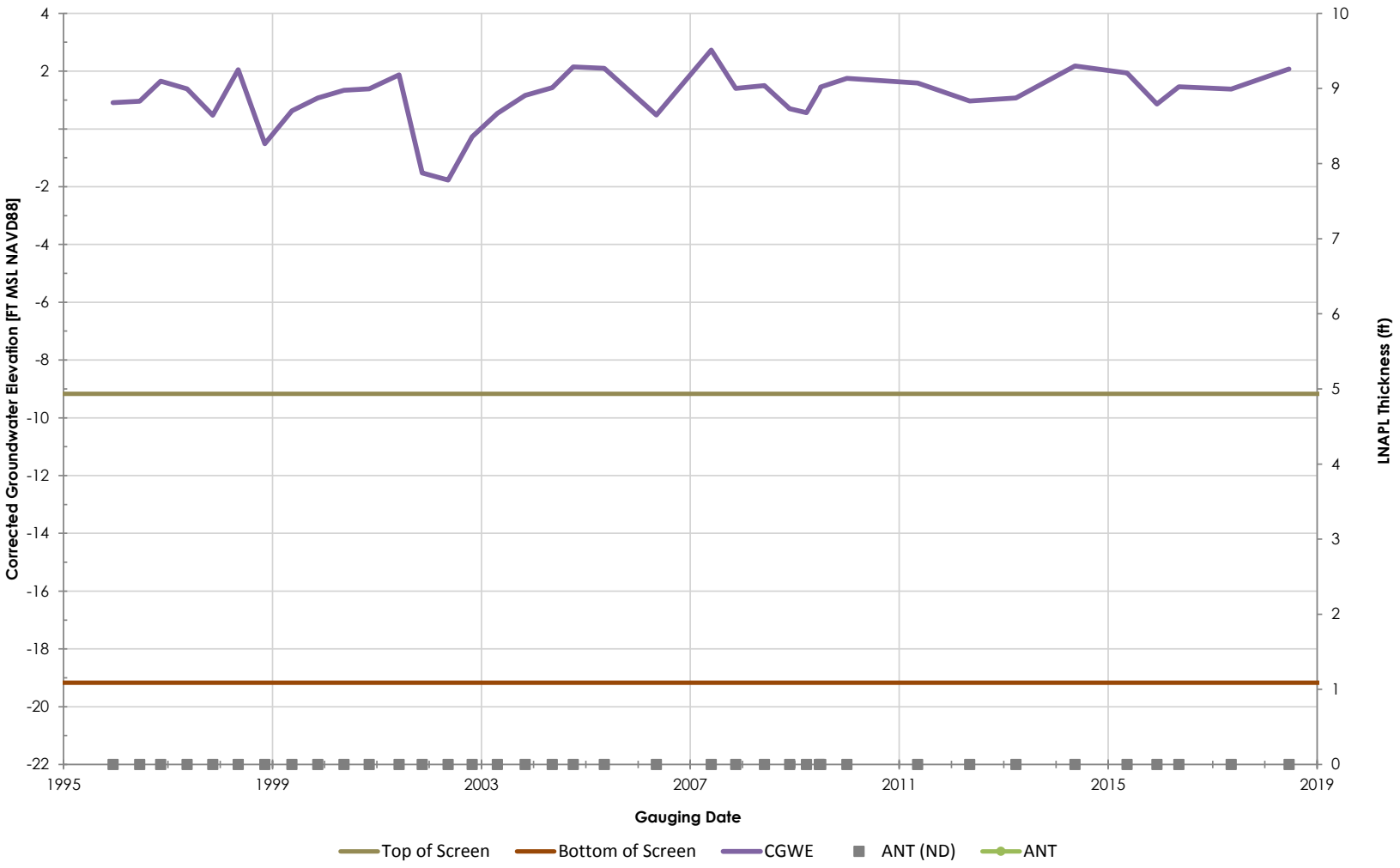
Stantec

Figure/Well No.

S-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

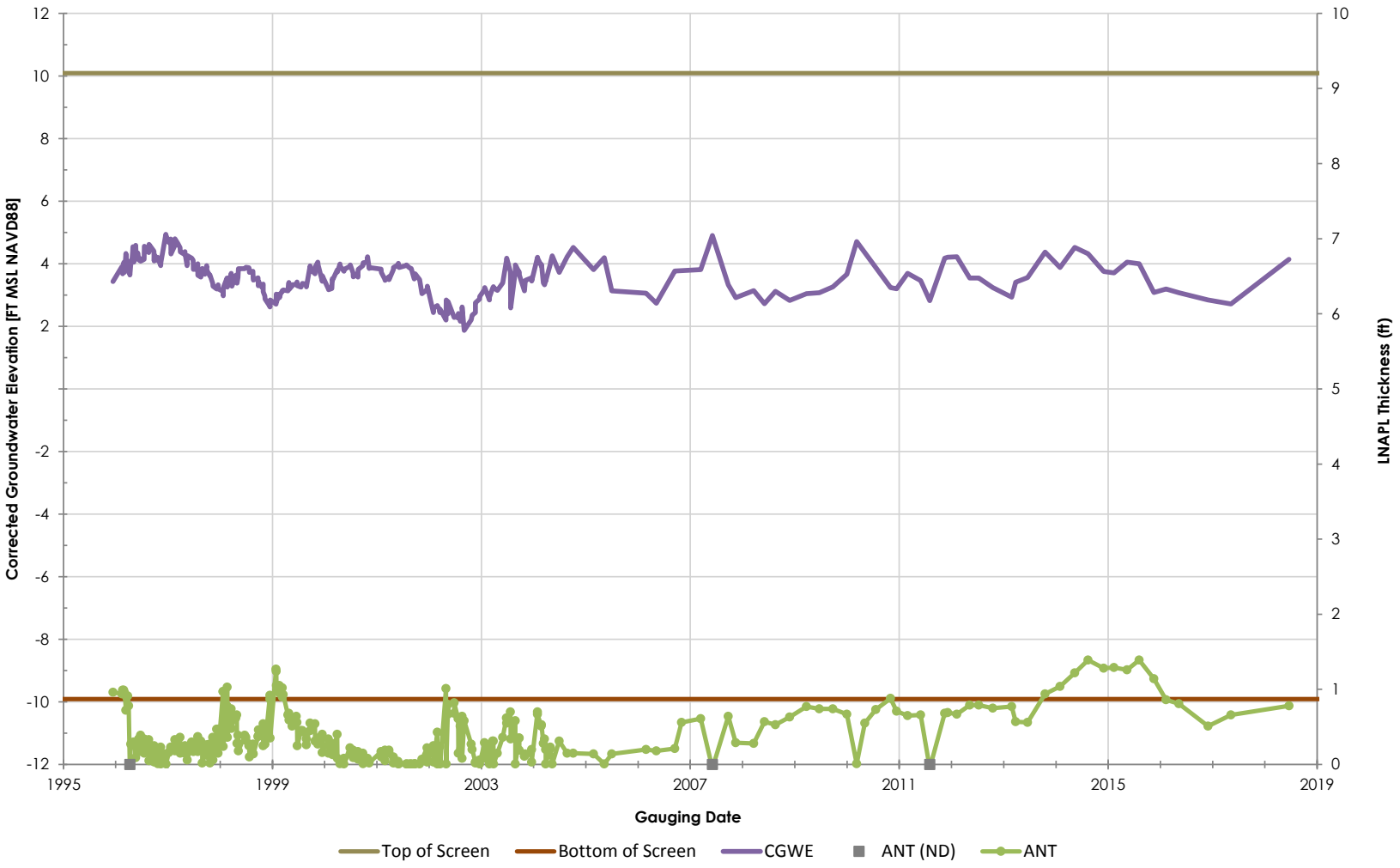
Stantec

Figure/Well No.

S-10

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

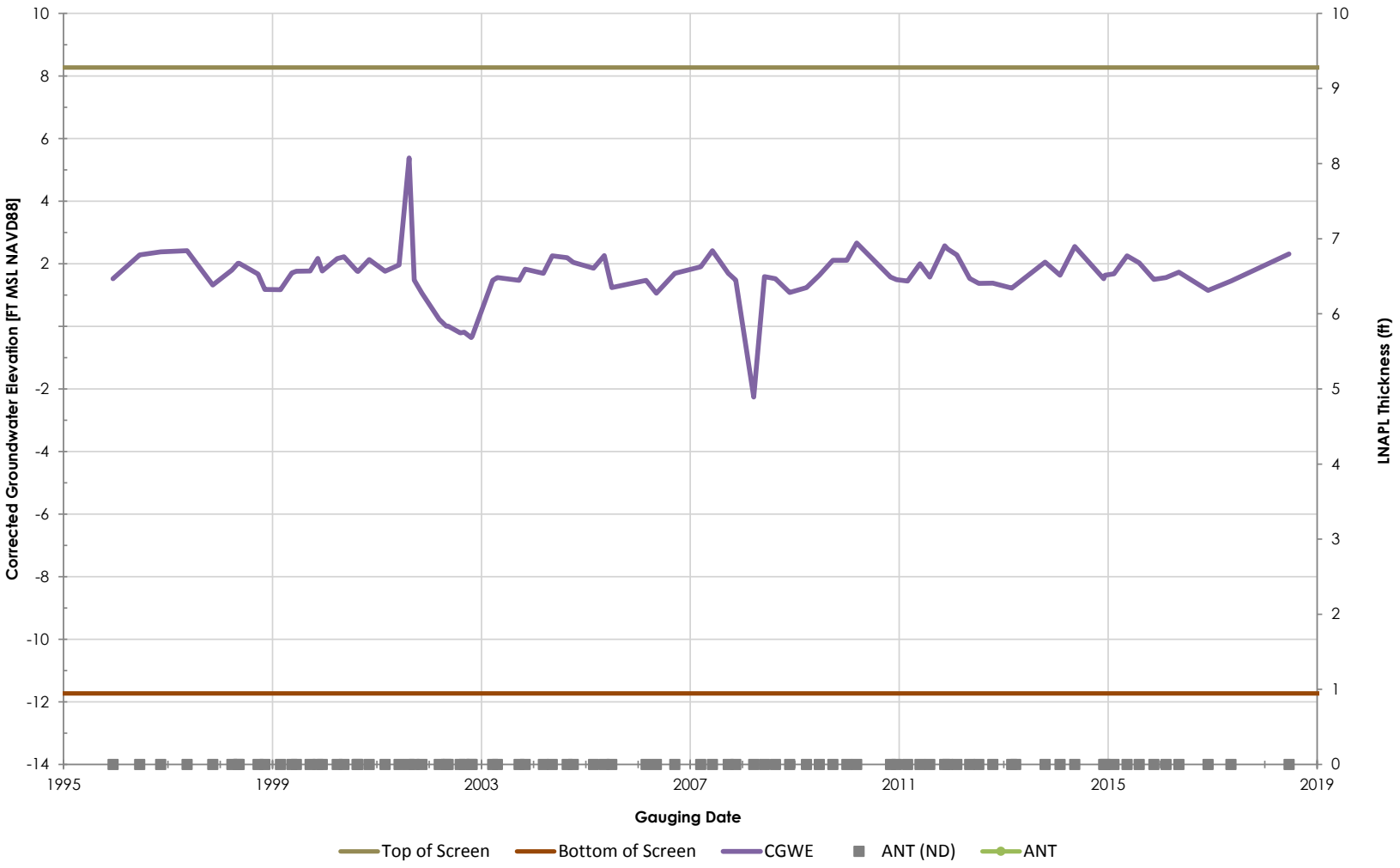
Stantec

Figure/Well No.

S-100

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

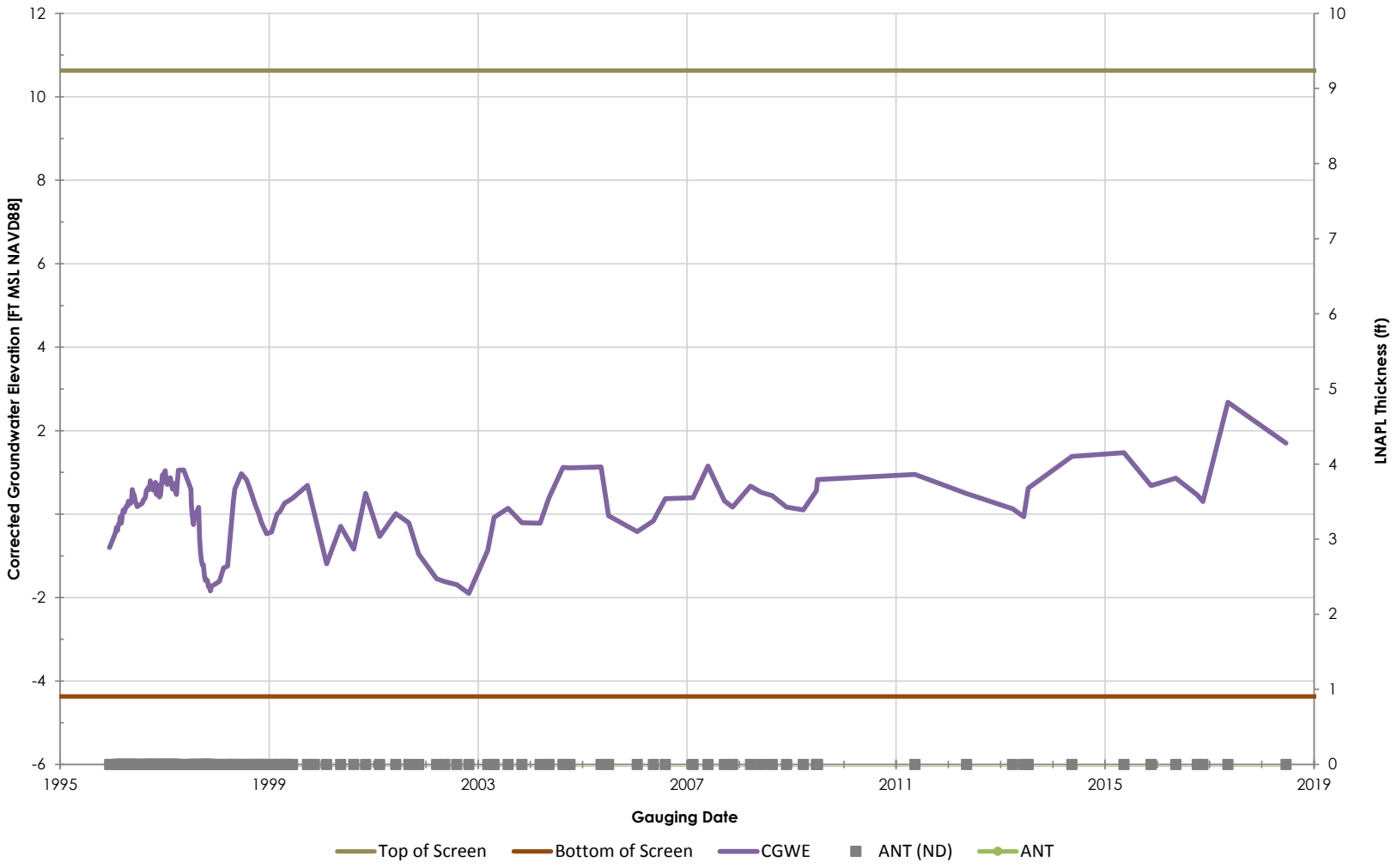
Stantec

Figure/Well No.

S-101

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

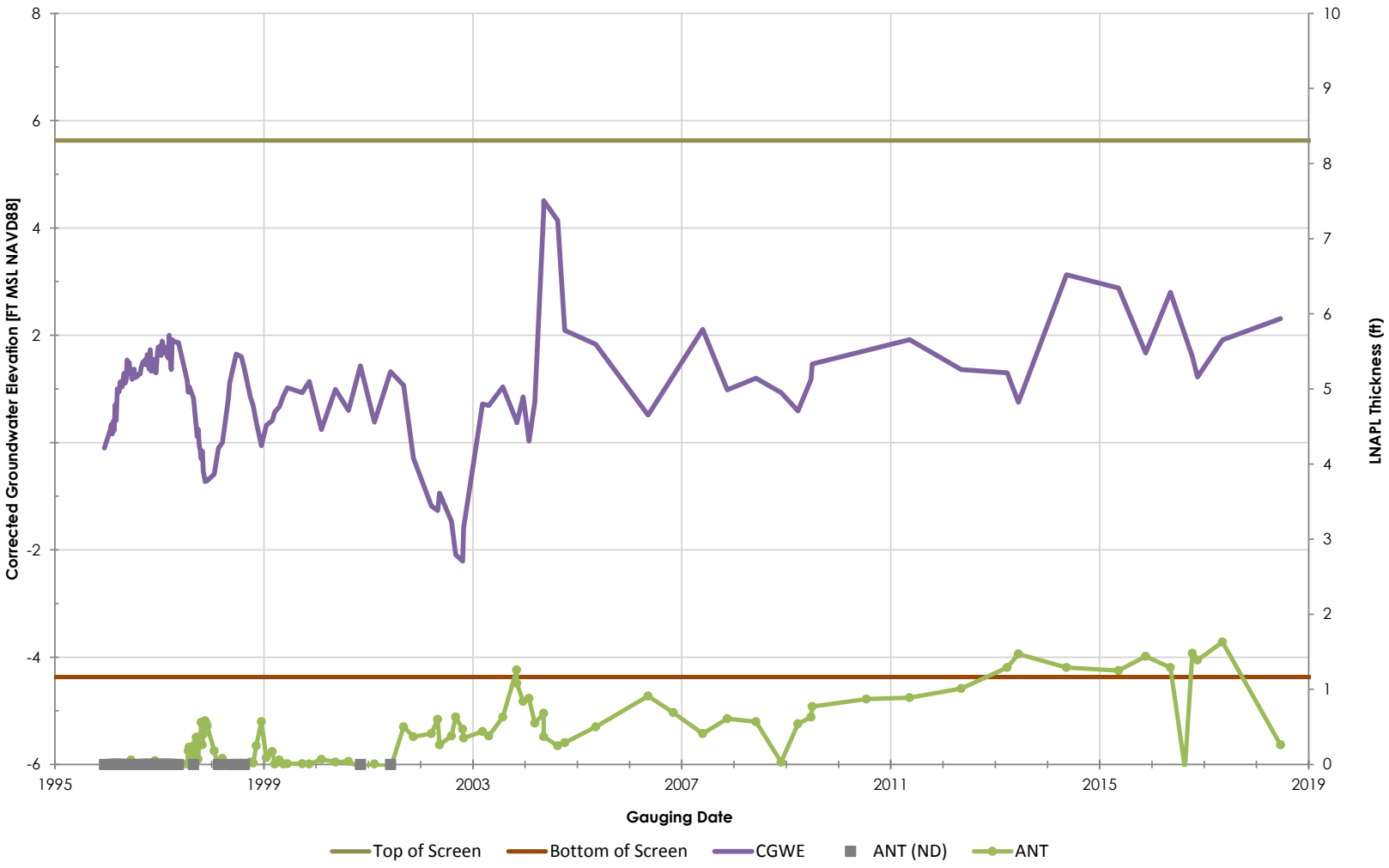
Stantec

Figure/Well No.

S-102

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

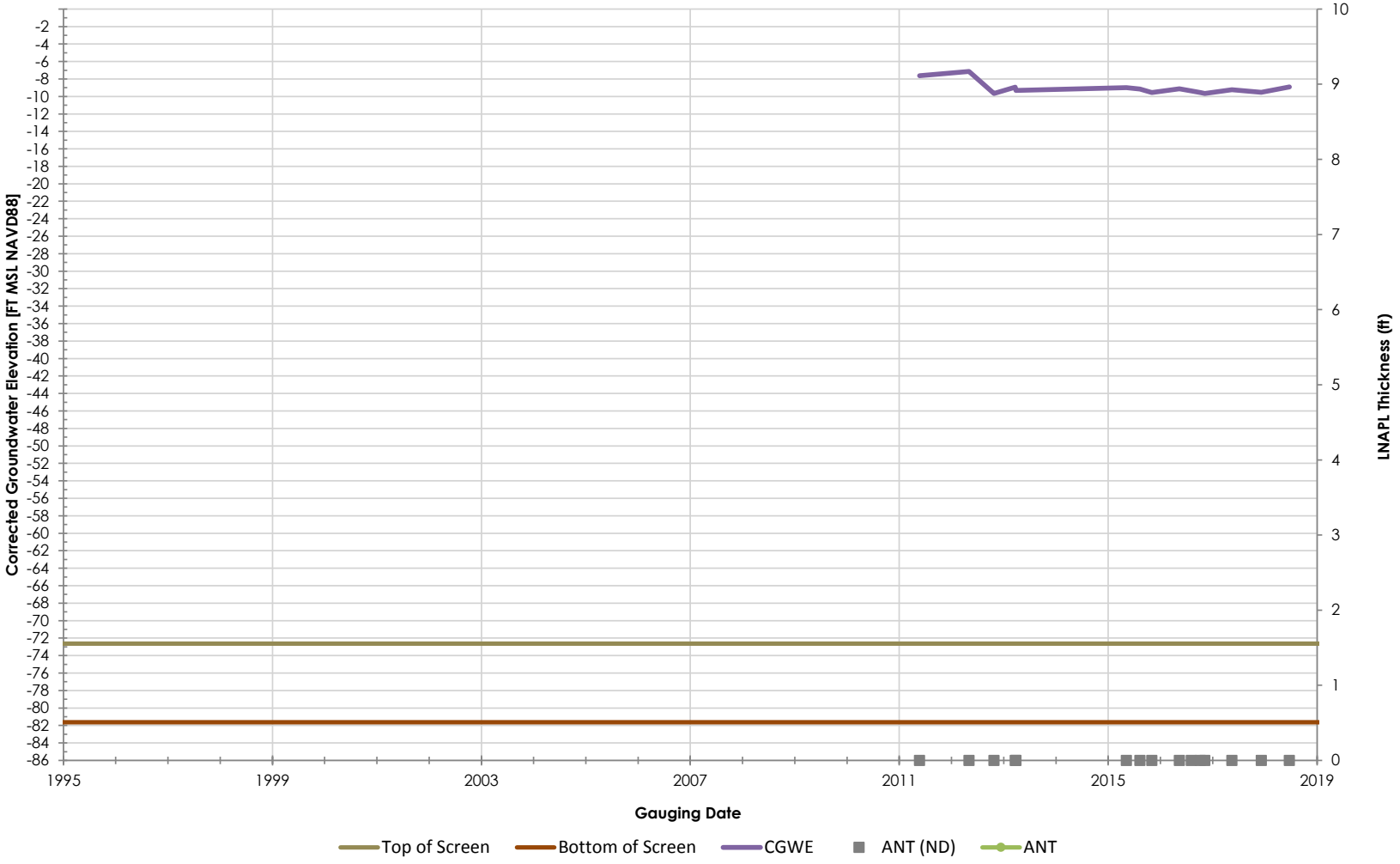
Stantec

Figure/Well No.

S-104

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



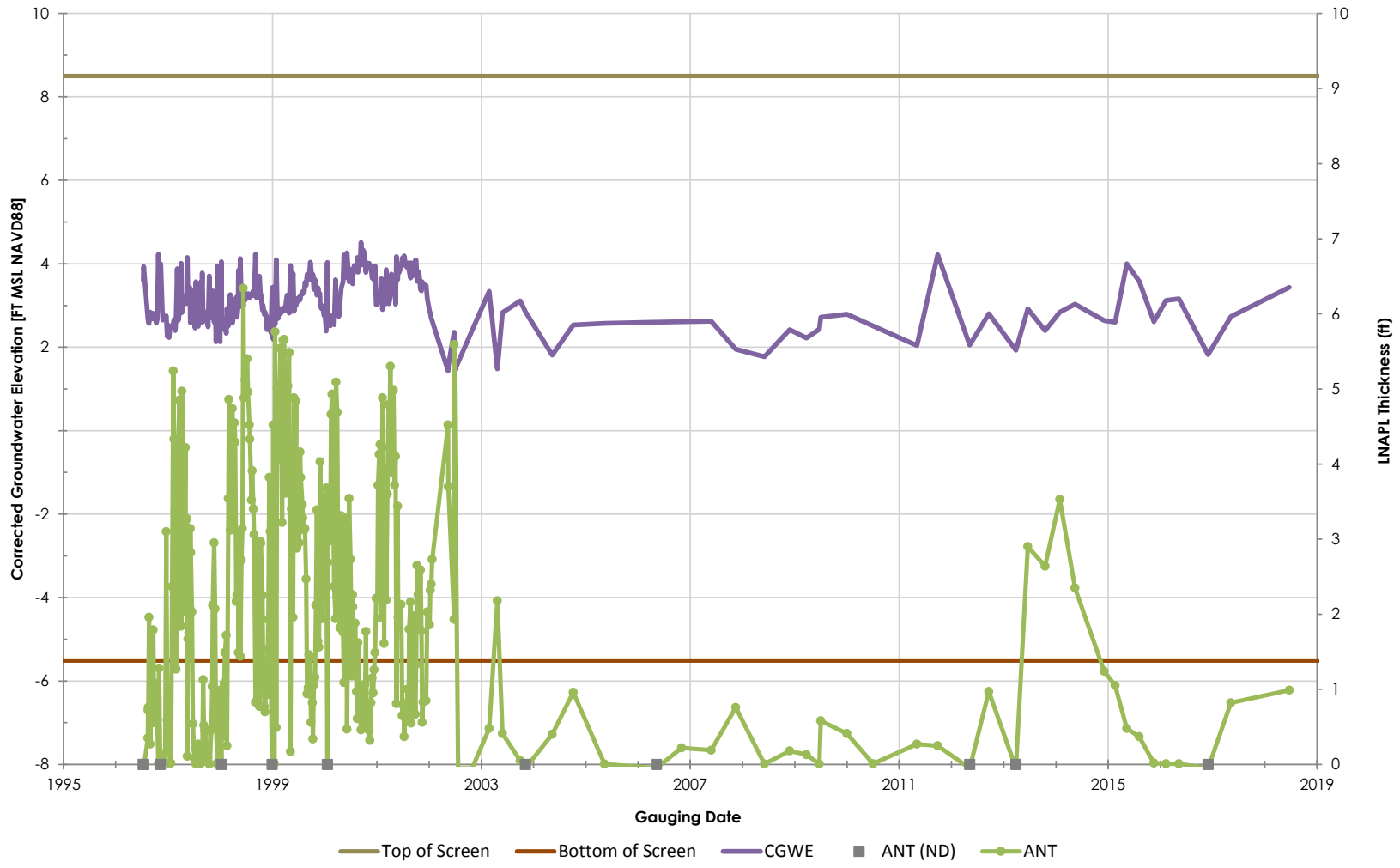
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-106DSRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

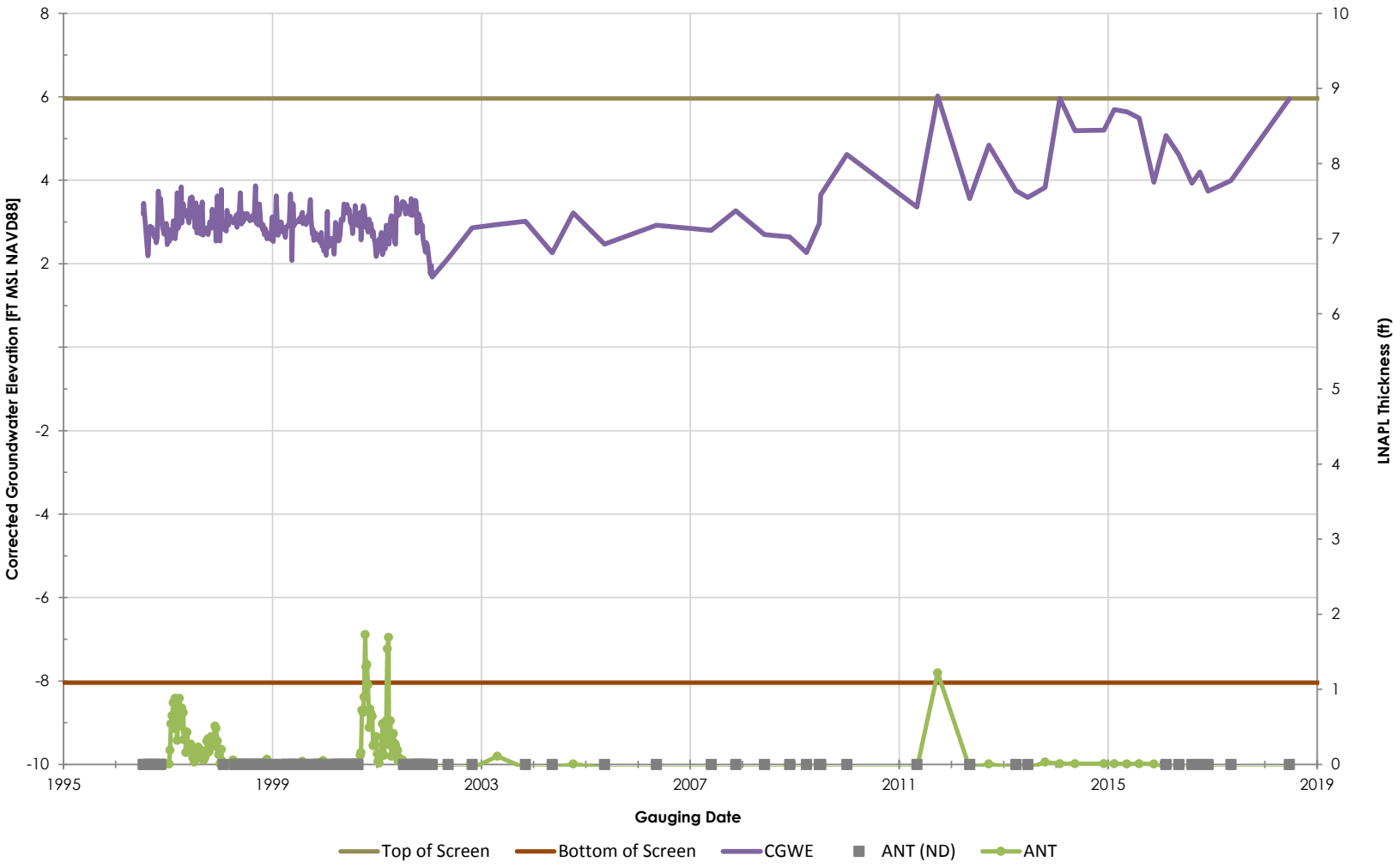
Stantec

Figure/Well No.

S-107

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

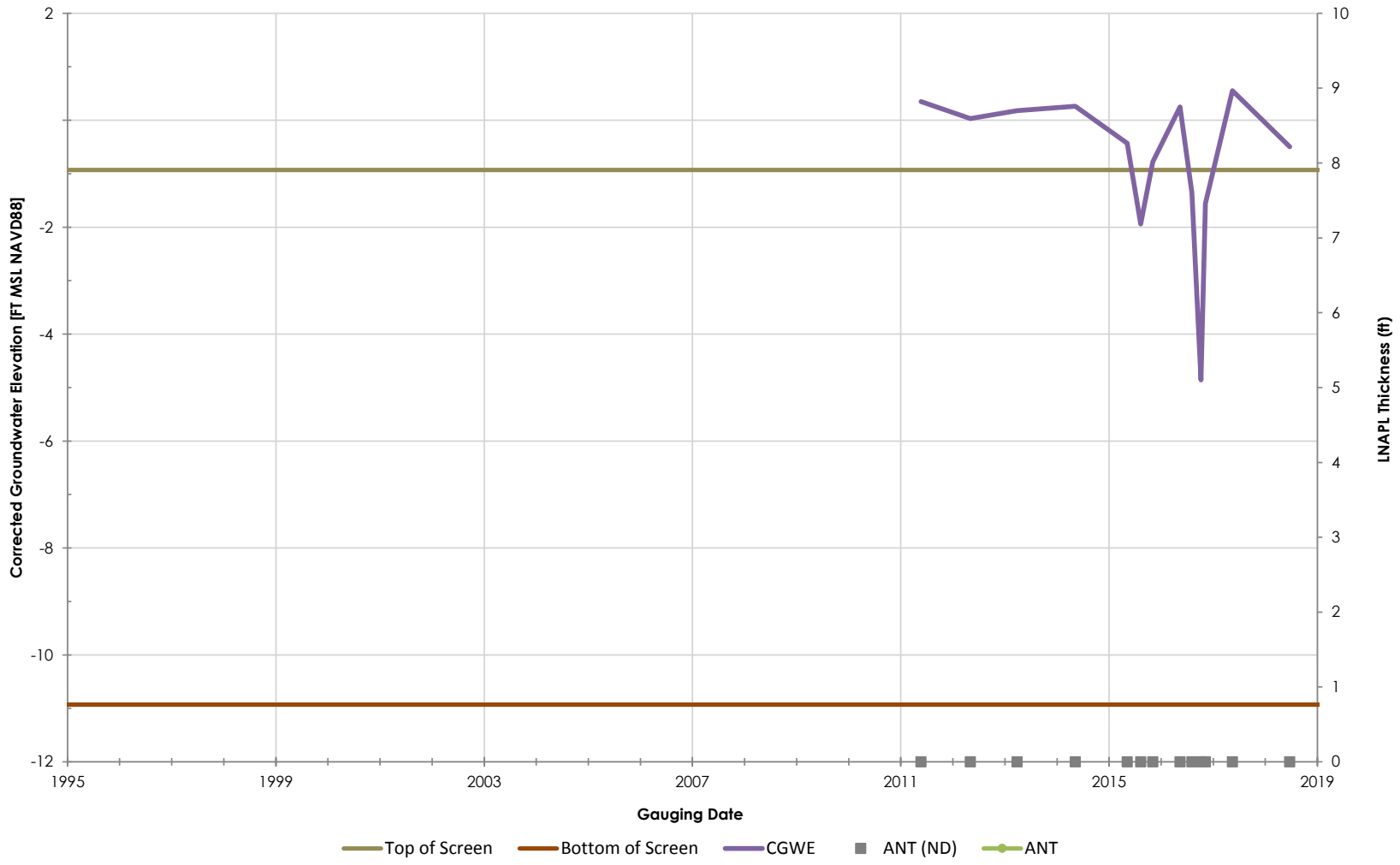
Stantec

Figure/Well No.

S-108

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

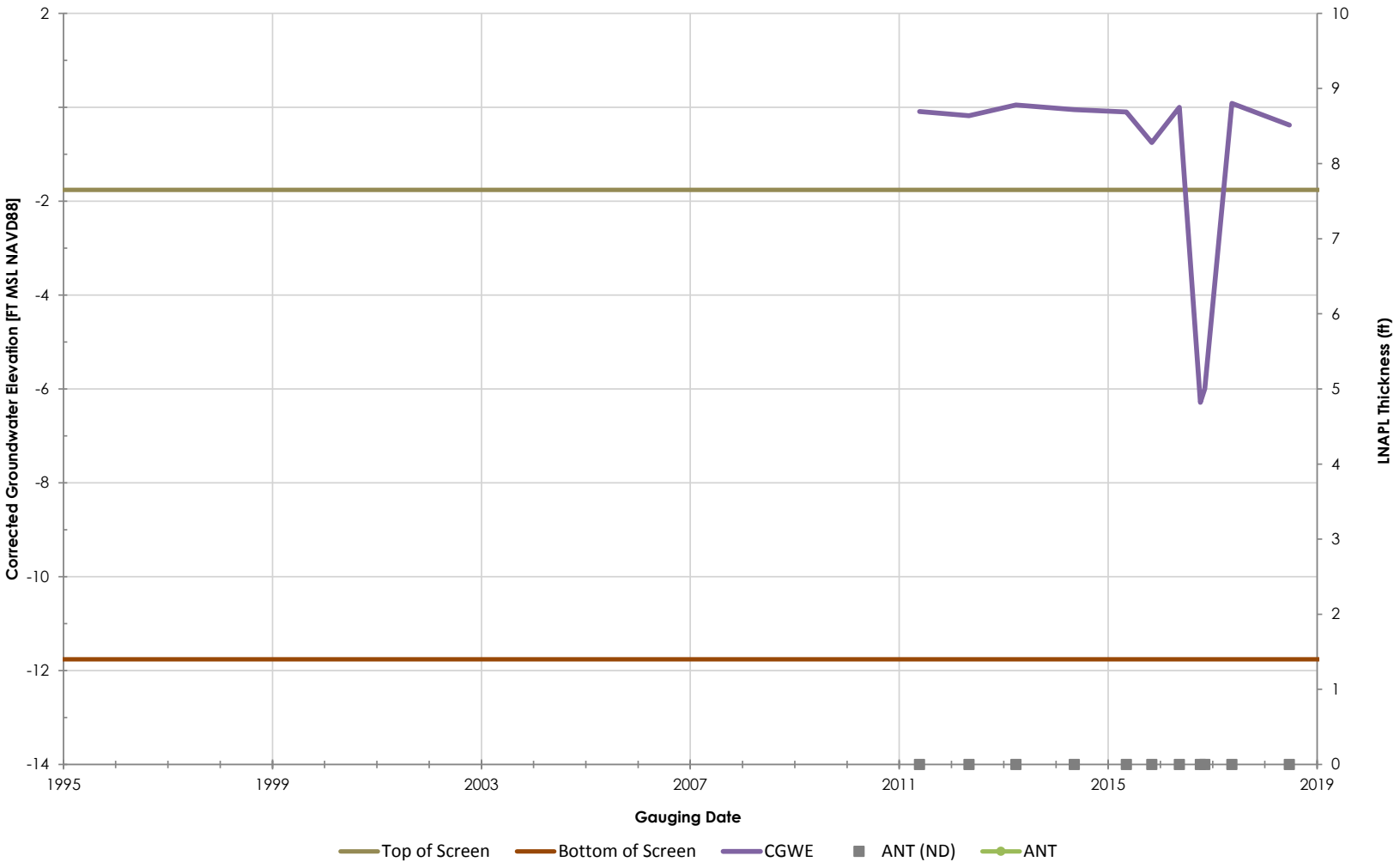
Stantec

Figure/Well No.

S-108SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

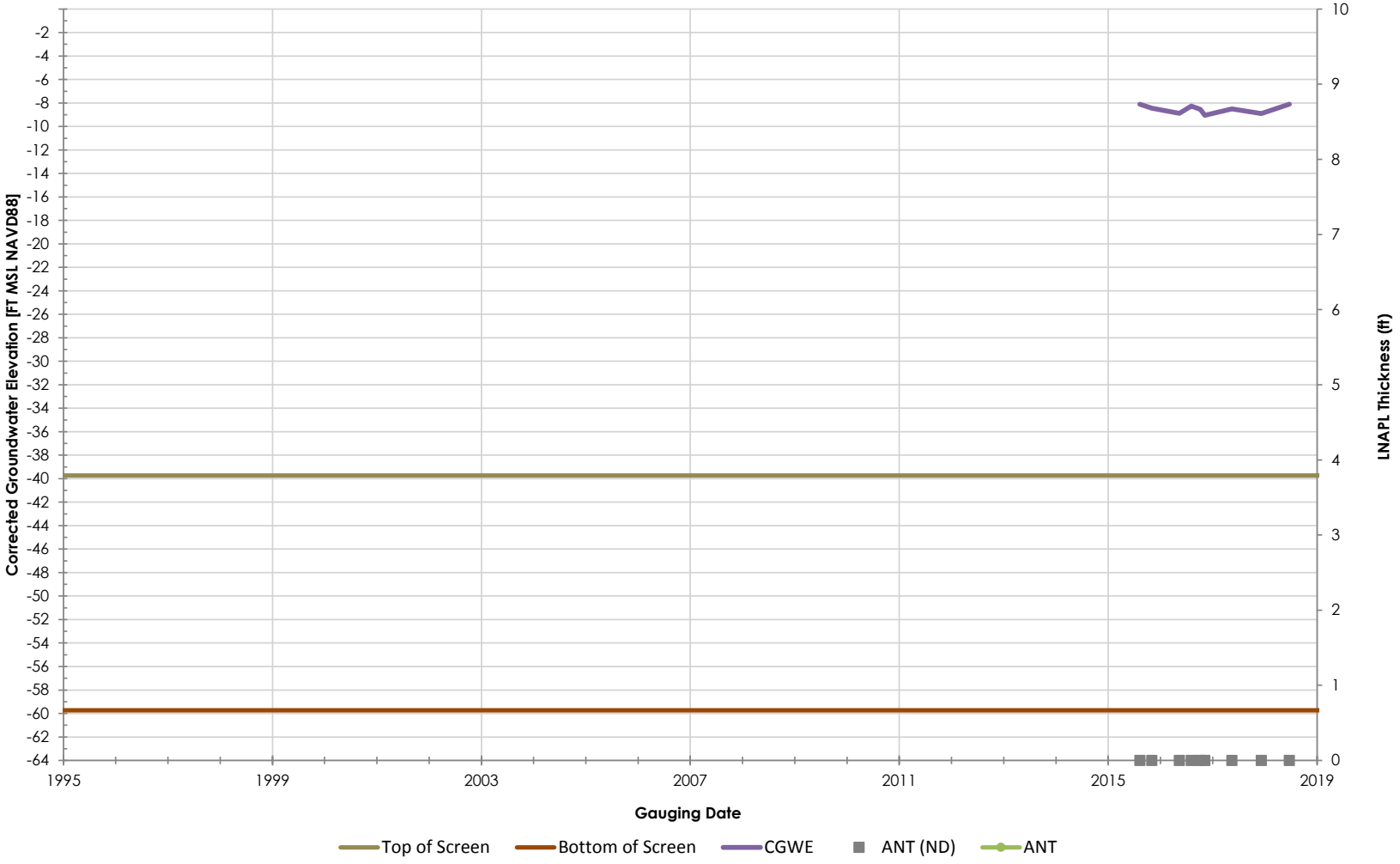
Stantec

Figure/Well No.

S-109SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

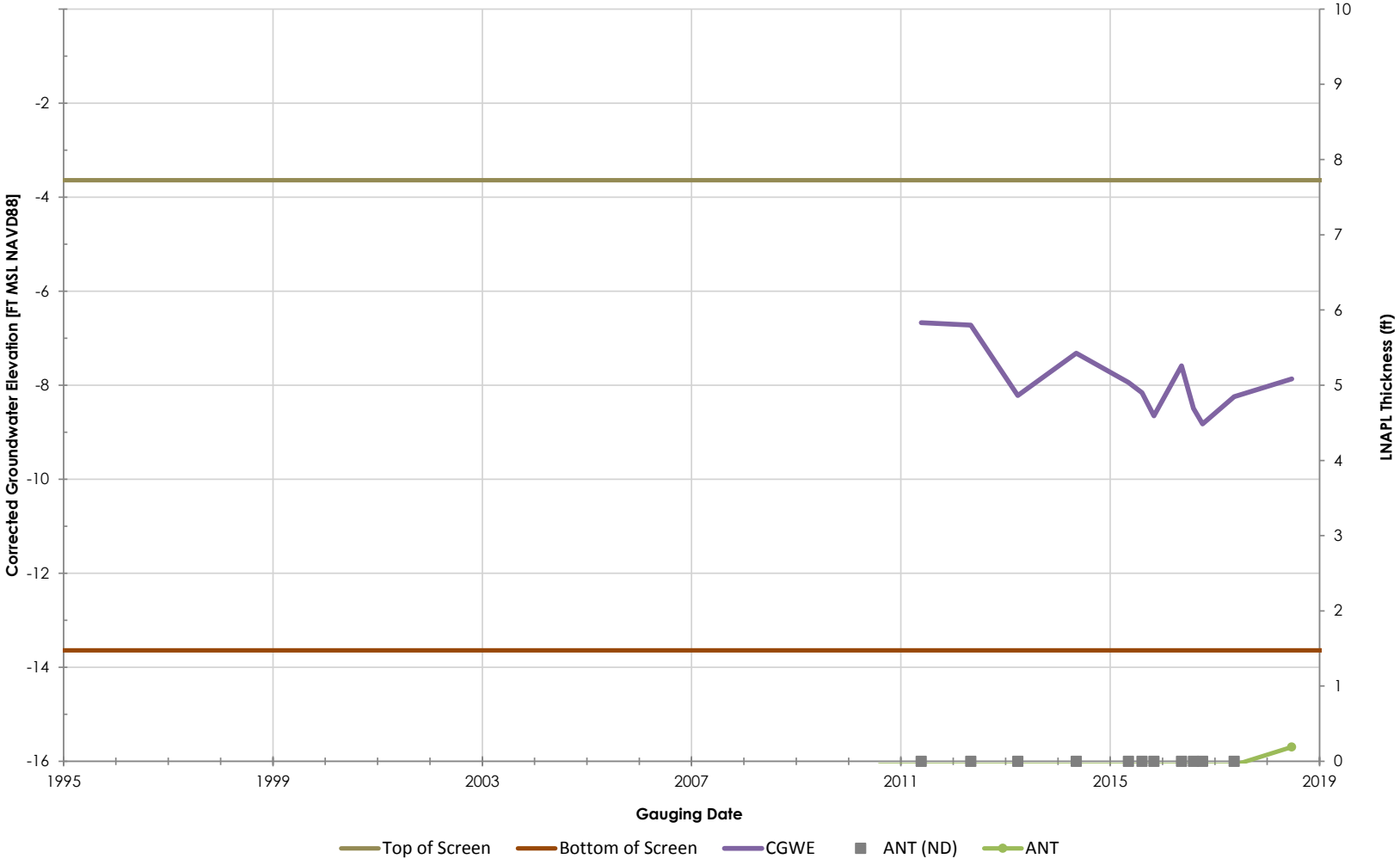
Stantec

Figure/Well No.

S-110DSRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

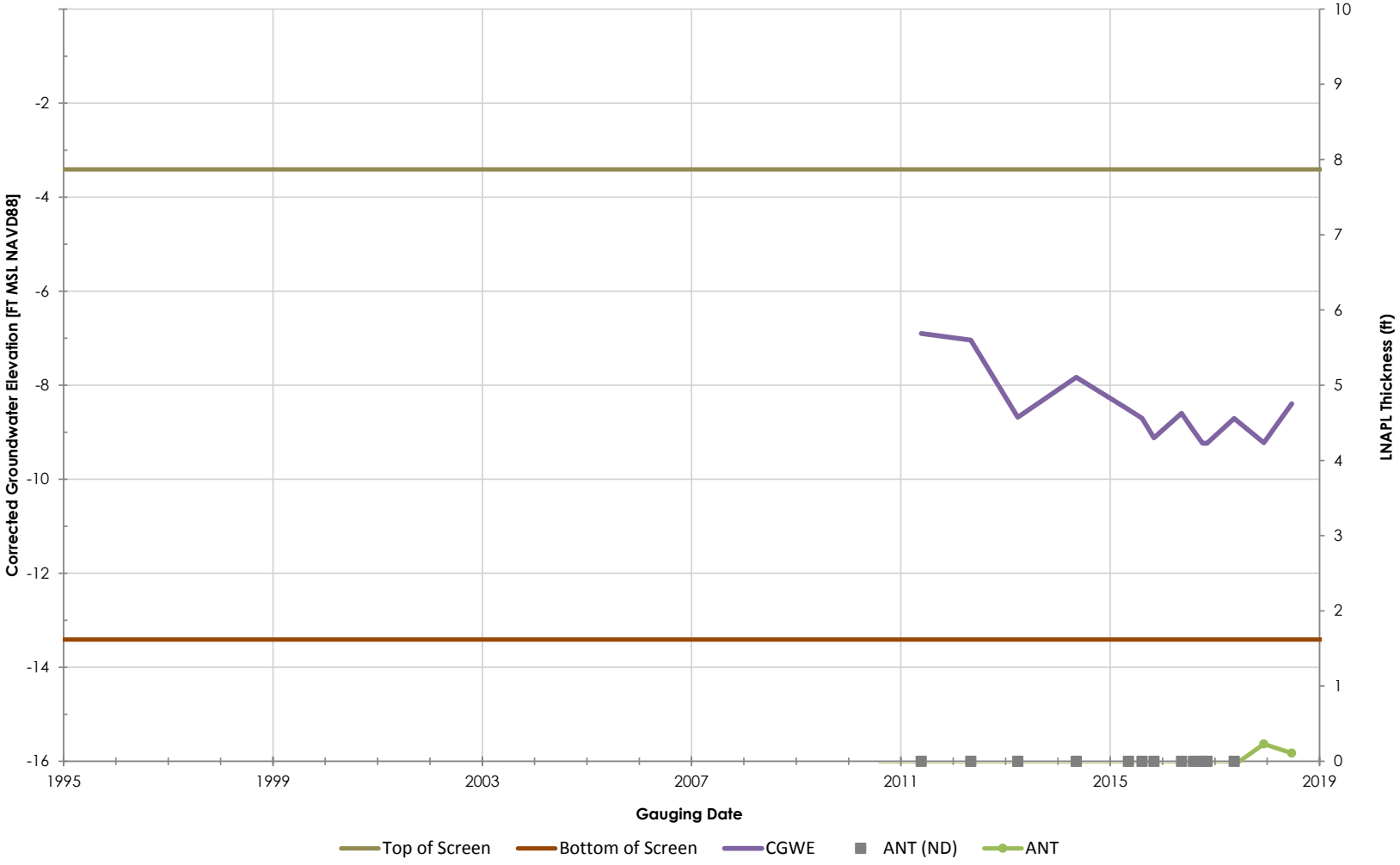
Stantec

Figure/Well No.

S-111SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

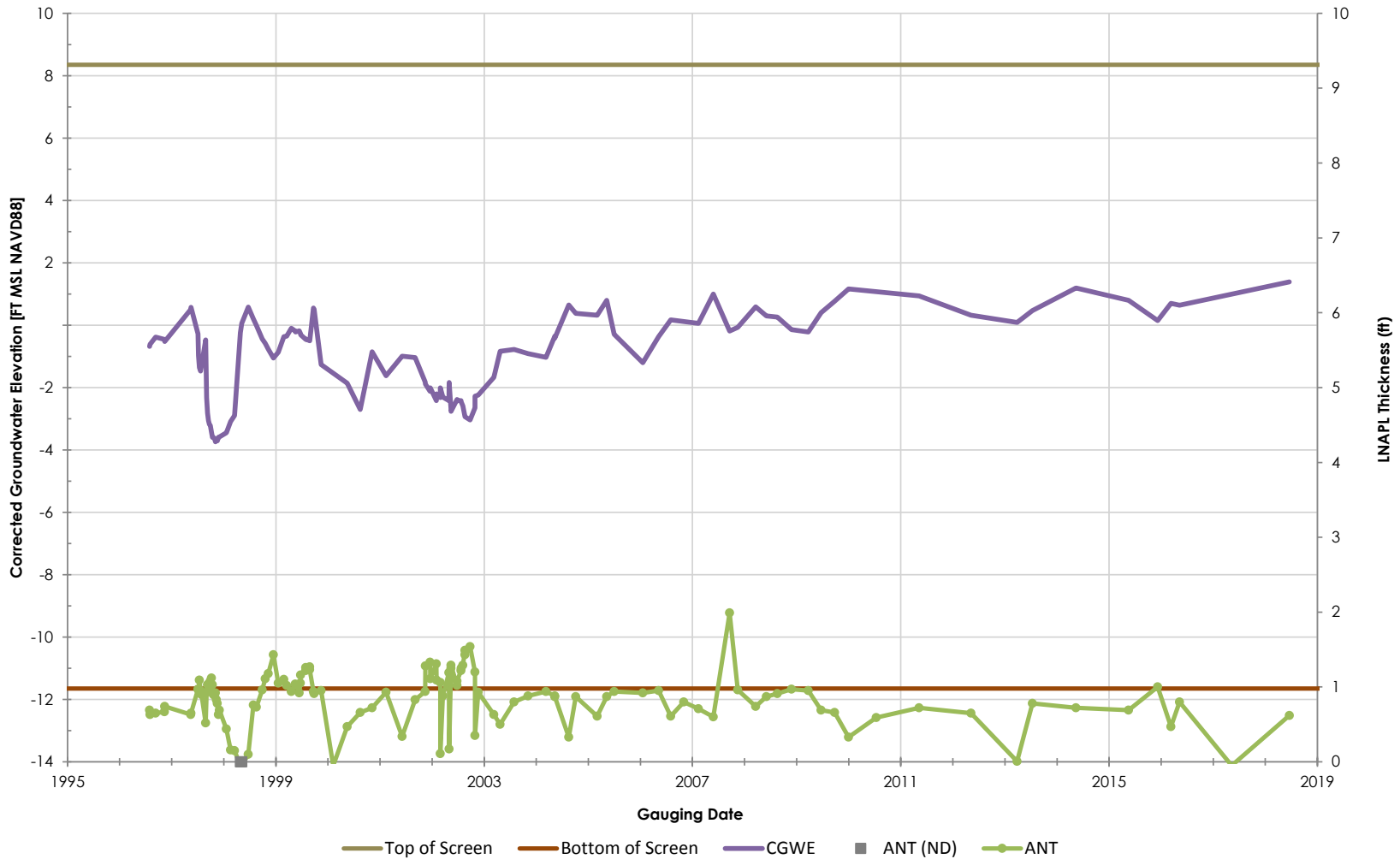
Stantec

Figure/Well No.

S-112SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

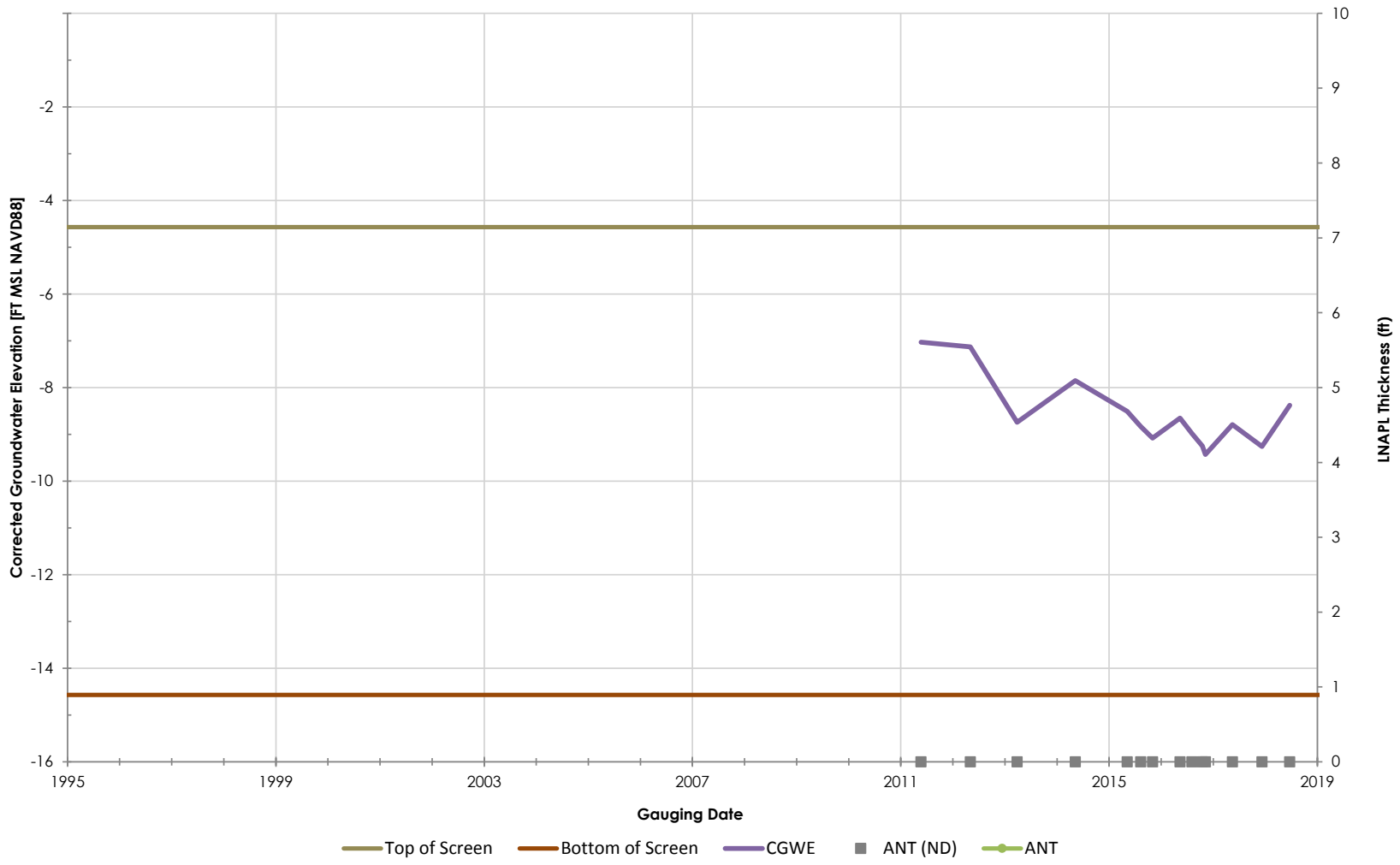
Stantec

Figure/Well No.

S-113

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

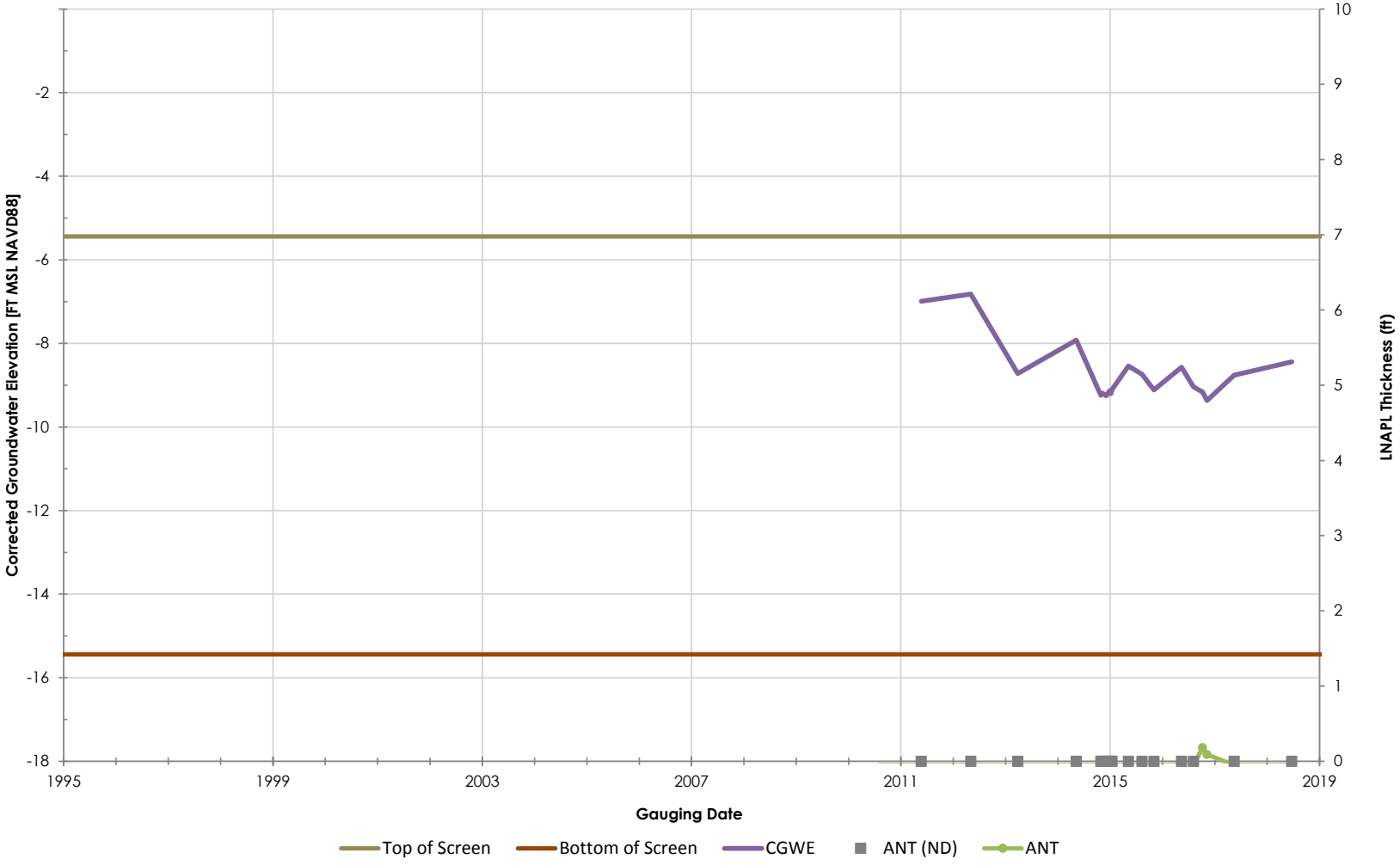
Stantec

Figure/Well No.

S-113SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



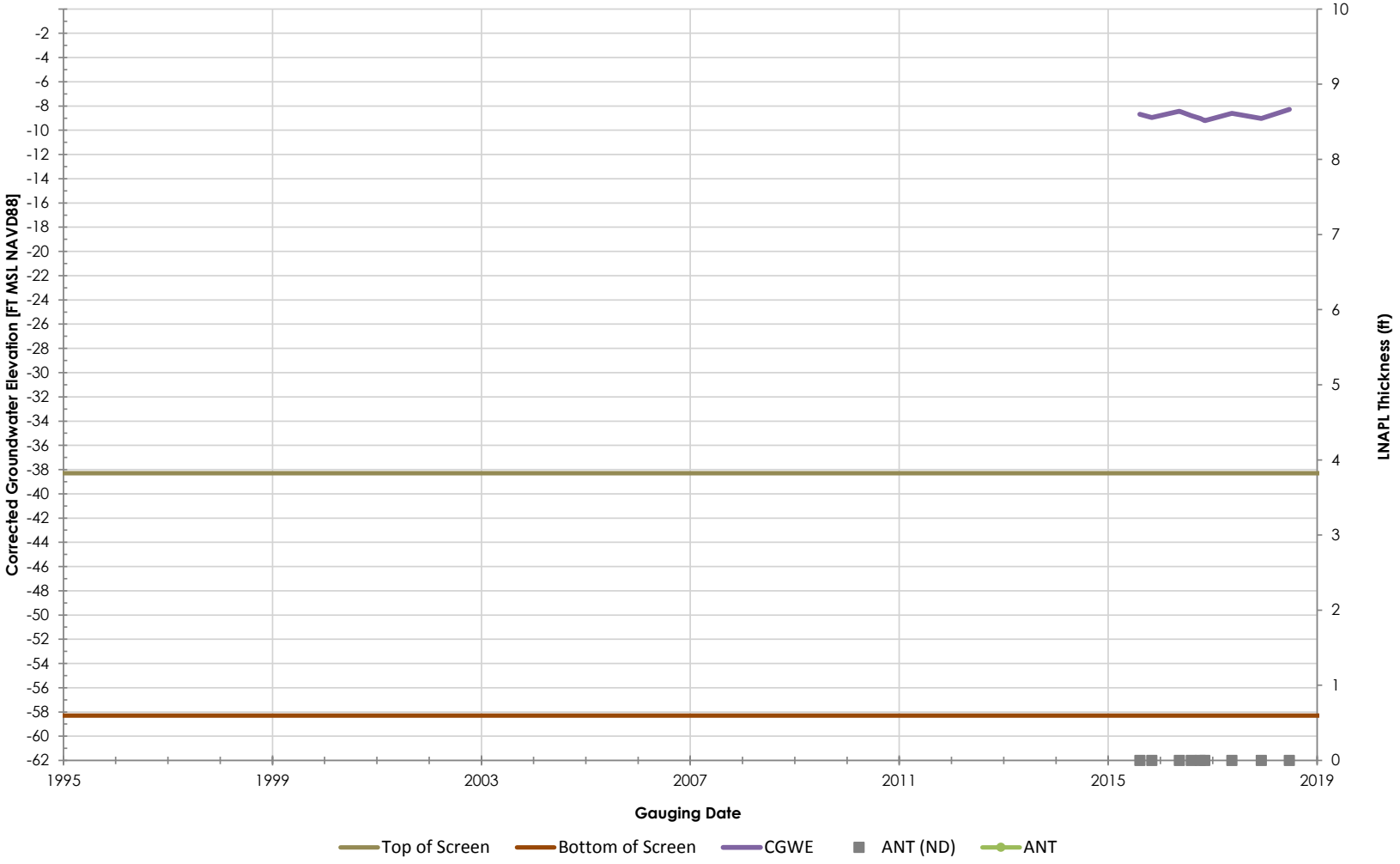
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-114SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

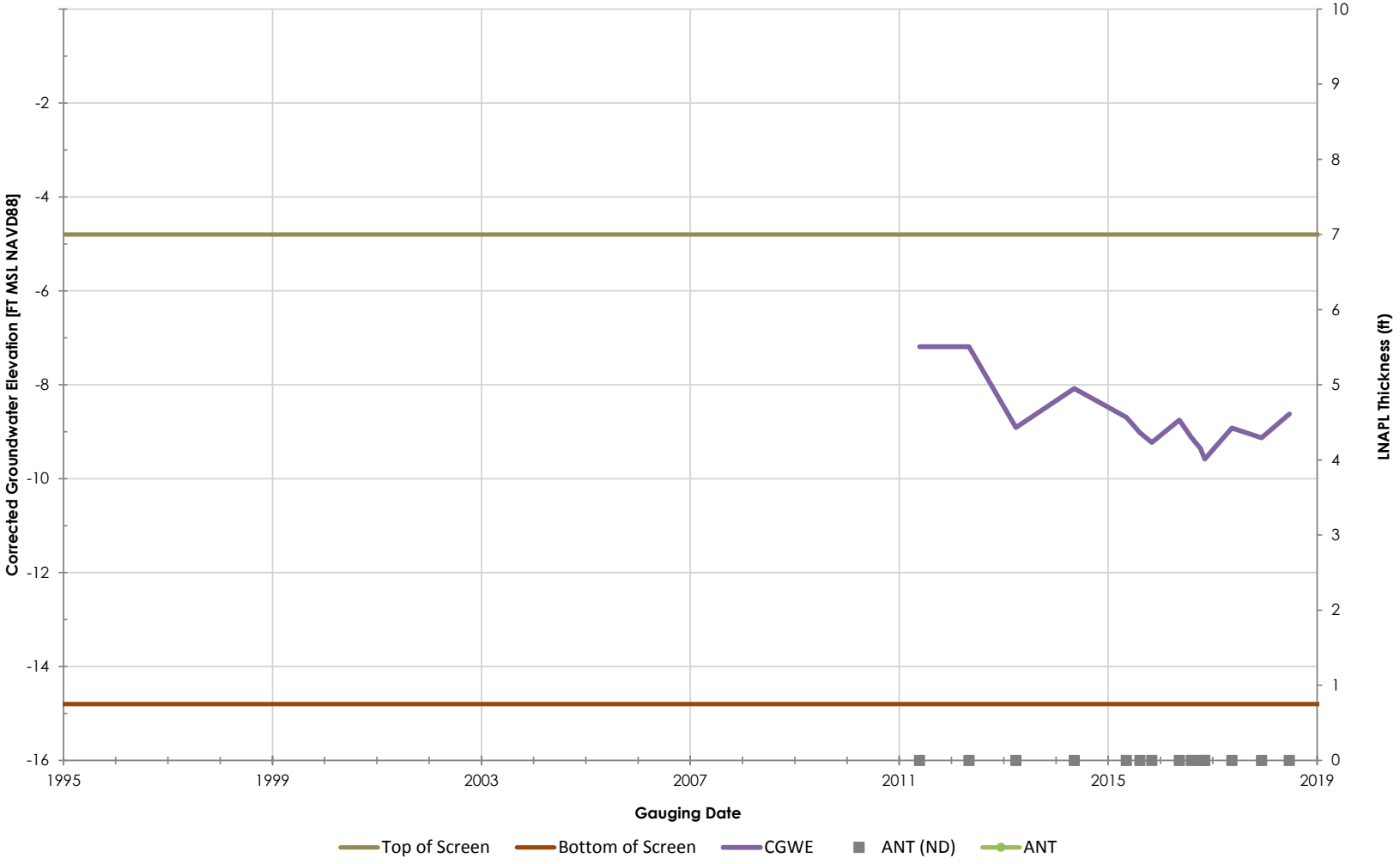
Stantec

Figure/Well No.

S-115DSRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

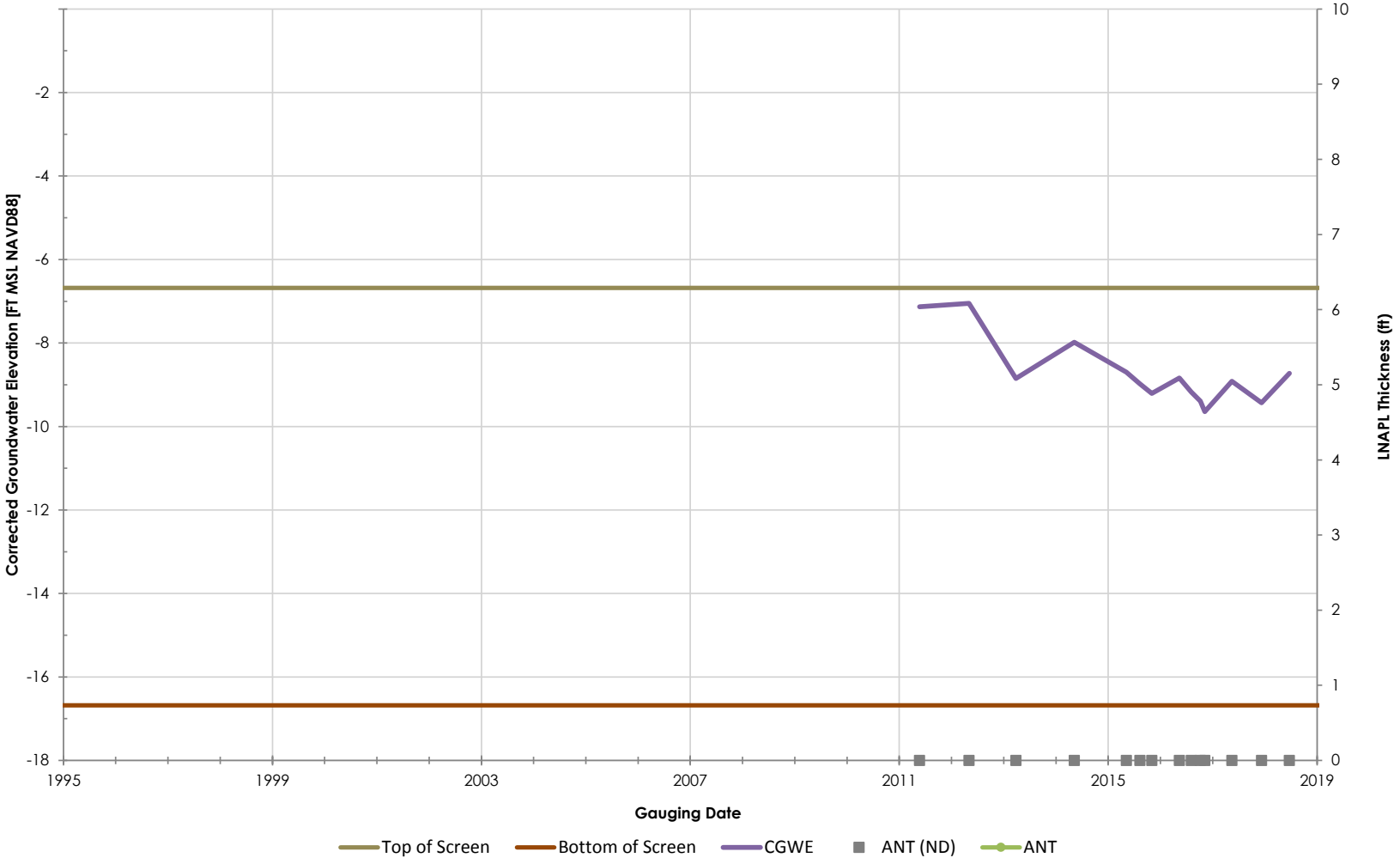
Stantec

Figure/Well No.

S-115SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

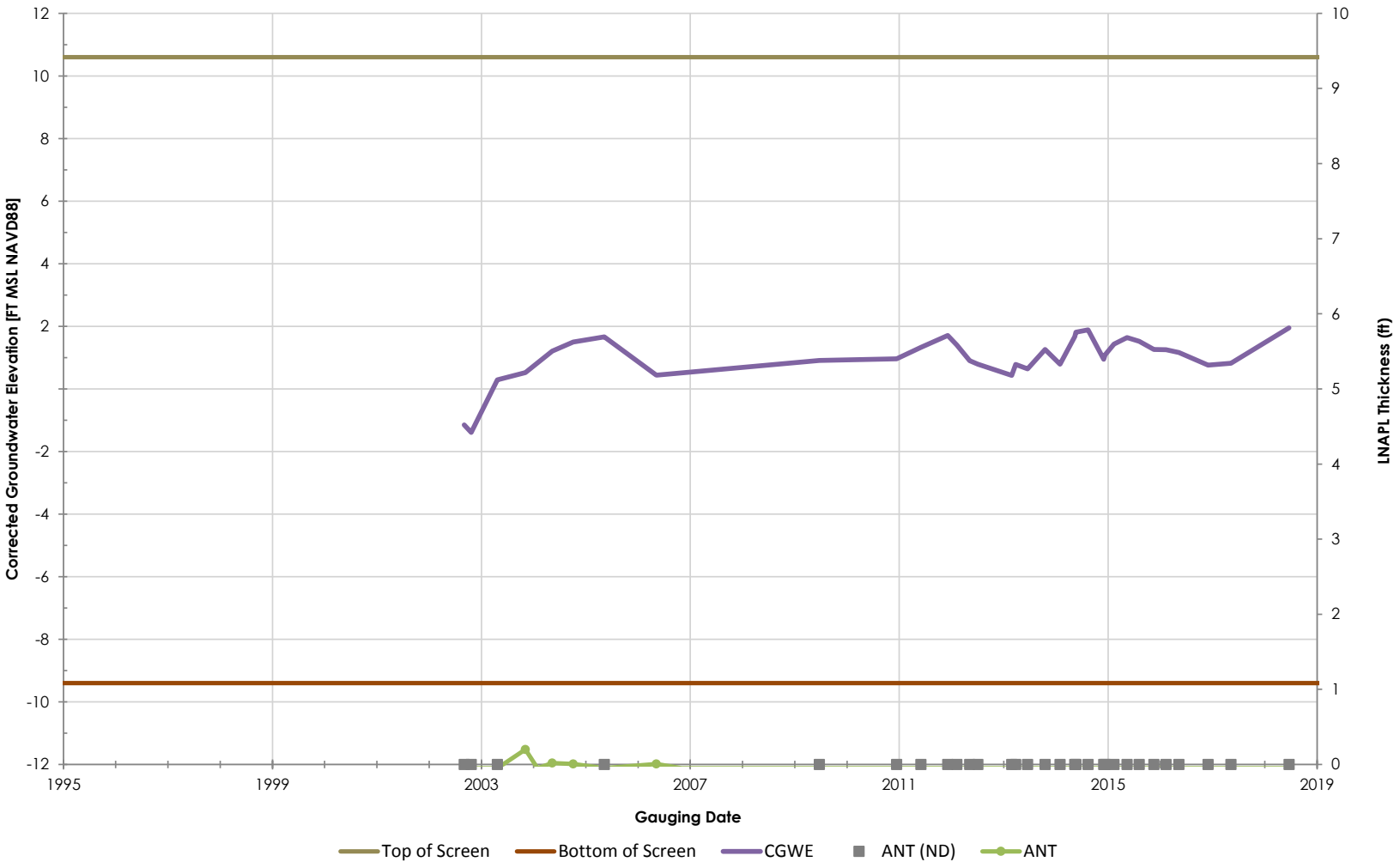
Stantec

Figure/Well No.

S-116SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

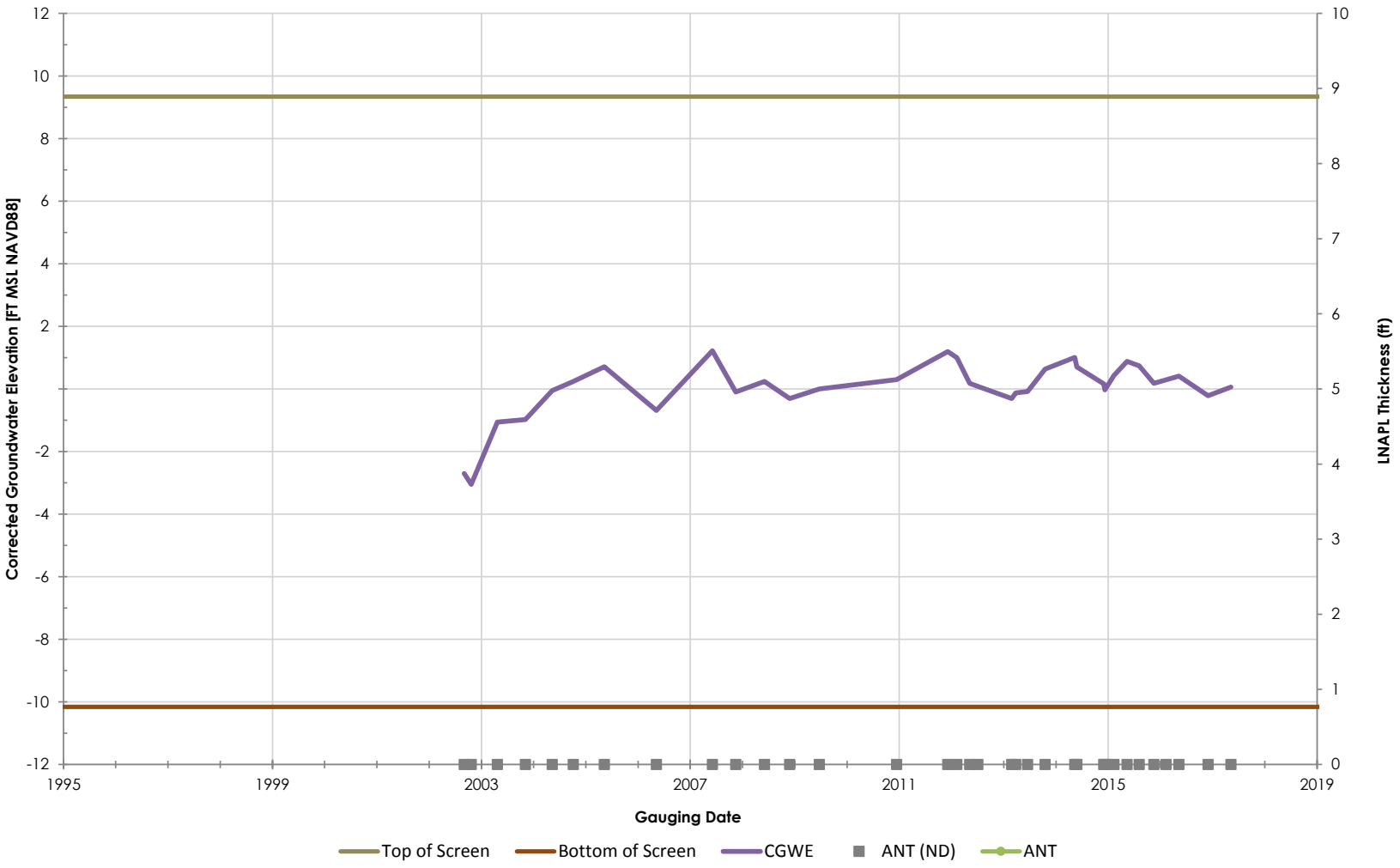
Stantec

Figure/Well No.

S-117

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

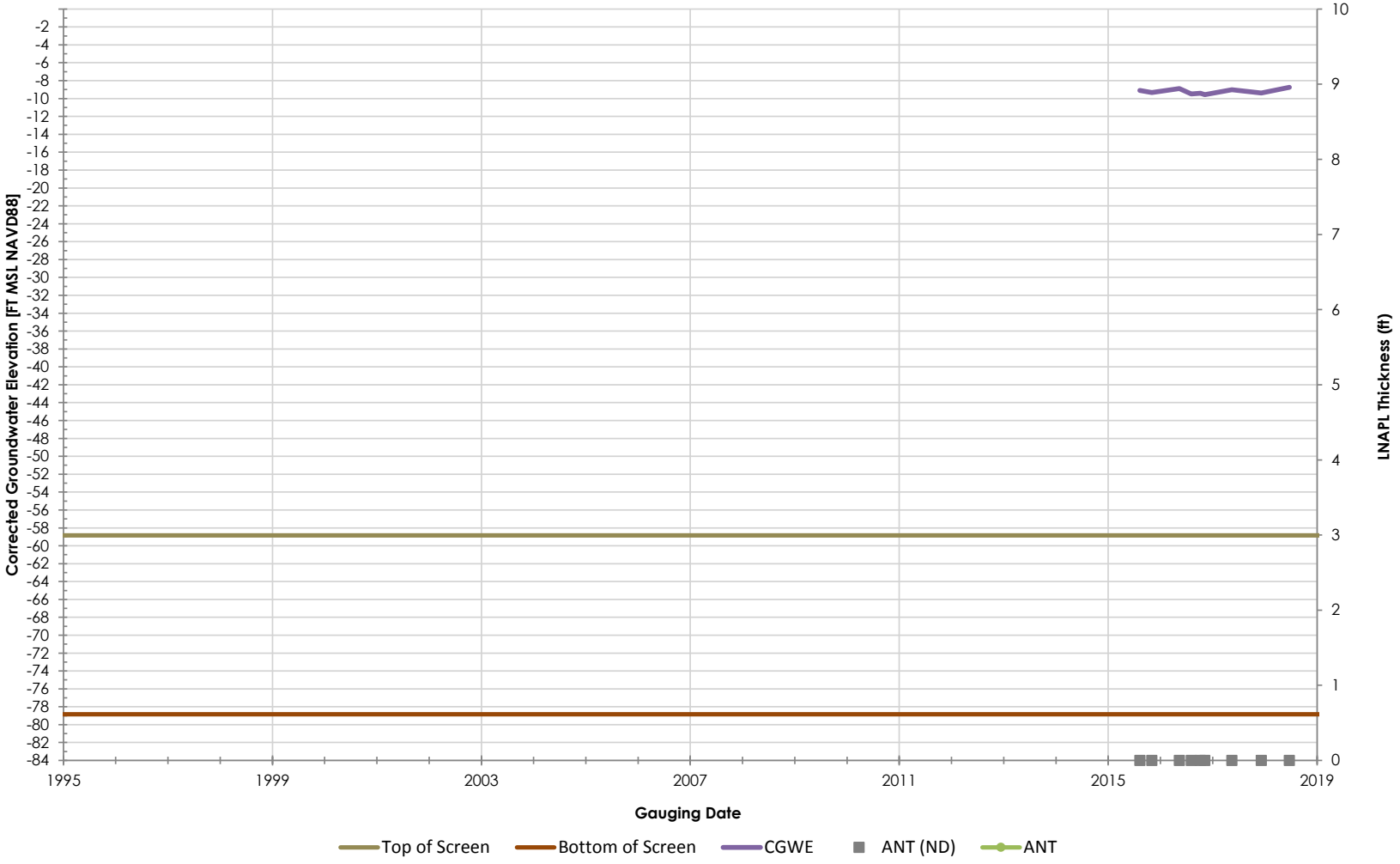
Stantec

Figure/Well No.

S-118

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



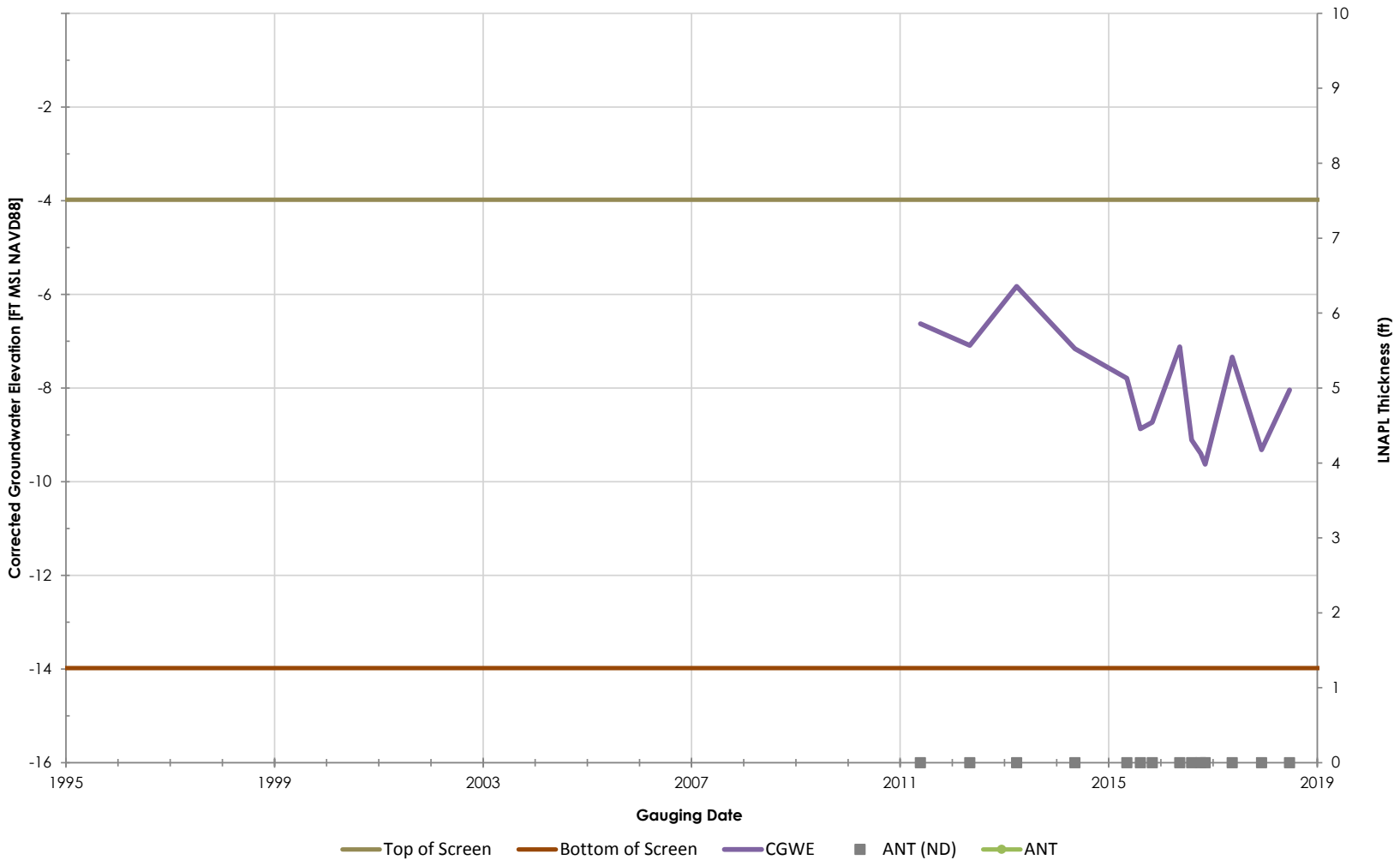
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-118DSRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

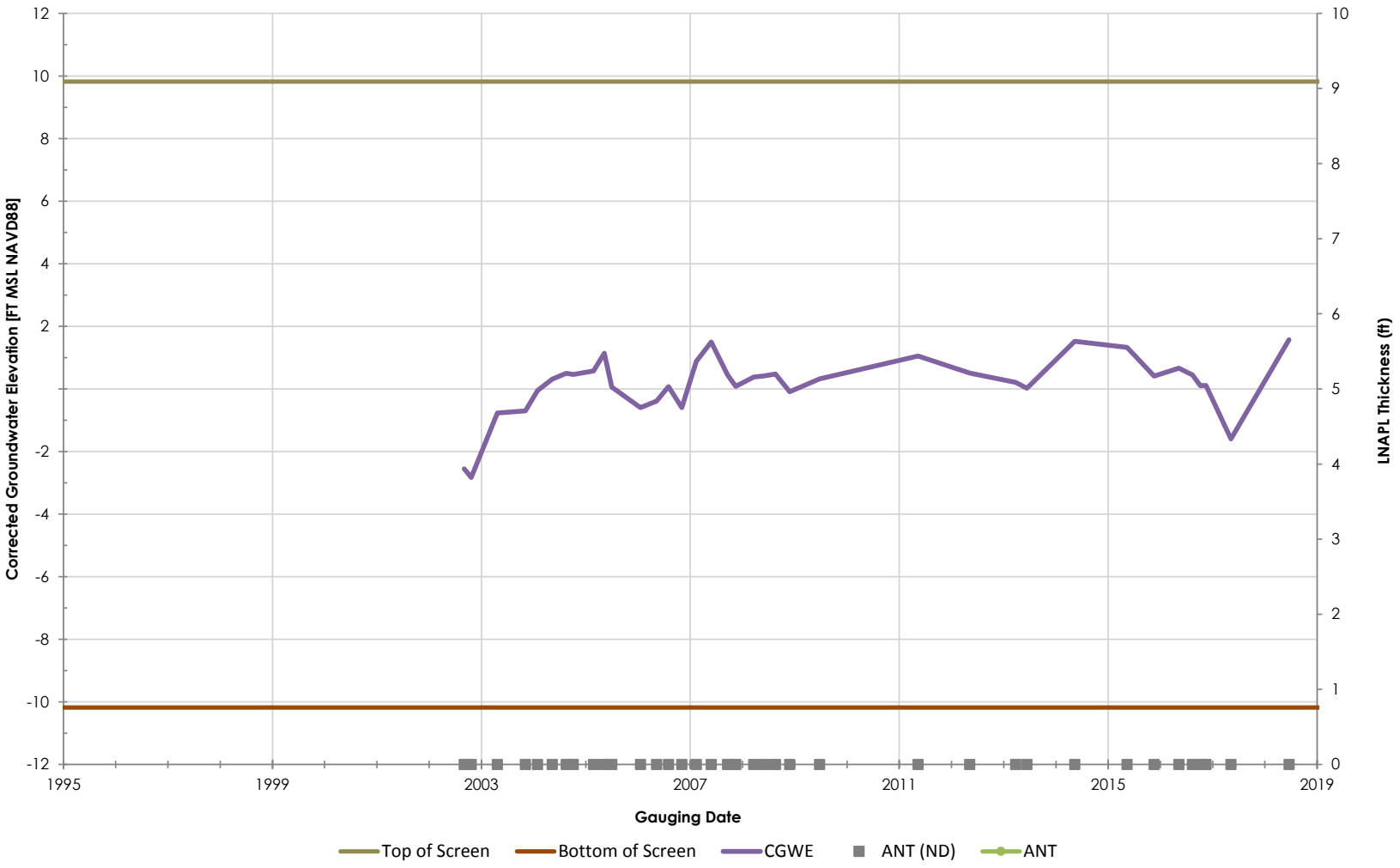
Stantec

Figure/Well No.

S-118SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

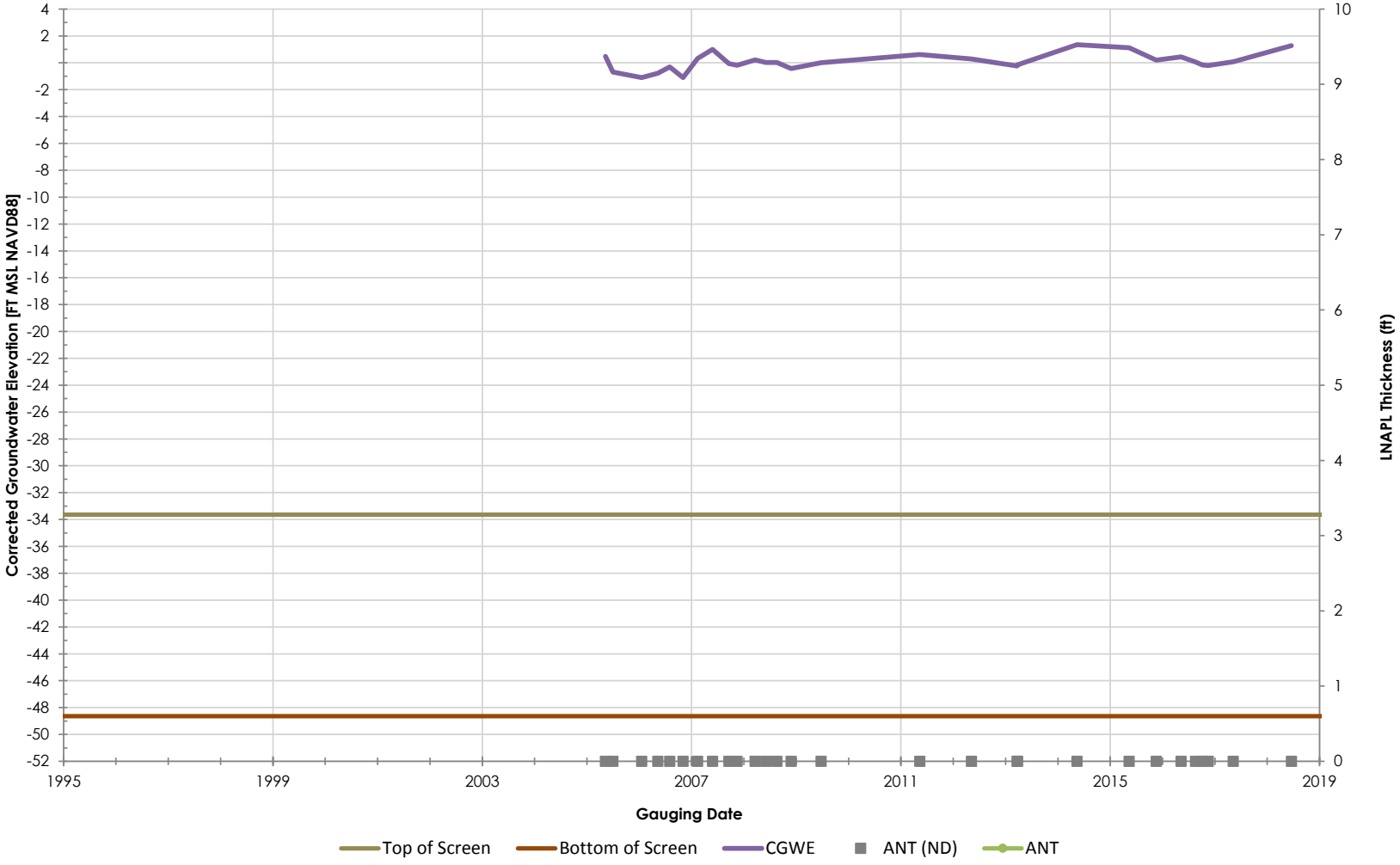
Stantec

Figure/Well No.

S-119

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



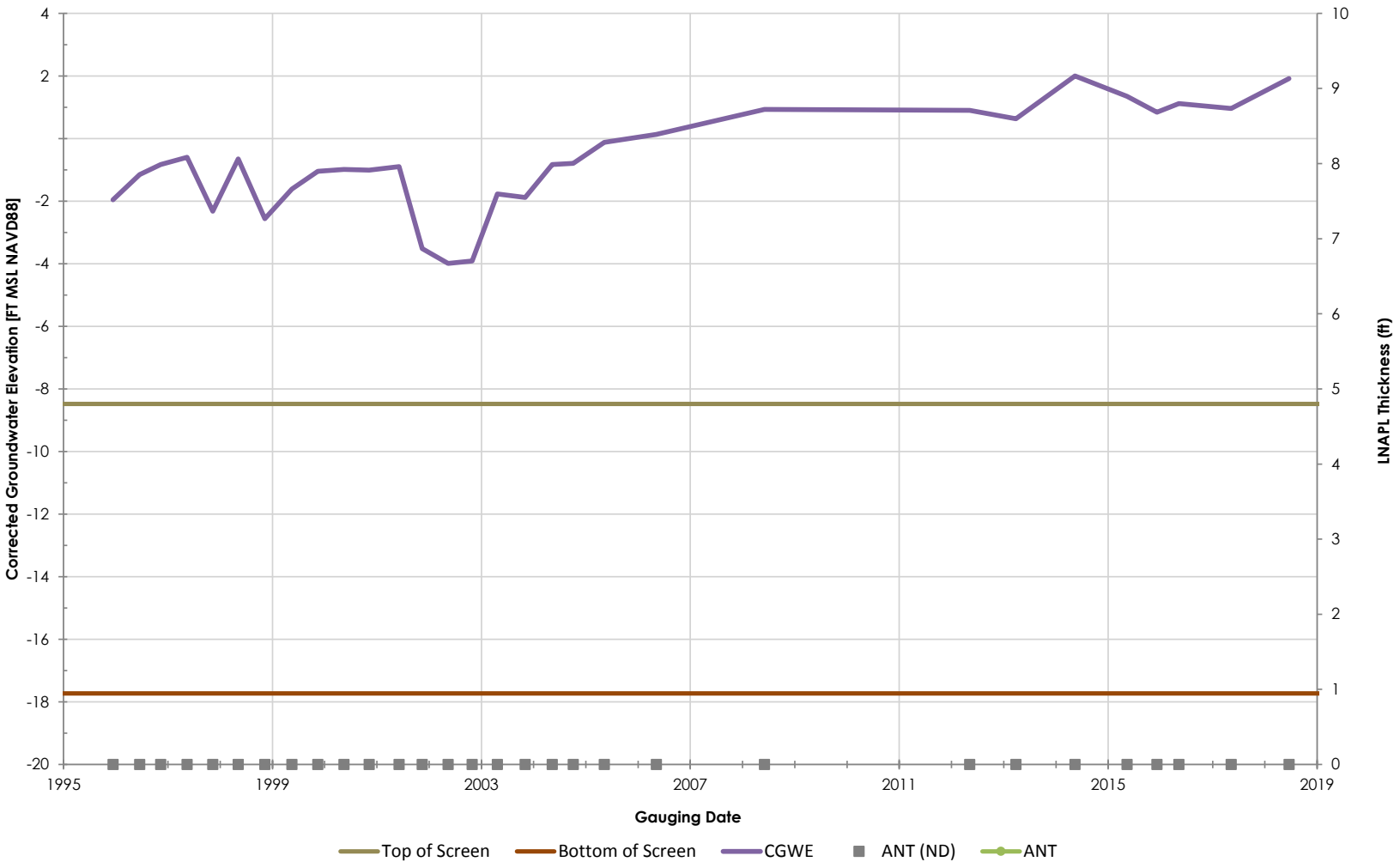
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-119D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

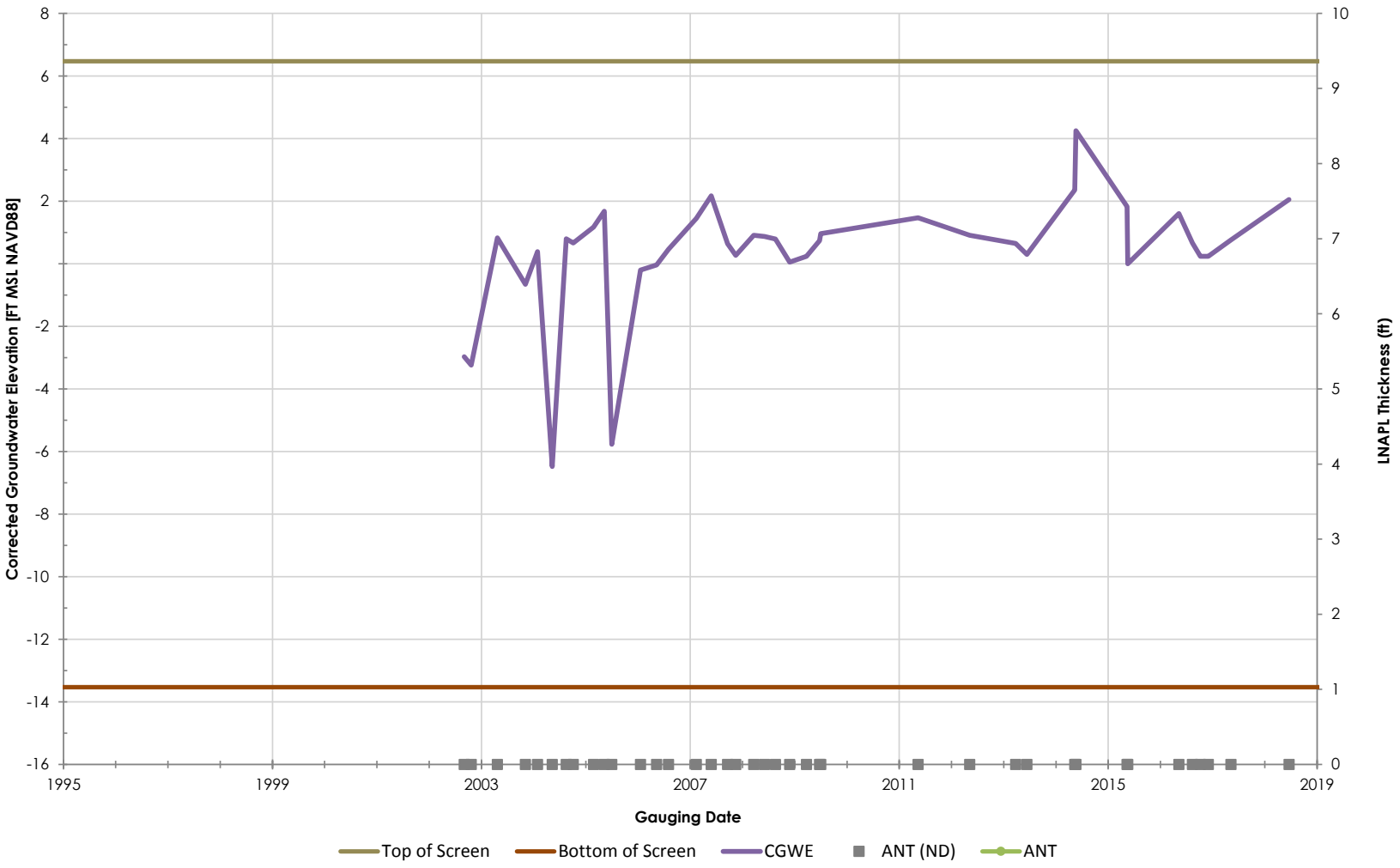
Stantec

Figure/Well No.

S-12

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

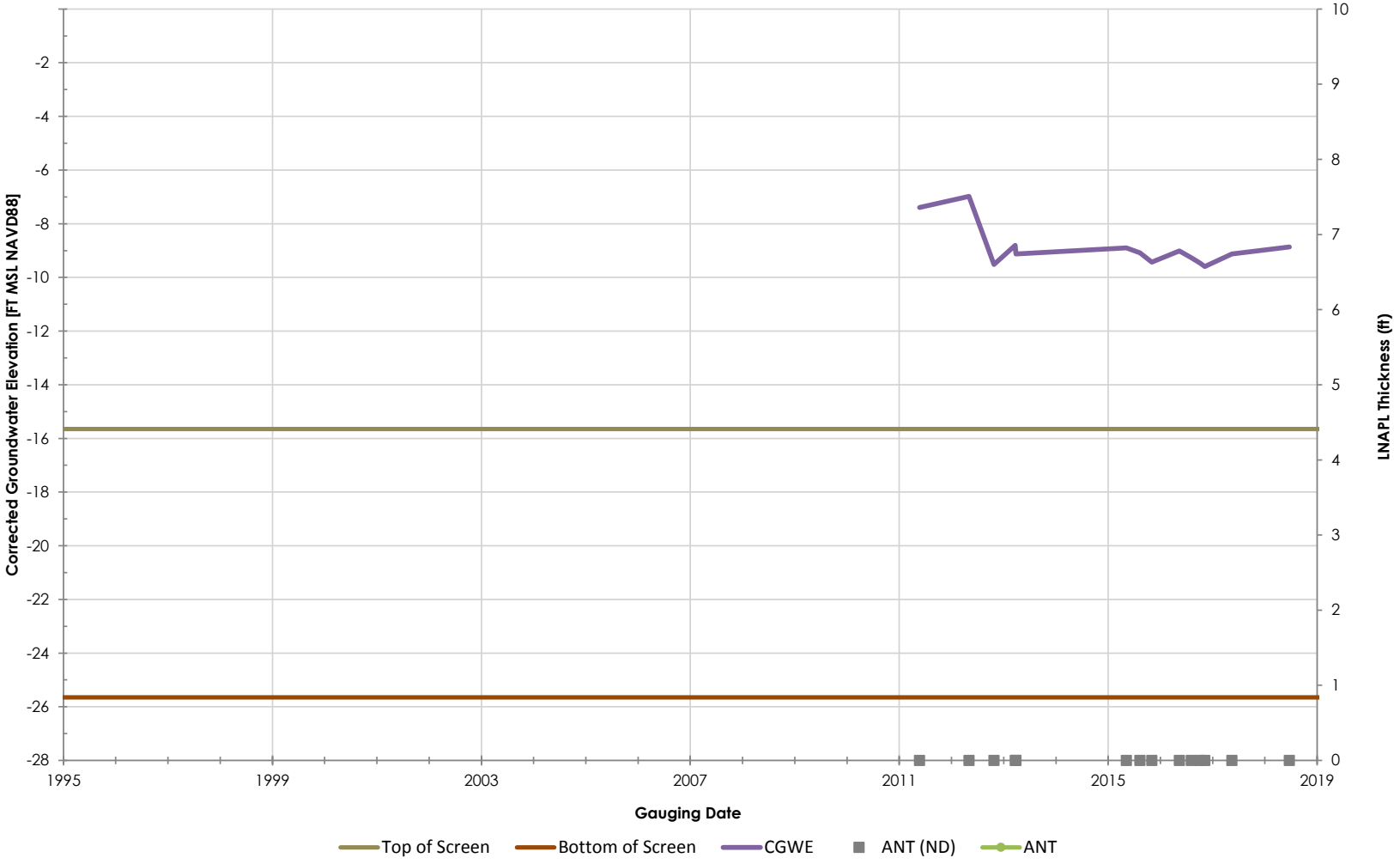
Stantec

Figure/Well No.

S-120

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



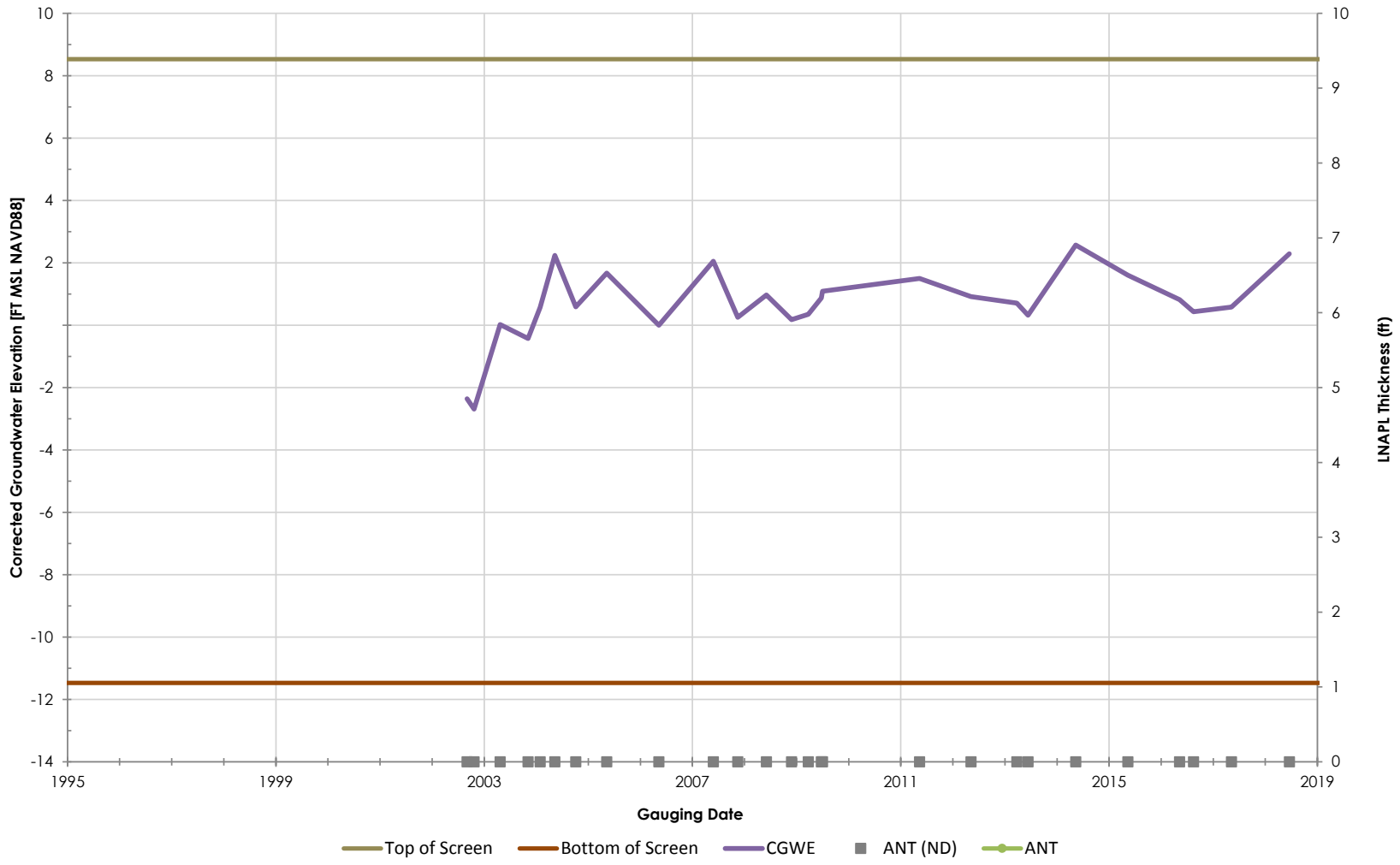
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-120DSRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

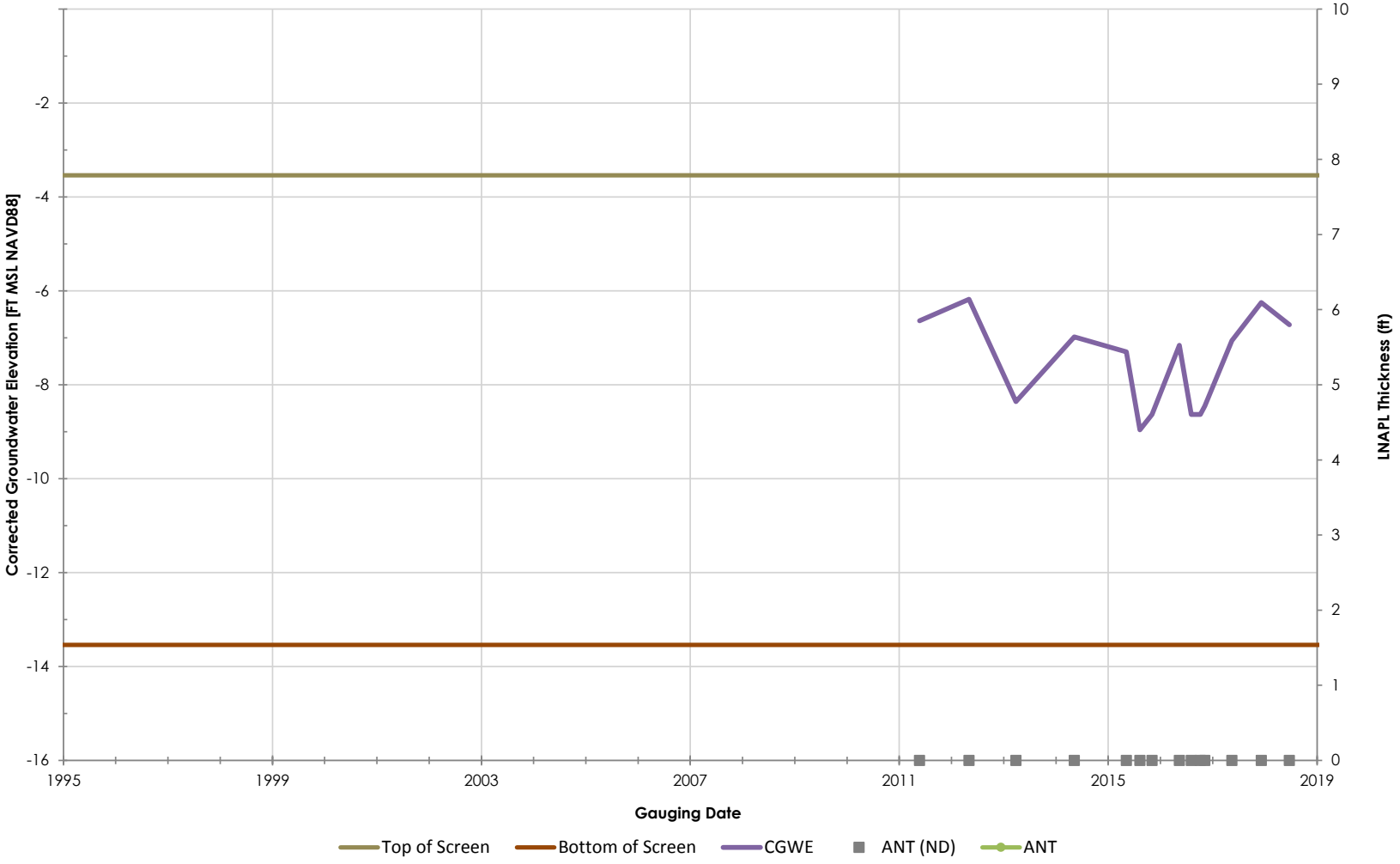
Stantec

Figure/Well No.

S-121

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

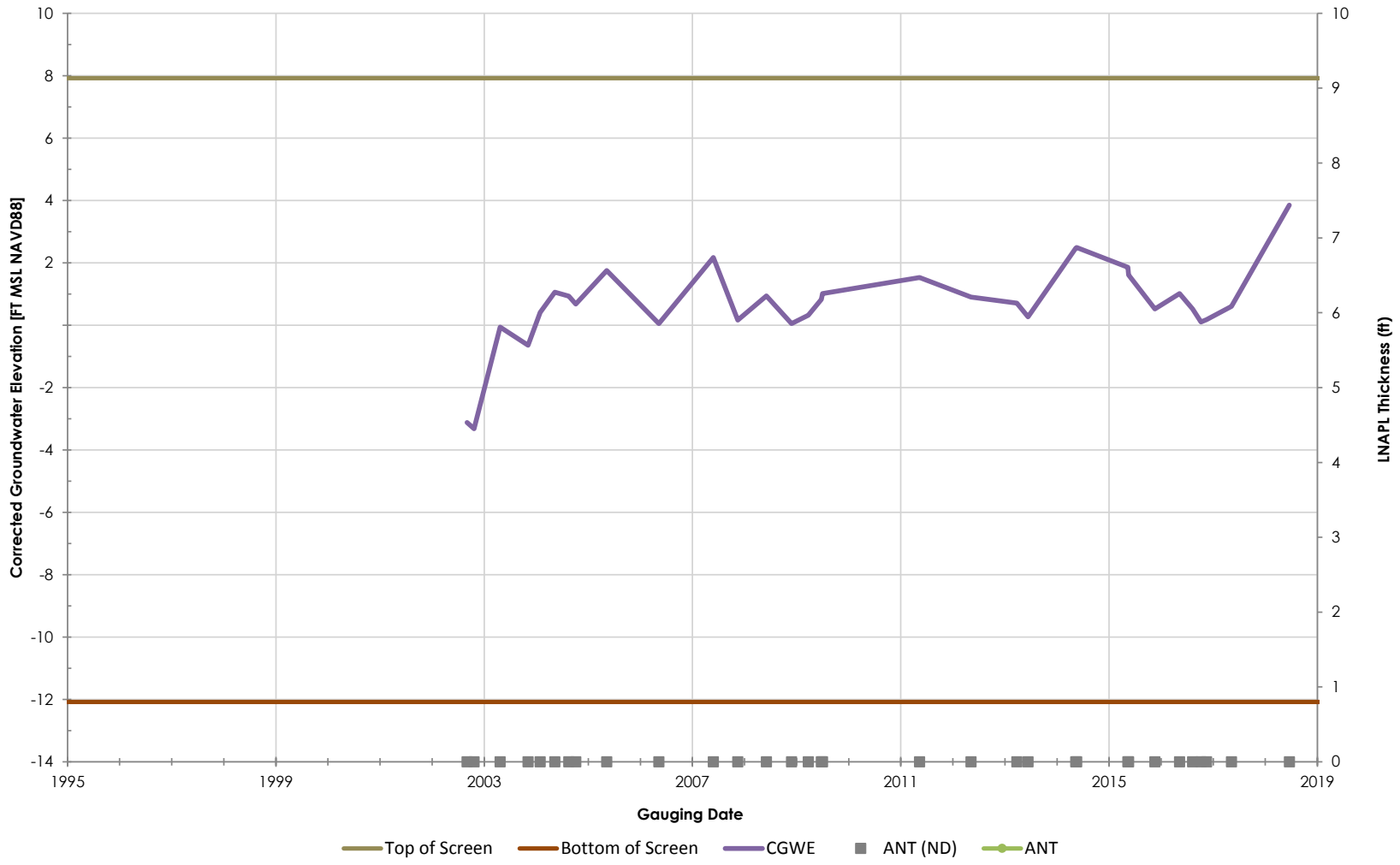
Stantec

Figure/Well No.

S-121SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

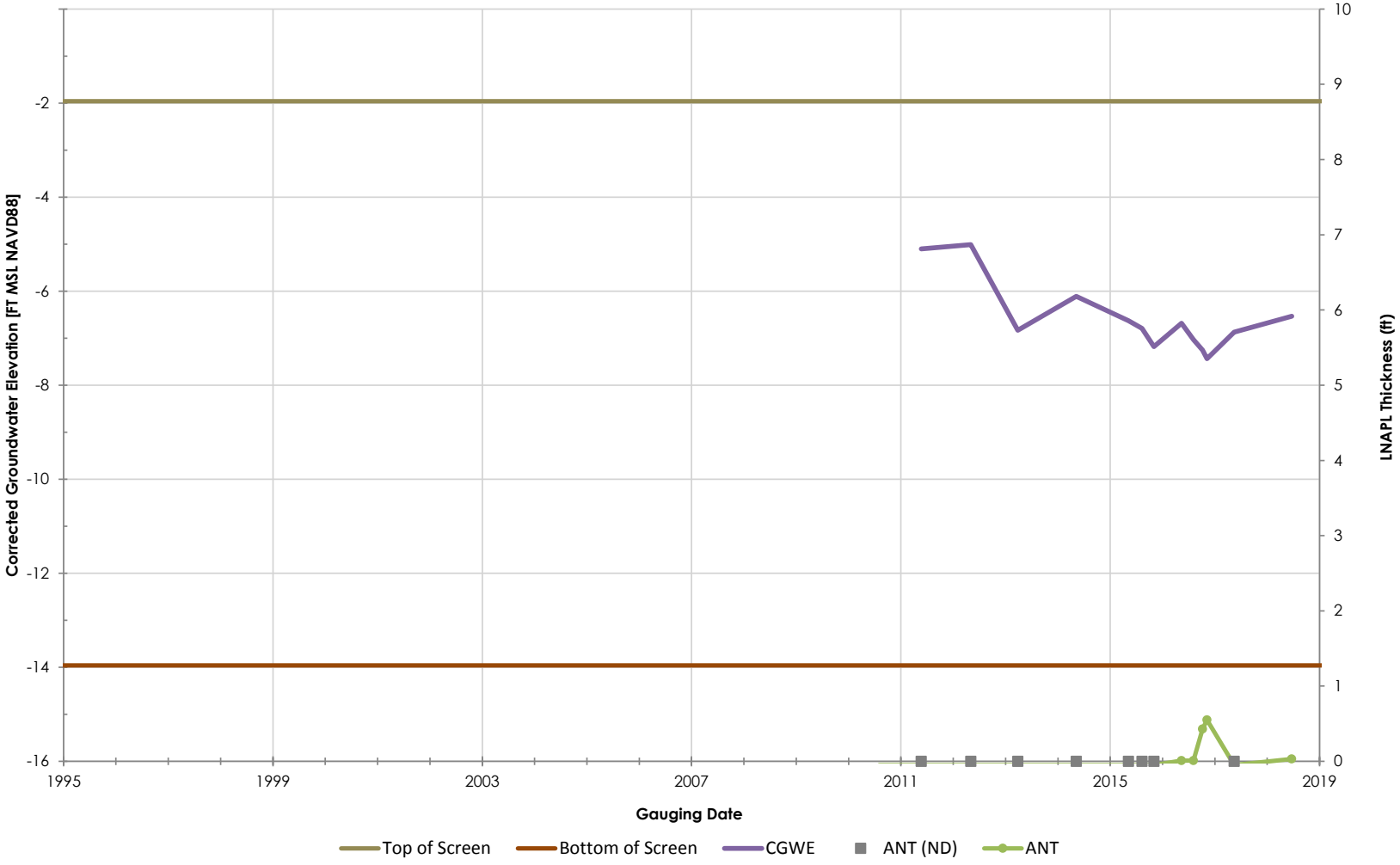
Stantec

Figure/Well No.

S-122

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

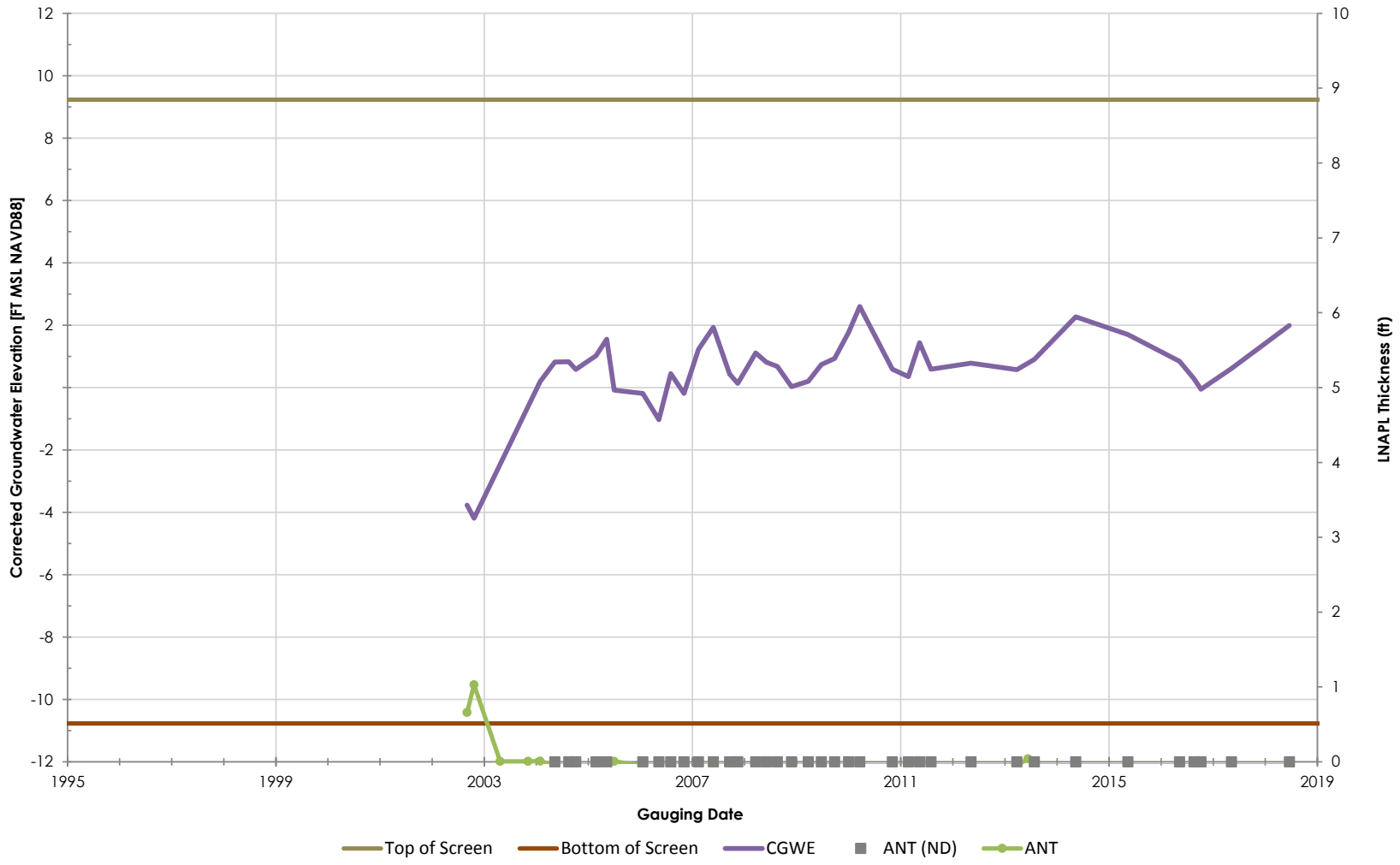
Stantec

Figure/Well No.

S-122SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

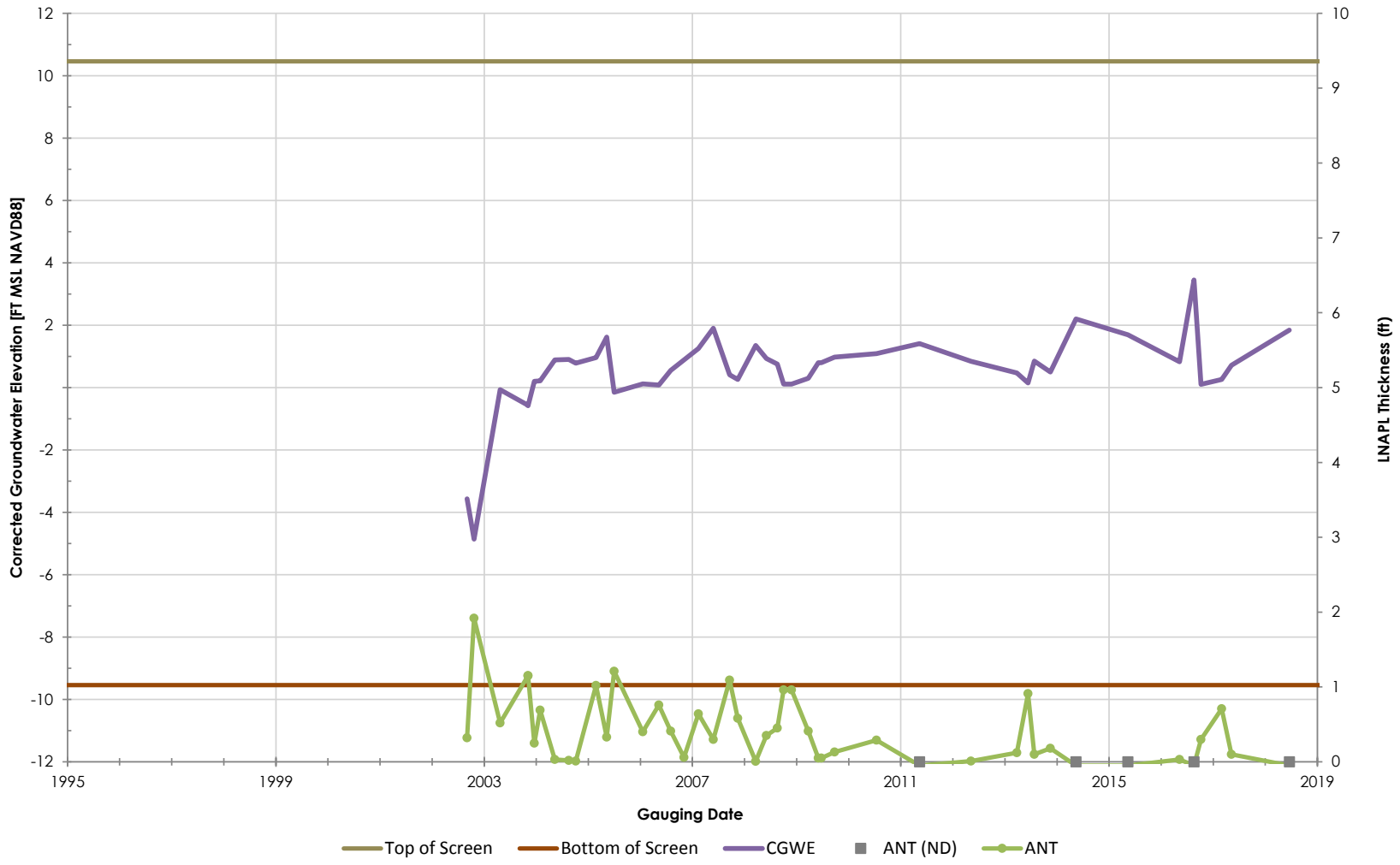
Stantec

Figure/Well No.

S-123

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

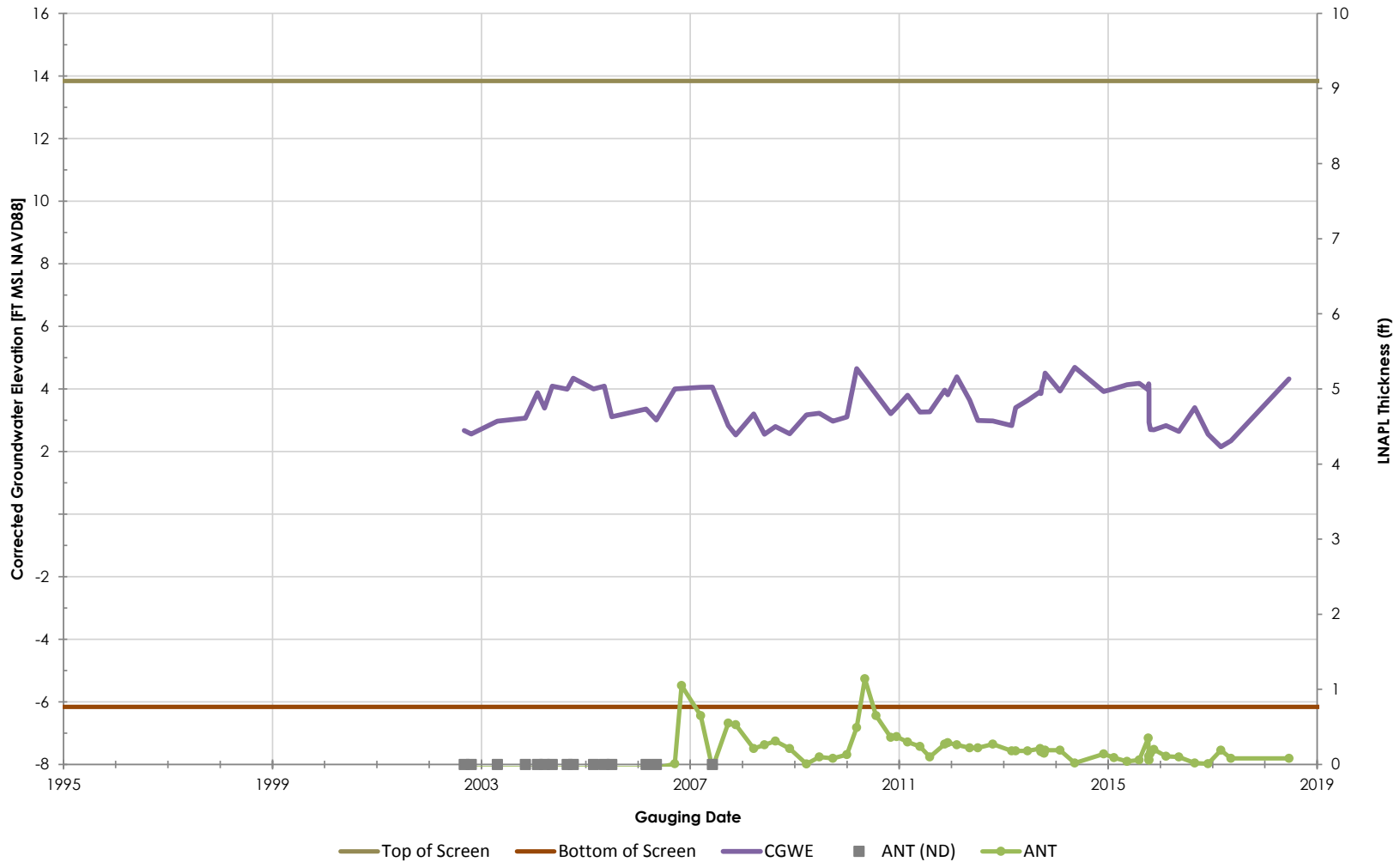
Stantec

Figure/Well No.

S-124

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

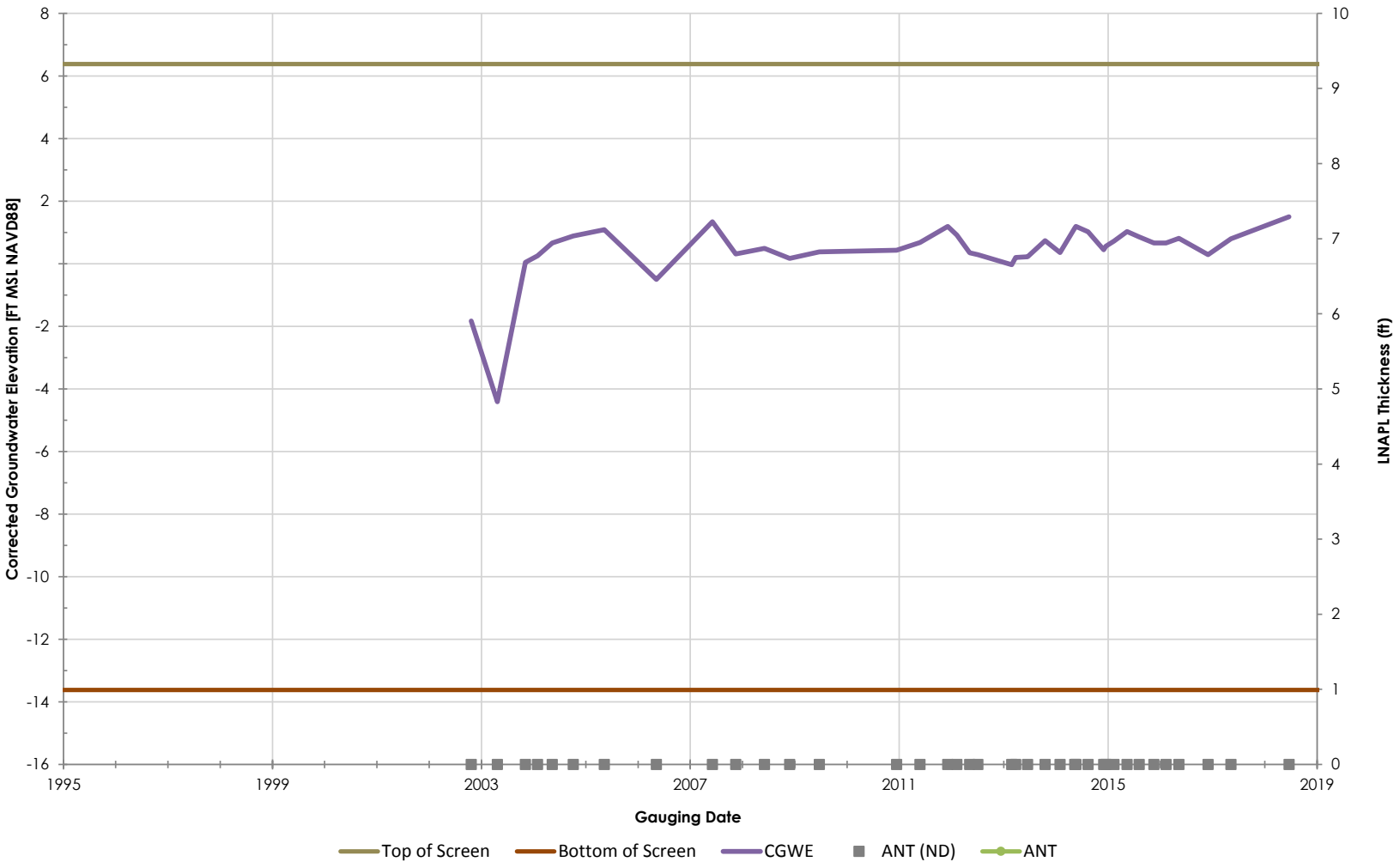
Stantec

Figure/Well No.

S-125

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

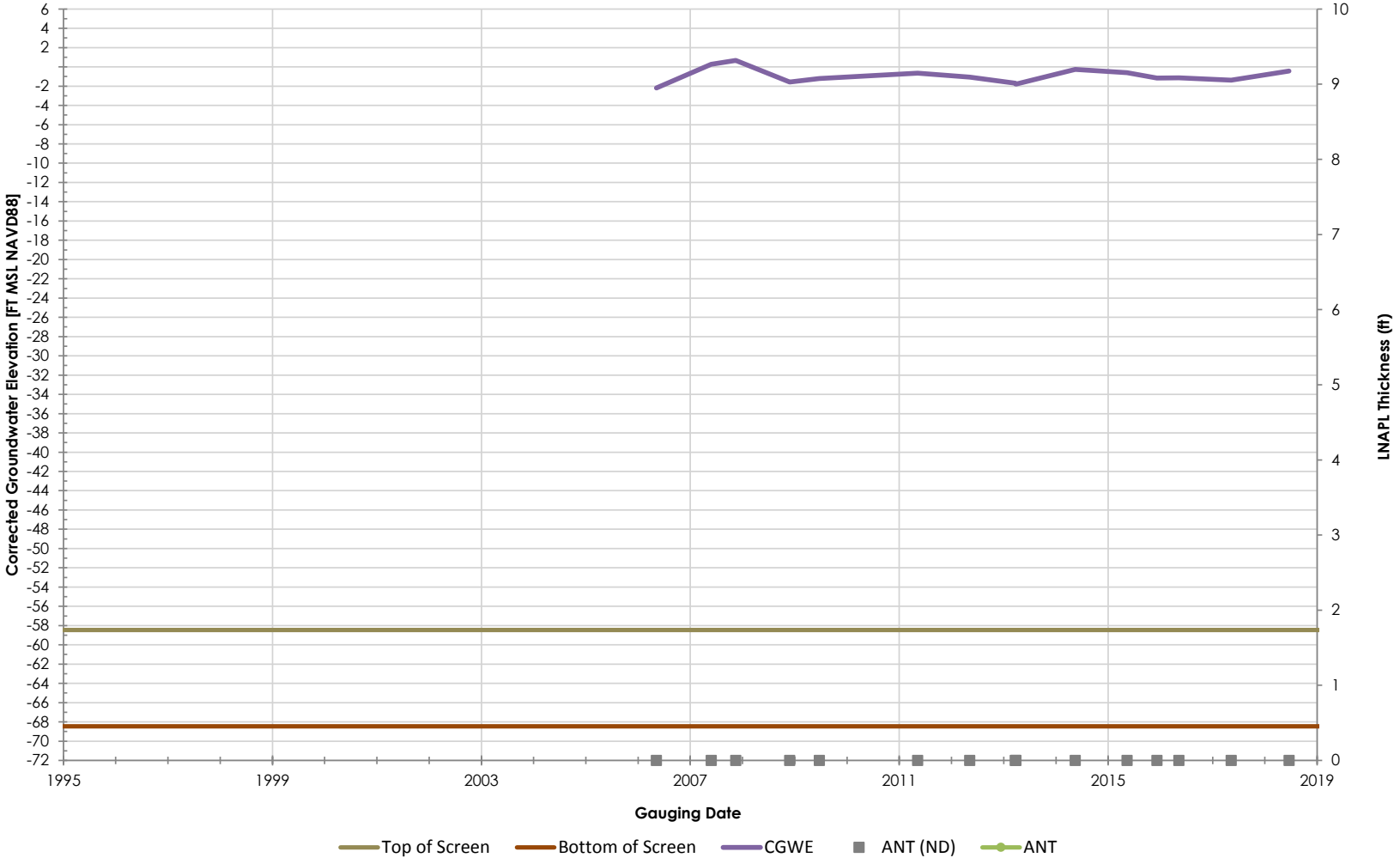
Stantec

Figure/Well No.

S-127

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

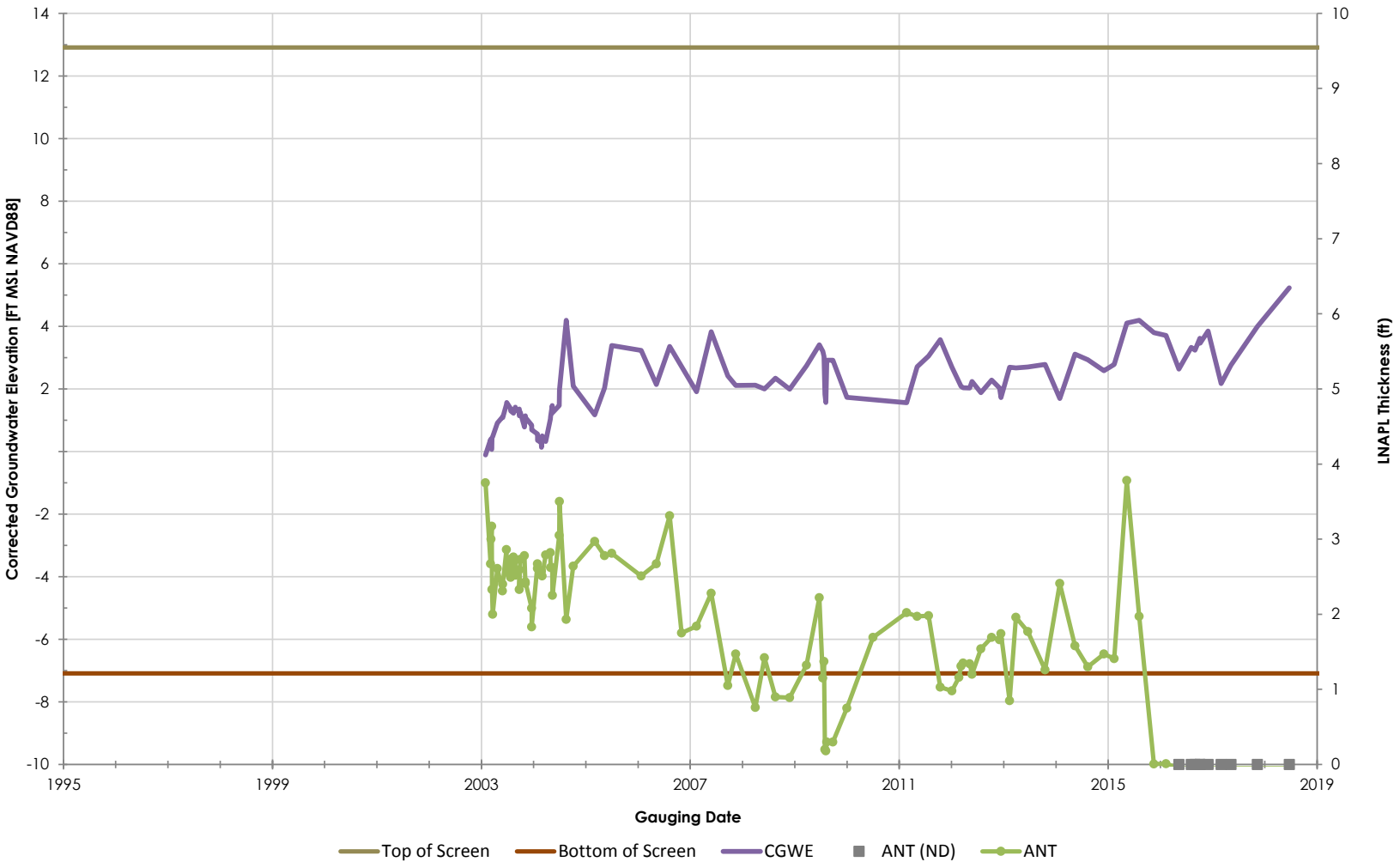
Stantec

Figure/Well No.

S-13

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

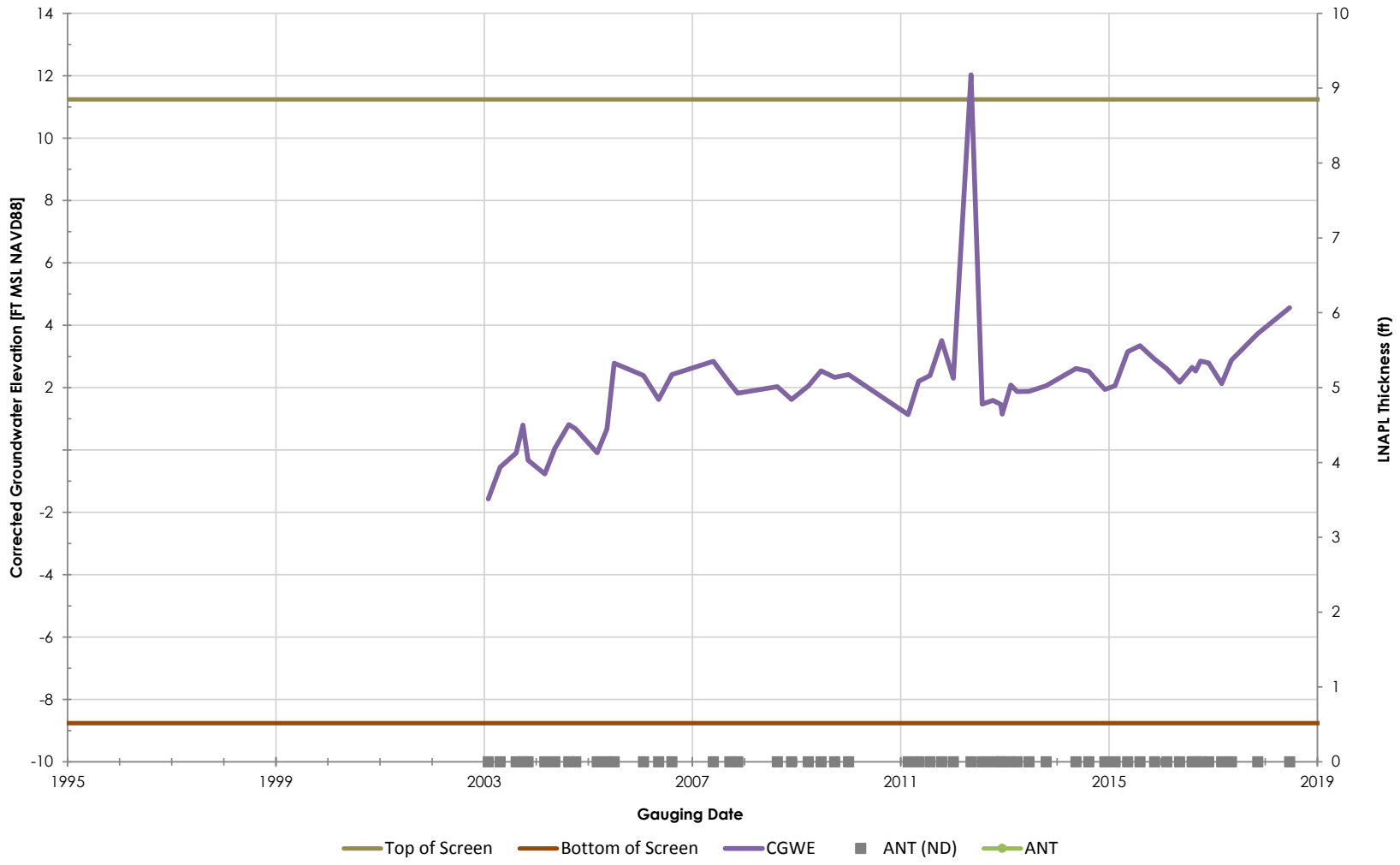
Stantec

Figure/Well No.

S-131

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

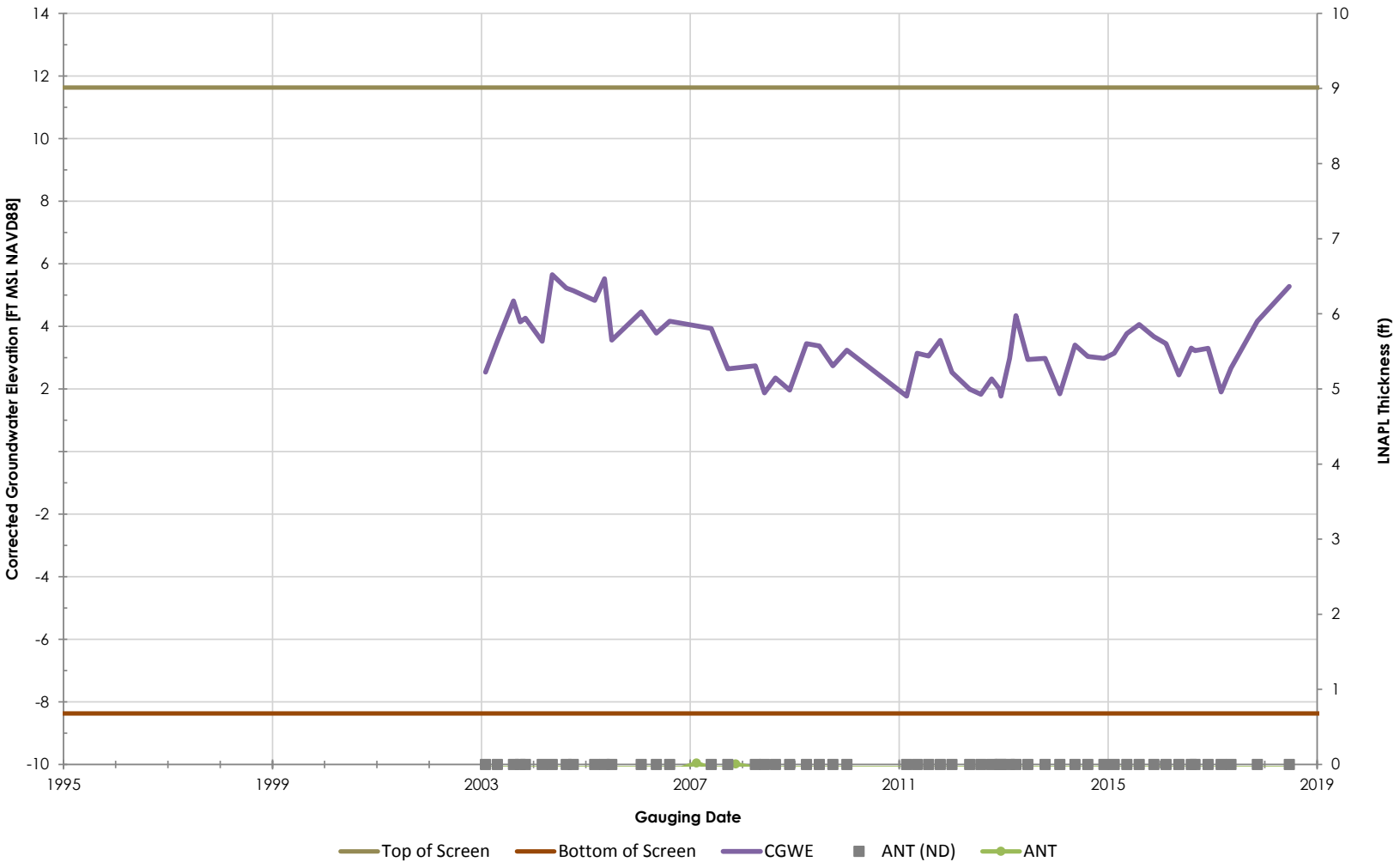
Stantec

Figure/Well No.

S-132

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

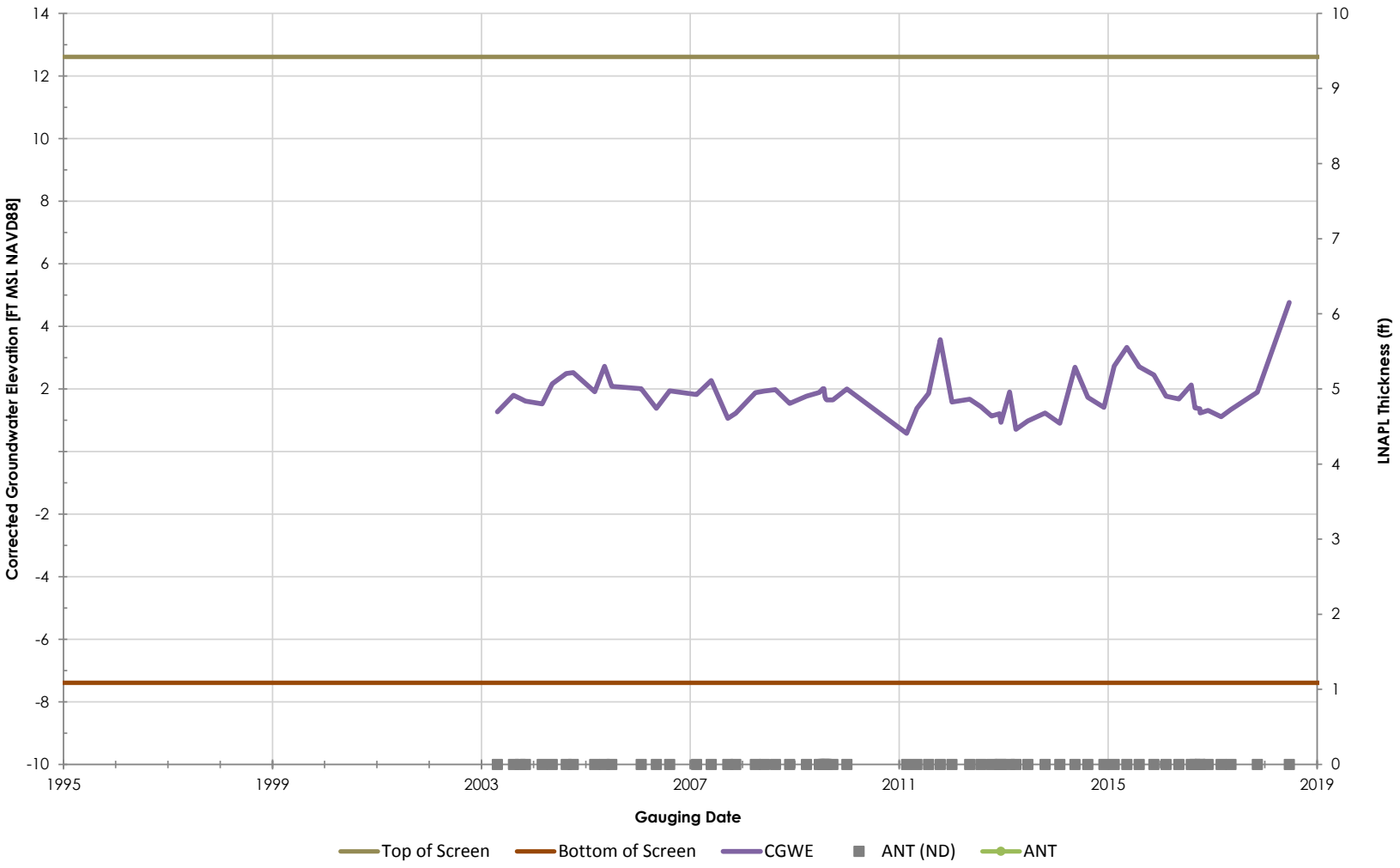
Stantec

Figure/Well No.

S-133

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

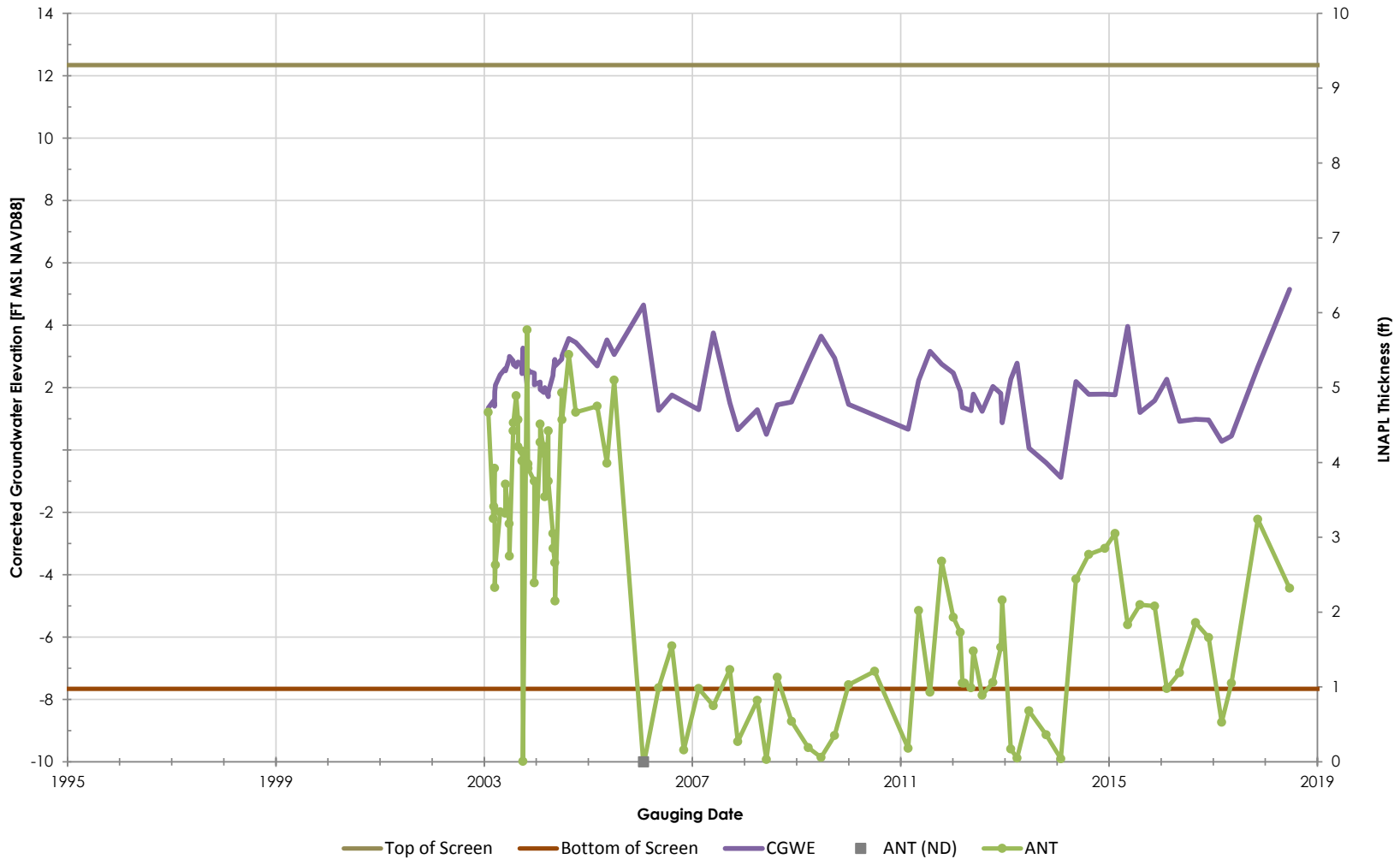
Stantec

Figure/Well No.

S-134

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

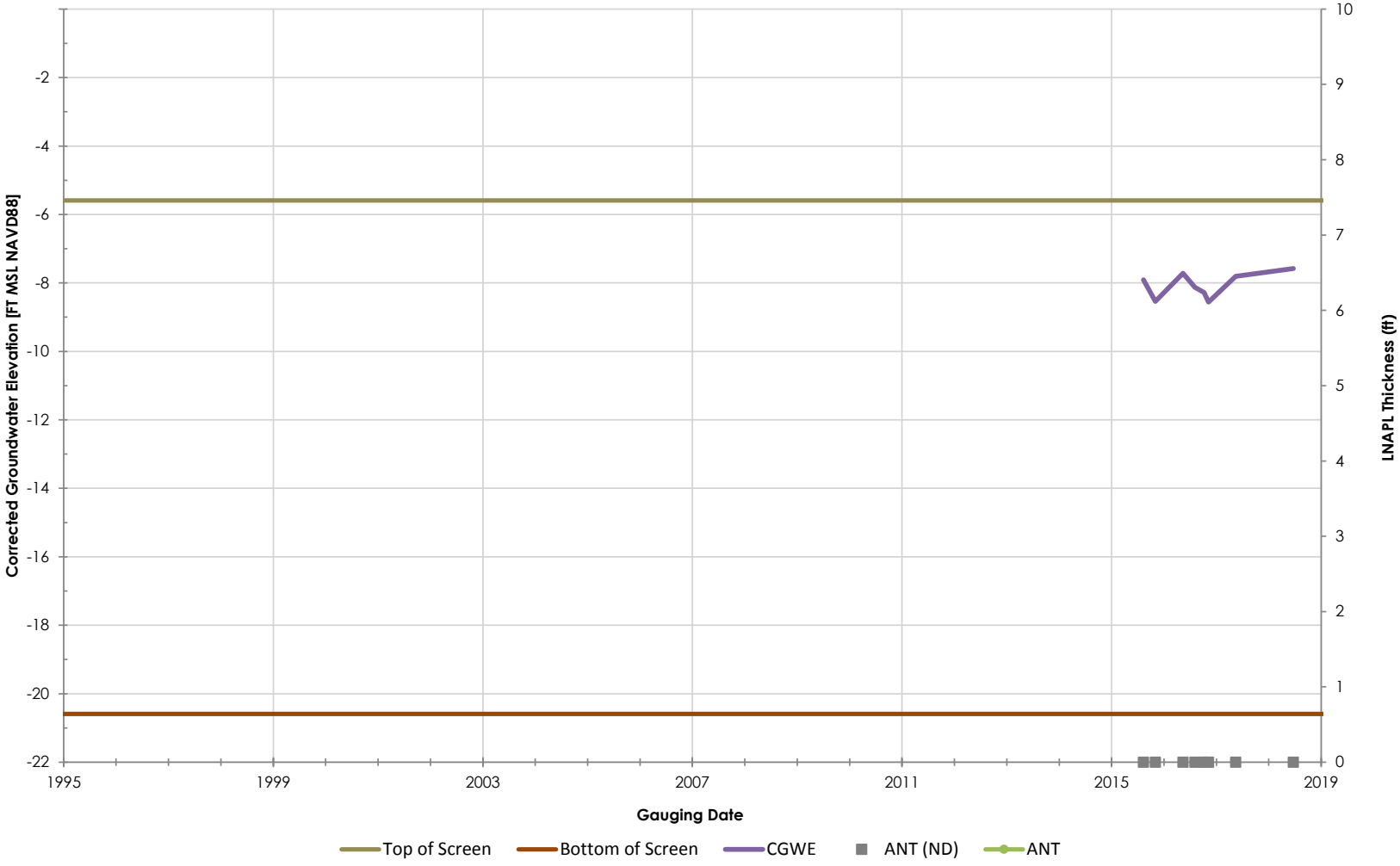
Stantec

Figure/Well No.

S-135

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

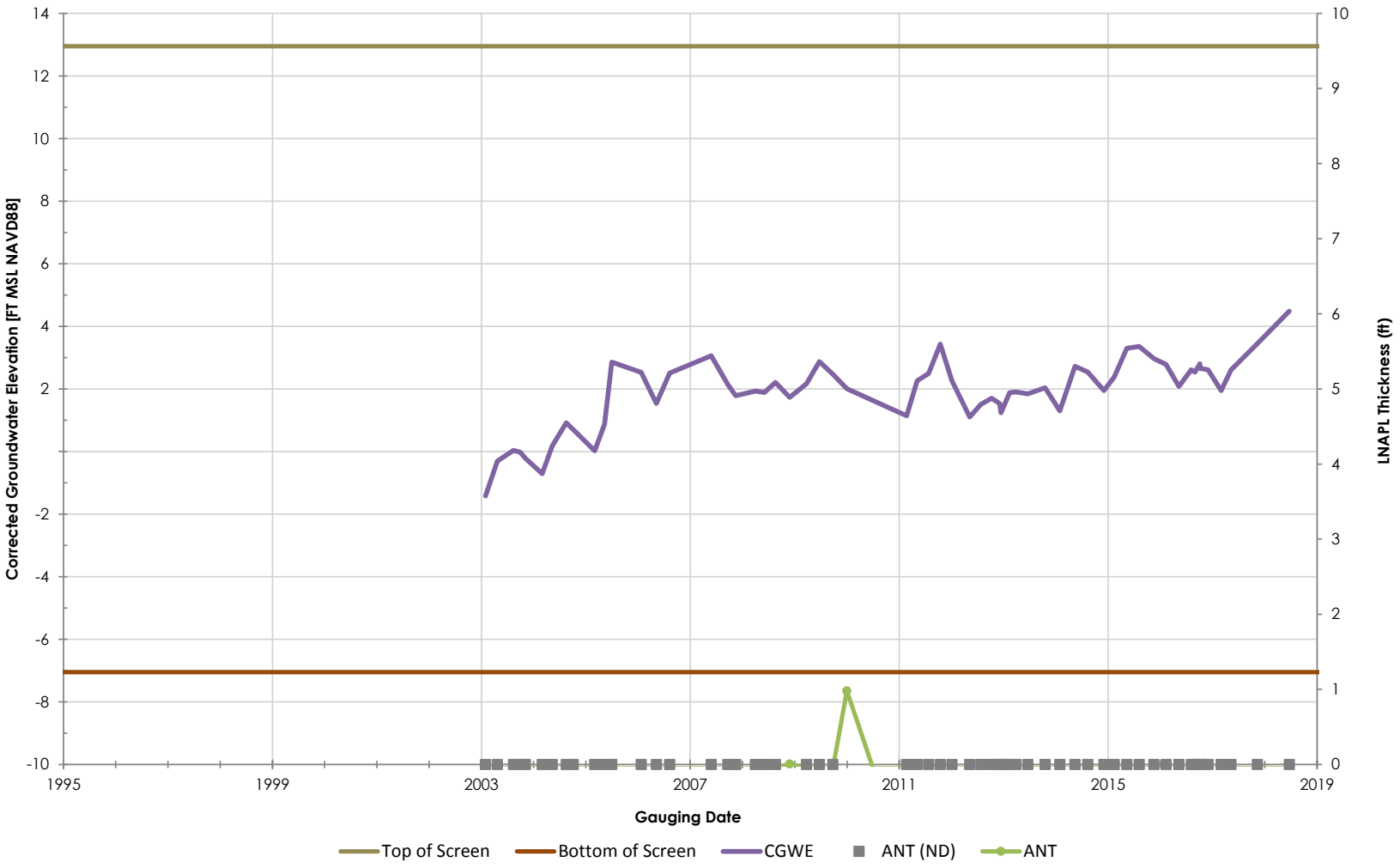
Stantec

Figure/Well No.

S-135SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

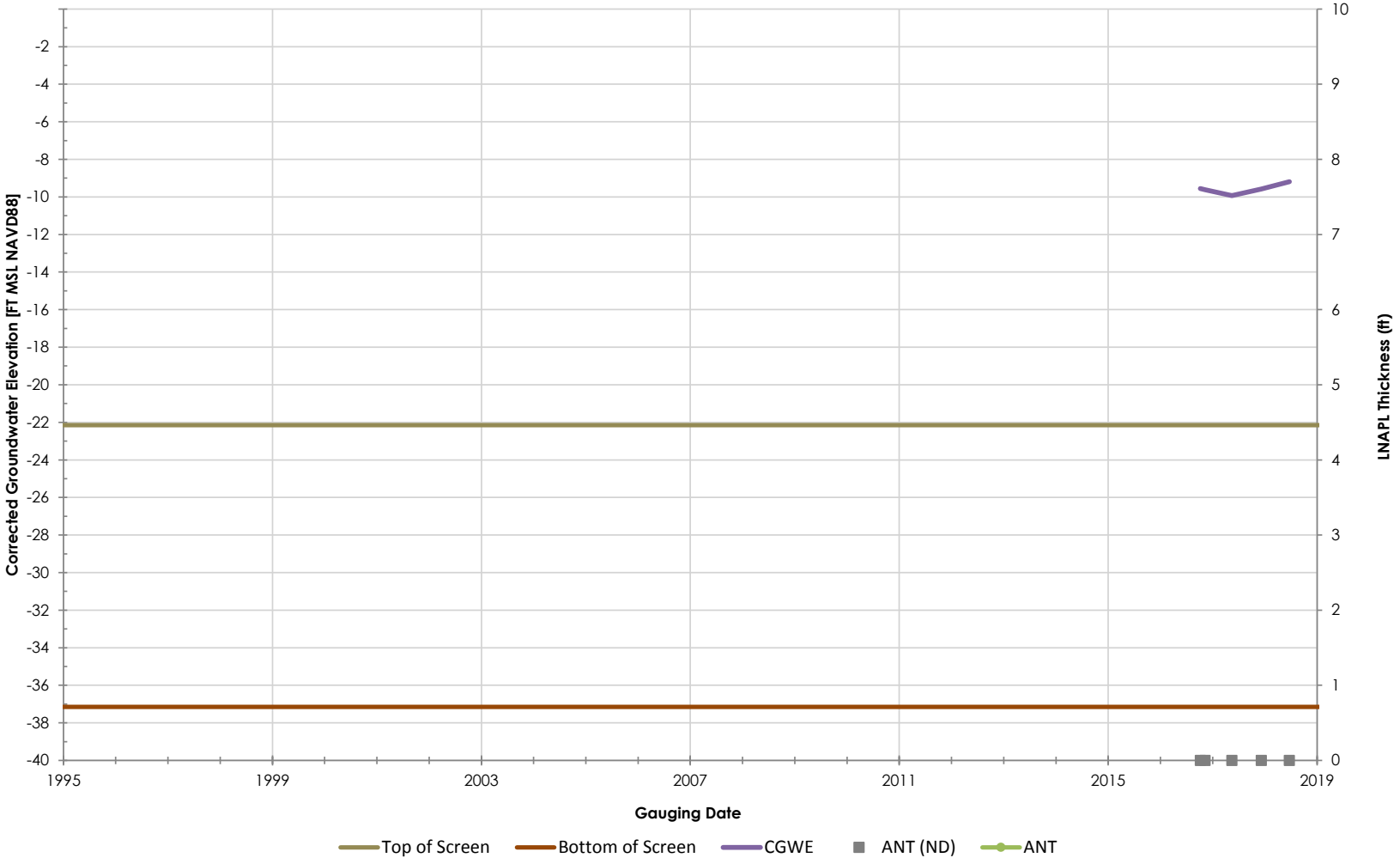
Stantec

Figure/Well No.

S-136

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



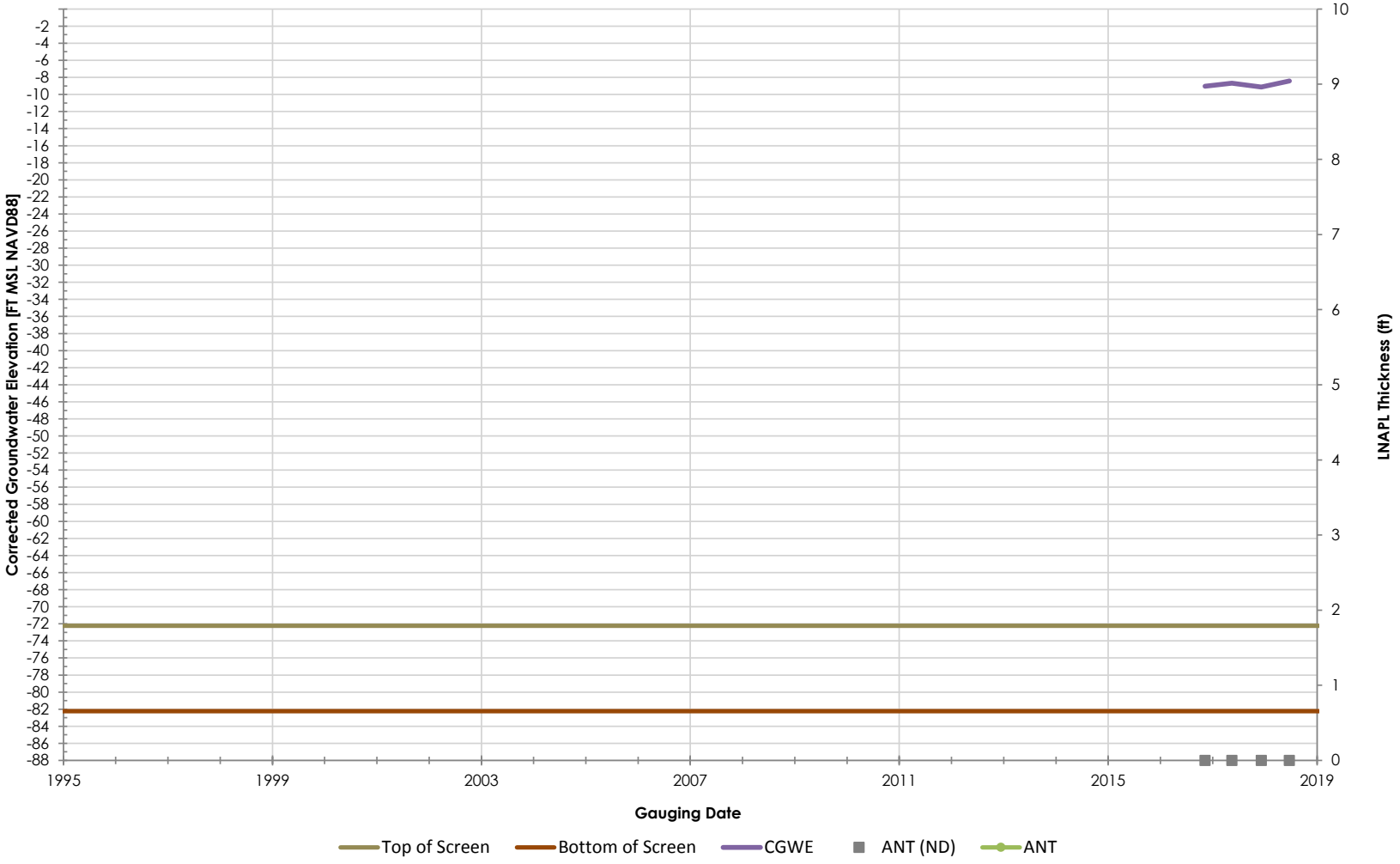
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-137SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



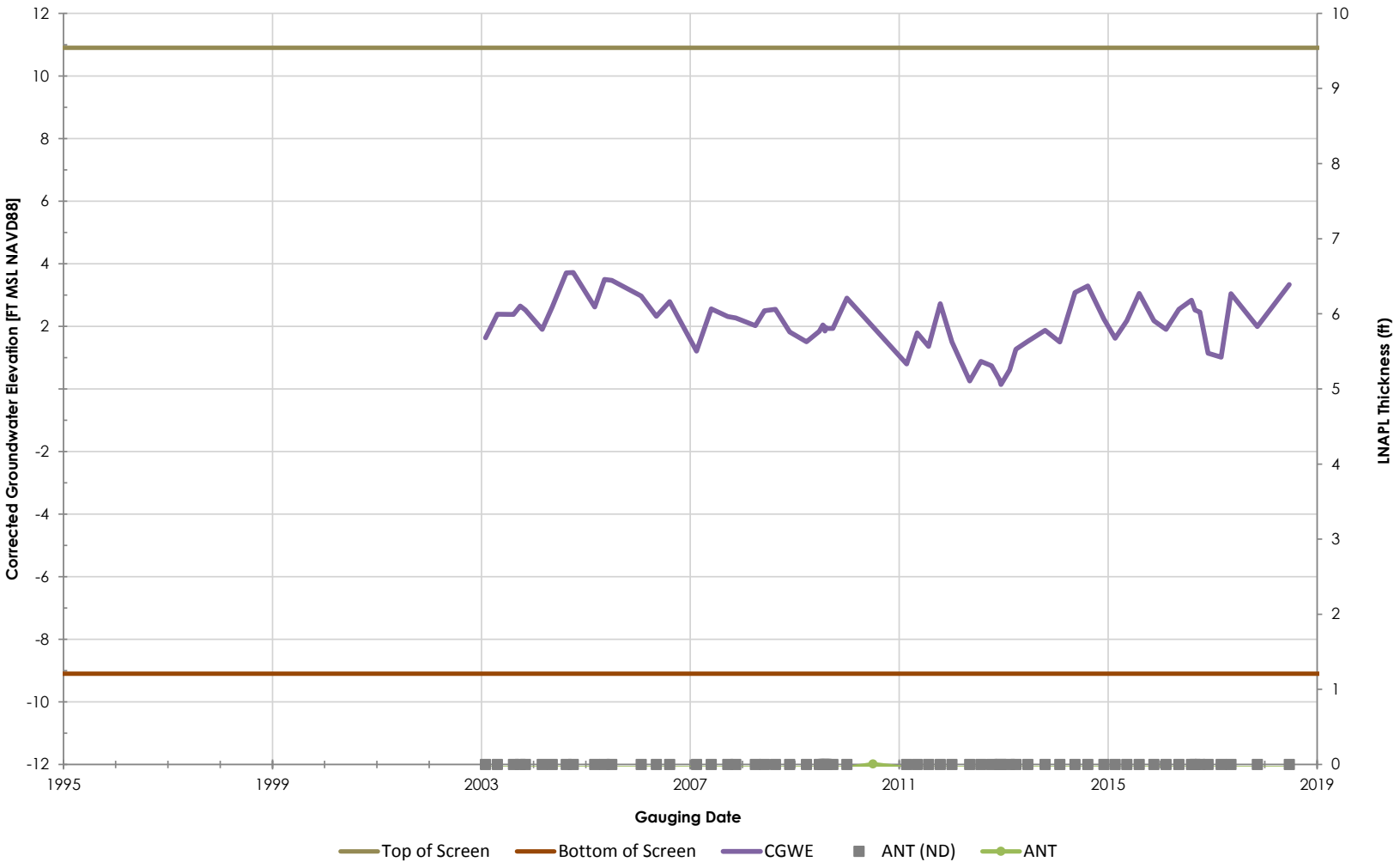
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-138SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

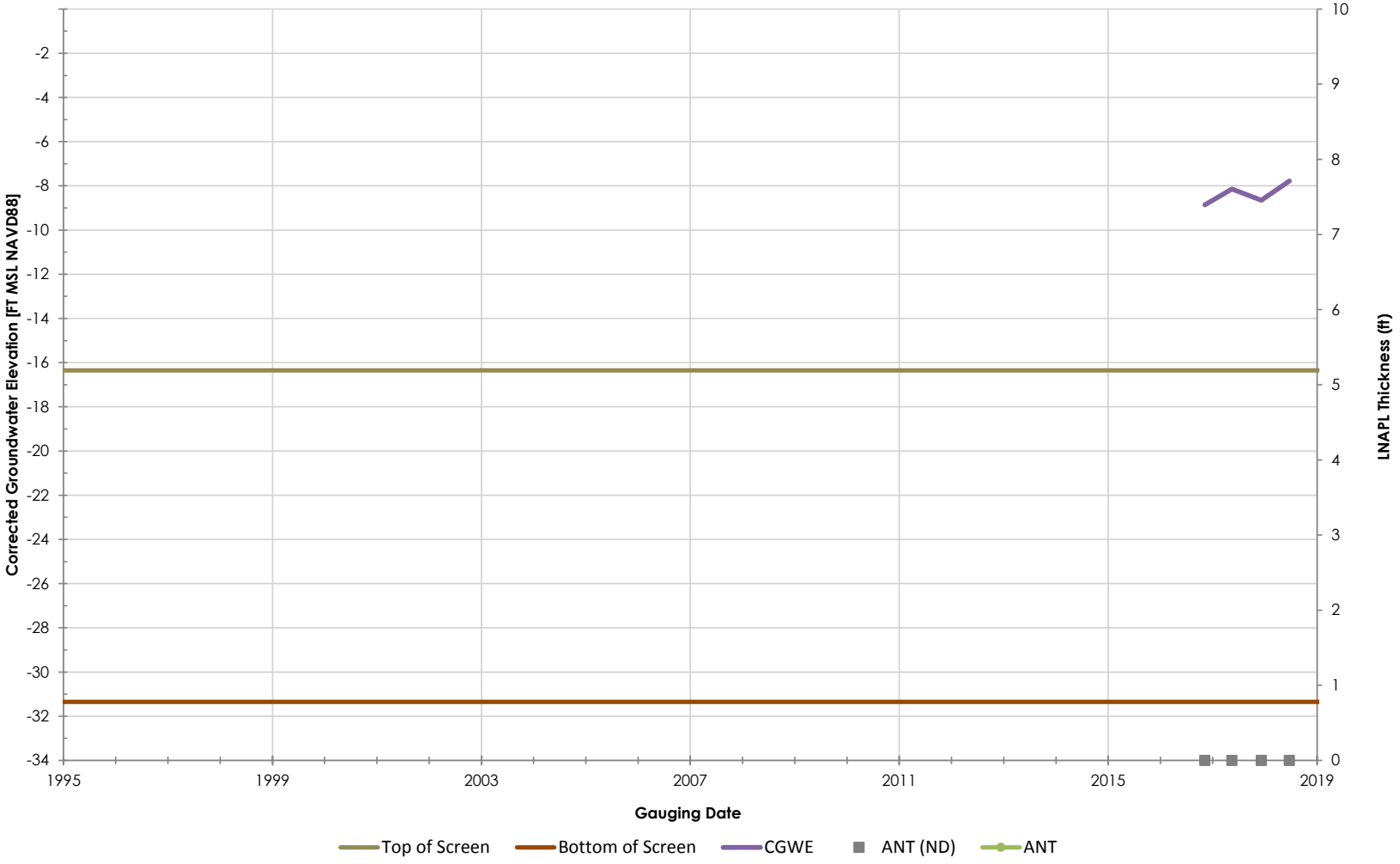
Stantec

Figure/Well No.

S-139

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

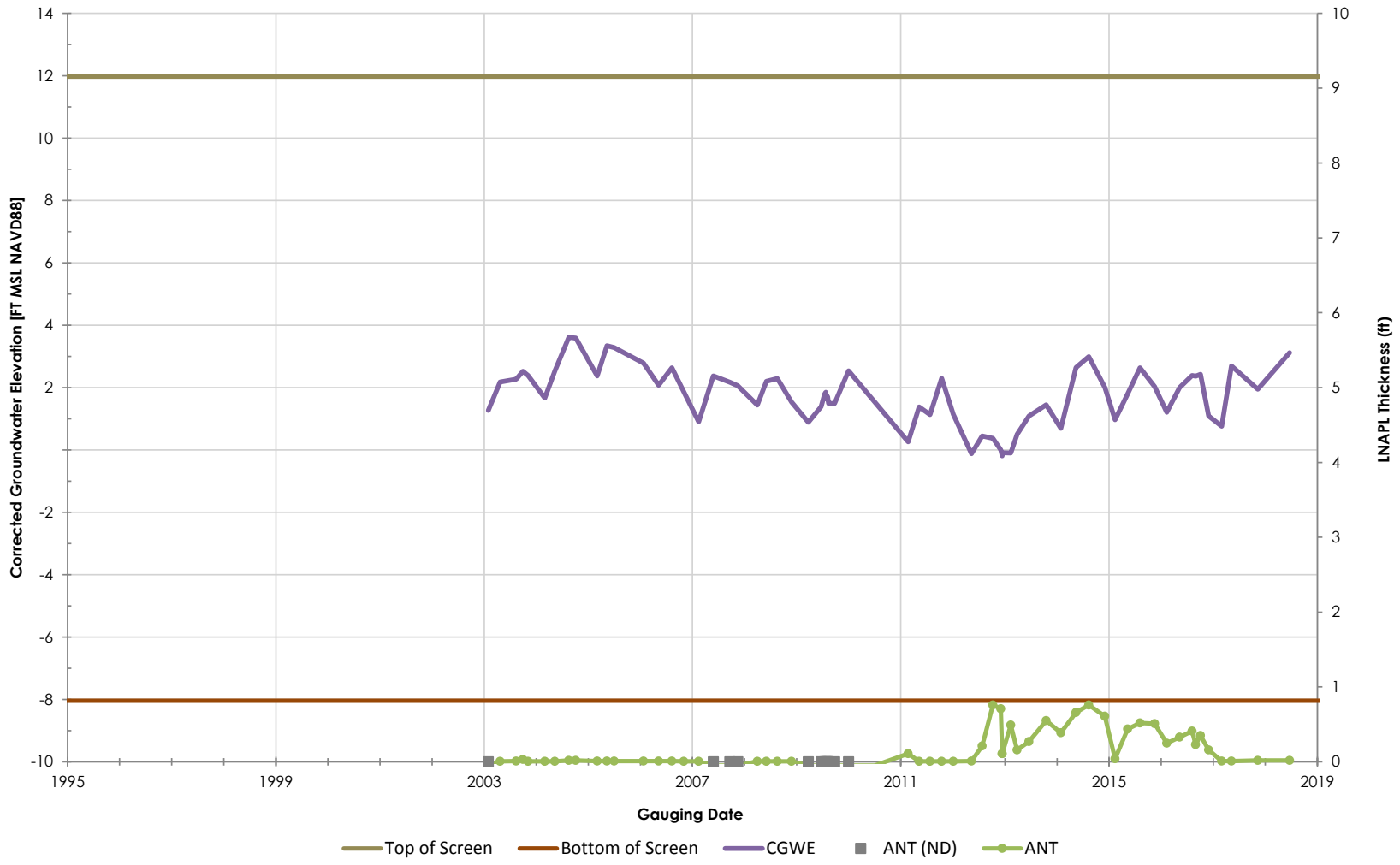
Stantec

Figure/Well No.

S-139SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

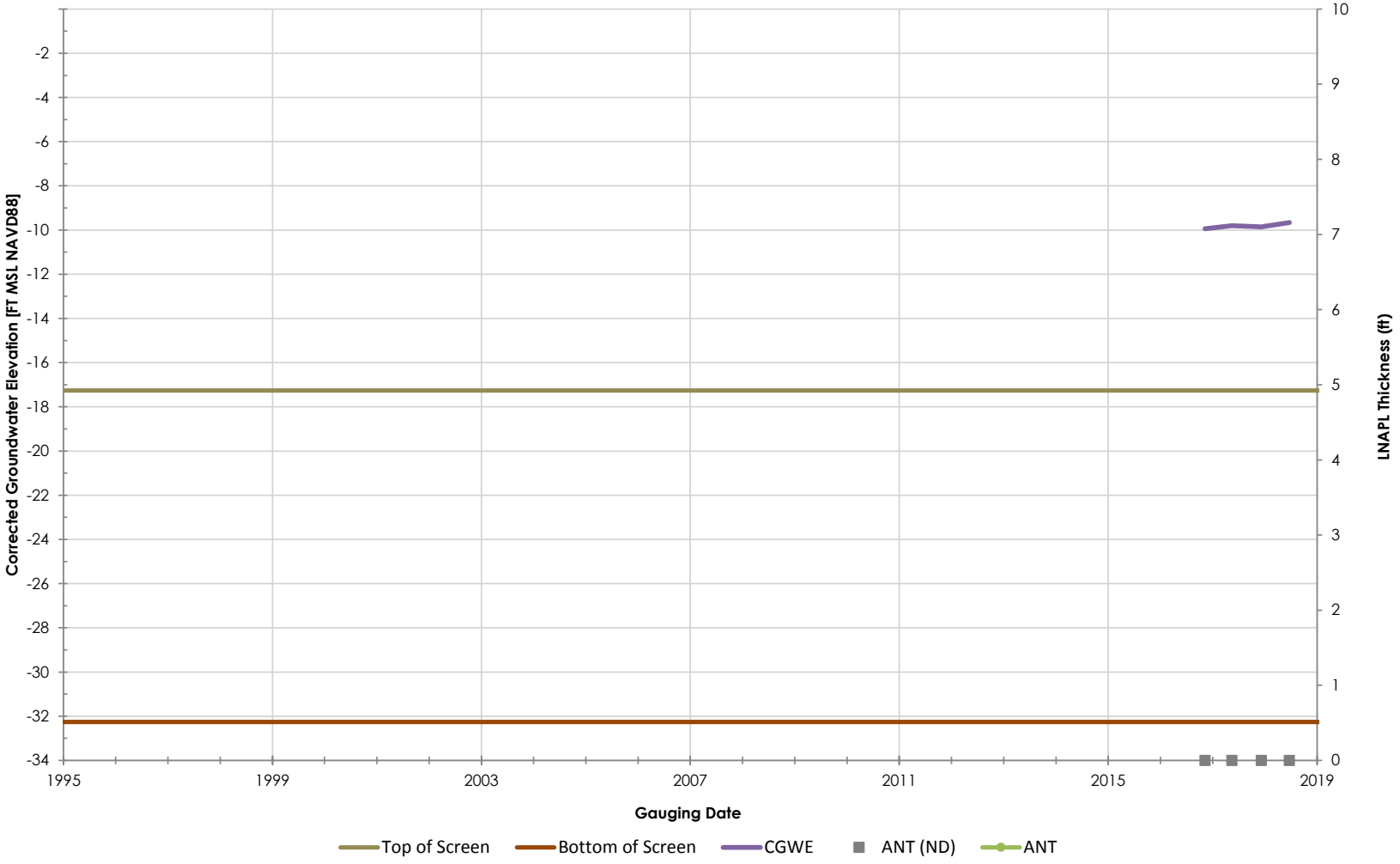
Stantec

Figure/Well No.

S-141

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

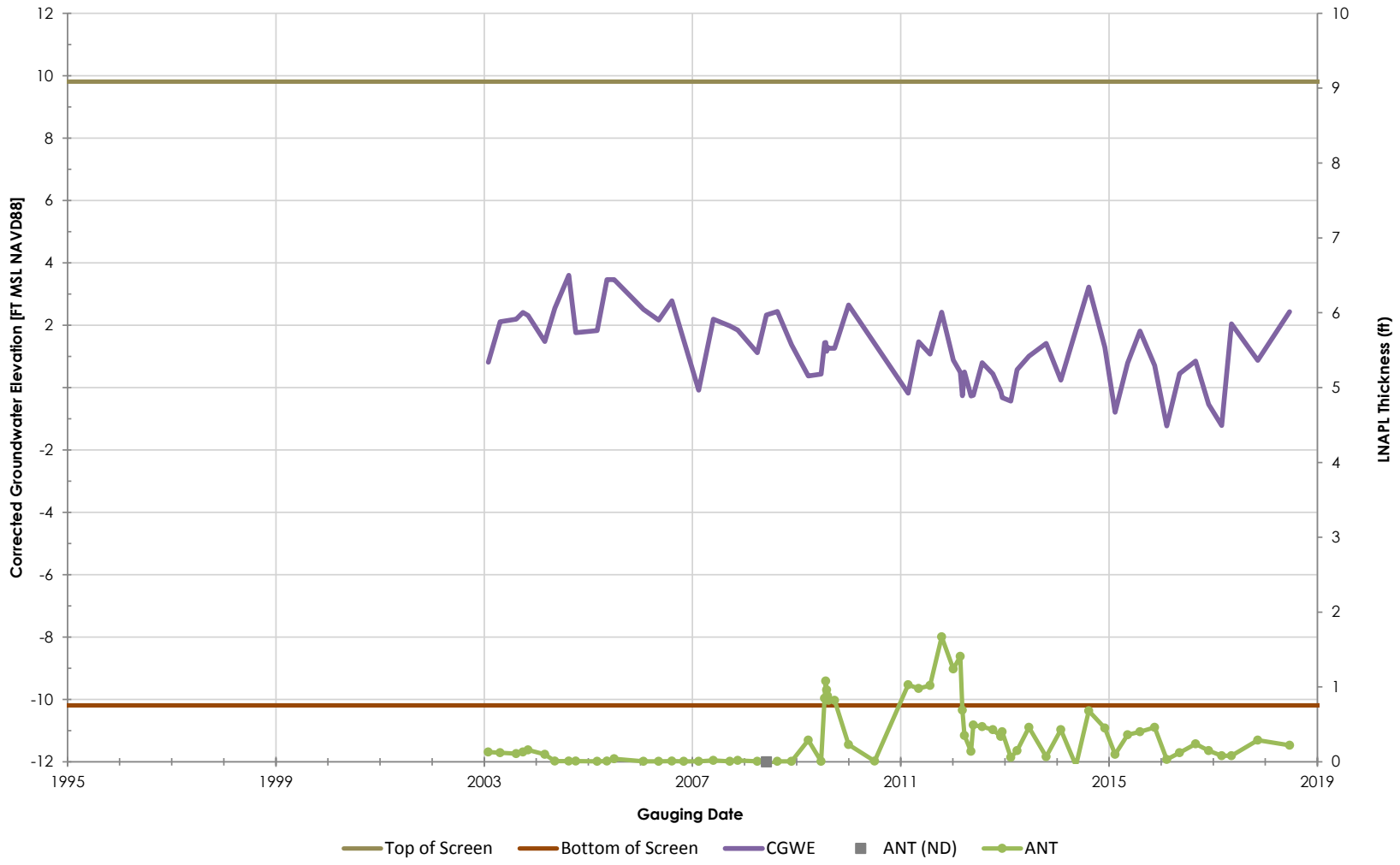
Stantec

Figure/Well No.

S-141SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

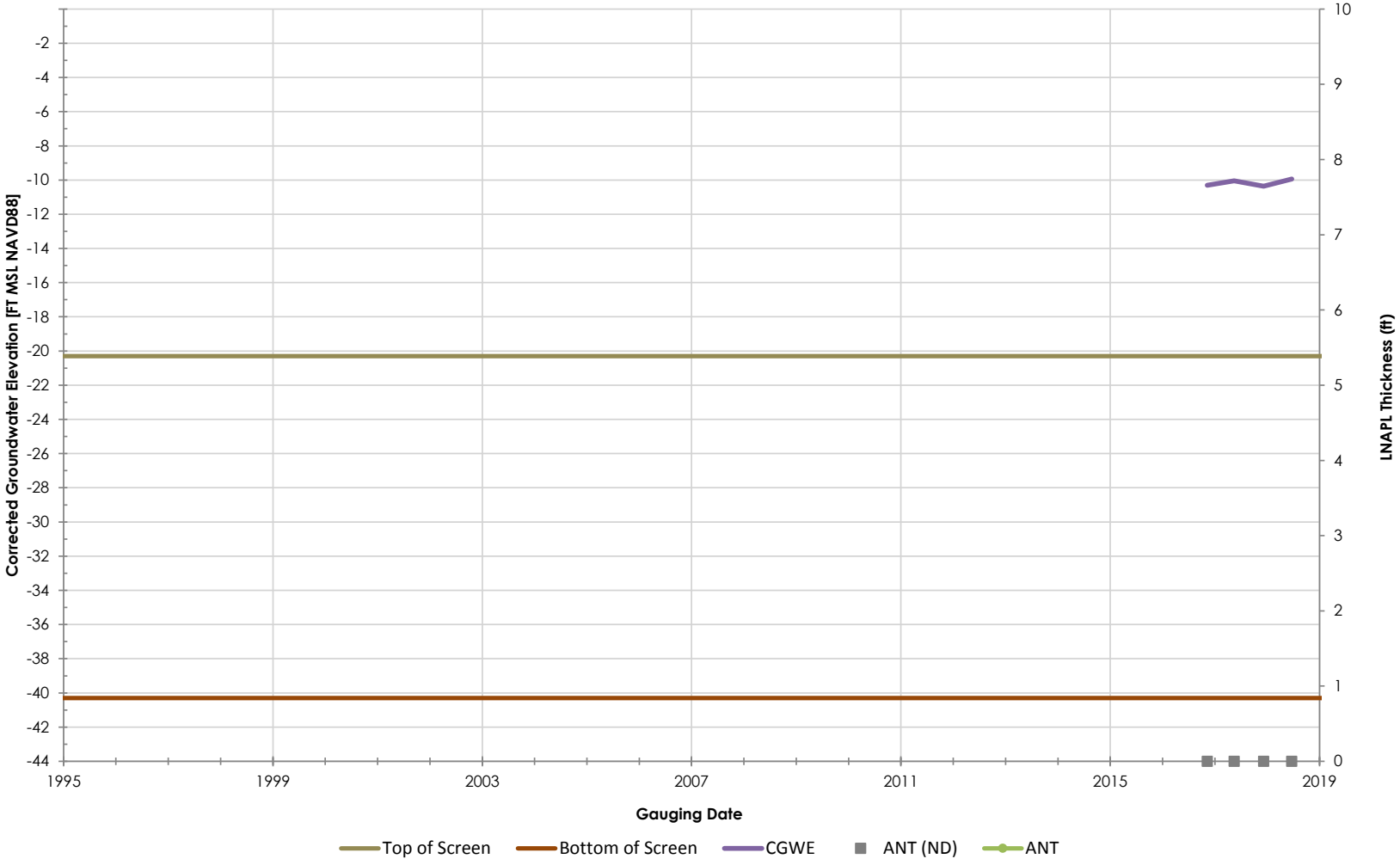
Stantec

Figure/Well No.

S-142

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



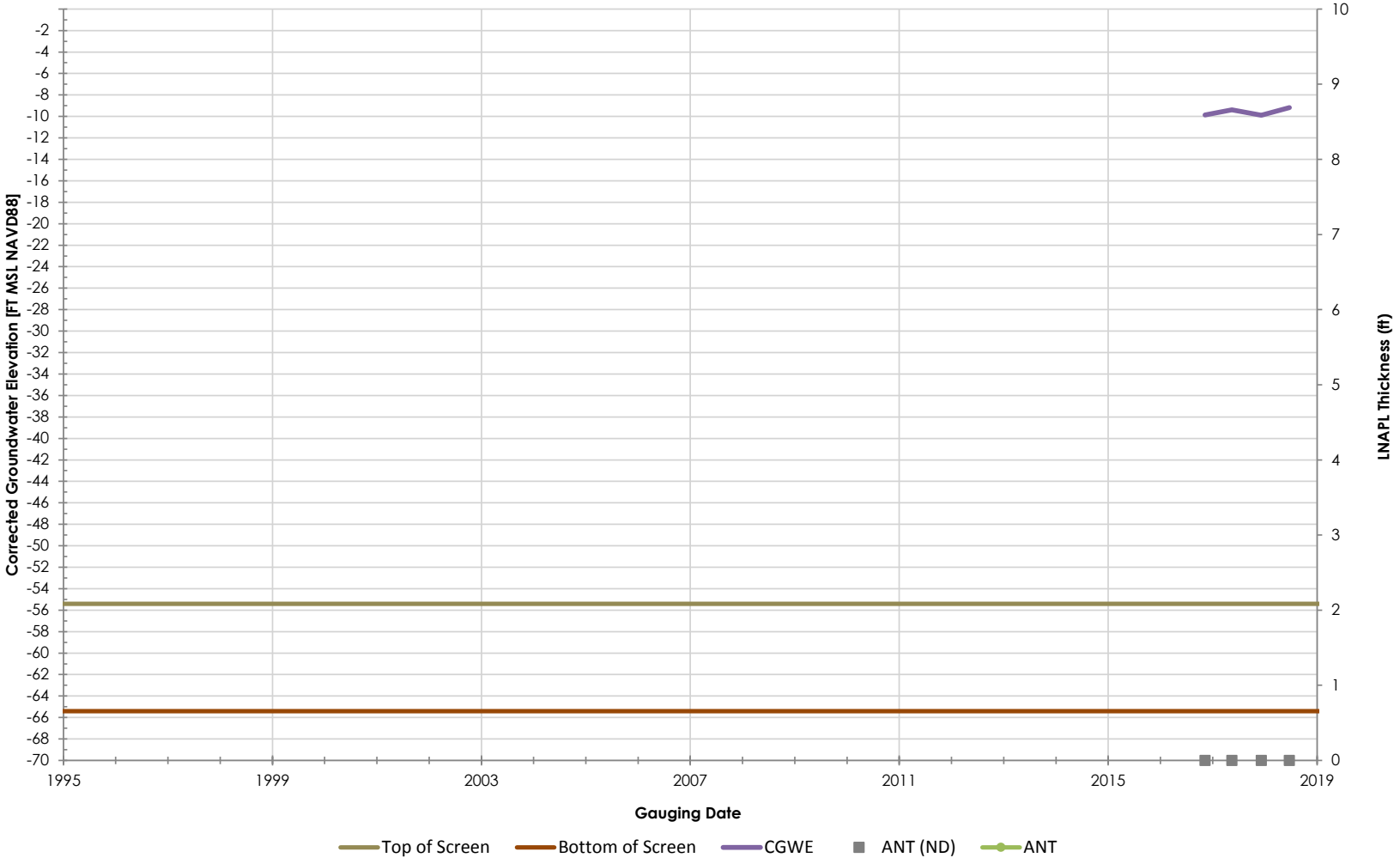
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-142SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

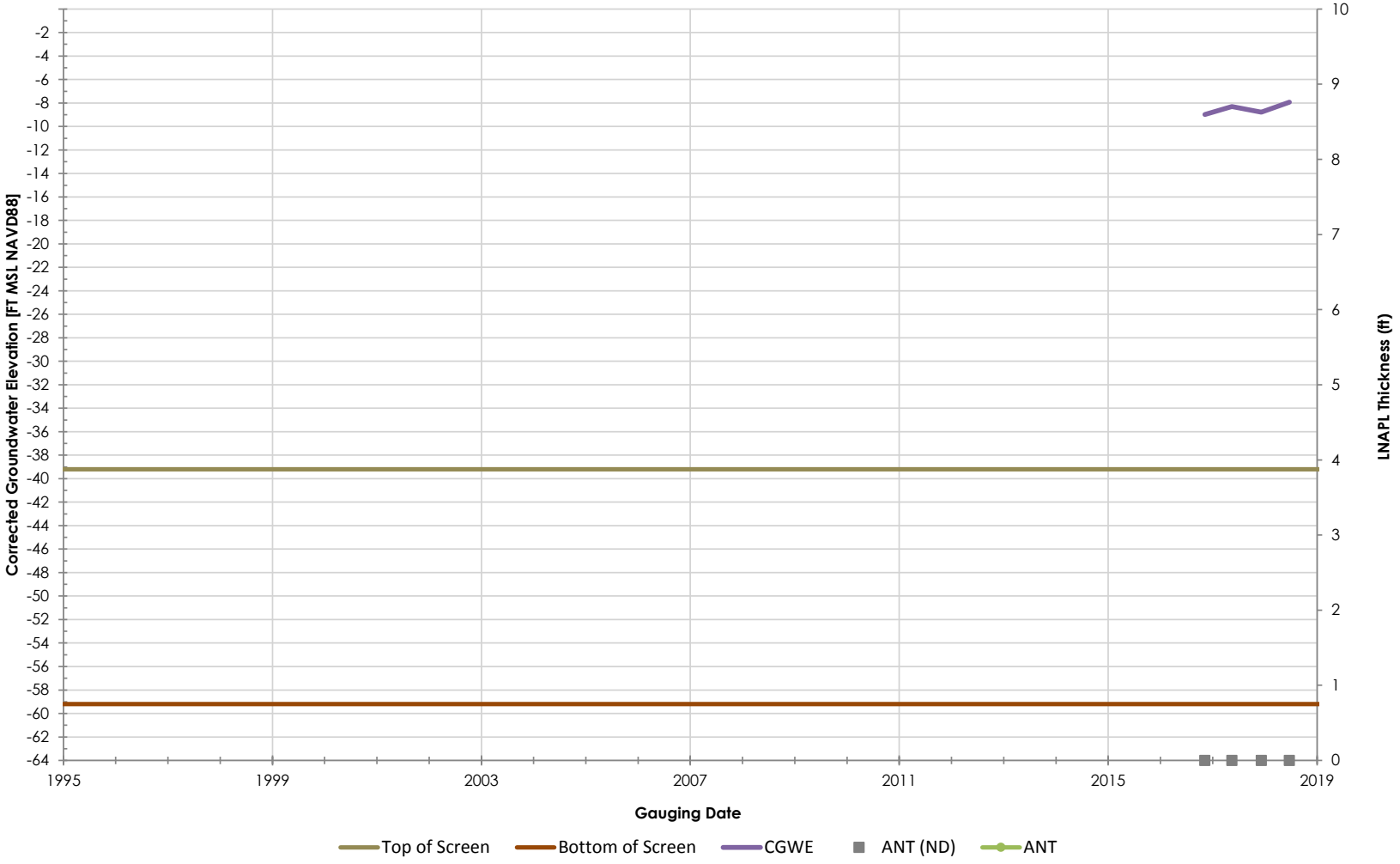
Stantec

Figure/Well No.

S-143SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



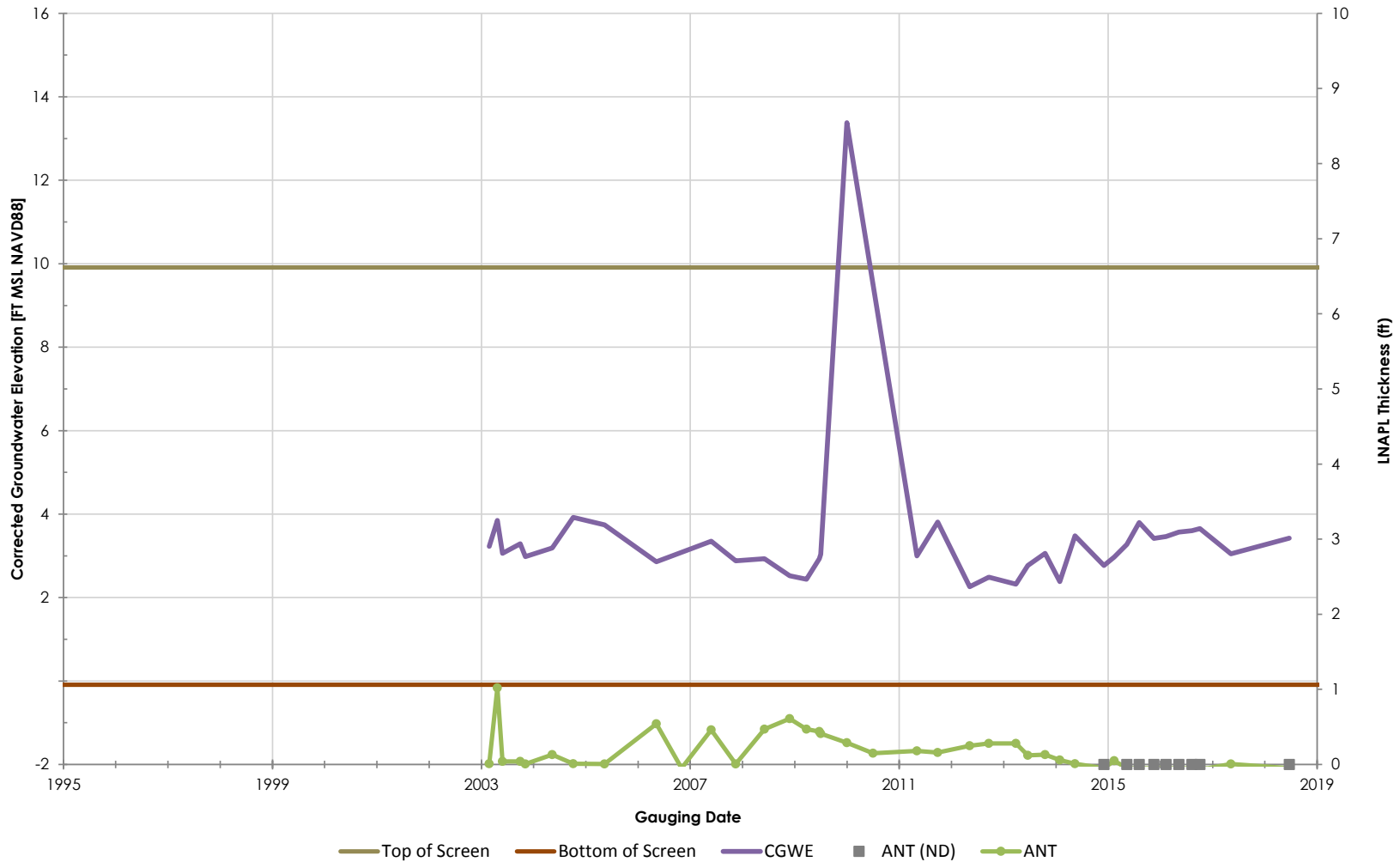
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-144SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

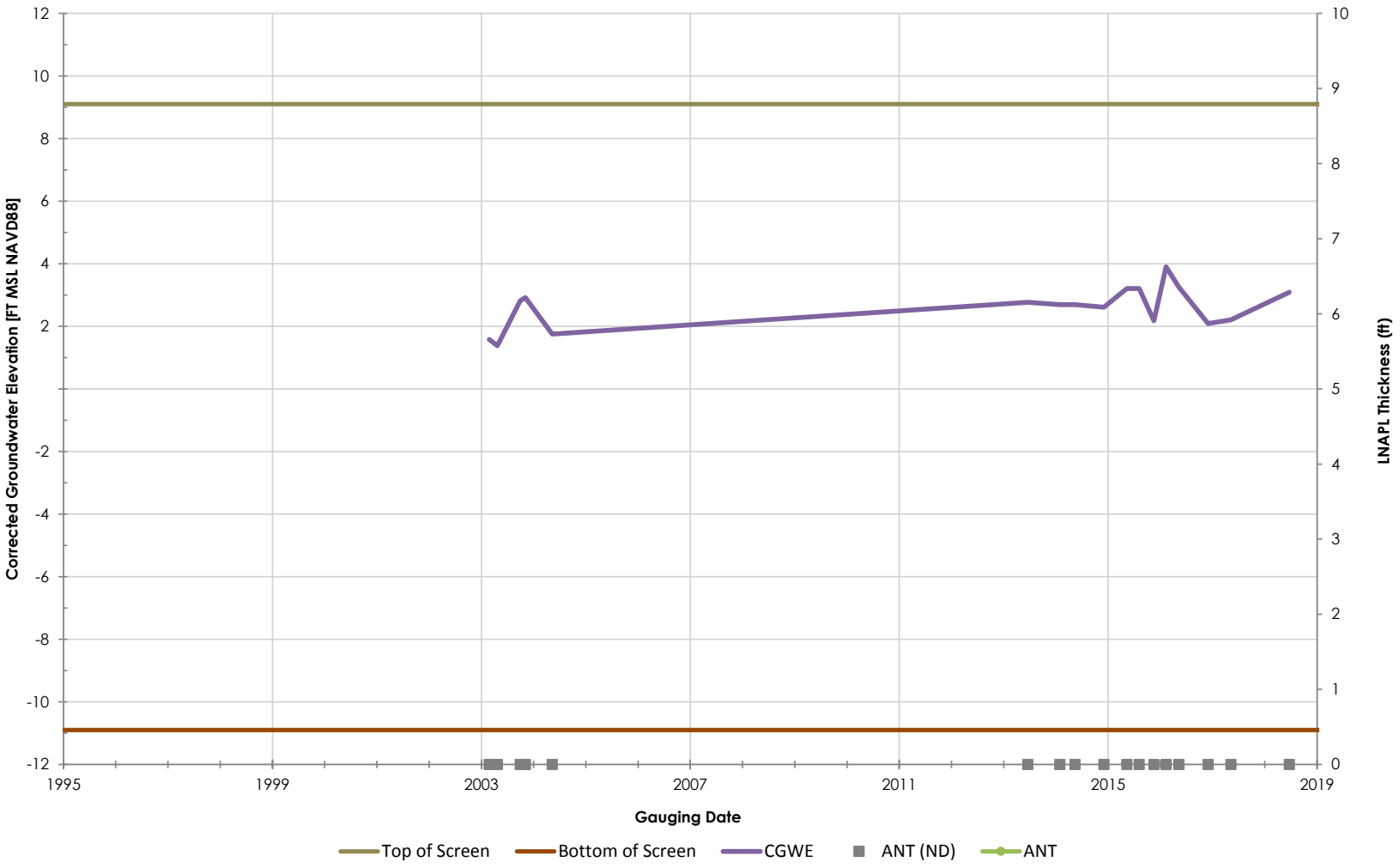
Stantec

Figure/Well No.

S-150

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

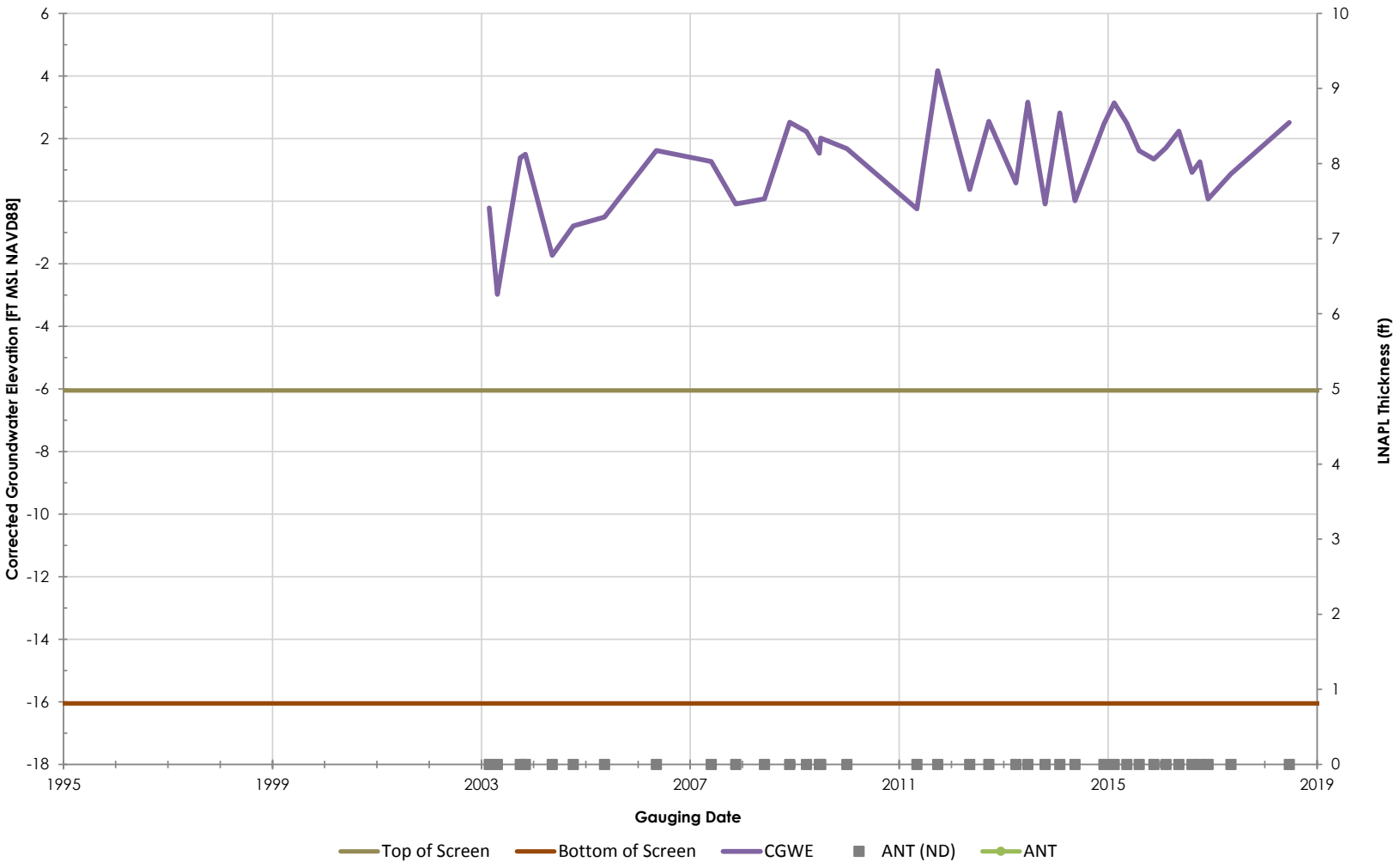
Stantec

Figure/Well No.

S-152

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

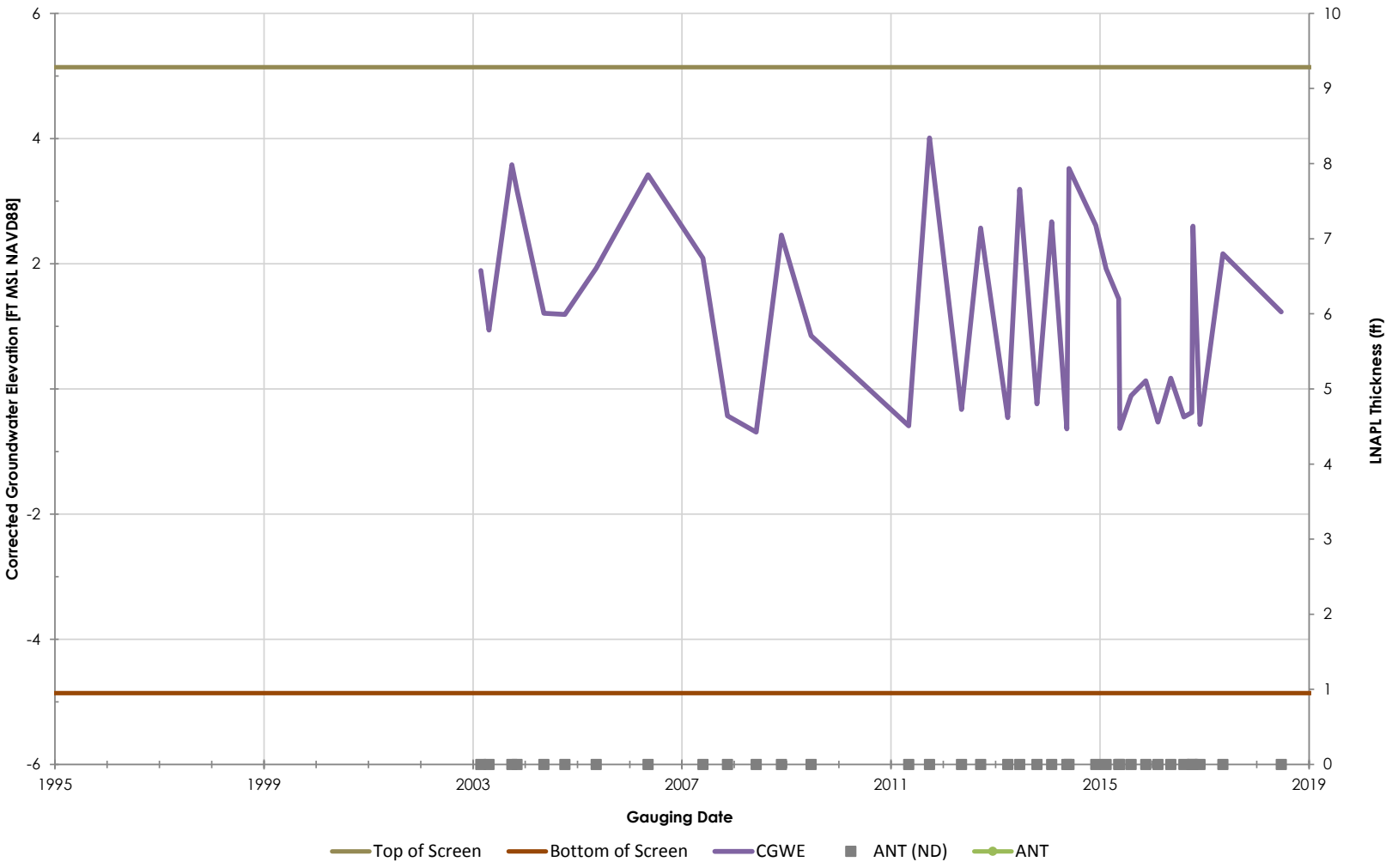
Stantec

Figure/Well No.

S-153

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

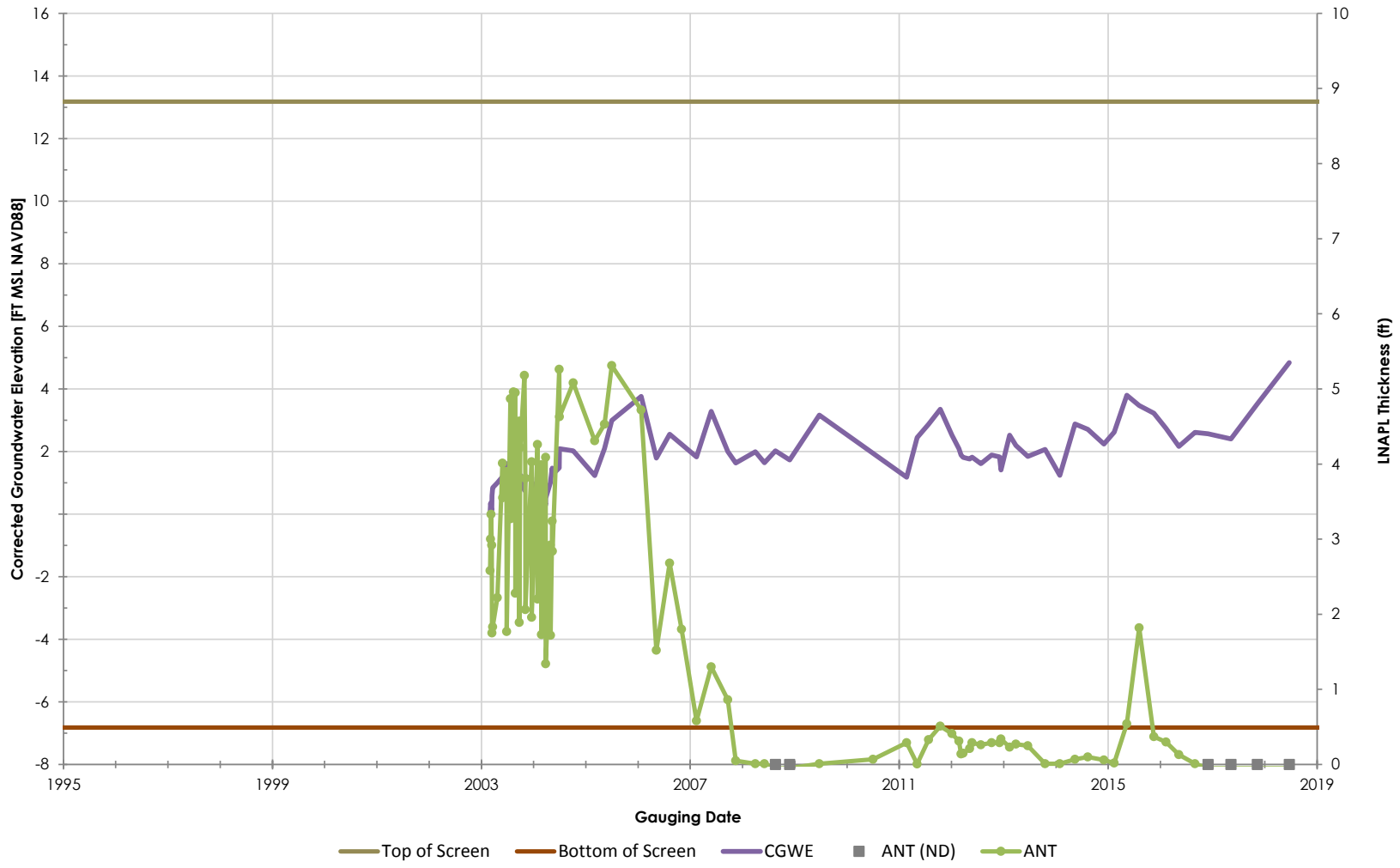
Stantec

Figure/Well No.

S-154

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

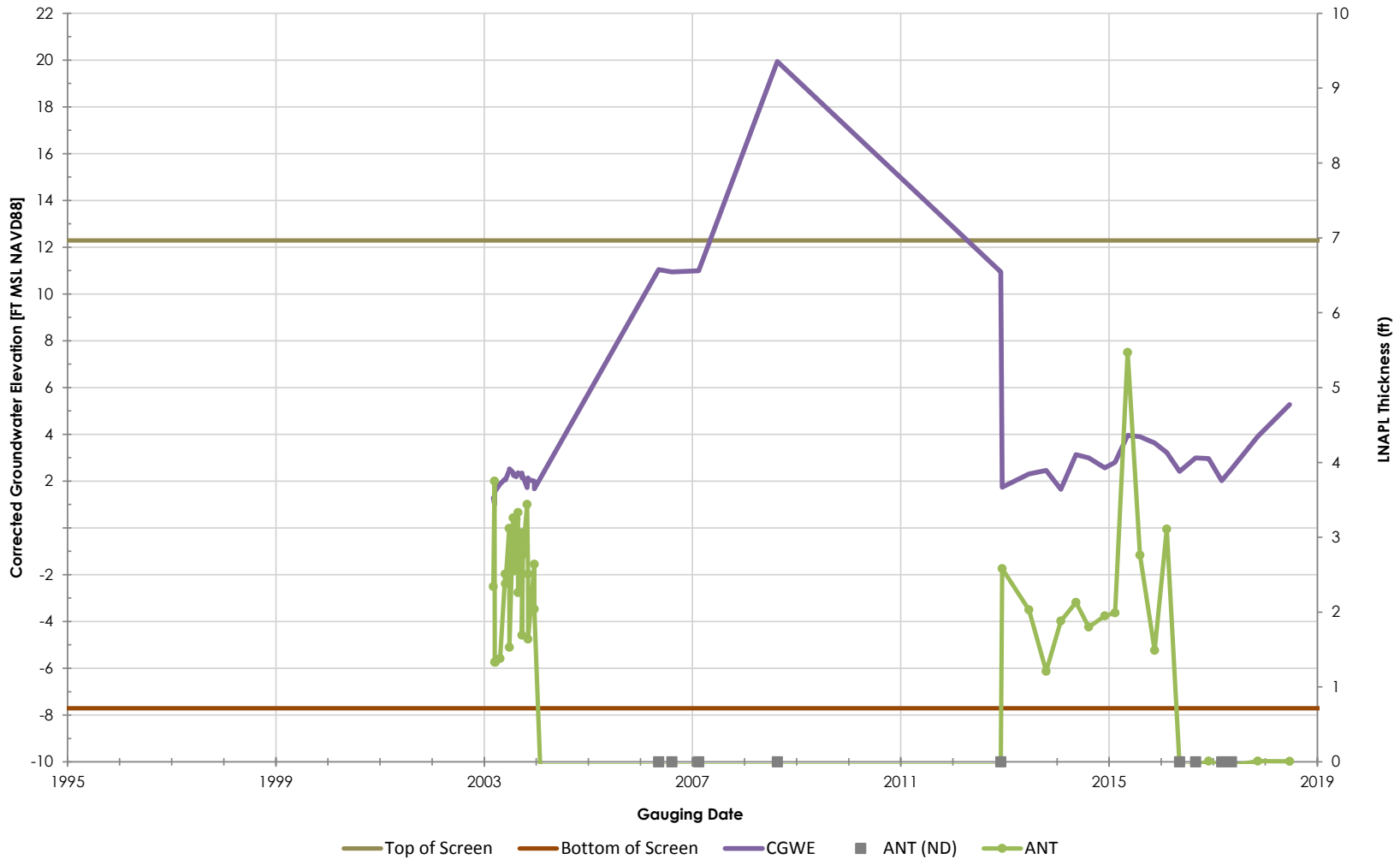
Stantec

Figure/Well No.

S-156

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

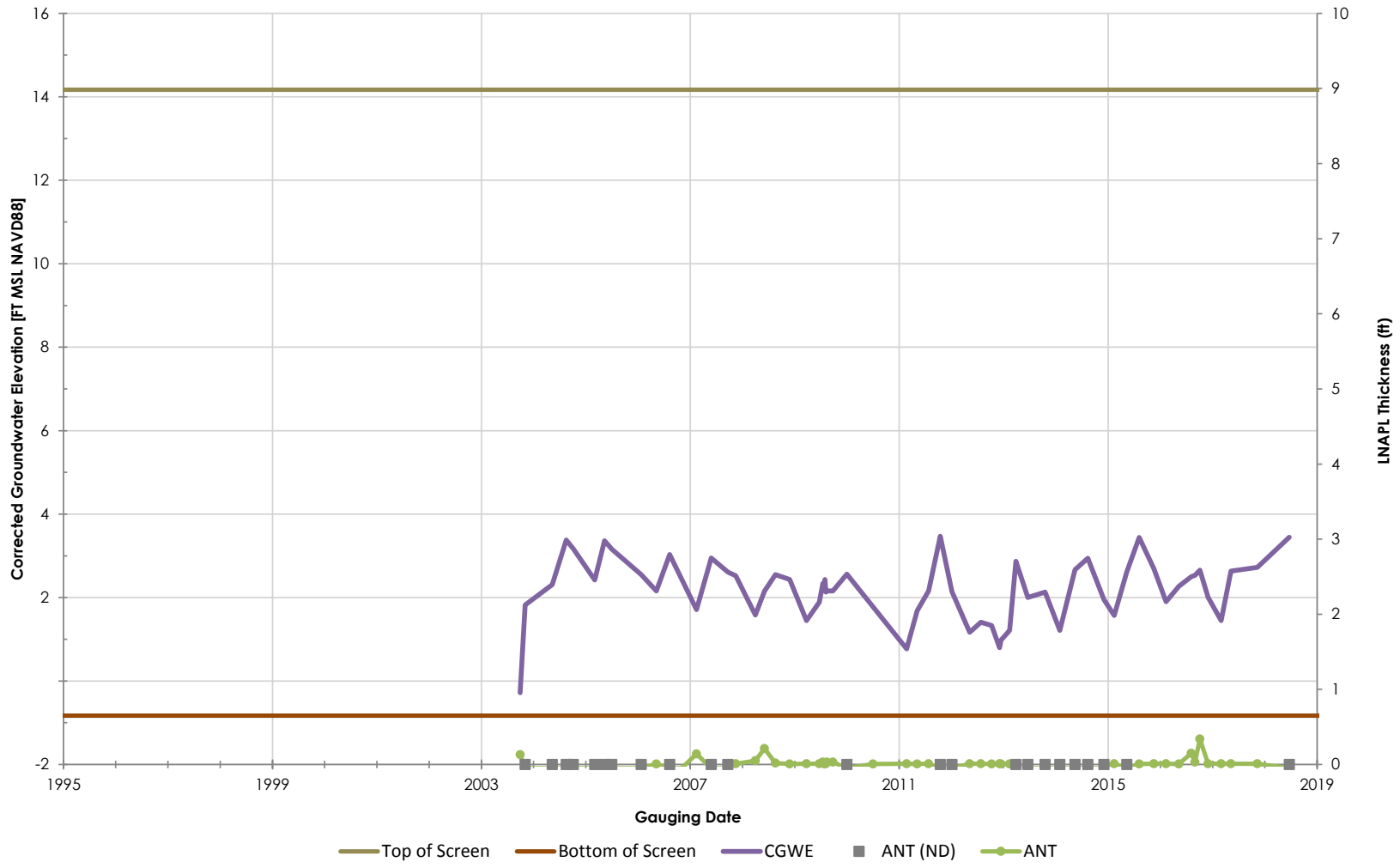
Stantec

Figure/Well No.

S-157

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

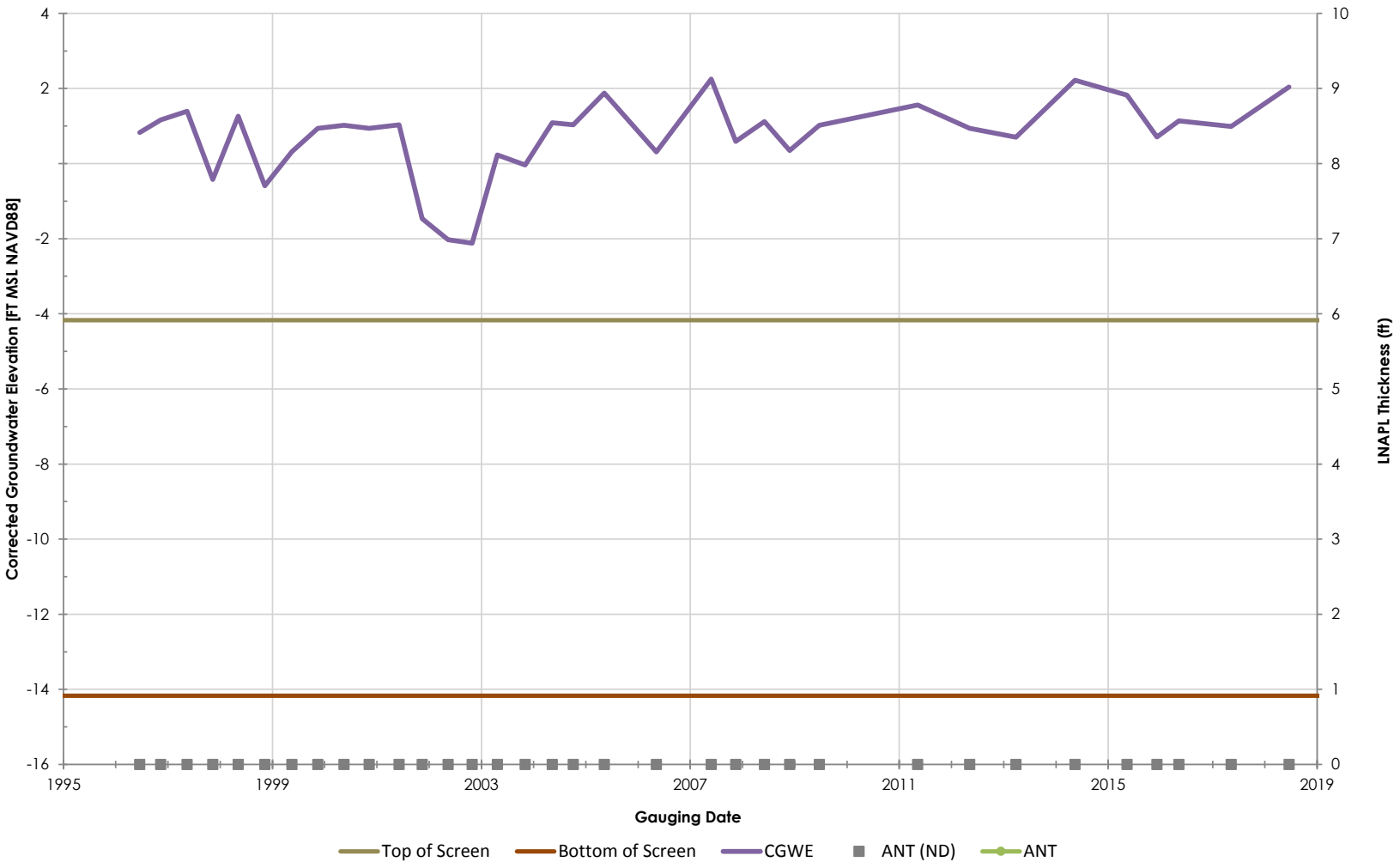
Stantec

Figure/Well No.

S-159

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

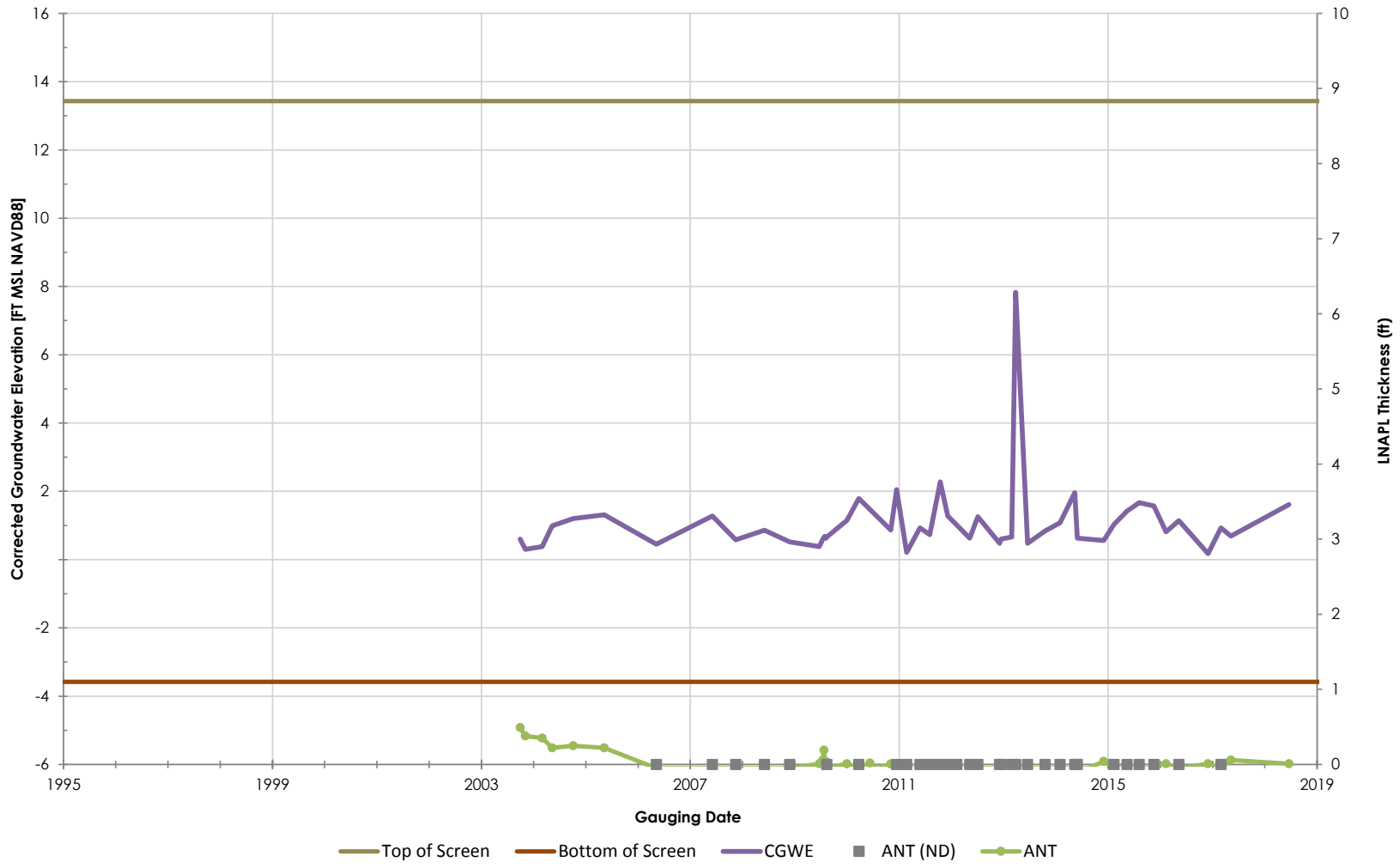
Stantec

Figure/Well No.

S-16

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

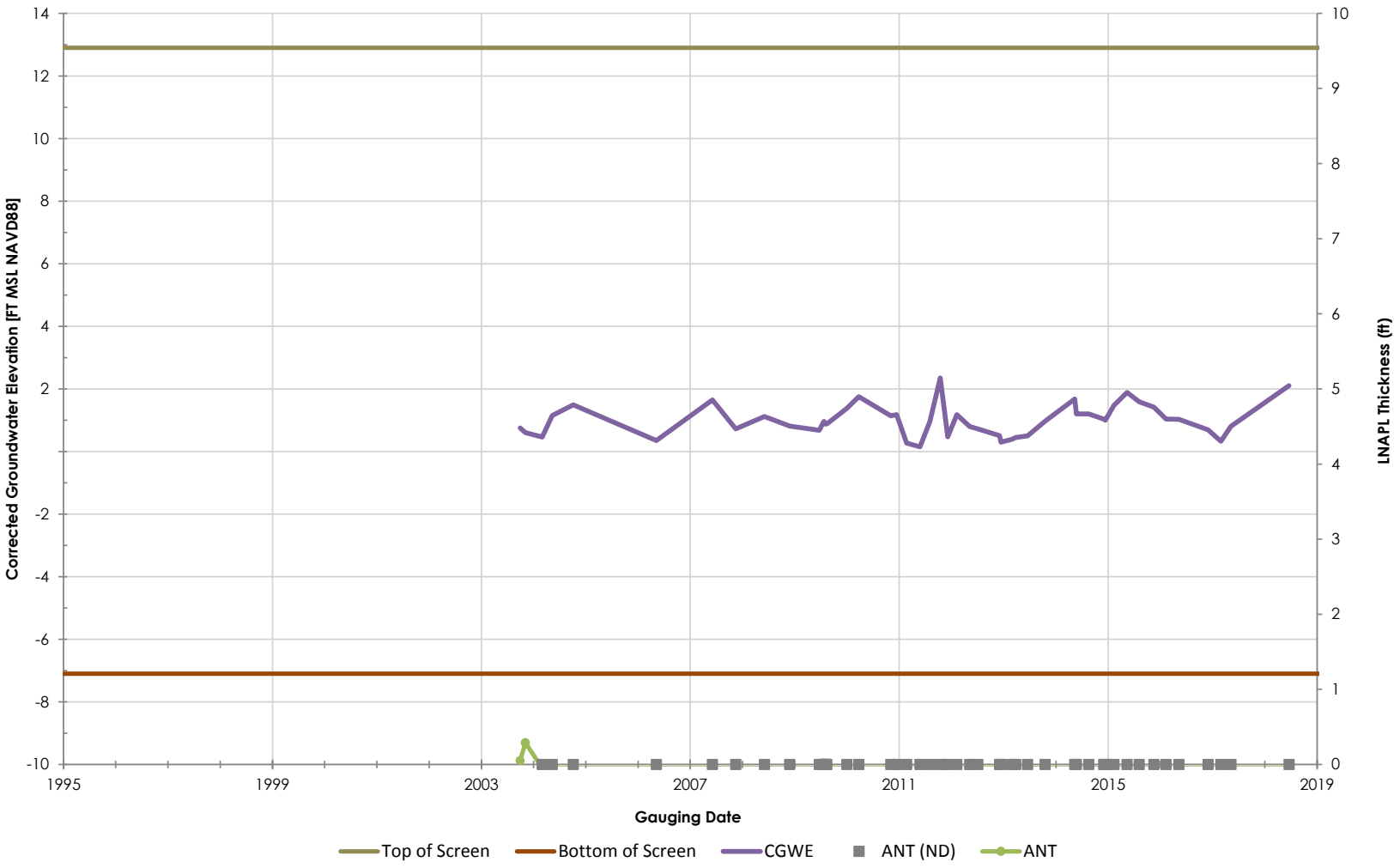
Stantec

Figure/Well No.

S-162

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

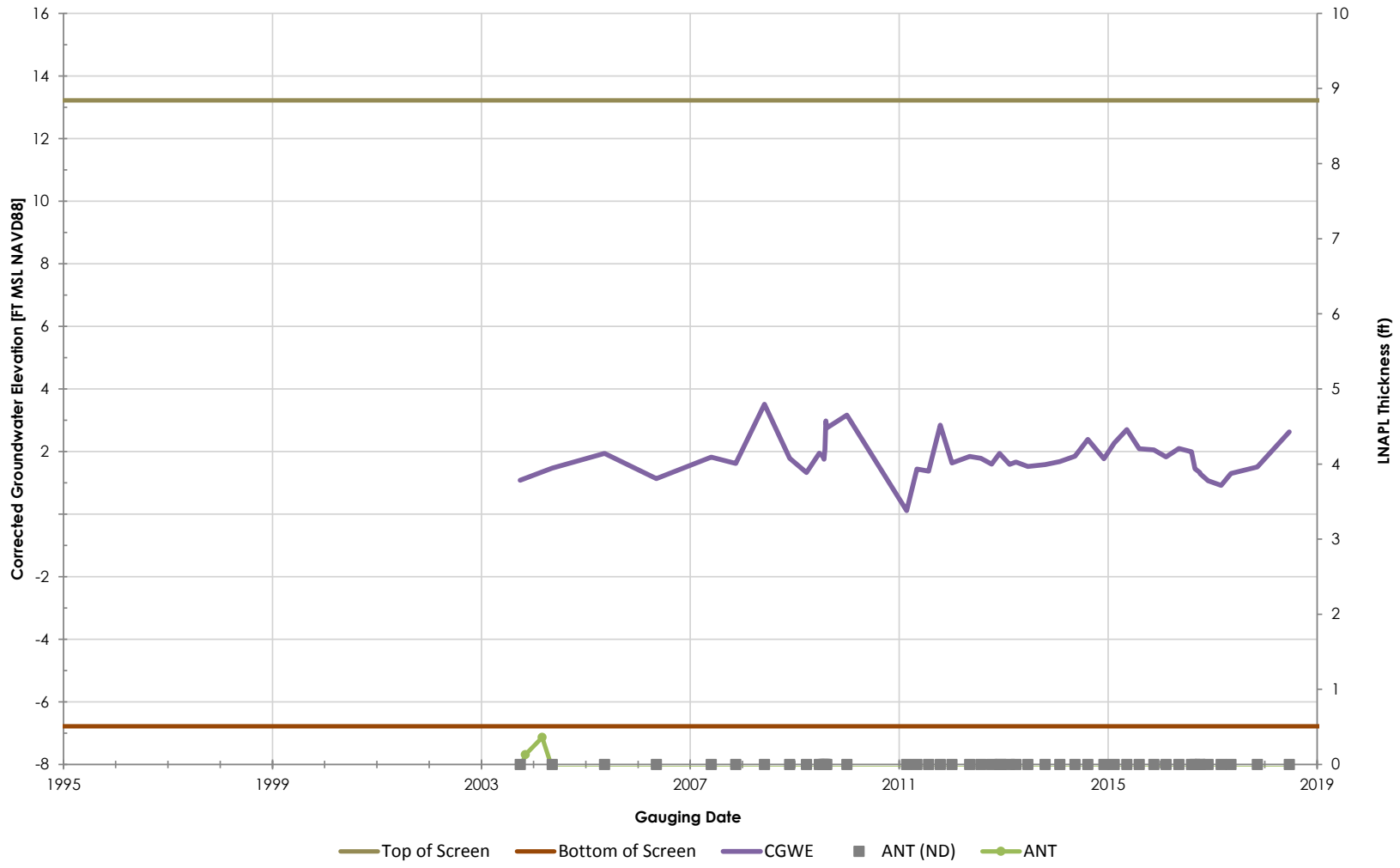
Stantec

Figure/Well No.

S-164

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

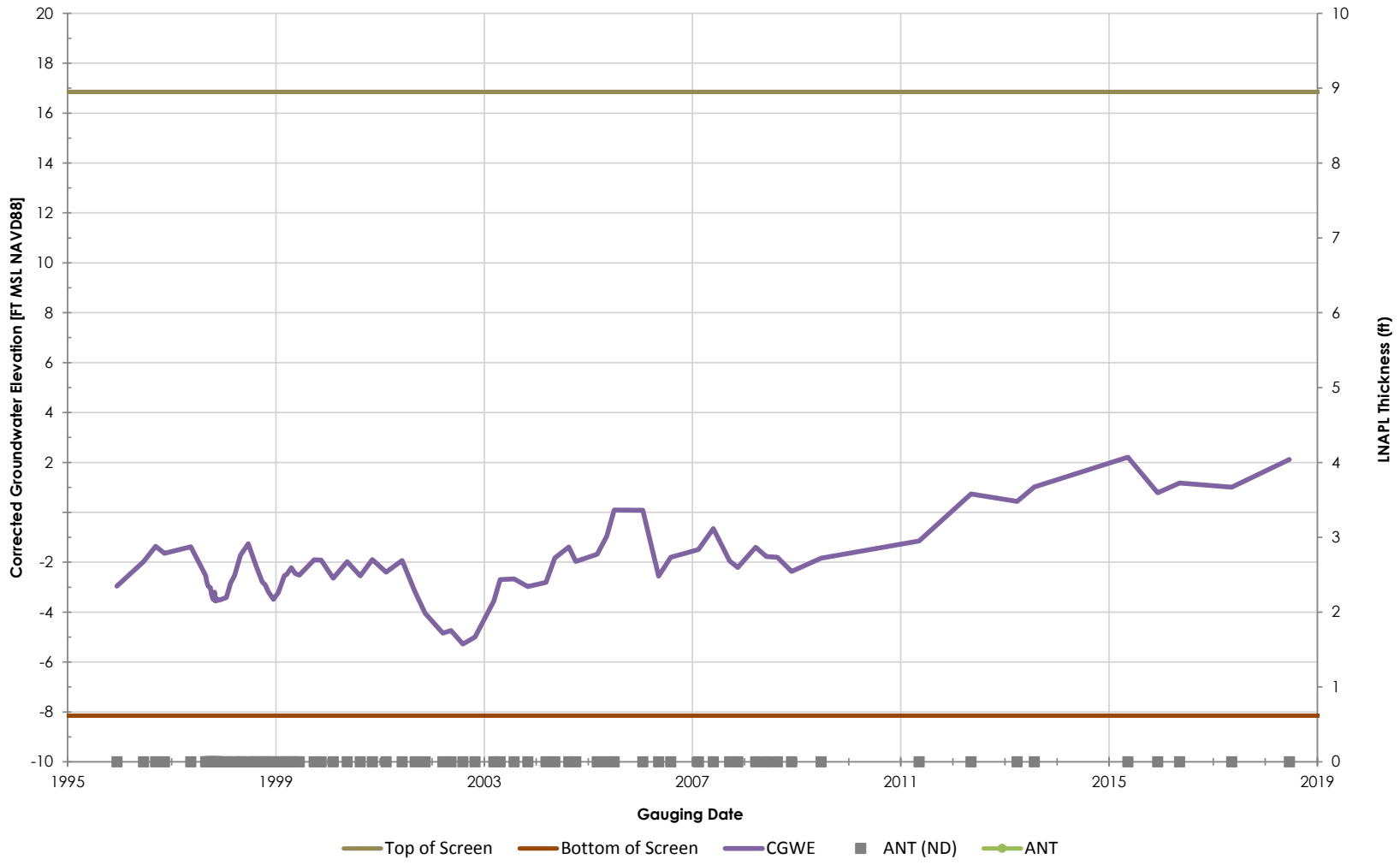
Stantec

Figure/Well No.

S-166

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

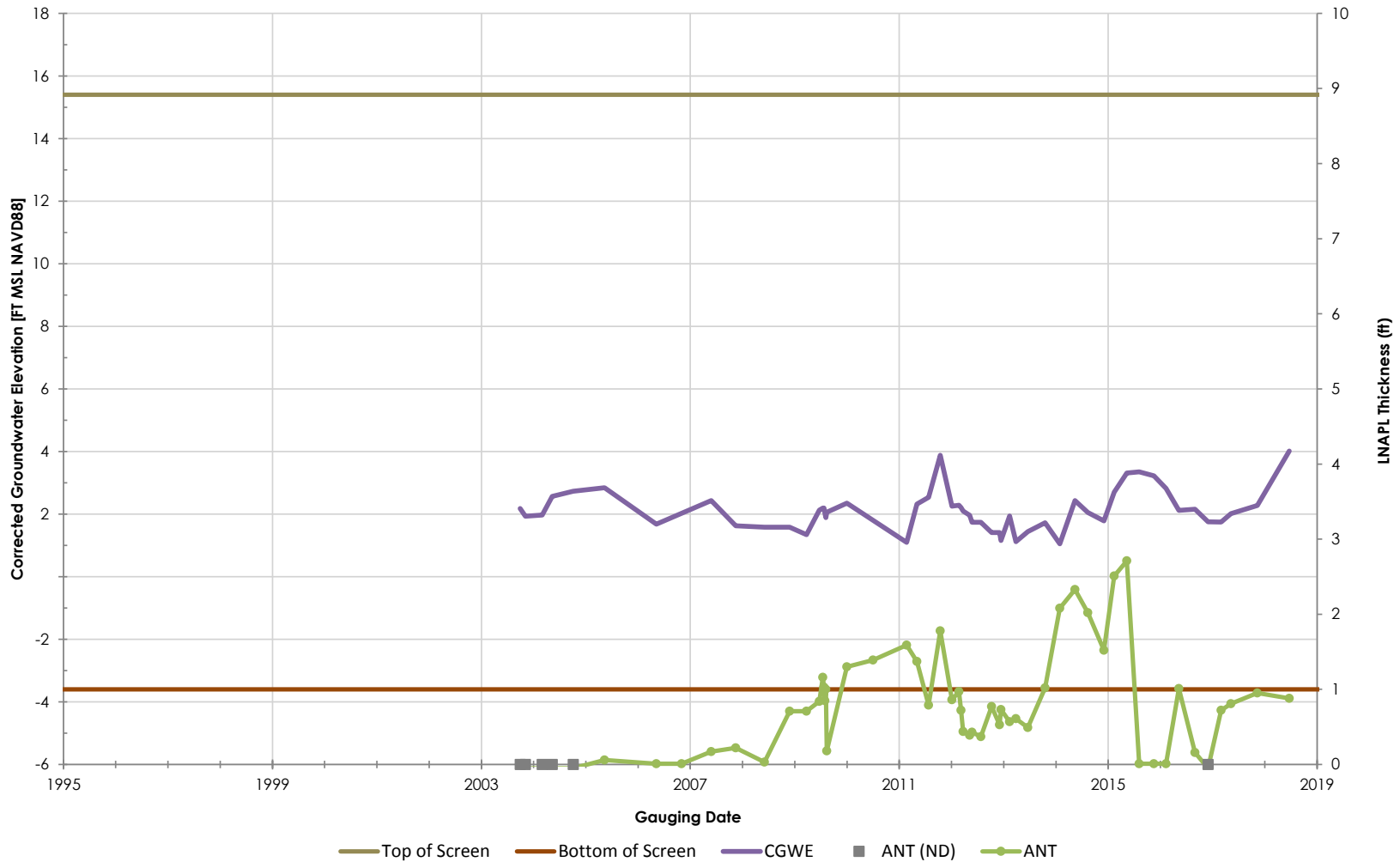
Stantec

Figure/Well No.

S-17

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

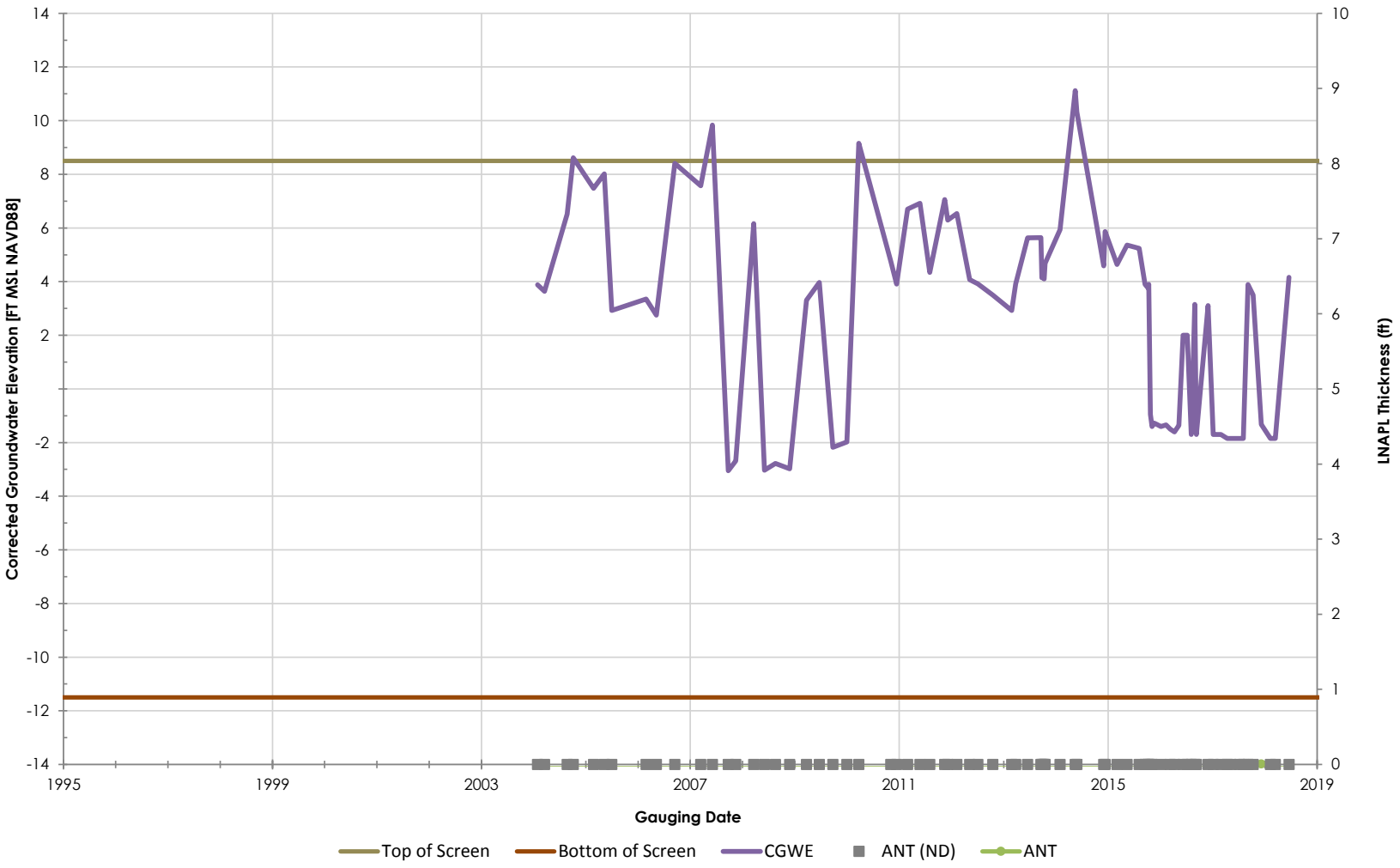
Stantec

Figure/Well No.

S-175

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

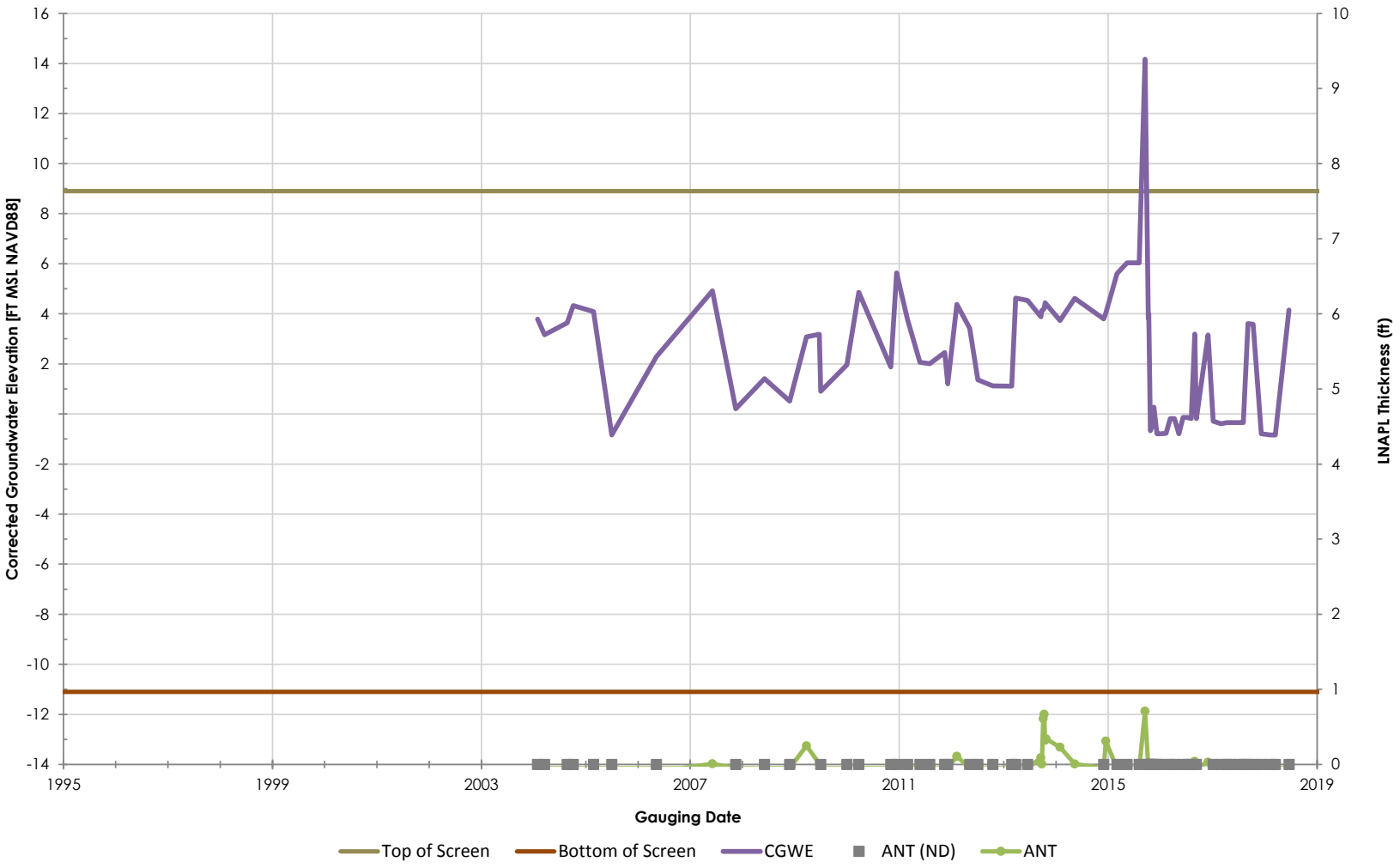
Stantec

Figure/Well No.

S-180

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

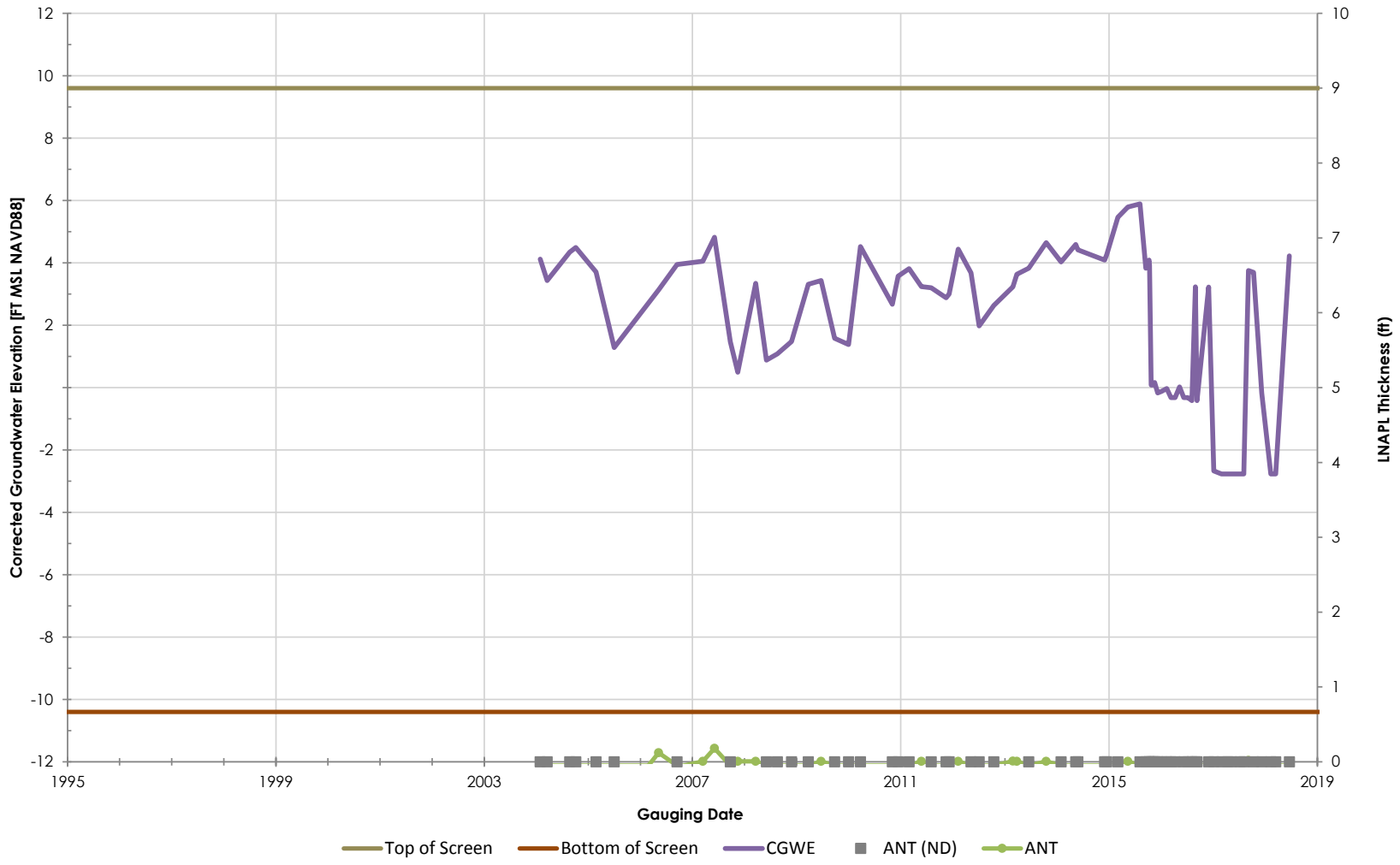
Stantec

Figure/Well No.

S-181

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

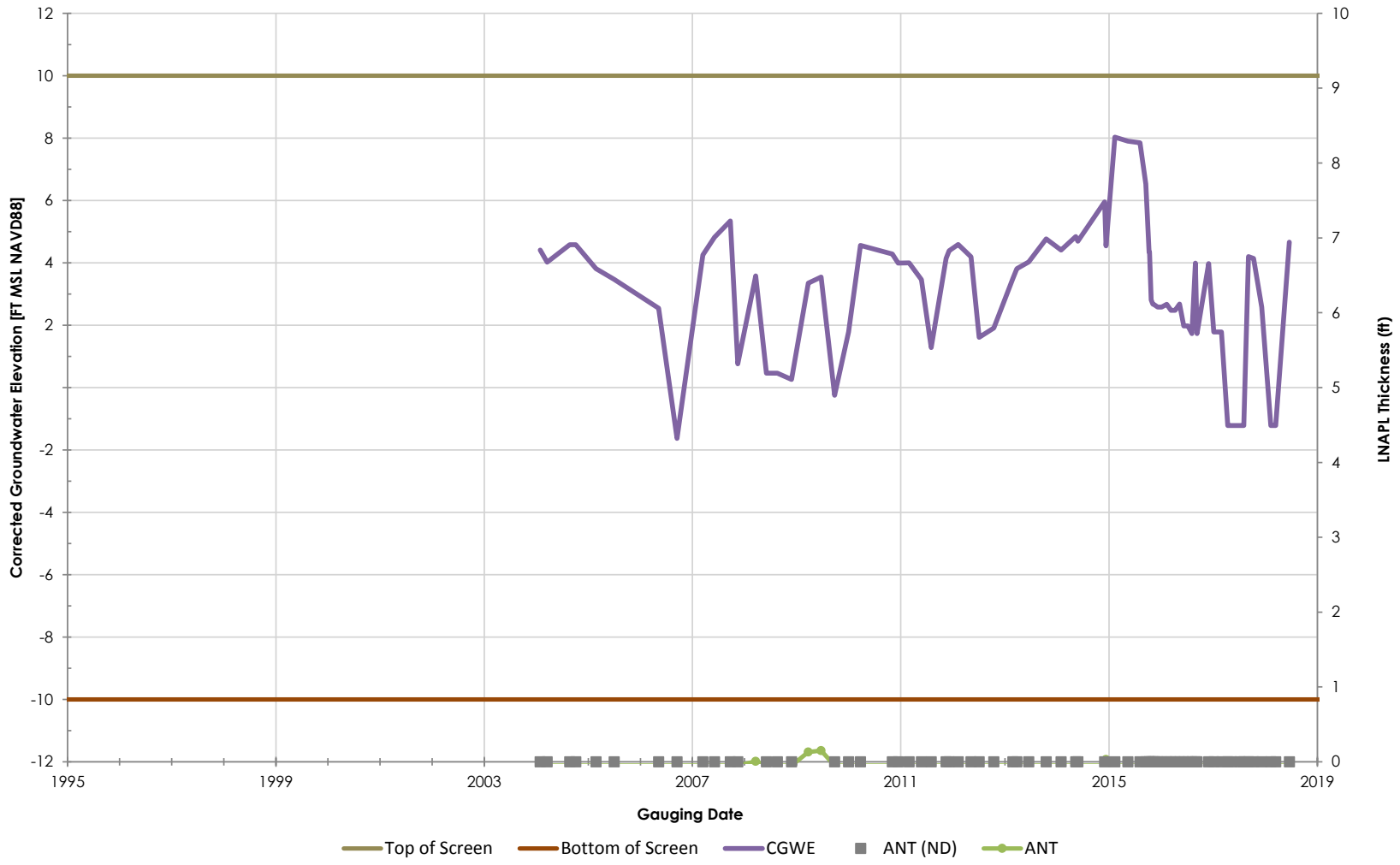
Stantec

Figure/Well No.

S-183

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

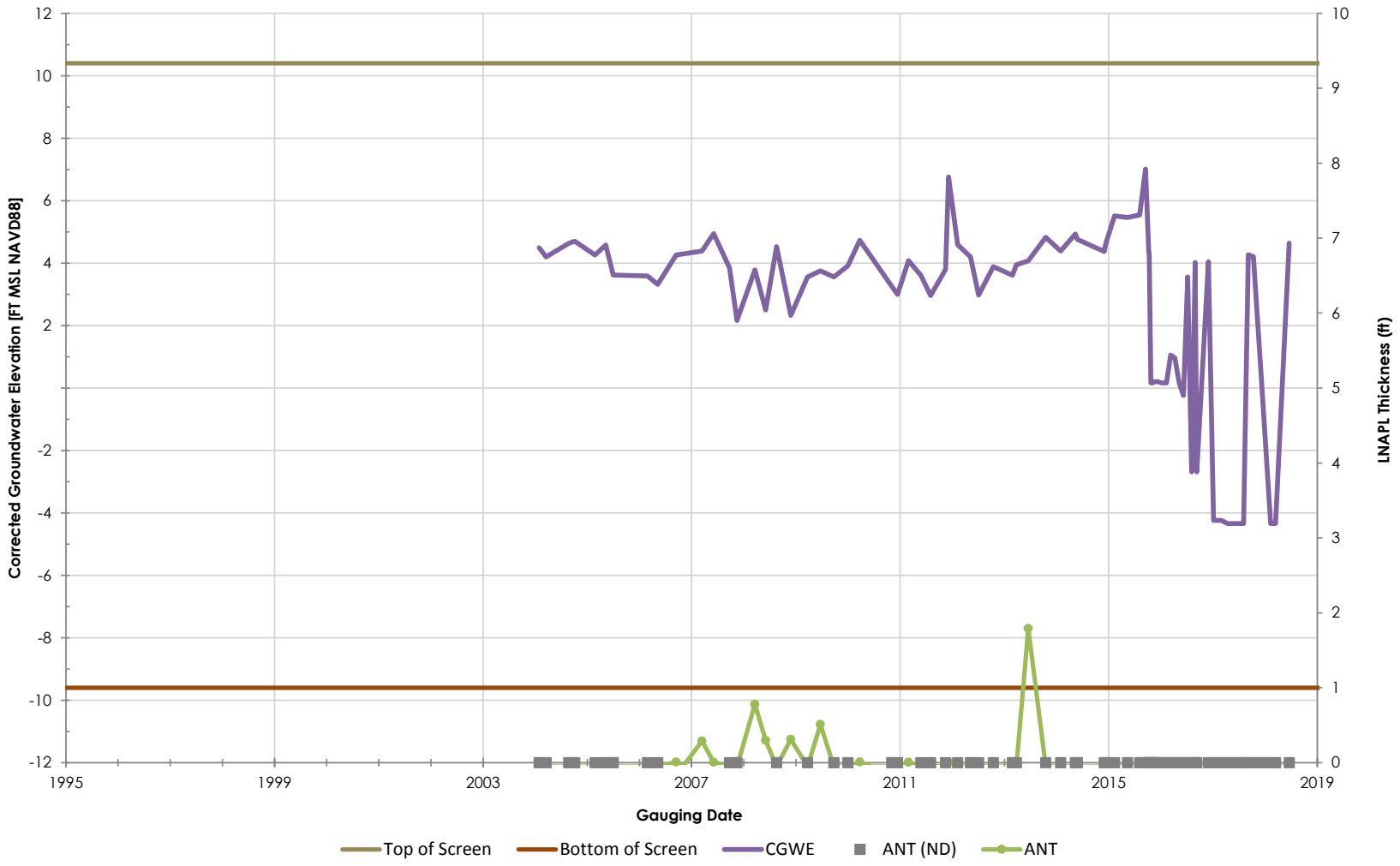
Stantec

Figure/Well No.

S-185

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

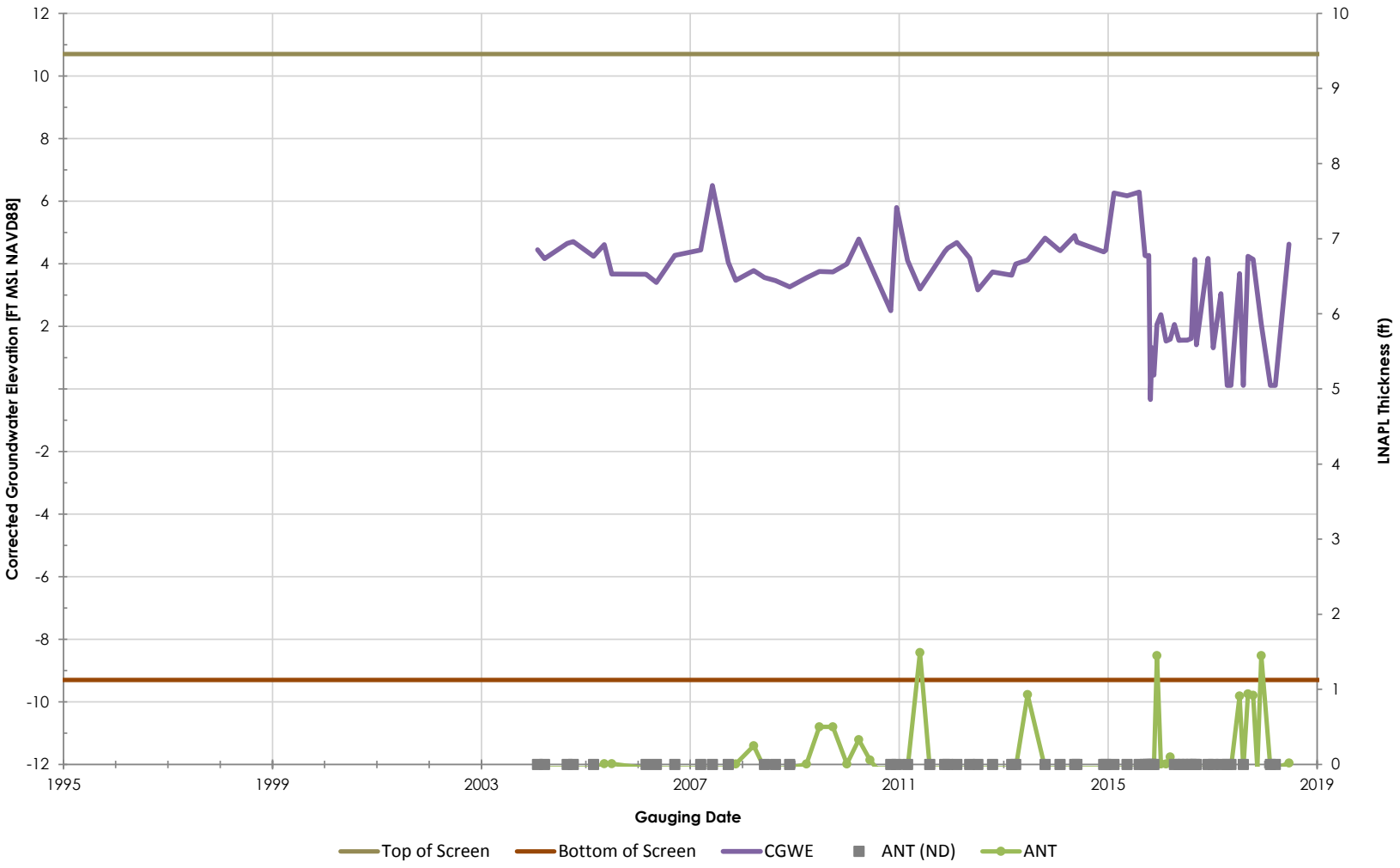
Stantec

Figure/Well No.

S-186

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

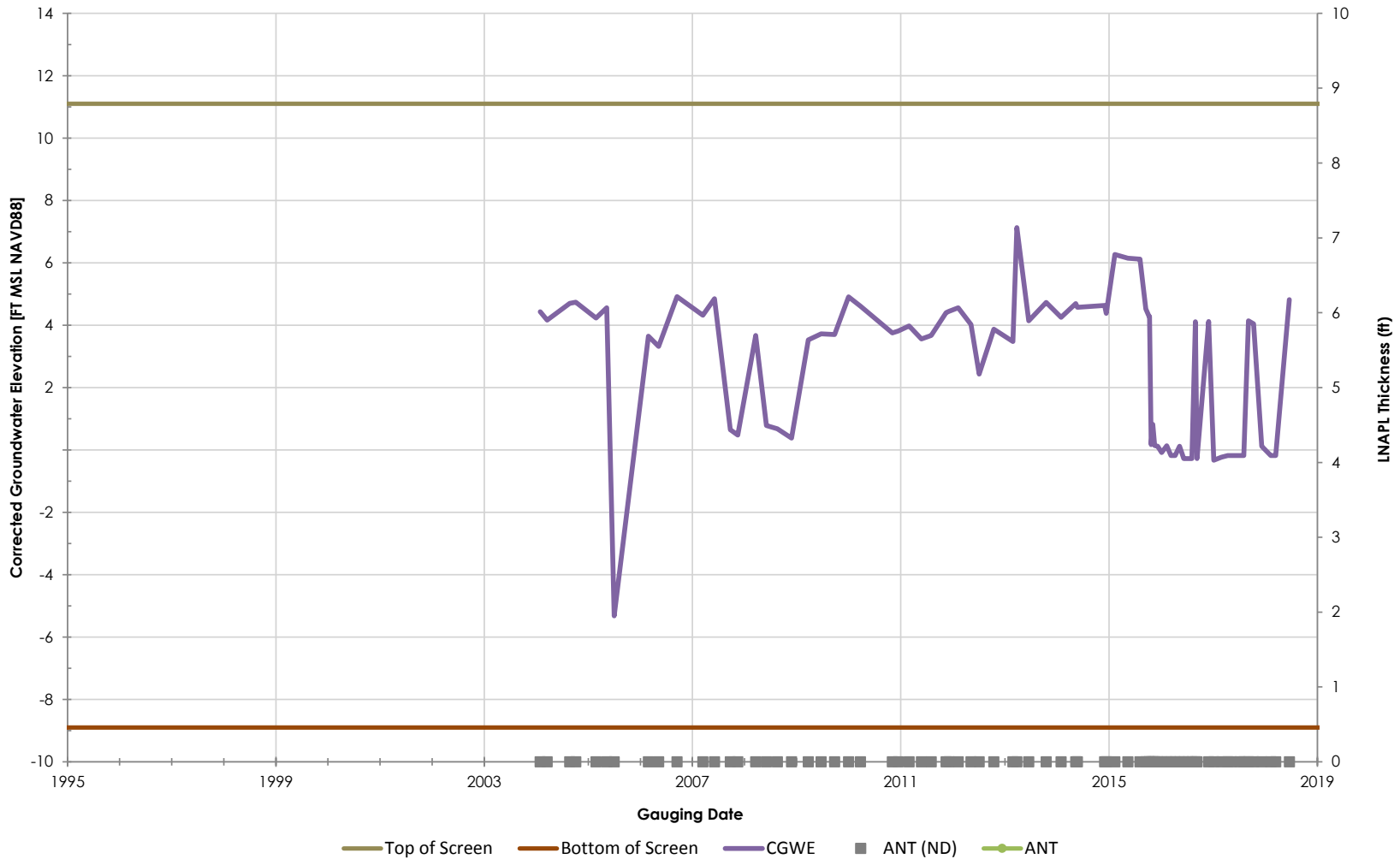
Stantec

Figure/Well No.

S-187

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

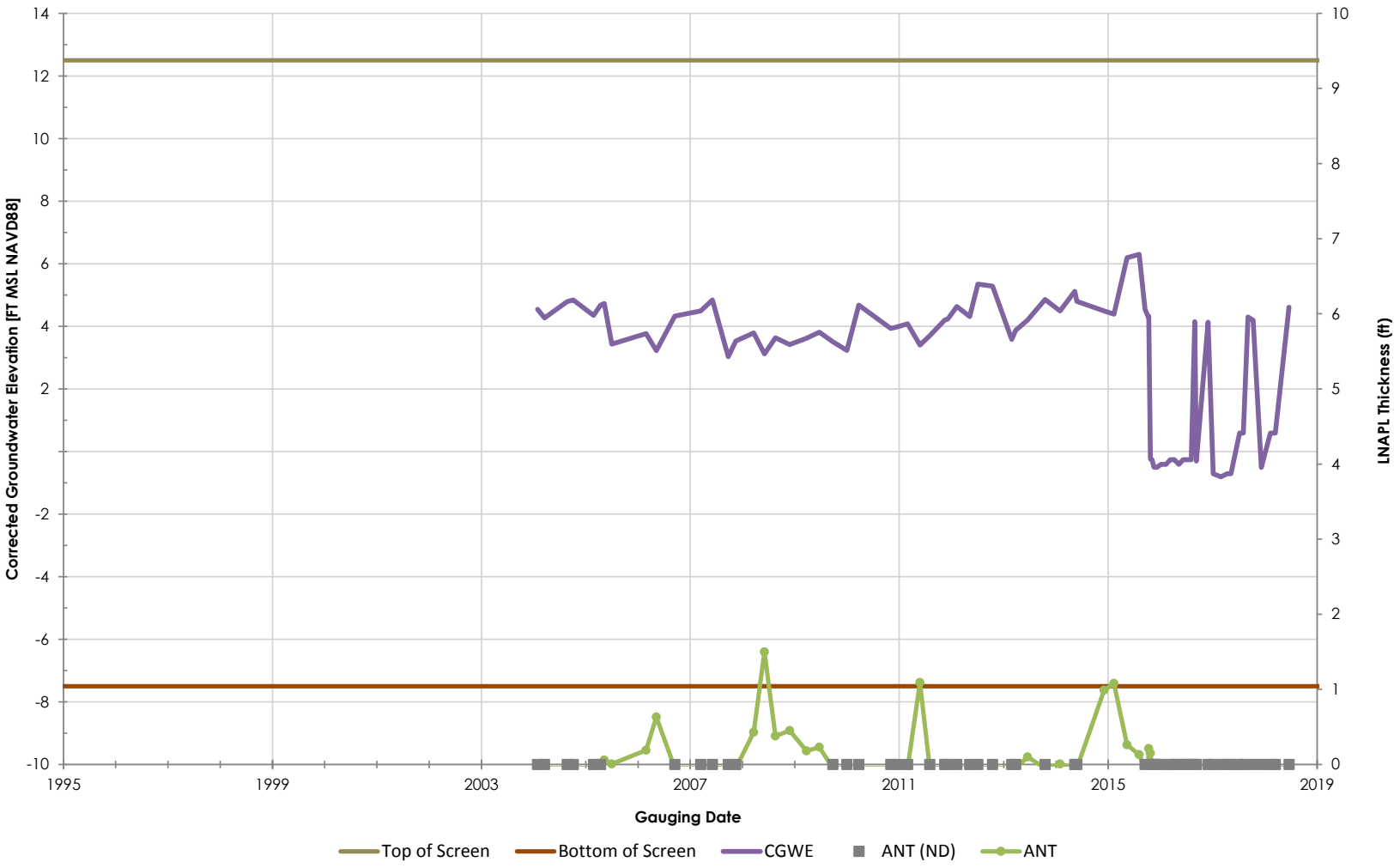
Stantec

Figure/Well No.

S-188

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Stantec

Figure/Well No.

S-189

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

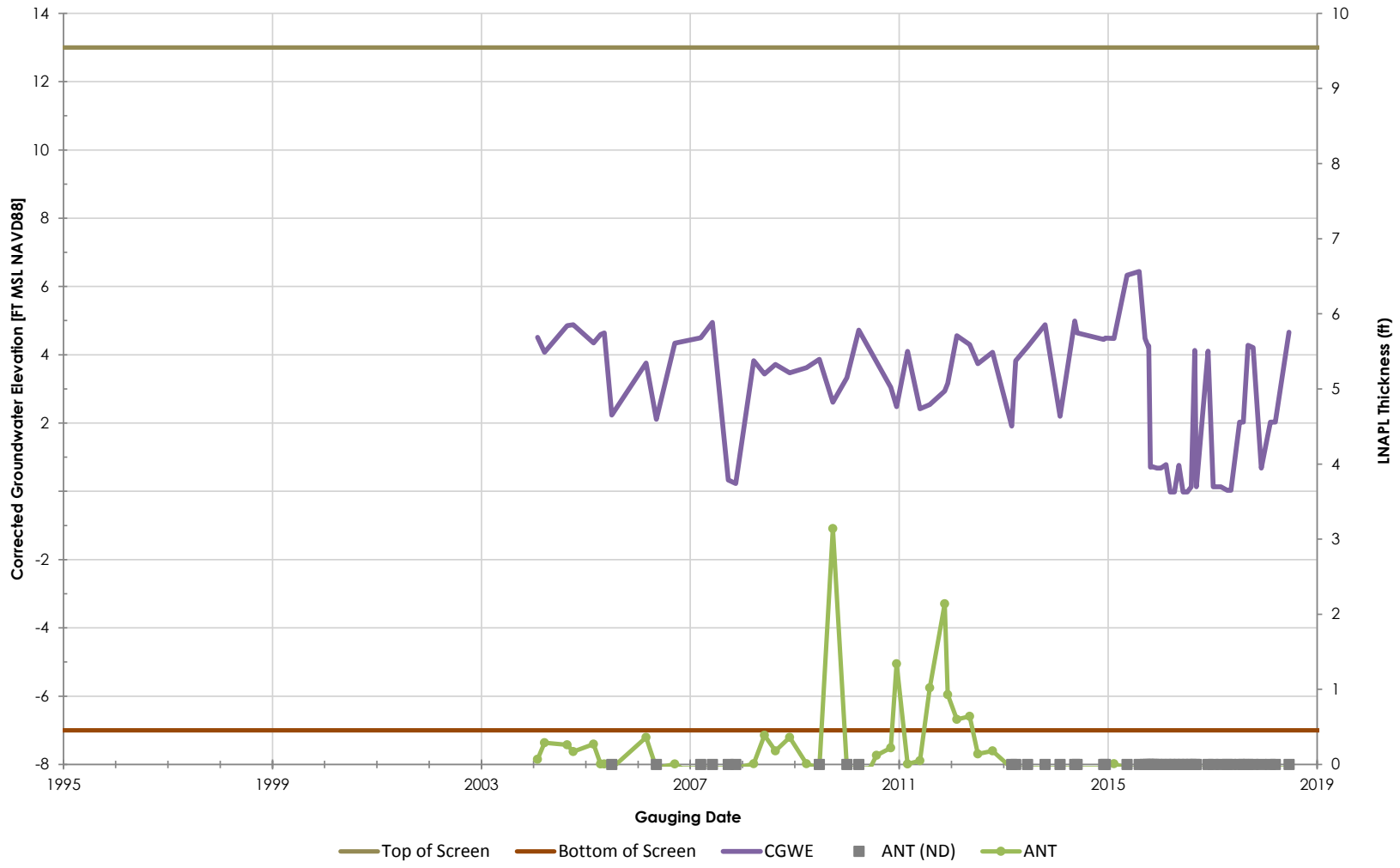
Stantec

Figure/Well No.

S-190

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

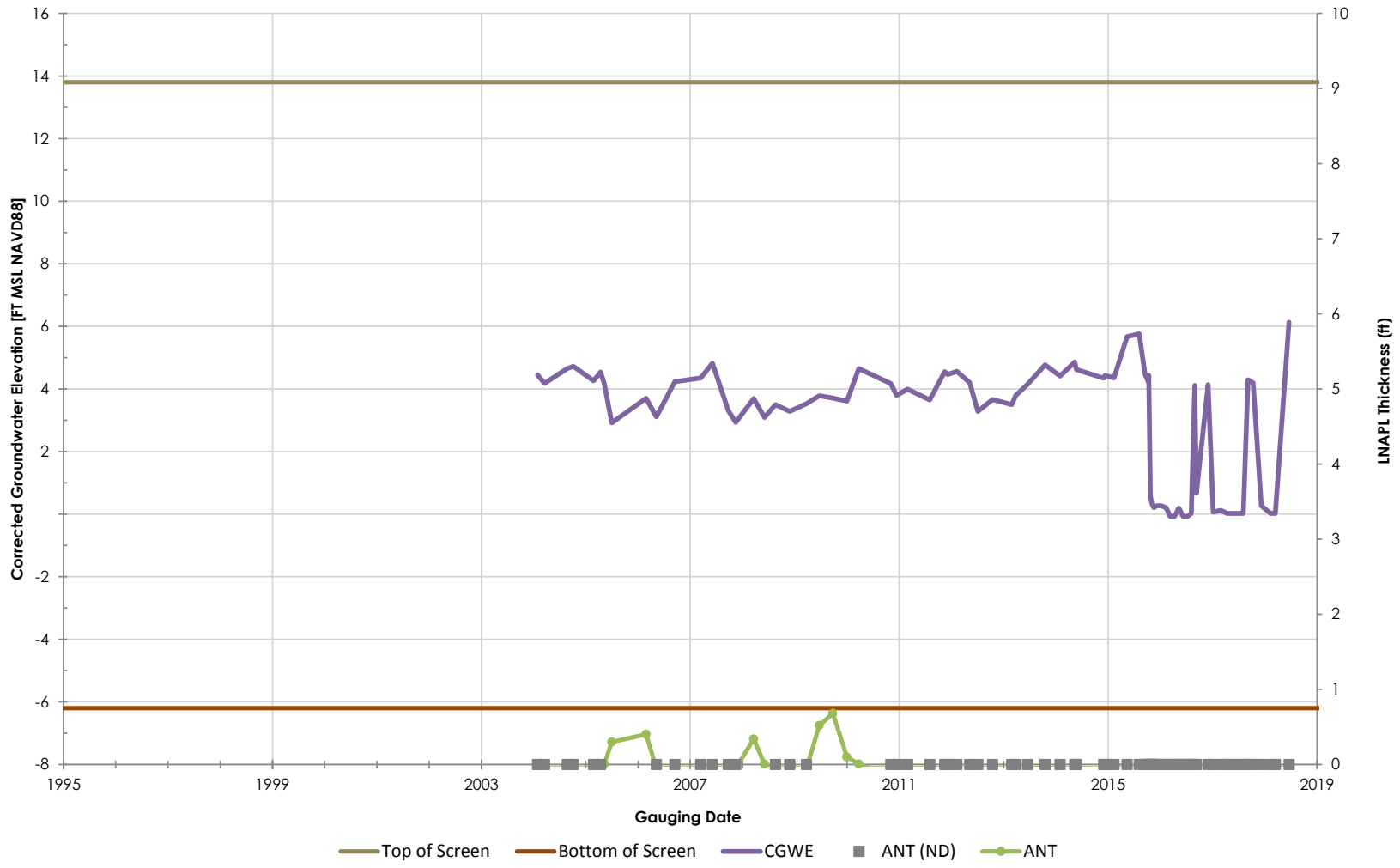
Stantec

Figure/Well No.

S-191

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

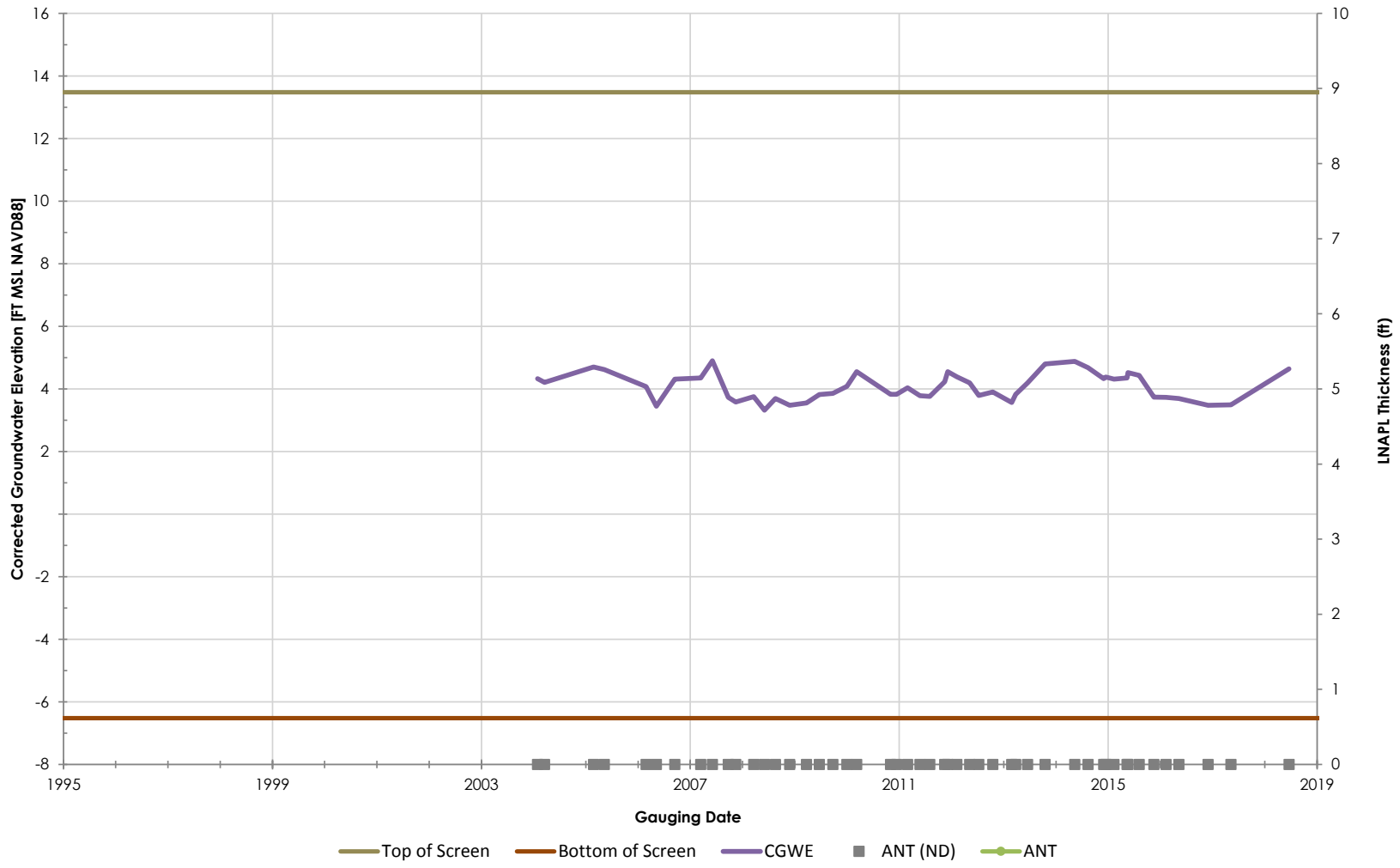
Stantec

Figure/Well No.

S-192

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

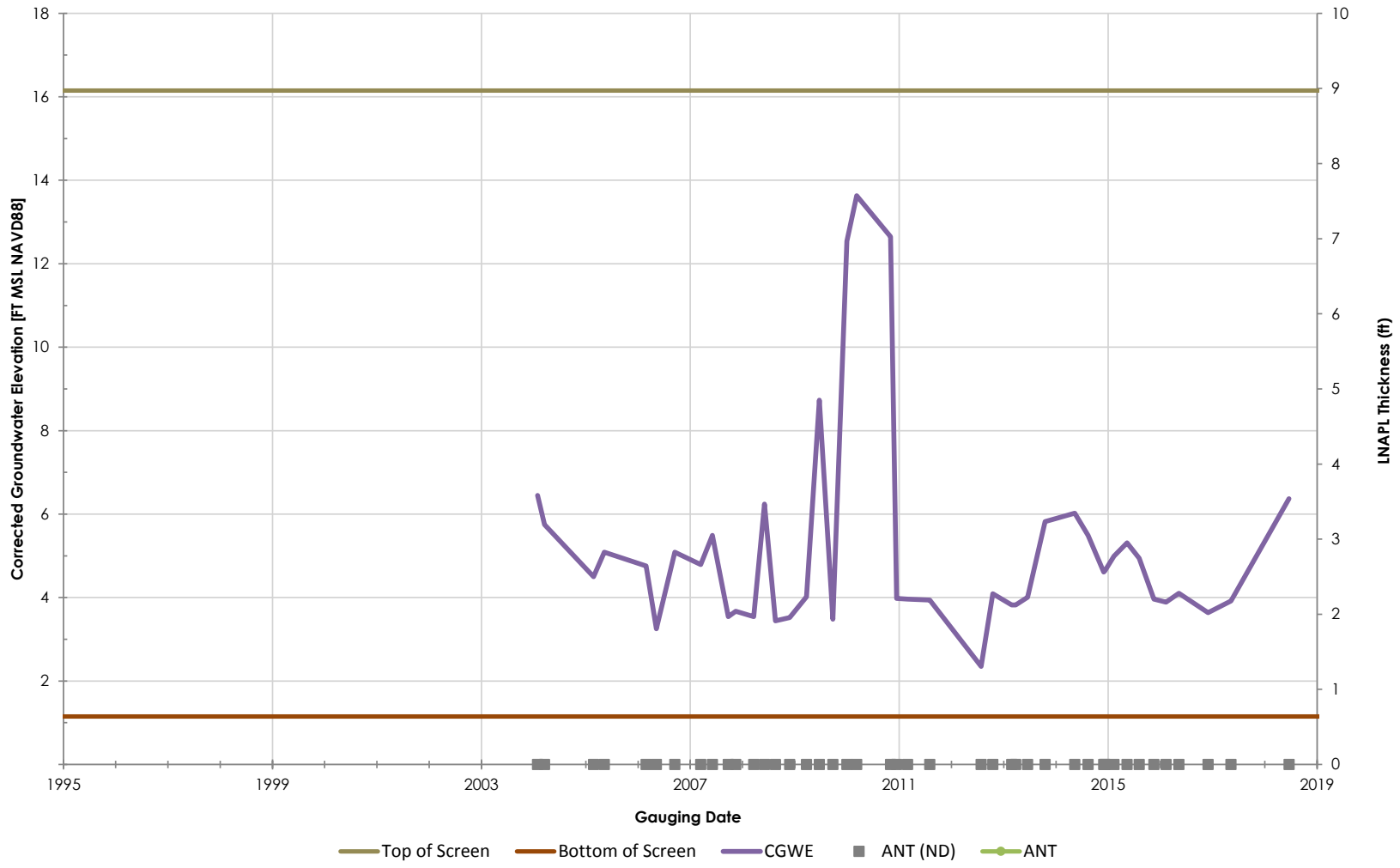
Stantec

Figure/Well No.

S-193

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

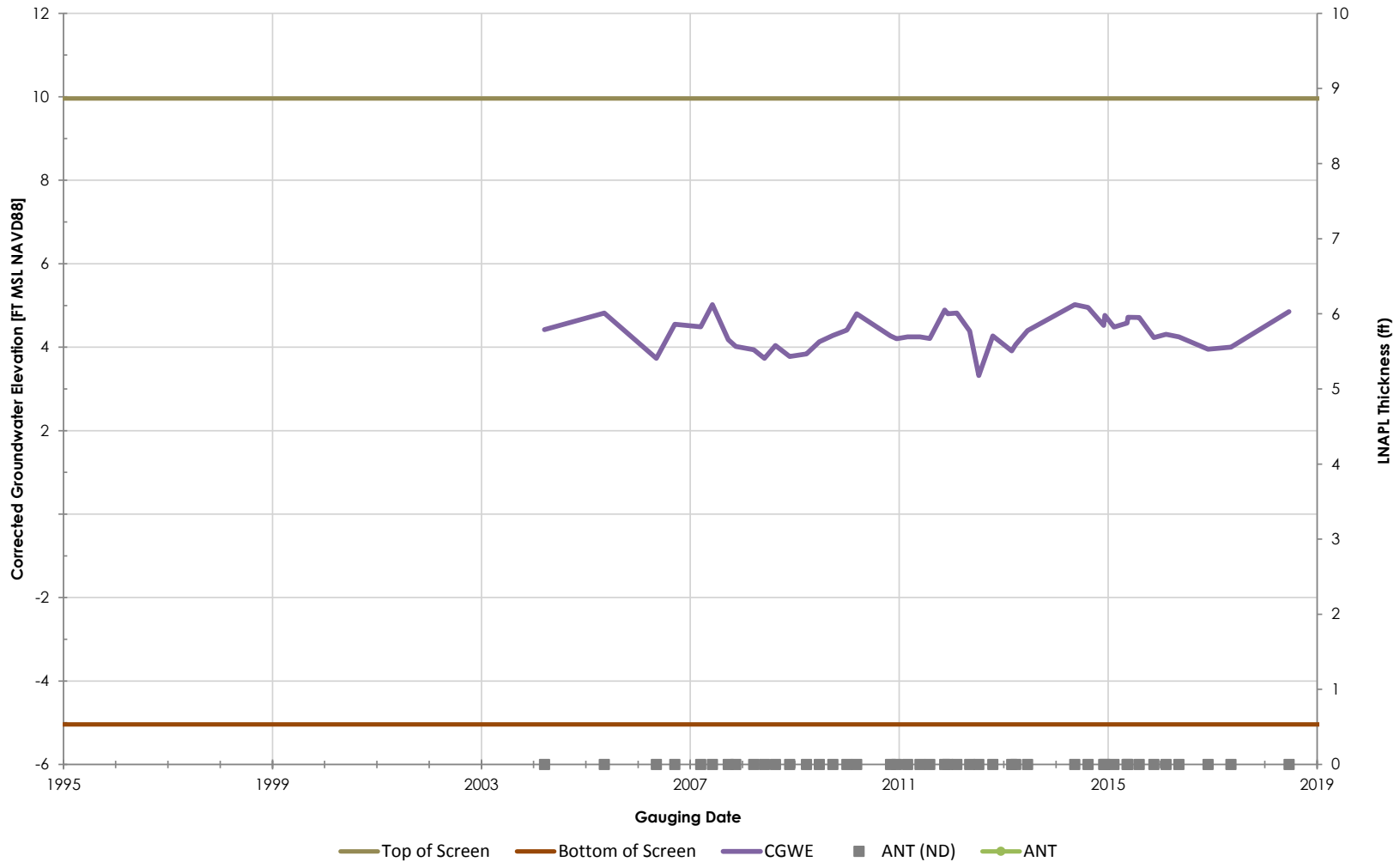
Stantec

Figure/Well No.

S-194

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



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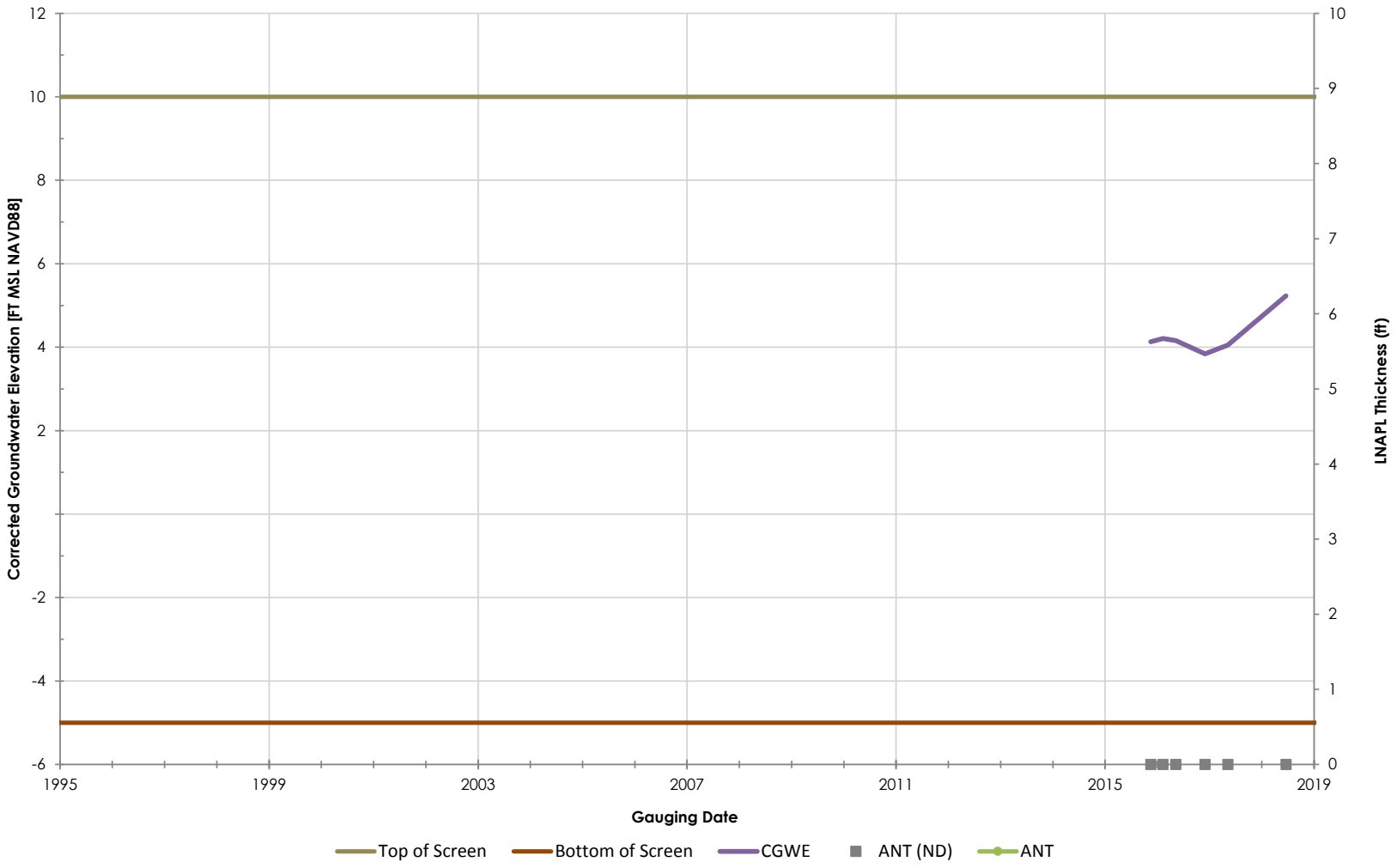
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-196

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

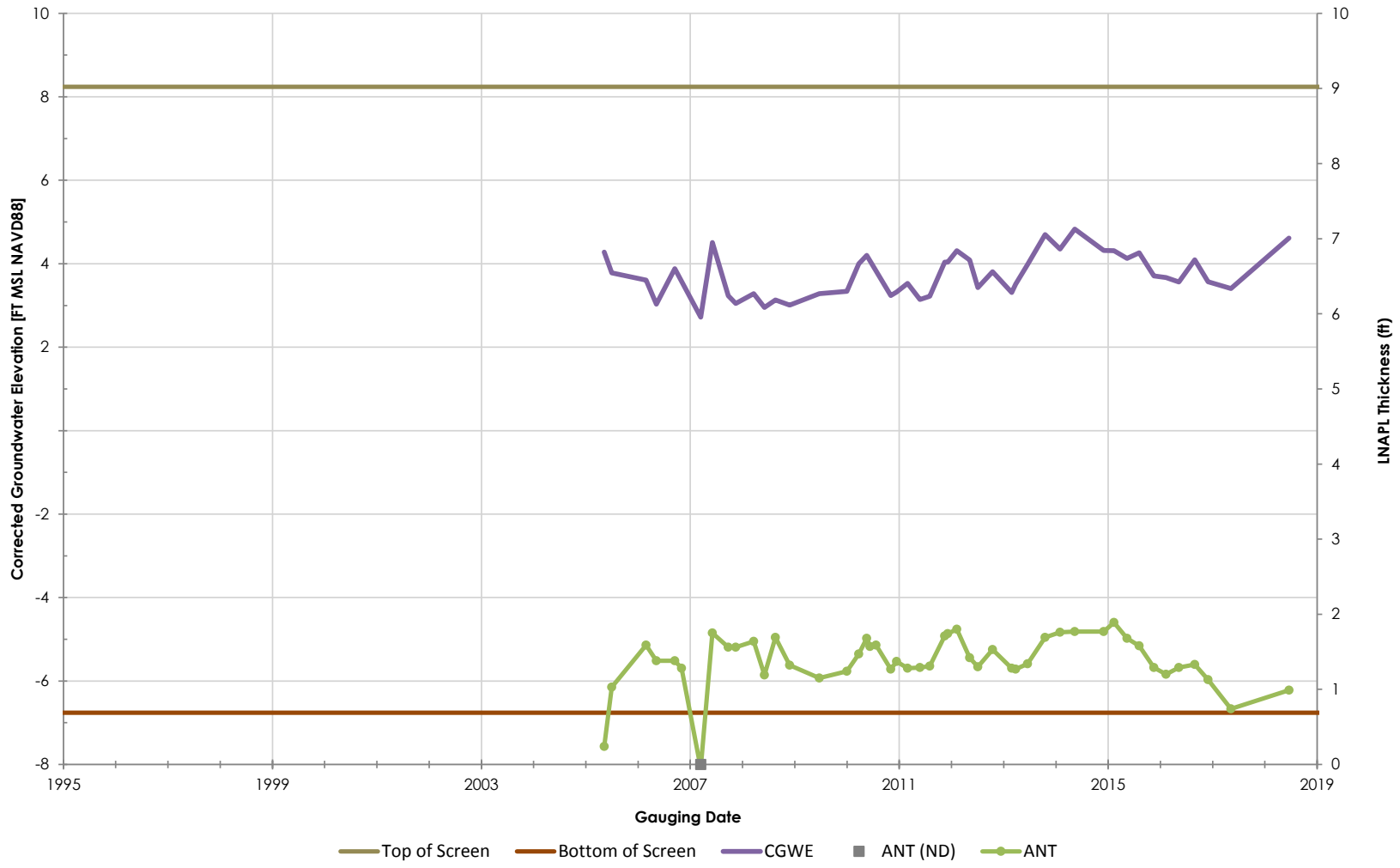
Stantec

Figure/Well No.

S-197

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

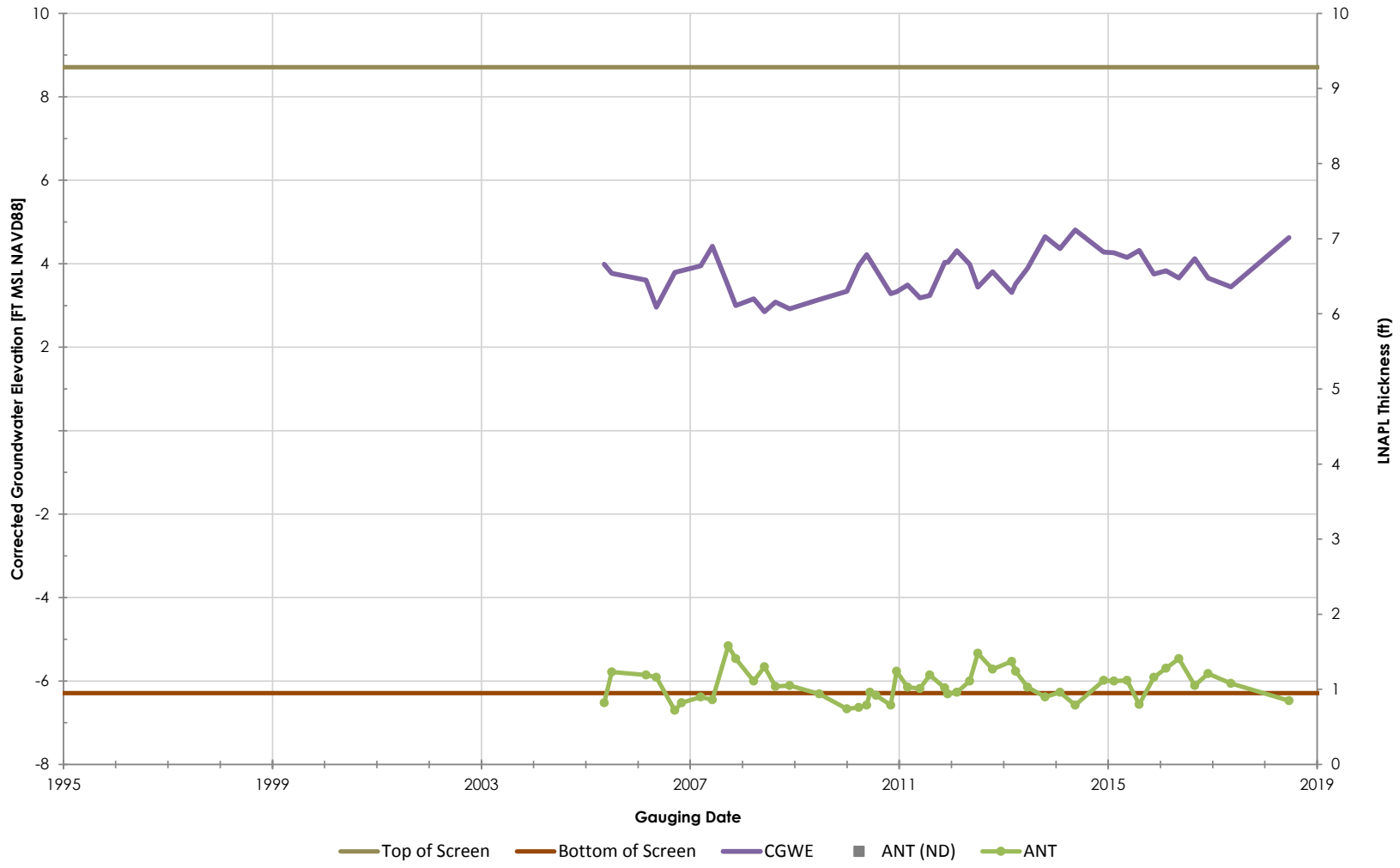
Stantec

Figure/Well No.

S-198

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

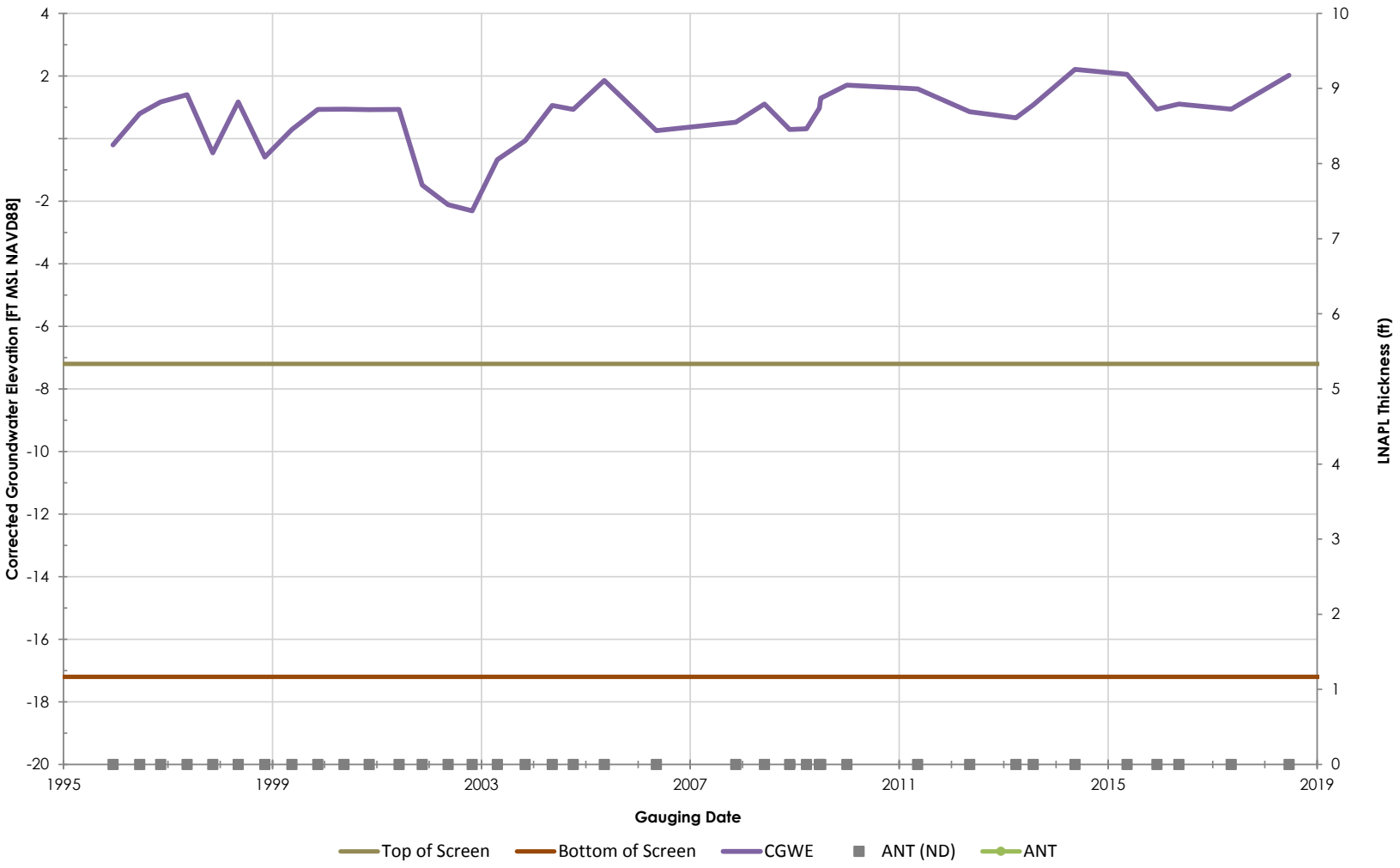
Stantec

Figure/Well No.

S-199

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

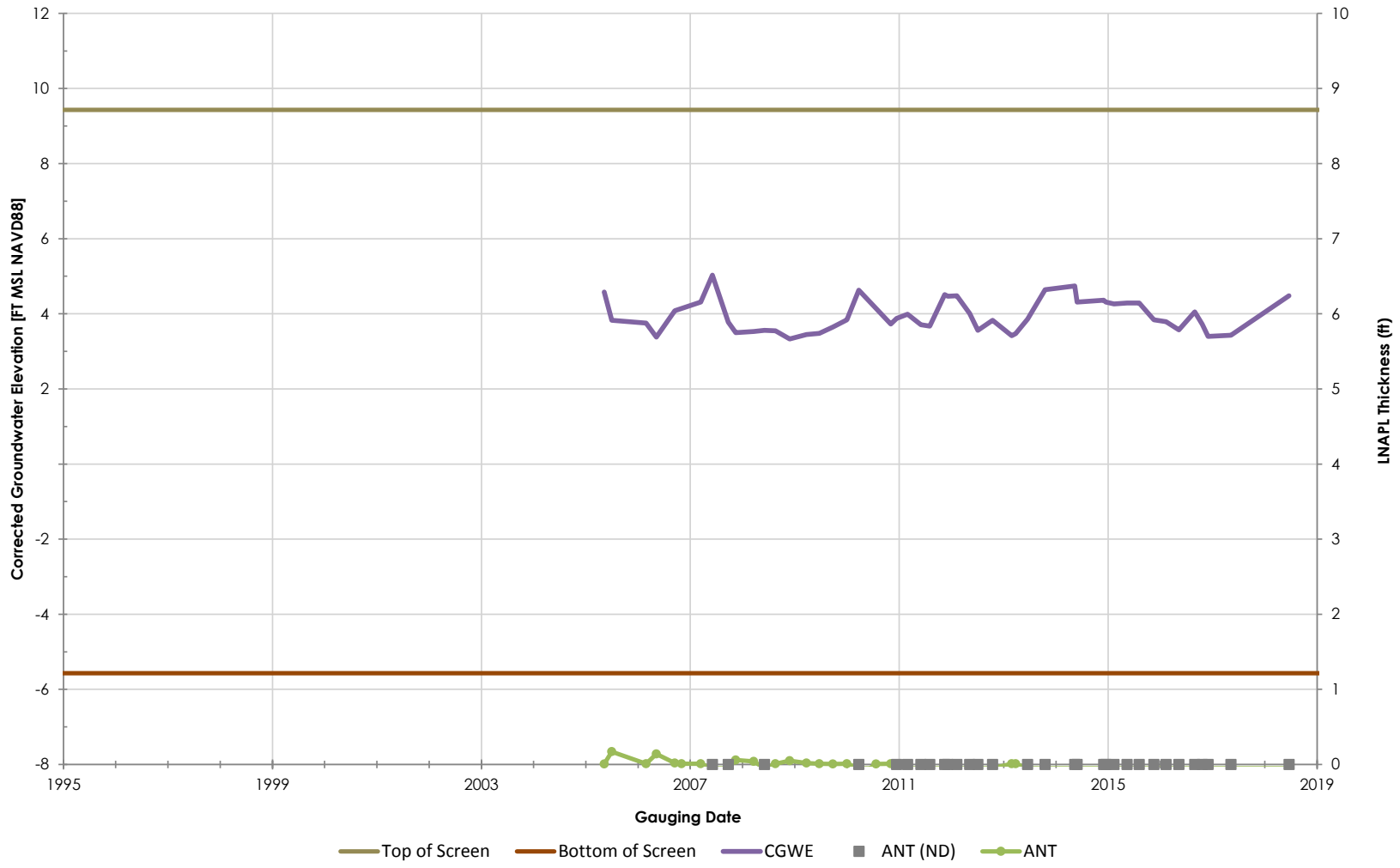
Stantec

Figure/Well No.

S-20

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

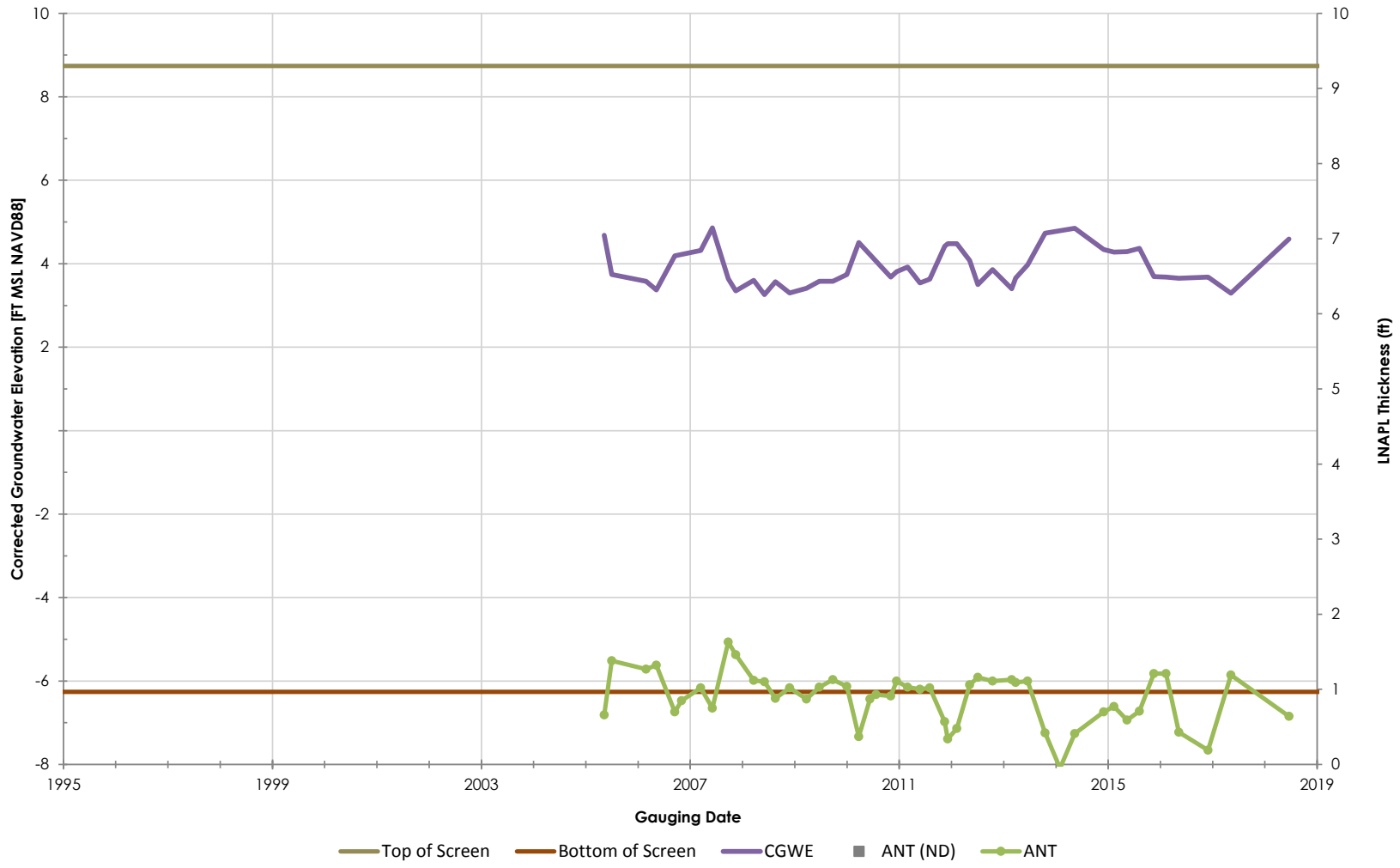
Stantec

Figure/Well No.

S-200

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

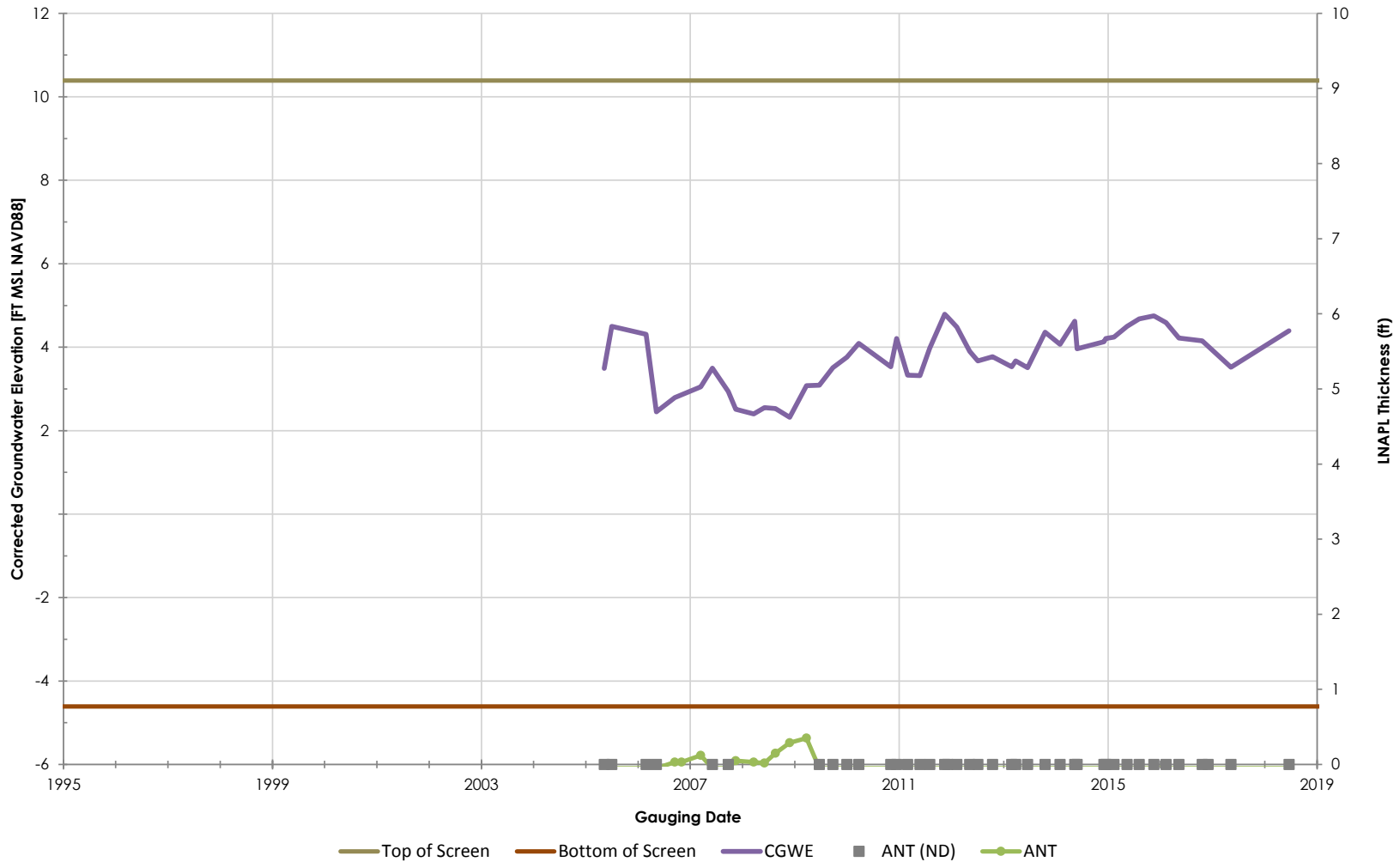
Stantec

Figure/Well No.

S-201

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

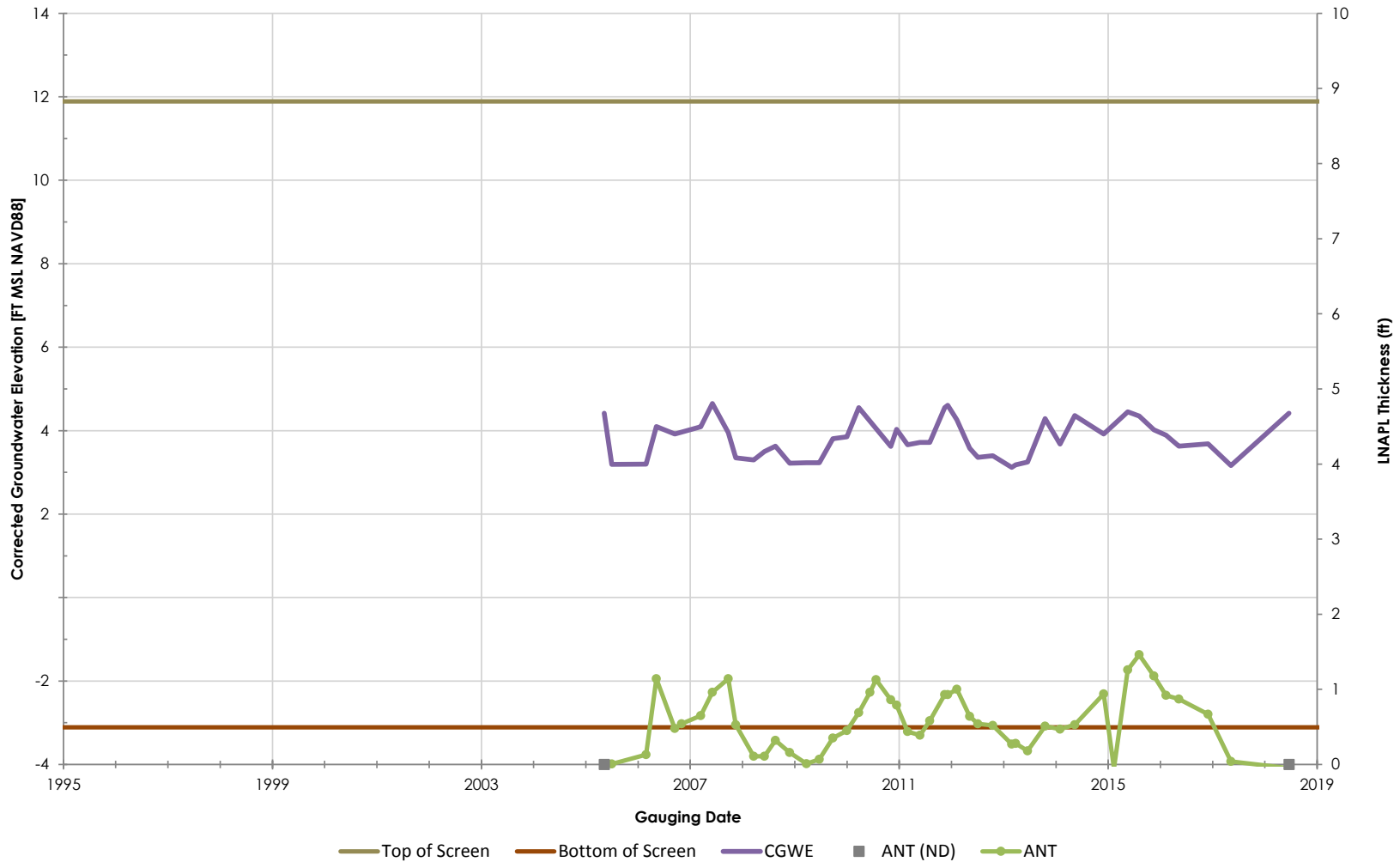
Stantec

Figure/Well No.

S-202

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Stantec

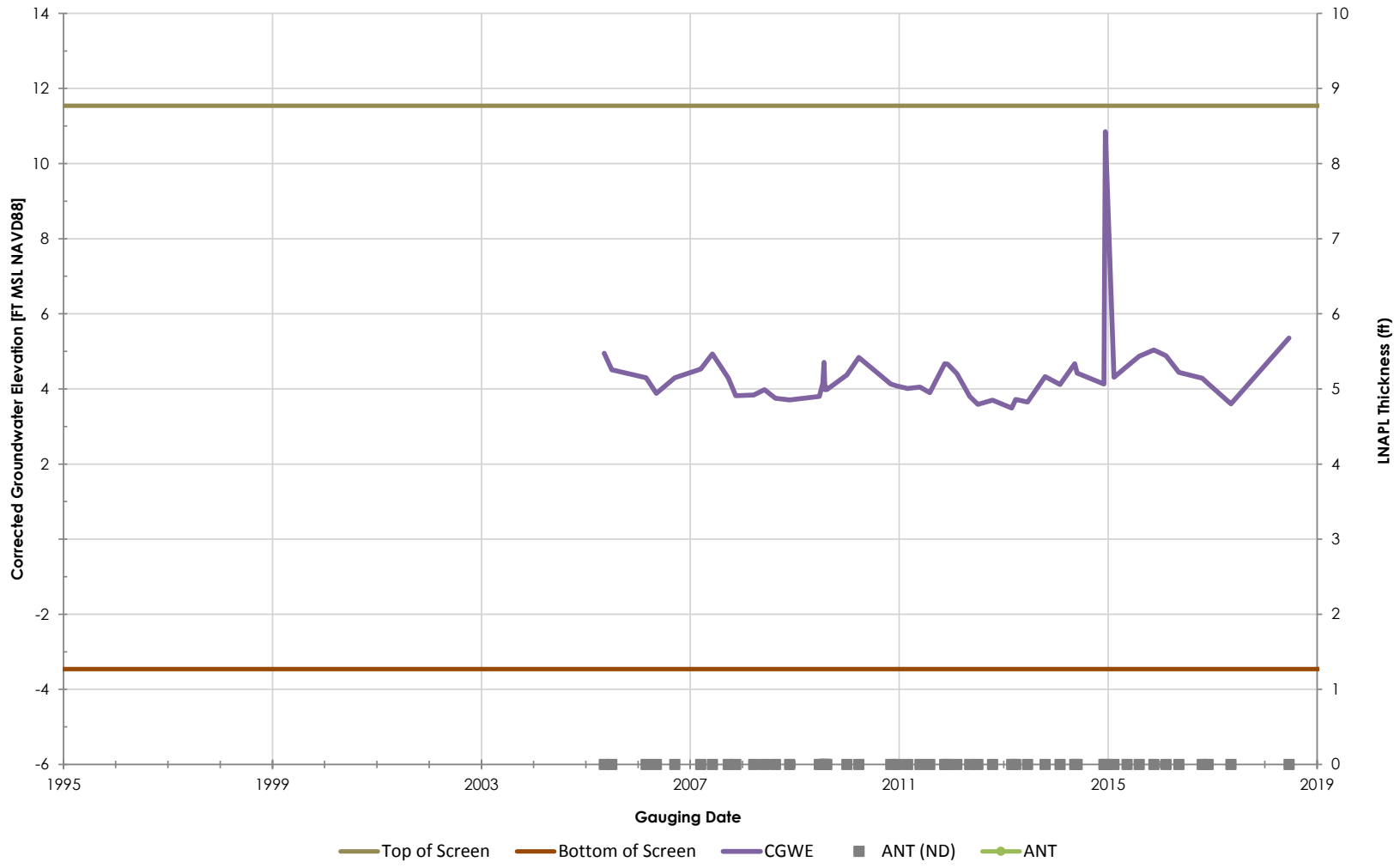
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-203

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

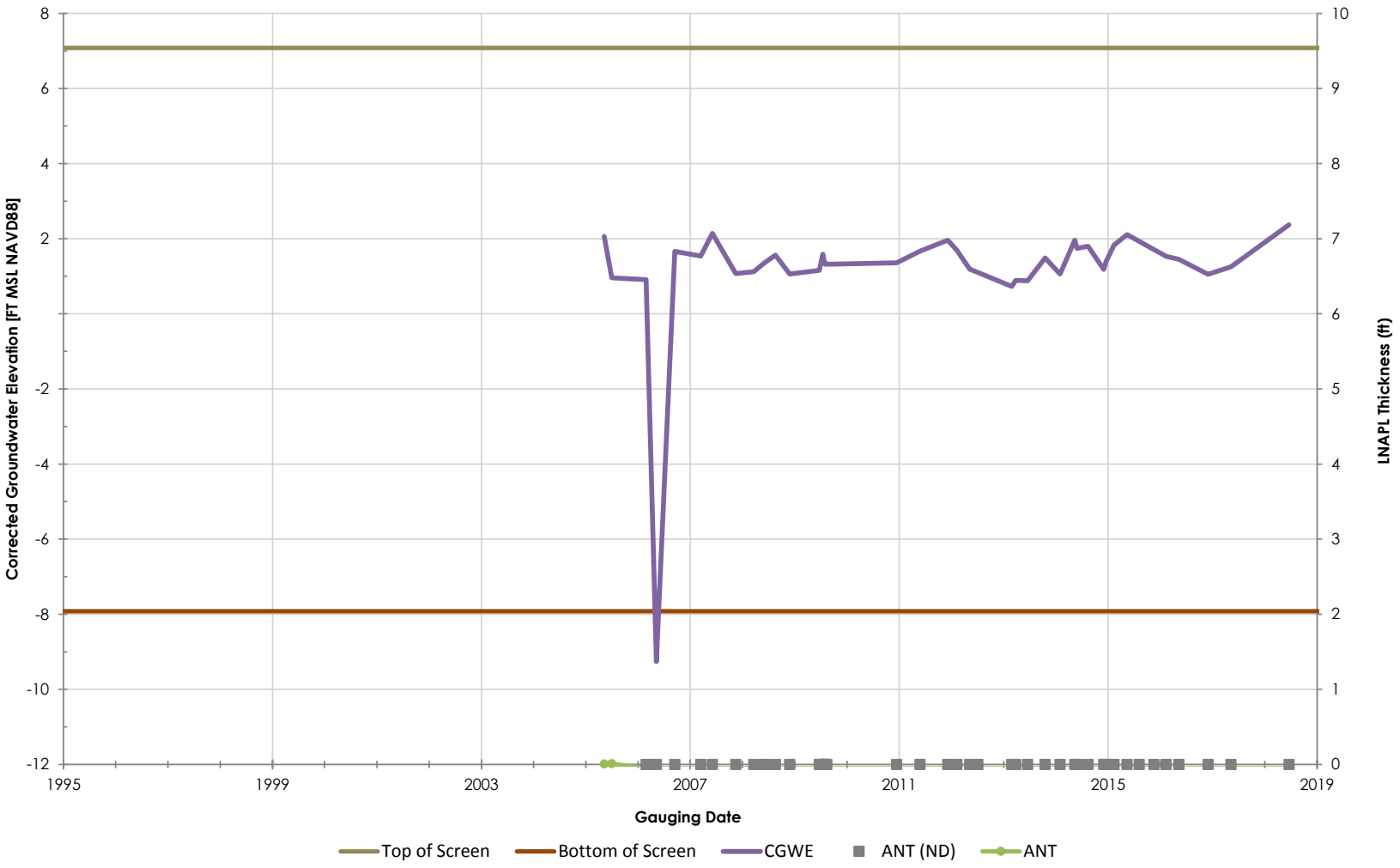
Stantec

Figure/Well No.

S-206

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

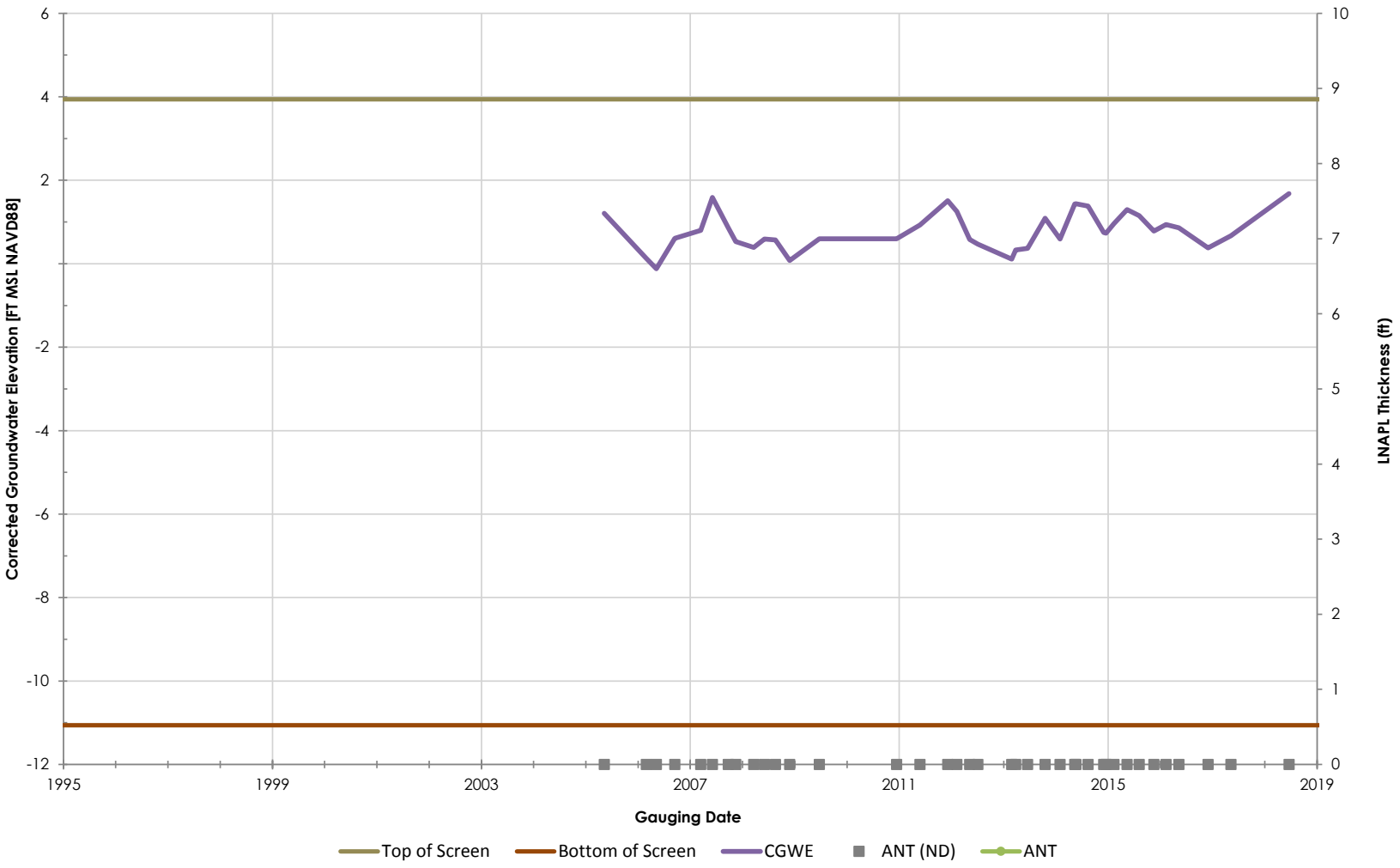
Stantec

Figure/Well No.

S-208

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

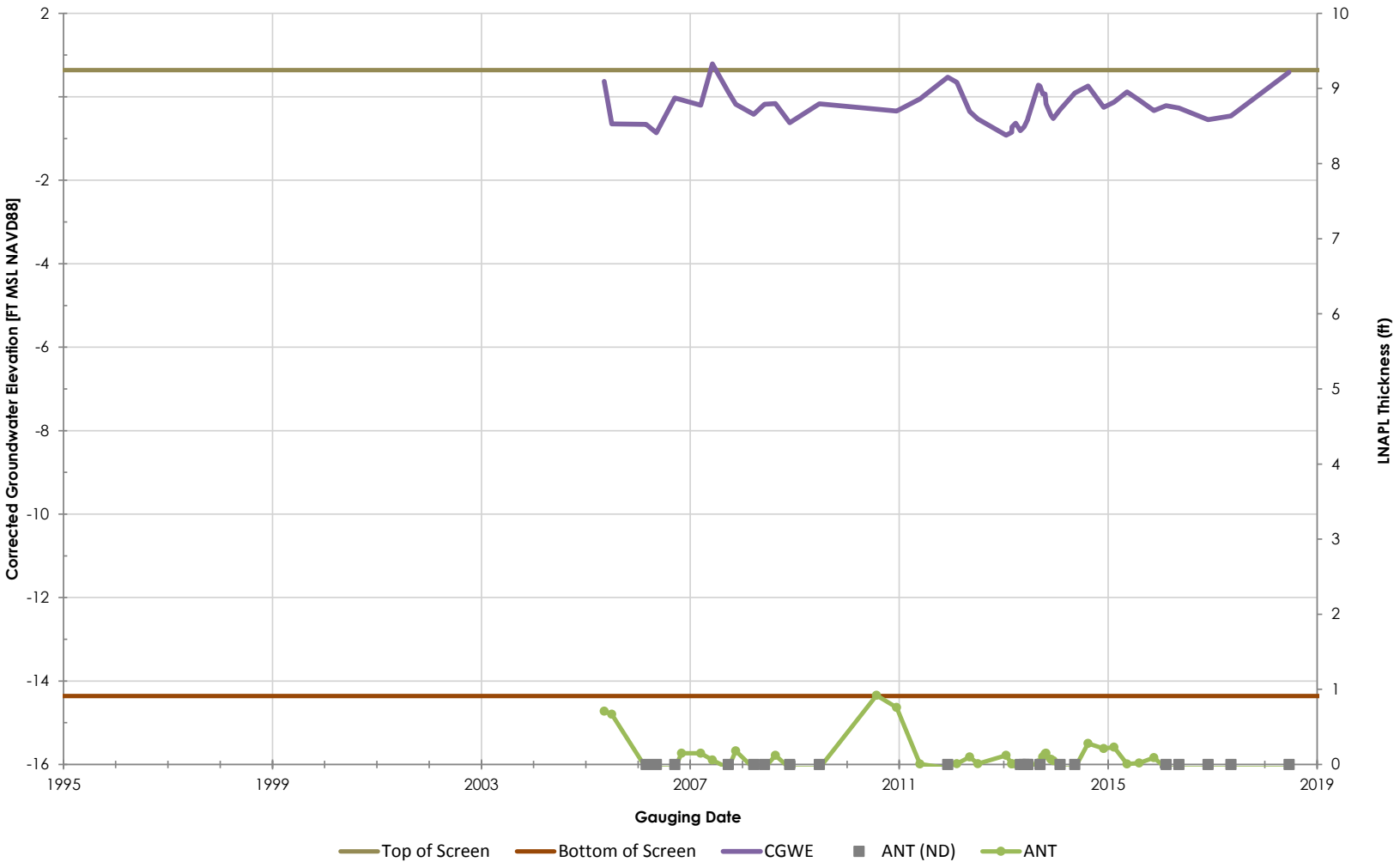
Stantec

Figure/Well No.

S-209

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

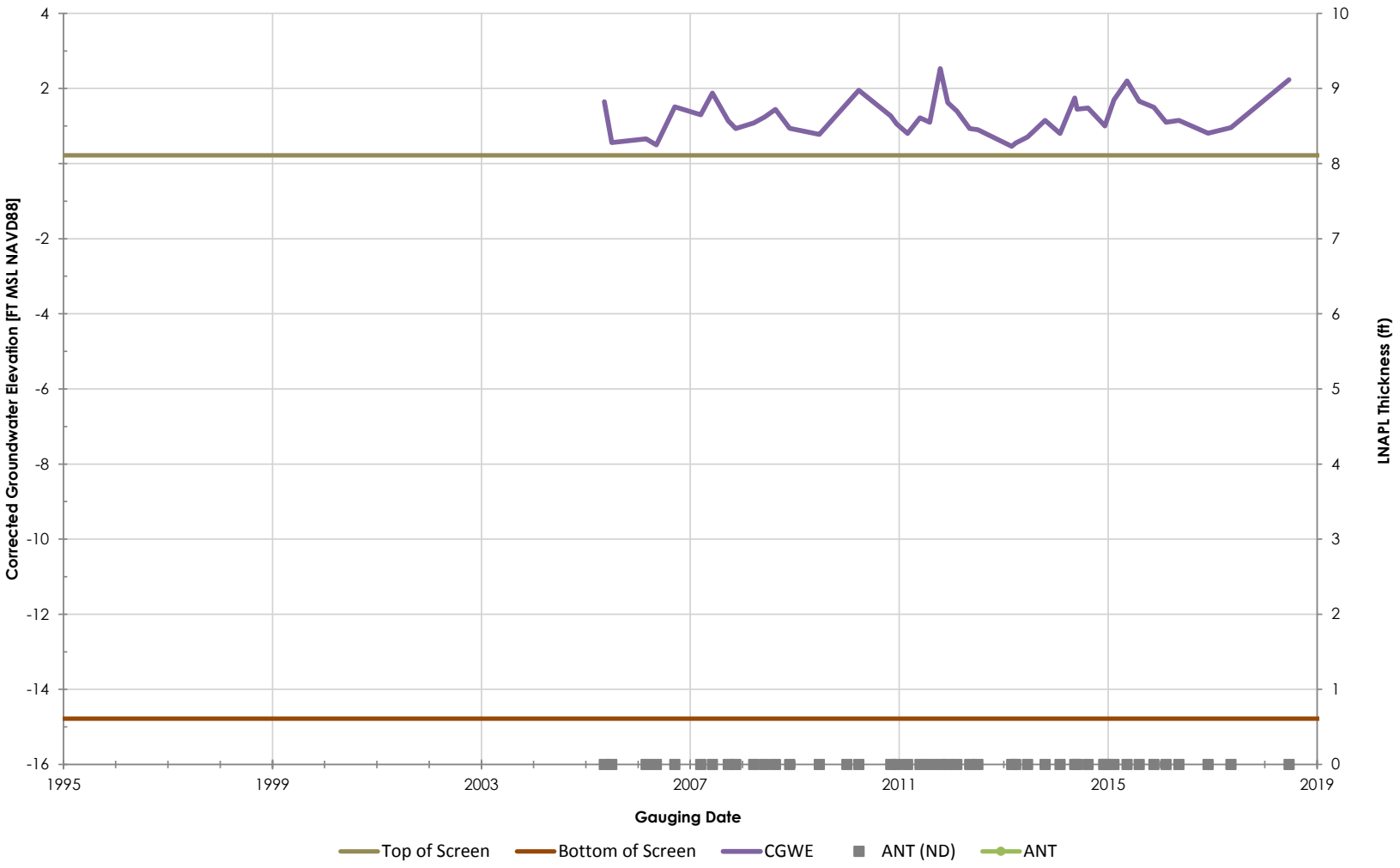
Stantec

Figure/Well No.

S-210

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

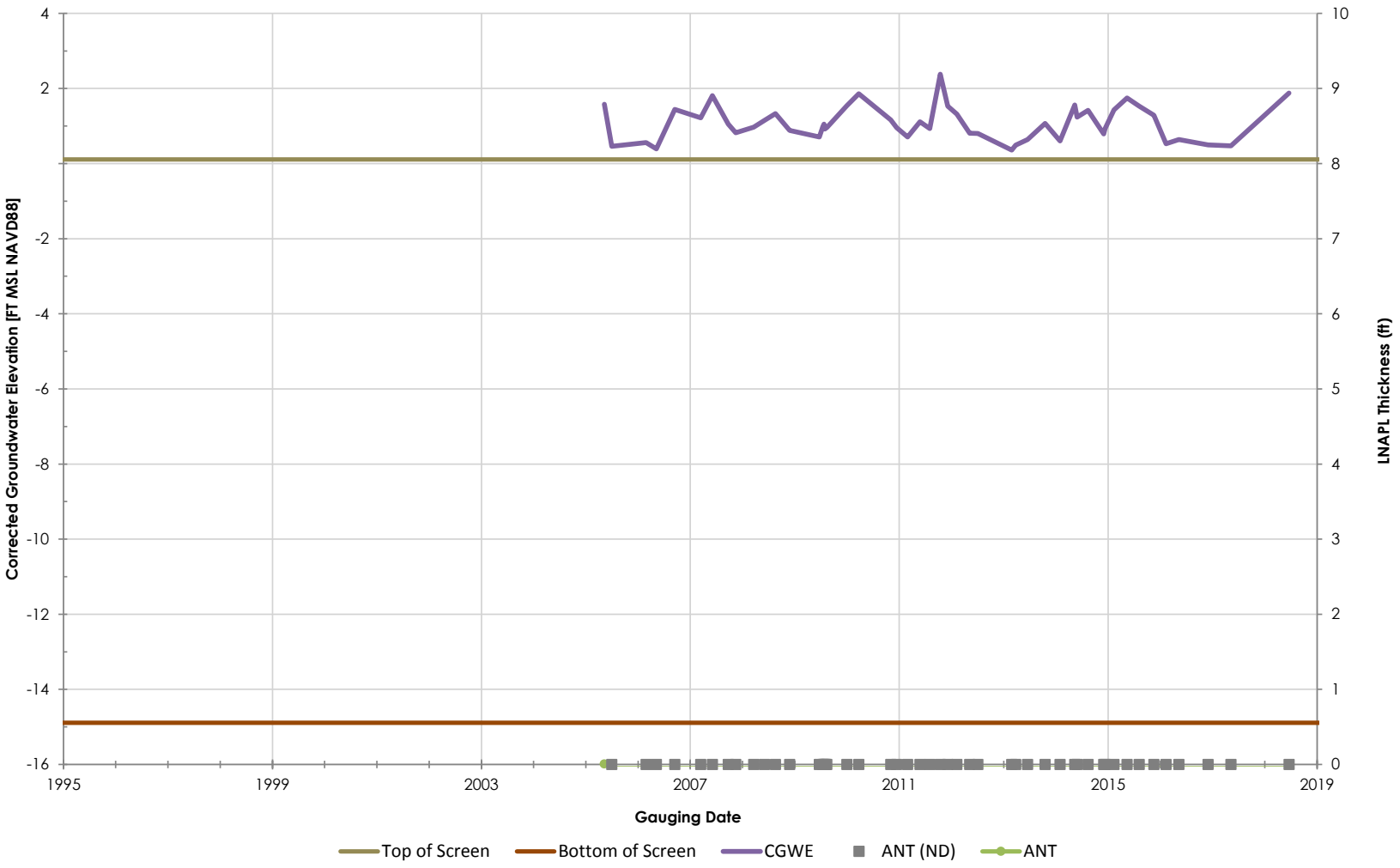
Stantec

Figure/Well No.

S-211

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

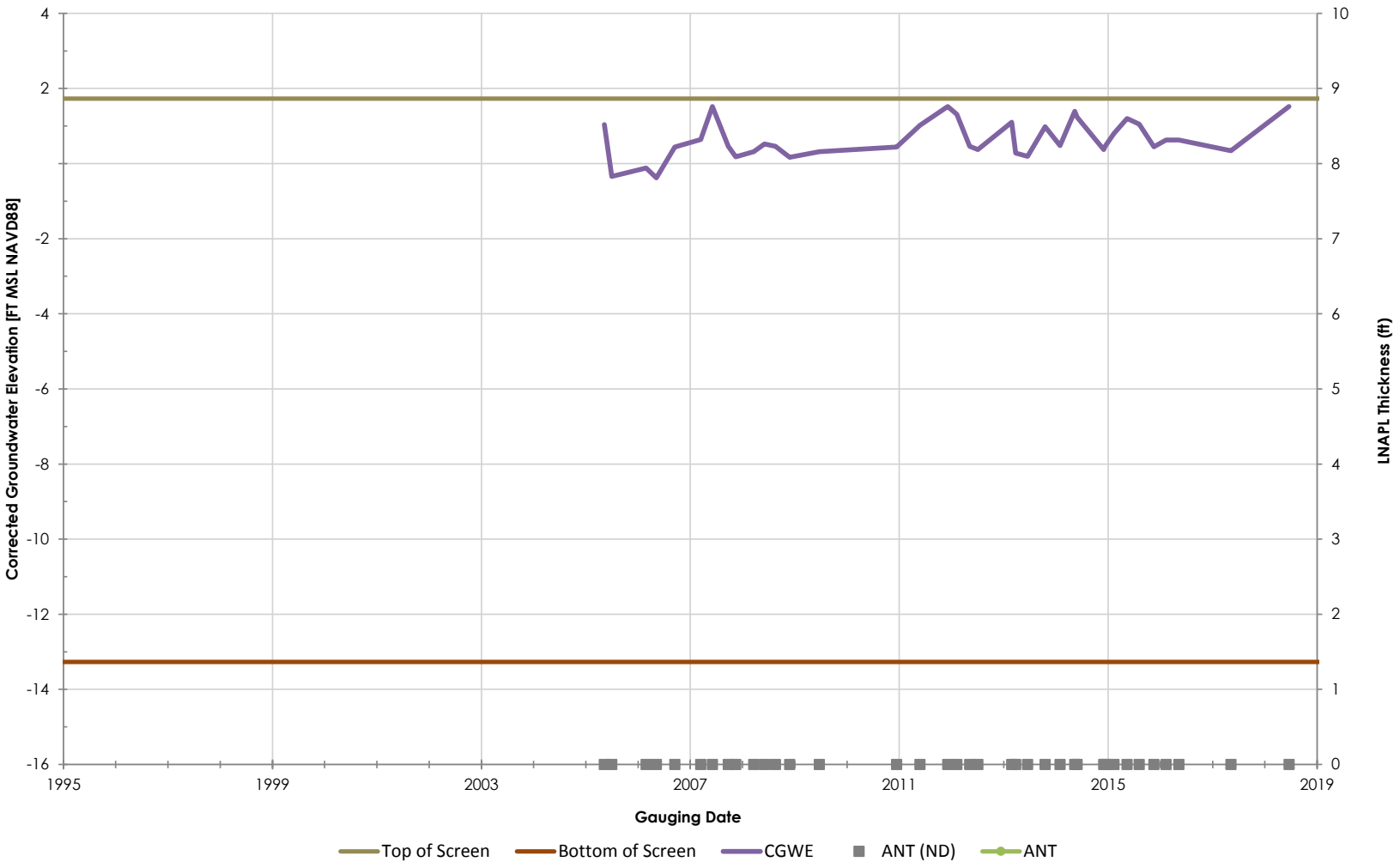
Stantec

Figure/Well No.

S-213

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

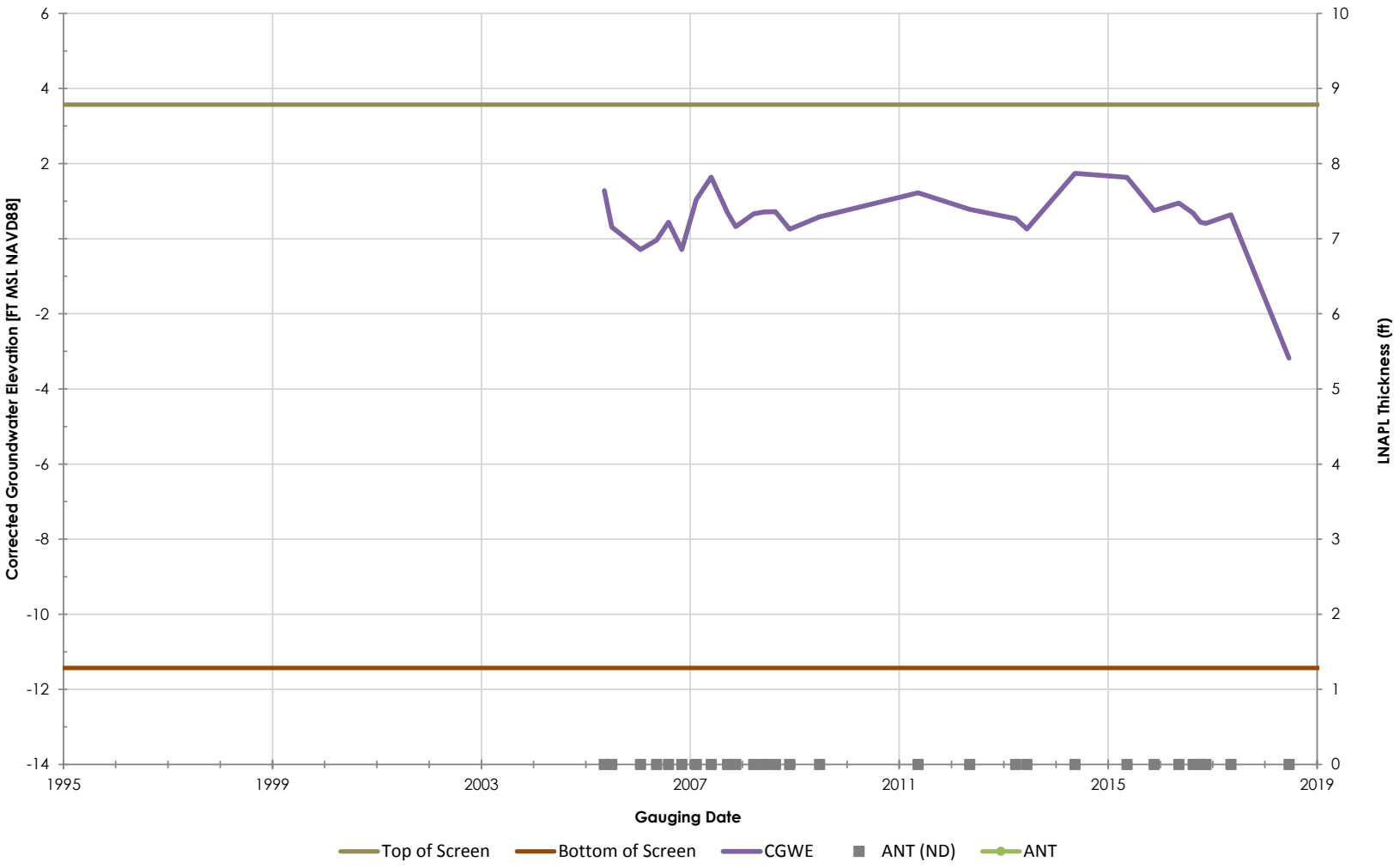
Stantec

Figure/Well No.

S-214

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

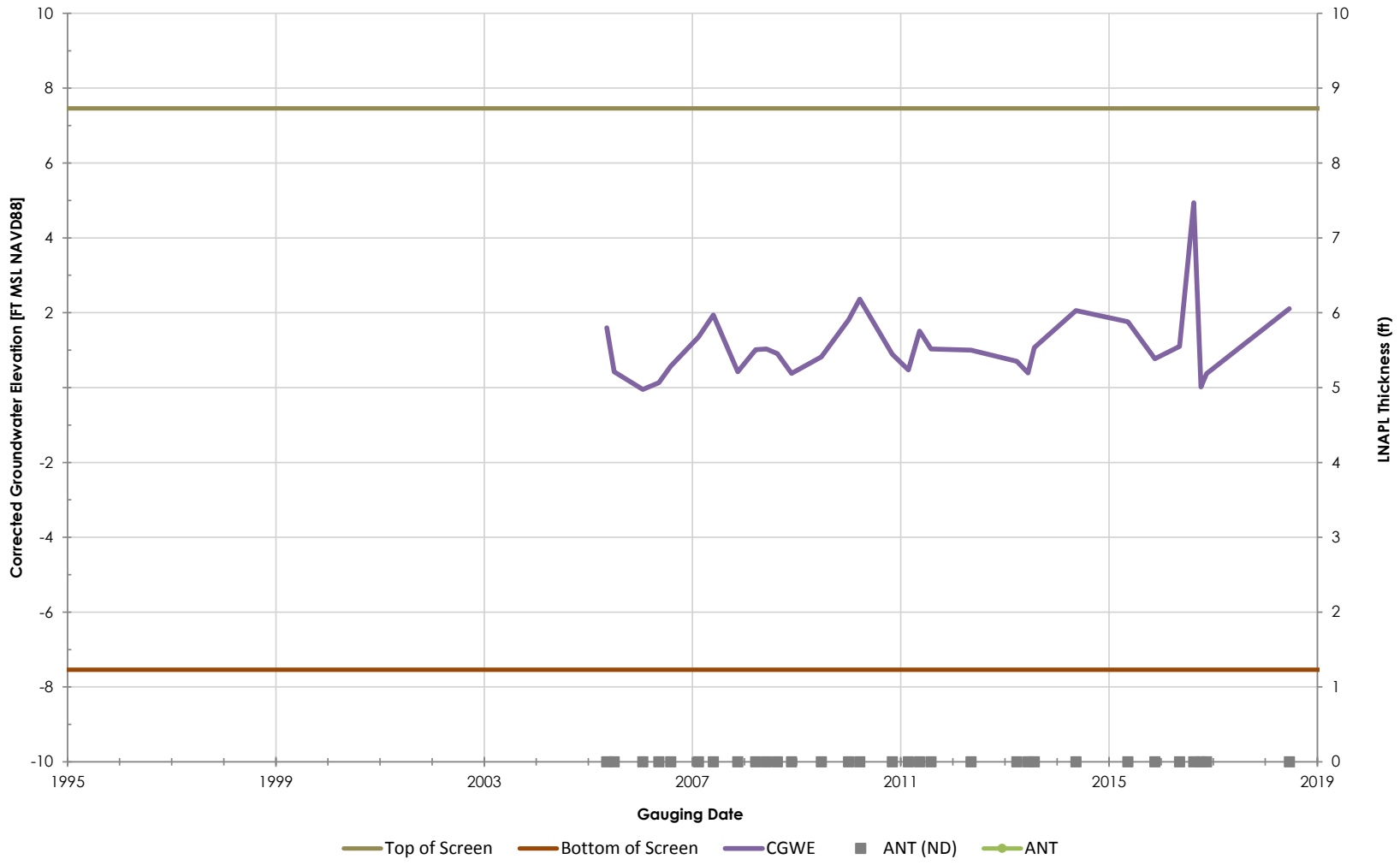
Stantec

Figure/Well No.

S-216

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

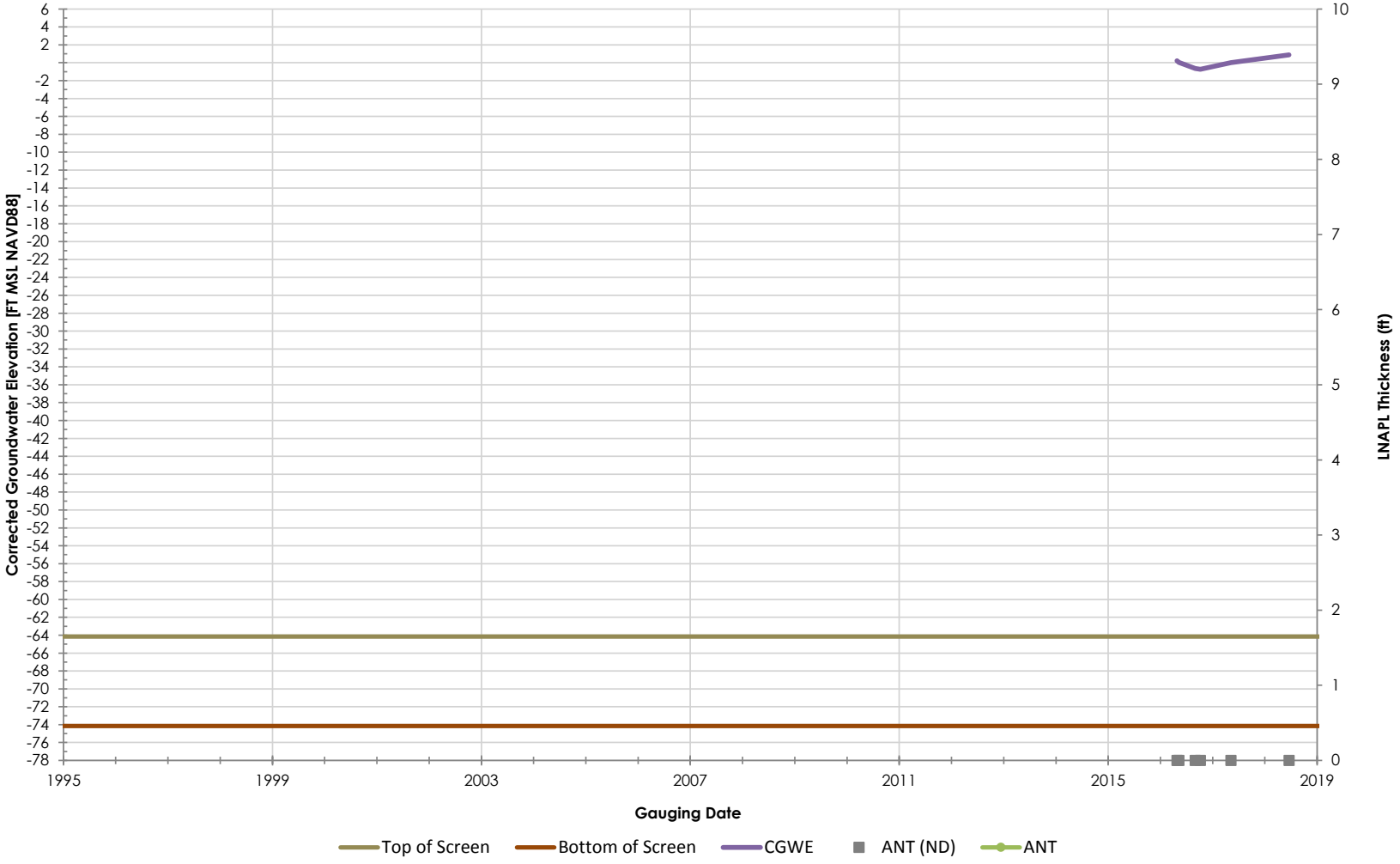
Stantec

Figure/Well No.

S-218

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



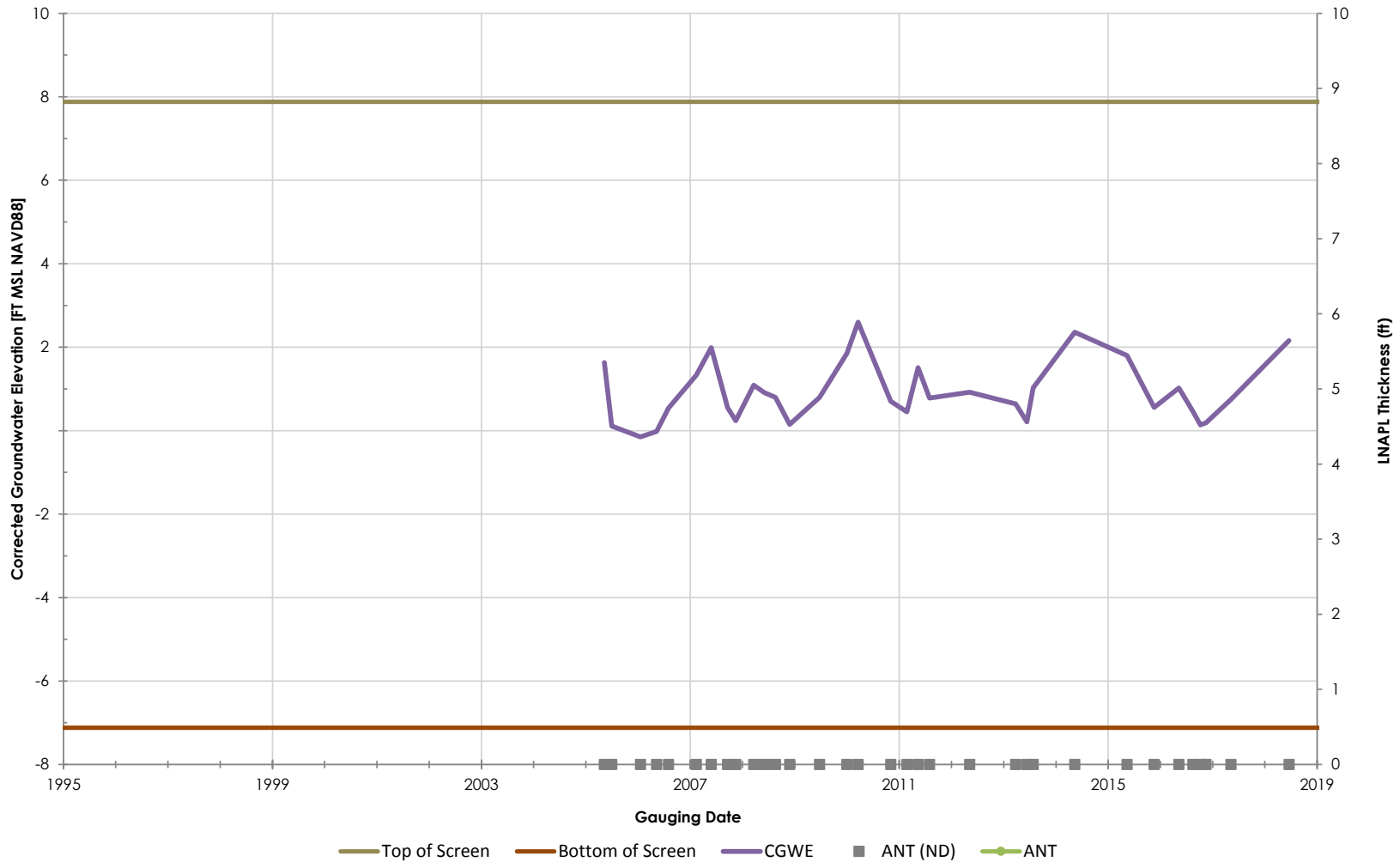
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-218D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

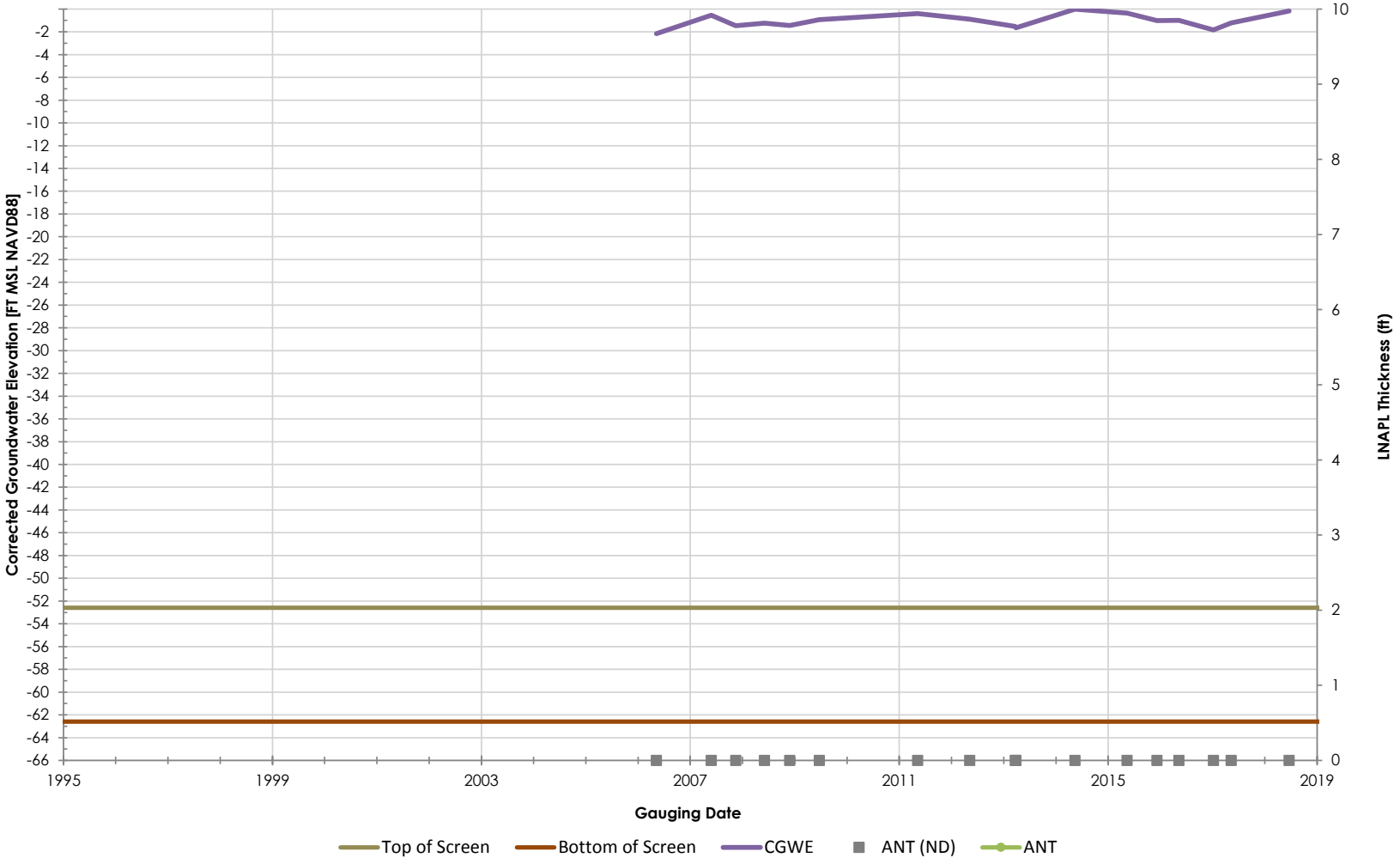
Stantec

Figure/Well No.

S-219

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Stantec

Figure/Well No.

S-22

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

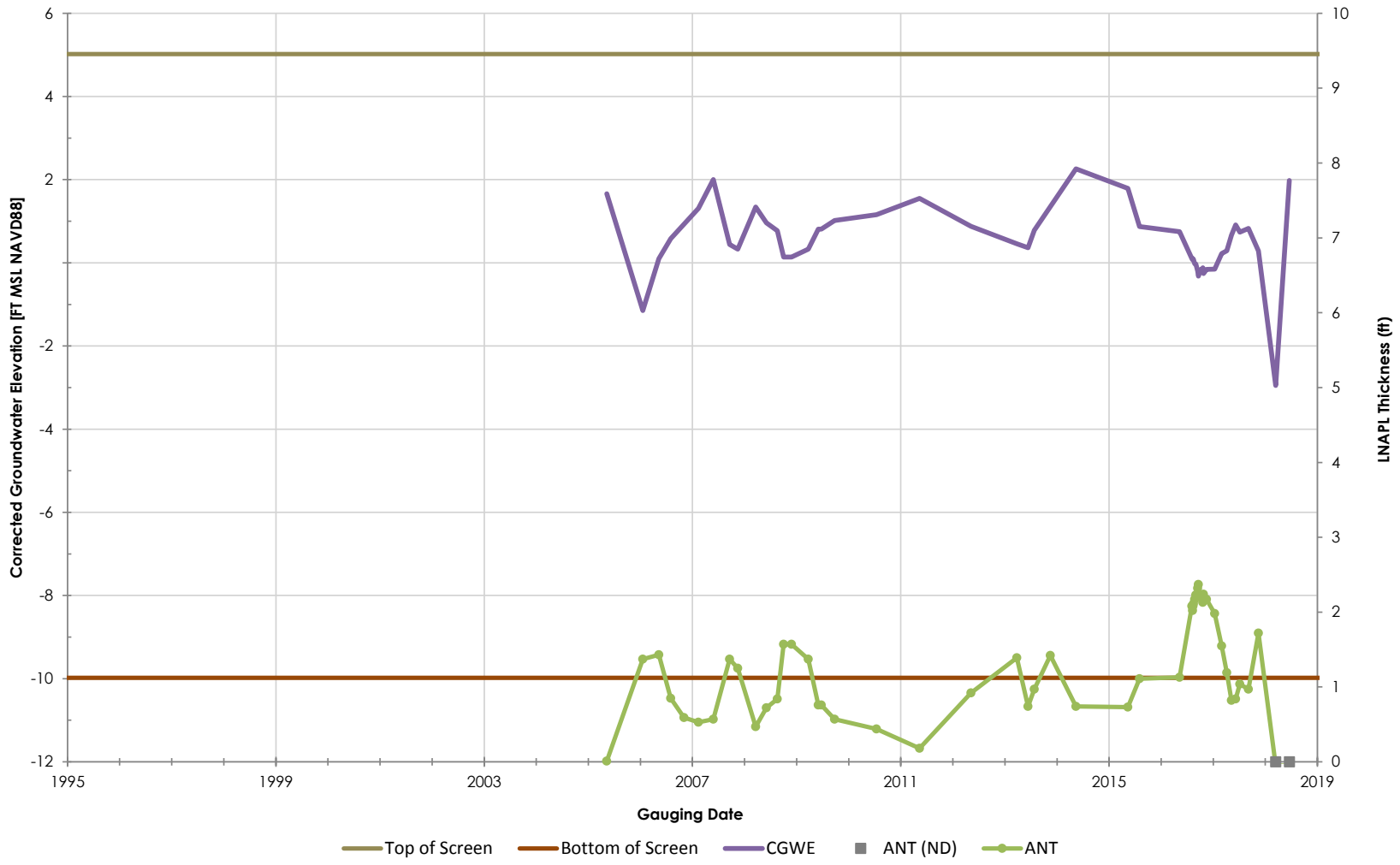
Stantec

Figure/Well No.

S-220

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

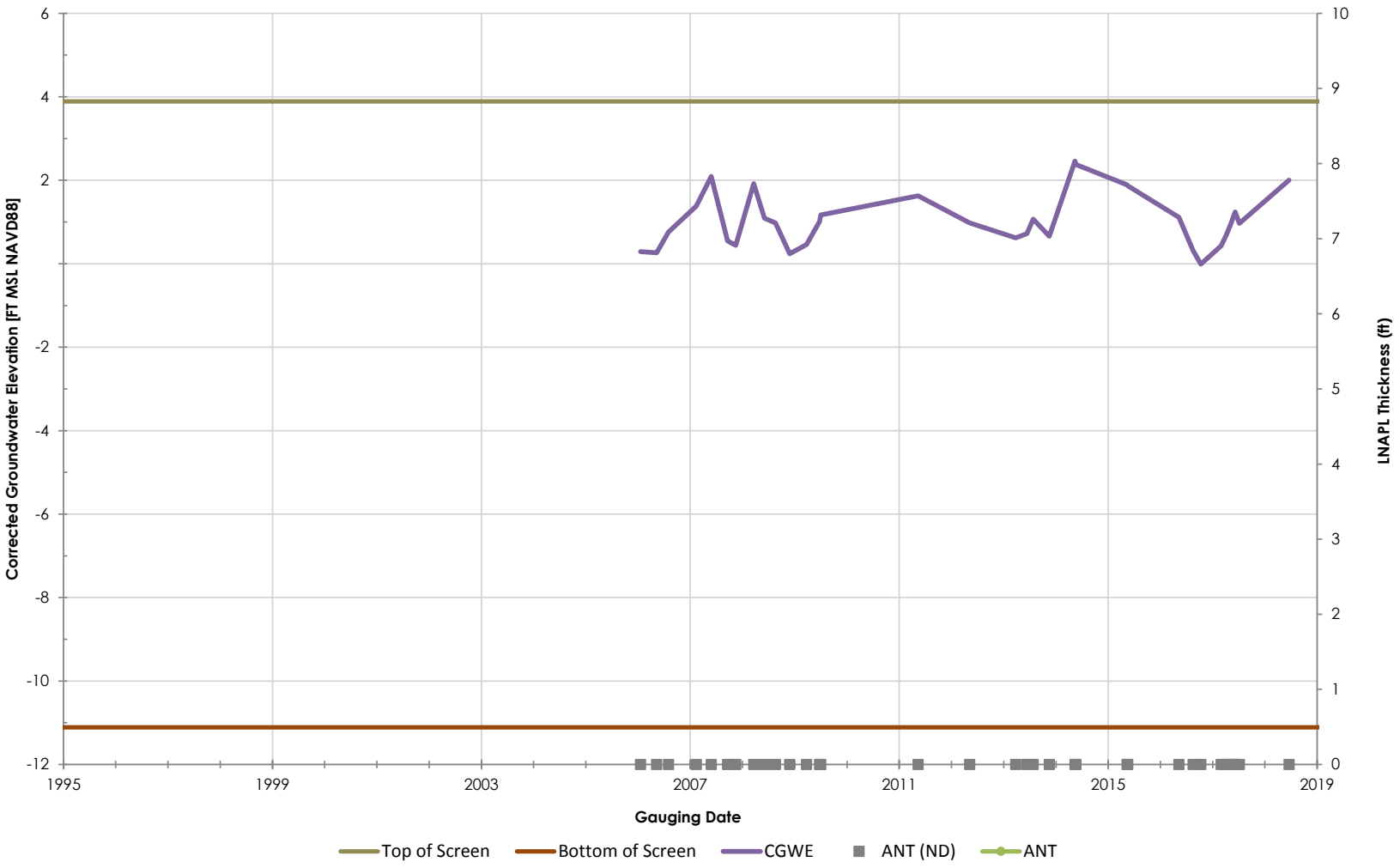
Stantec

Figure/Well No.

S-221

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

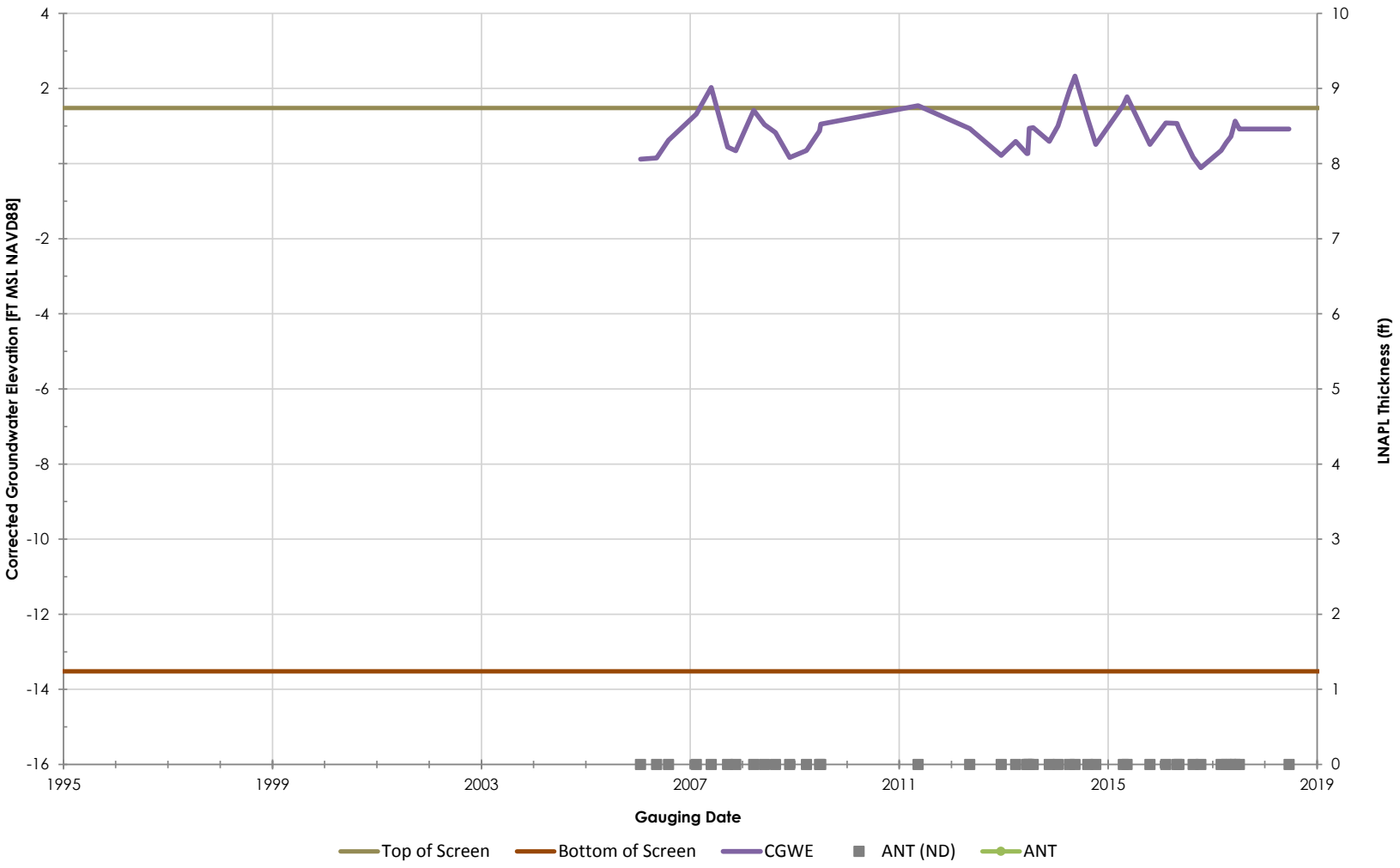
Stantec

Figure/Well No.

S-222

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

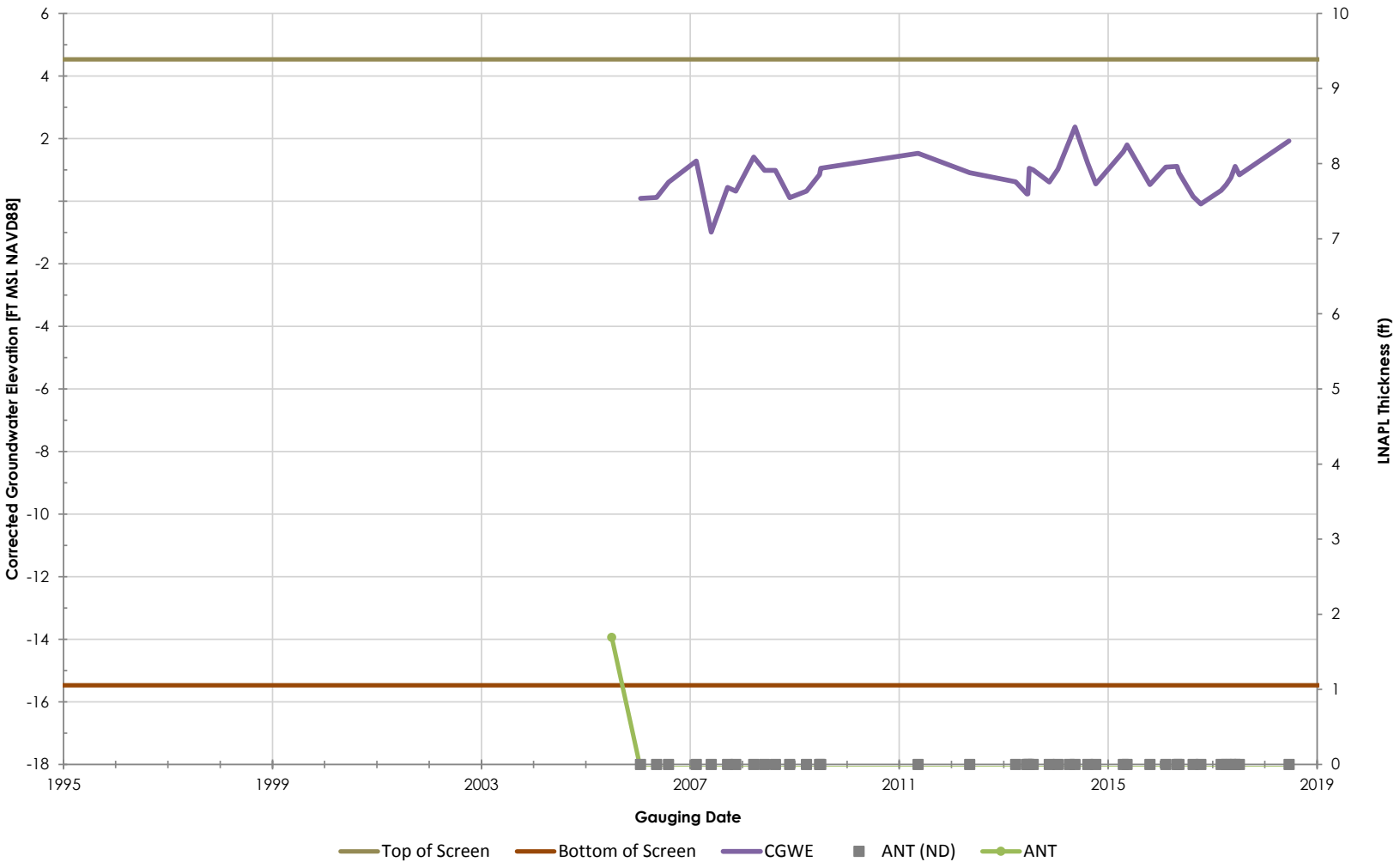
Stantec

Figure/Well No.

S-223

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

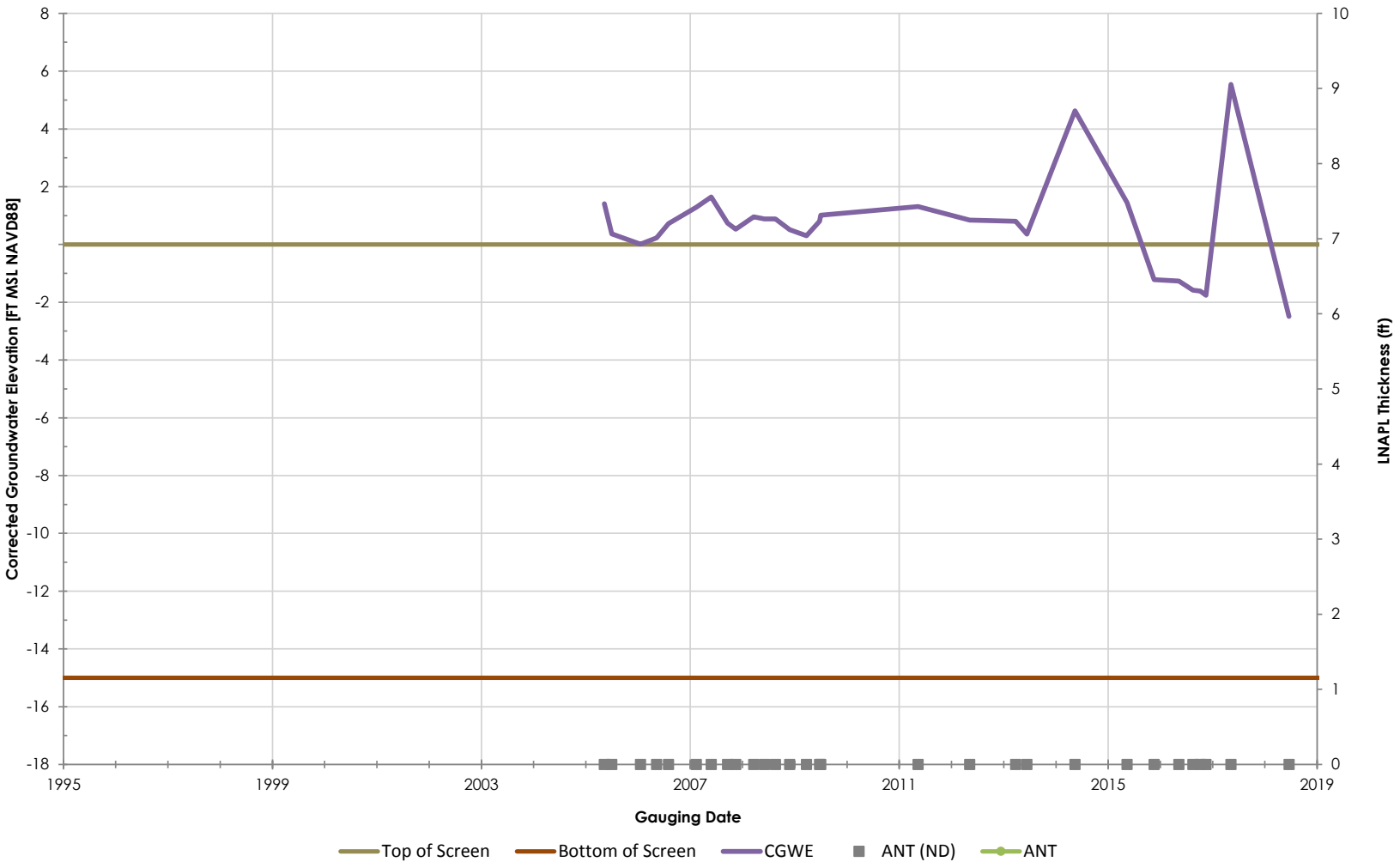
Stantec

Figure/Well No.

S-224

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

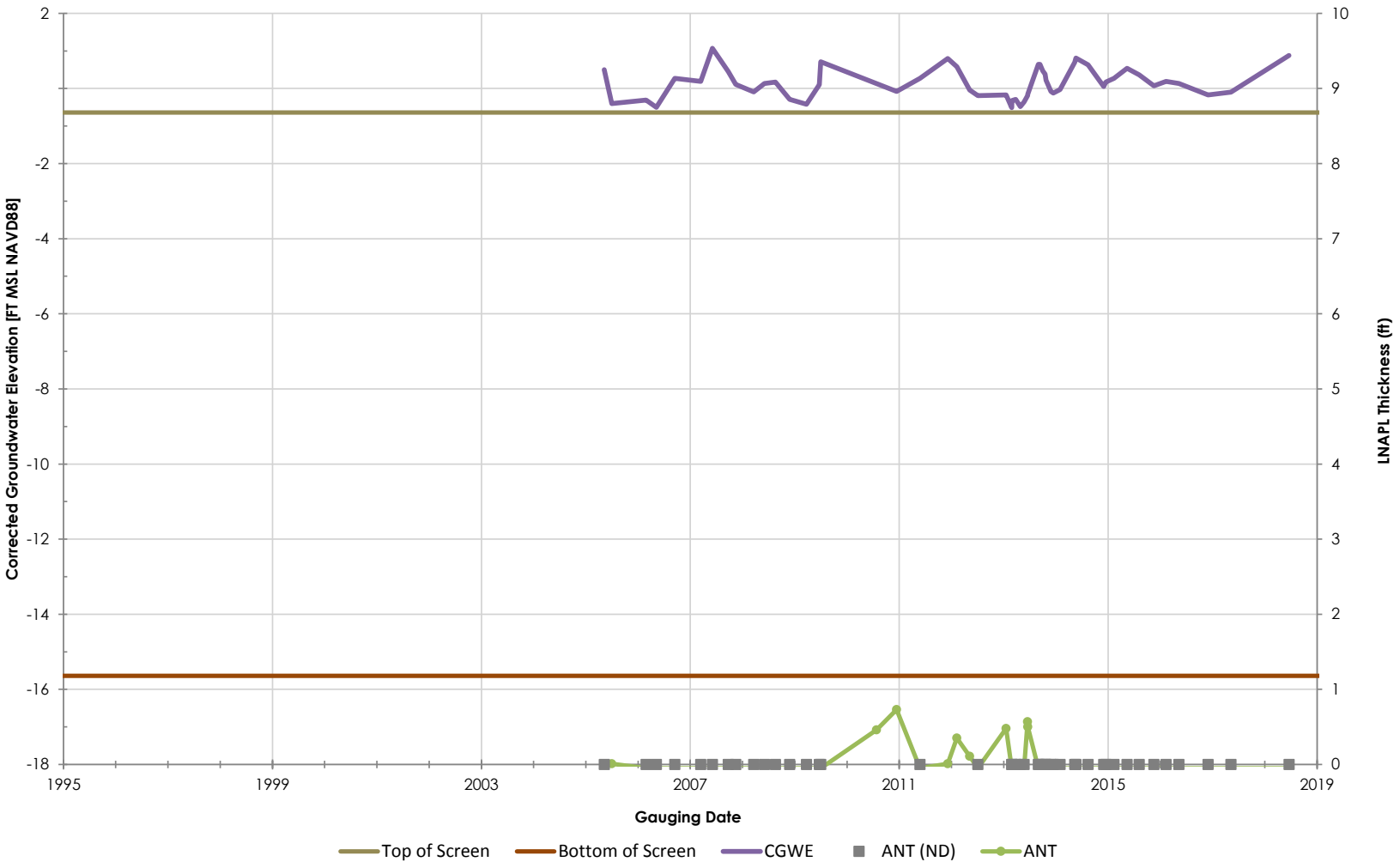
Stantec

Figure/Well No.

S-225

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

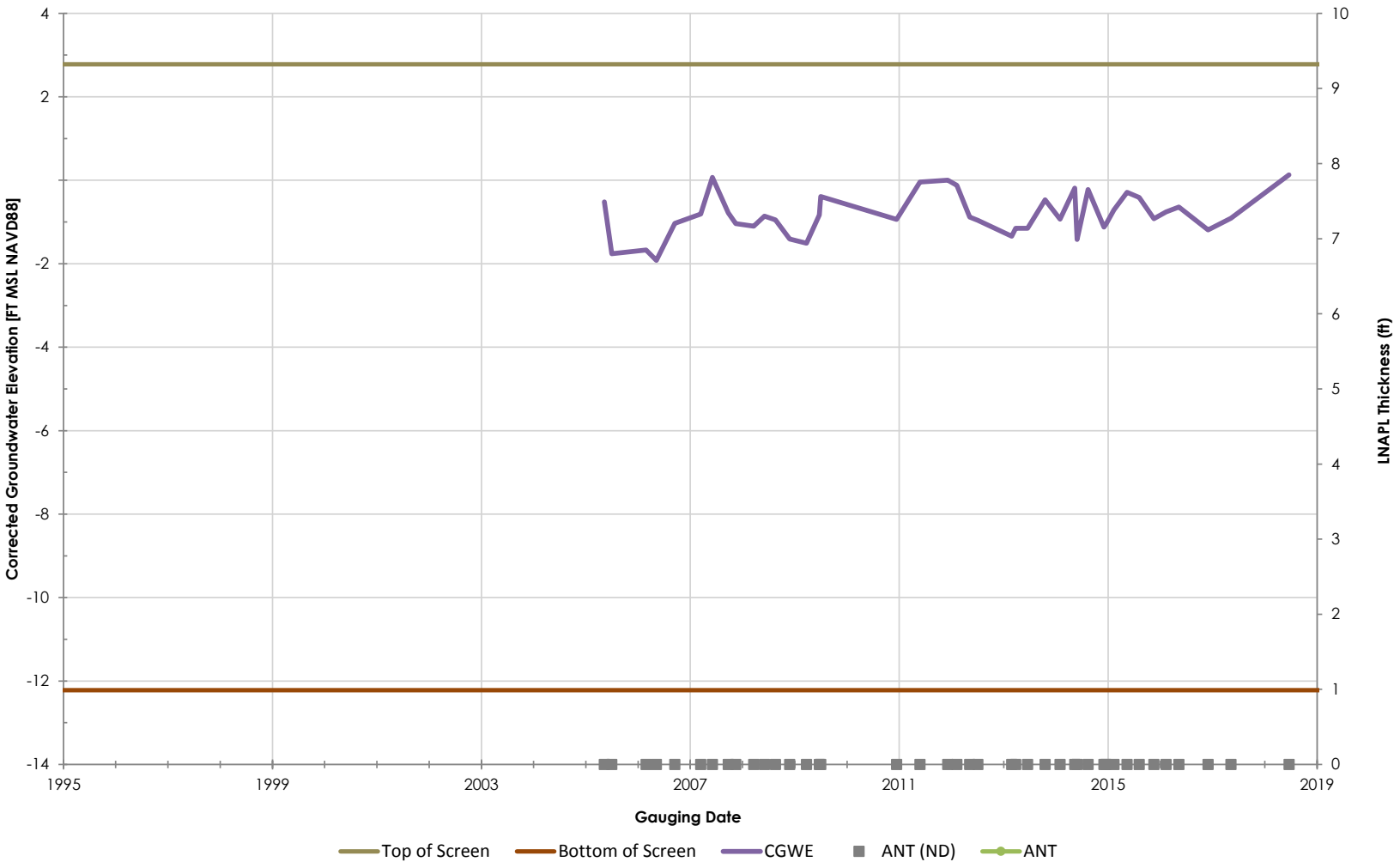
Stantec

Figure/Well No.

S-226

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

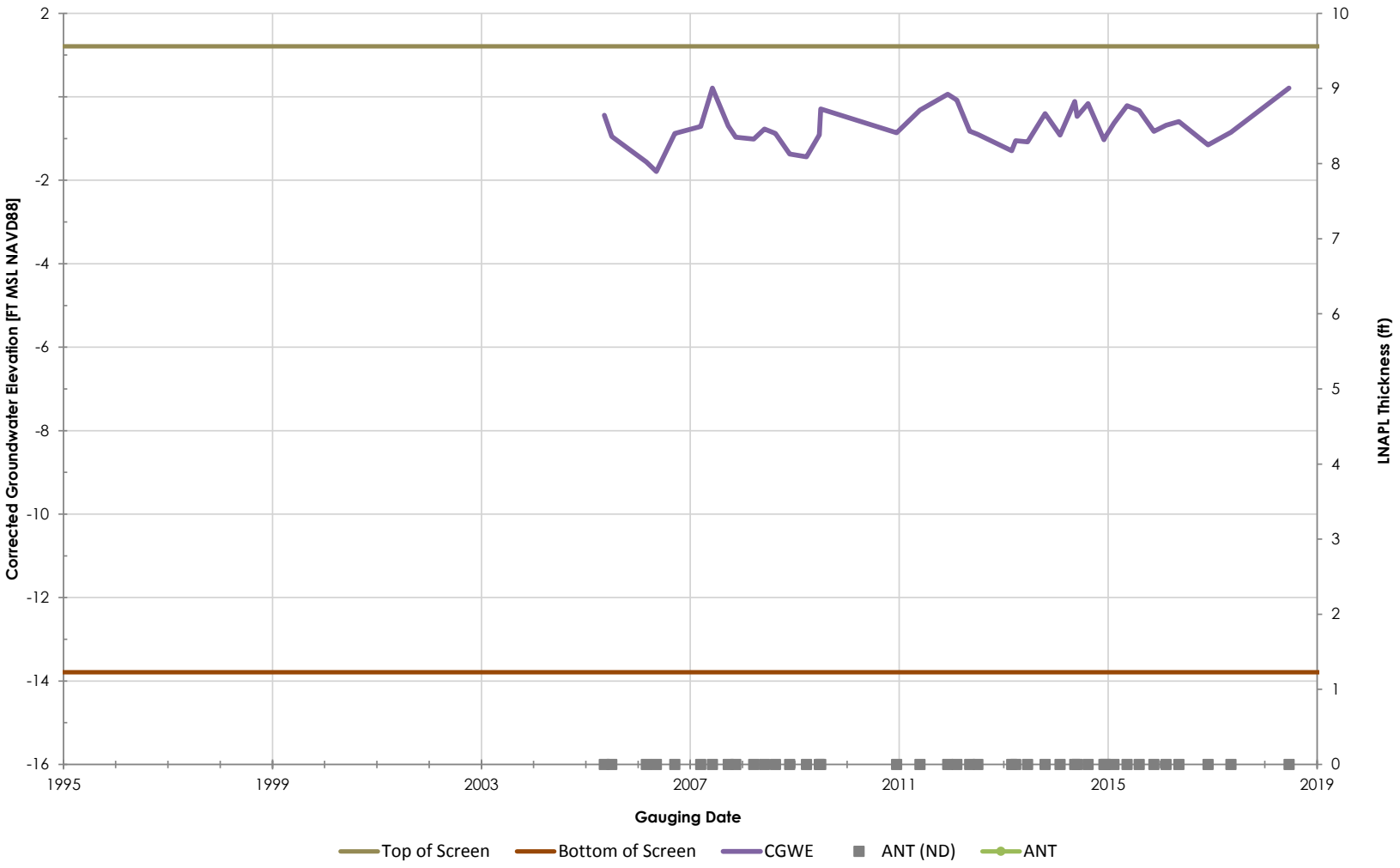
Stantec

Figure/Well No.

S-227

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

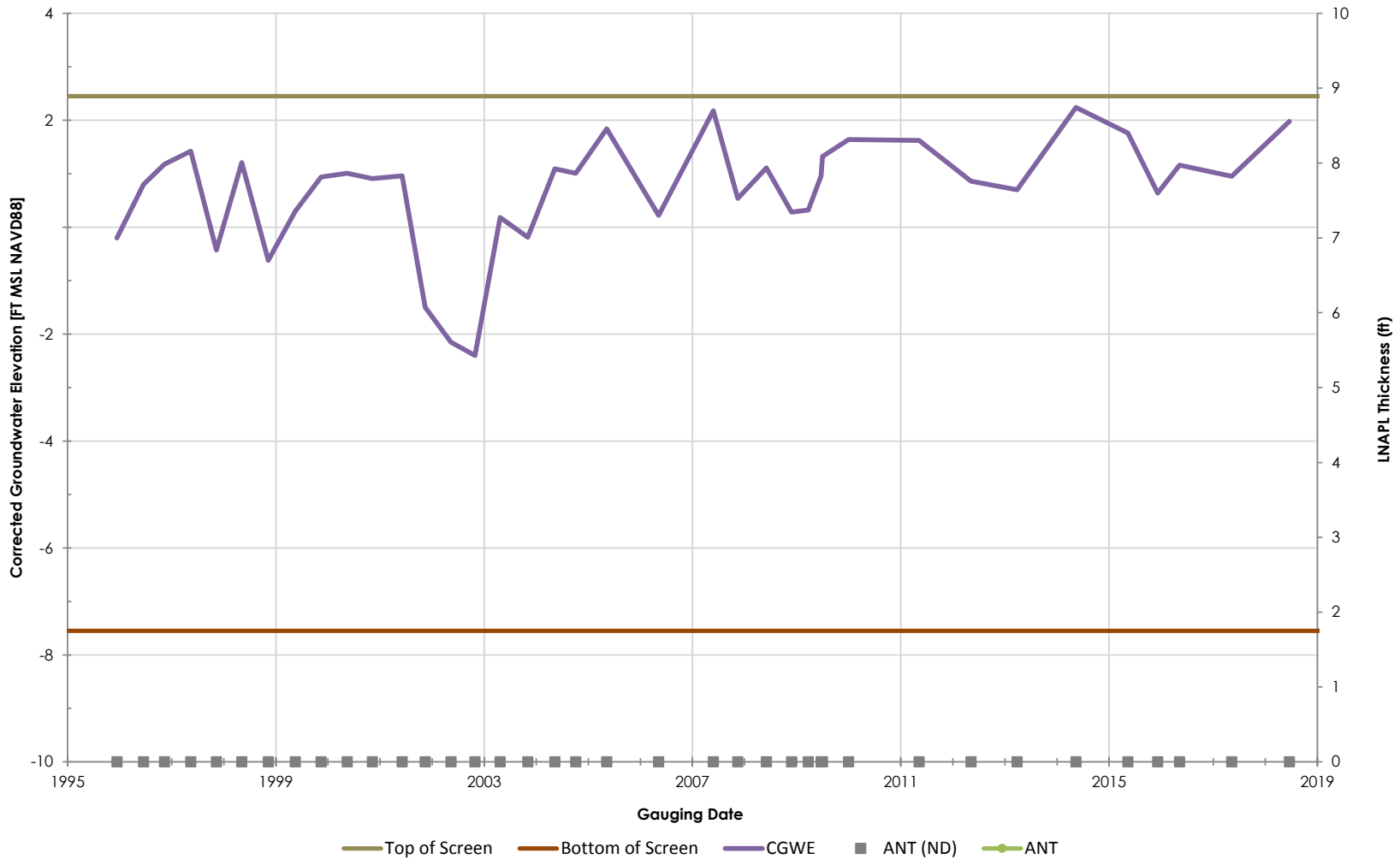
Stantec

Figure/Well No.

S-228

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

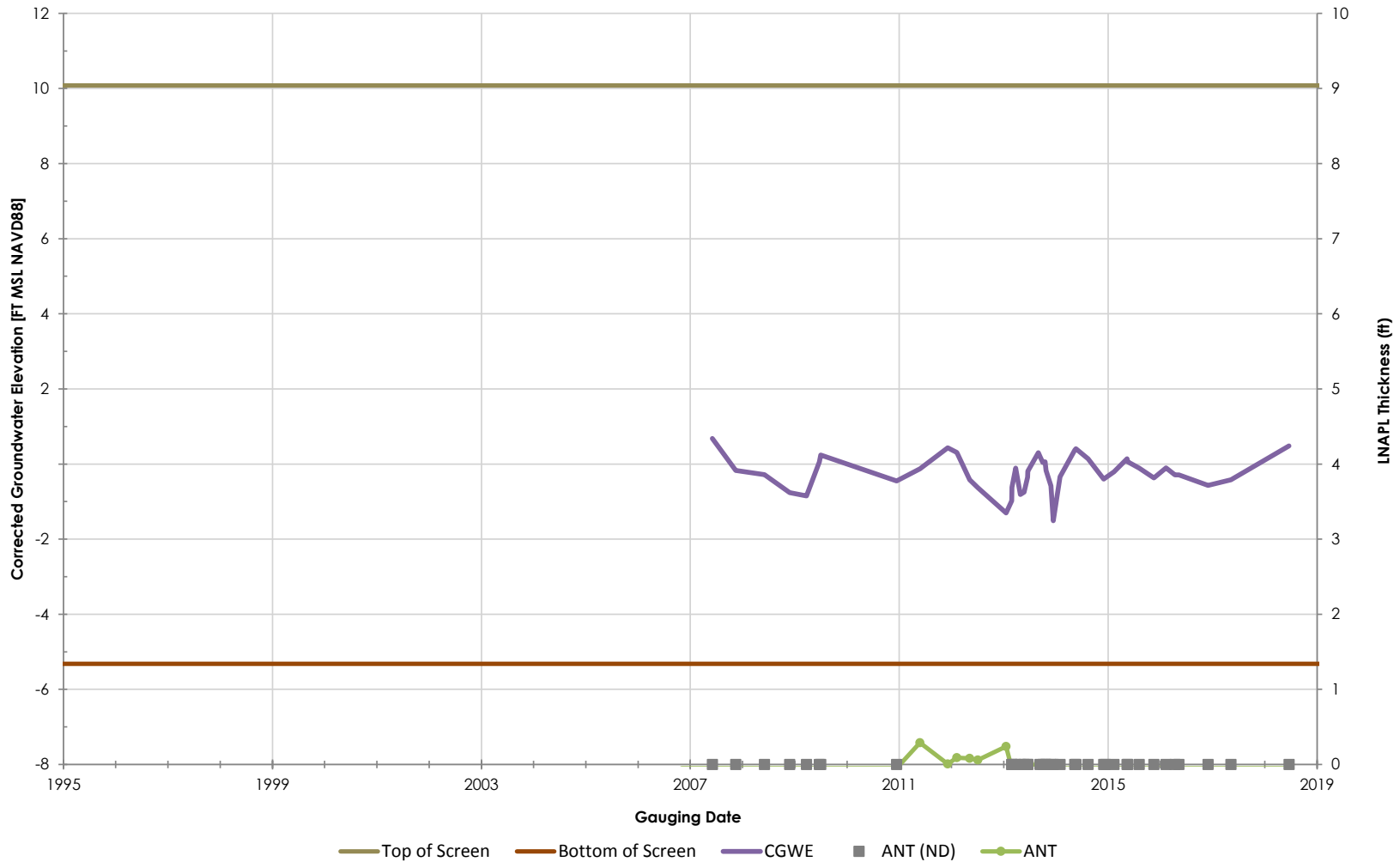
Stantec

Figure/Well No.

S-23

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

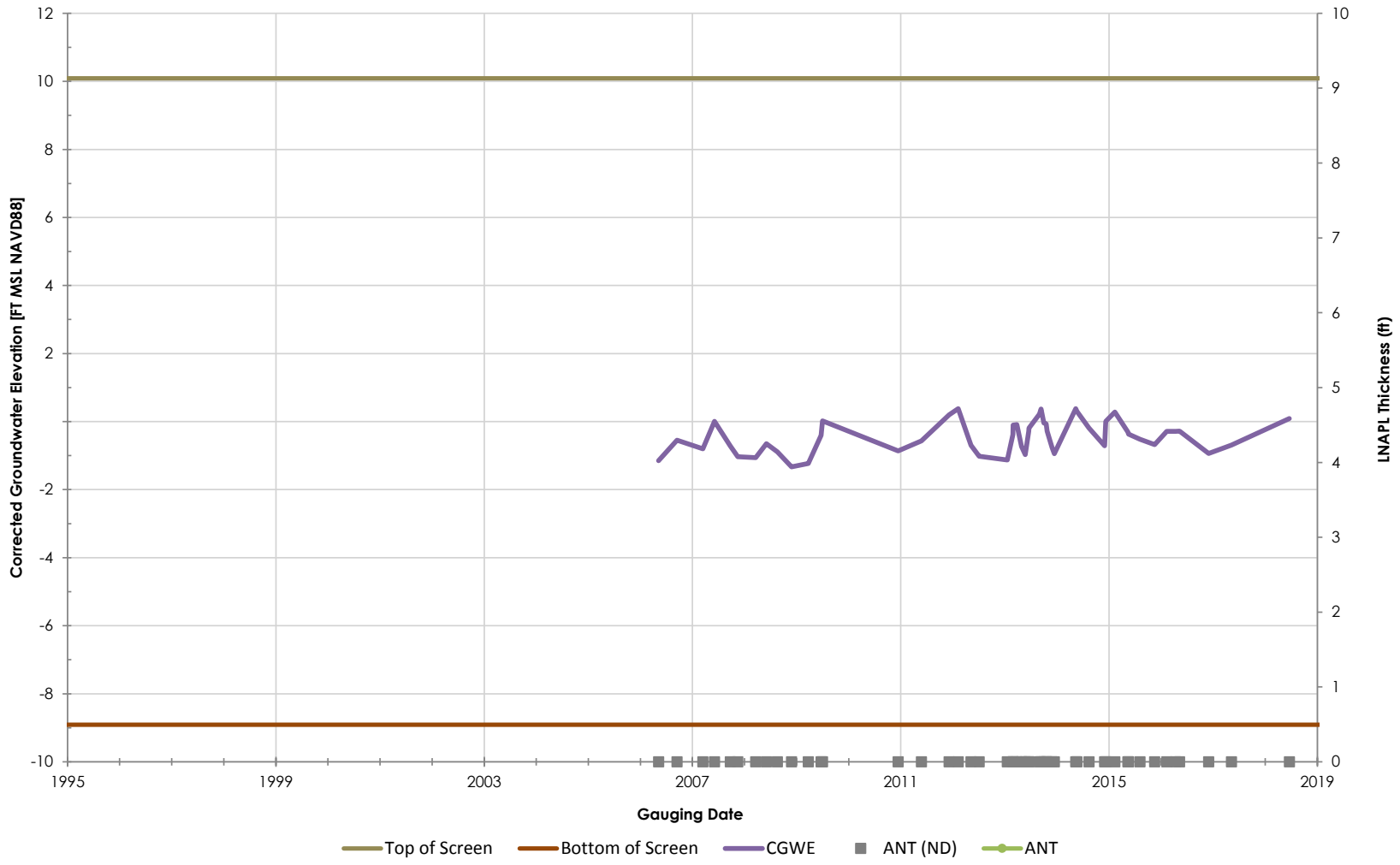
Stantec

Figure/Well No.

S-231

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Stantec

Figure/Well No.

S-232

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

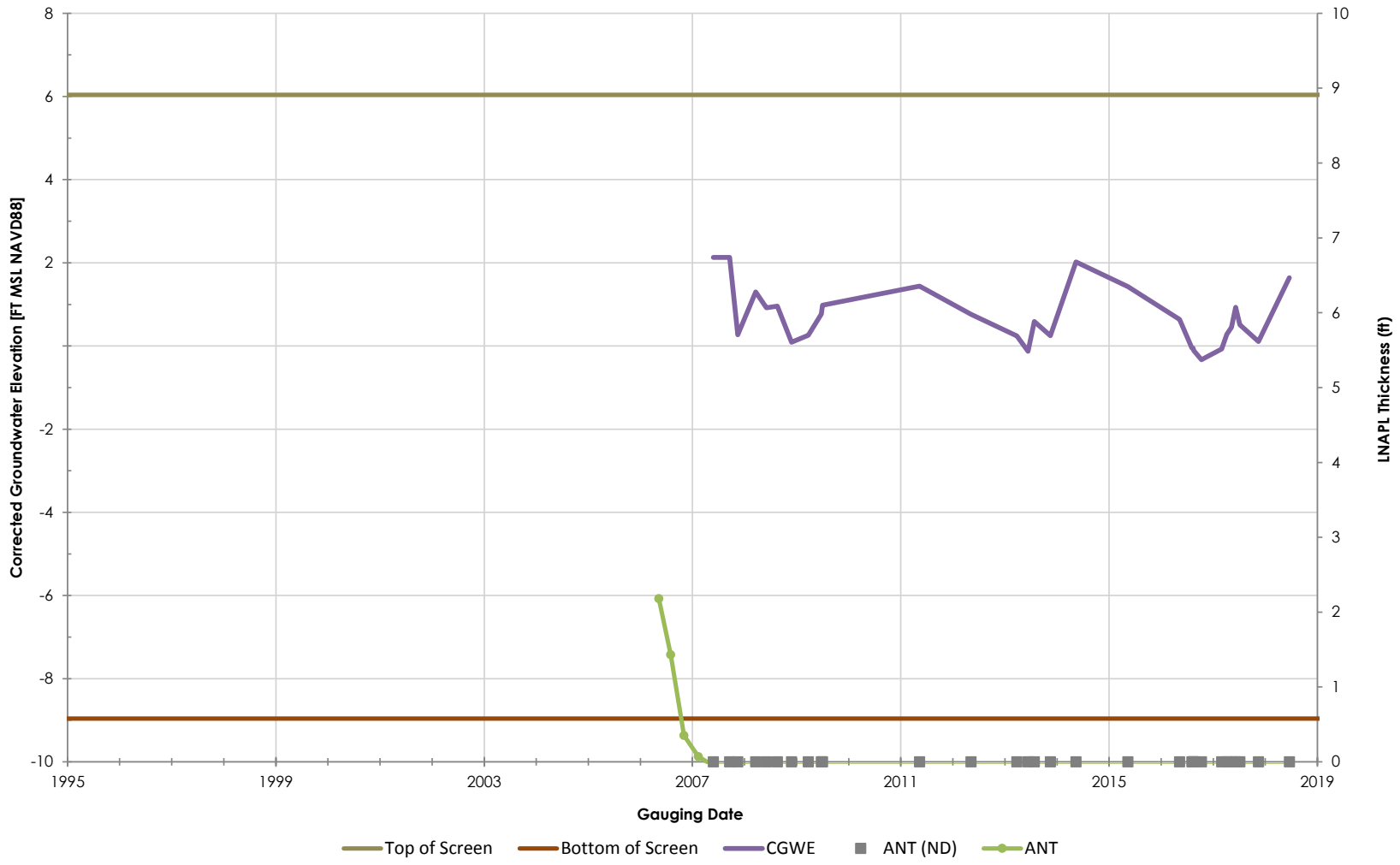
Stantec

Figure/Well No.

S-233

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

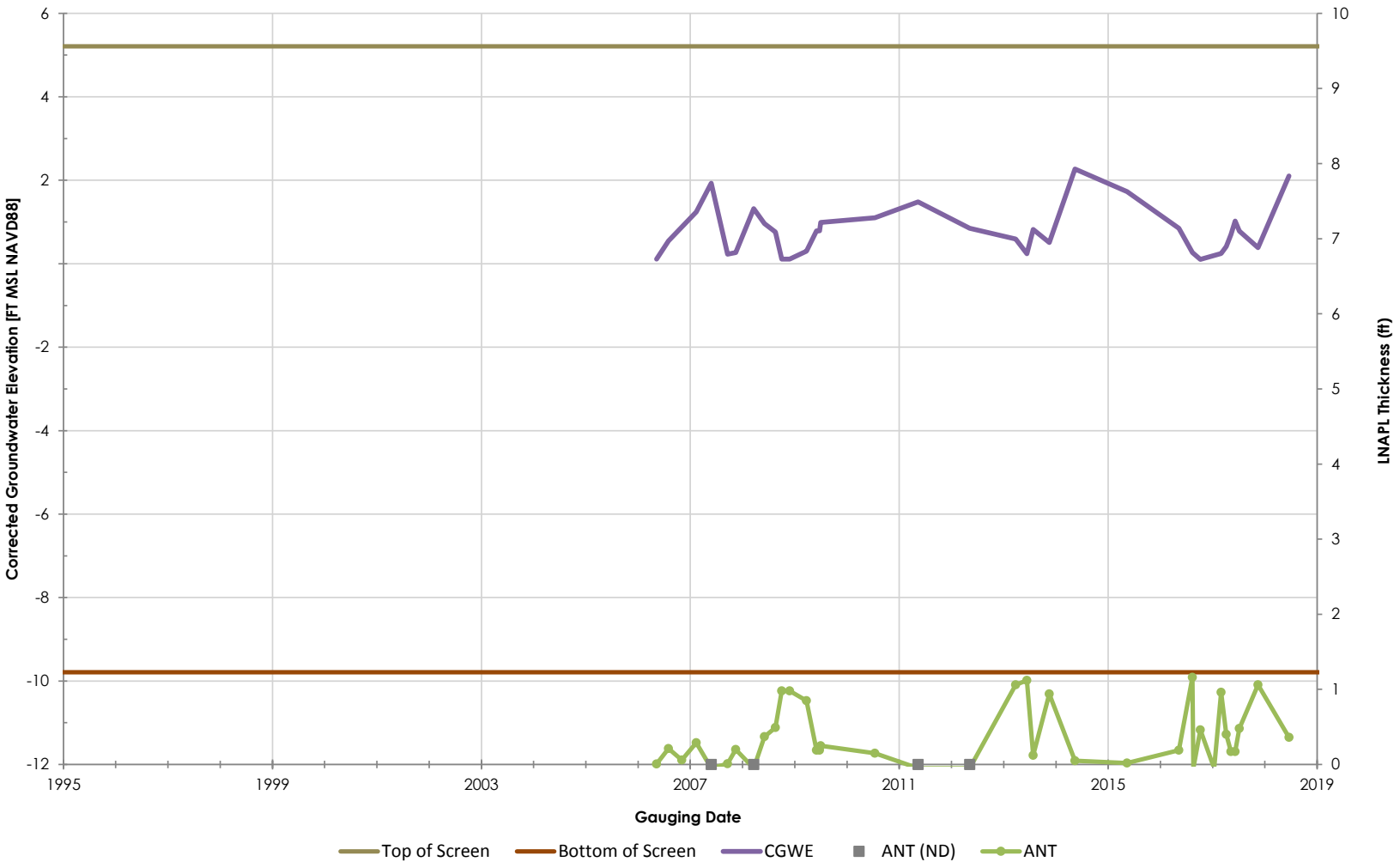
Stantec

Figure/Well No.

S-234

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

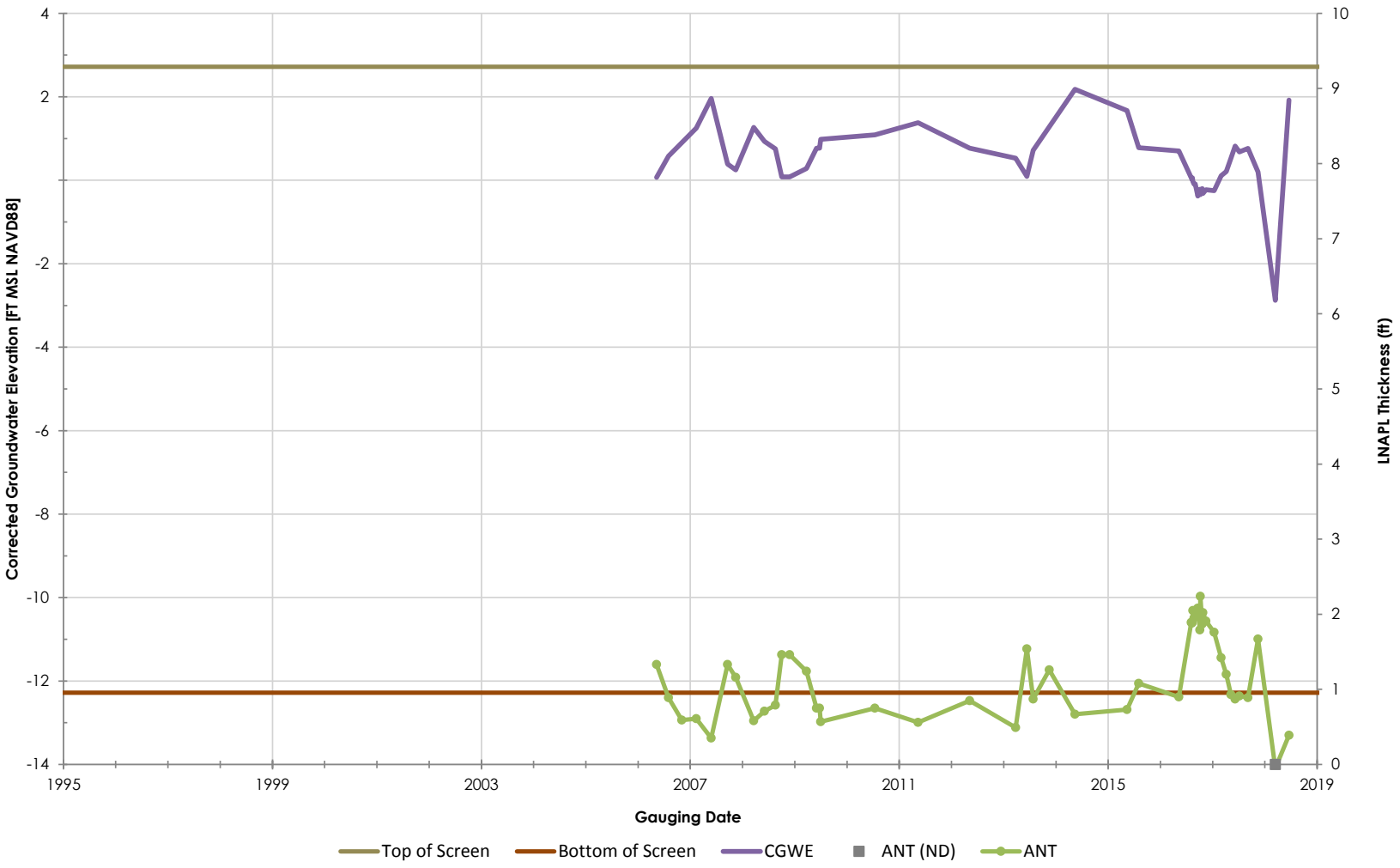
Stantec

Figure/Well No.

S-235

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

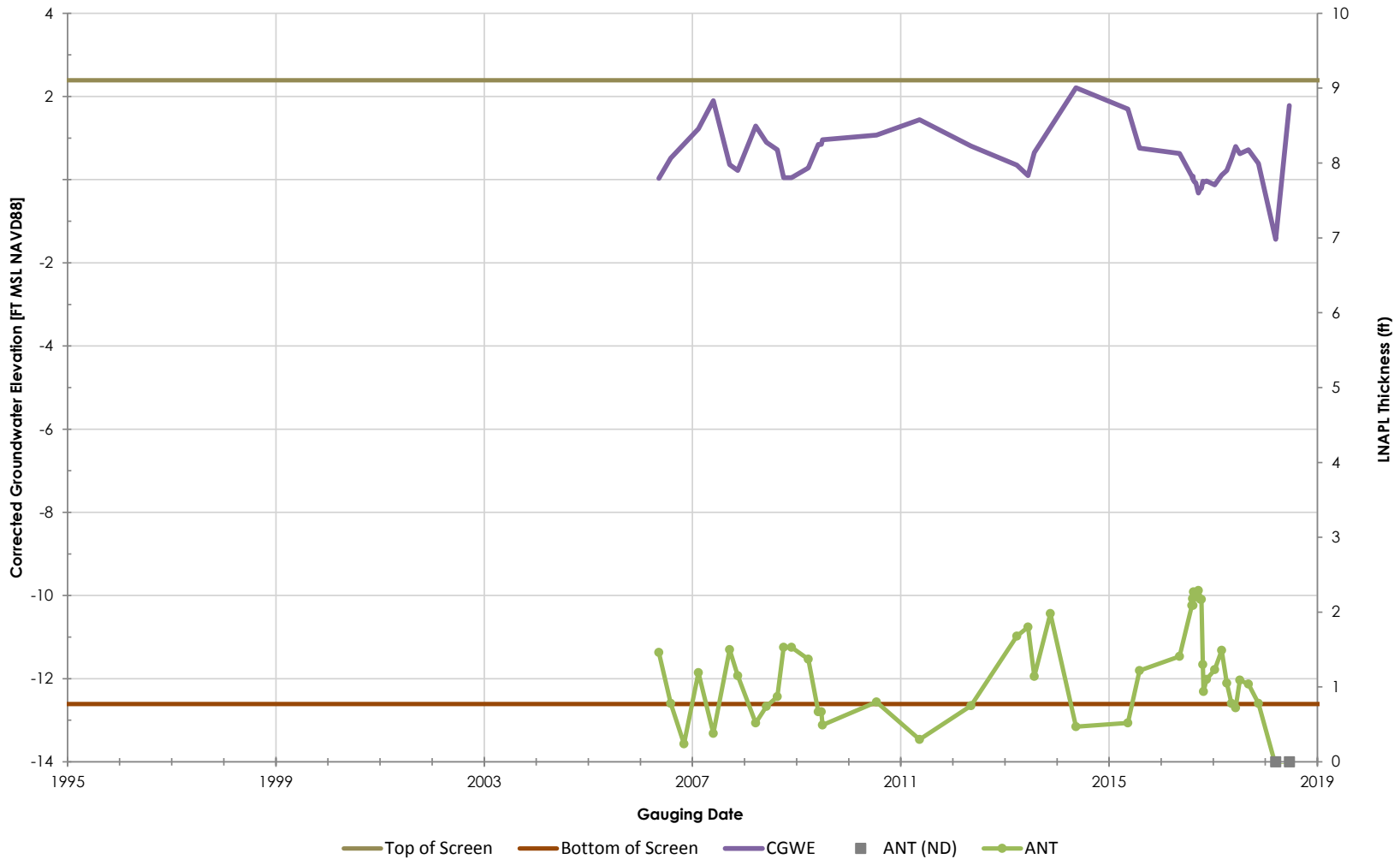
Stantec

Figure/Well No.

S-236

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

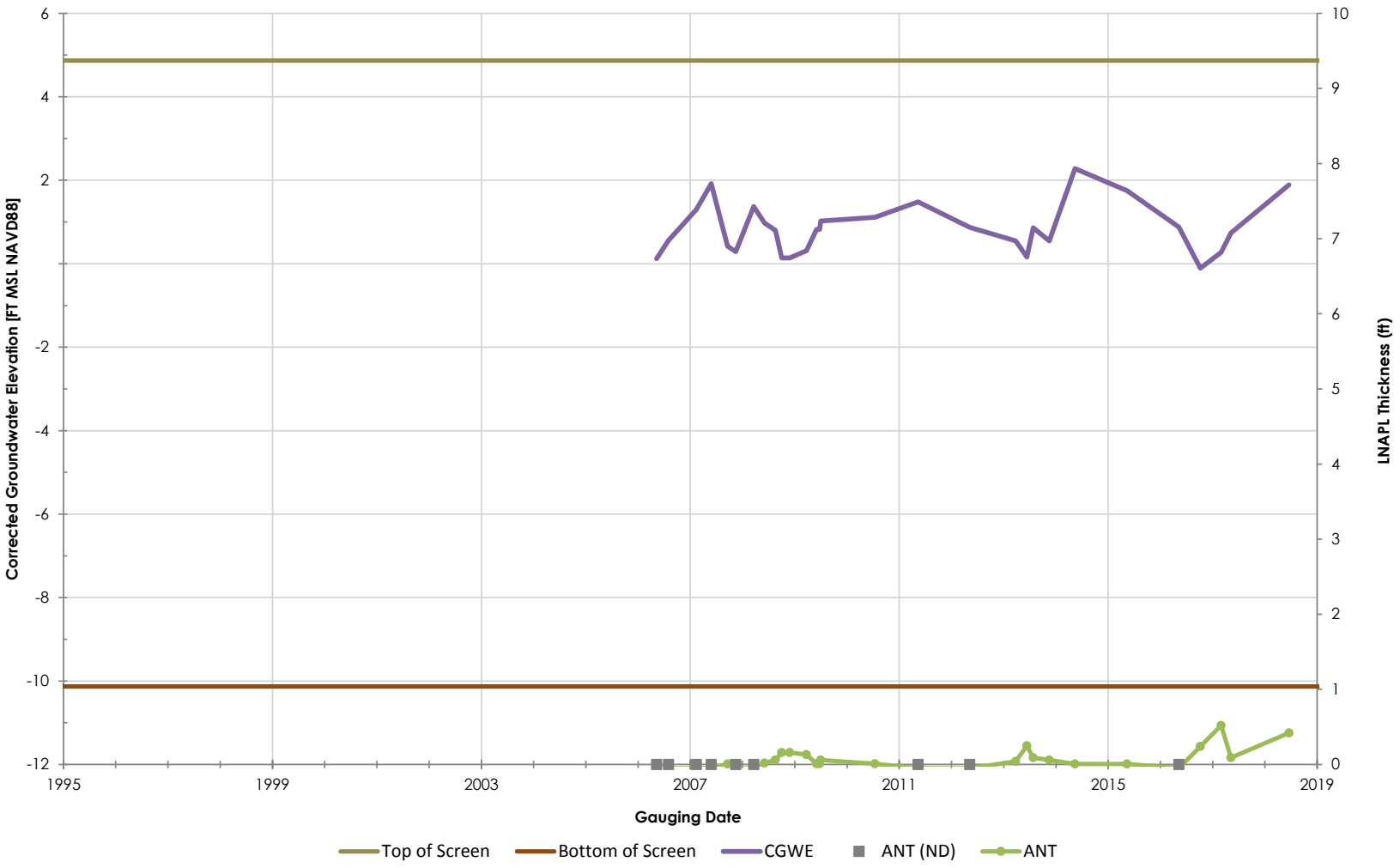
Stantec

Figure/Well No.

S-237

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

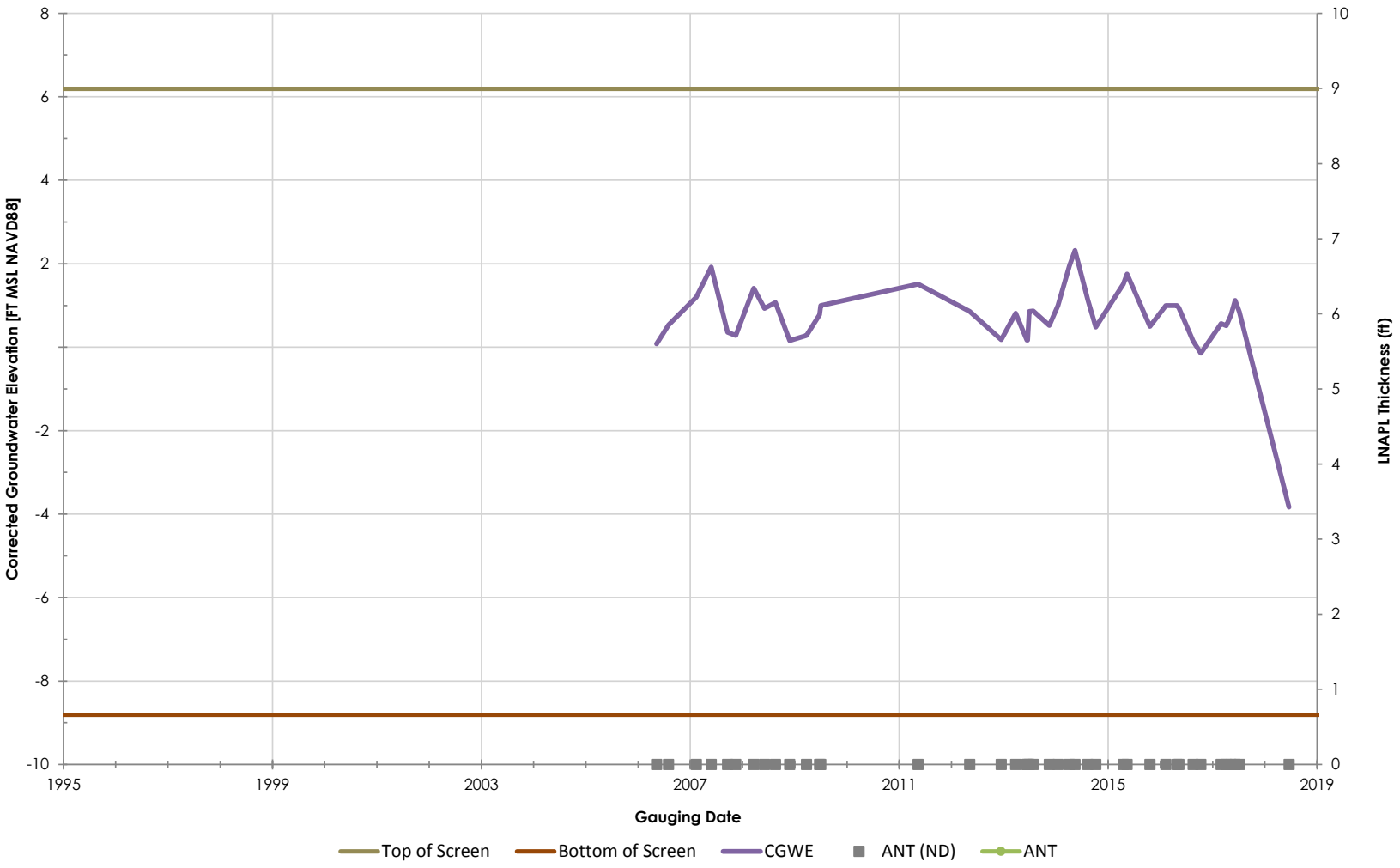
Stantec

Figure/Well No.

S-238

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

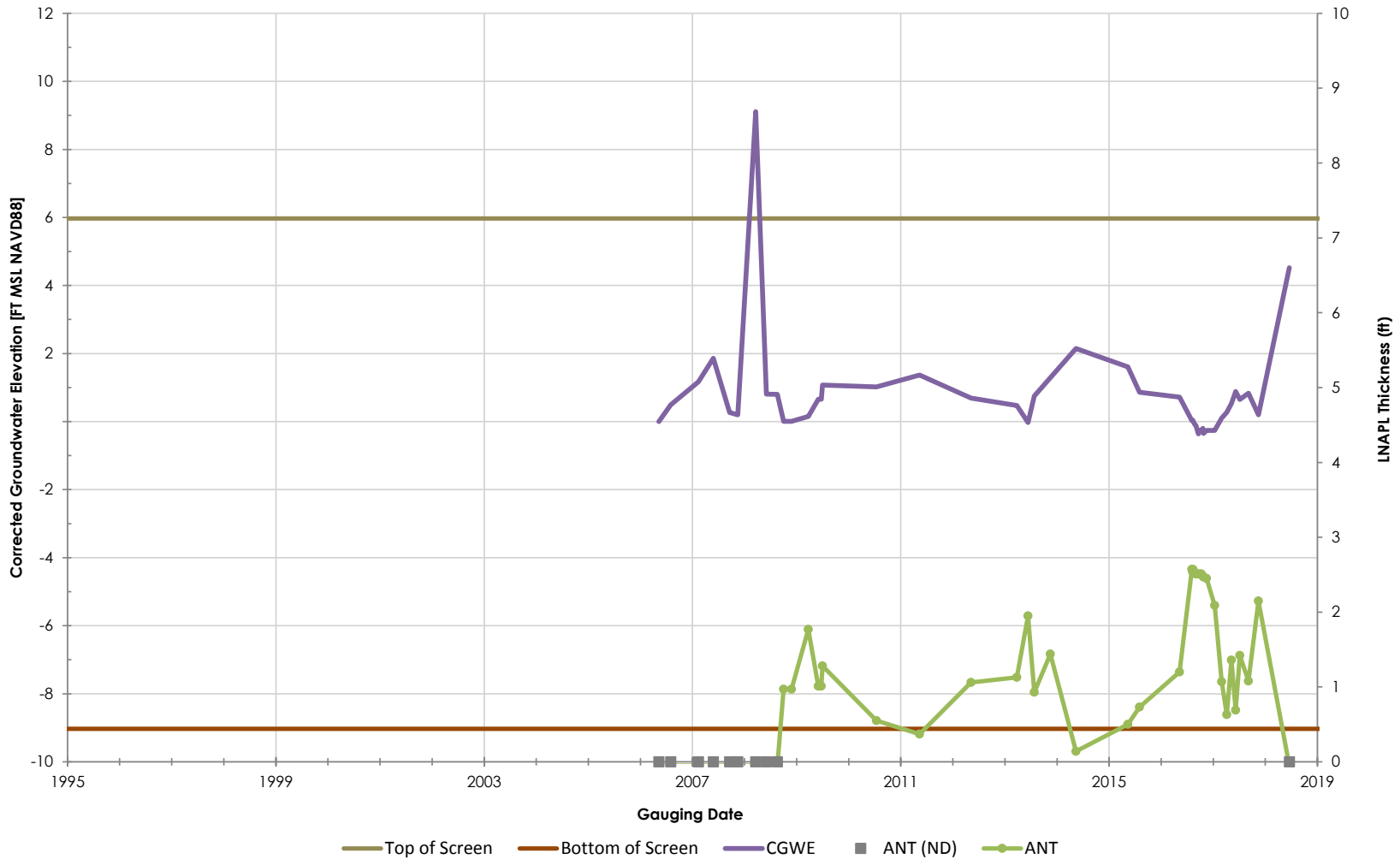
Stantec

Figure/Well No.

S-239

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

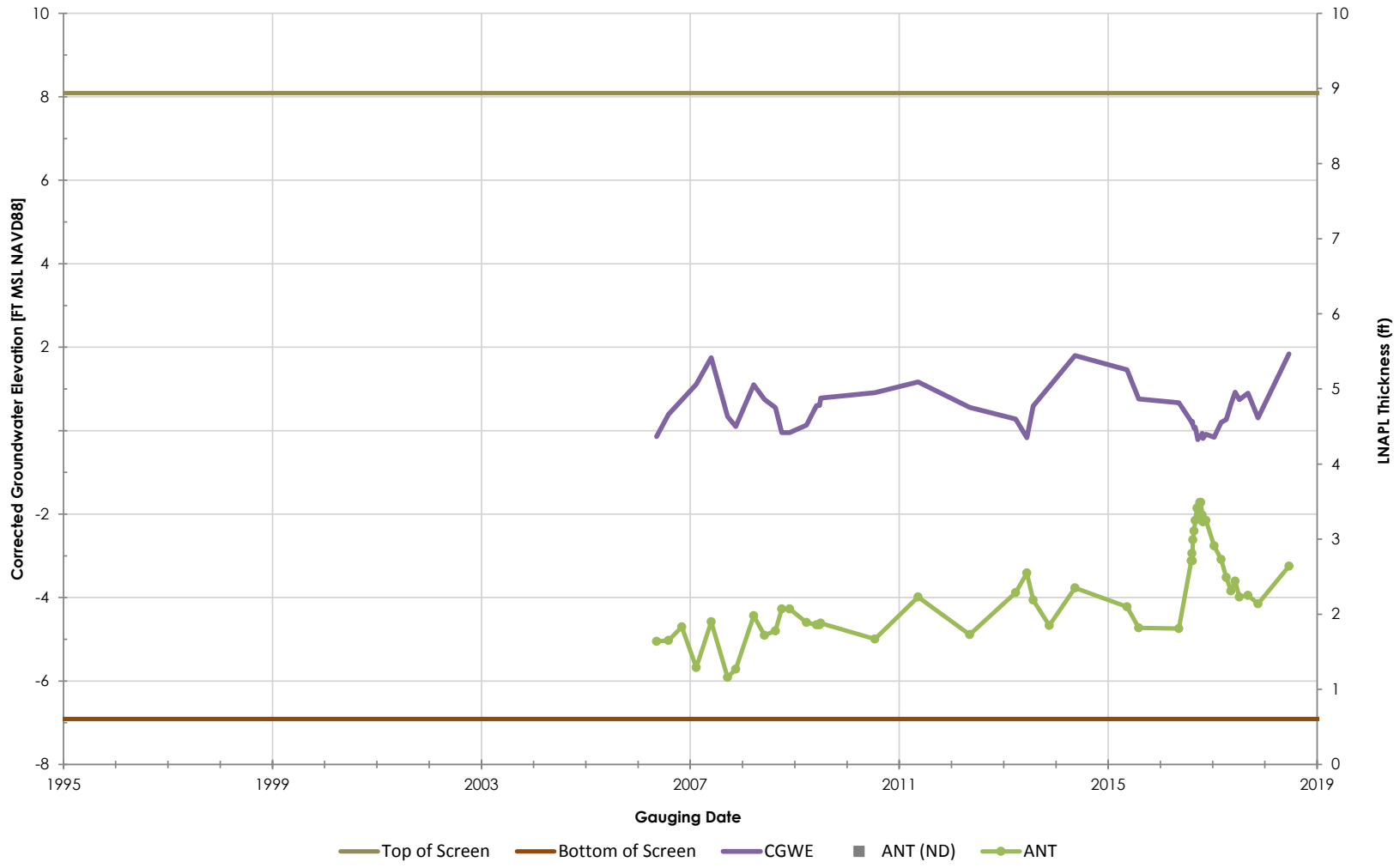
Stantec

Figure/Well No.

S-240

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

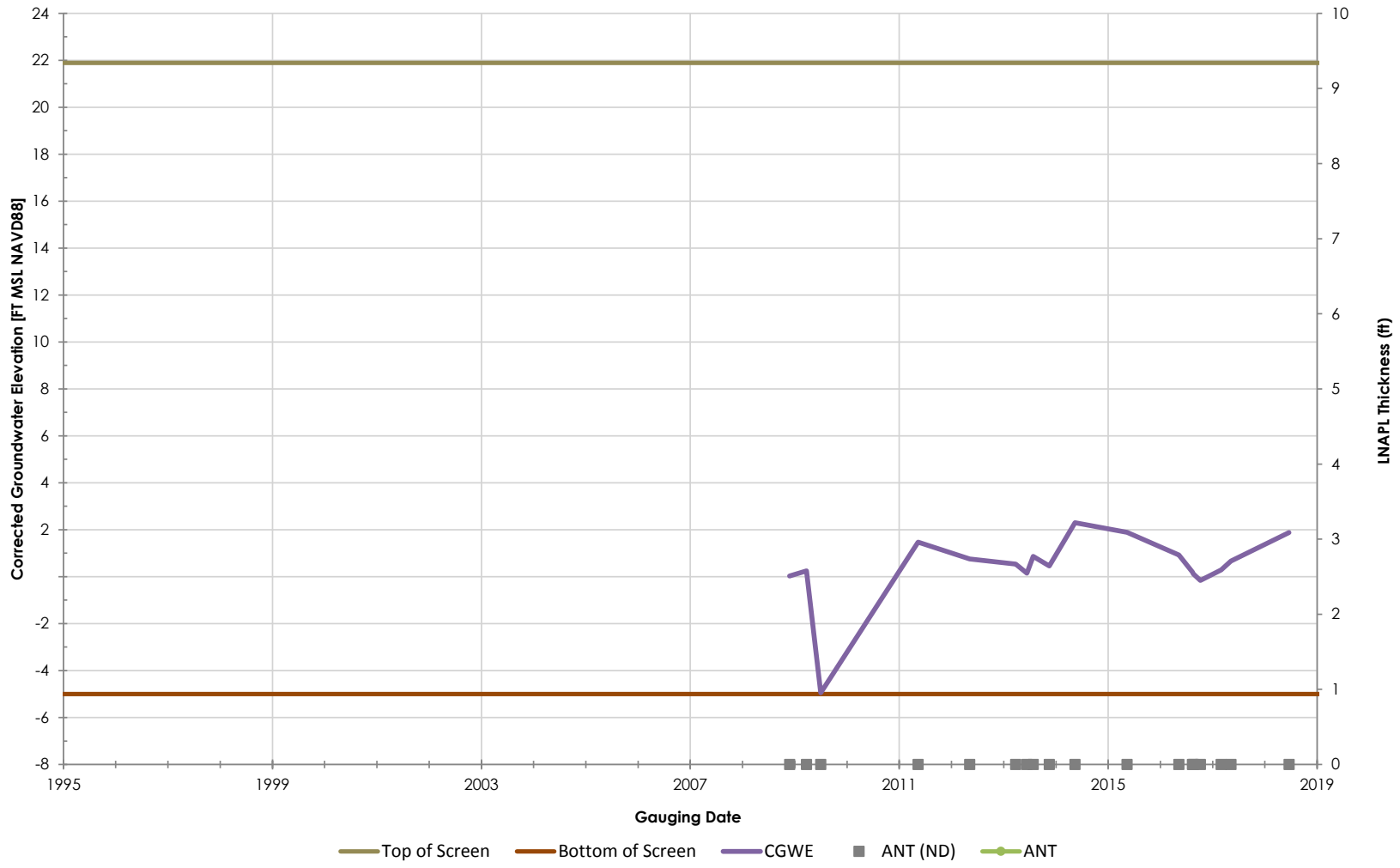
Stantec

Figure/Well No.

S-241

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

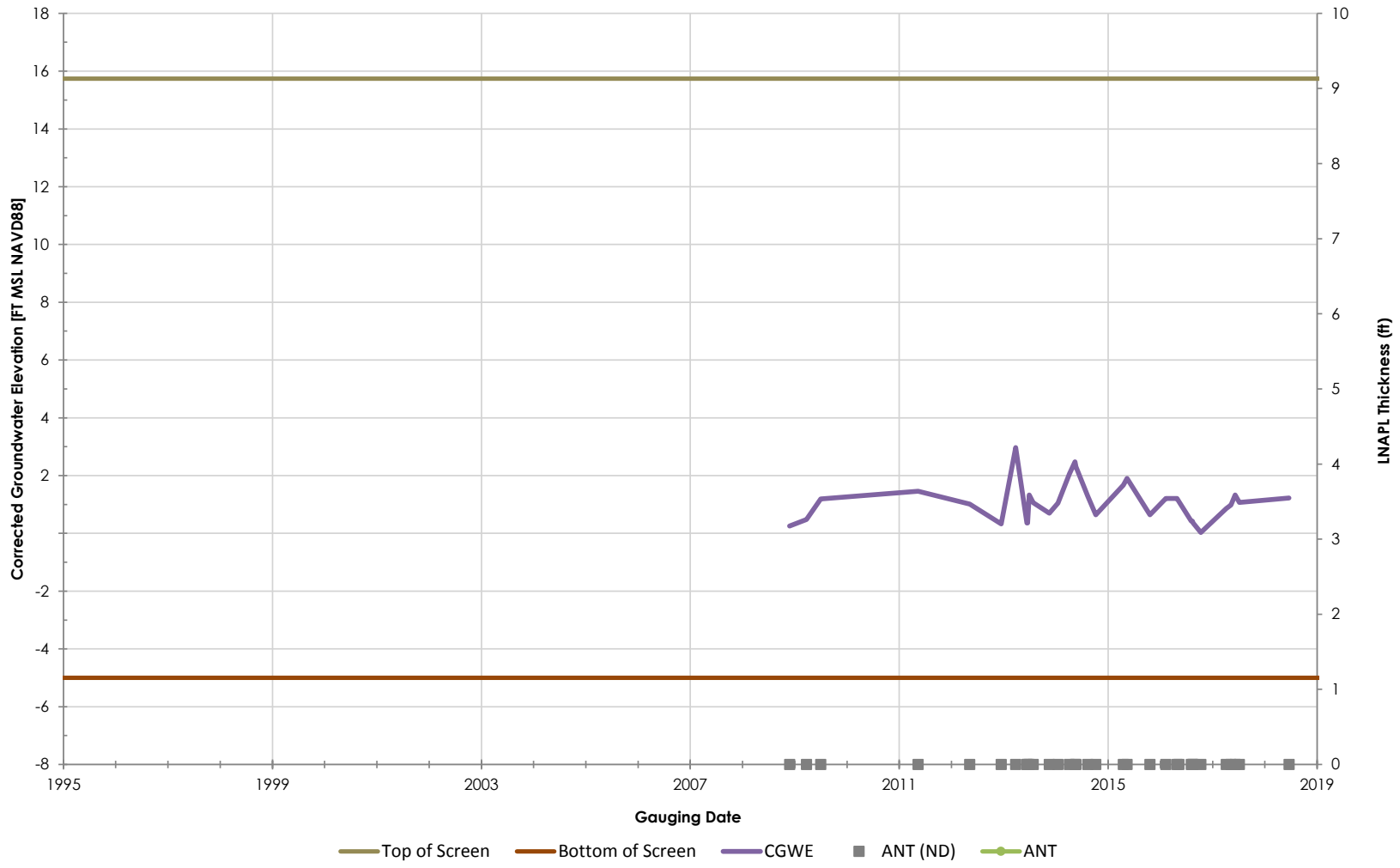
Stantec

Figure/Well No.

S-242

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

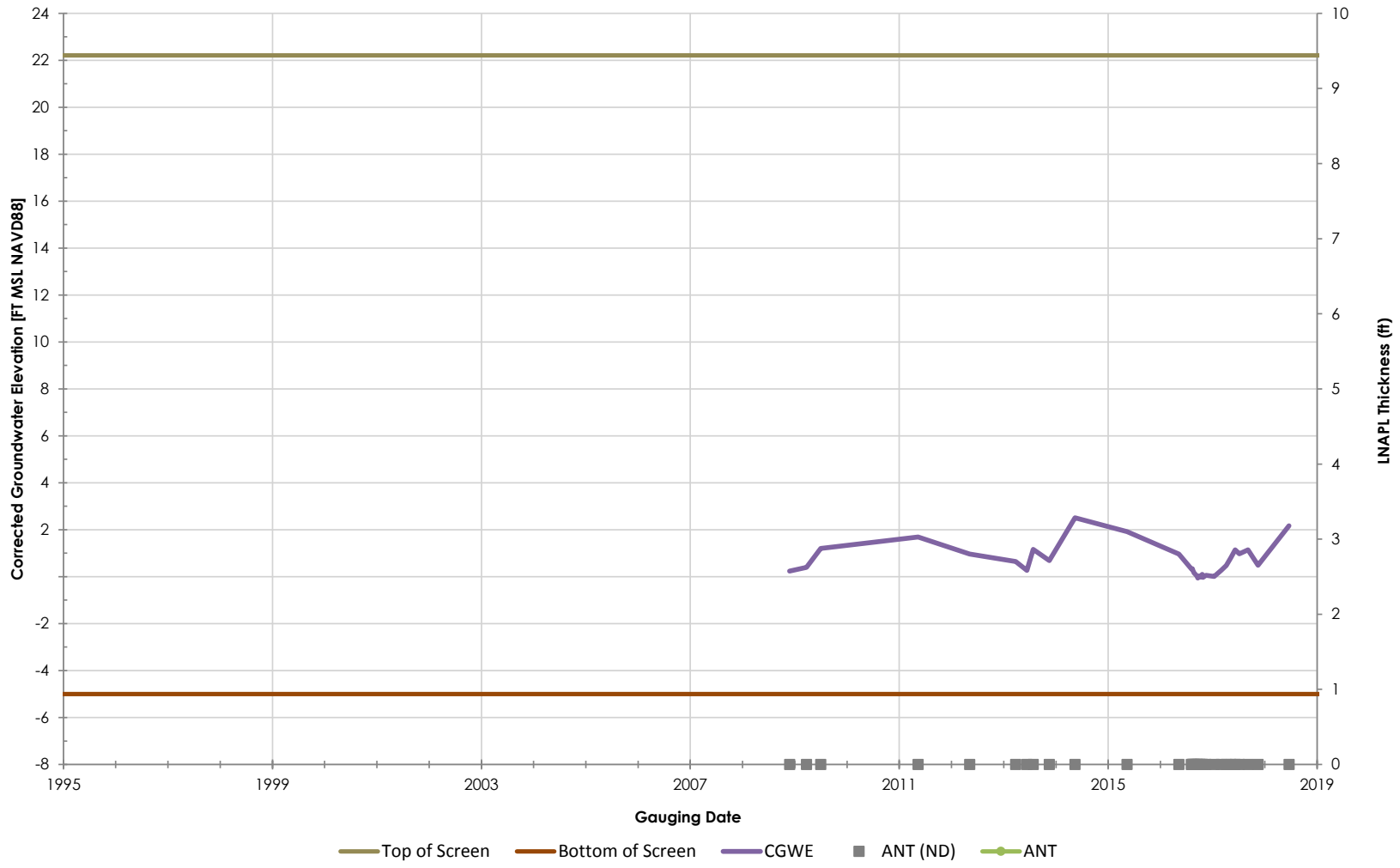
Stantec

Figure/Well No.

S-243

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

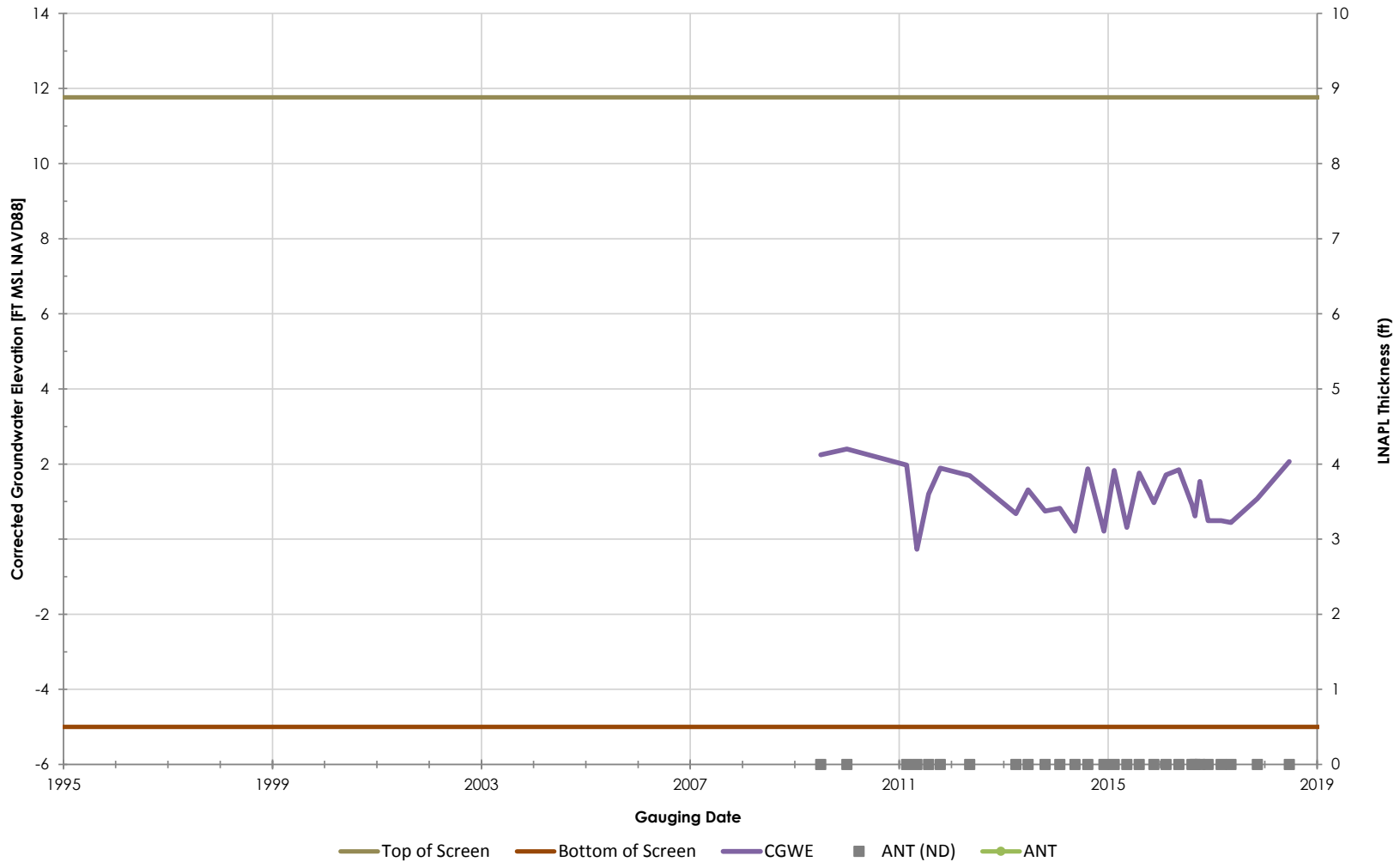
Stantec

Figure/Well No.

S-245

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

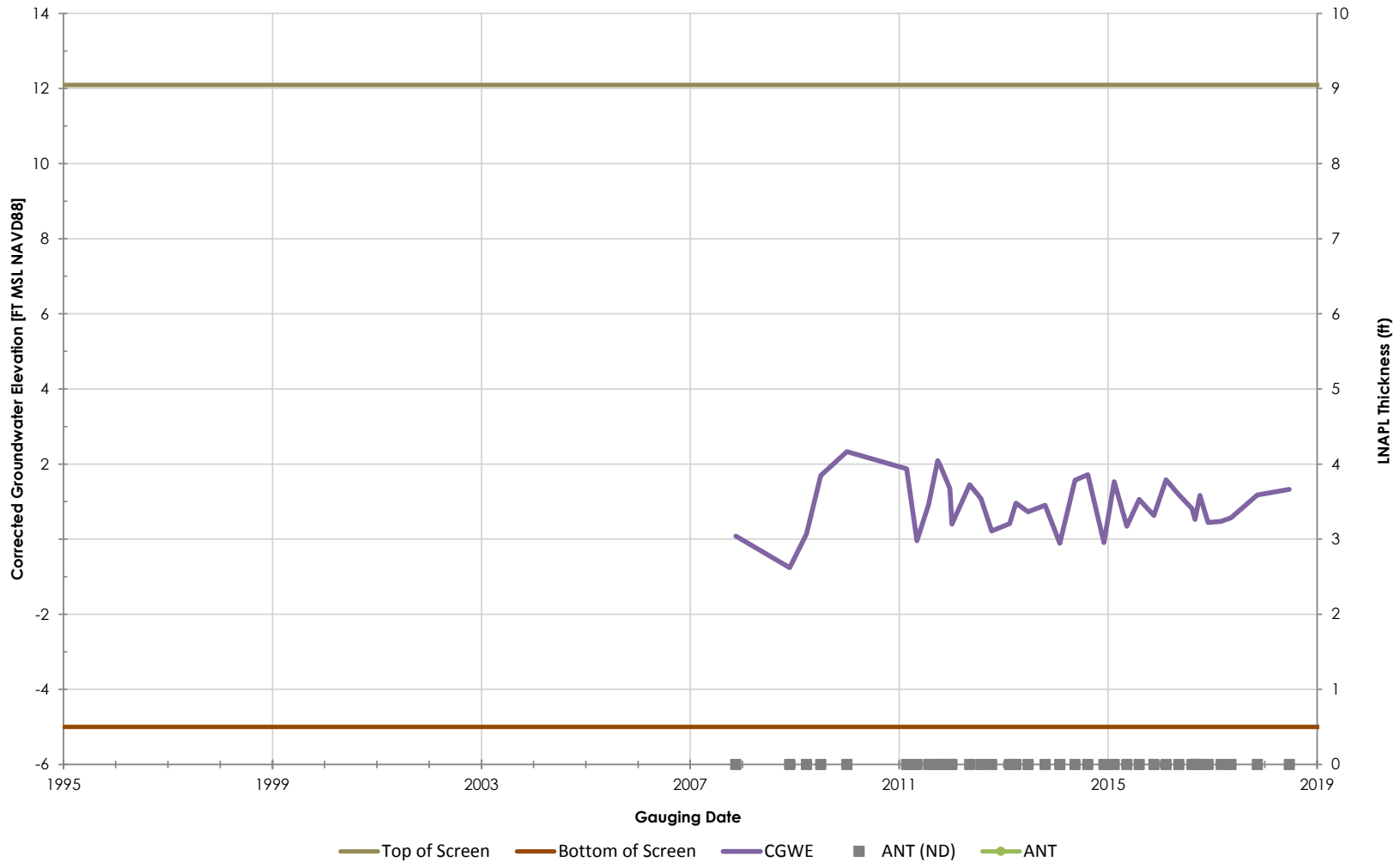
Stantec

Figure/Well No.

S-246A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

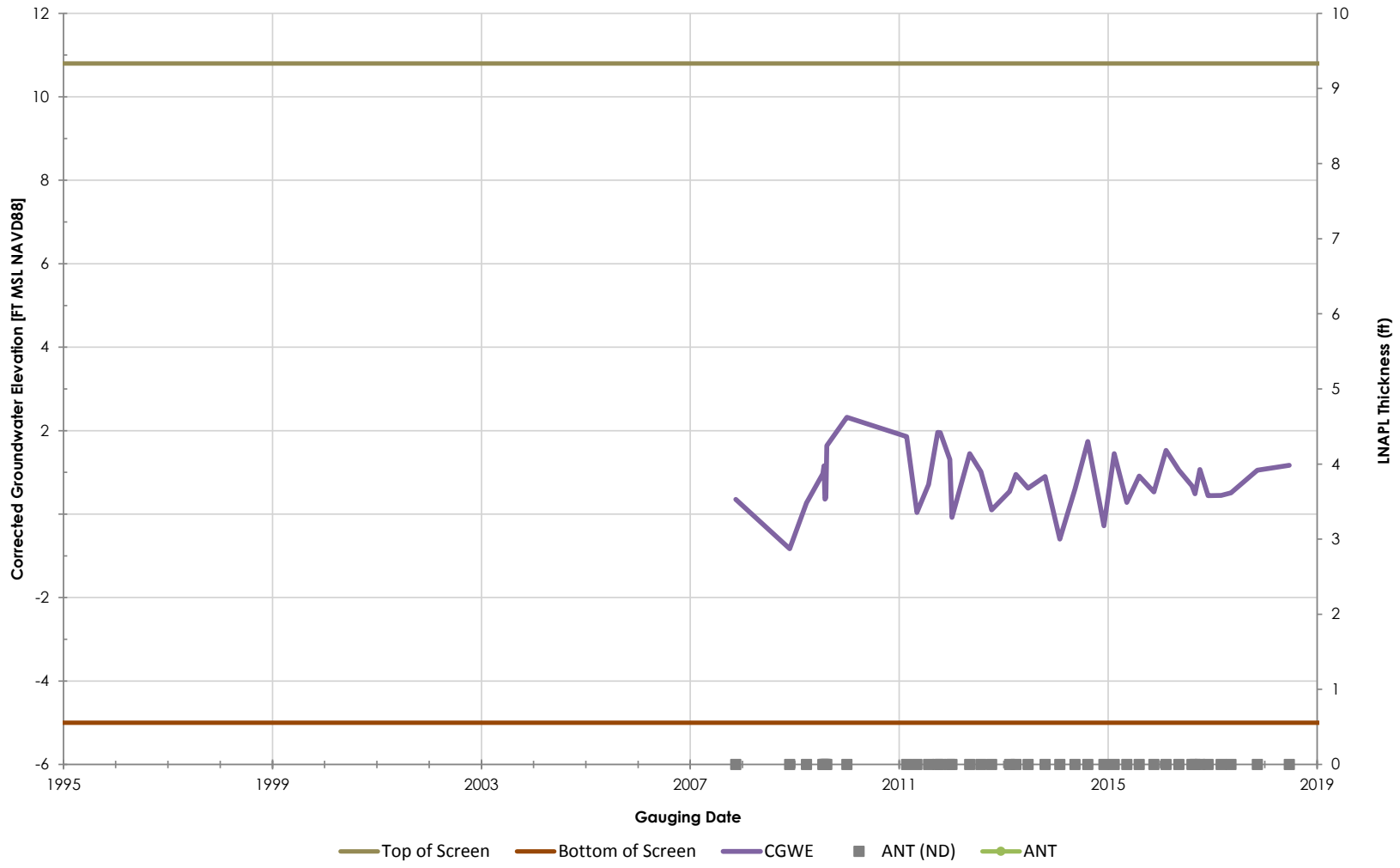
Stantec

Figure/Well No.

S-247

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

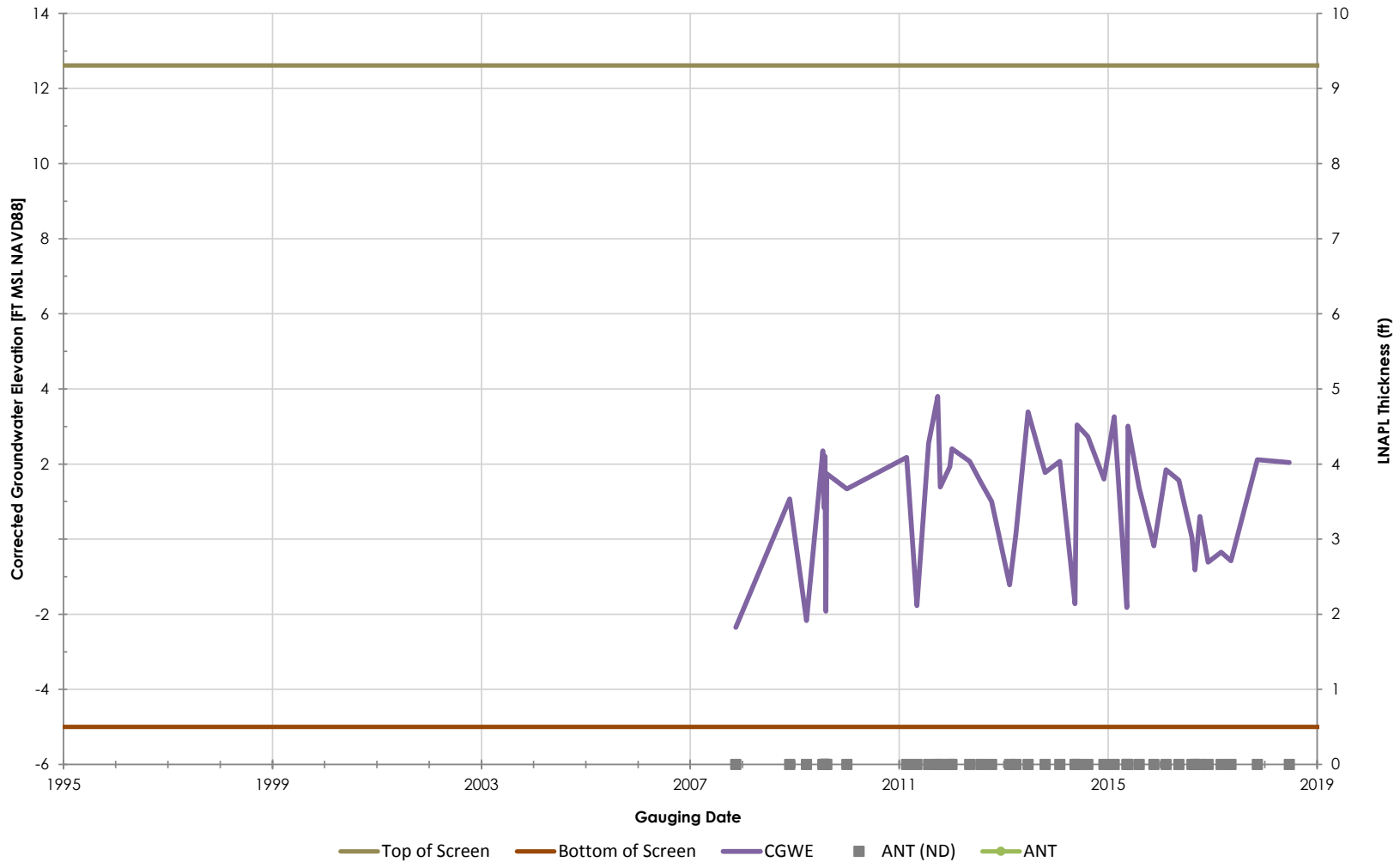
Stantec

Figure/Well No.

S-248

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

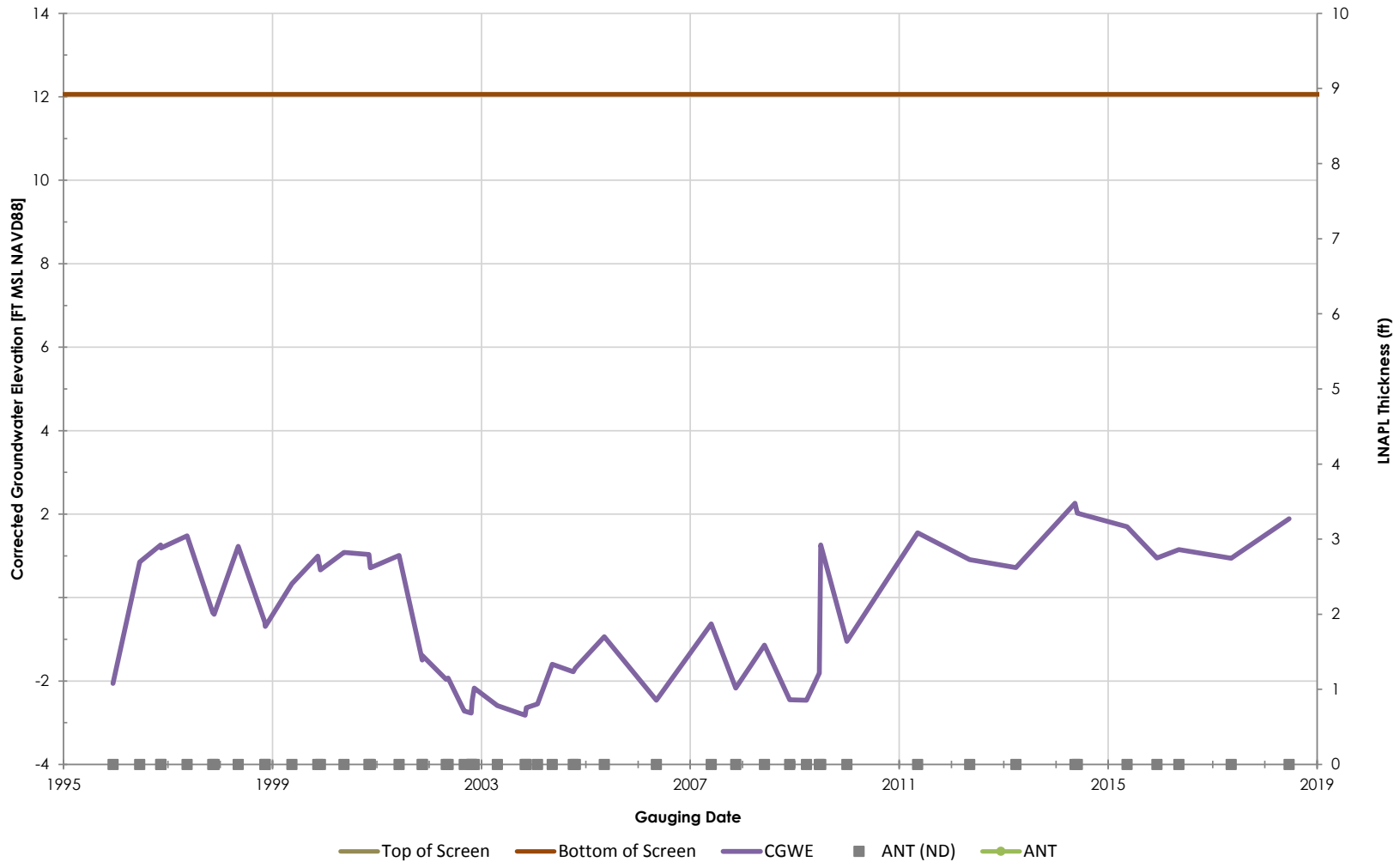
Stantec

Figure/Well No.

S-249

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

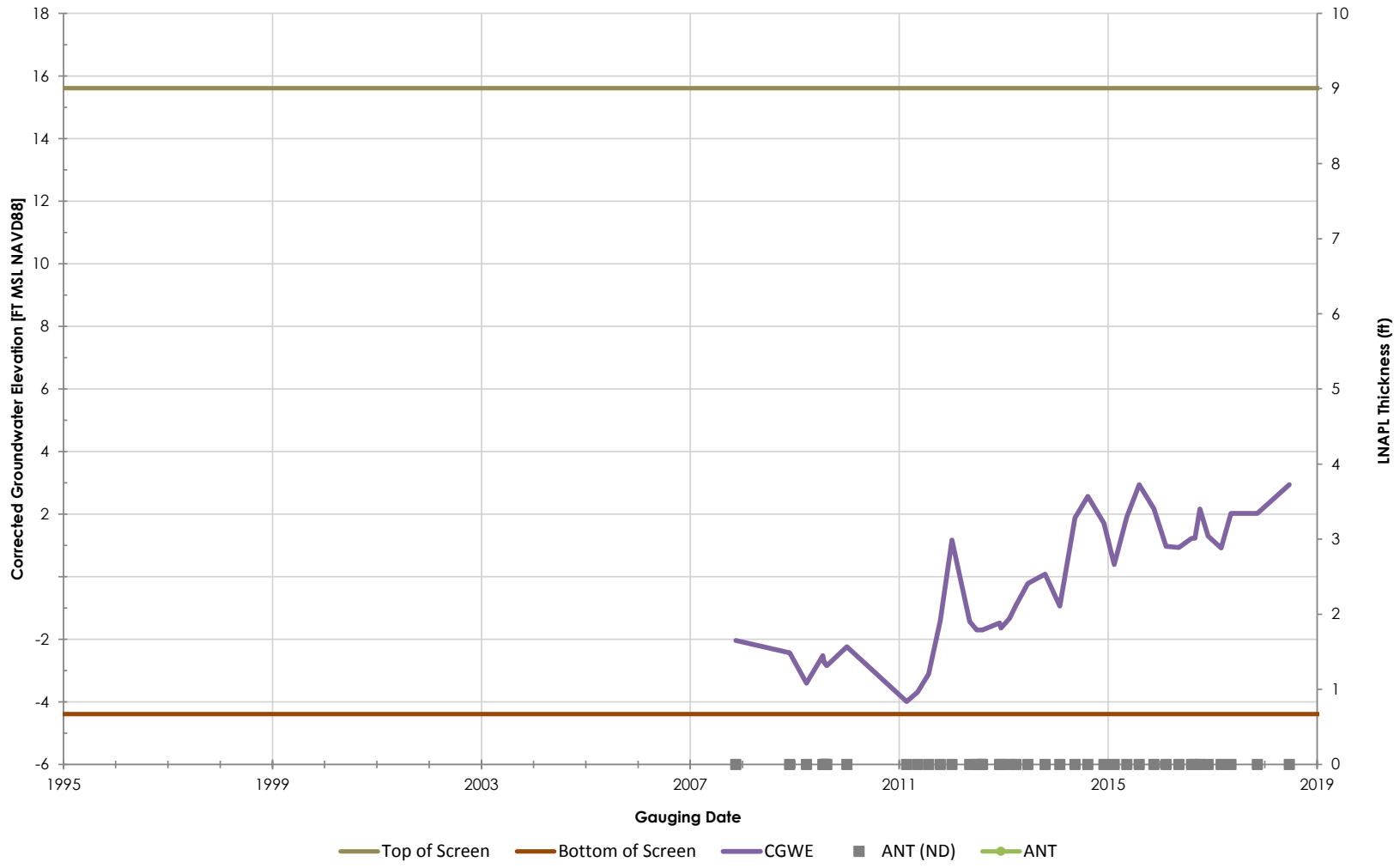
Stantec

Figure/Well No.

S-25

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

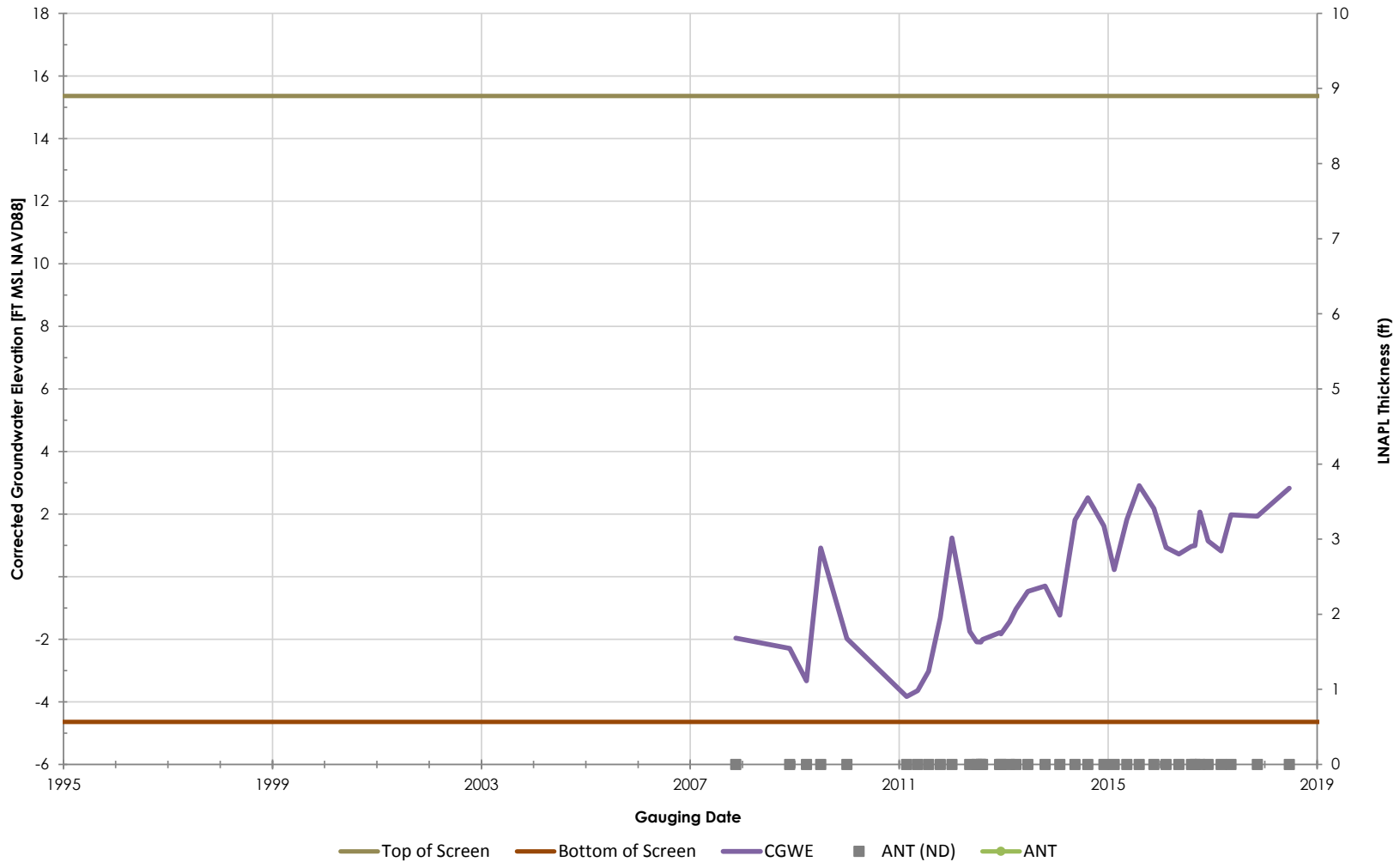
Stantec

Figure/Well No.

S-251

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

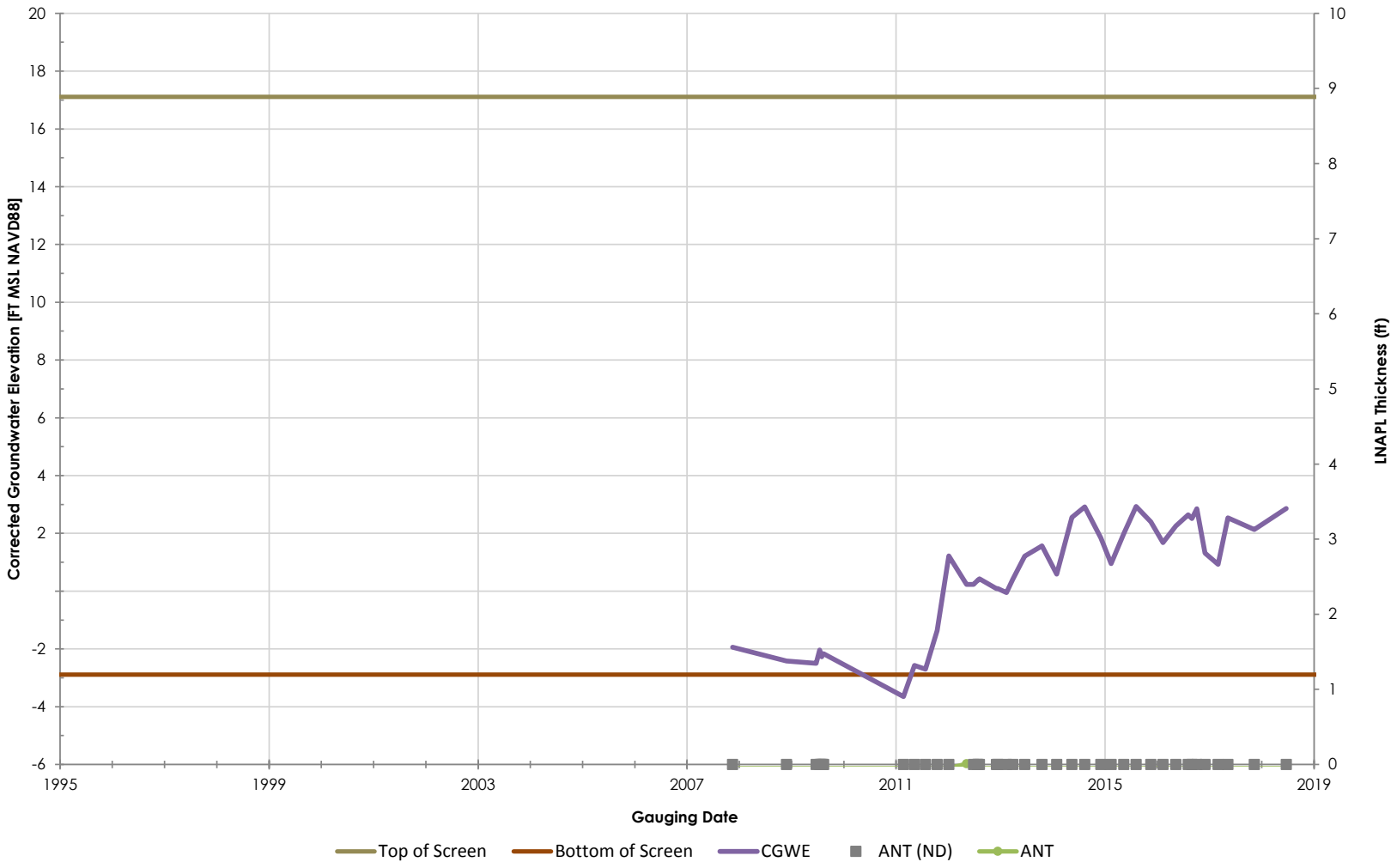
Stantec

Figure/Well No.

S-252

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

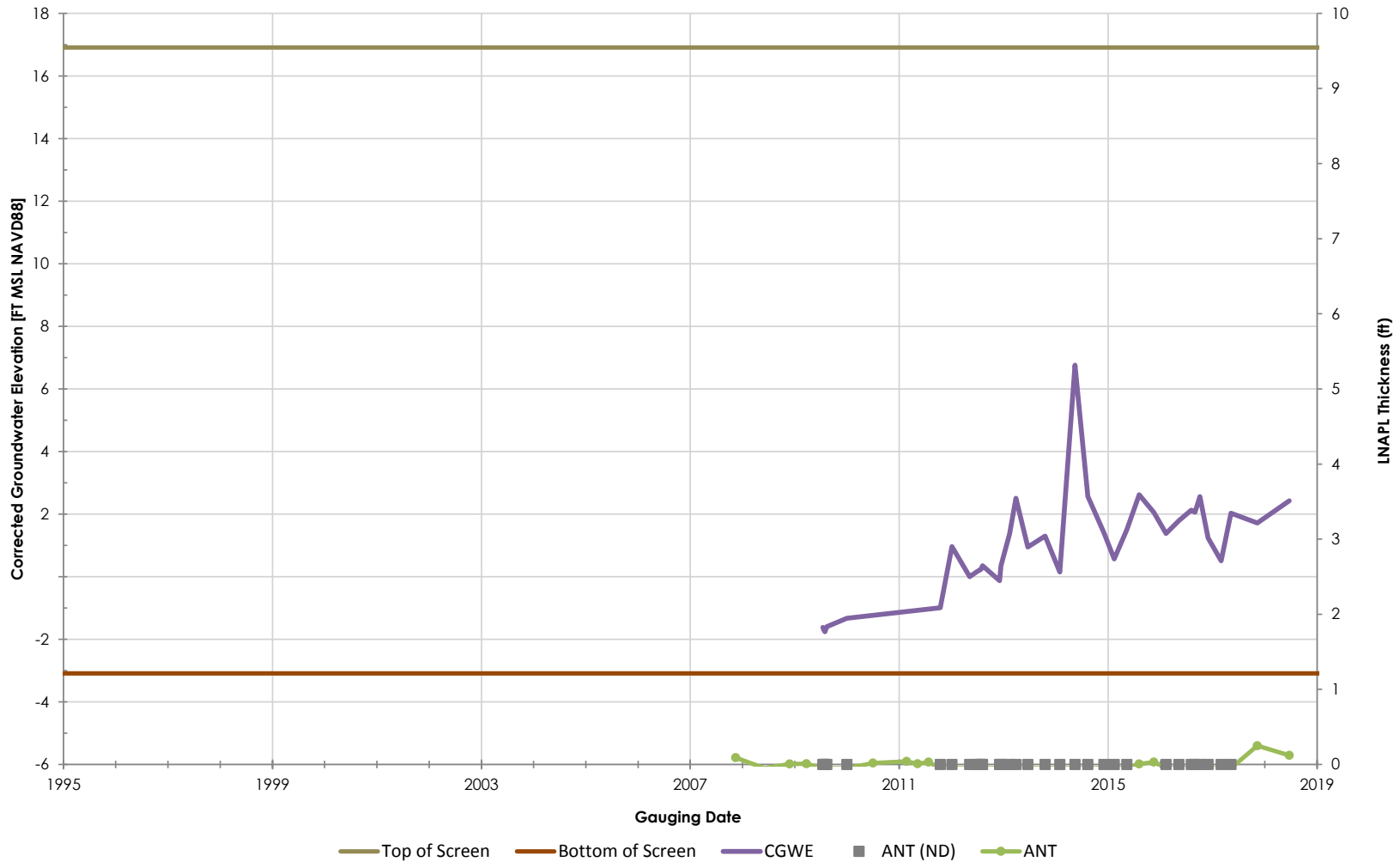
Stantec

Figure/Well No.

S-253

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

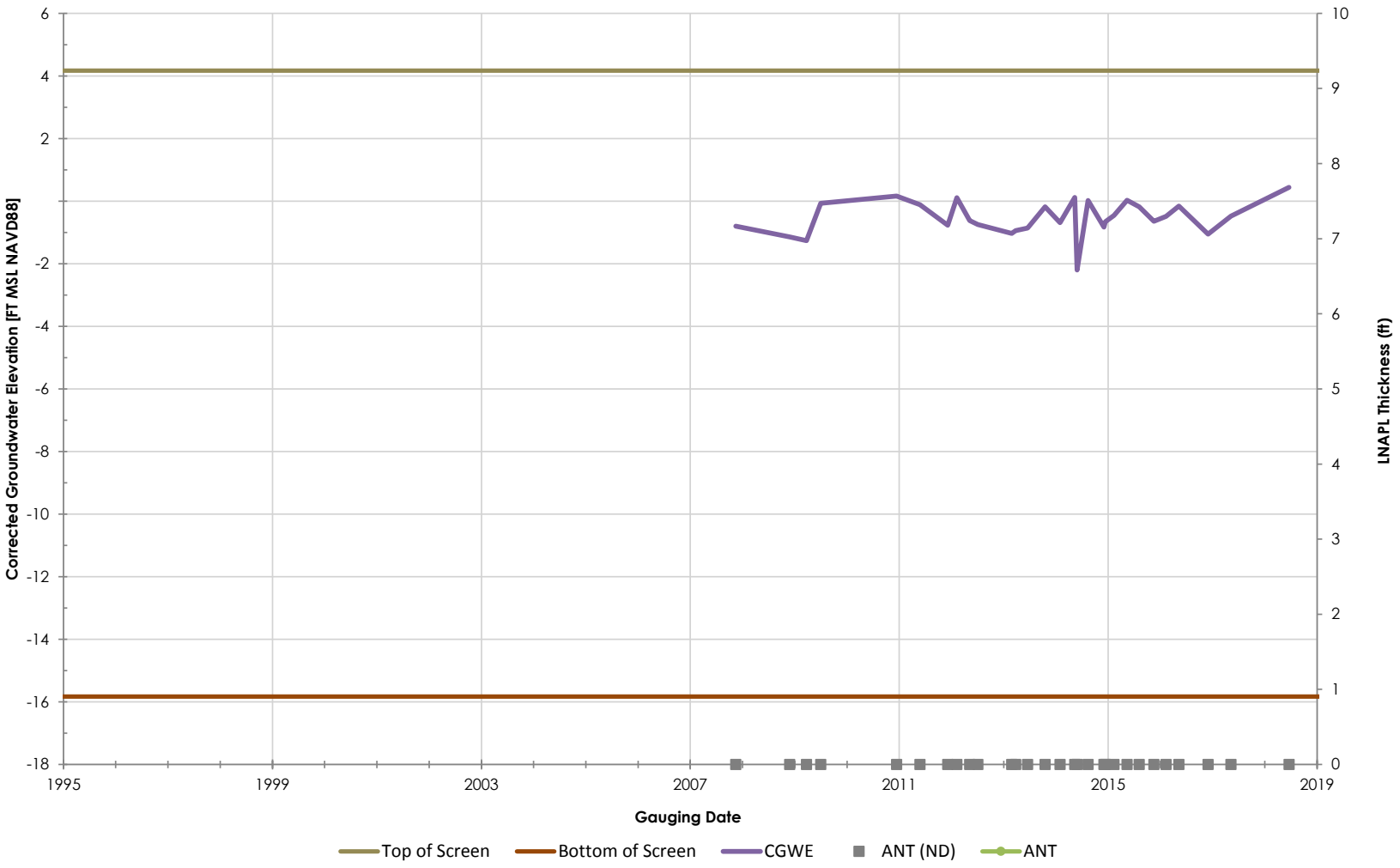
Stantec

Figure/Well No.

S-254

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

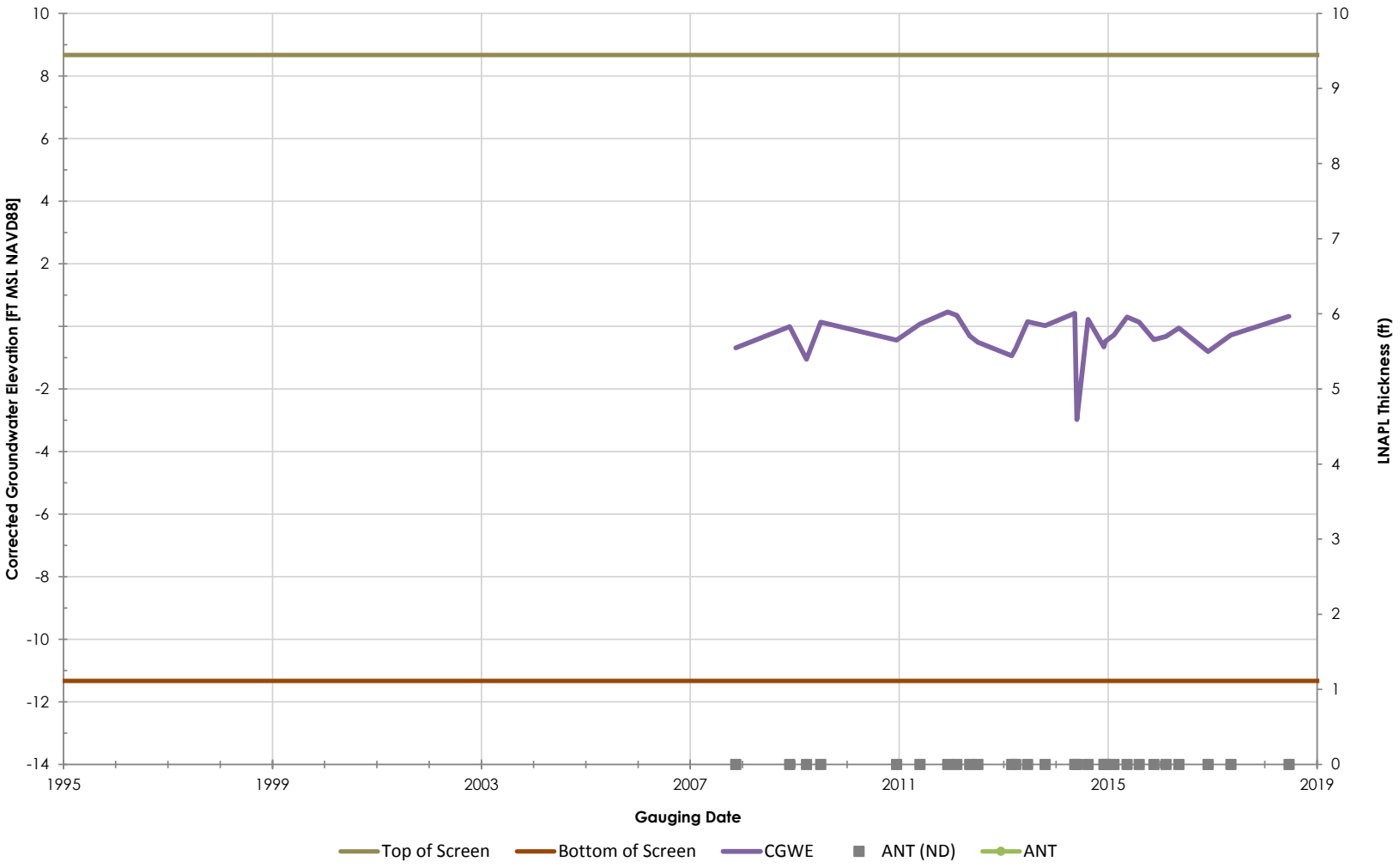
Stantec

Figure/Well No.

S-256

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

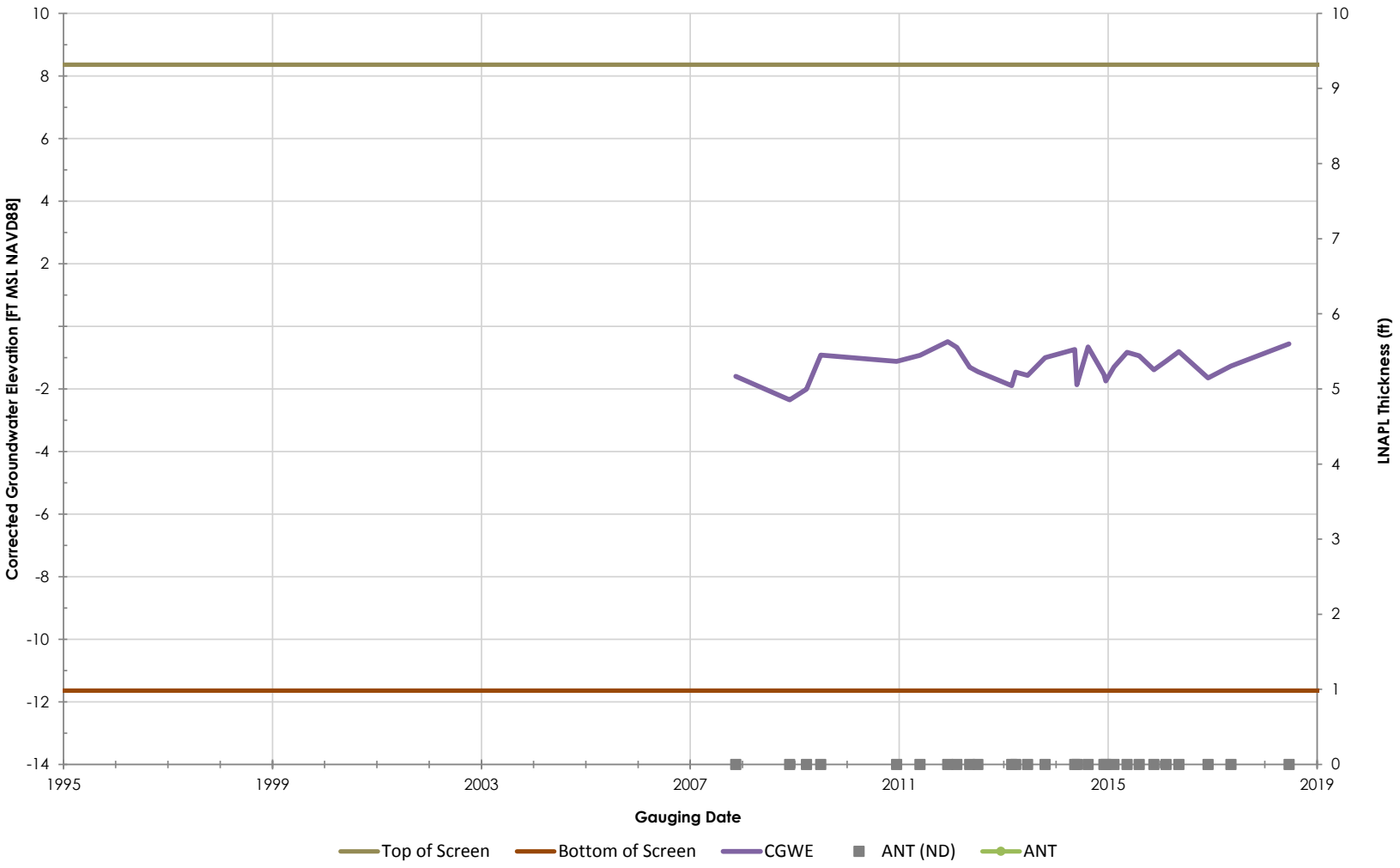
Stantec

Figure/Well No.

S-257

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

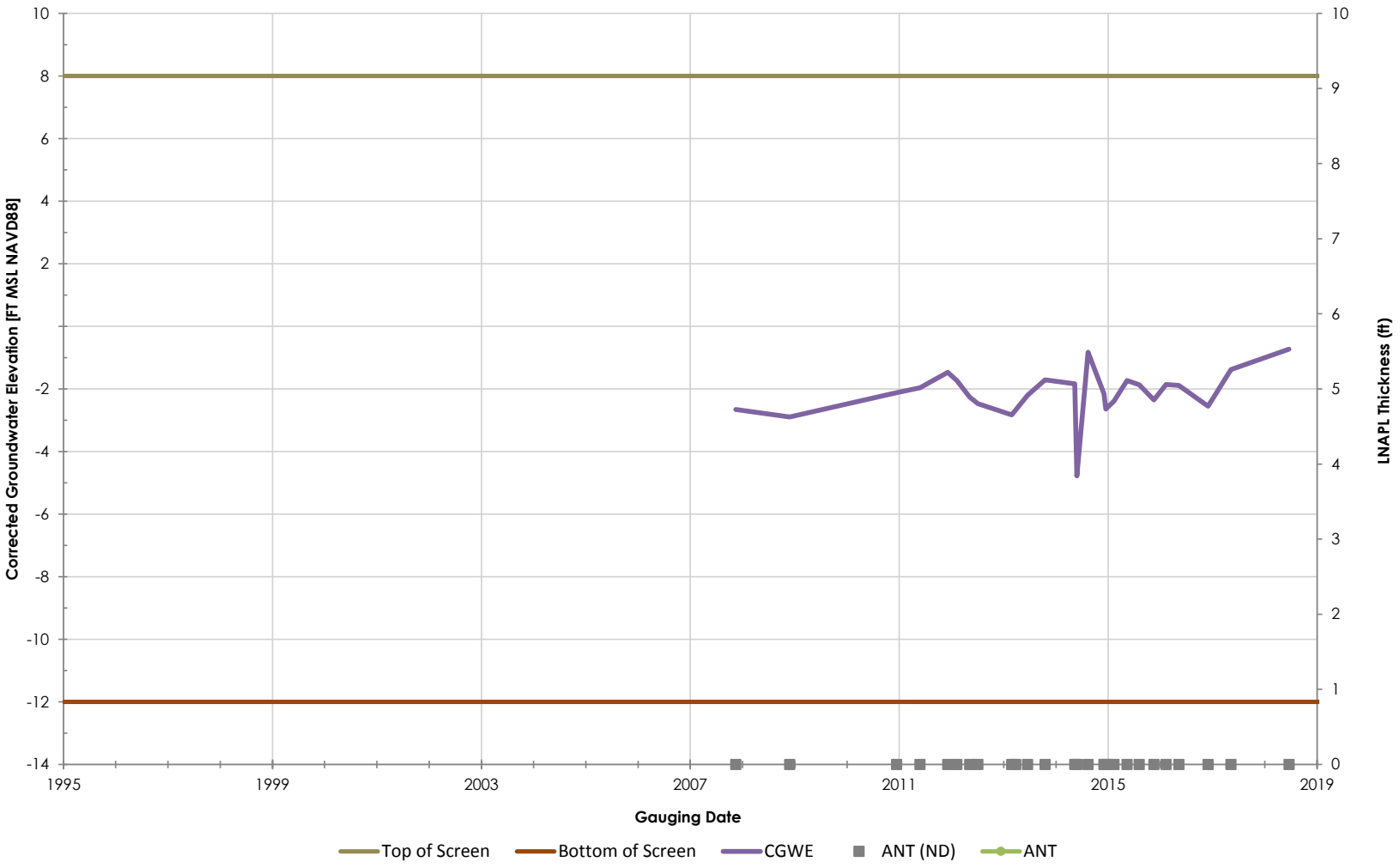
Stantec

Figure/Well No.

S-258

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

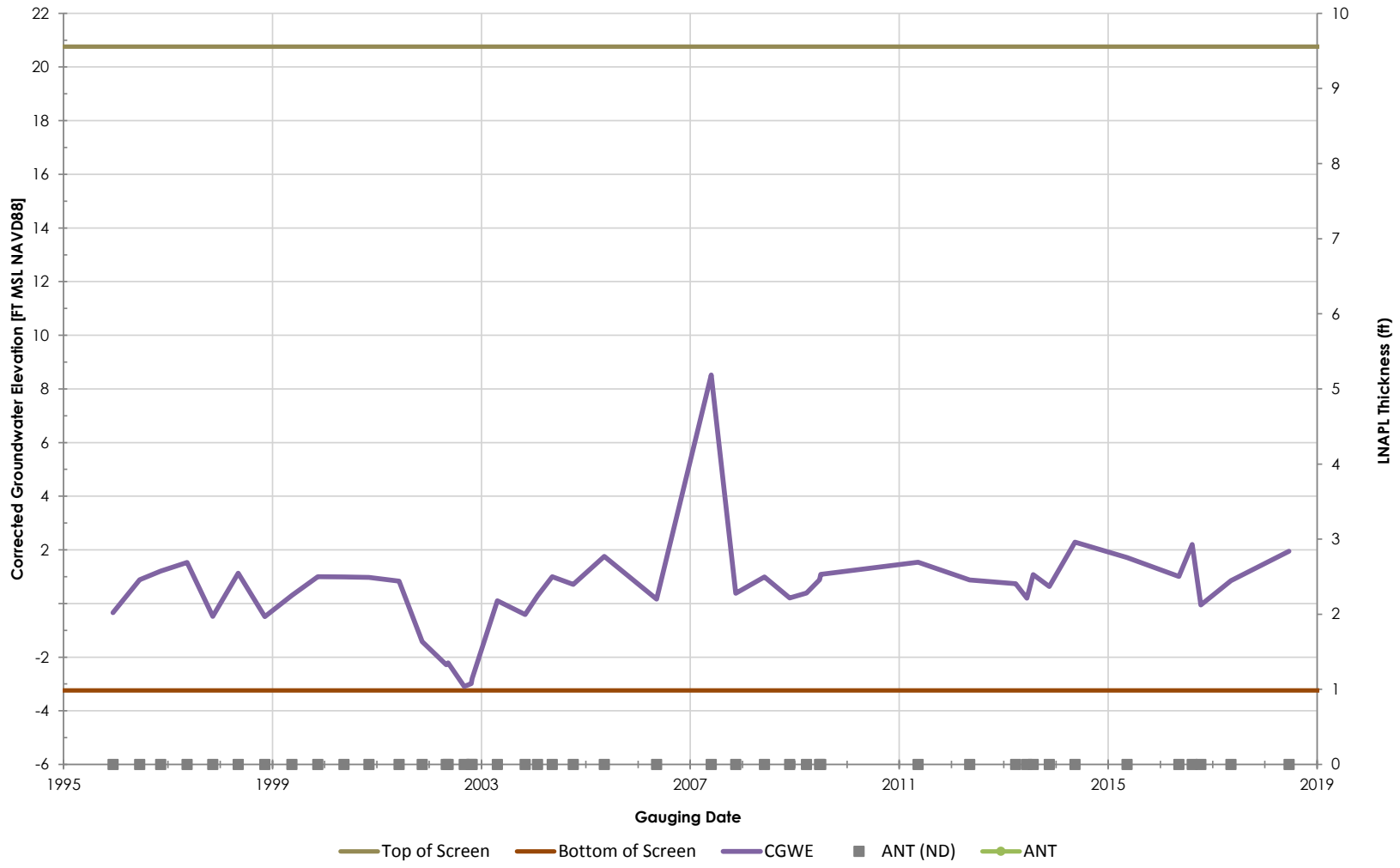
Stantec

Figure/Well No.

S-259

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

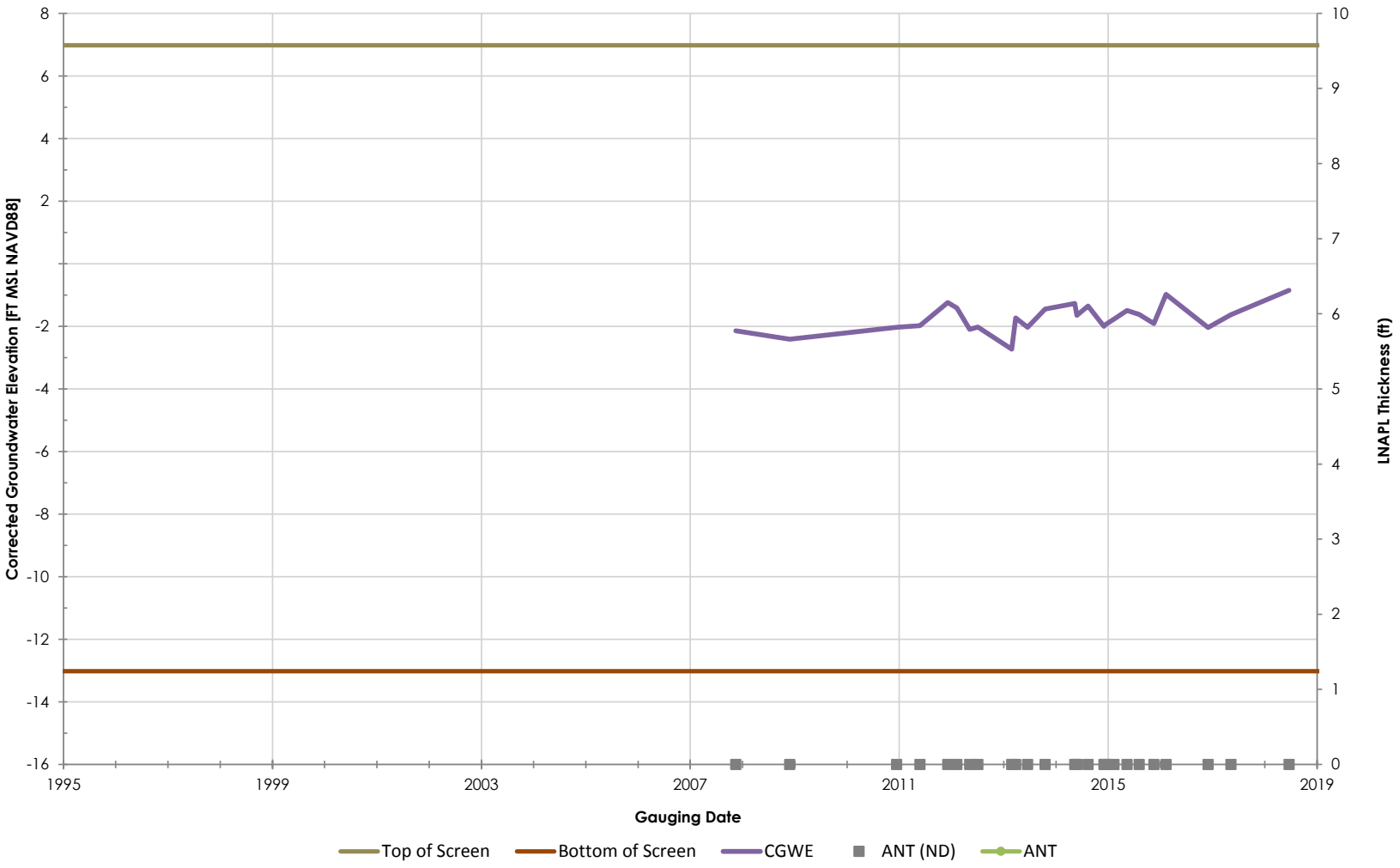
Stantec

Figure/Well No.

S-26

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

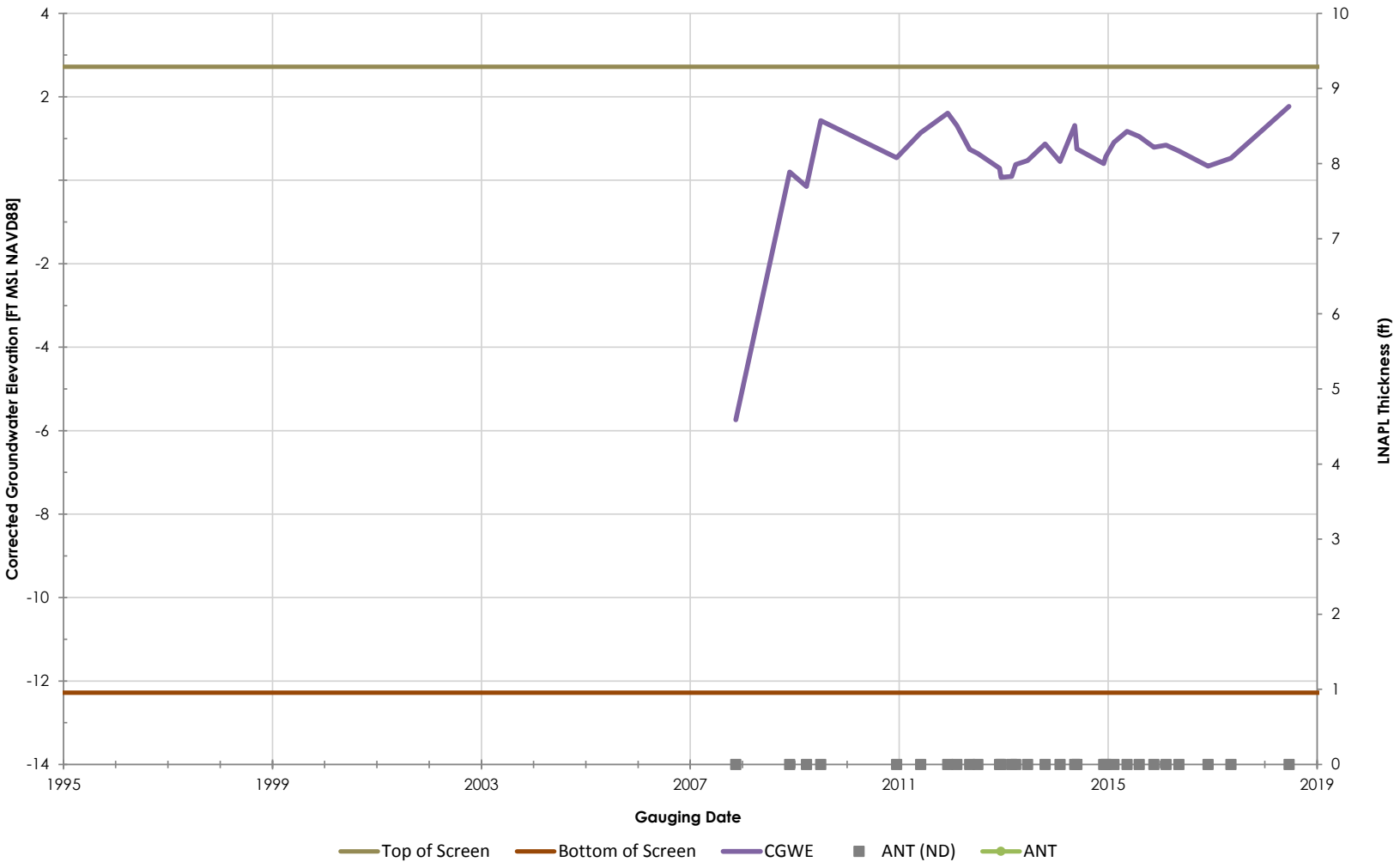
Stantec

Figure/Well No.

S-260

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

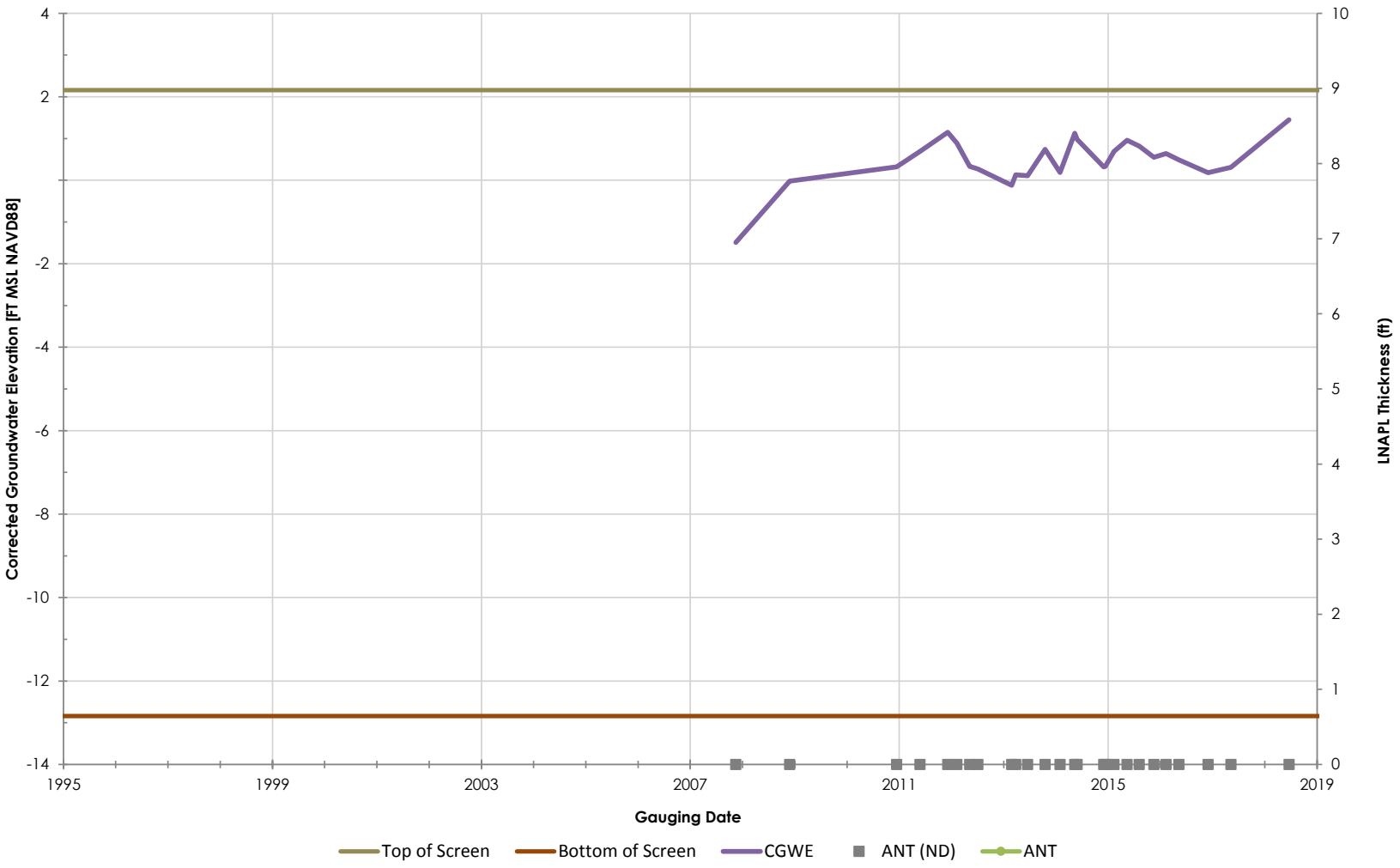
Stantec

Figure/Well No.

S-262

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

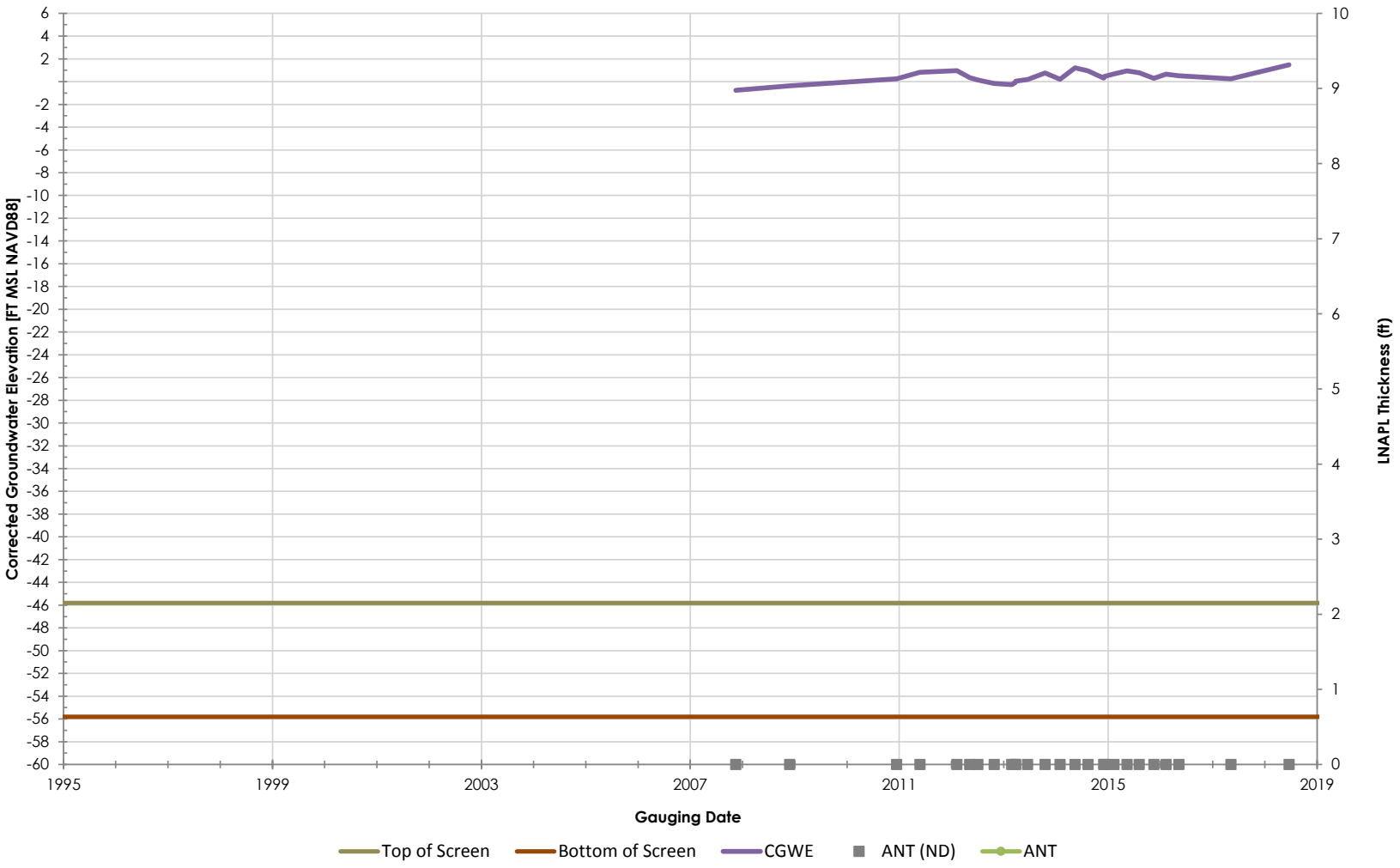
Stantec

Figure/Well No.

S-263

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

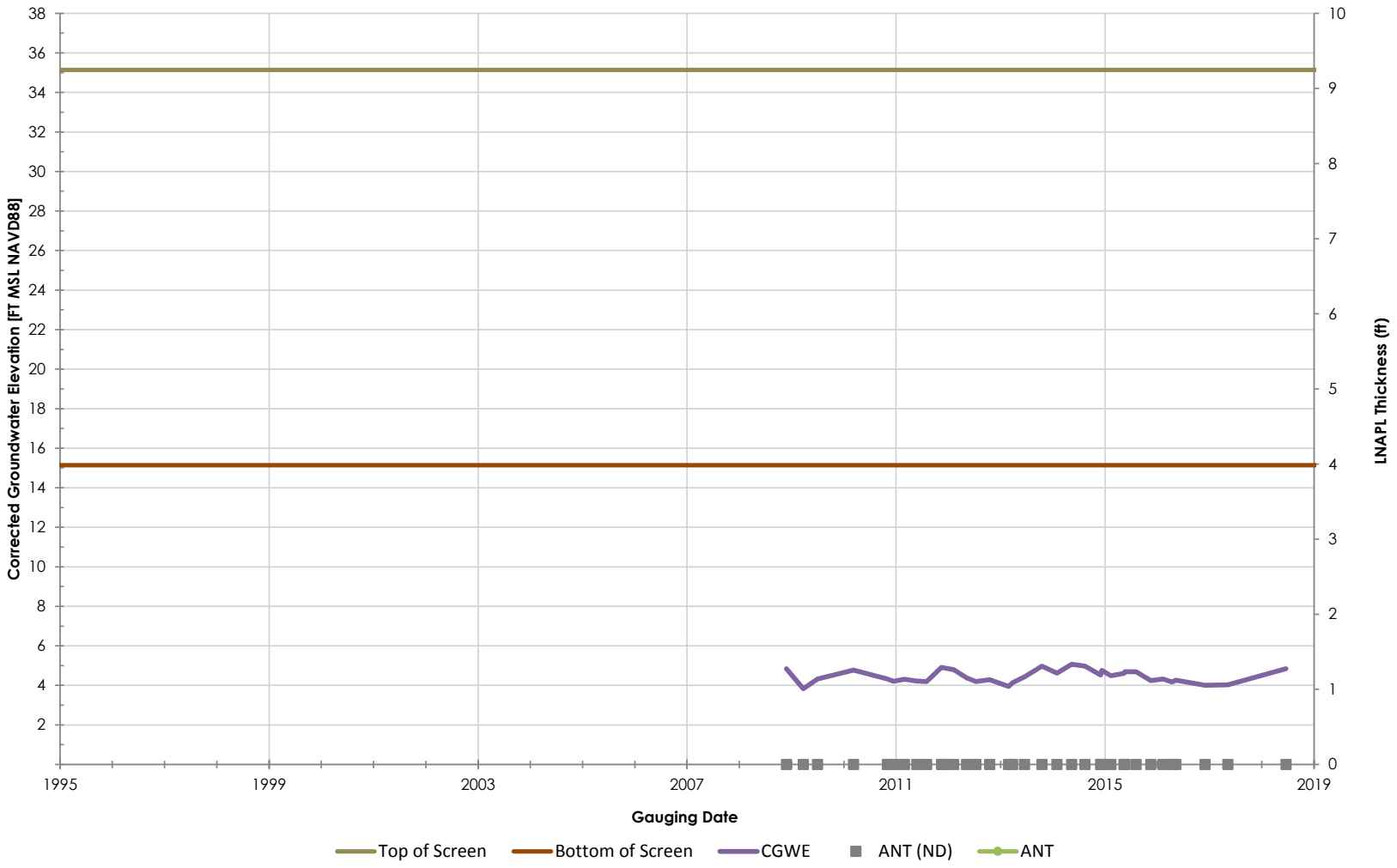
Stantec

Figure/Well No.

S-264D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

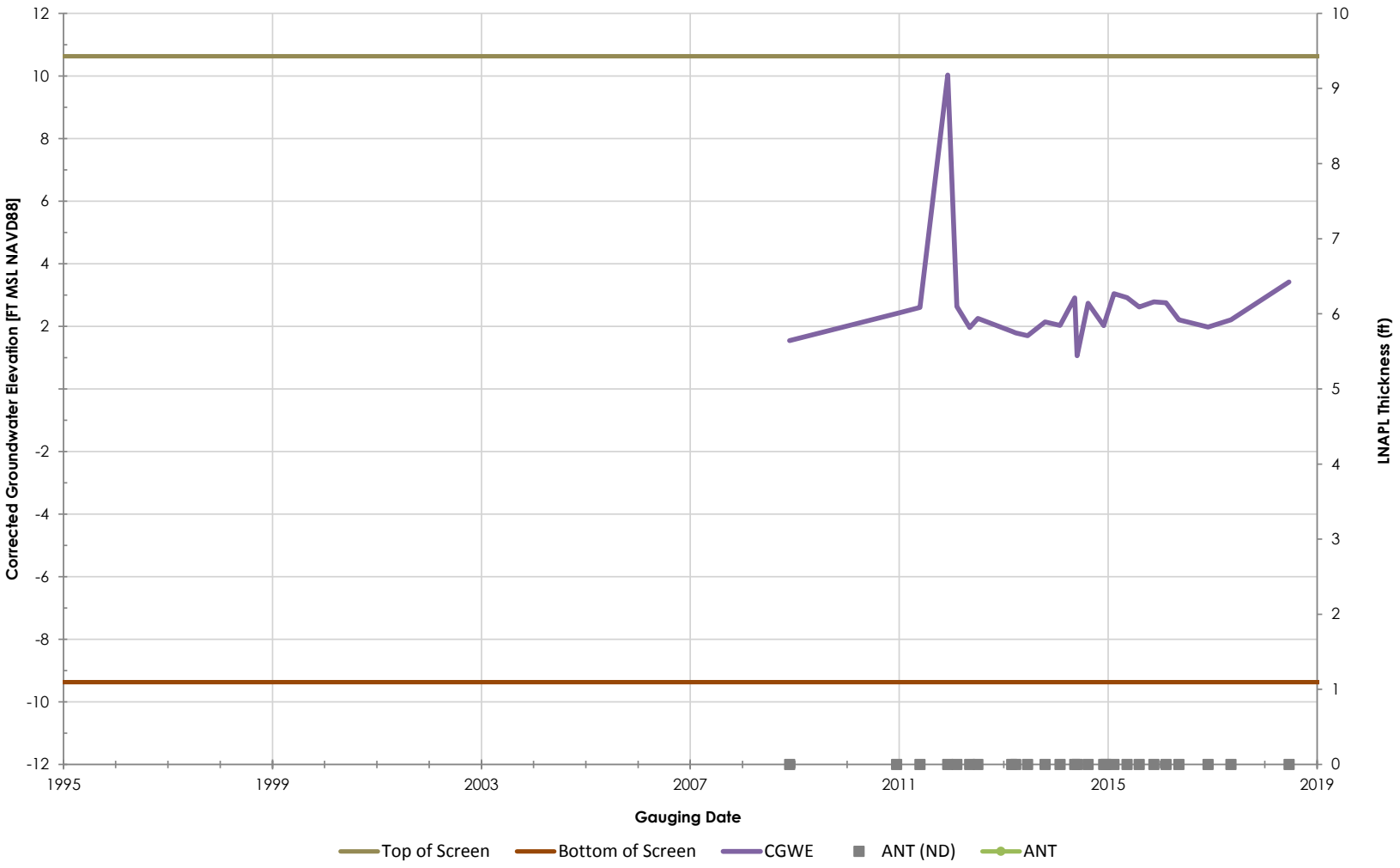
Stantec

Figure/Well No.

S-268

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

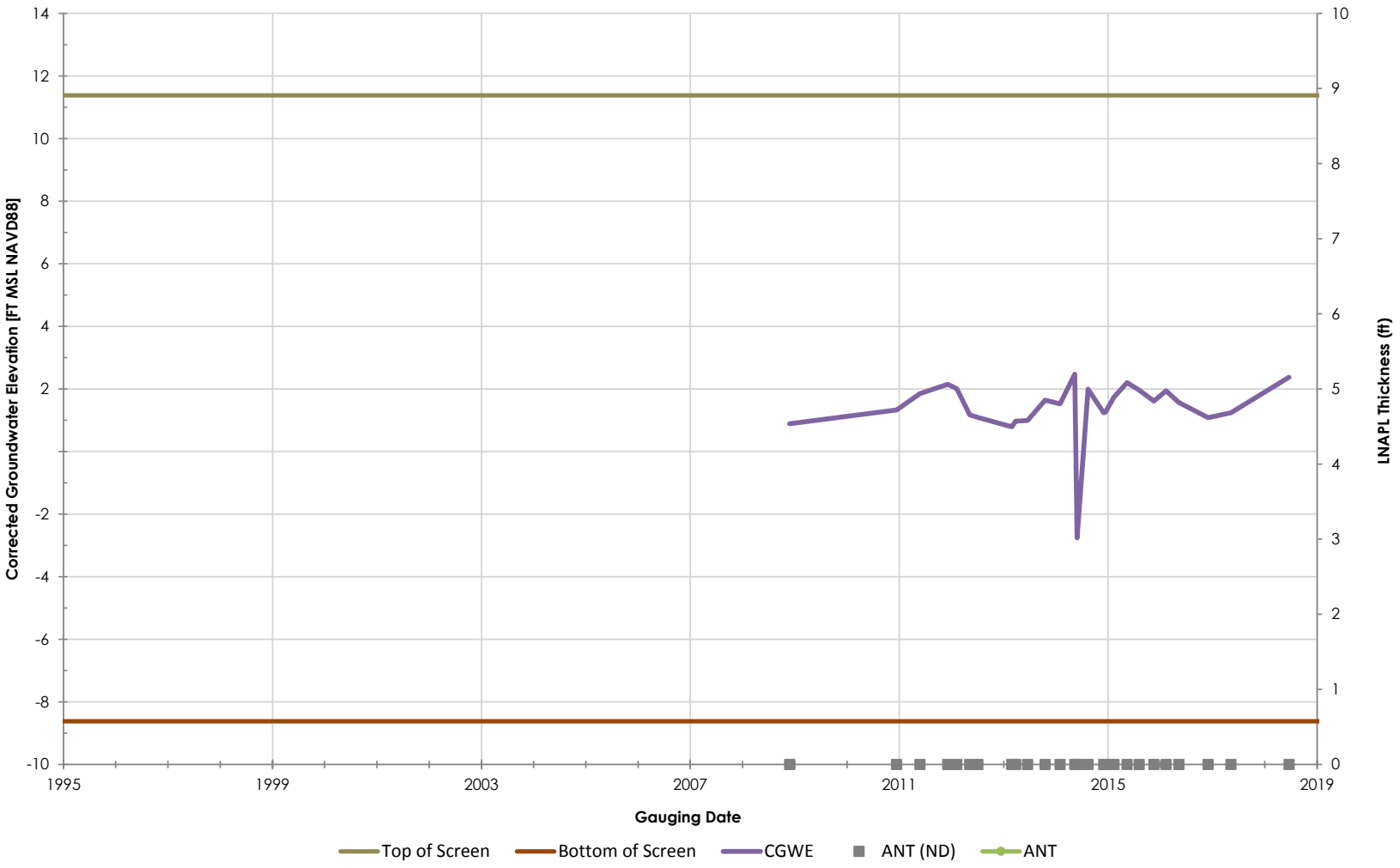
Stantec

Figure/Well No.

S-269

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

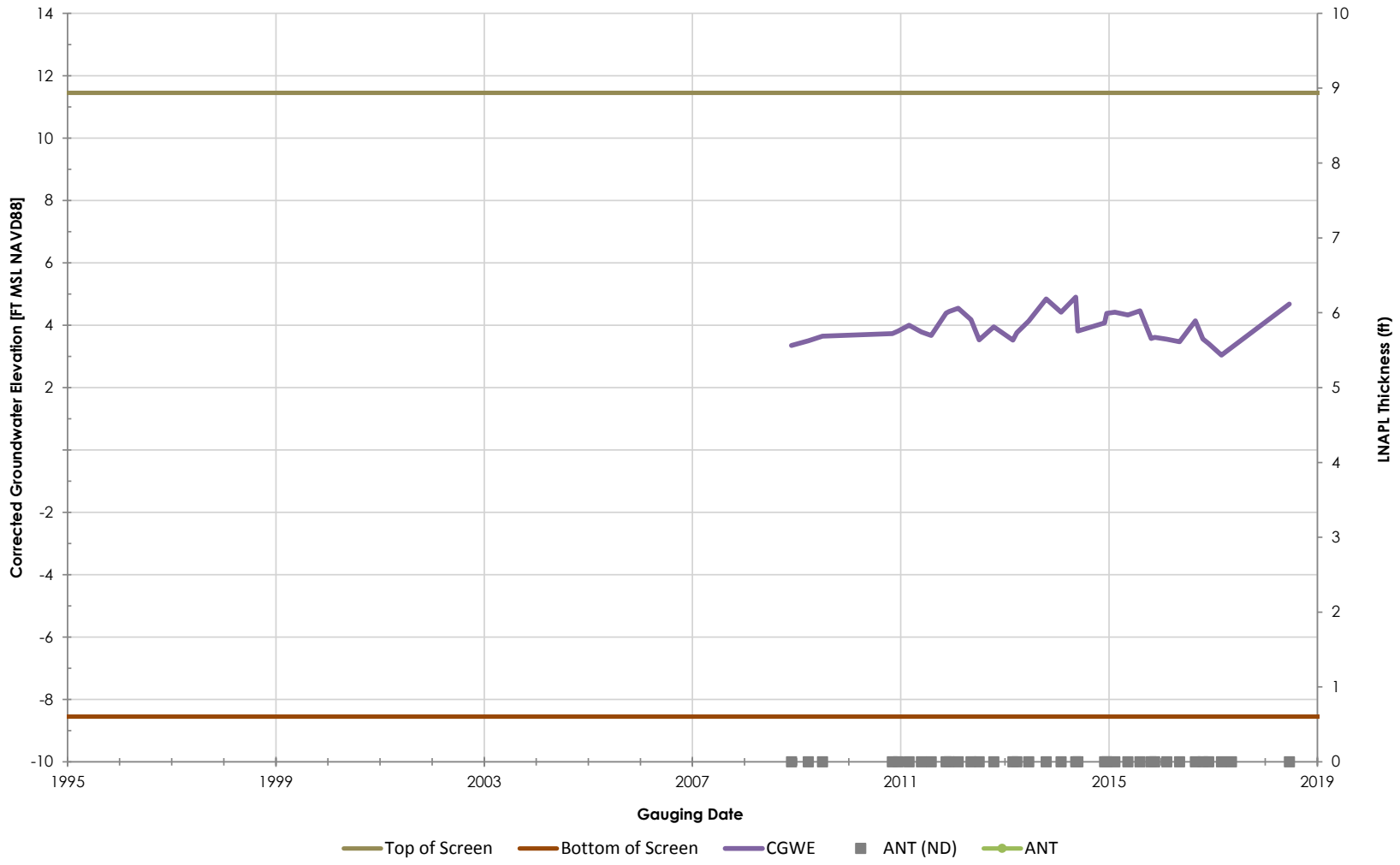
Stantec

Figure/Well No.

S-270

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

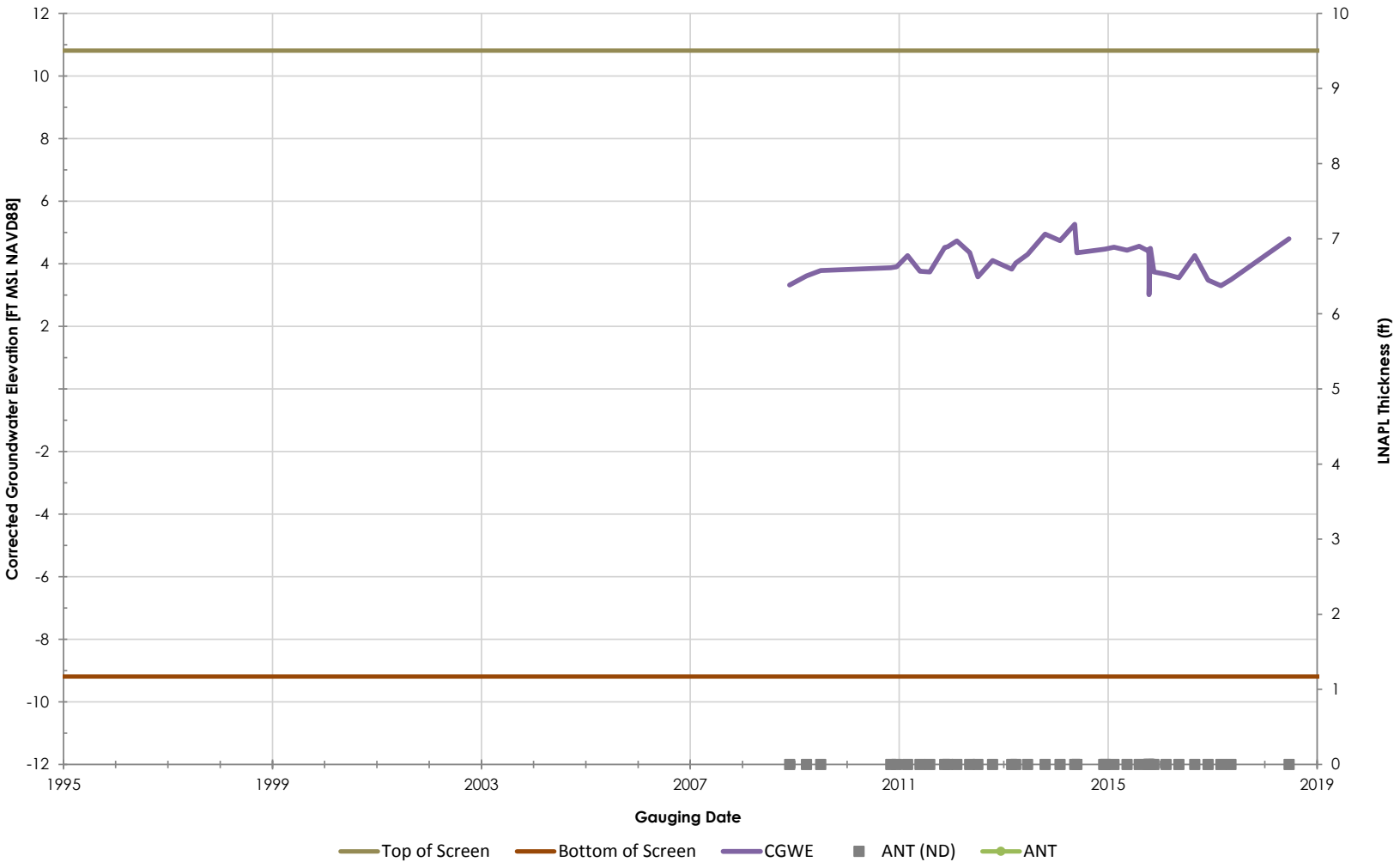
Stantec

Figure/Well No.

S-271

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

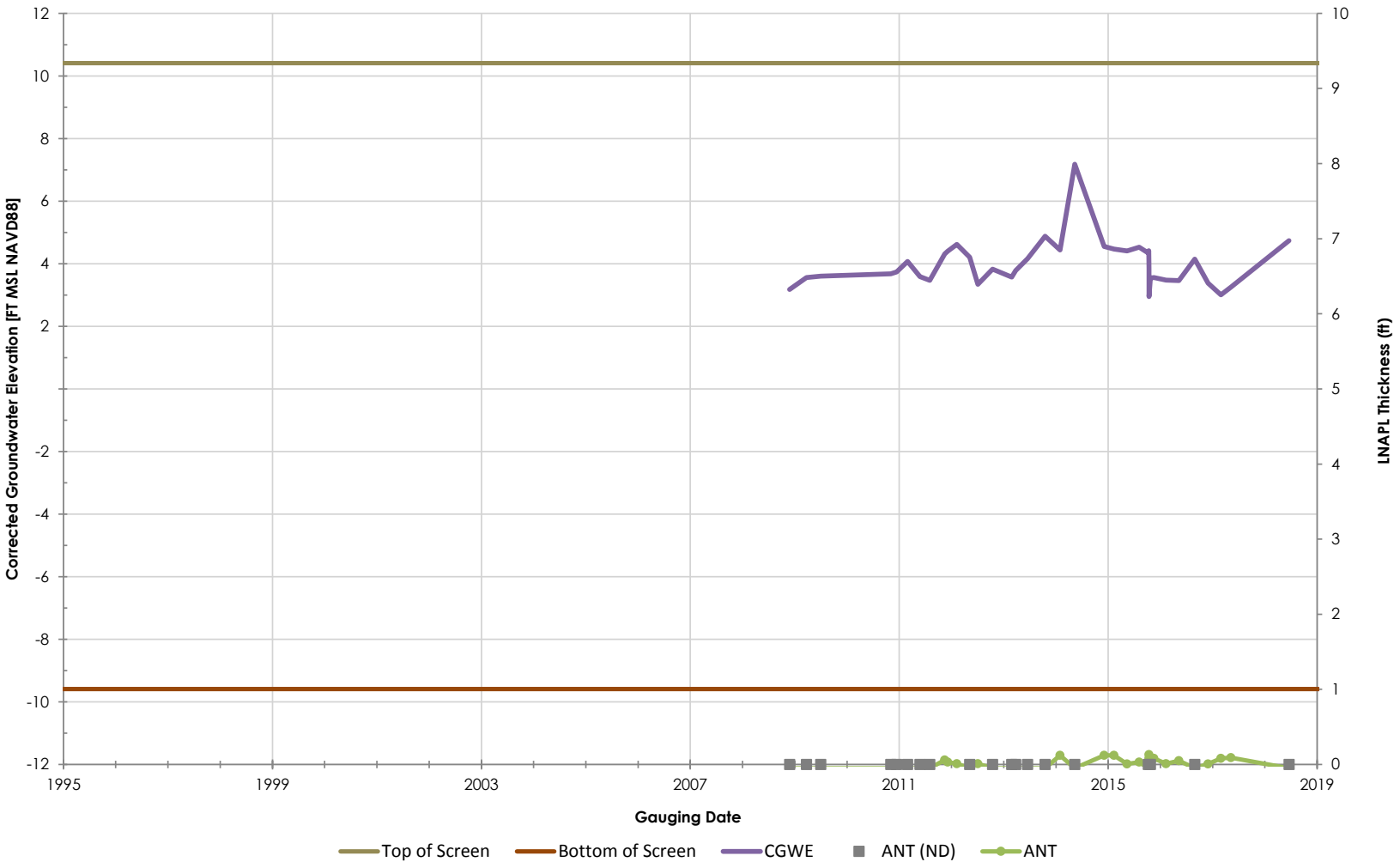
Stantec

Figure/Well No.

S-273

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

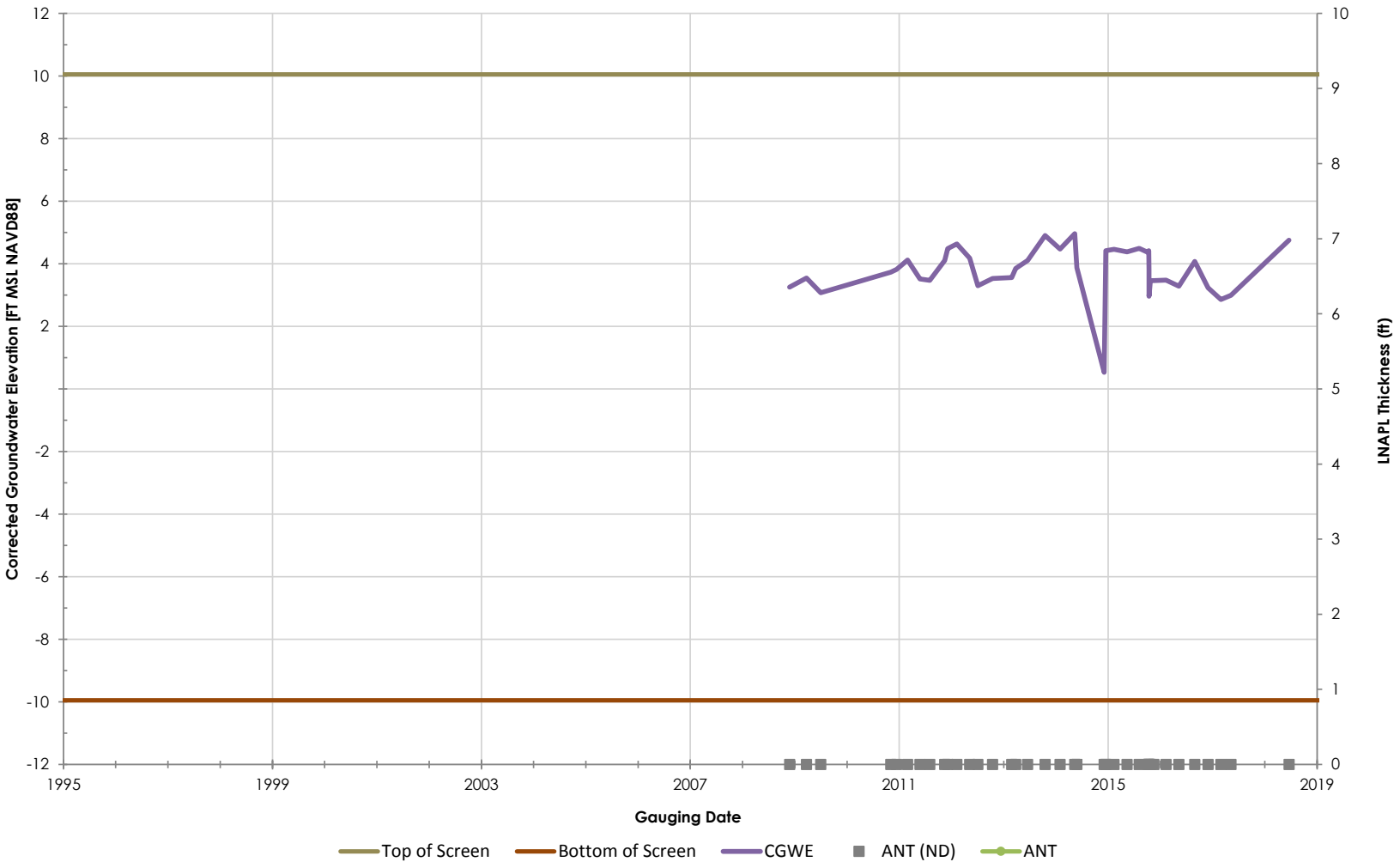
Stantec

Figure/Well No.

S-274

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

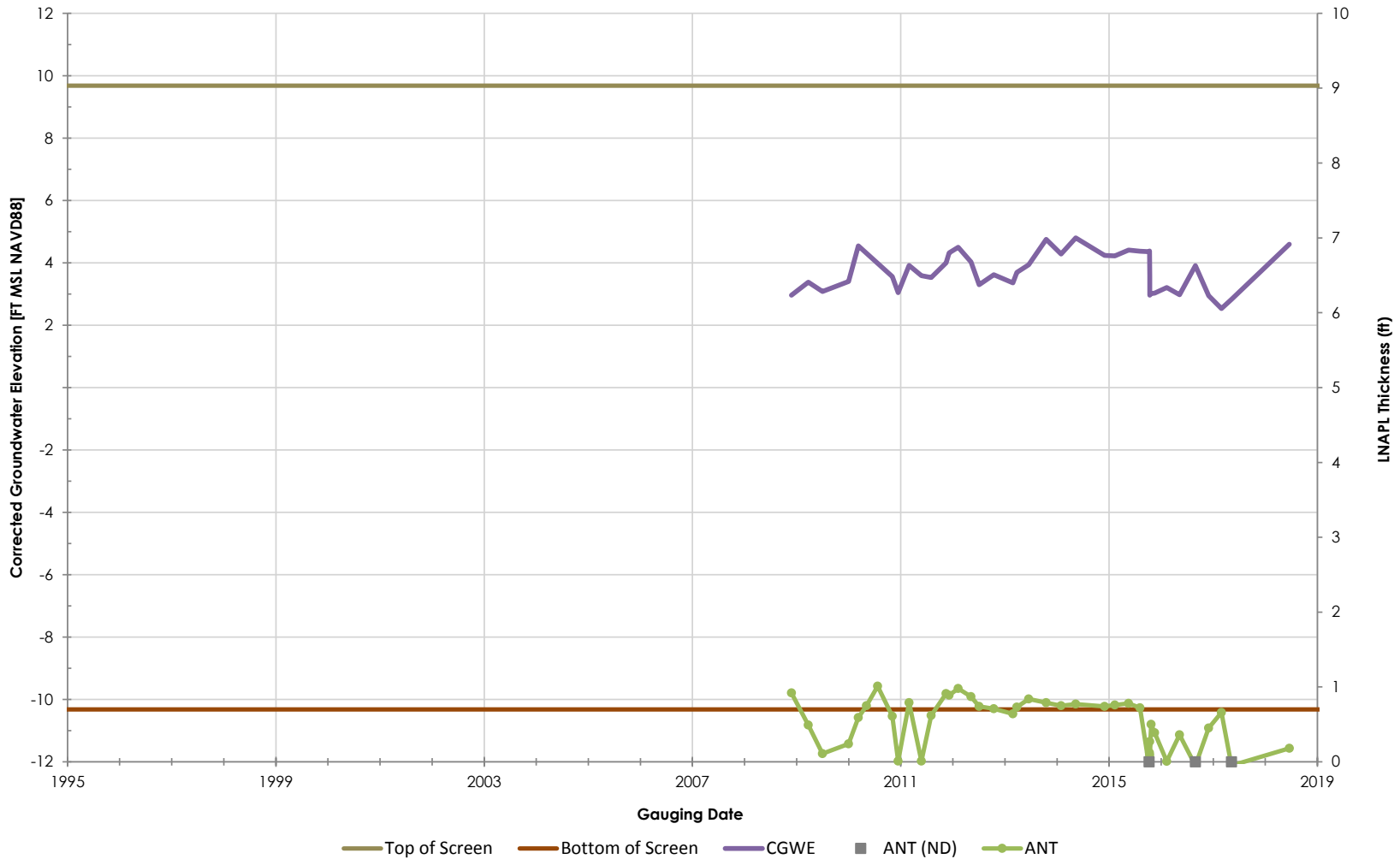
Stantec

Figure/Well No.

S-275

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

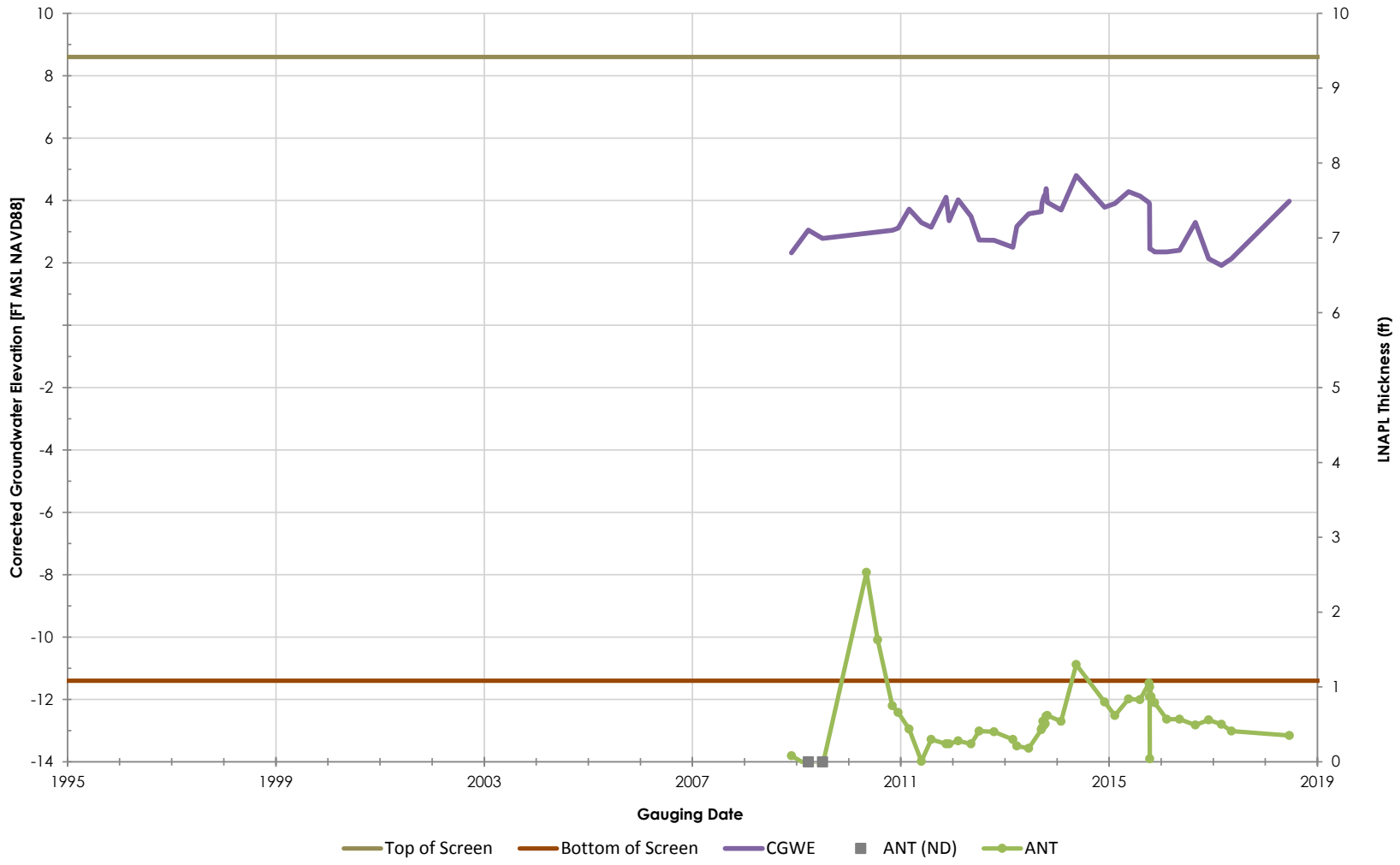
Stantec

Figure/Well No.

S-276

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

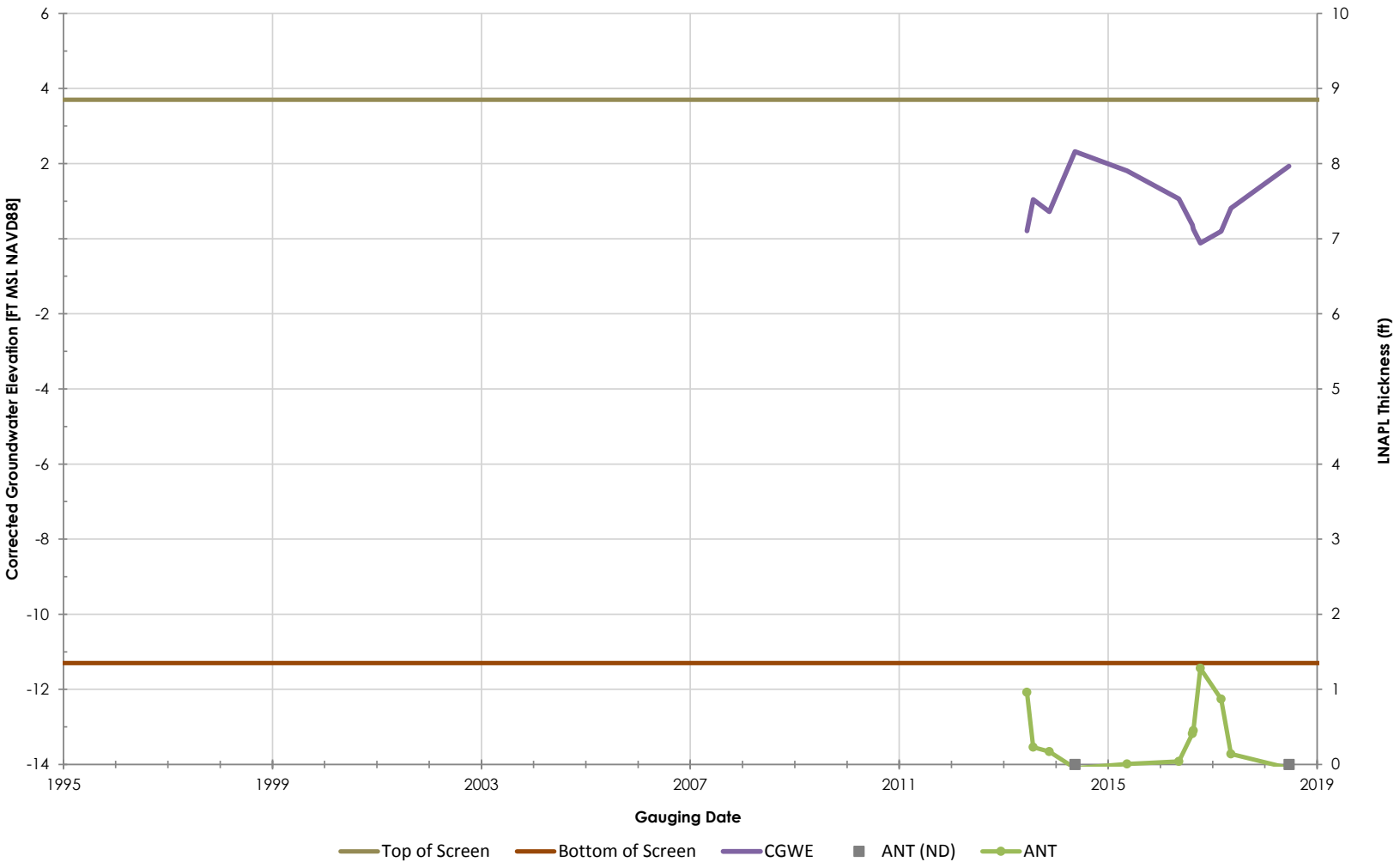
Stantec

Figure/Well No.

S-277

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

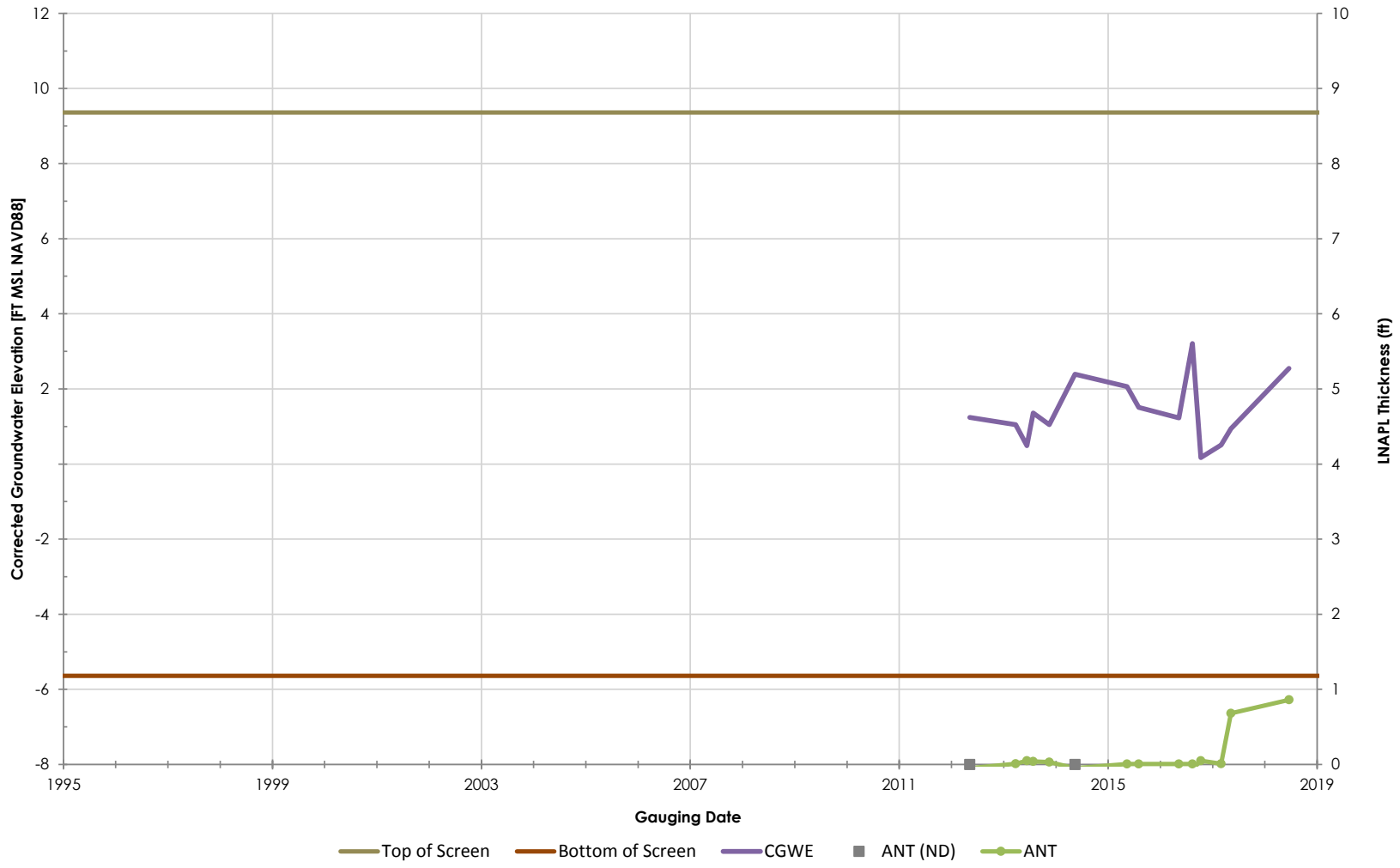
Stantec

Figure/Well No.

S-278

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

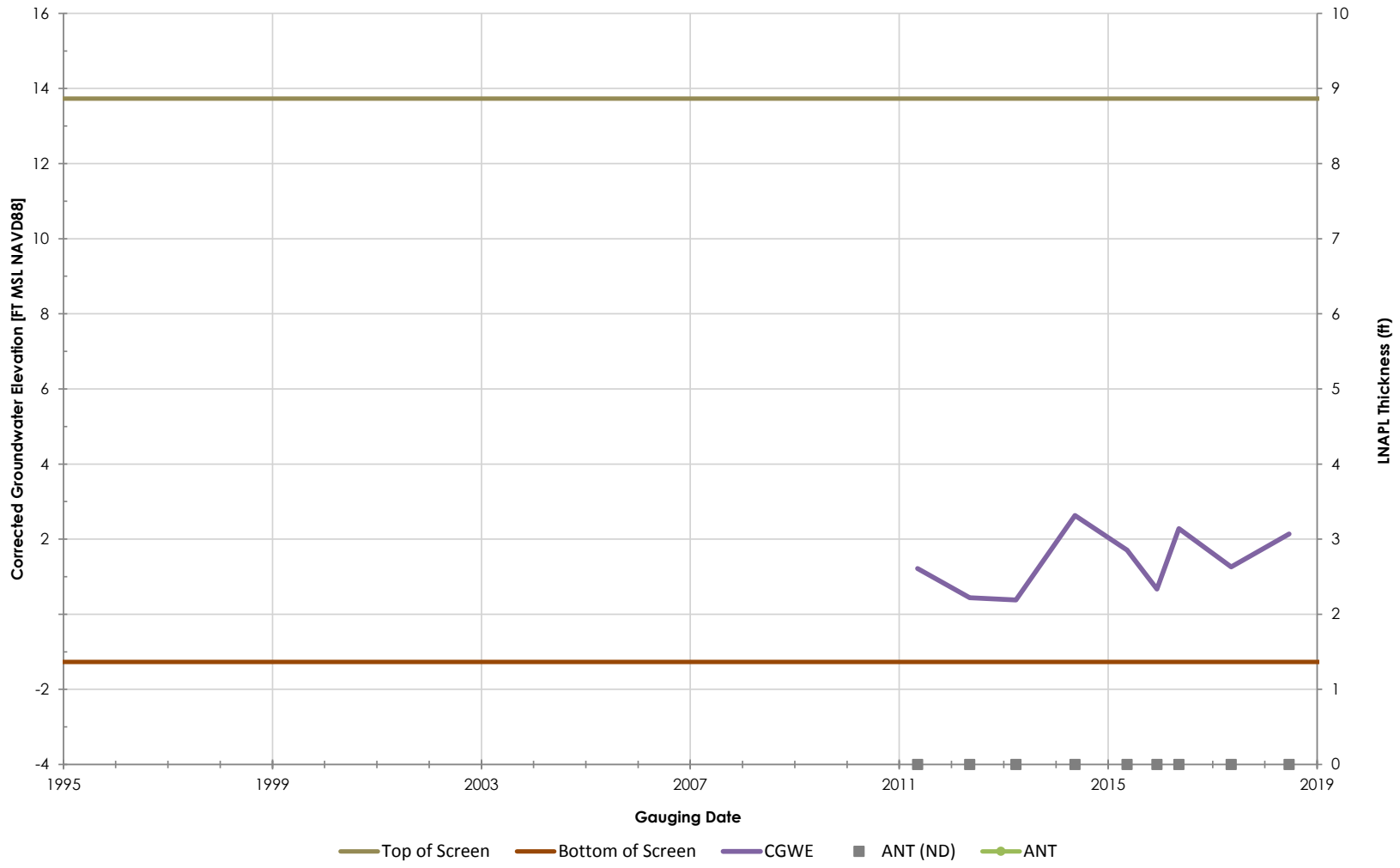
Stantec

Figure/Well No.

S-279

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Stantec

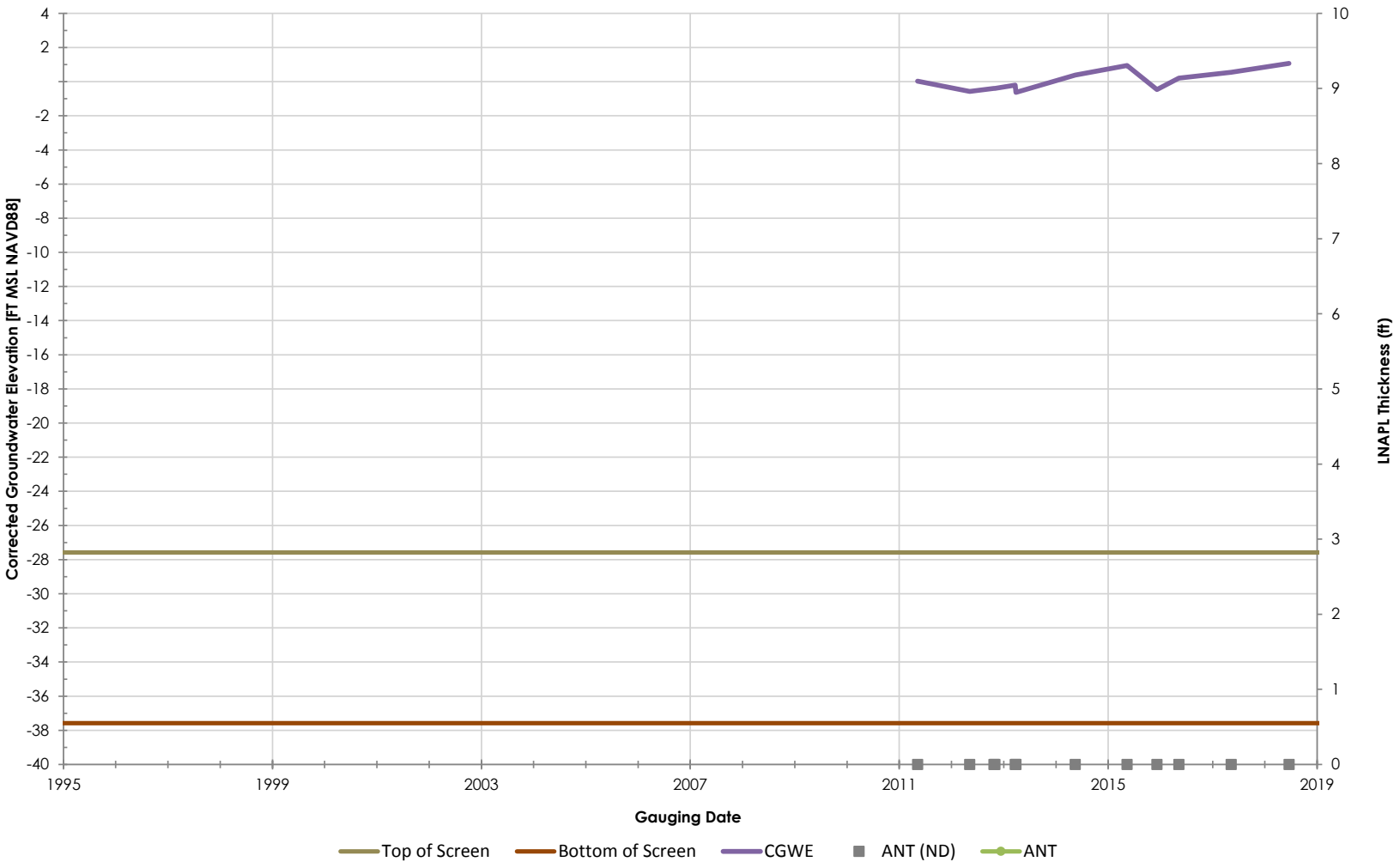
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-280

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

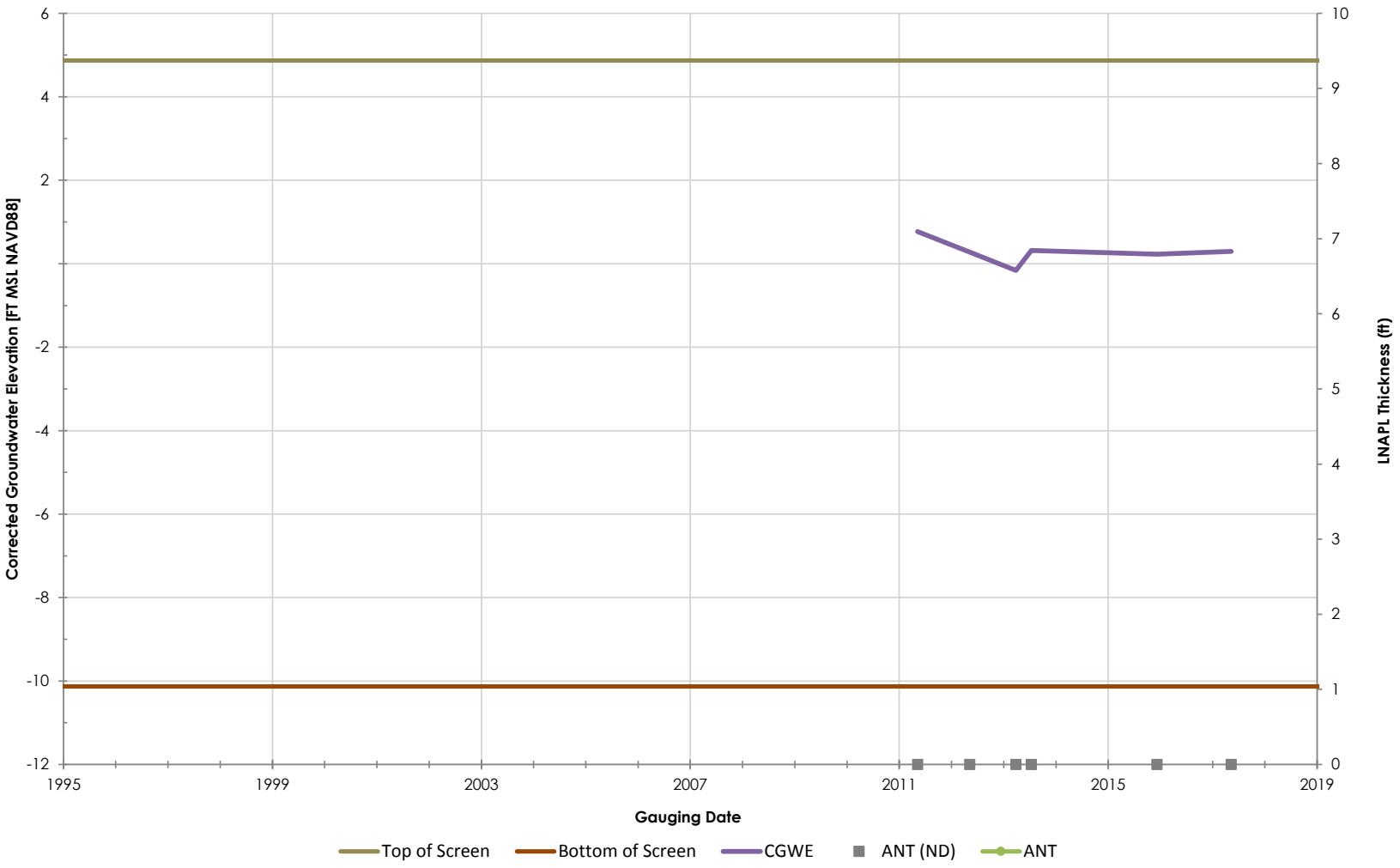
Stantec

Figure/Well No.

S-280D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

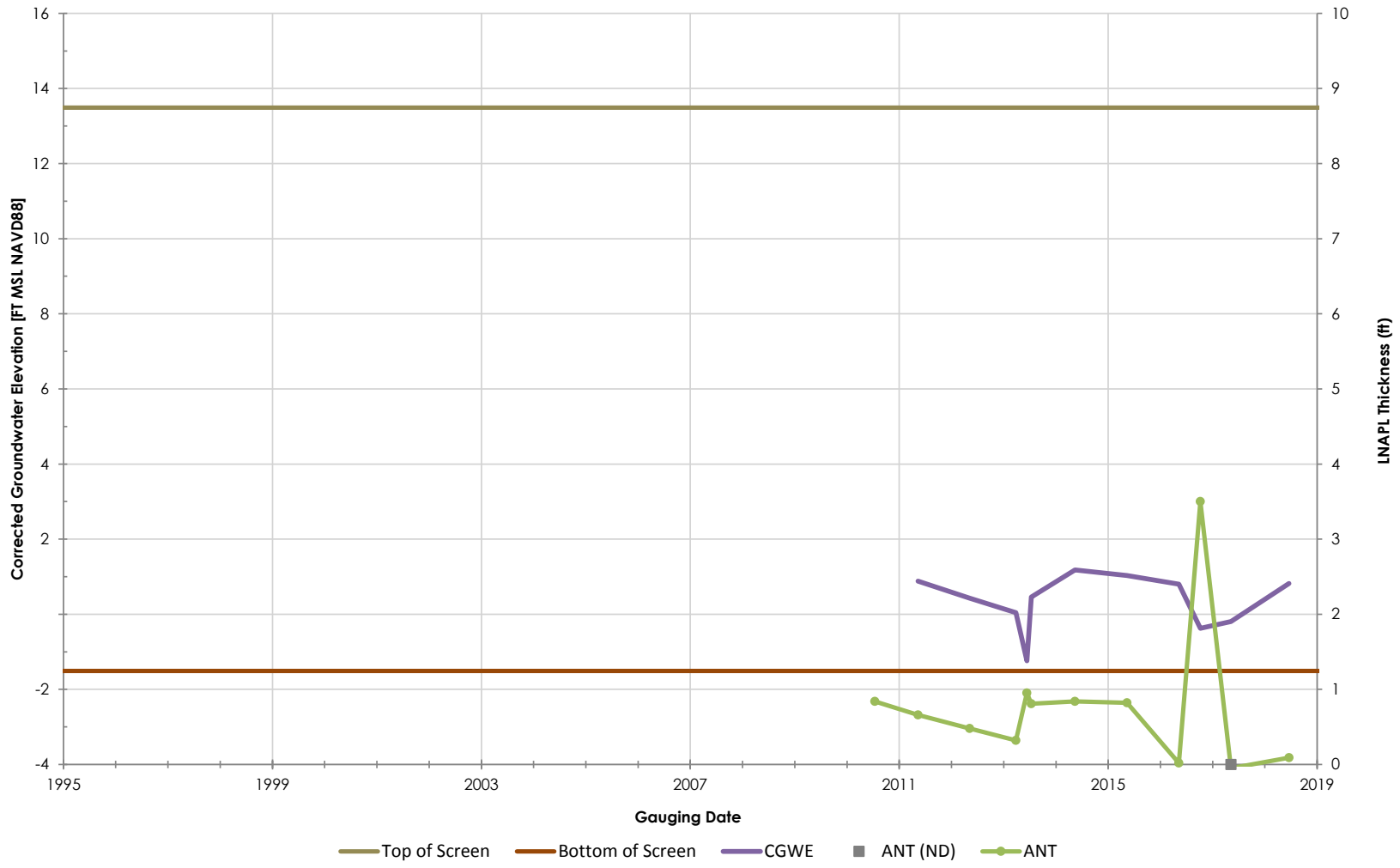
Stantec

Figure/Well No.

S-281

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

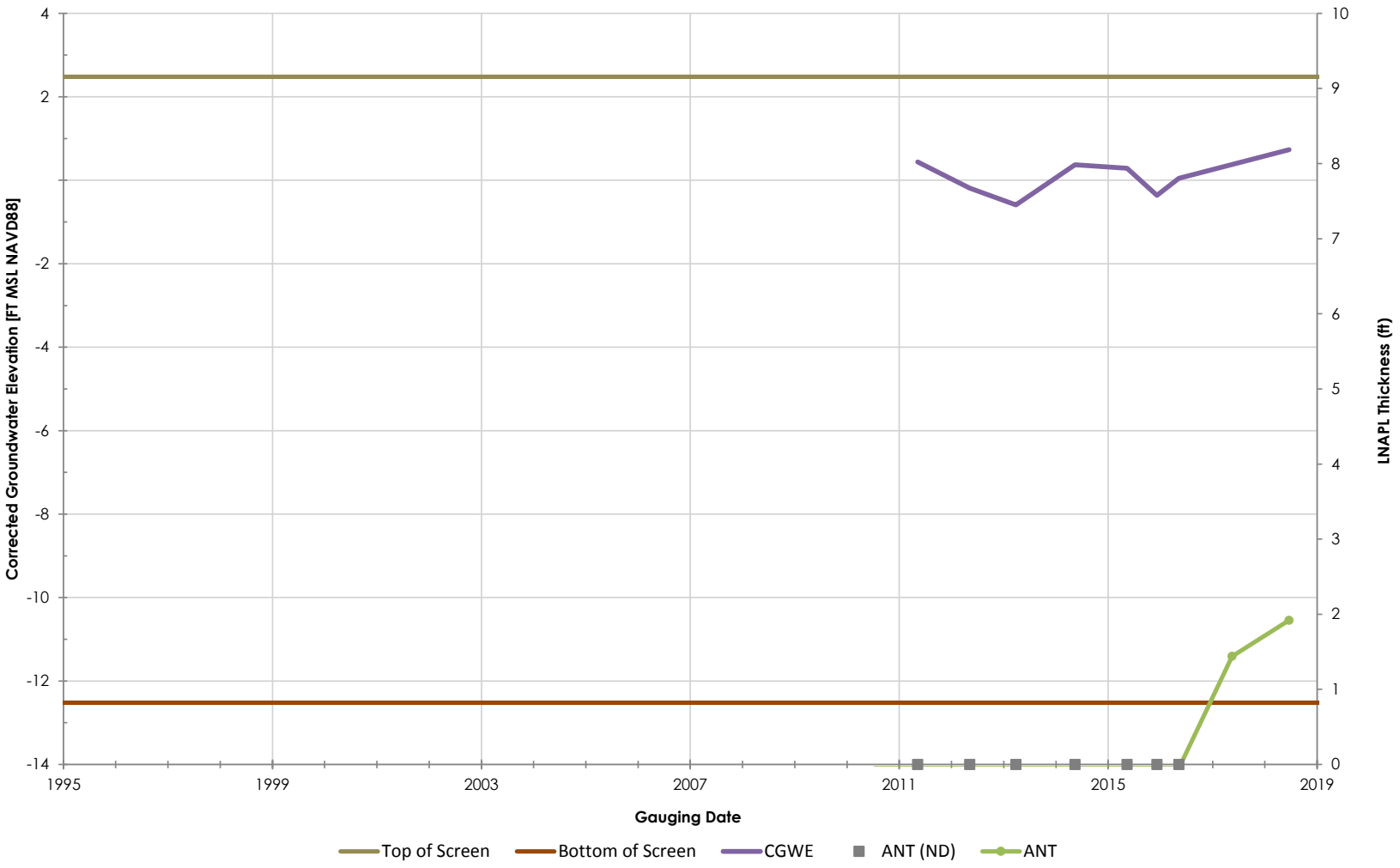
Stantec

Figure/Well No.

S-282

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

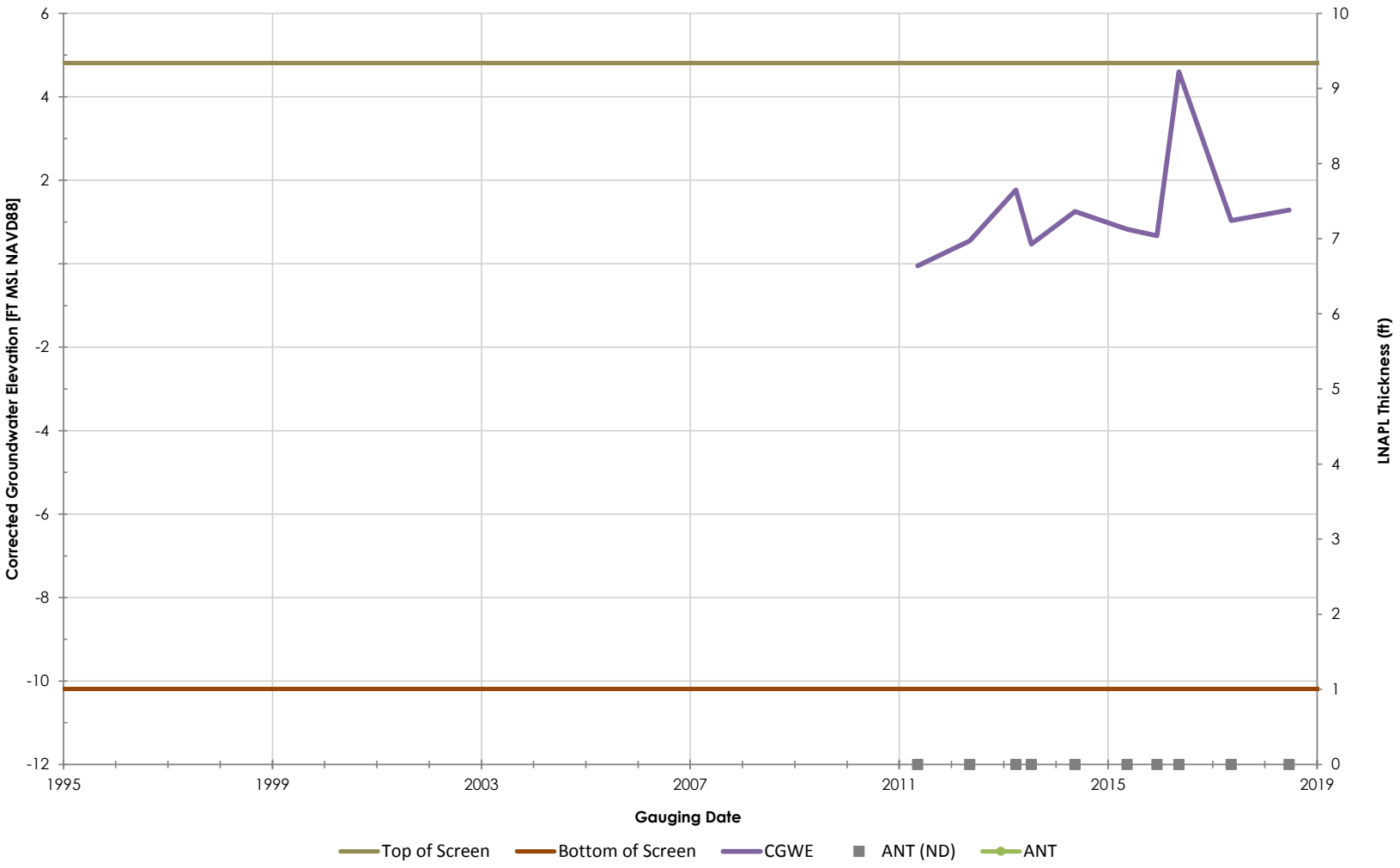
Stantec

Figure/Well No.

S-283

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

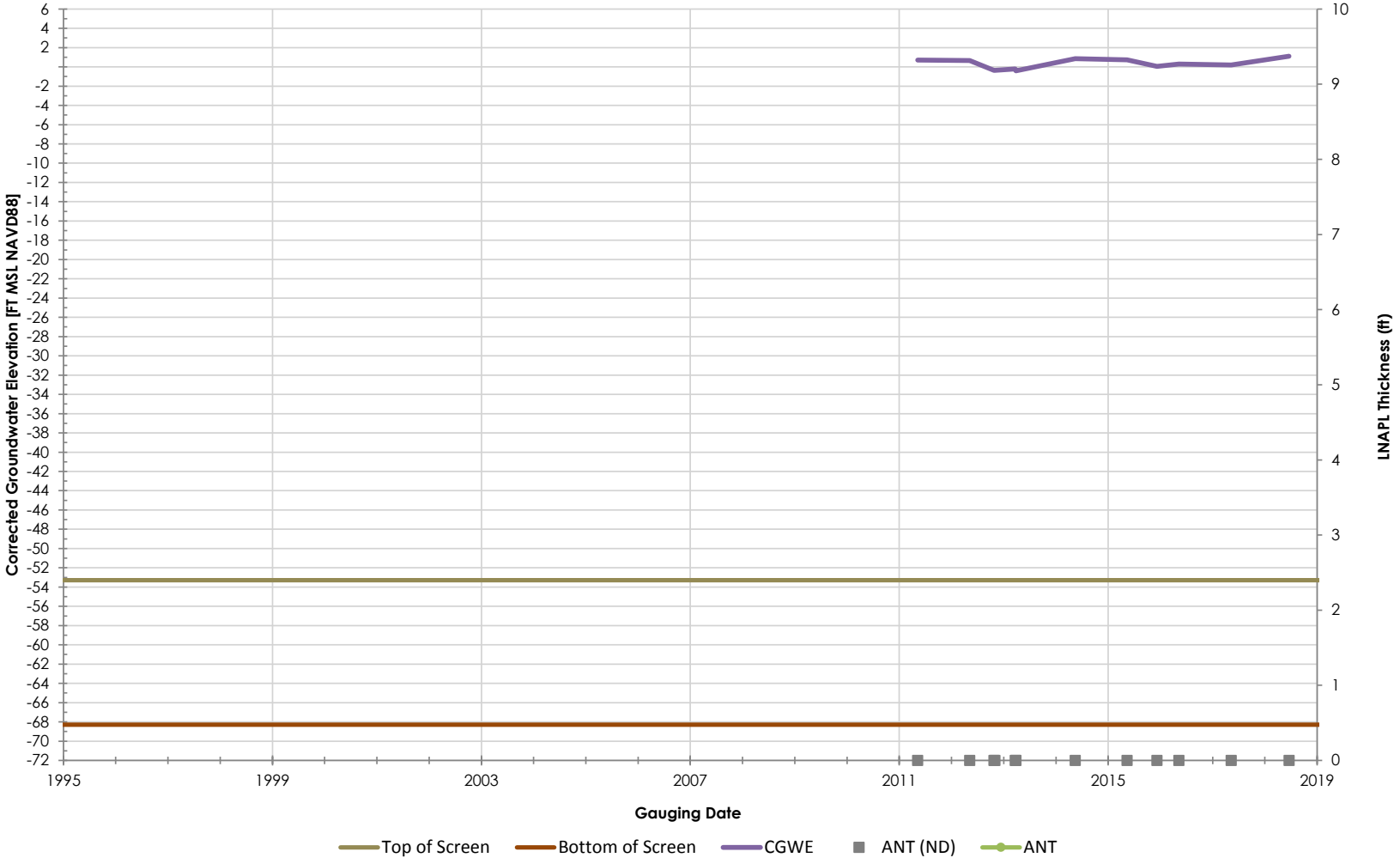
Stantec

Figure/Well No.

S-284

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

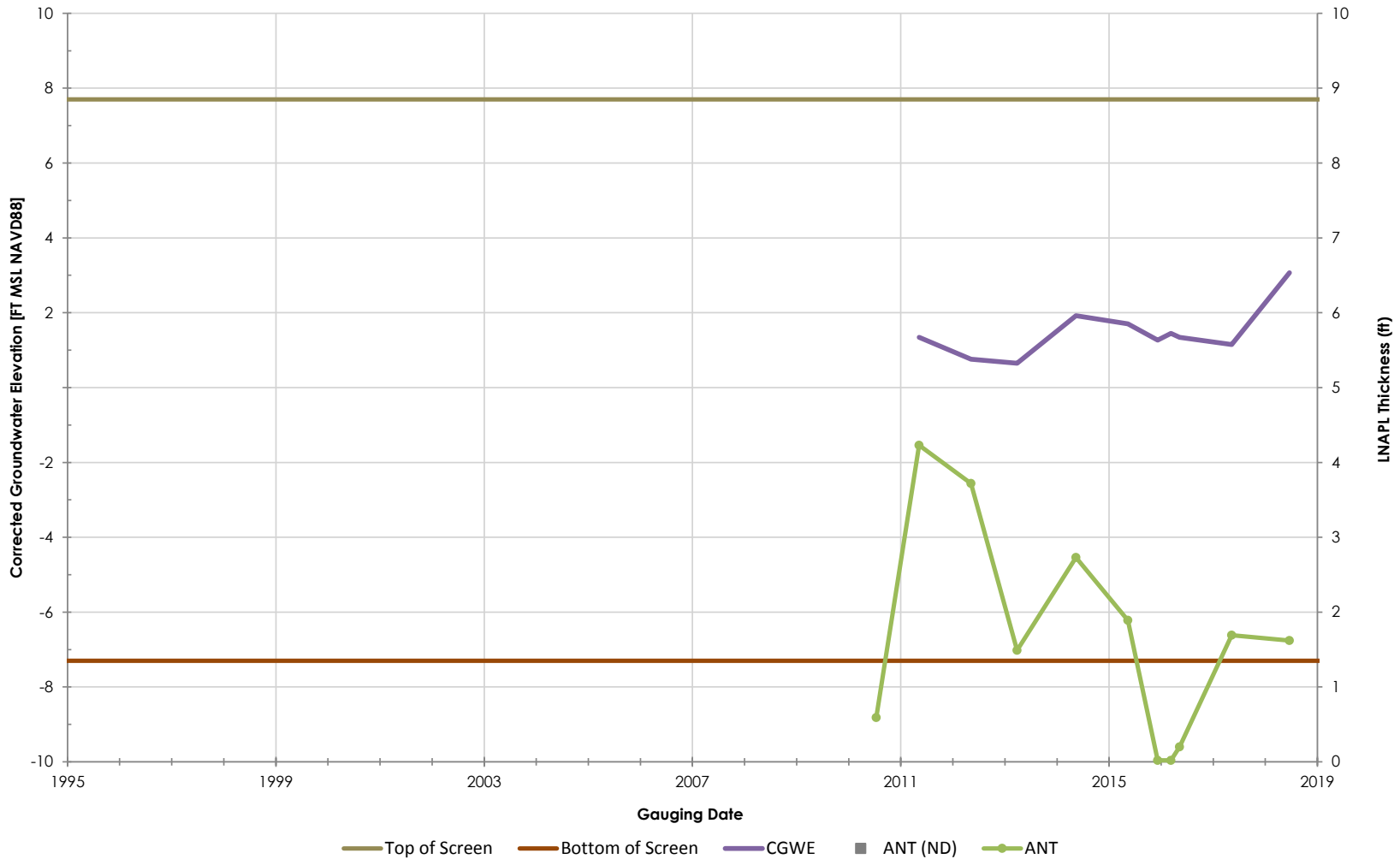
Stantec

Figure/Well No.

S-284D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

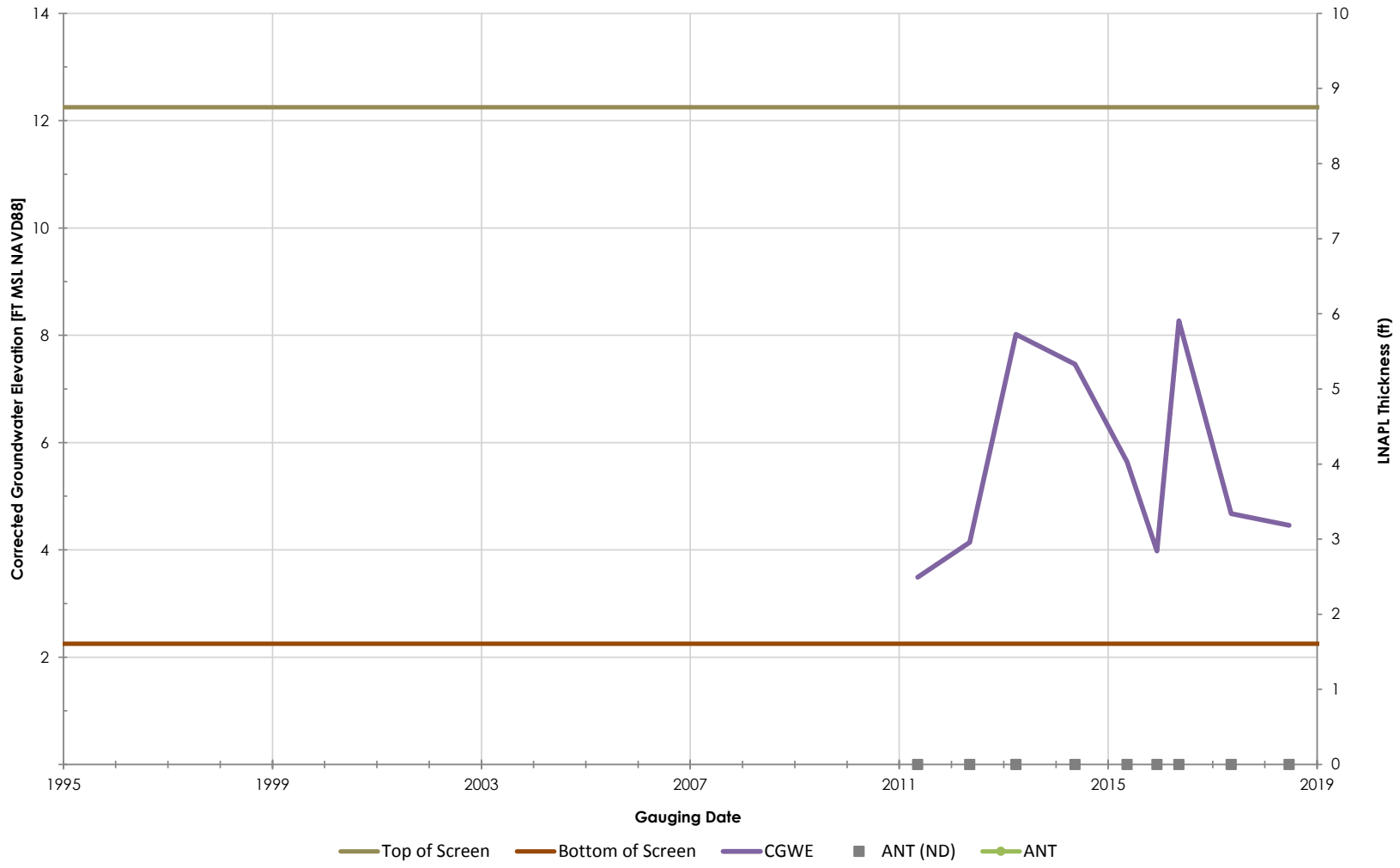
Stantec

Figure/Well No.

S-285

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

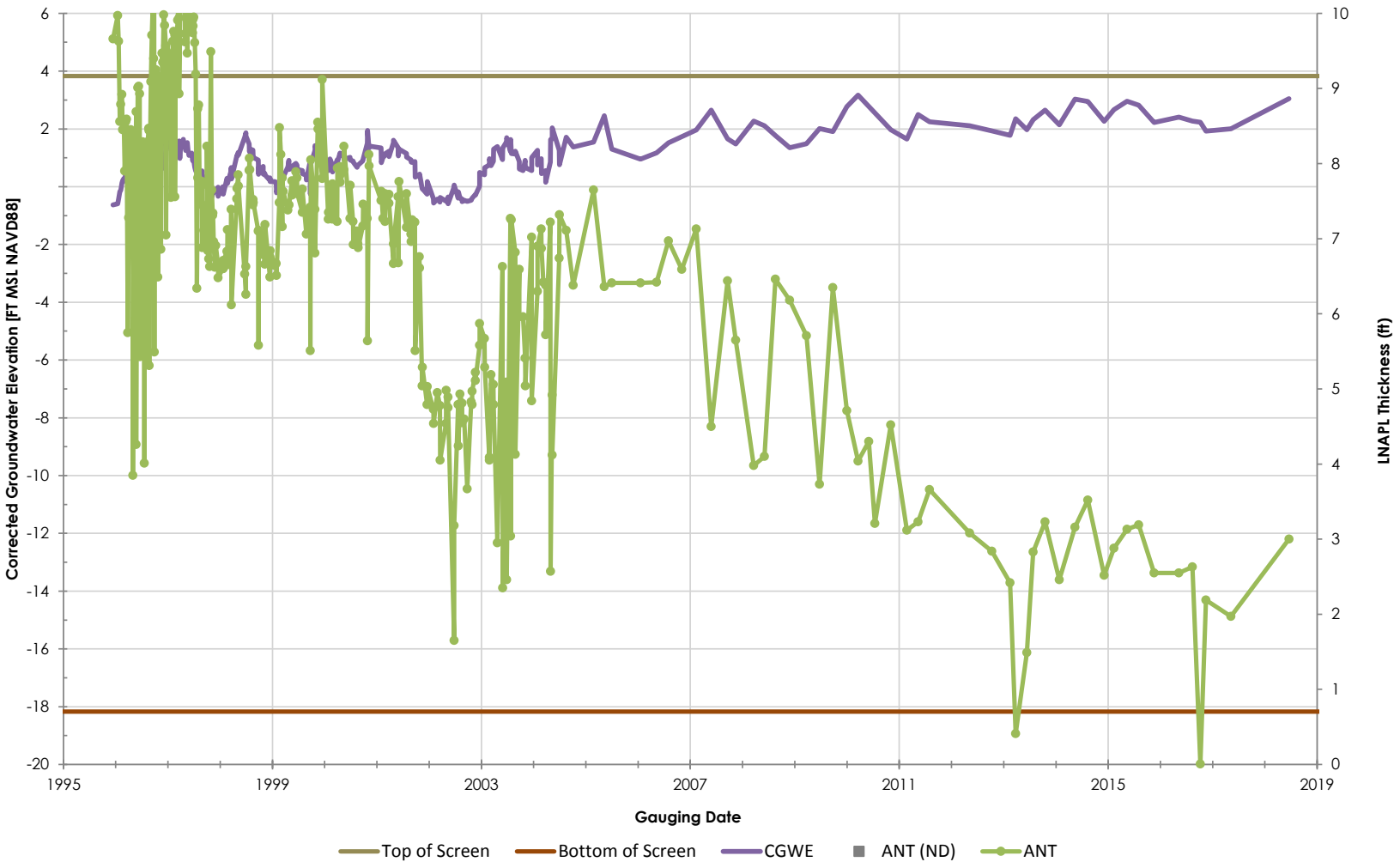
Stantec

Figure/Well No.

S-288

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

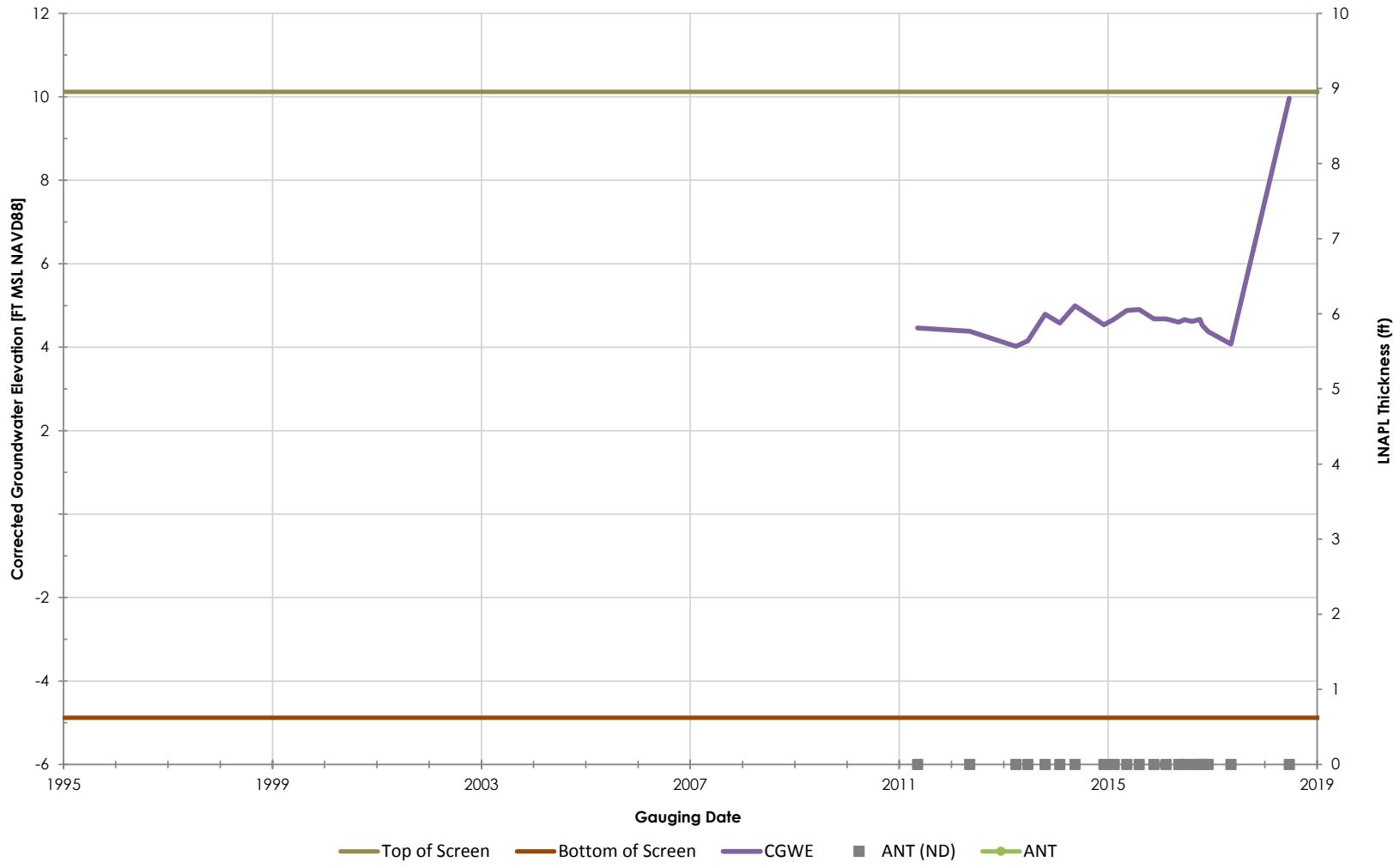
Stantec

Figure/Well No.

S-29

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

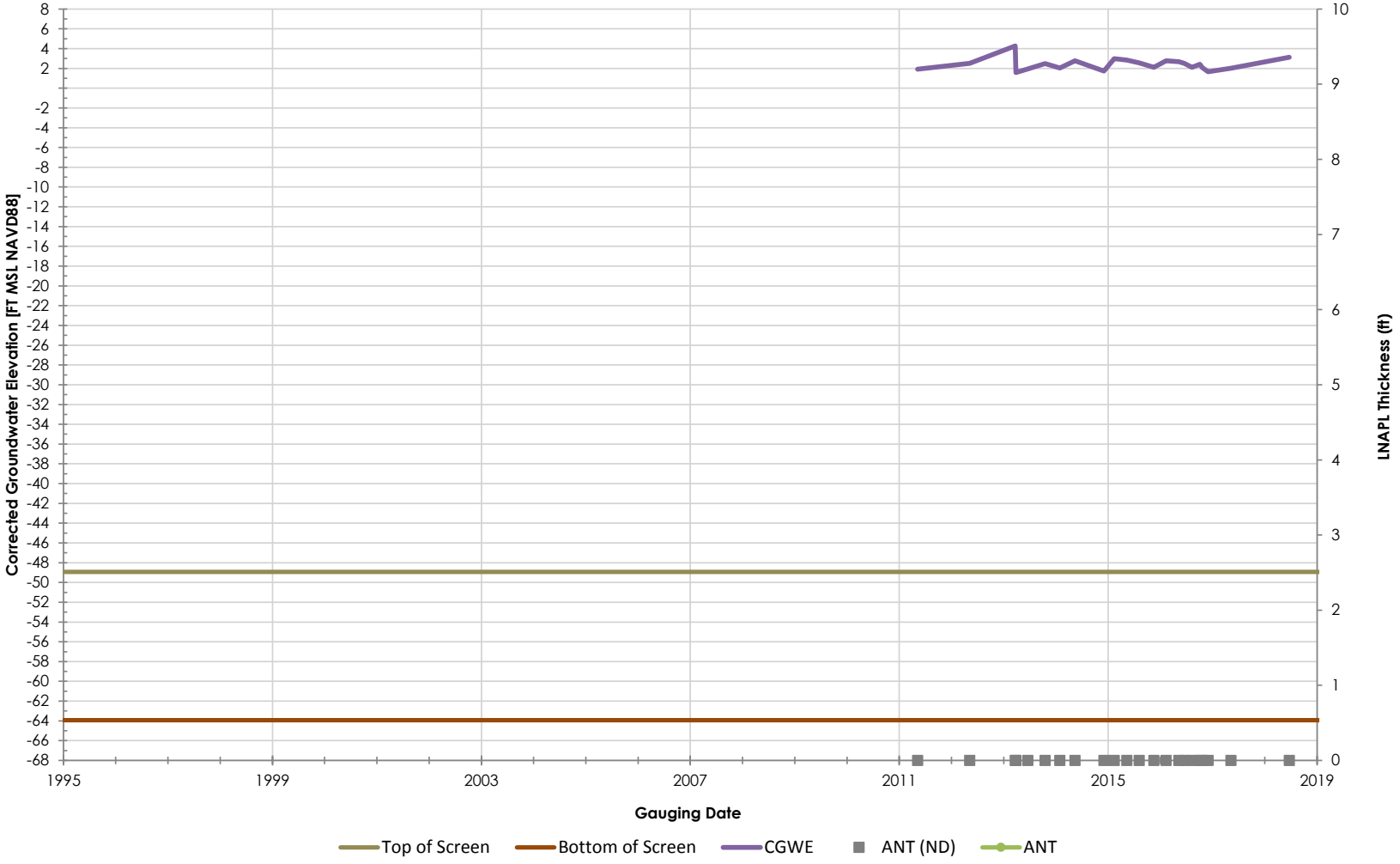
Stantec

Figure/Well No.

S-294

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

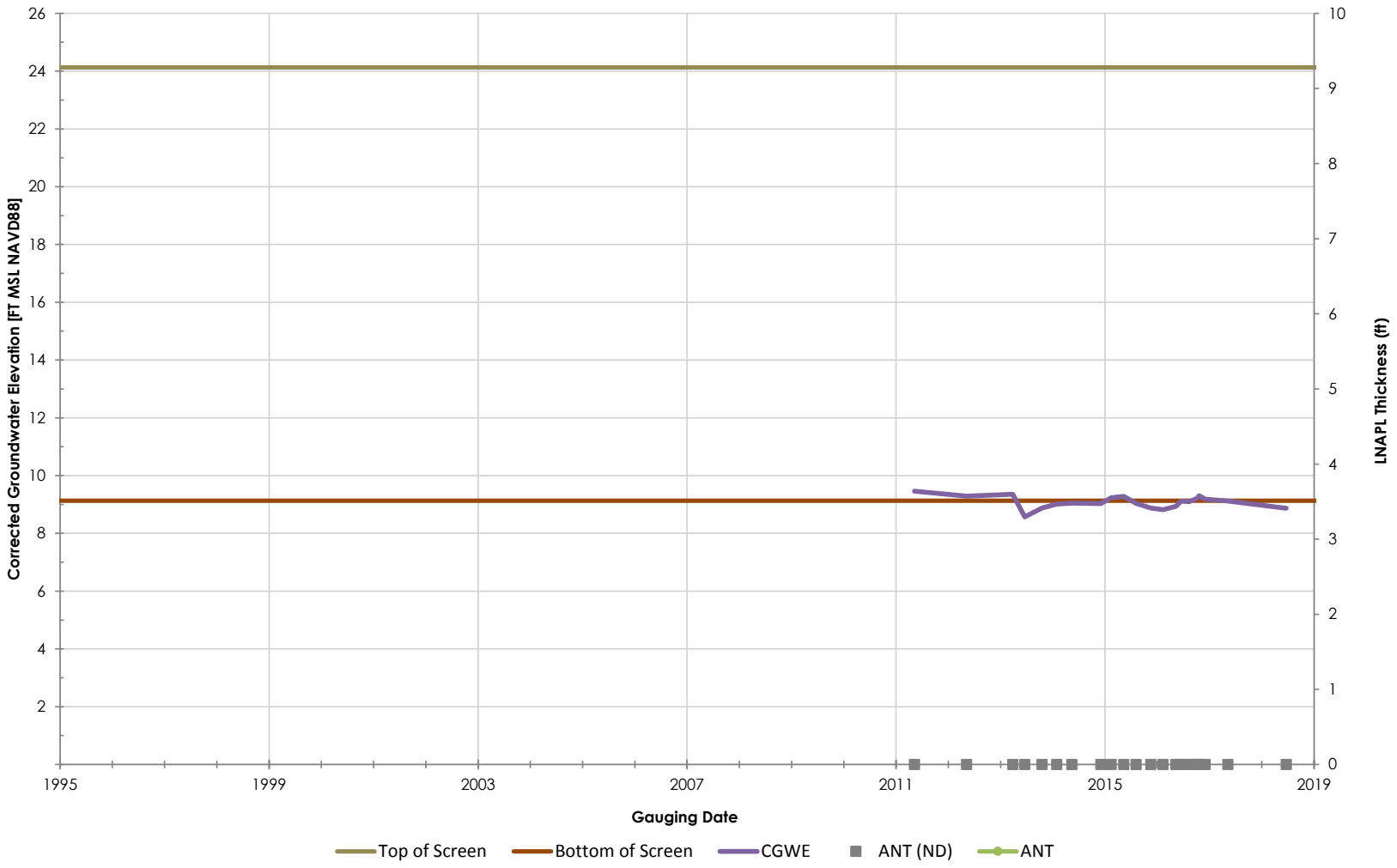
Stantec

Figure/Well No.

S-294D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

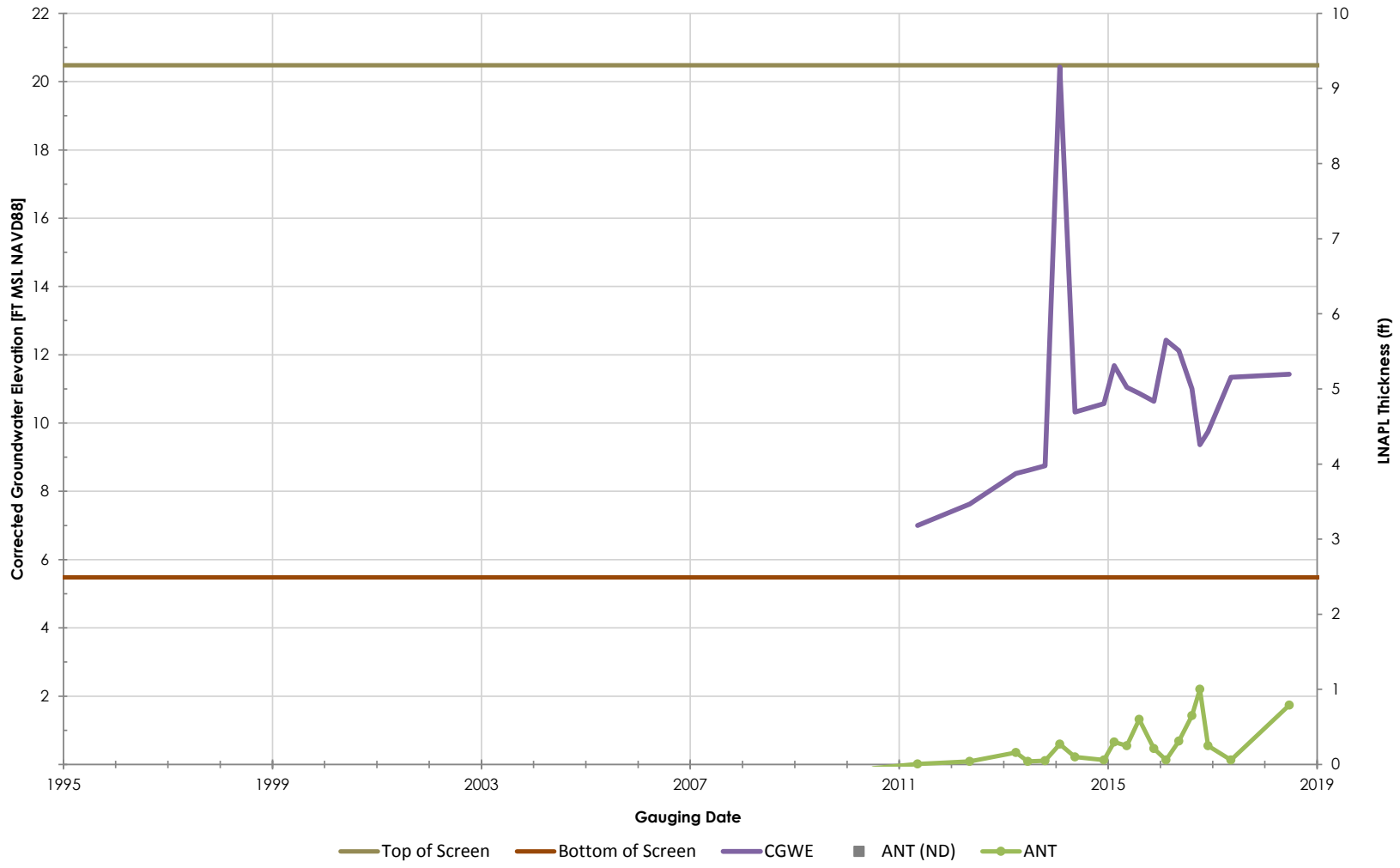
Stantec

Figure/Well No.

S-295

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

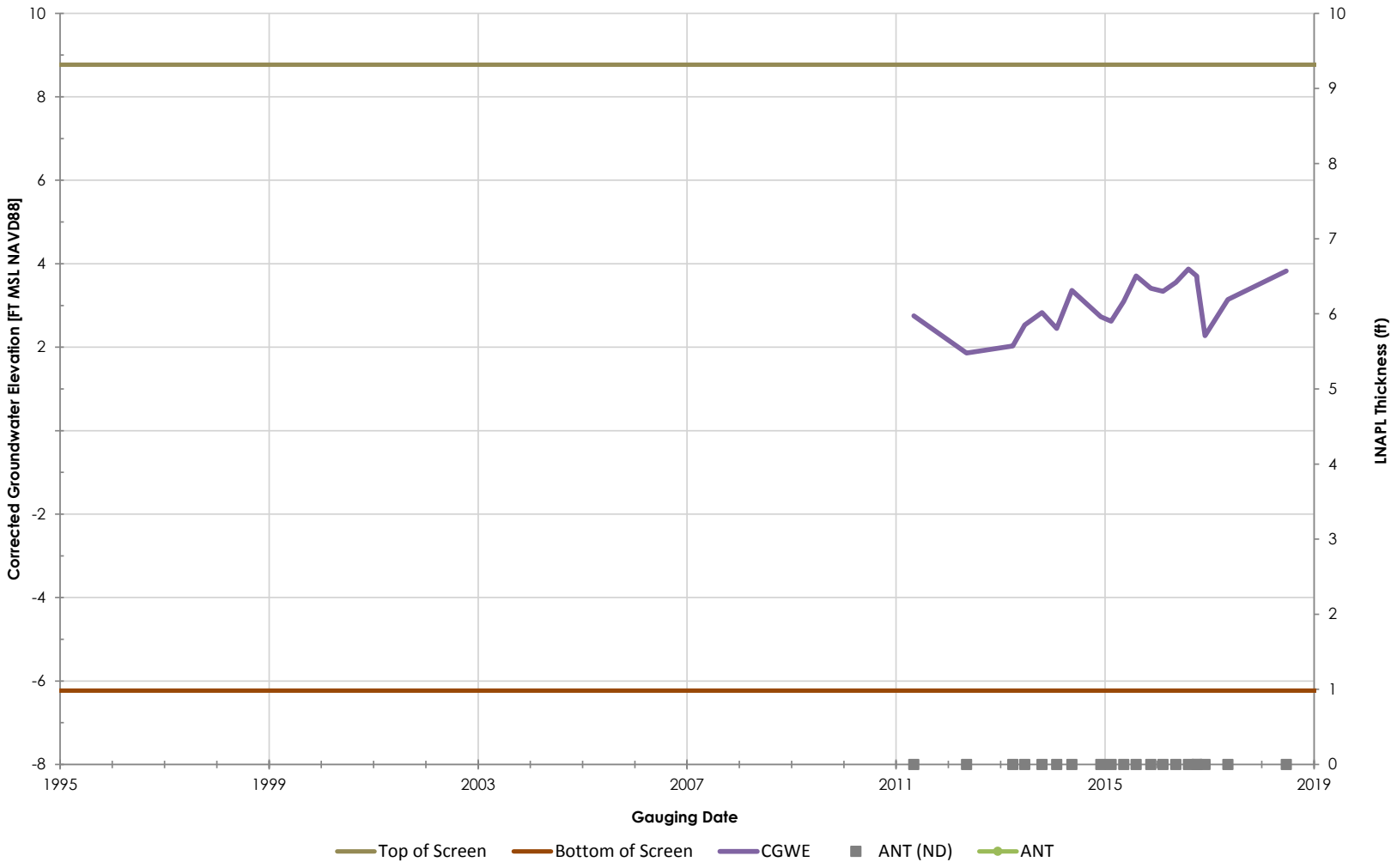
Stantec

Figure/Well No.

S-298

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

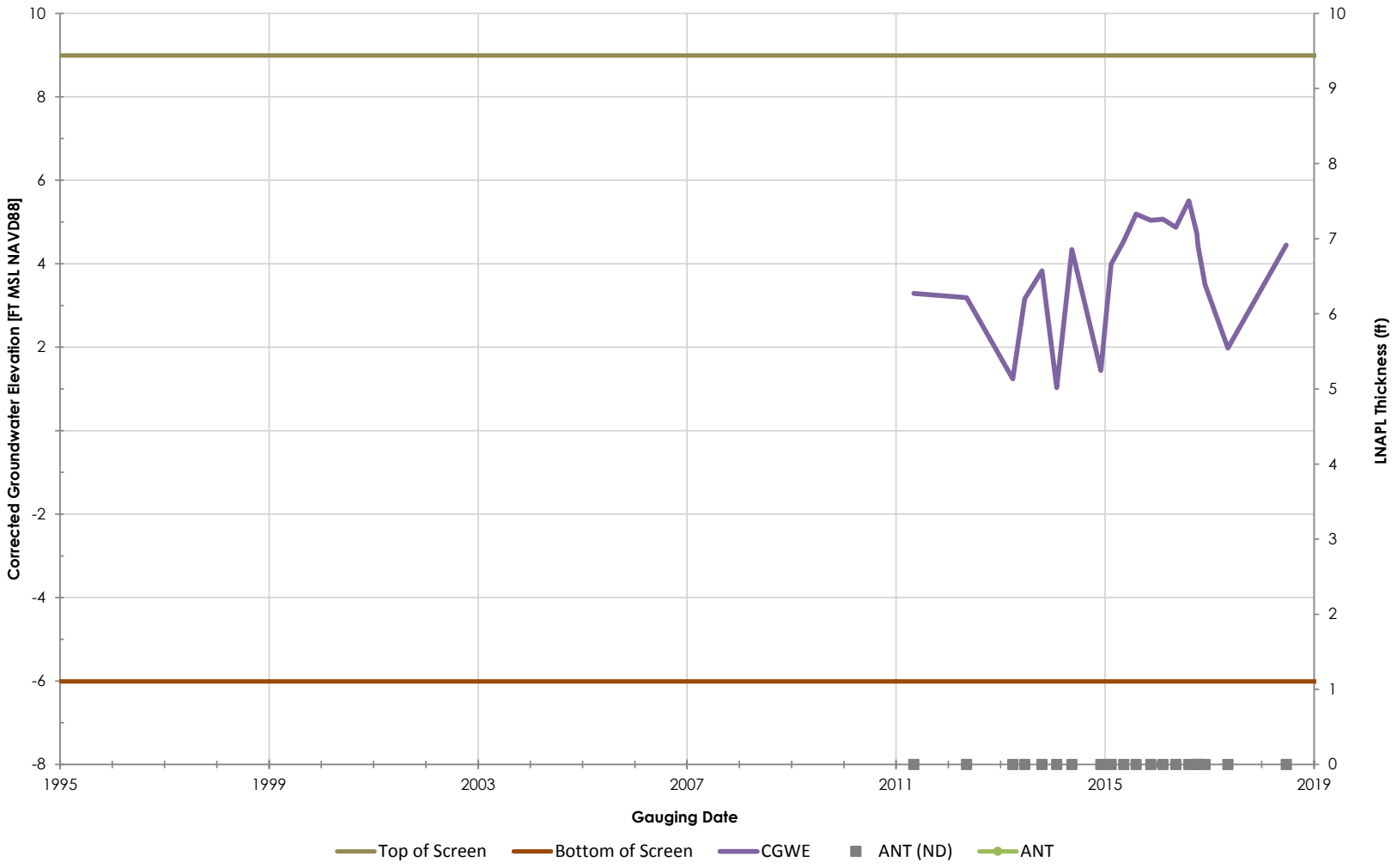
Stantec

Figure/Well No.

S-299

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

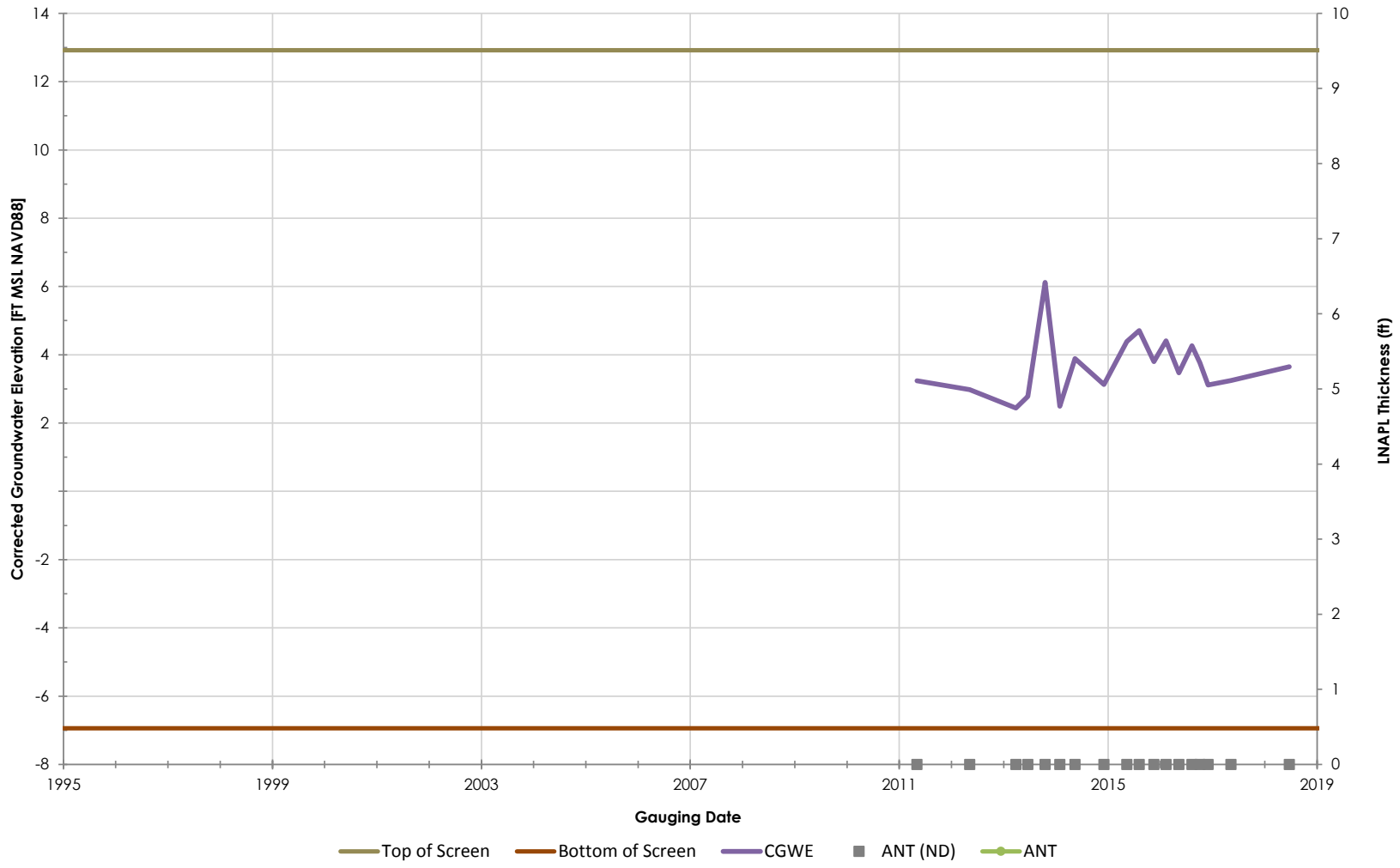
Stantec

Figure/Well No.

S-300

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

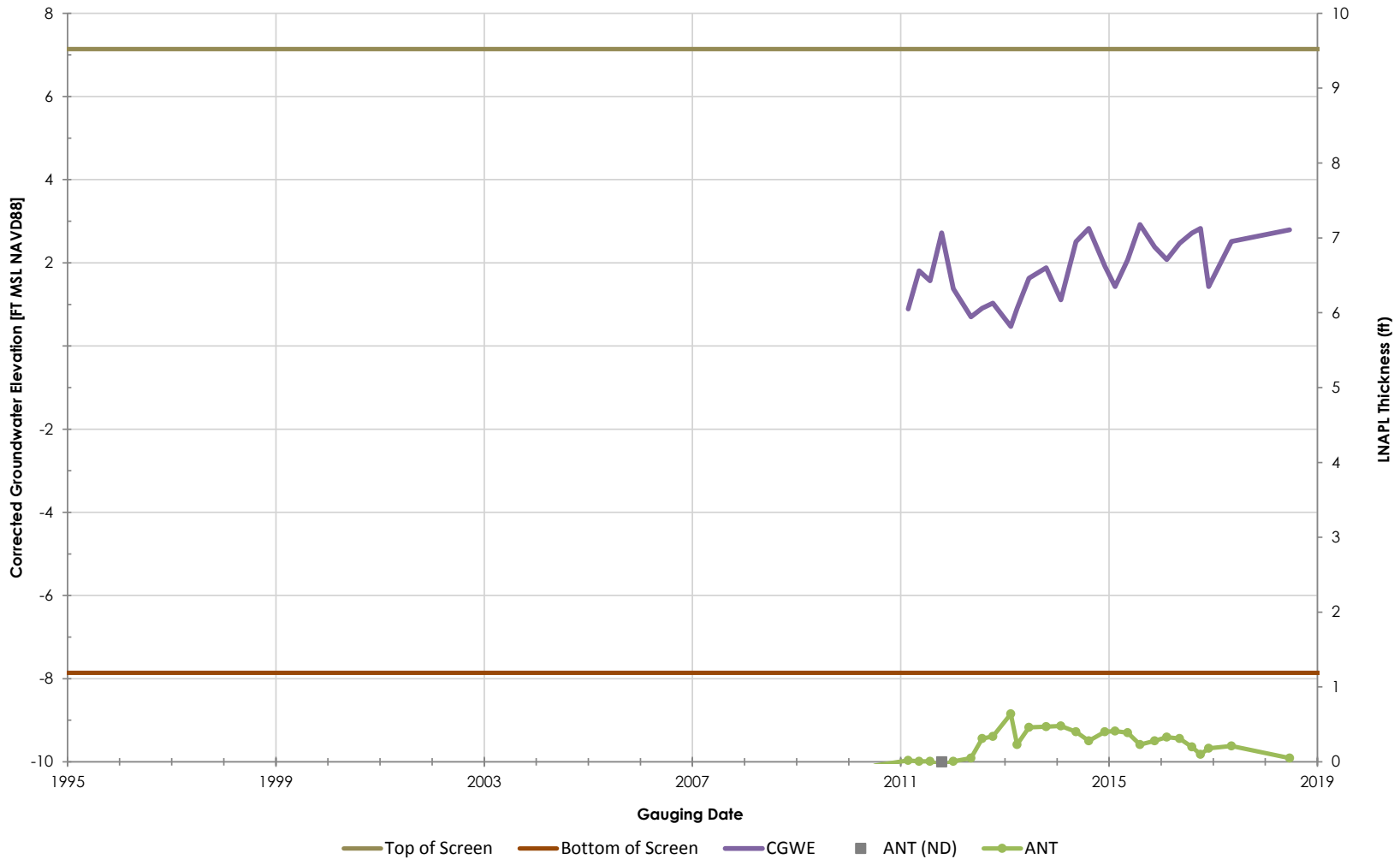
Stantec

Figure/Well No.

S-301

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

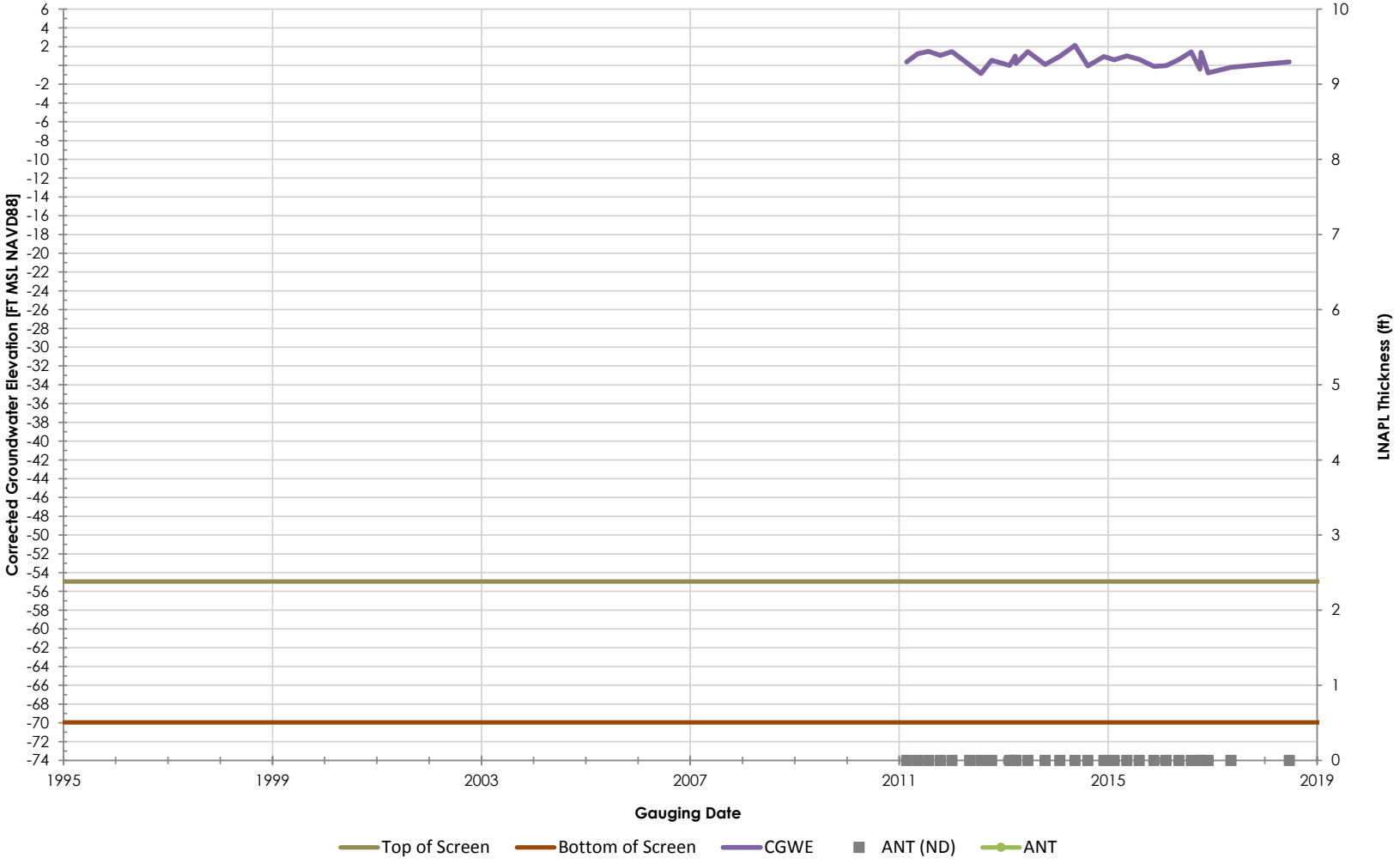
Stantec

Figure/Well No.

S-302

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



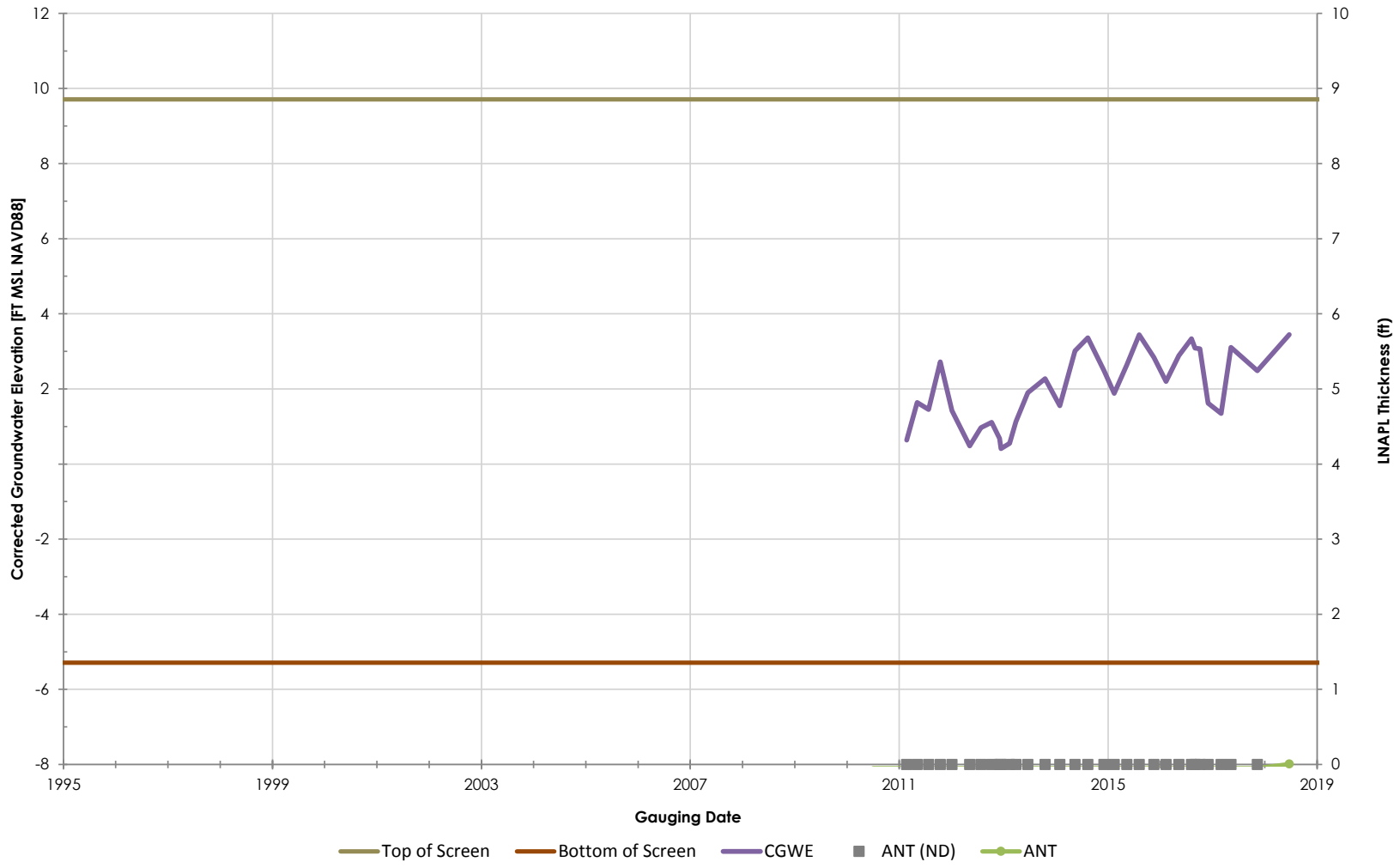
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-302D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

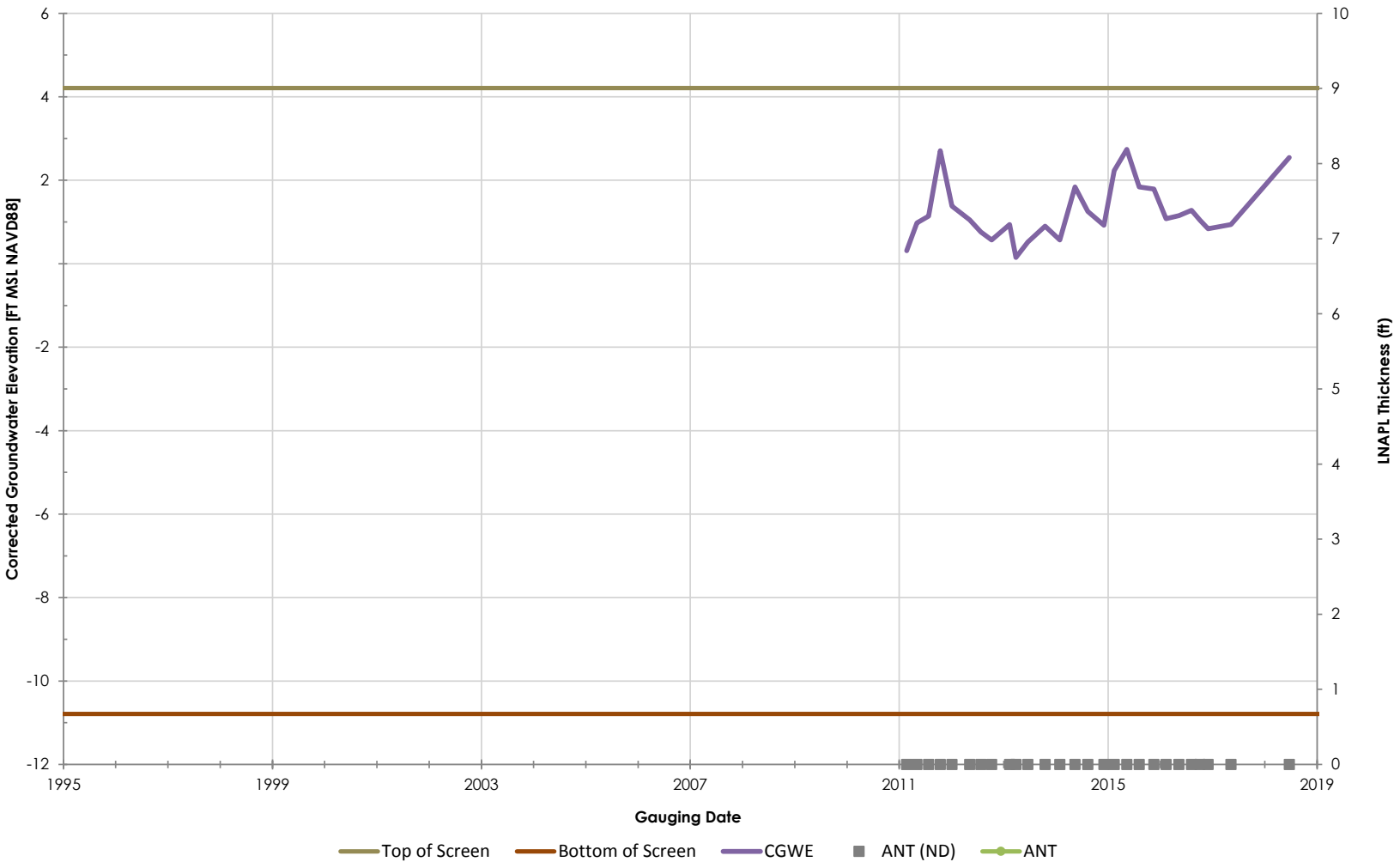
Stantec

Figure/Well No.

S-303

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

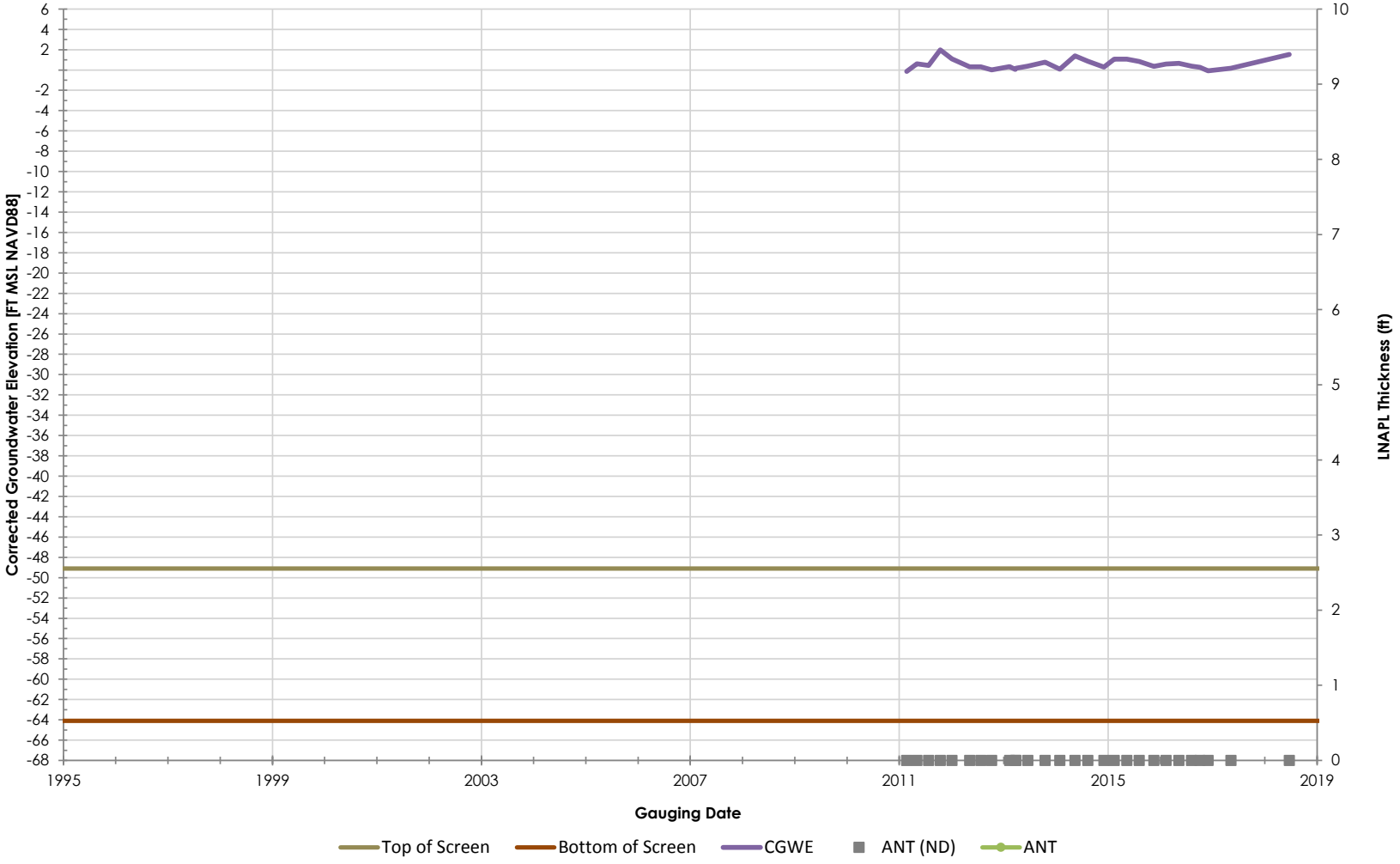
Stantec

Figure/Well No.

S-305

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

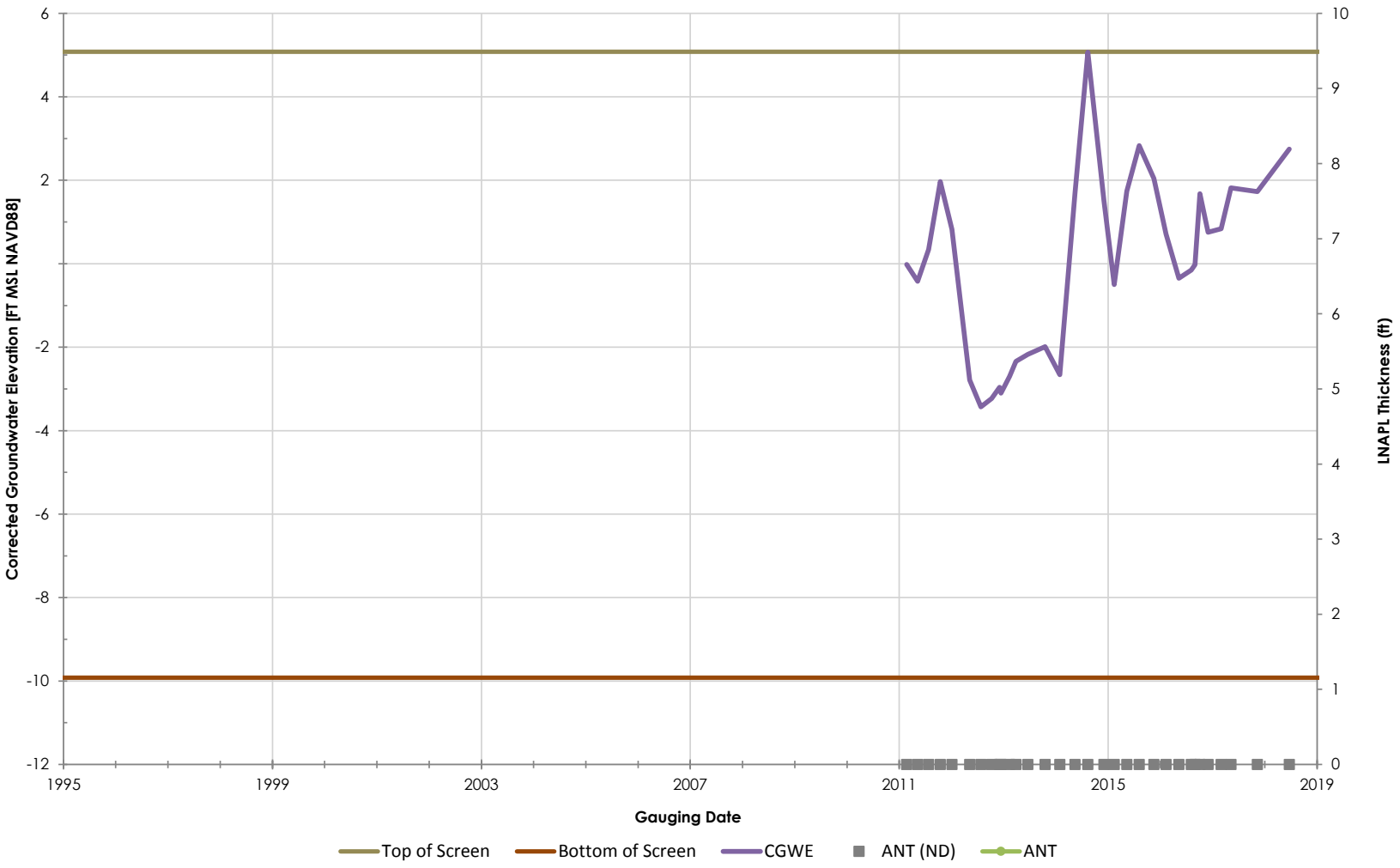
Stantec

Figure/Well No.

S-305D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

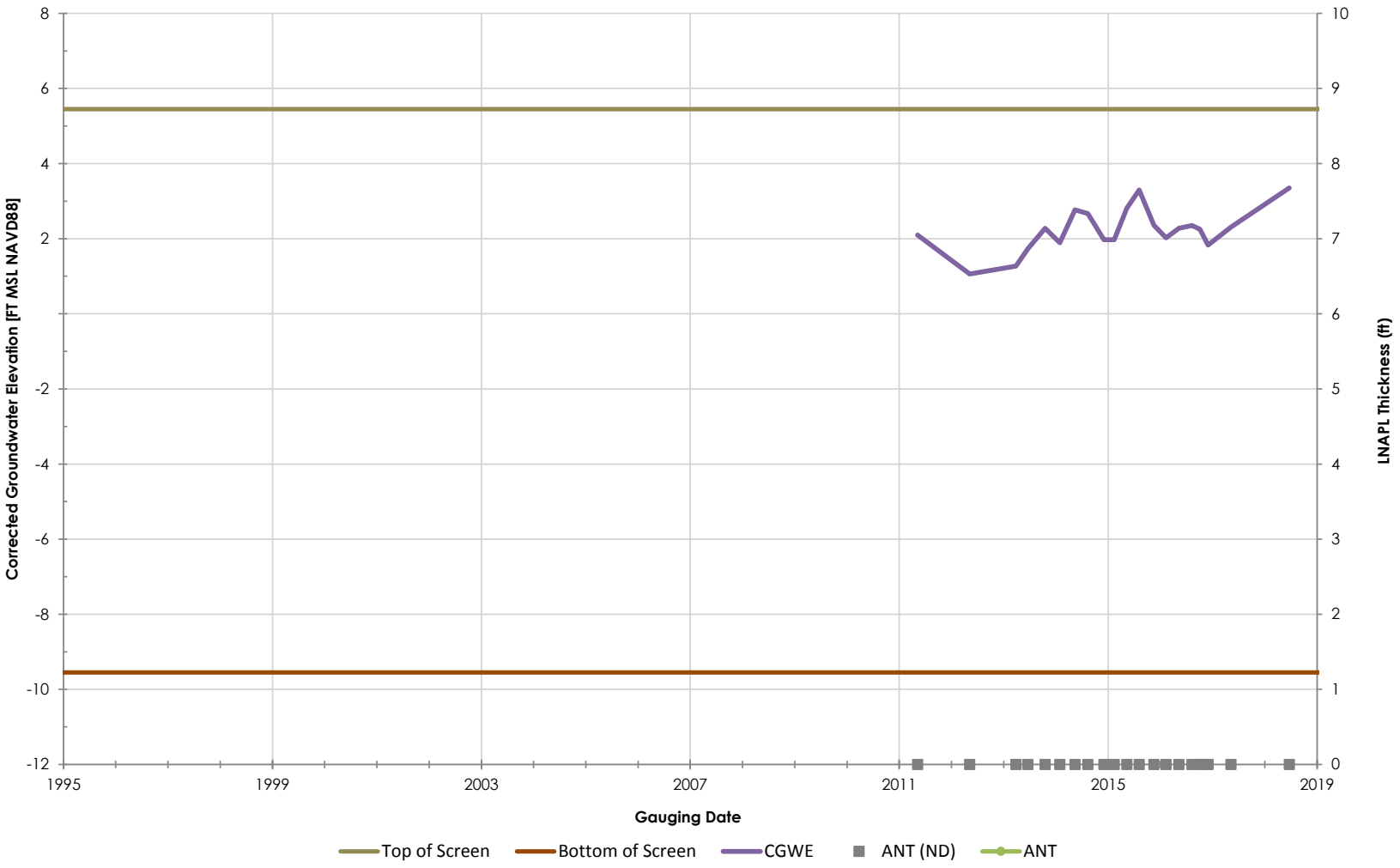
Stantec

Figure/Well No.

S-306

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

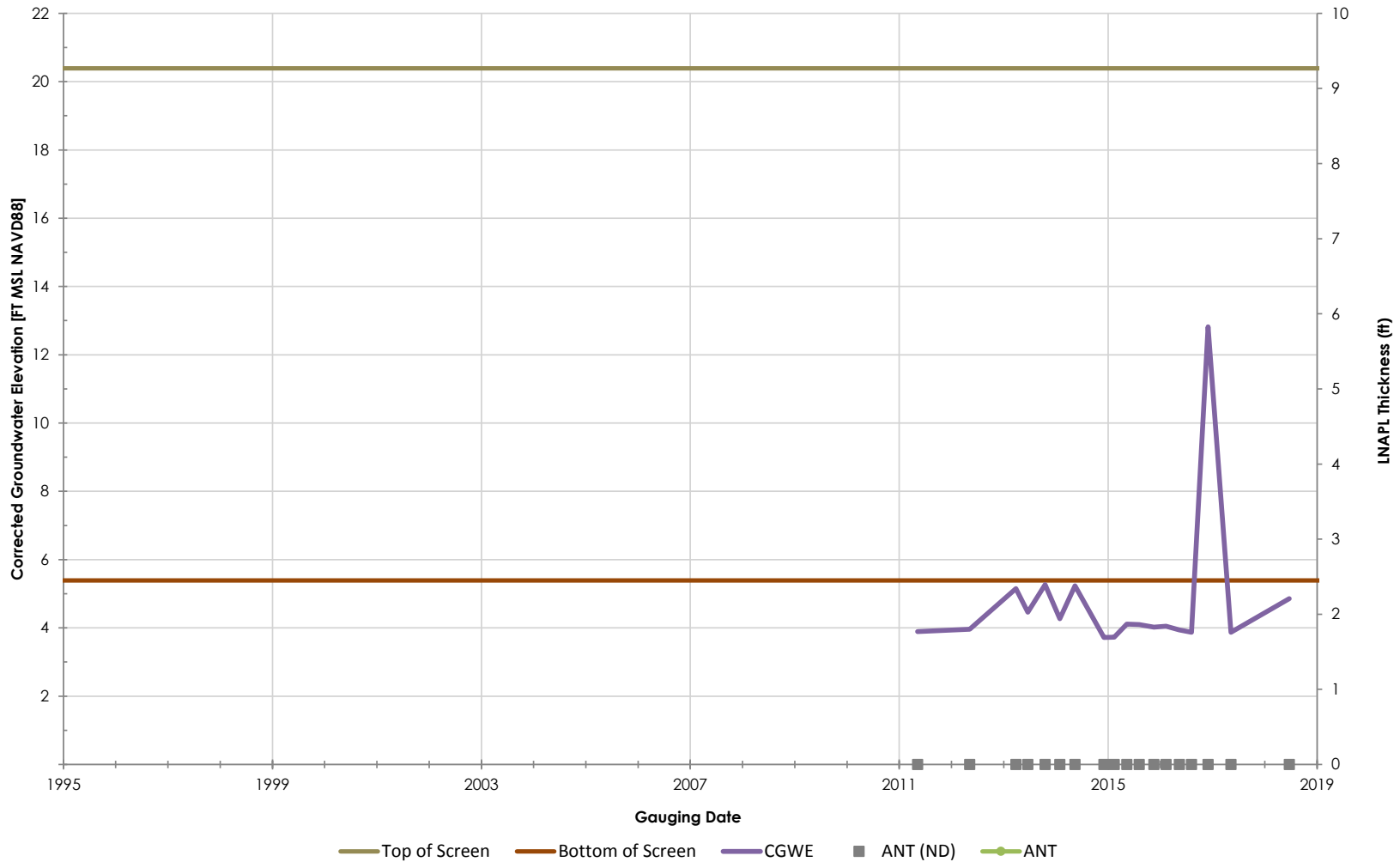
Stantec

Figure/Well No.

S-307

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

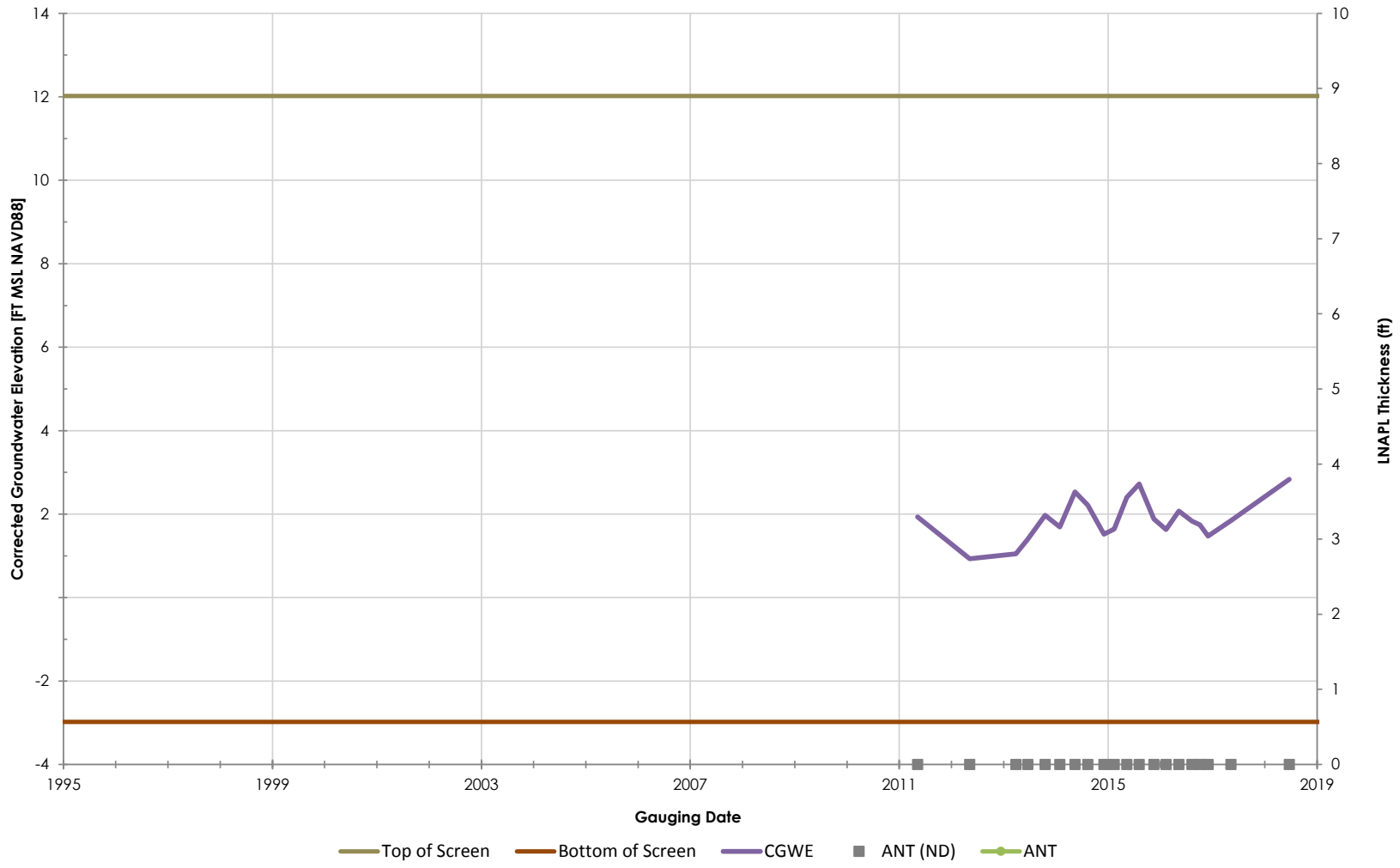
Stantec

Figure/Well No.

S-308

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

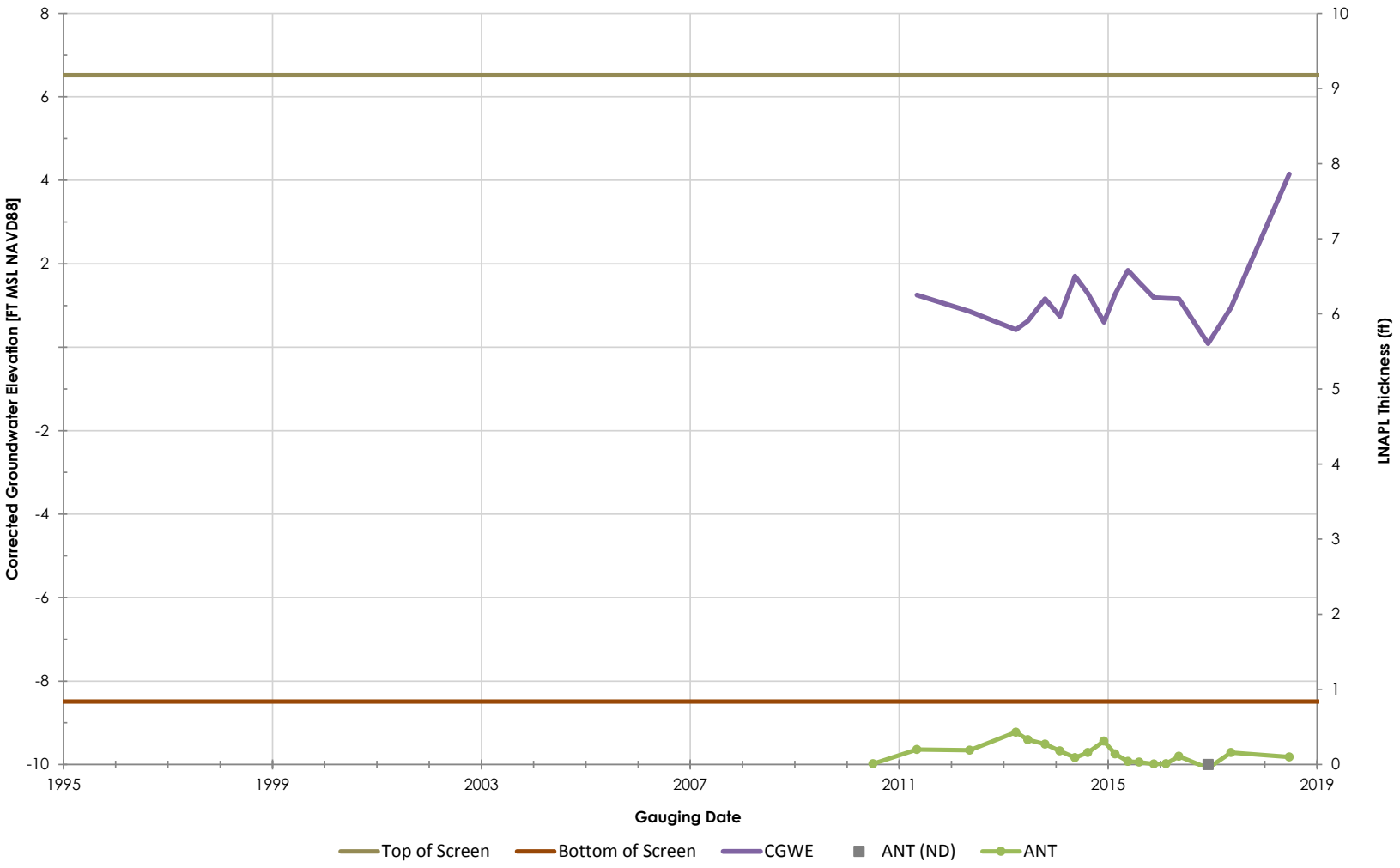
Stantec

Figure/Well No.

S-309

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

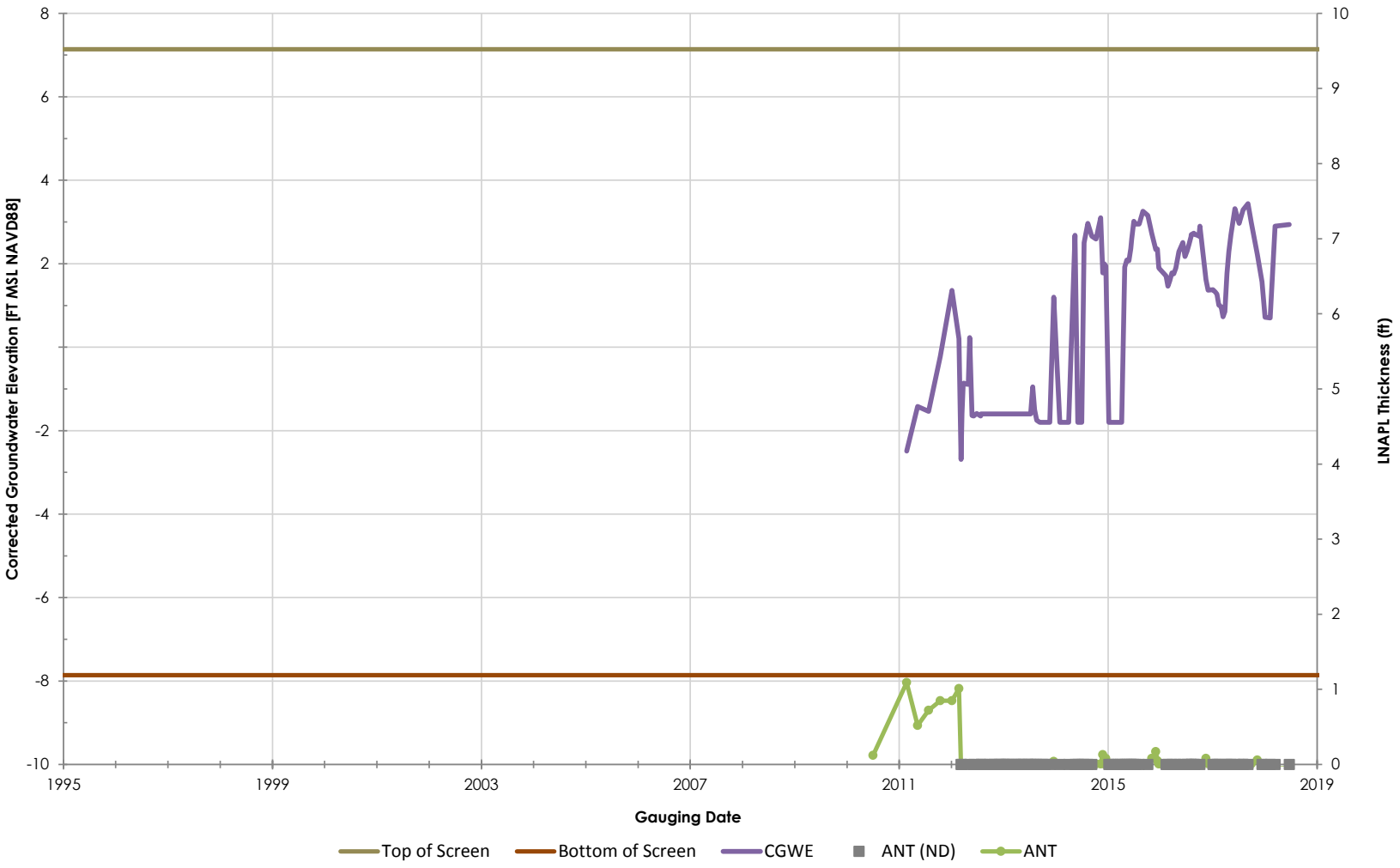
Stantec

Figure/Well No.

S-311

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

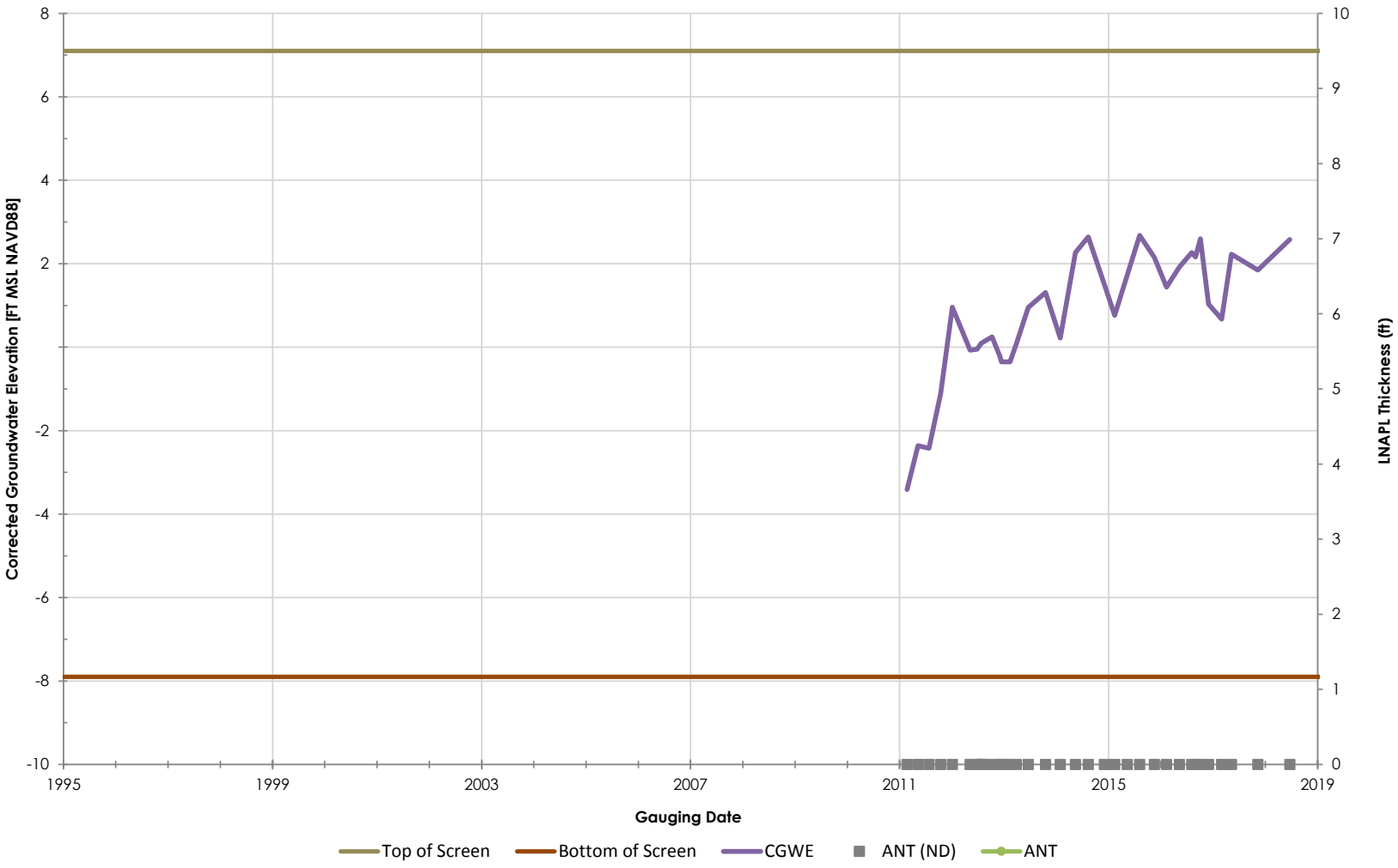
Stantec

Figure/Well No.

S-313

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

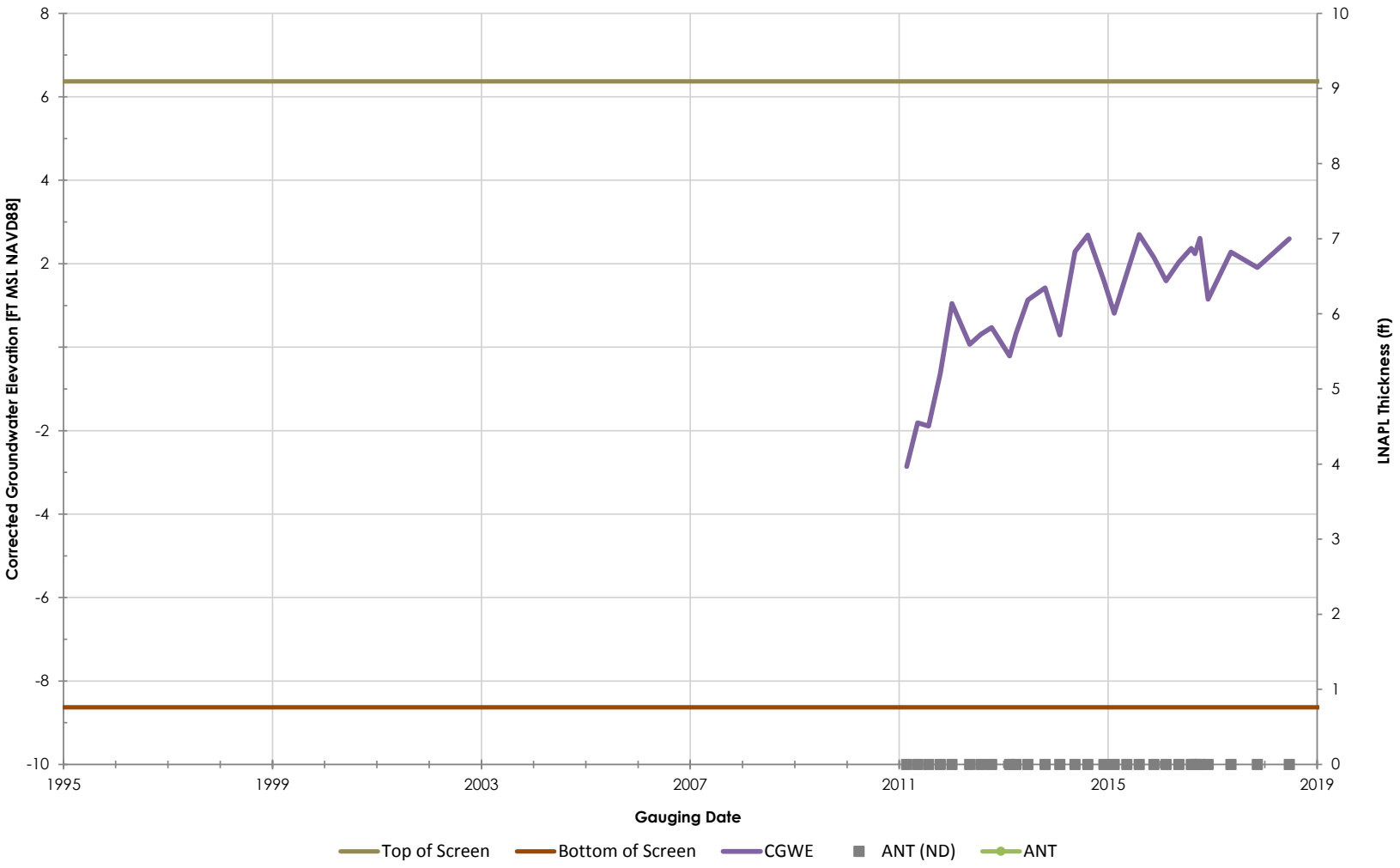
Stantec

Figure/Well No.

S-314

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

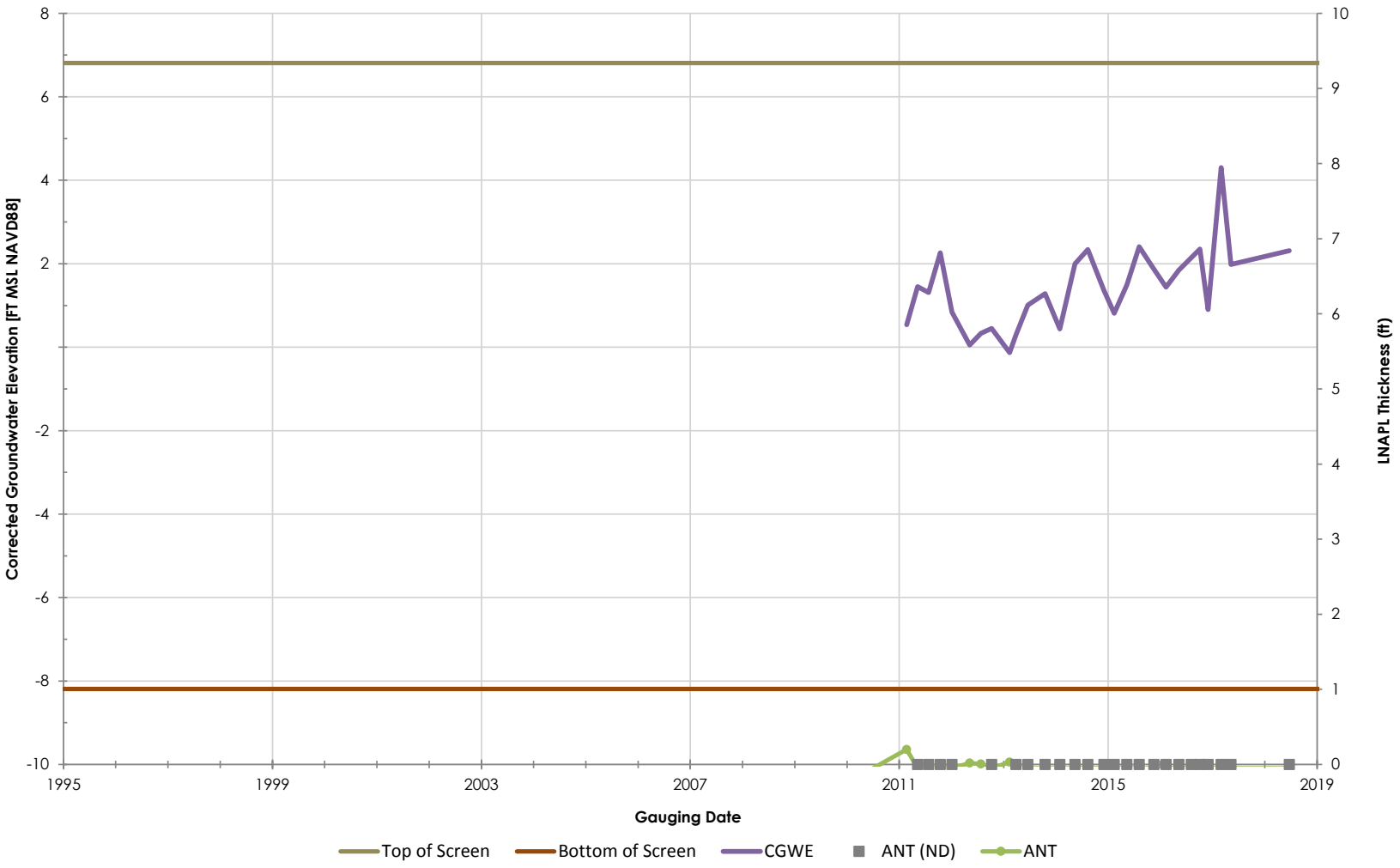
Stantec

Figure/Well No.

S-317

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

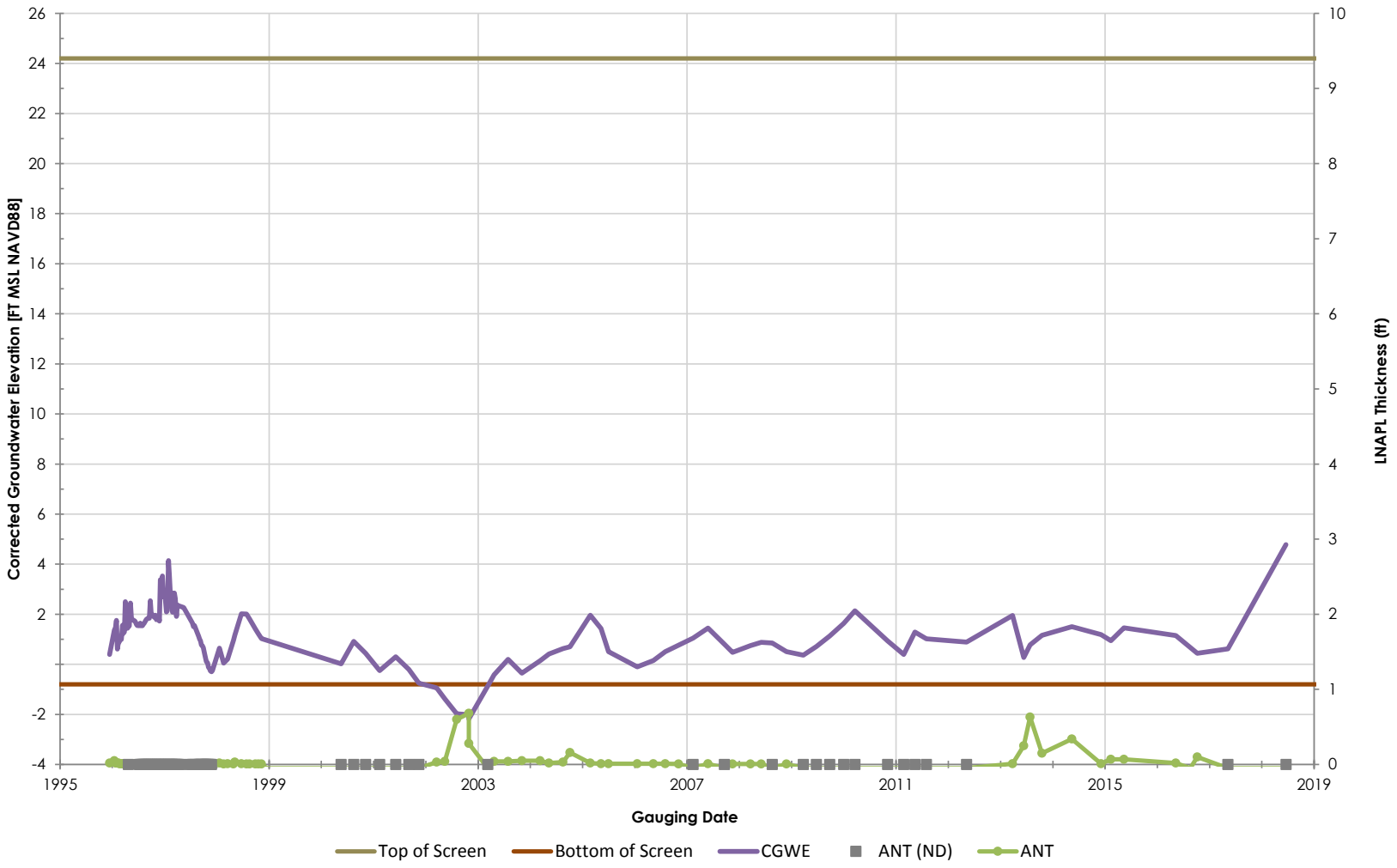
Stantec

Figure/Well No.

S-318

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

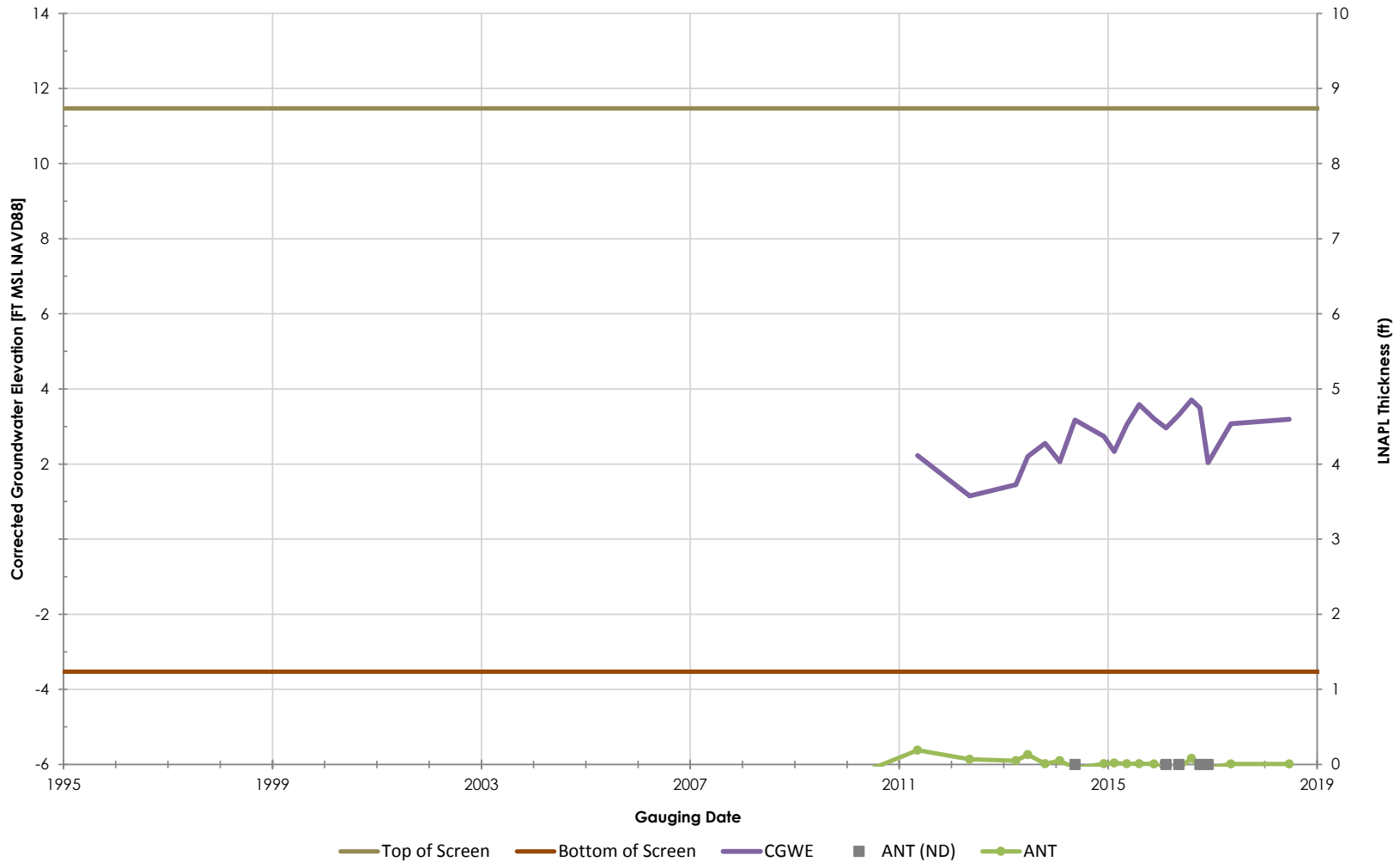
Stantec

Figure/Well No.

S-32

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

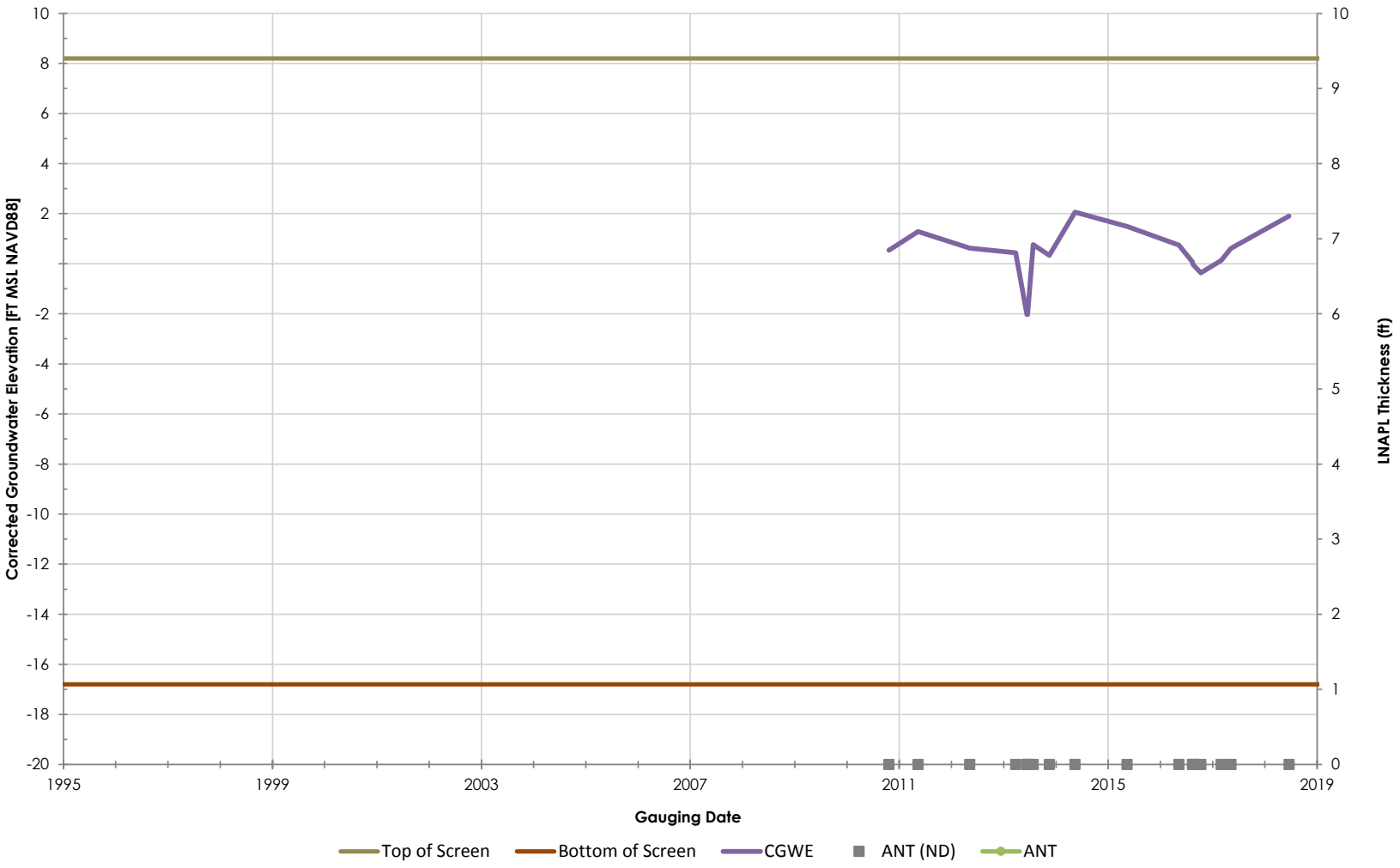
Stantec

Figure/Well No.

S-328

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

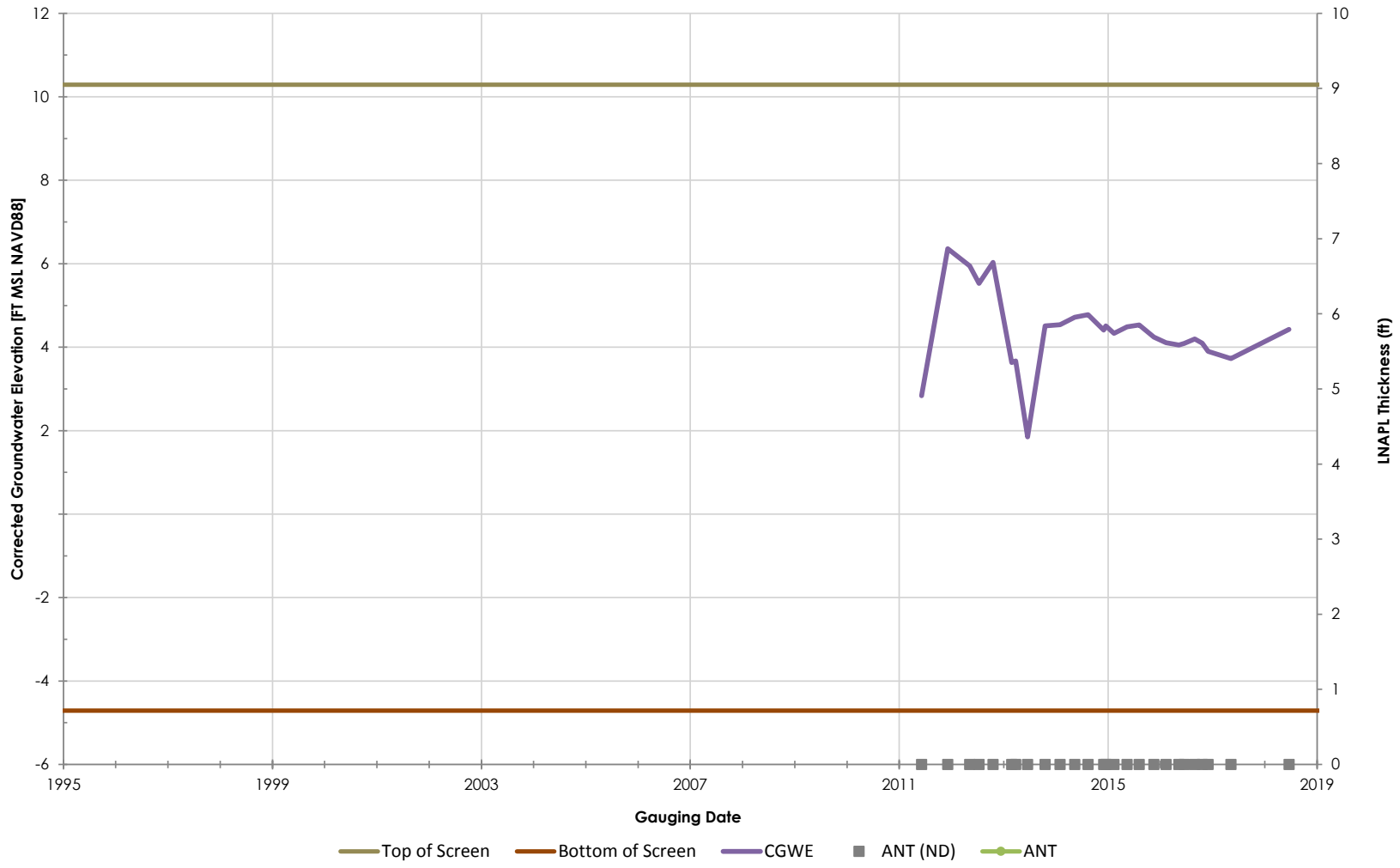
Stantec

Figure/Well No.

S-329

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

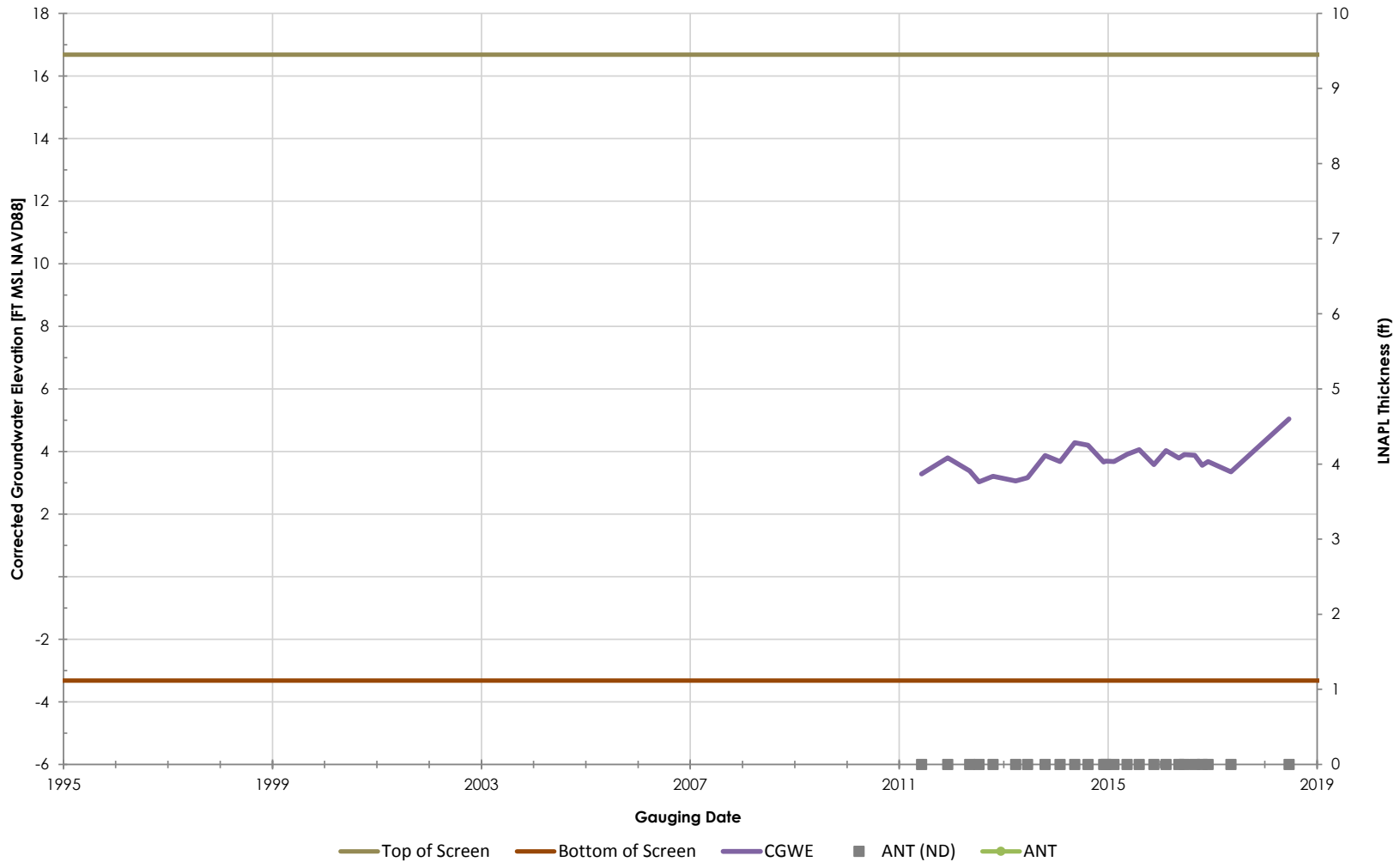
Stantec

Figure/Well No.

S-330

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

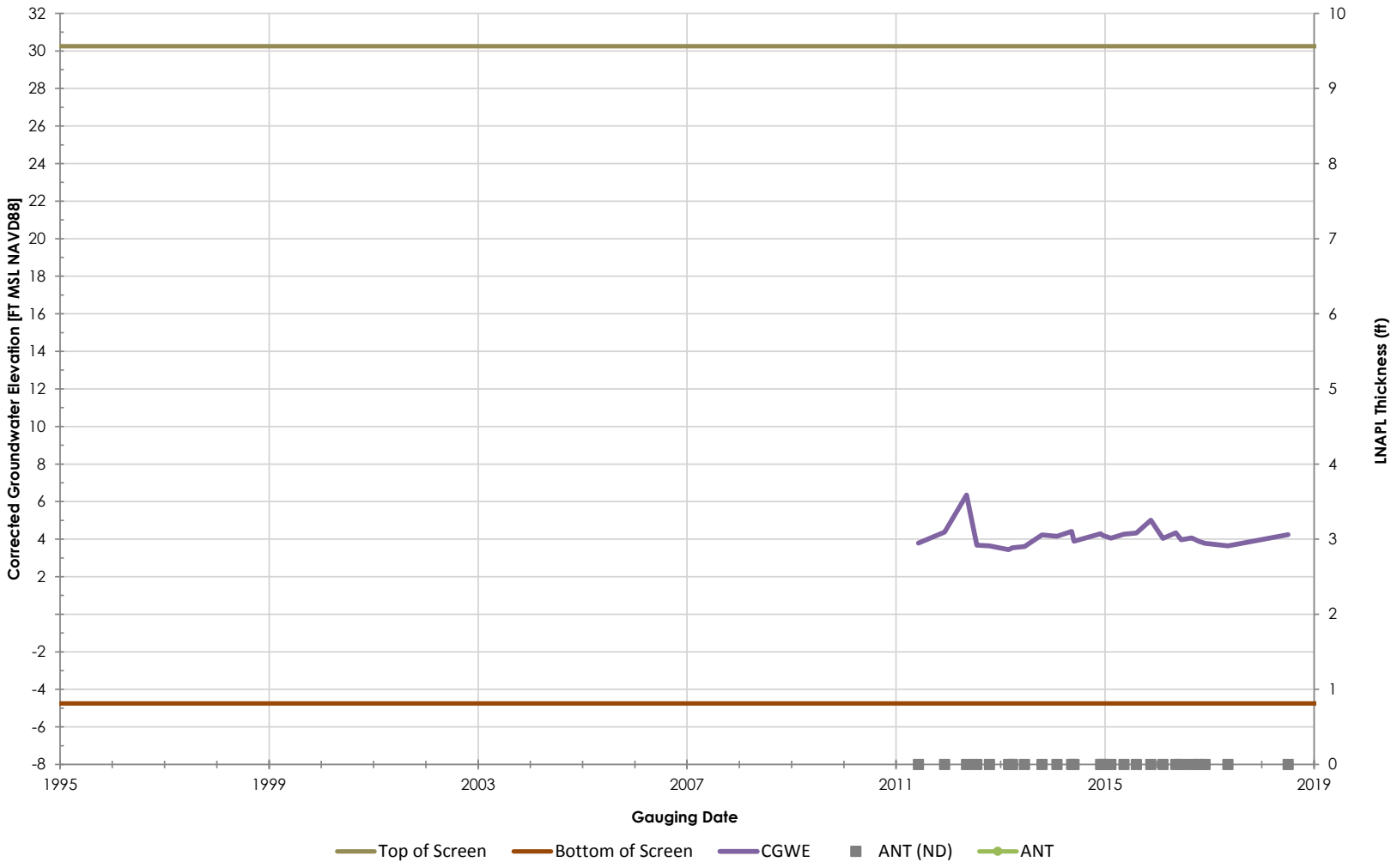
Stantec

Figure/Well No.

S-331

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

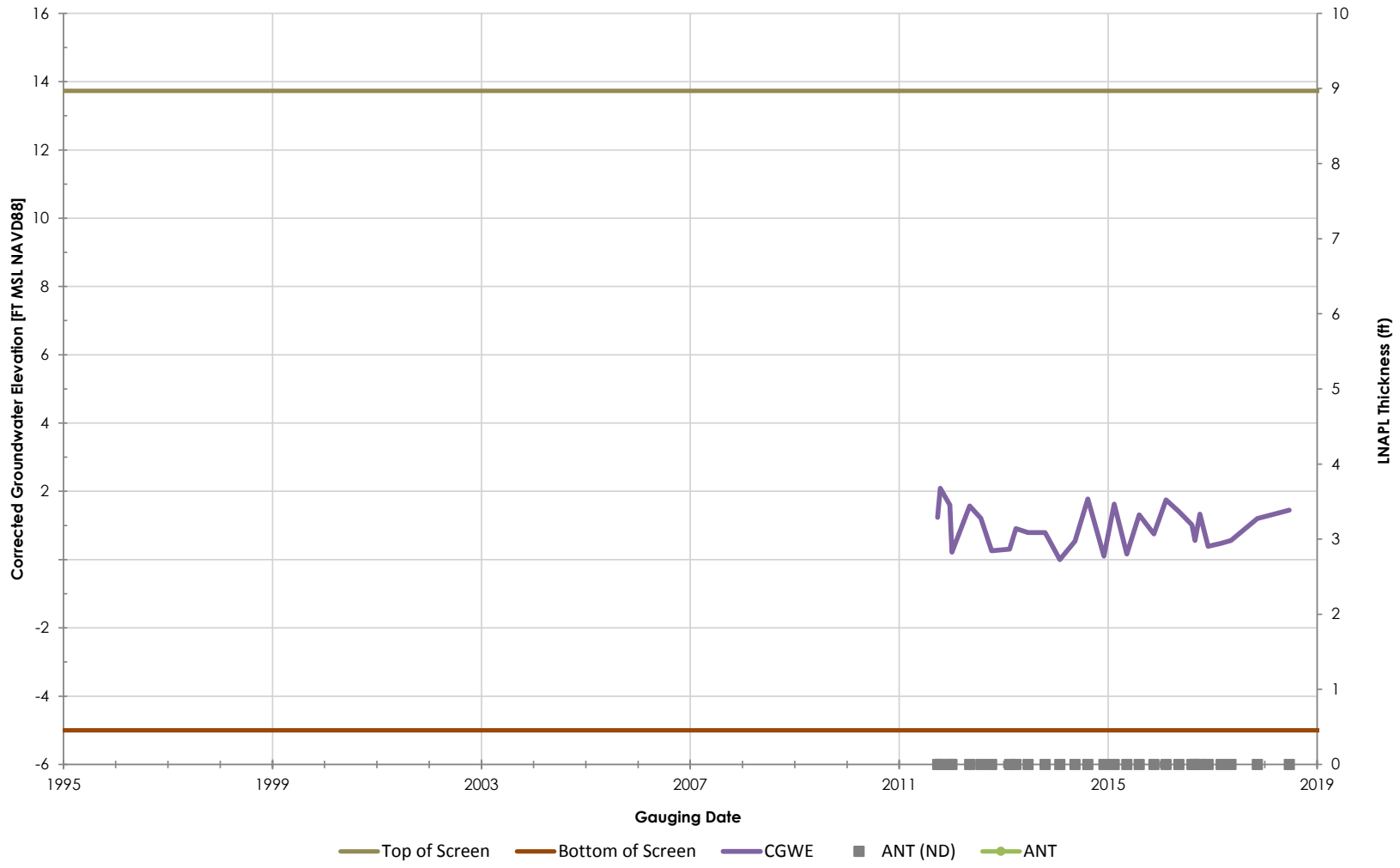
Stantec

Figure/Well No.

S-332

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

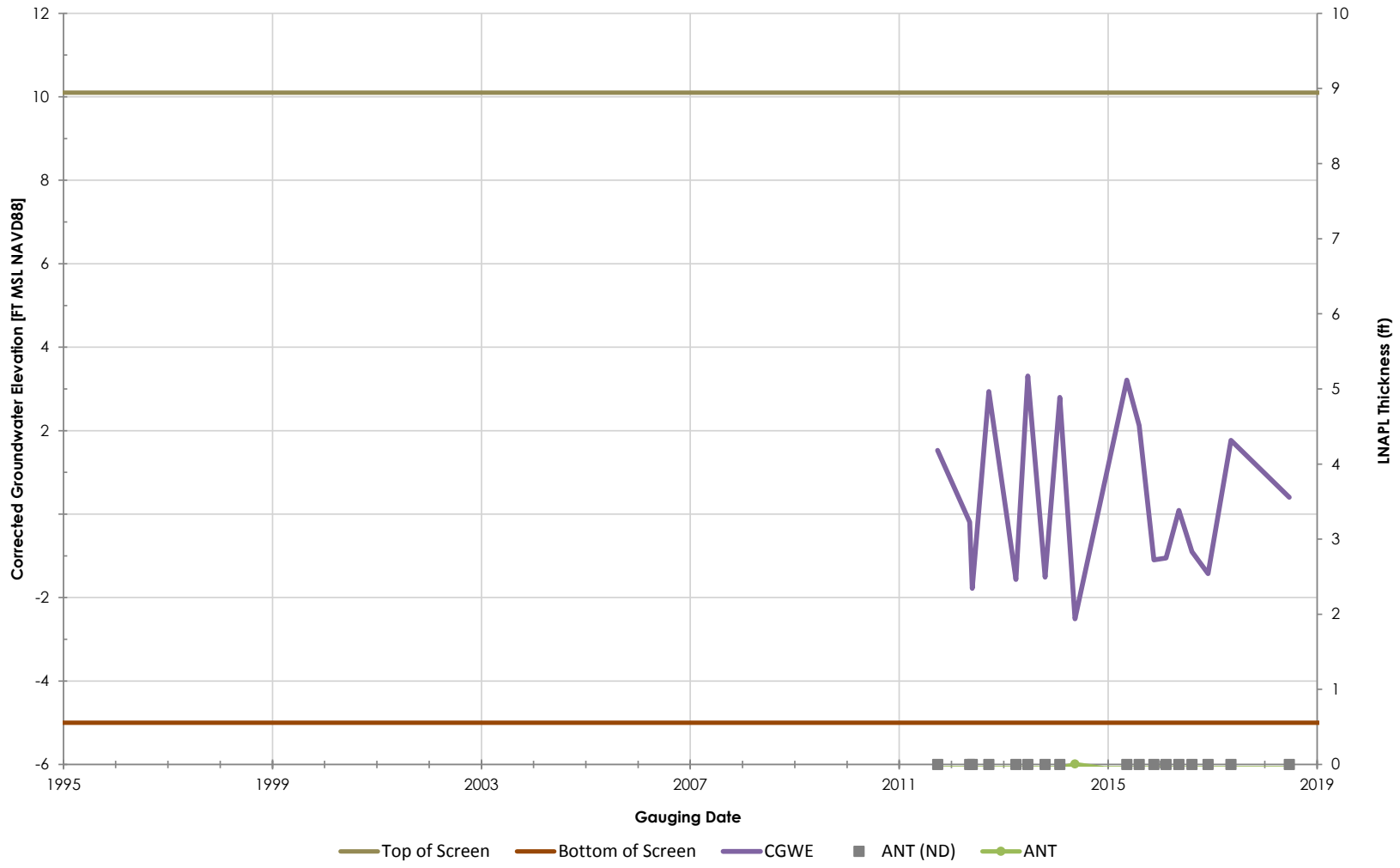
Stantec

Figure/Well No.

S-333

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

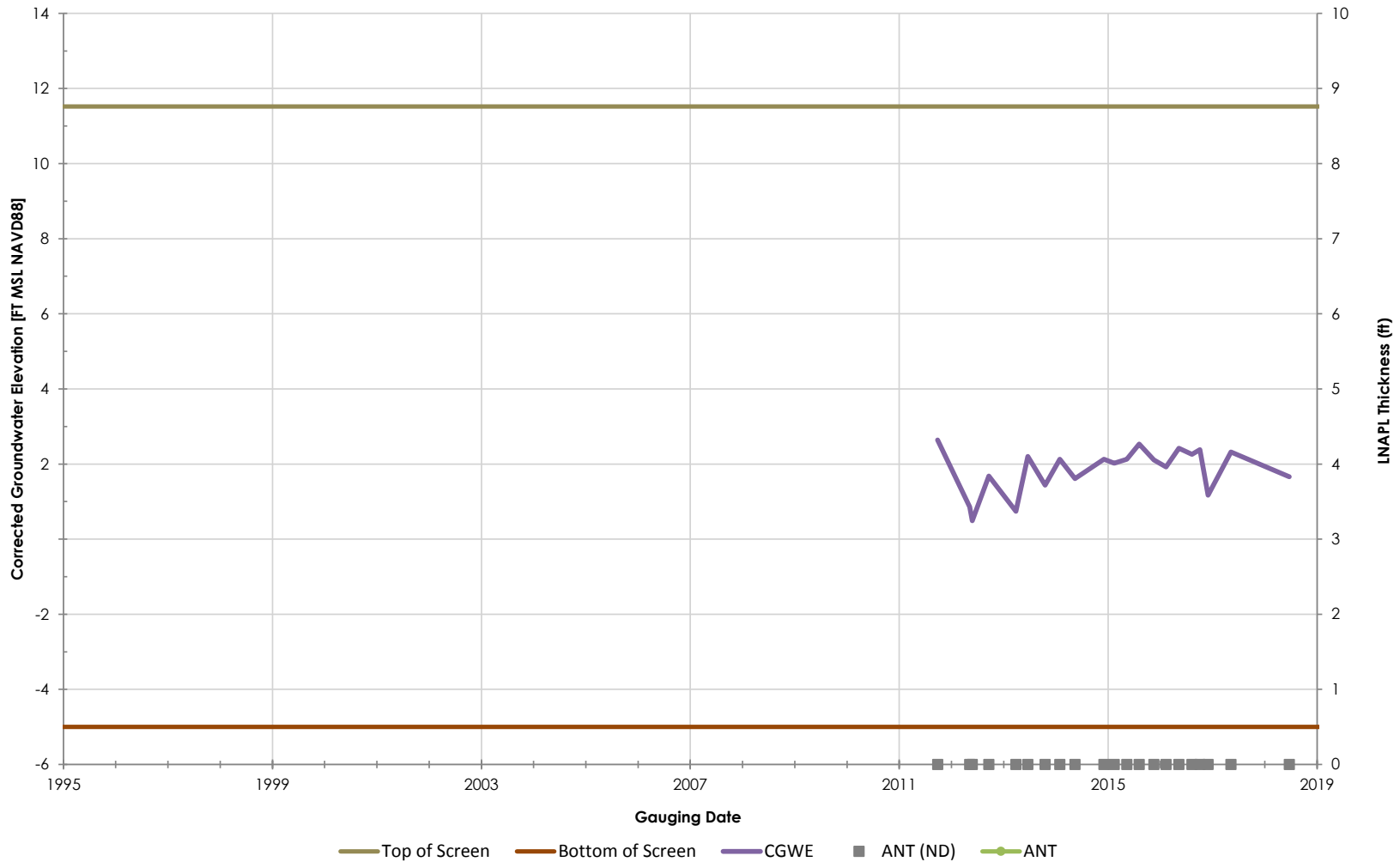
Stantec

Figure/Well No.

S-335

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

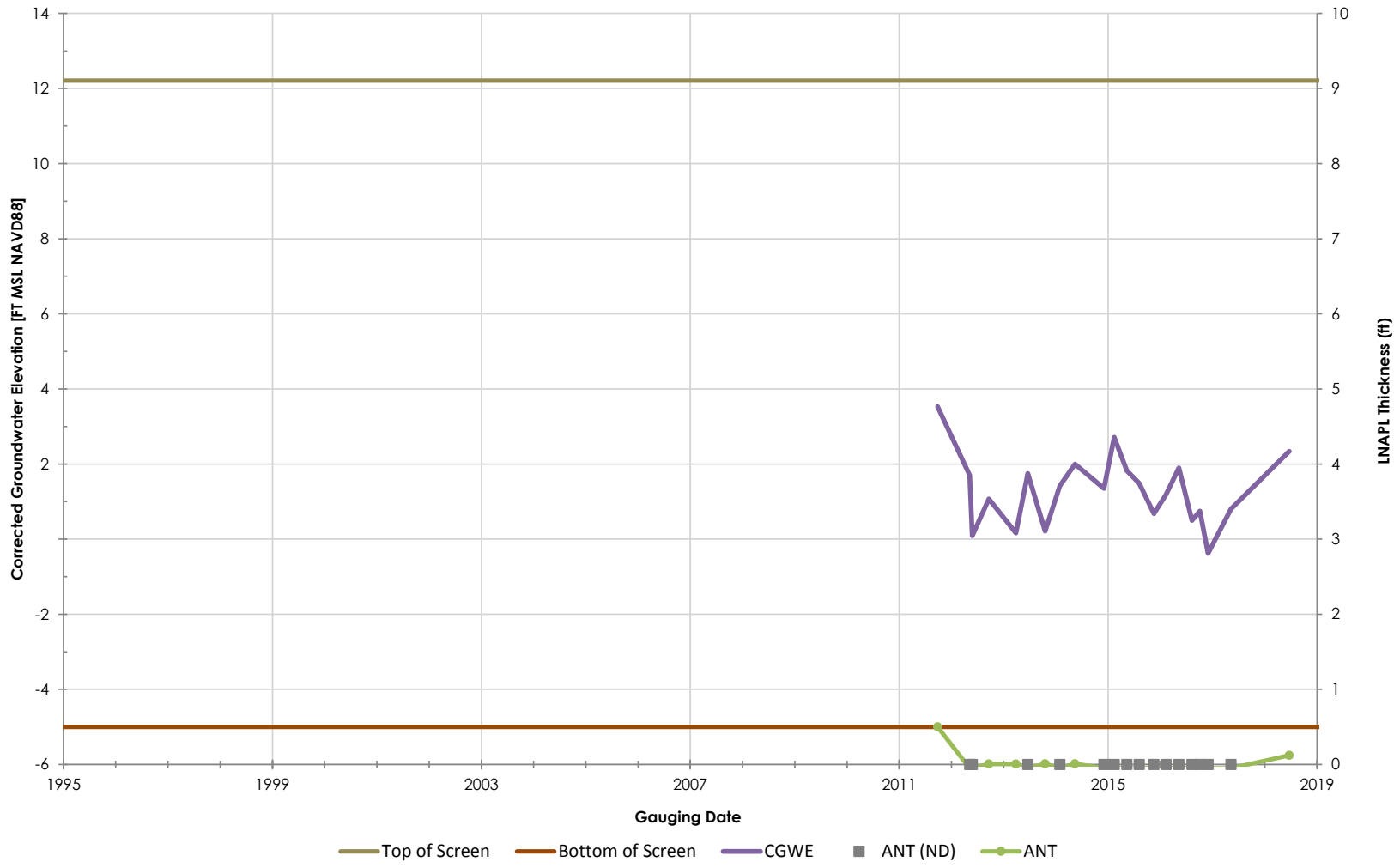
Stantec

Figure/Well No.

S-336

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

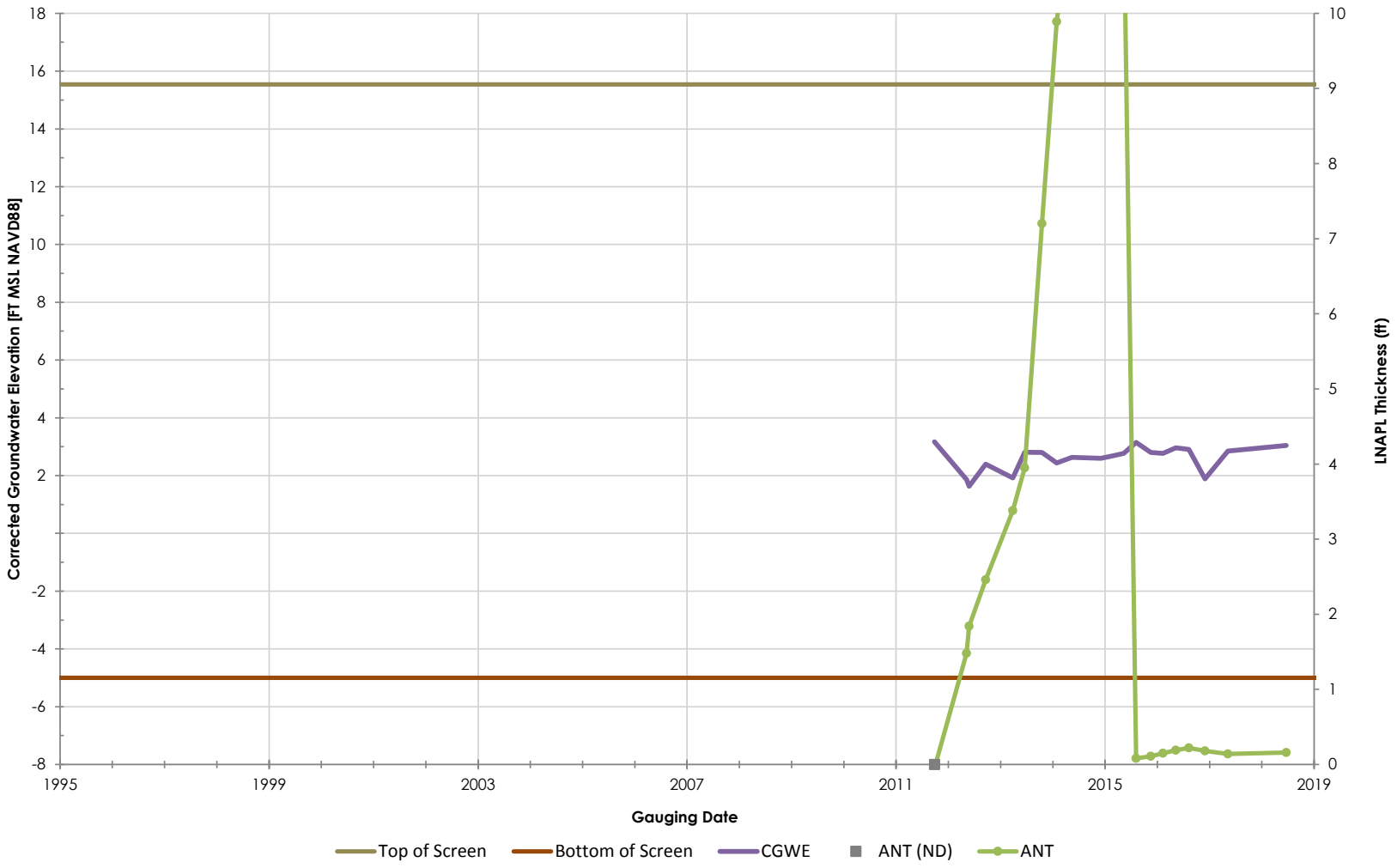
Stantec

Figure/Well No.

S-337

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

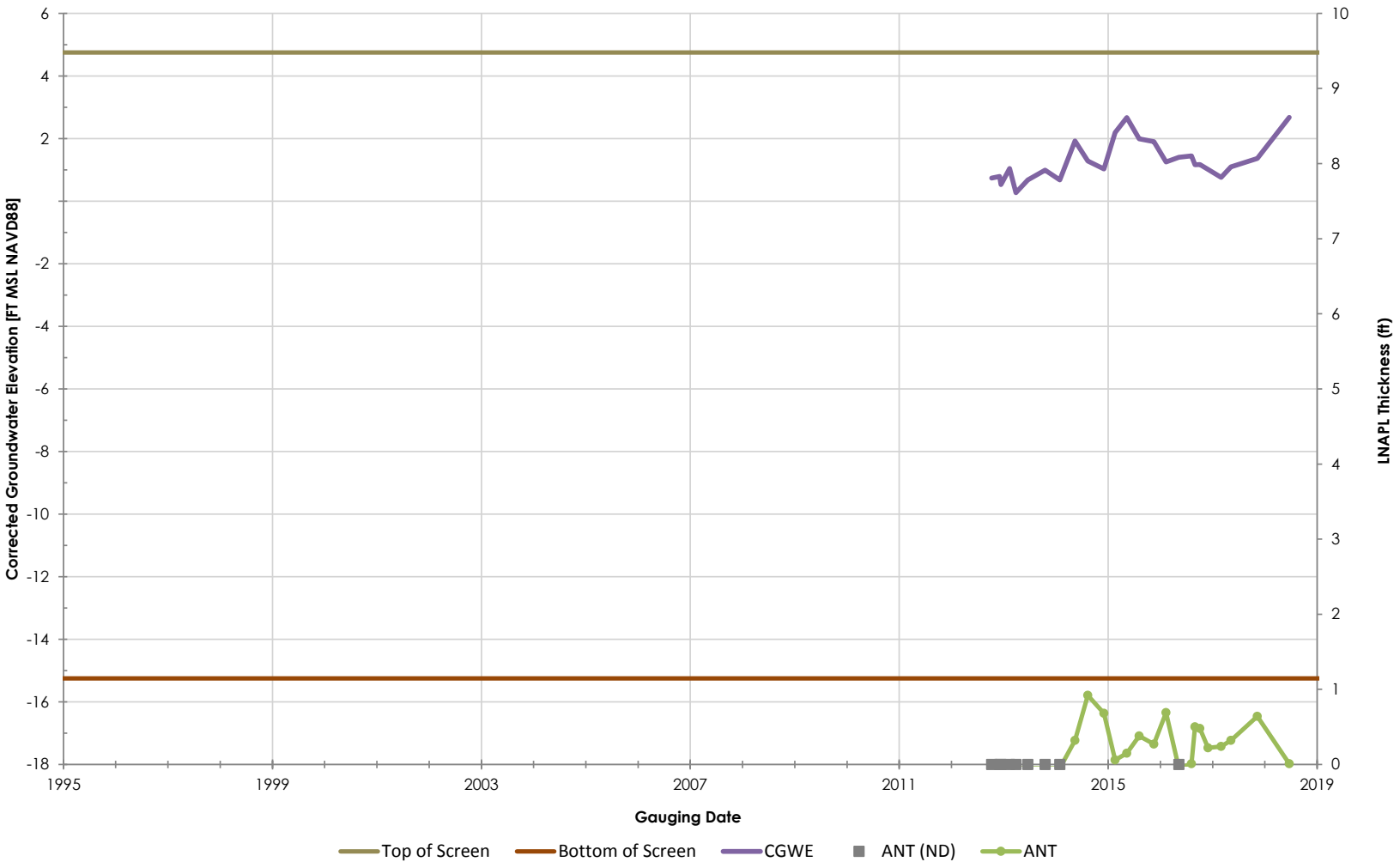
Stantec

Figure/Well No.

S-338

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

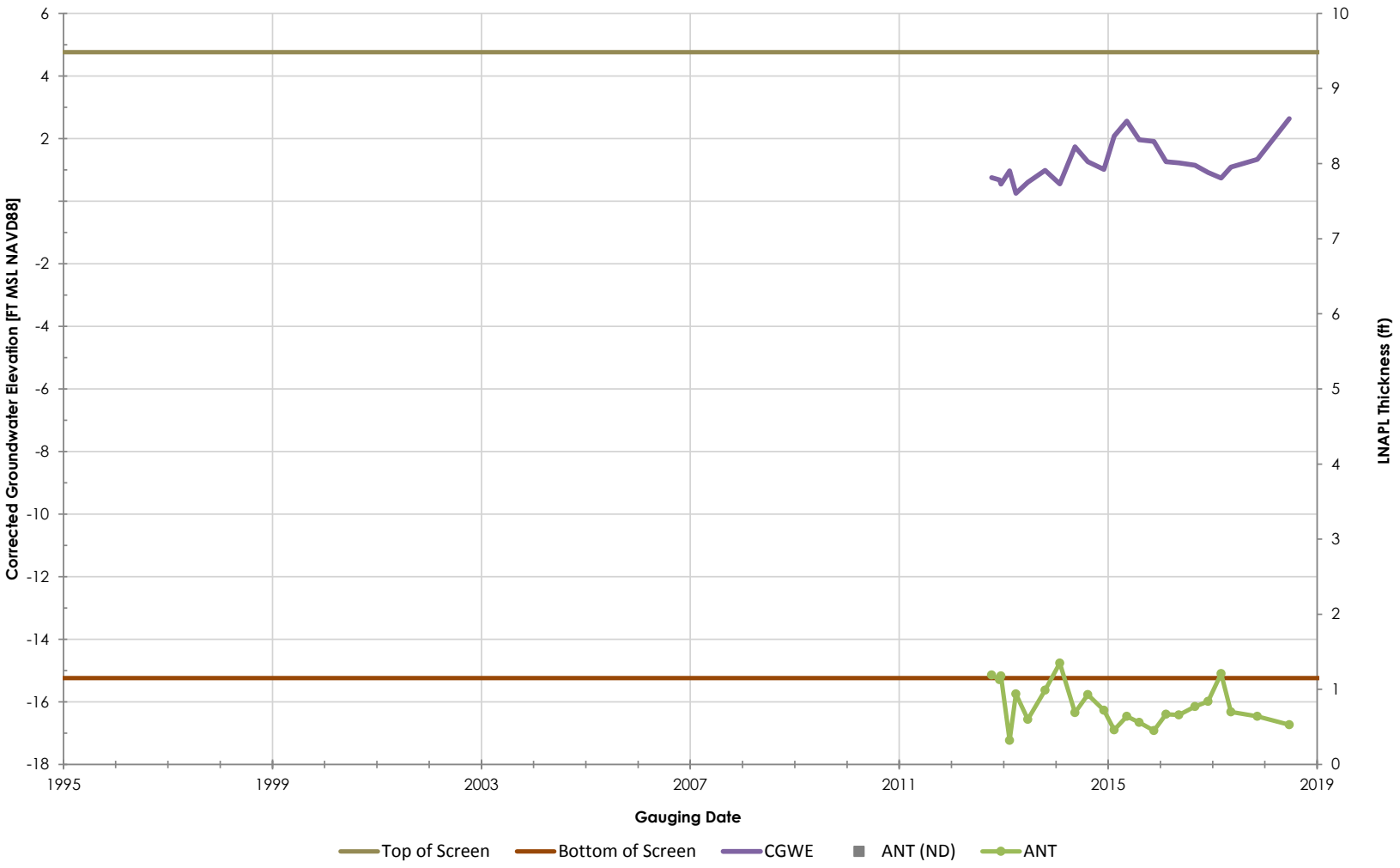
Stantec

Figure/Well No.

S-346

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

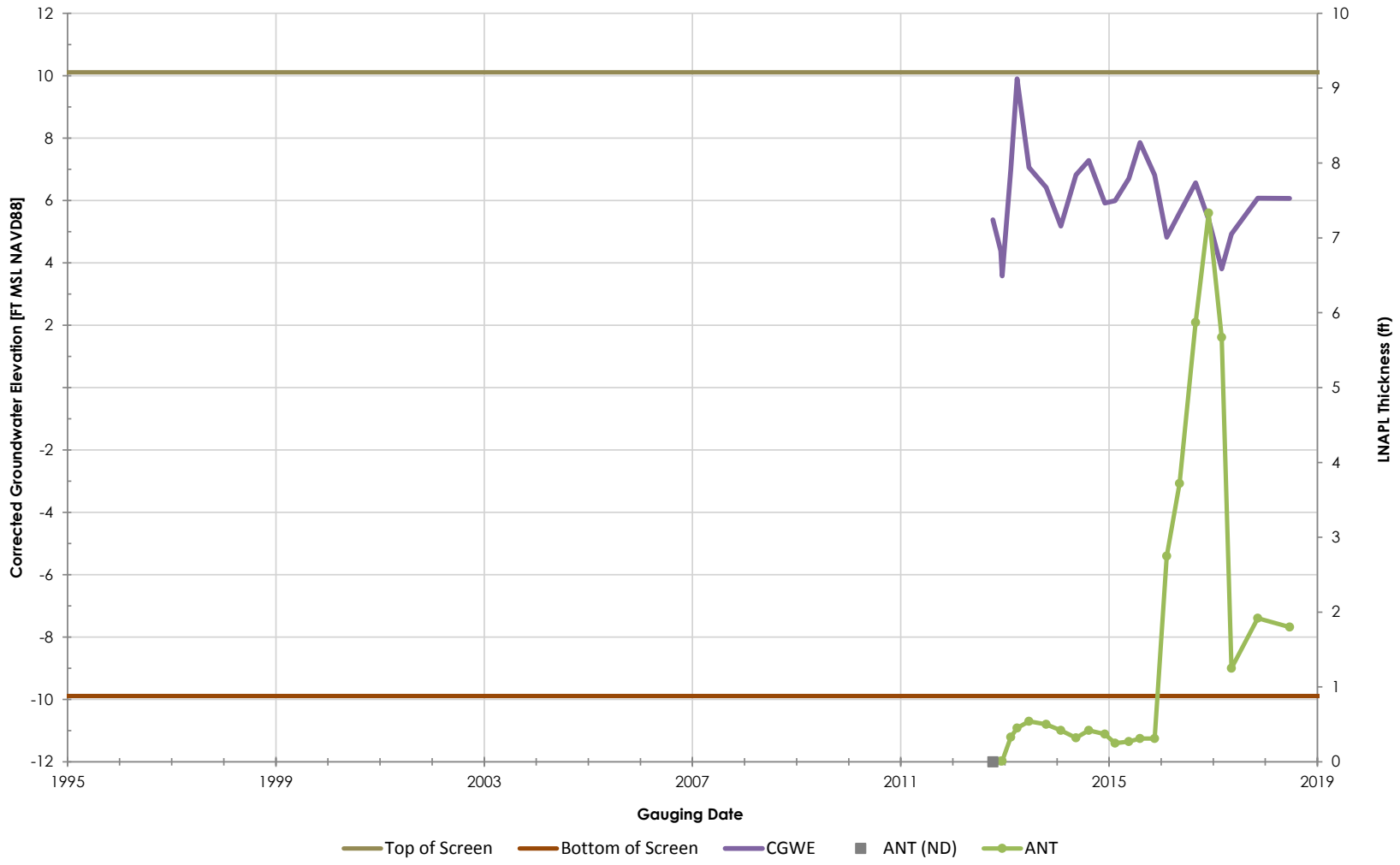
Stantec

Figure/Well No.

S-347

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

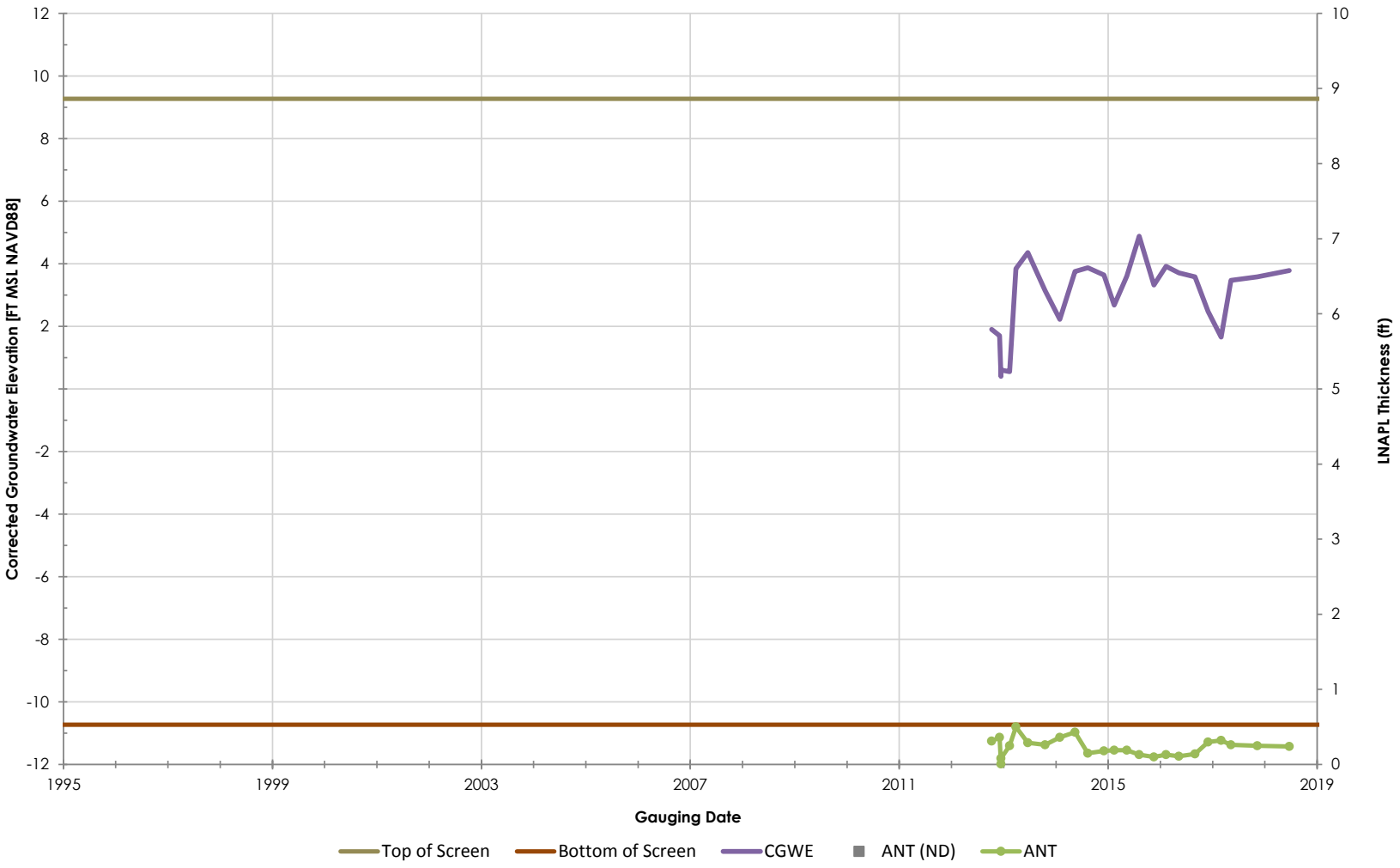
Stantec

Figure/Well No.

S-348

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

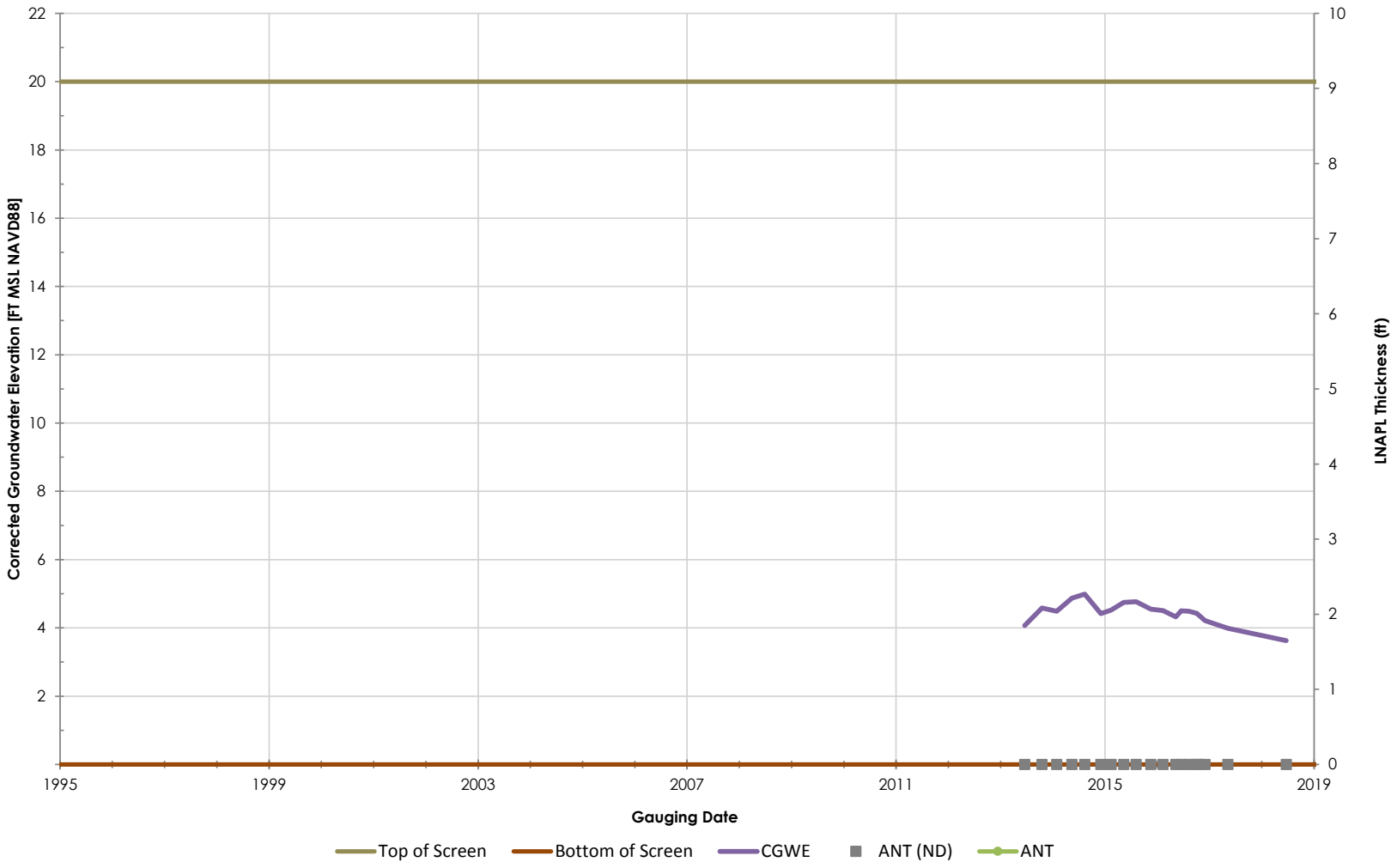
Stantec

Figure/Well No.

S-349

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

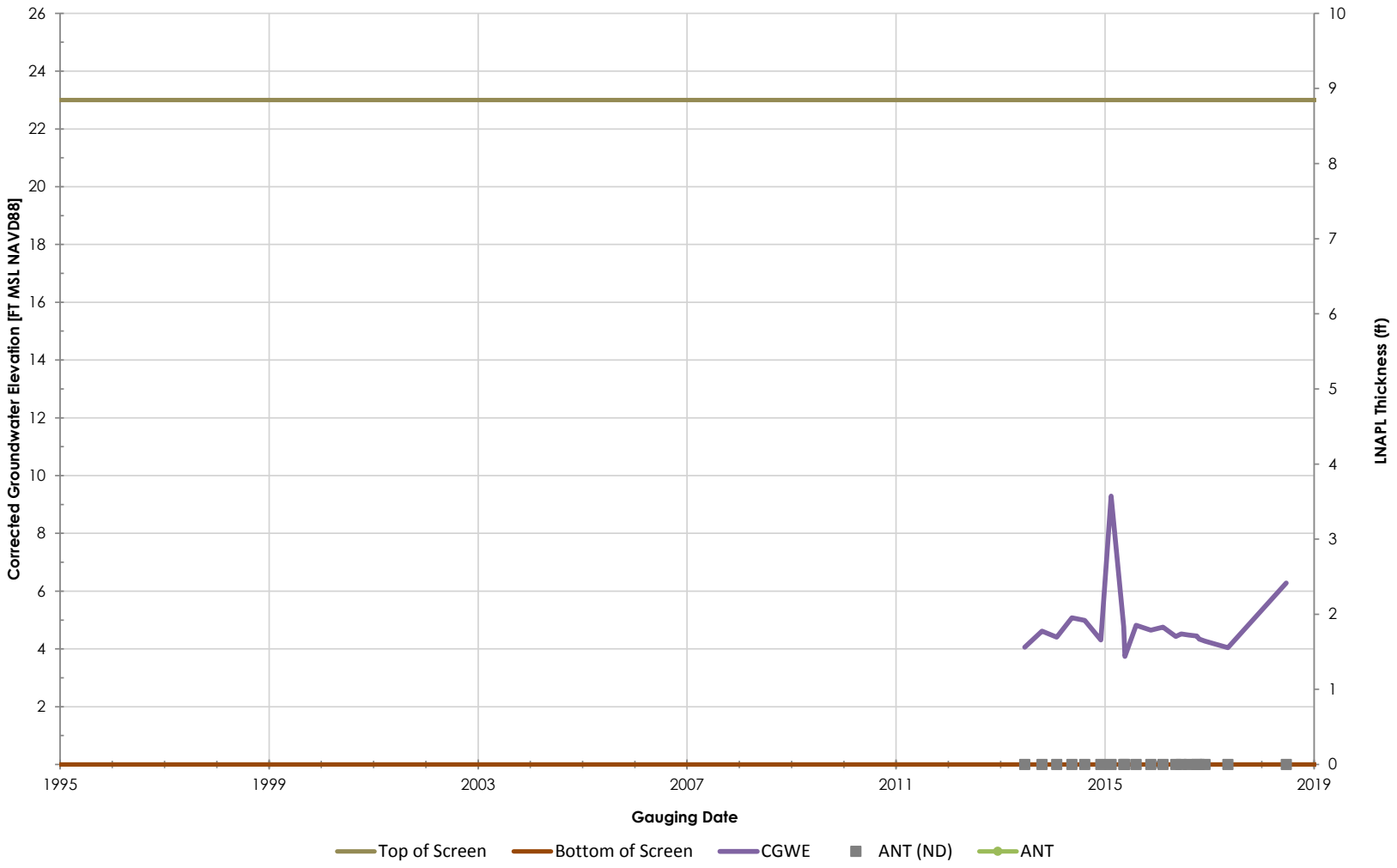
Stantec

Figure/Well No.

S-350

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

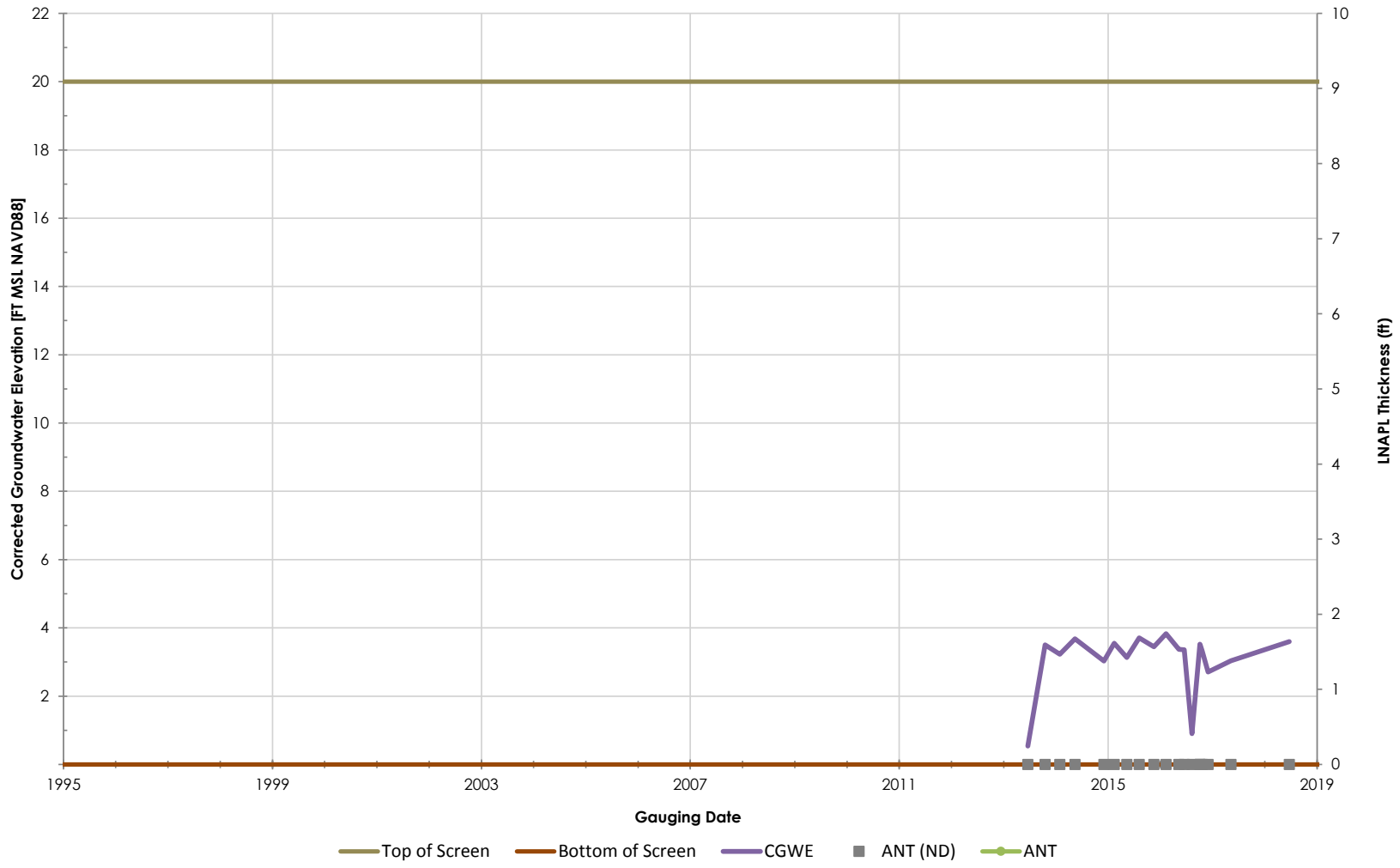
Stantec

Figure/Well No.

S-351

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

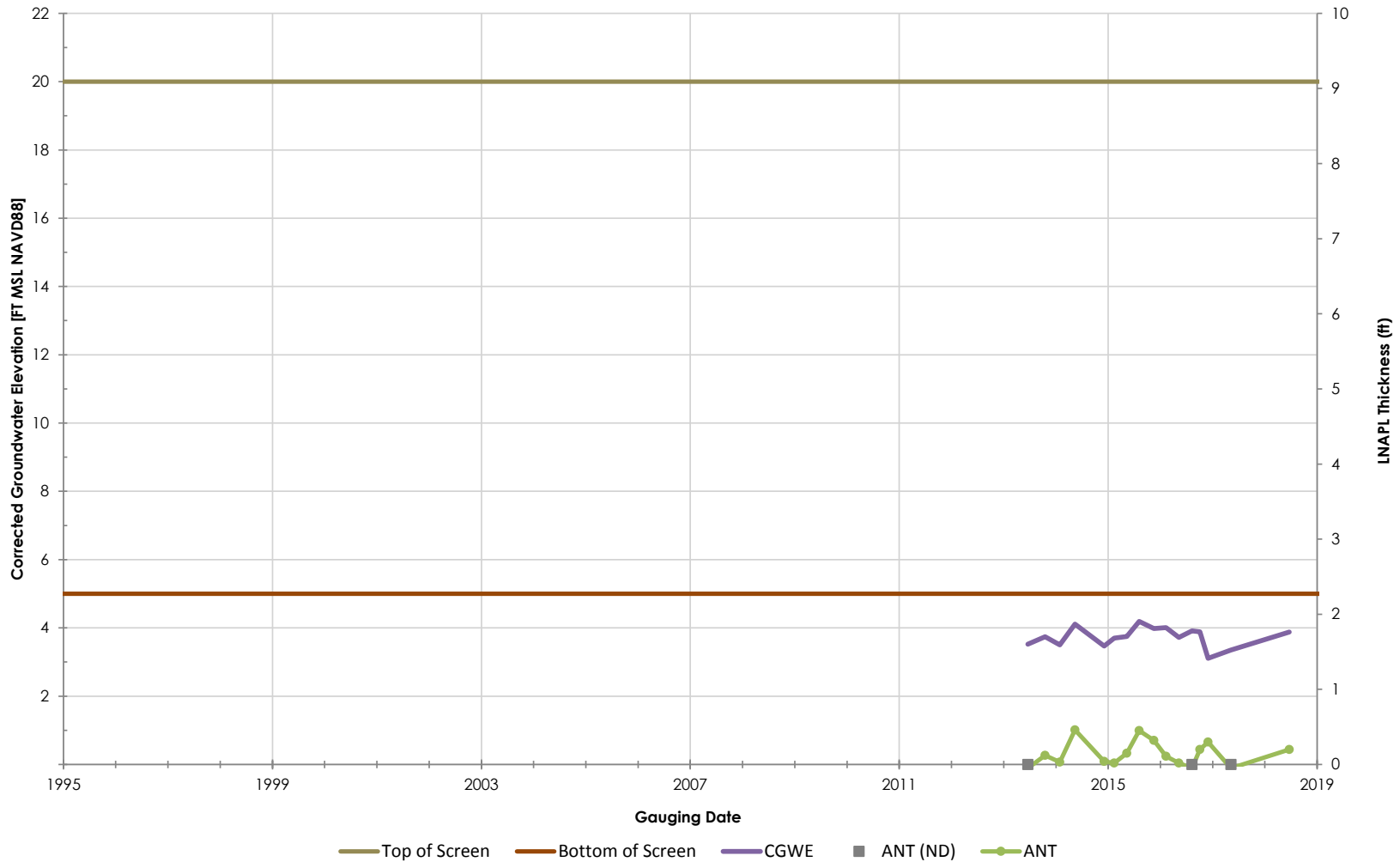
Stantec

Figure/Well No.

S-354

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

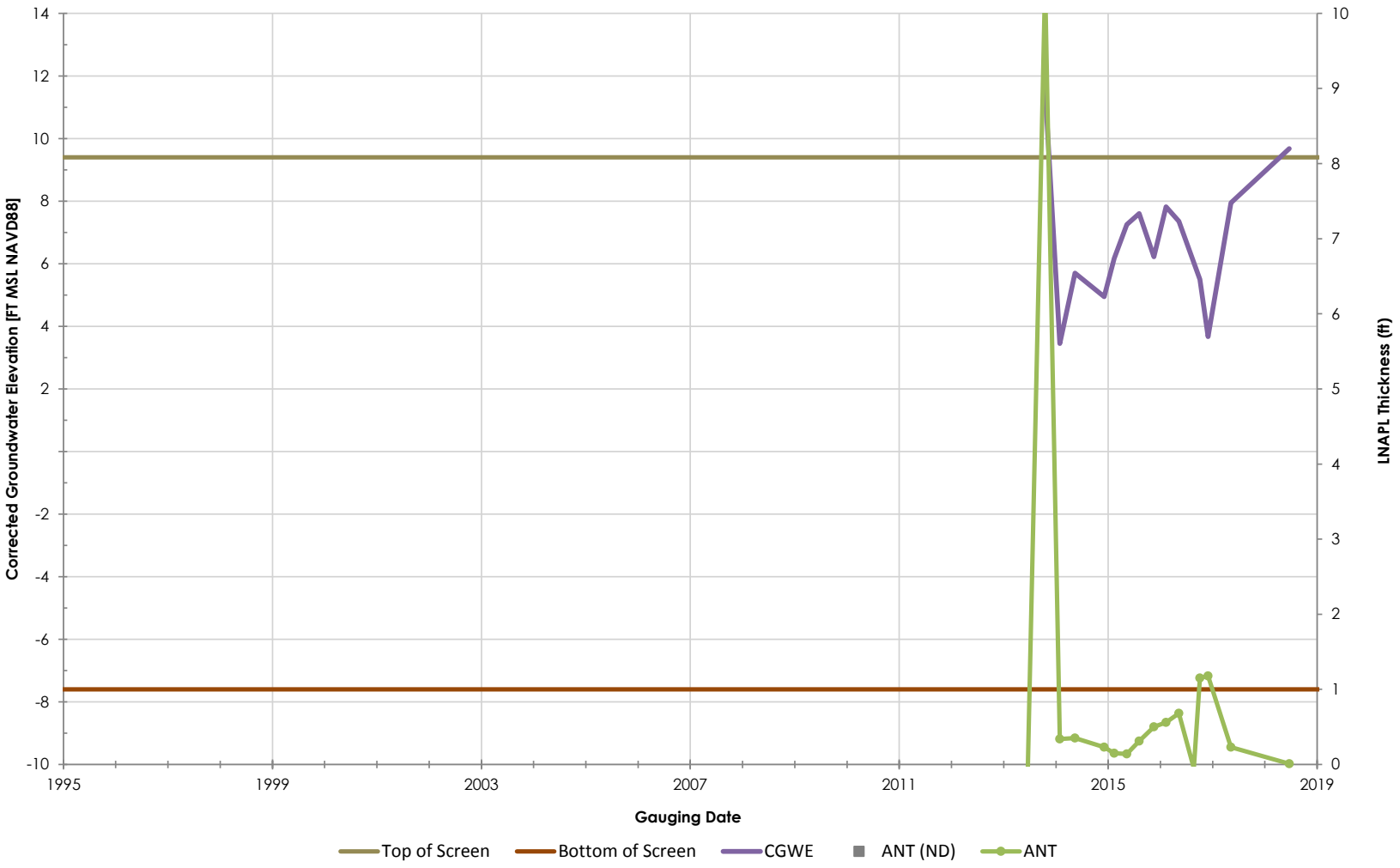
Stantec

Figure/Well No.

S-355

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

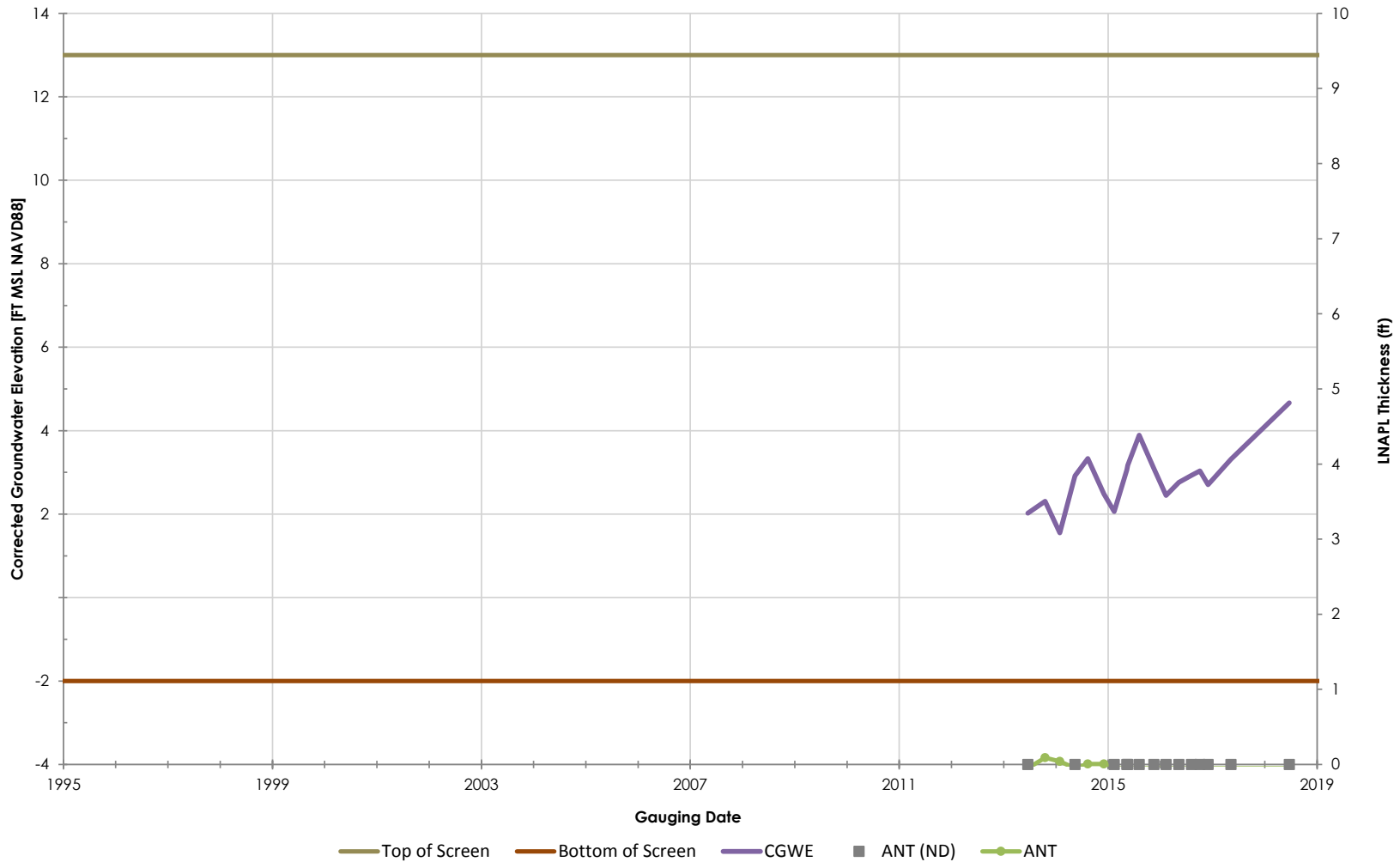
Stantec

Figure/Well No.

S-357

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

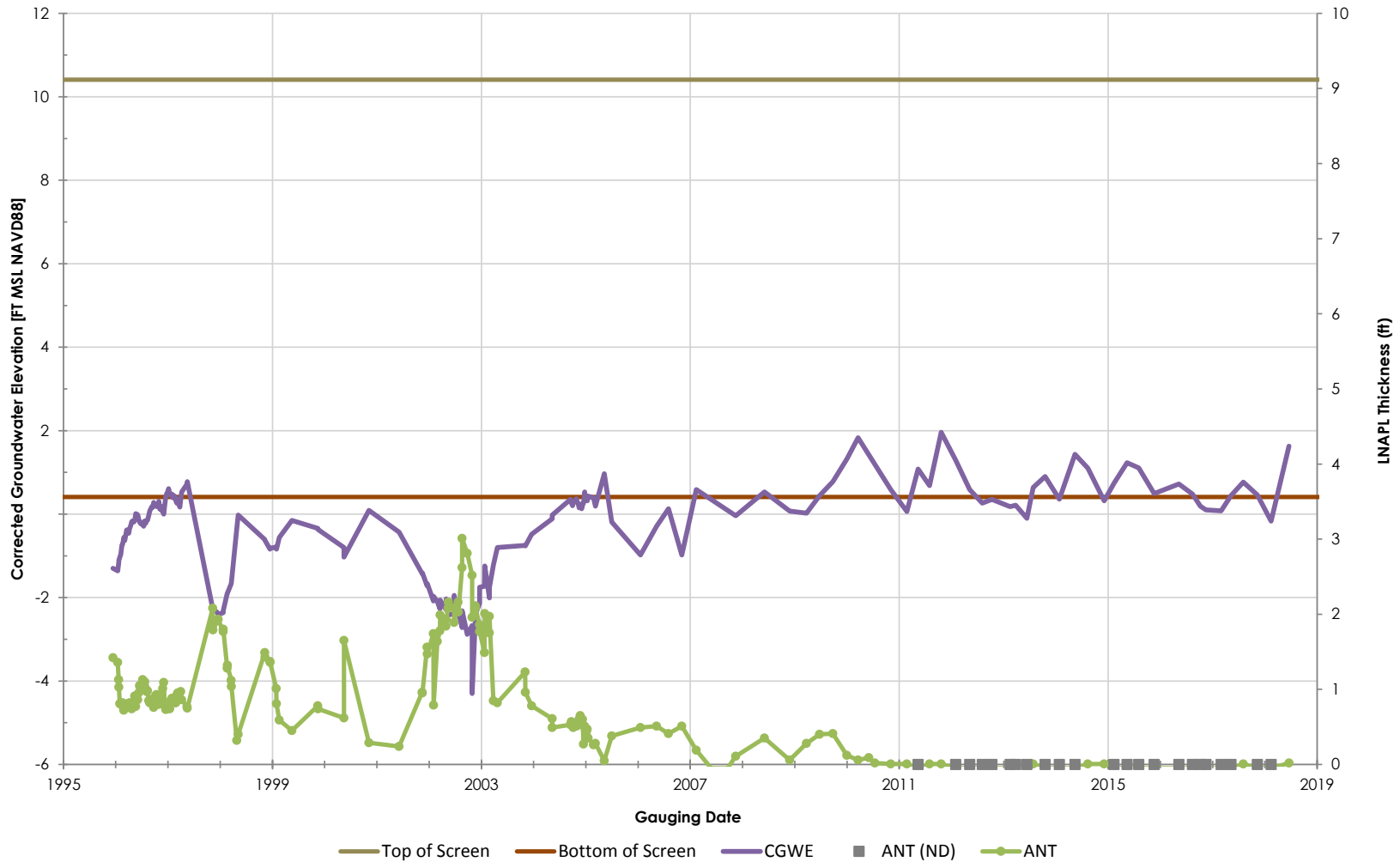
Stantec

Figure/Well No.

S-359

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

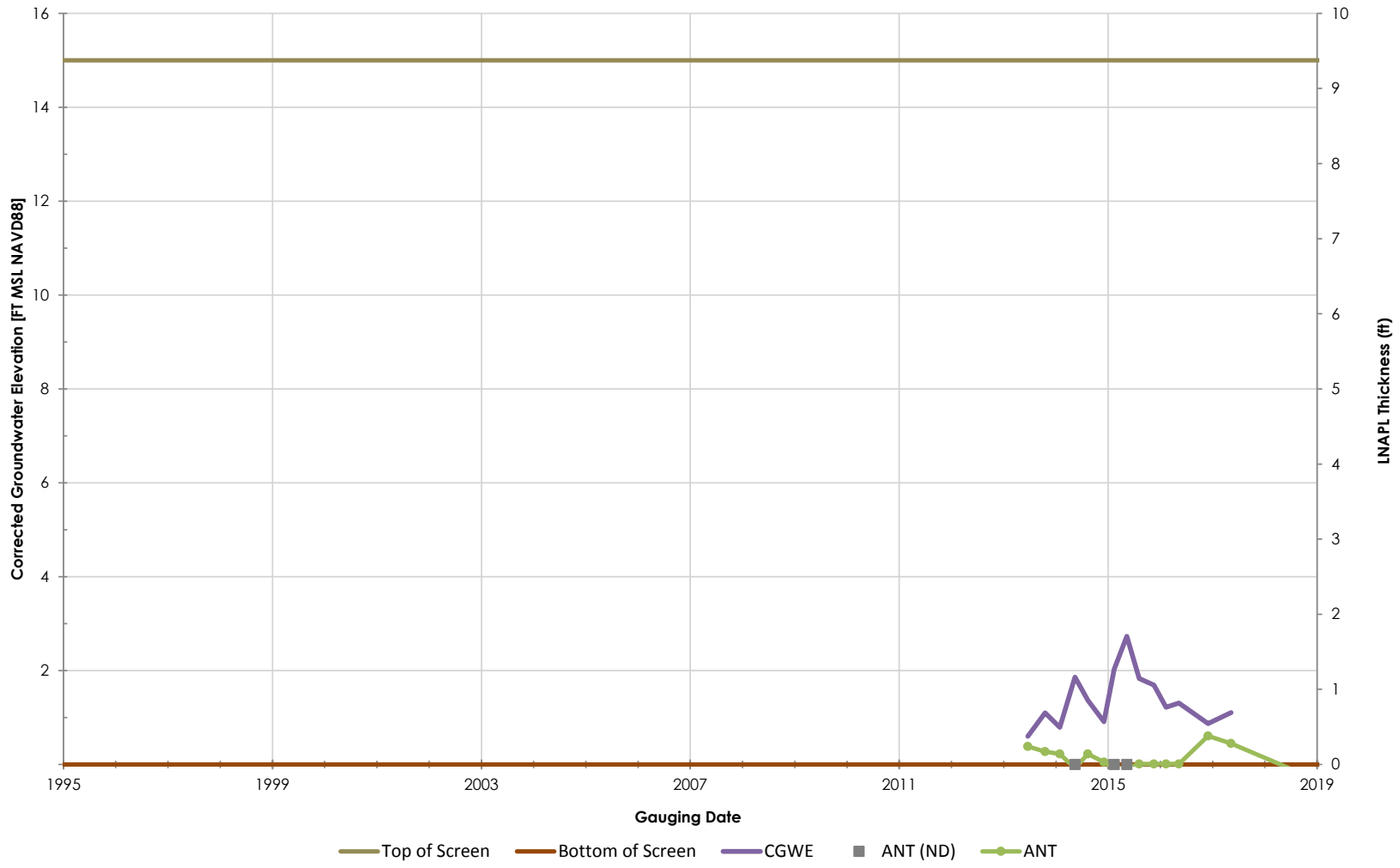
Stantec

Figure/Well No.

S-36

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

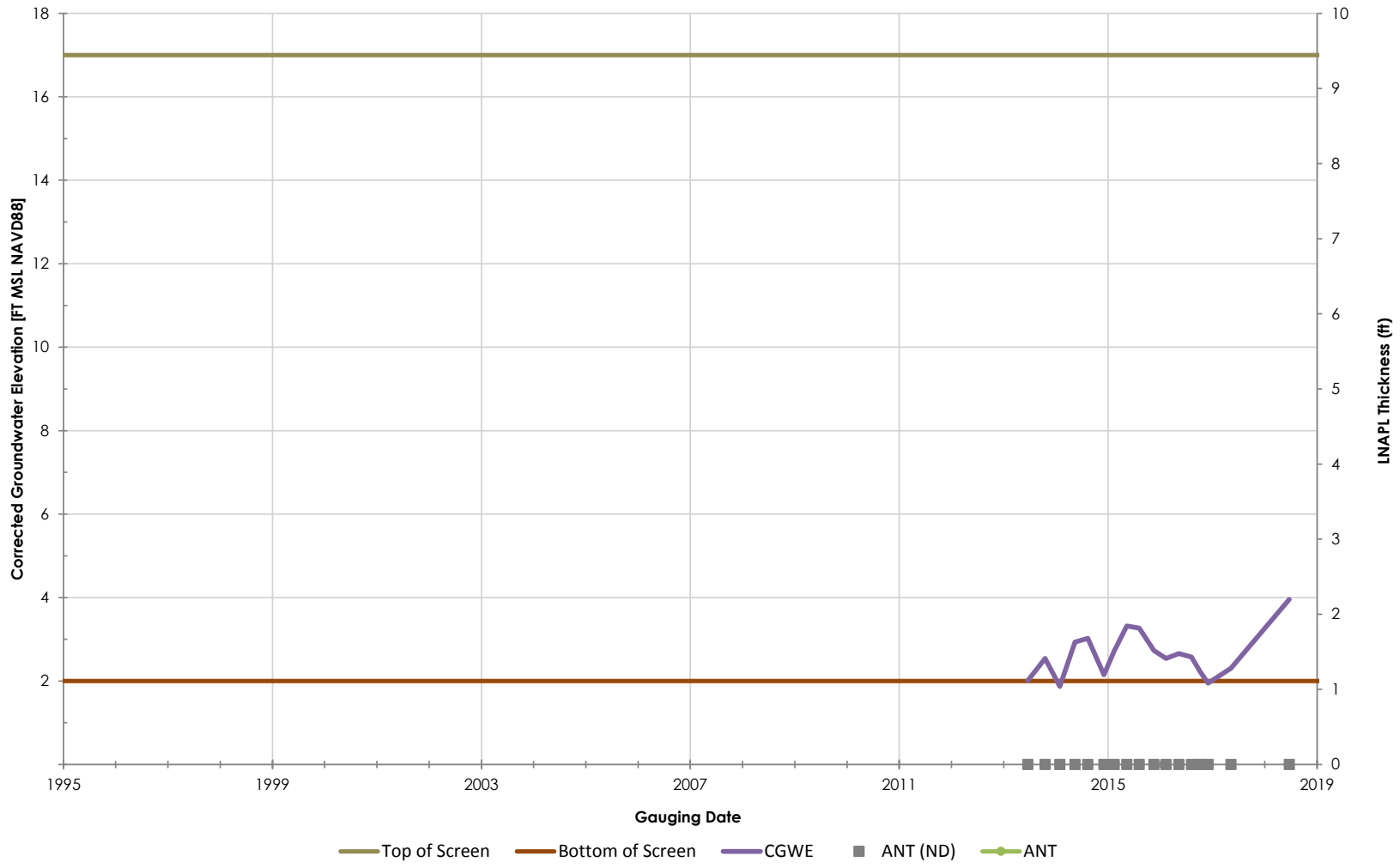
Stantec

Figure/Well No.

S-360

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

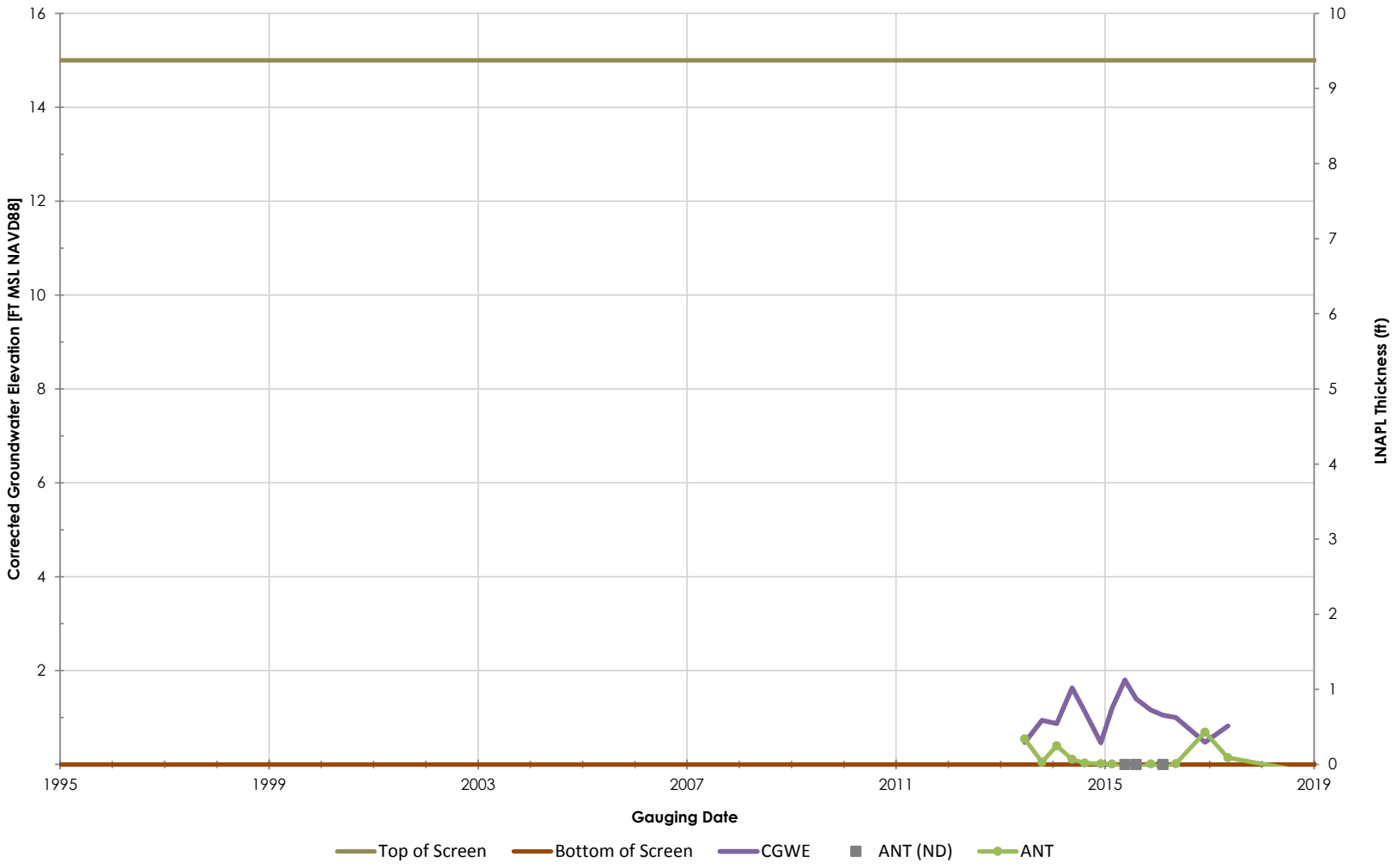
Stantec

Figure/Well No.

S-361

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

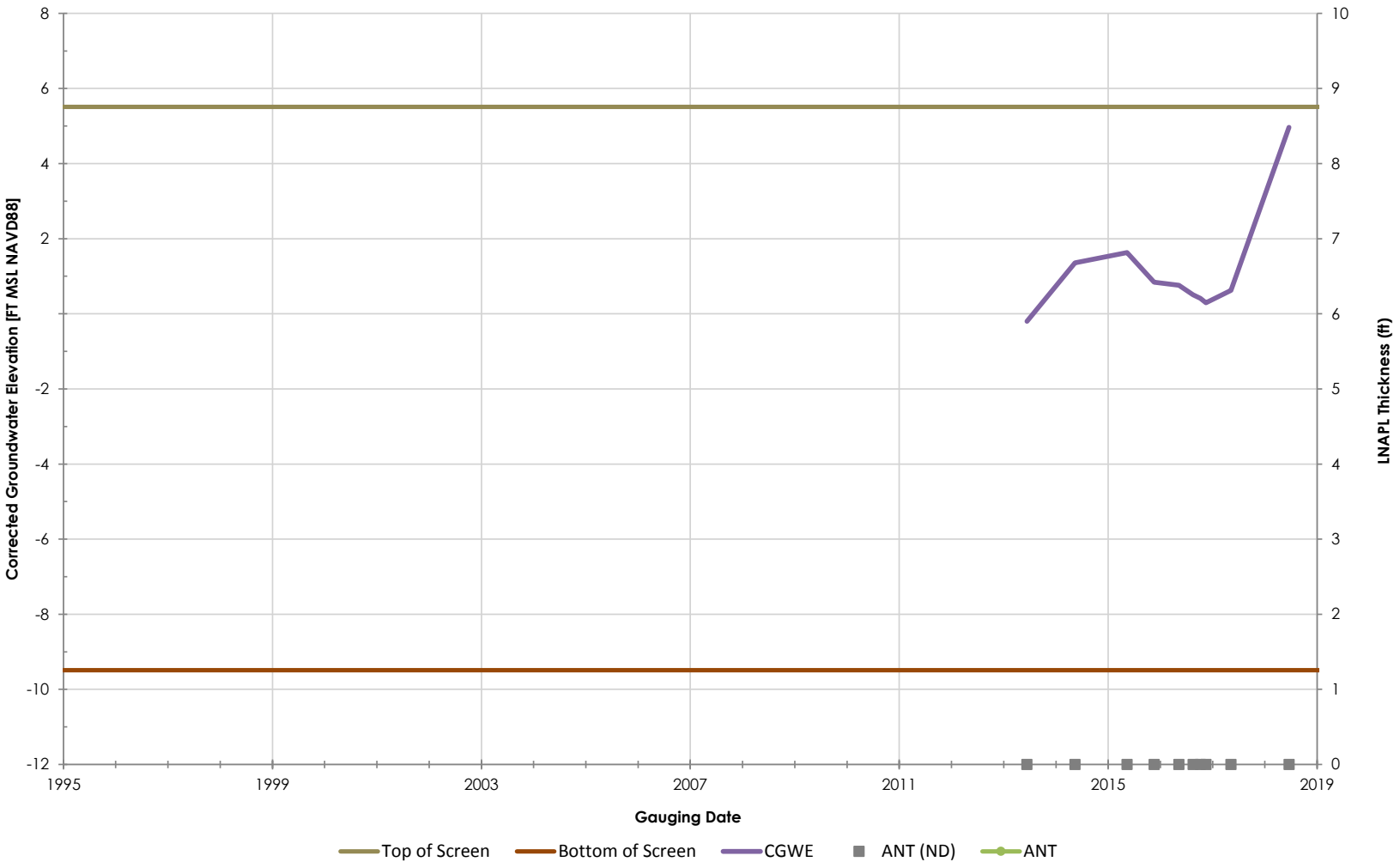
Stantec

Figure/Well No.

S-363

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

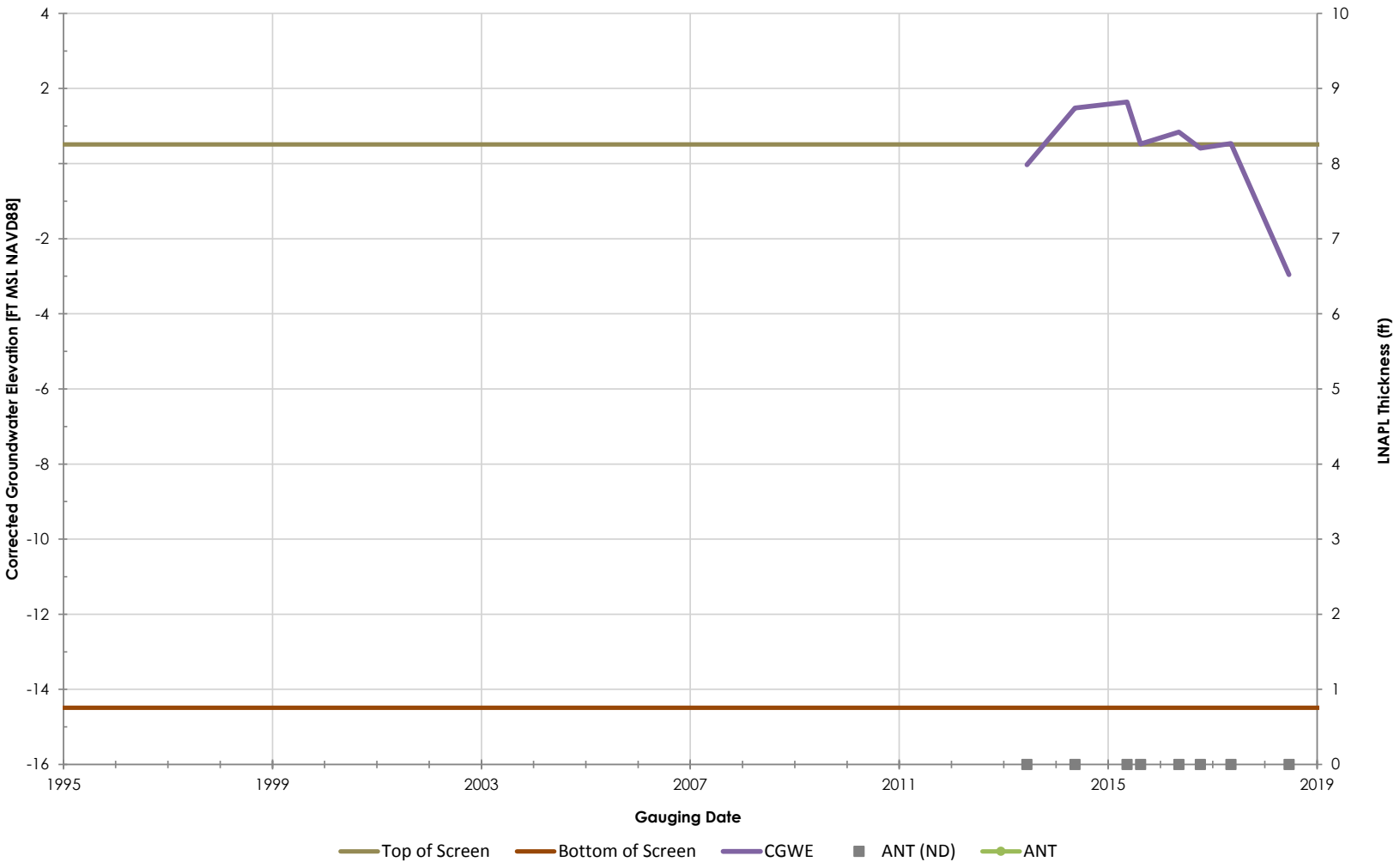
Stantec

Figure/Well No.

S-366

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

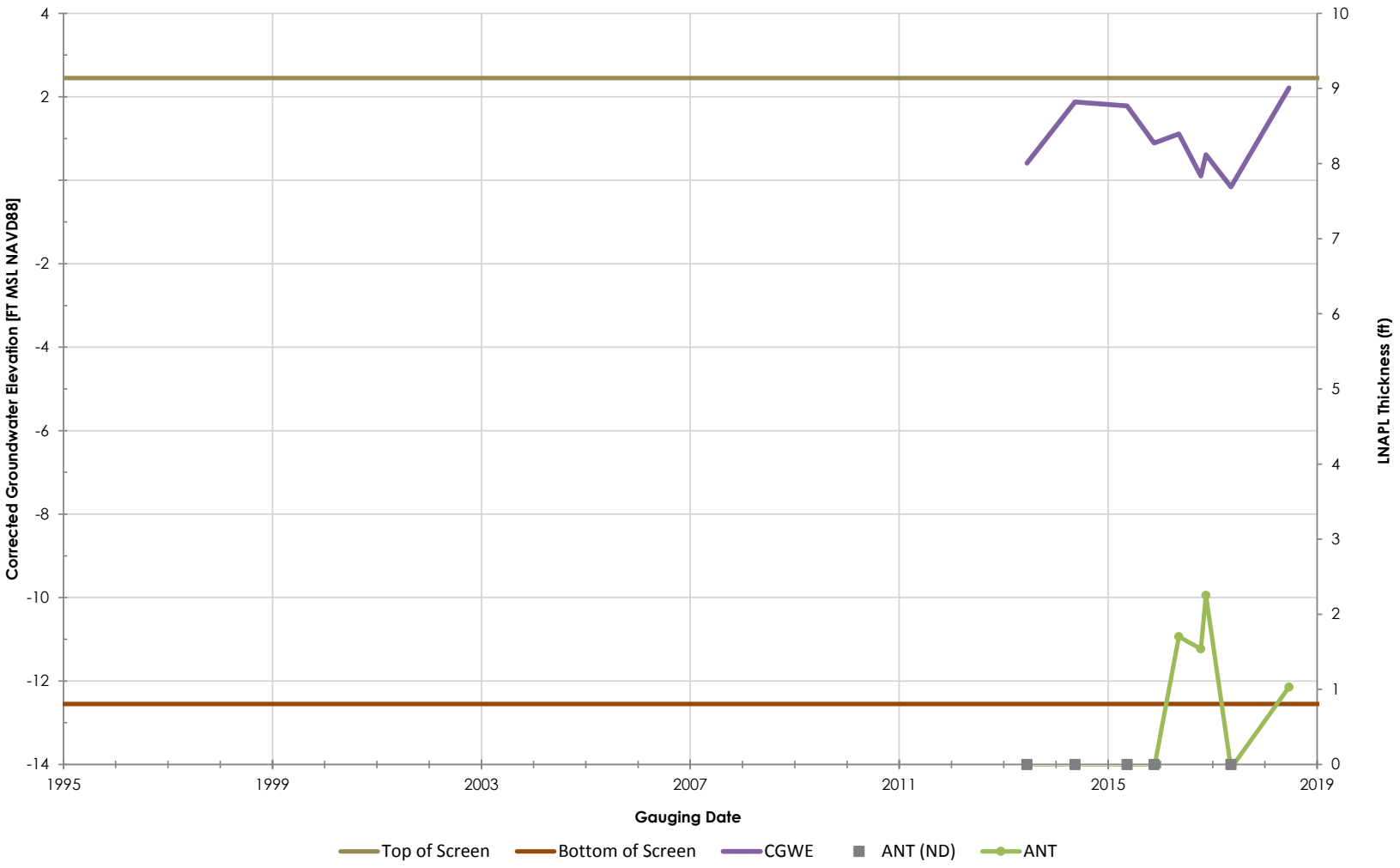
Stantec

Figure/Well No.

S-367

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

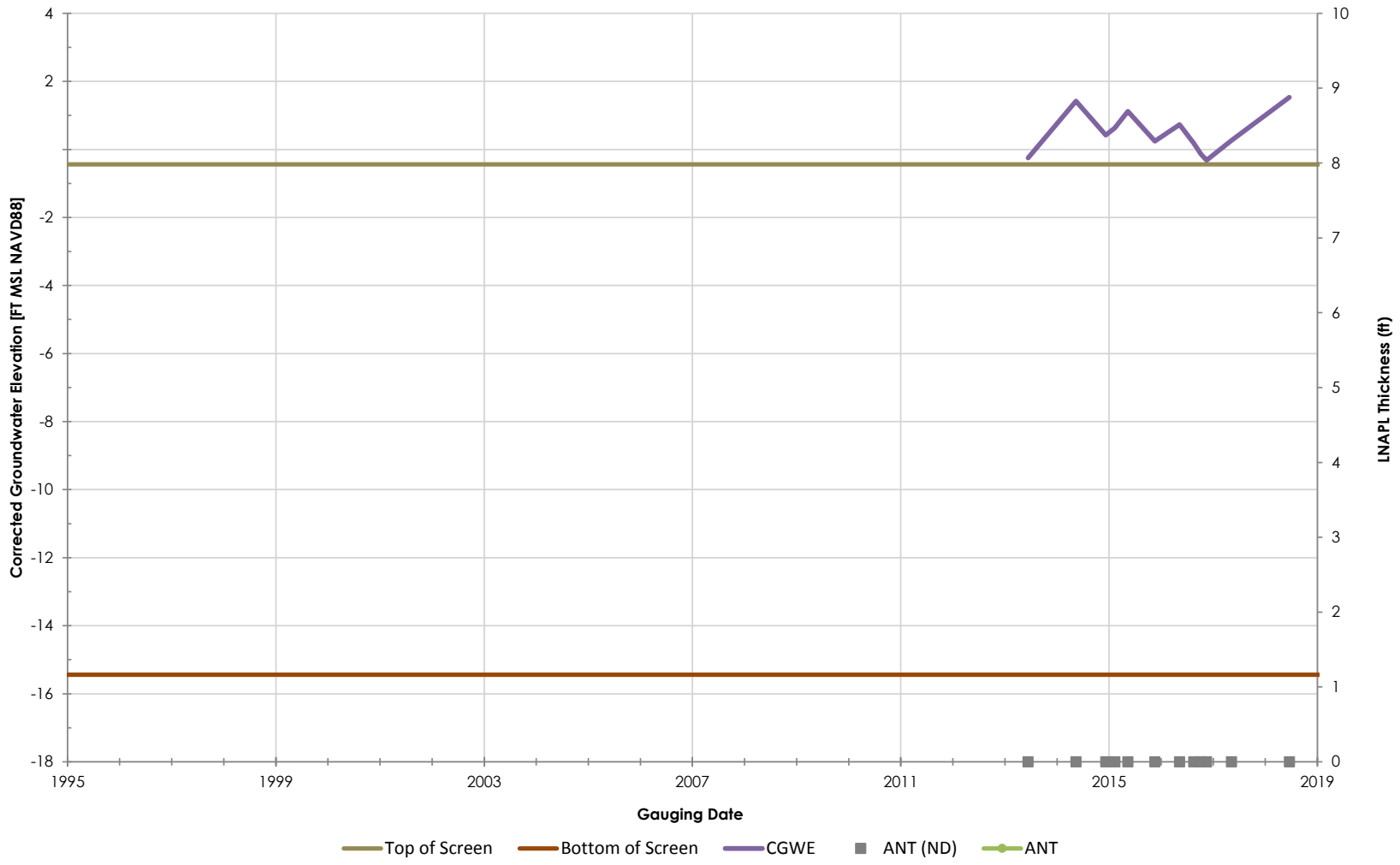
Stantec

Figure/Well No.

S-368

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

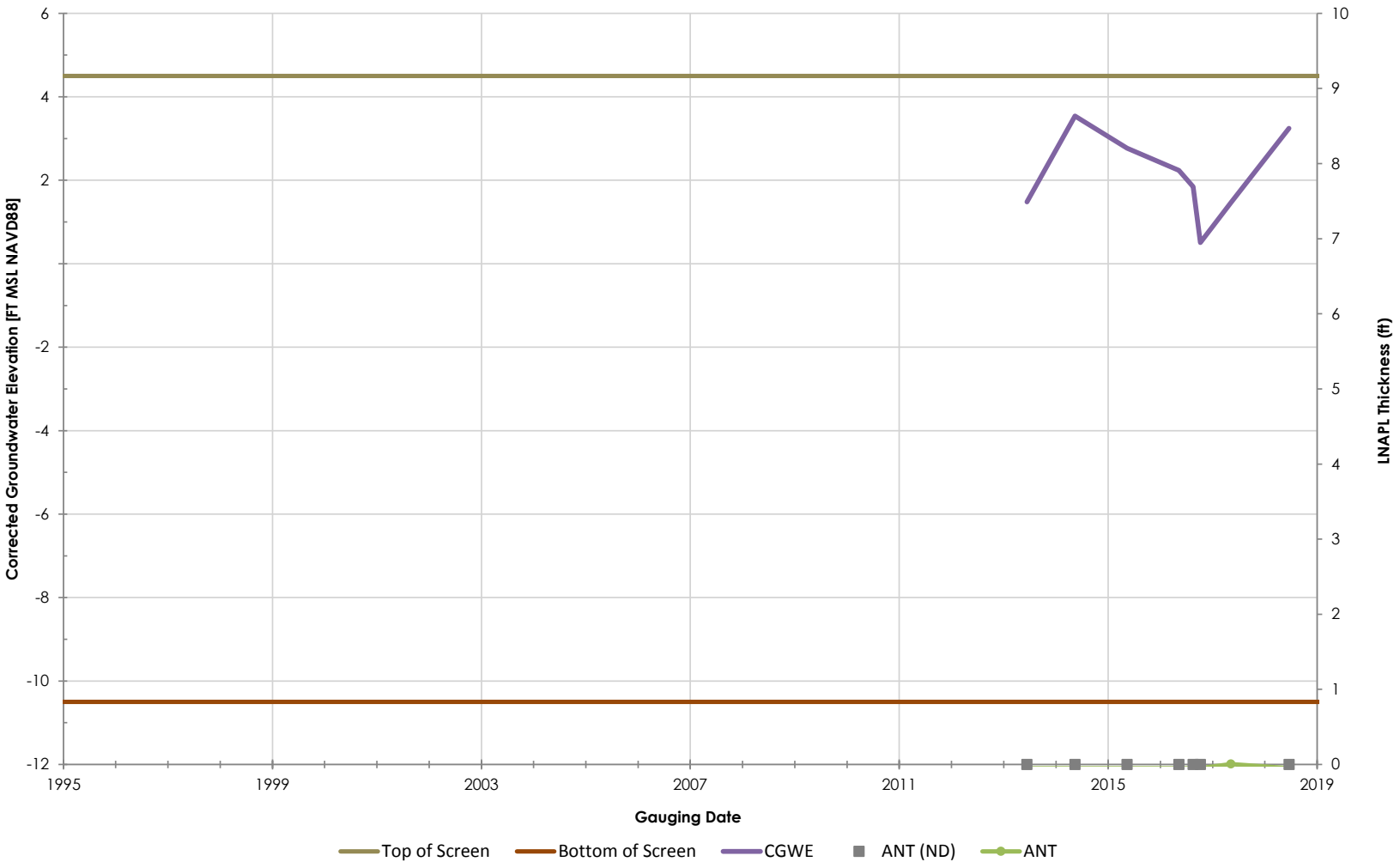
Stantec

Figure/Well No.

S-370

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

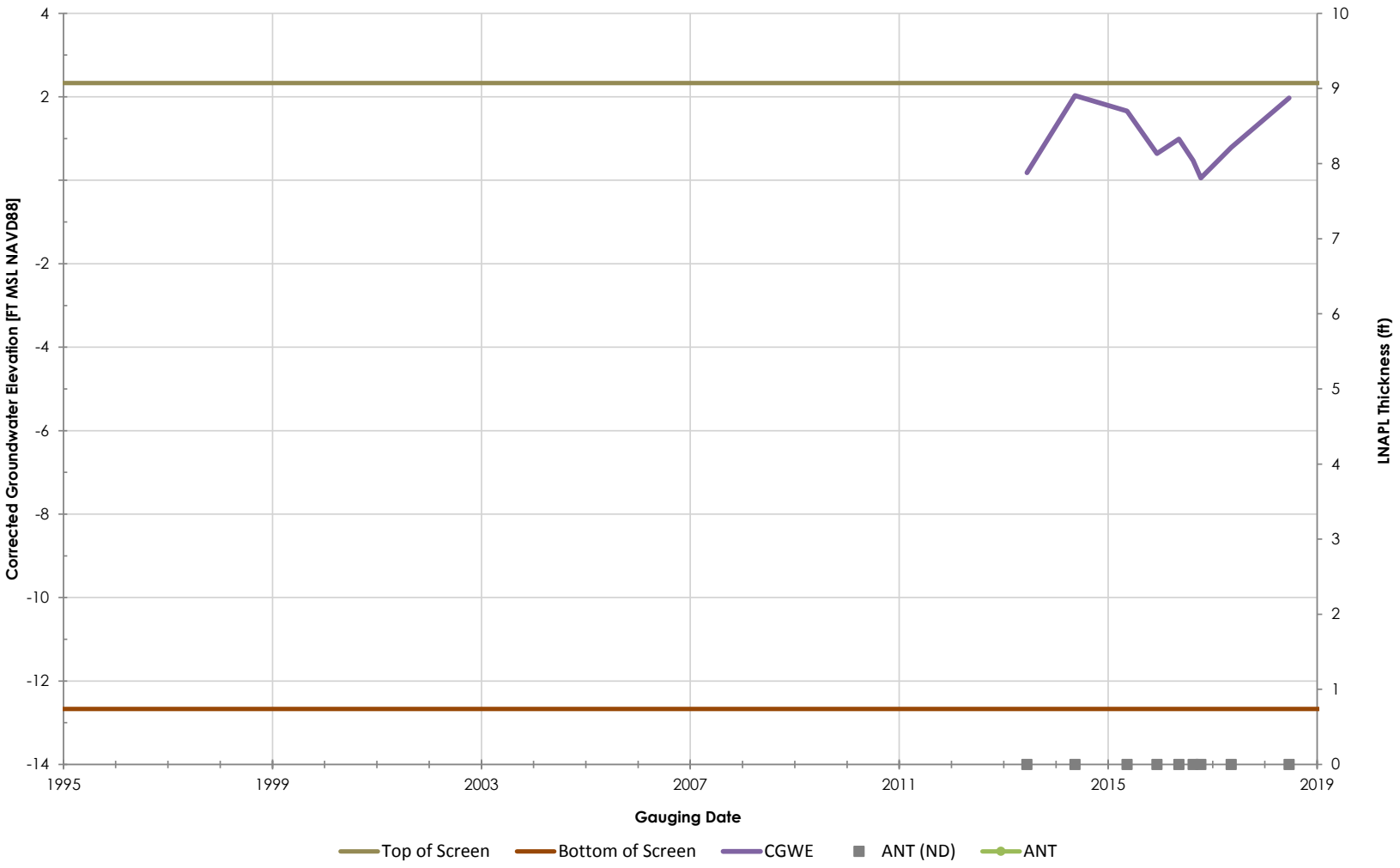
Stantec

Figure/Well No.

S-371

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

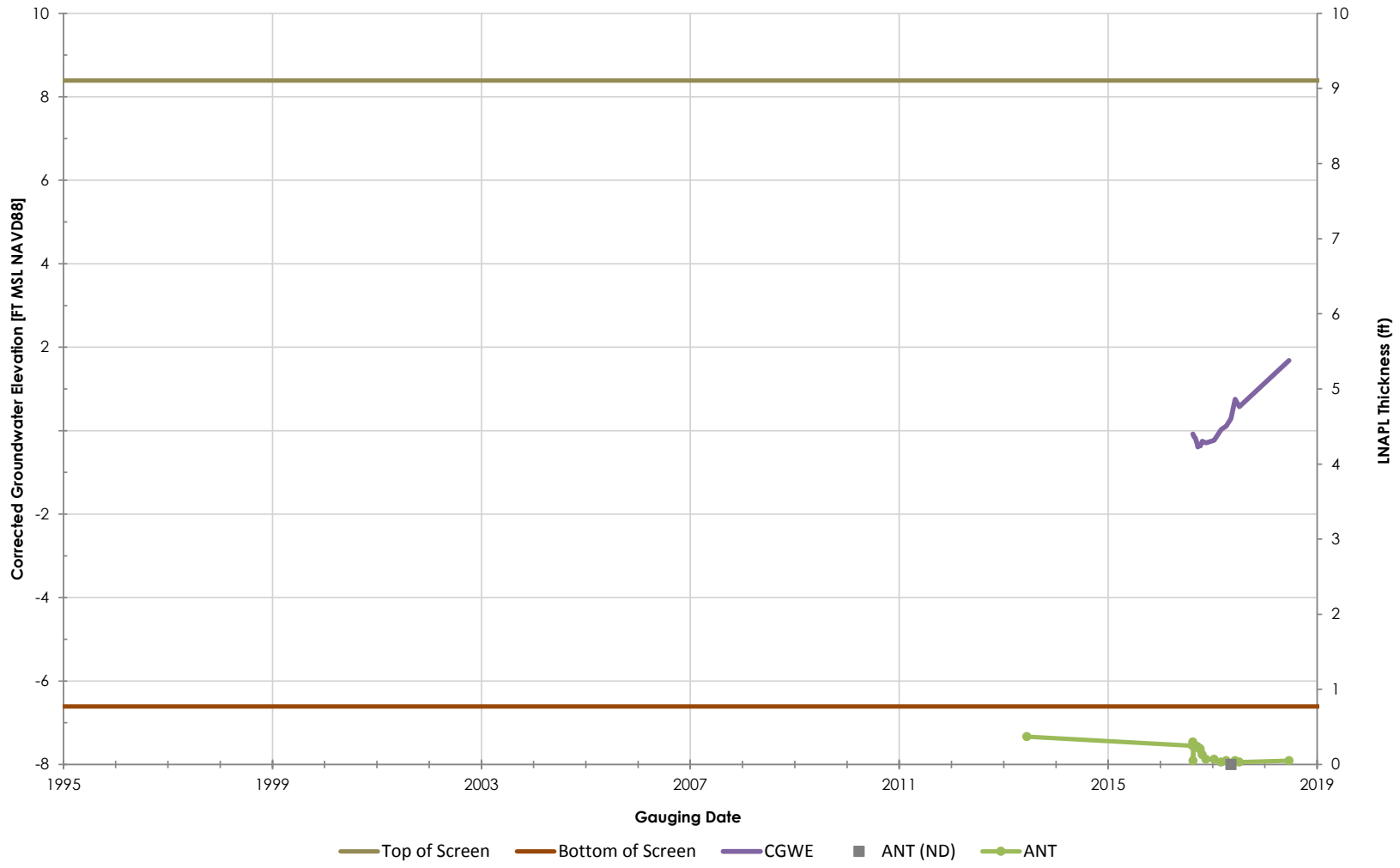
Stantec

Figure/Well No.

S-372

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

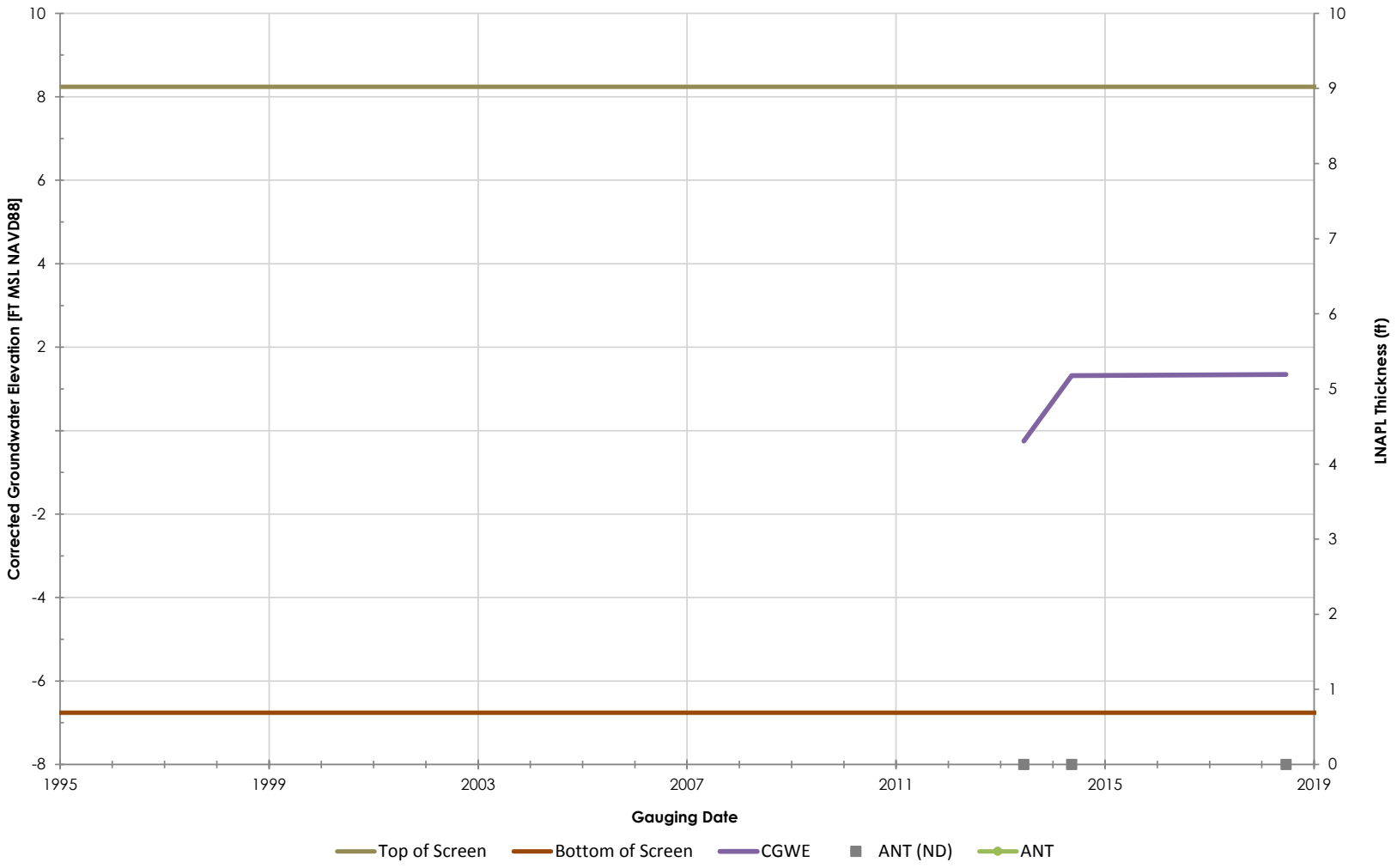
Stantec

Figure/Well No.

S-373

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

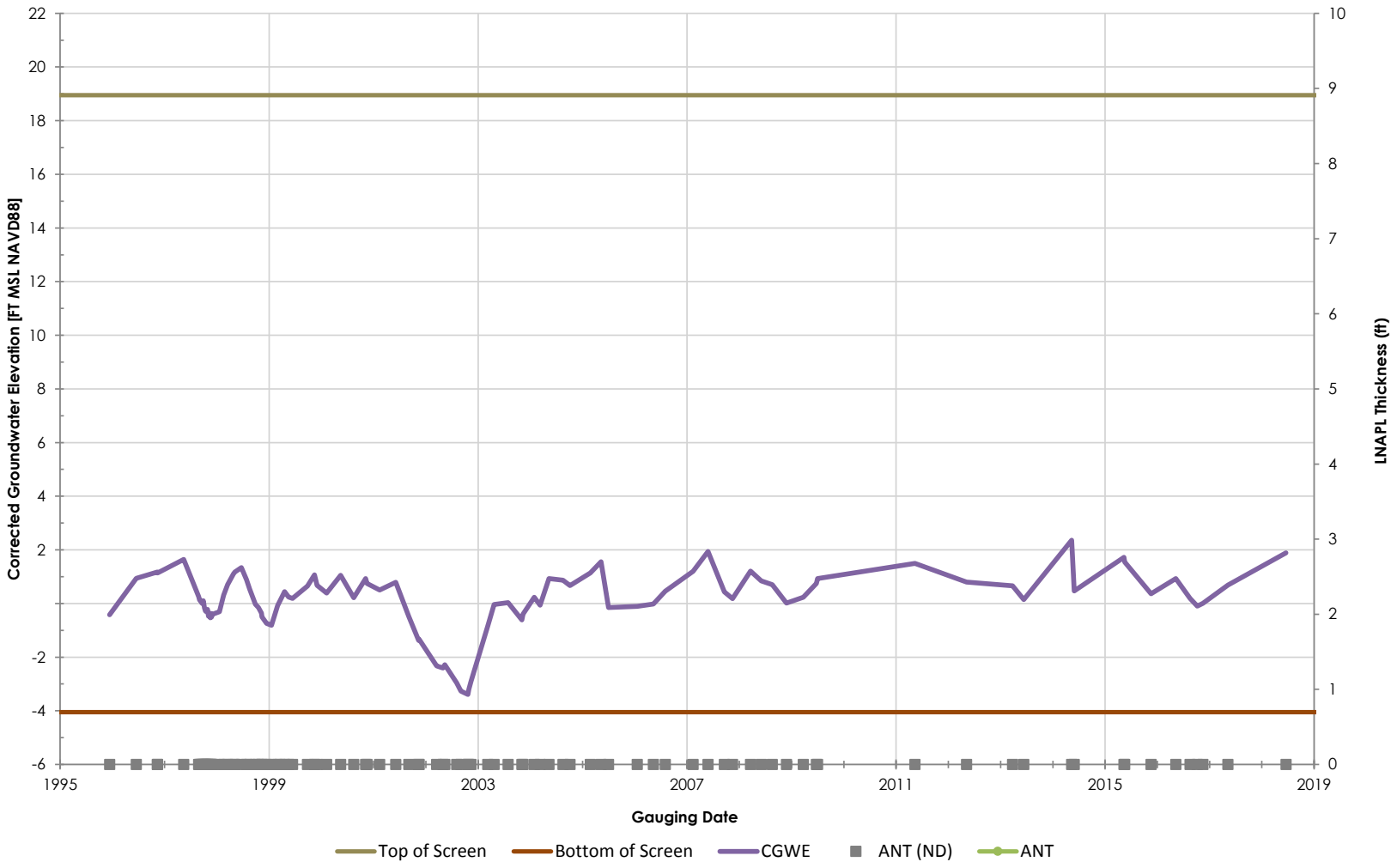
Stantec

Figure/Well No.

S-379

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

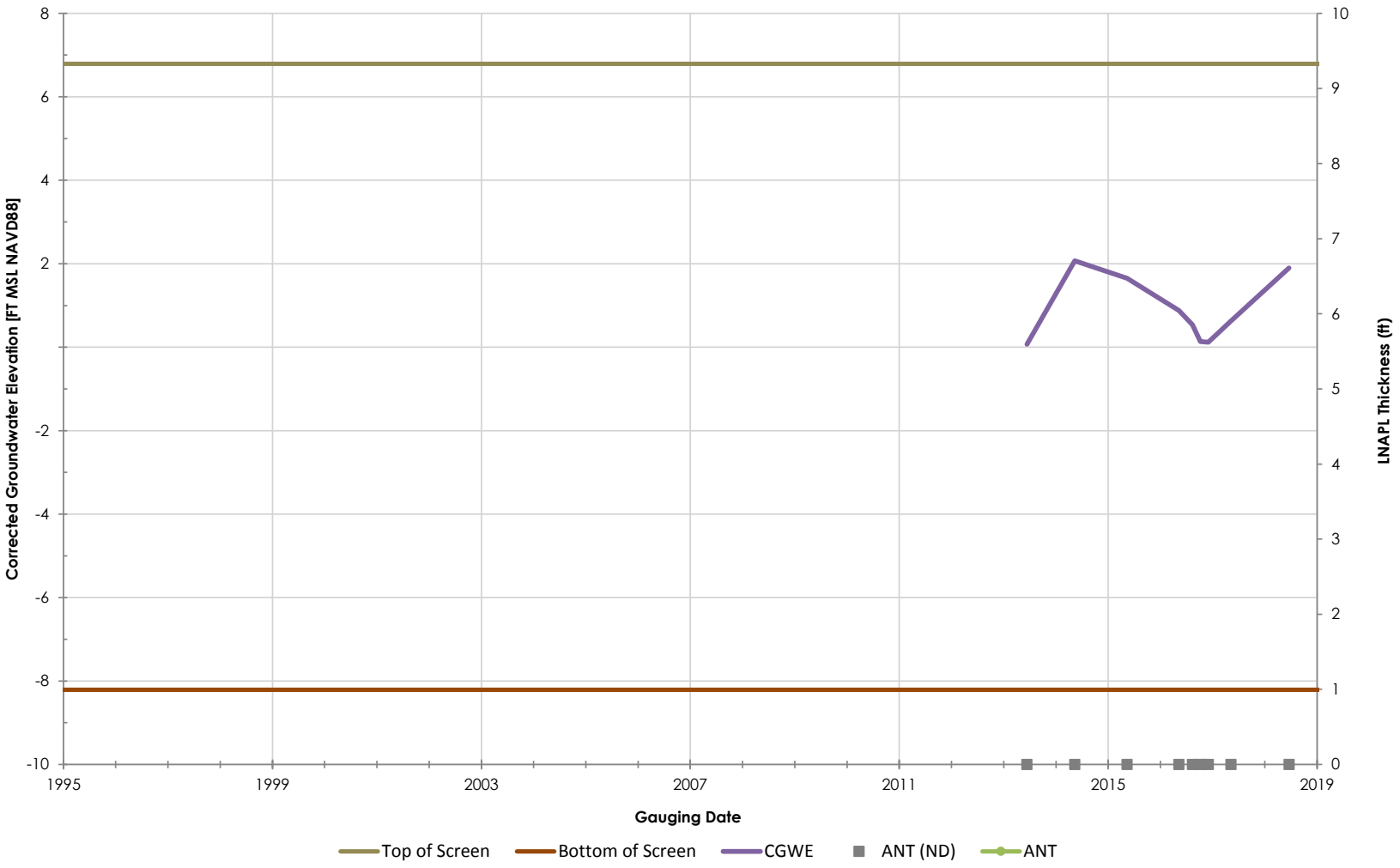
Stantec

Figure/Well No.

S-38

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

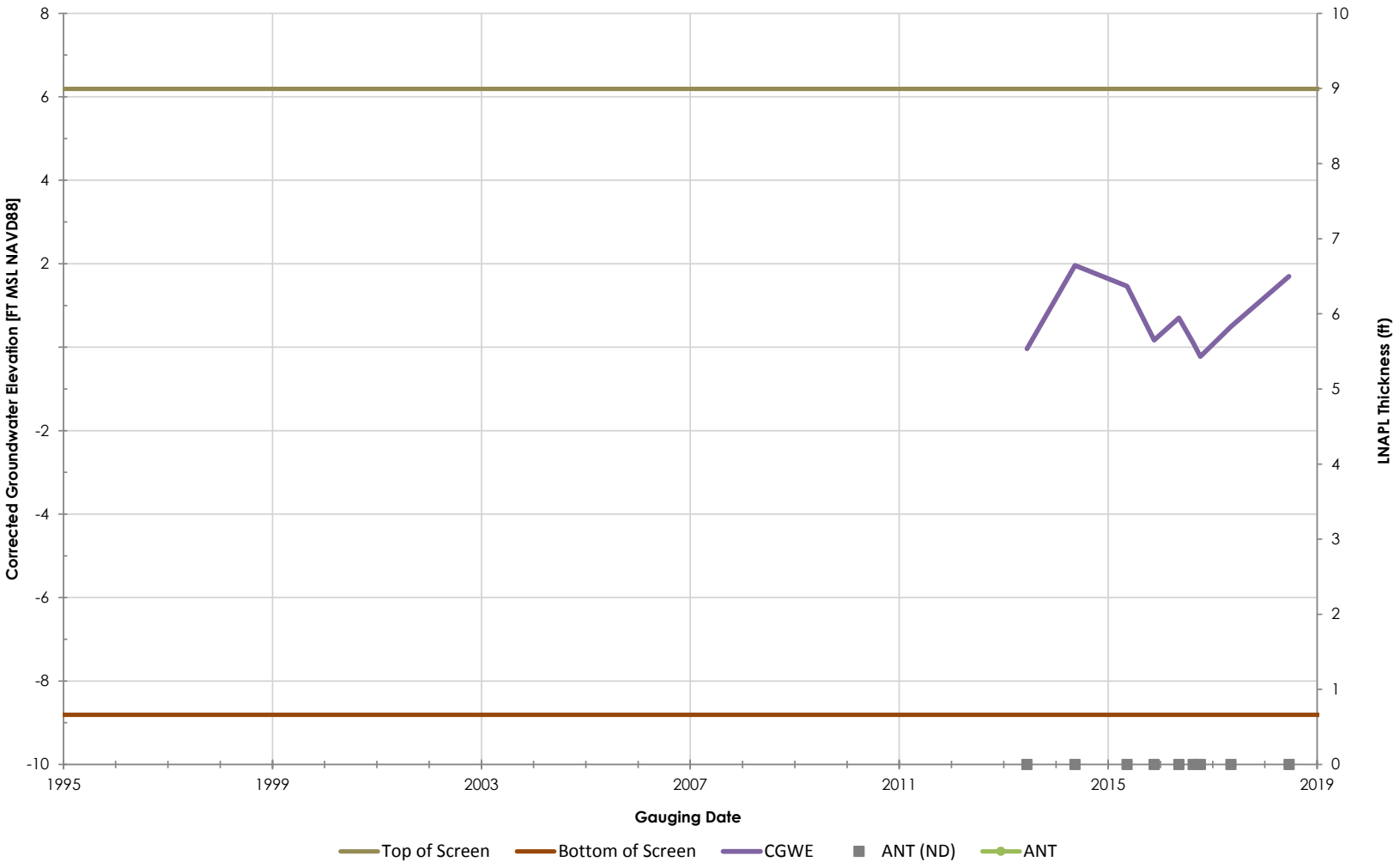
Stantec

Figure/Well No.

S-380

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

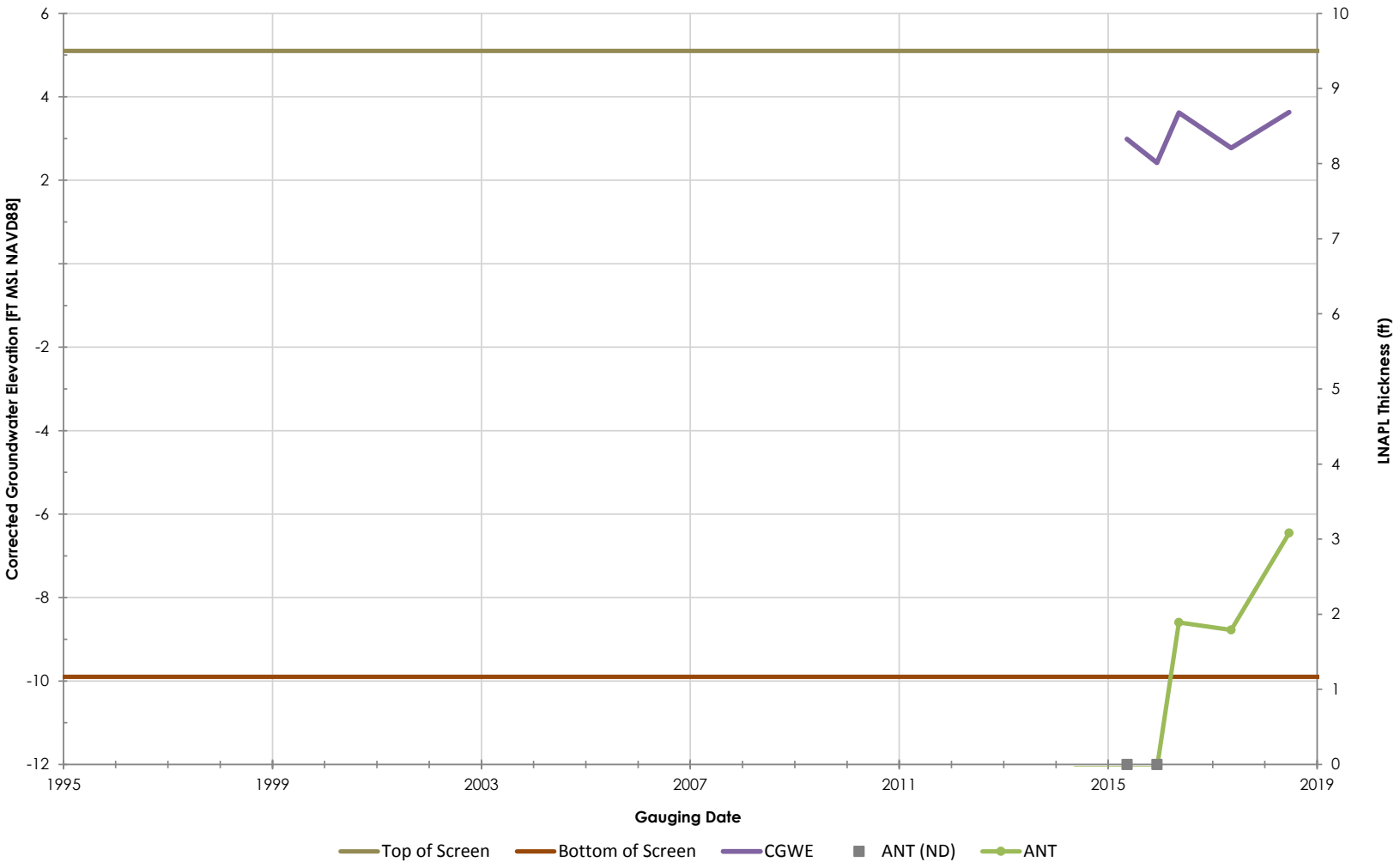
Stantec

Figure/Well No.

S-381

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

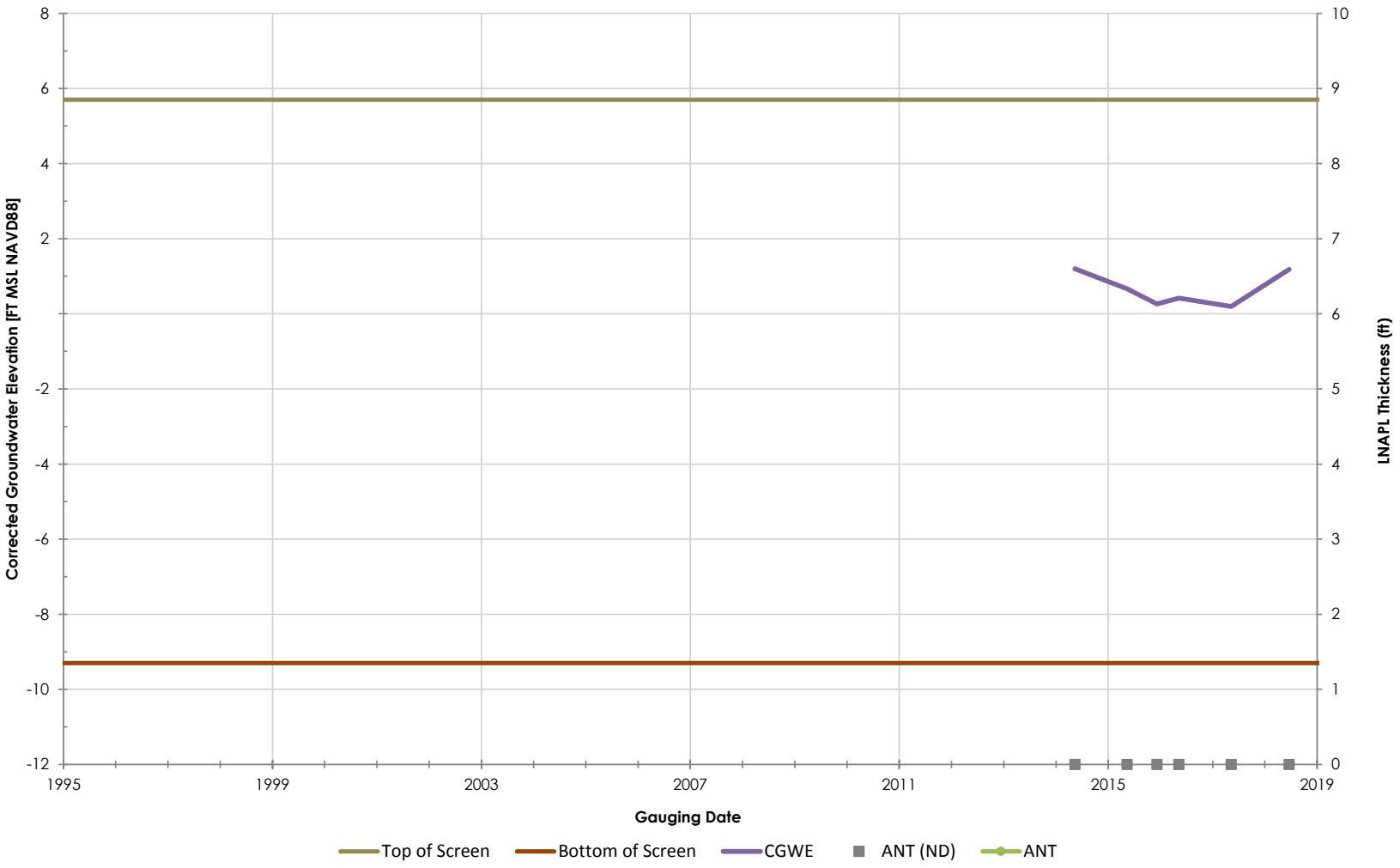
Stantec

Figure/Well No.

S-382

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

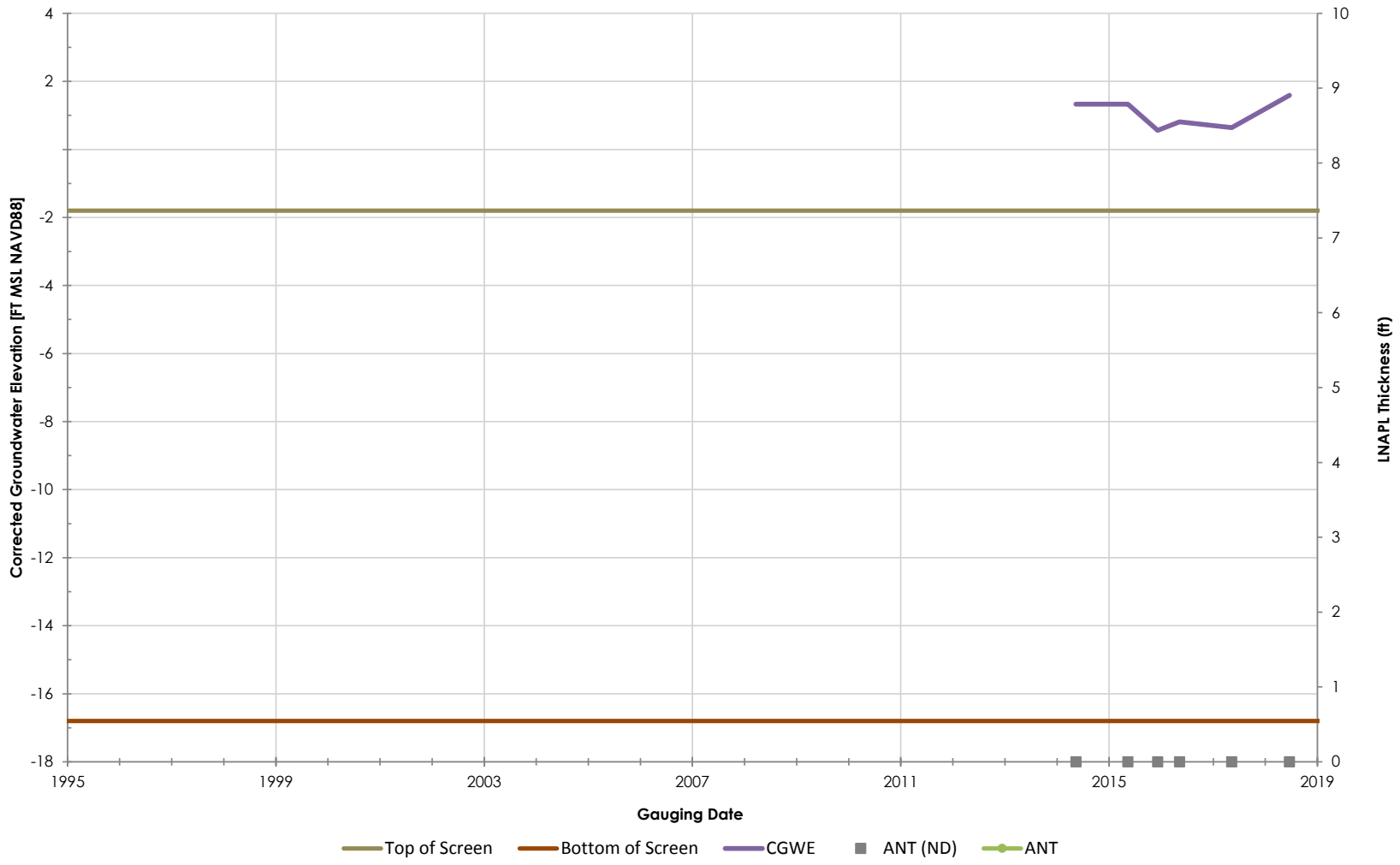
Stantec

Figure/Well No.

S-384

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

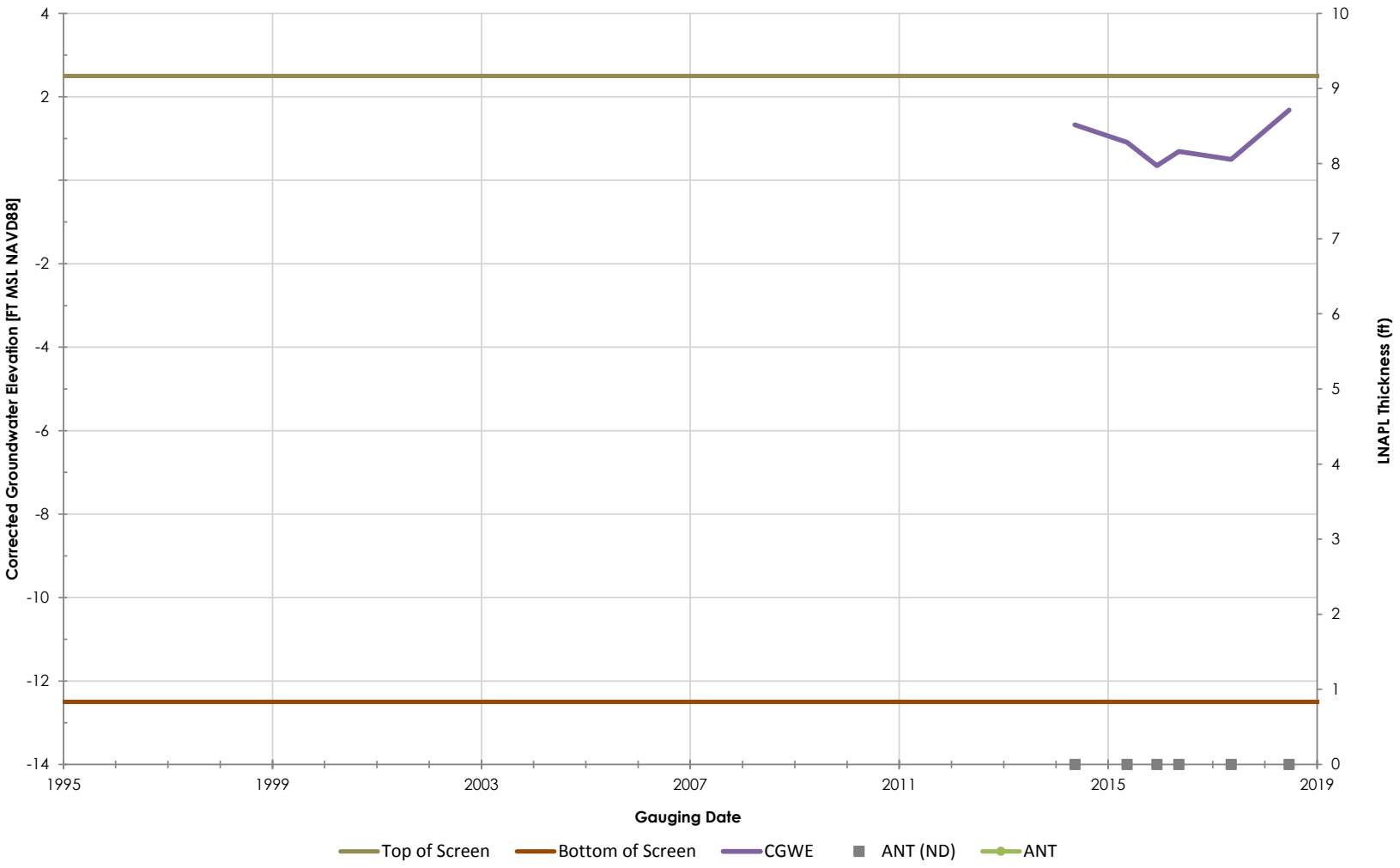
Stantec

Figure/Well No.

S-385

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

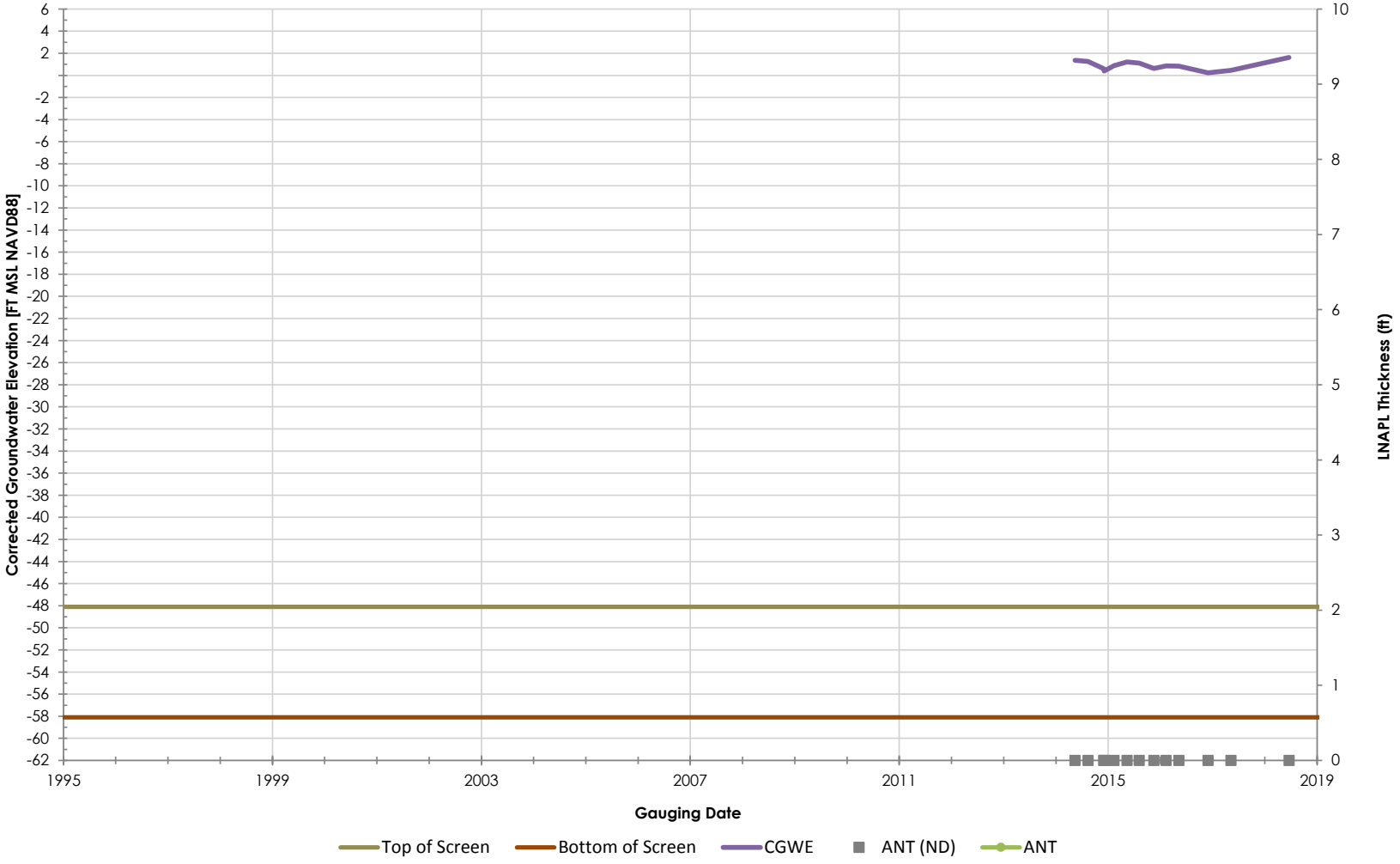
Stantec

Figure/Well No.

S-386

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

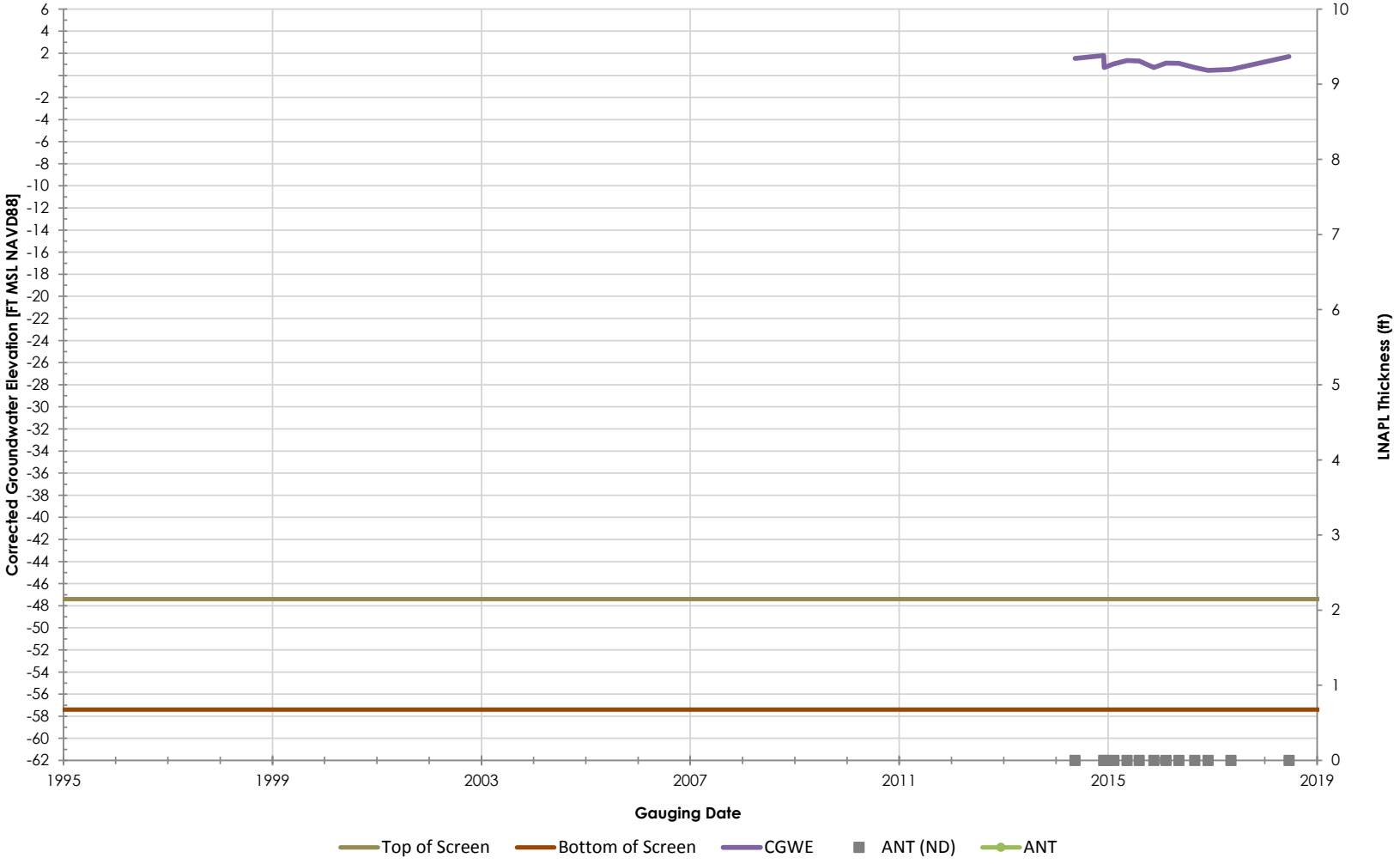
Stantec

Figure/Well No.

S-388D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



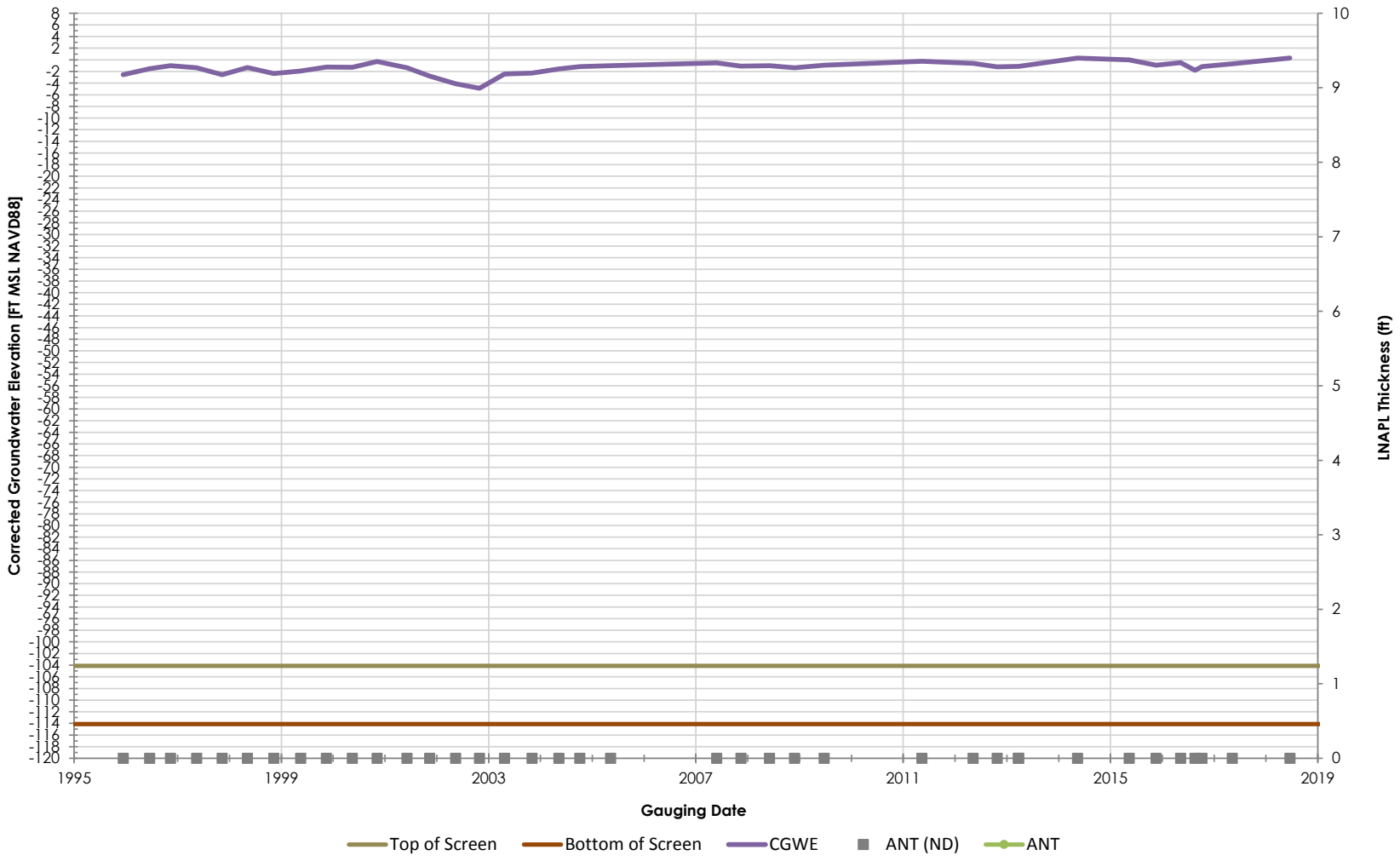
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-389D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

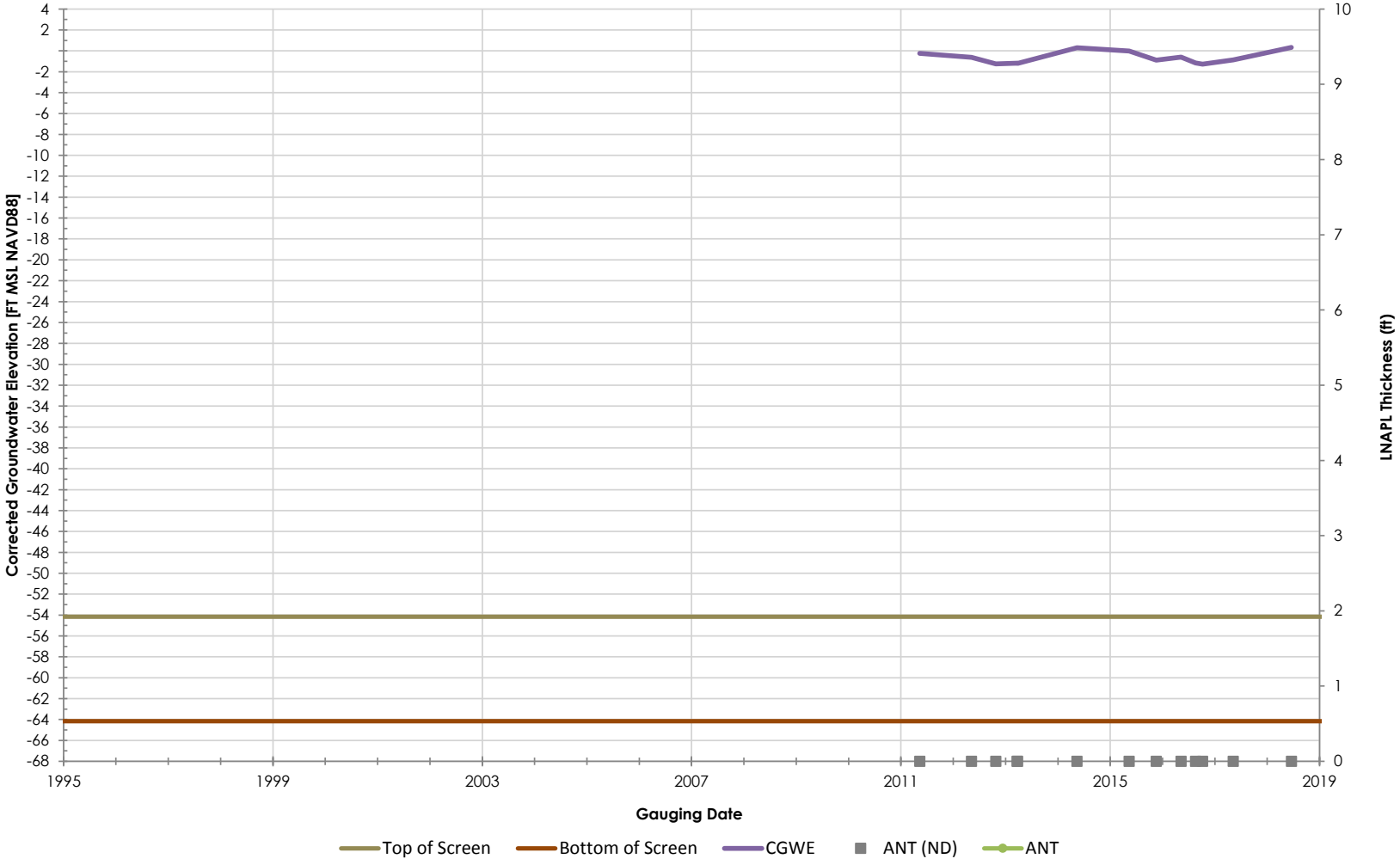
Stantec

Figure/Well No.

S-38D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



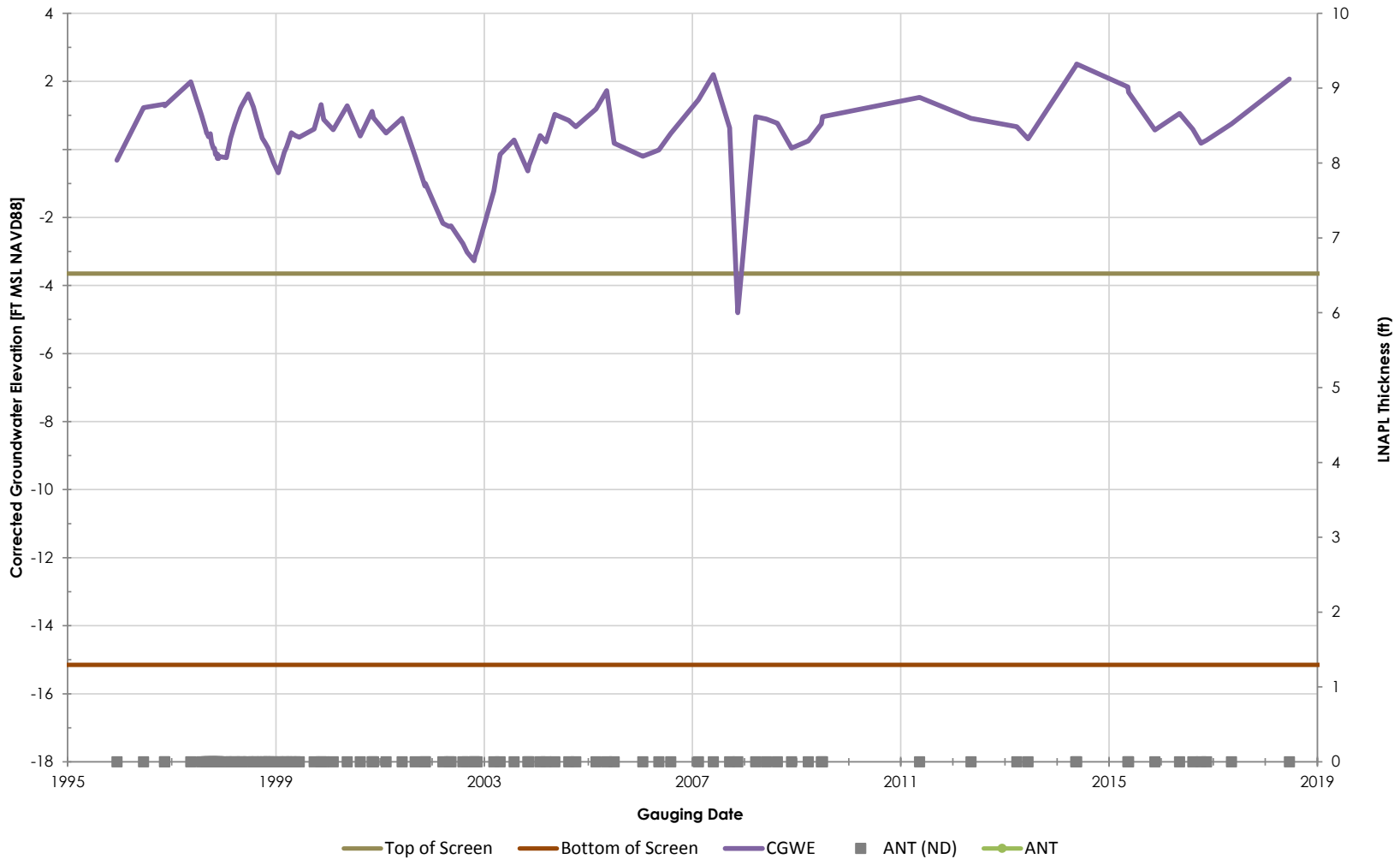
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-38D2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

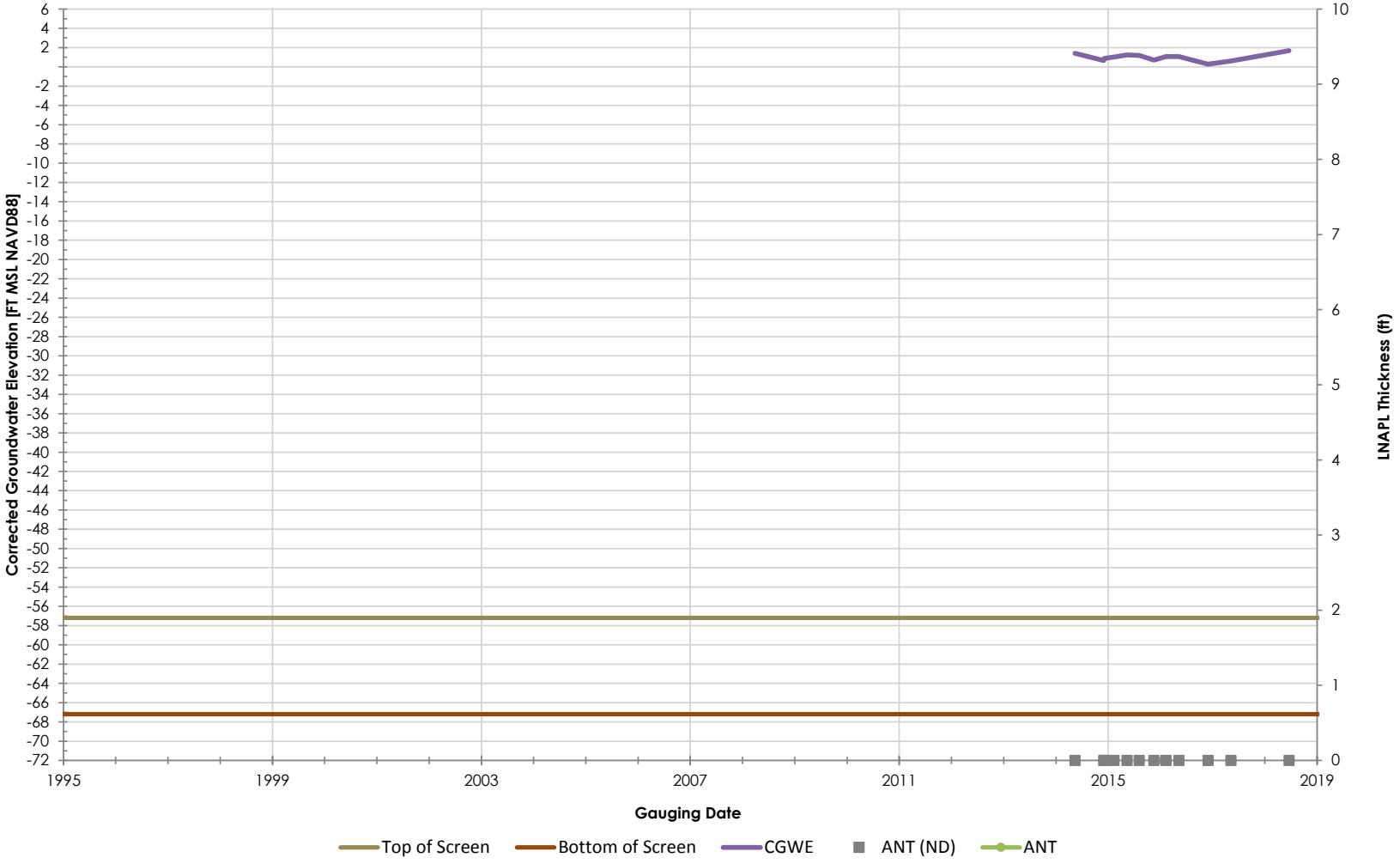
Stantec

Figure/Well No.

S-39

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



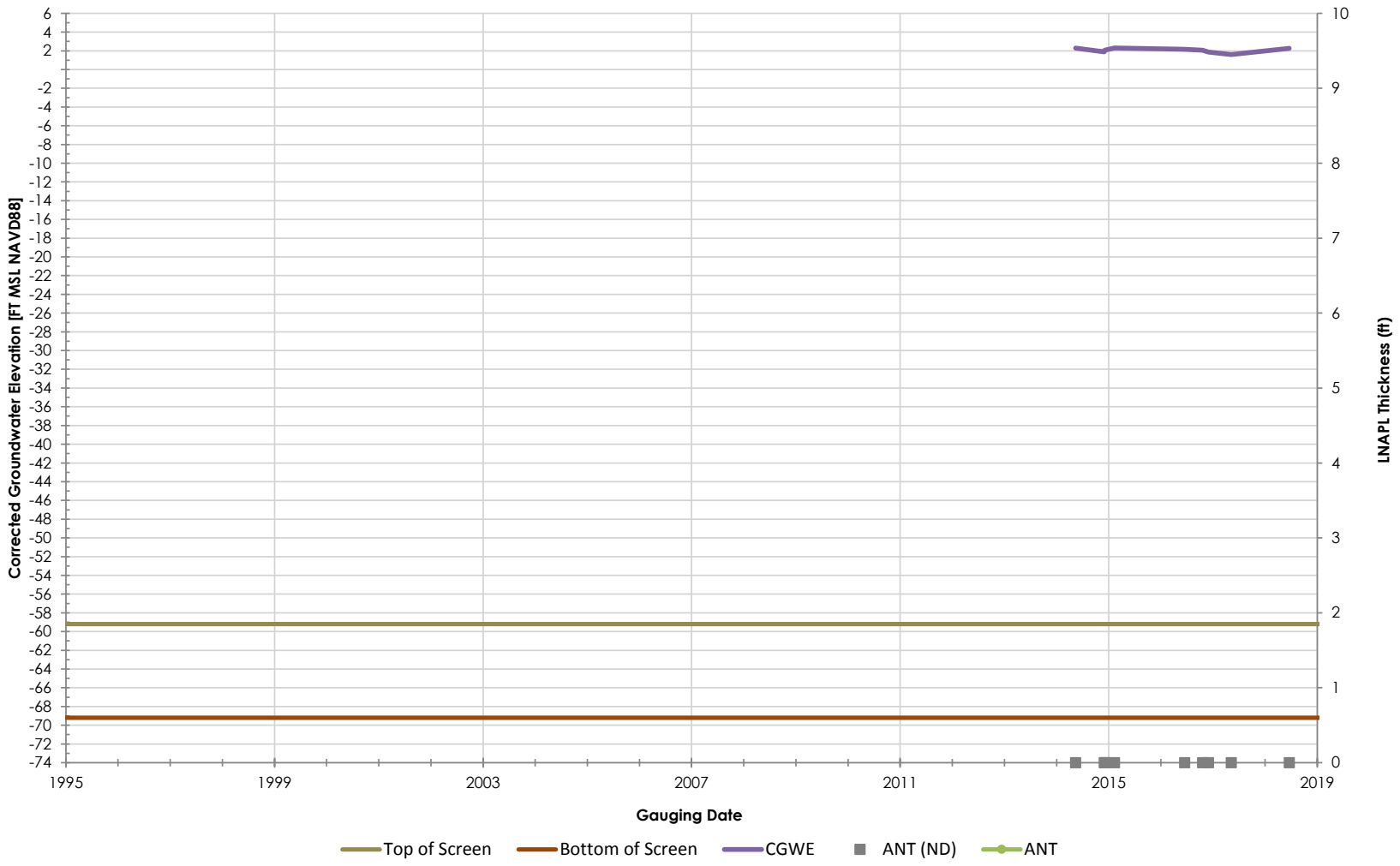
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-390D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

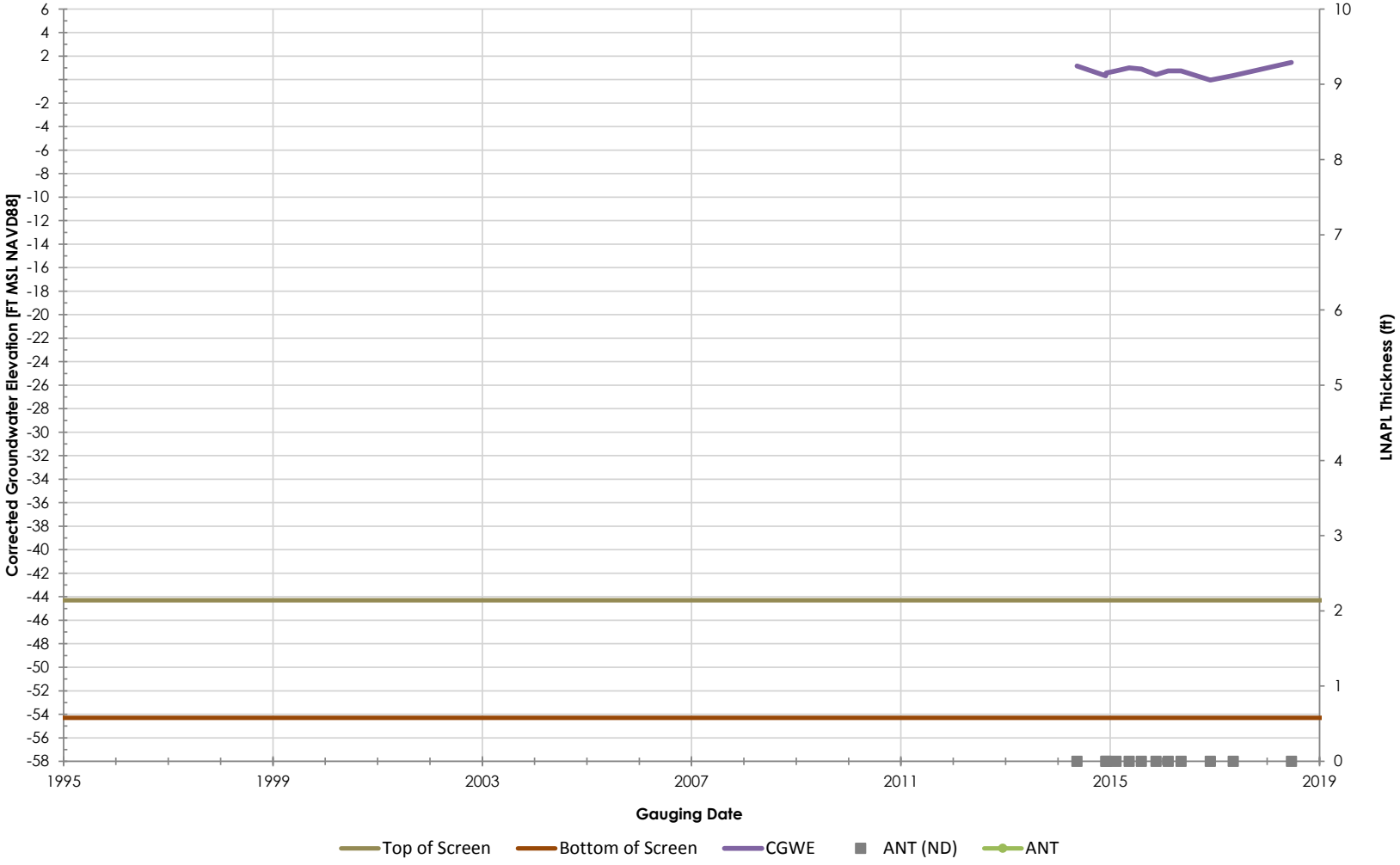
Stantec

Figure/Well No.

S-391D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



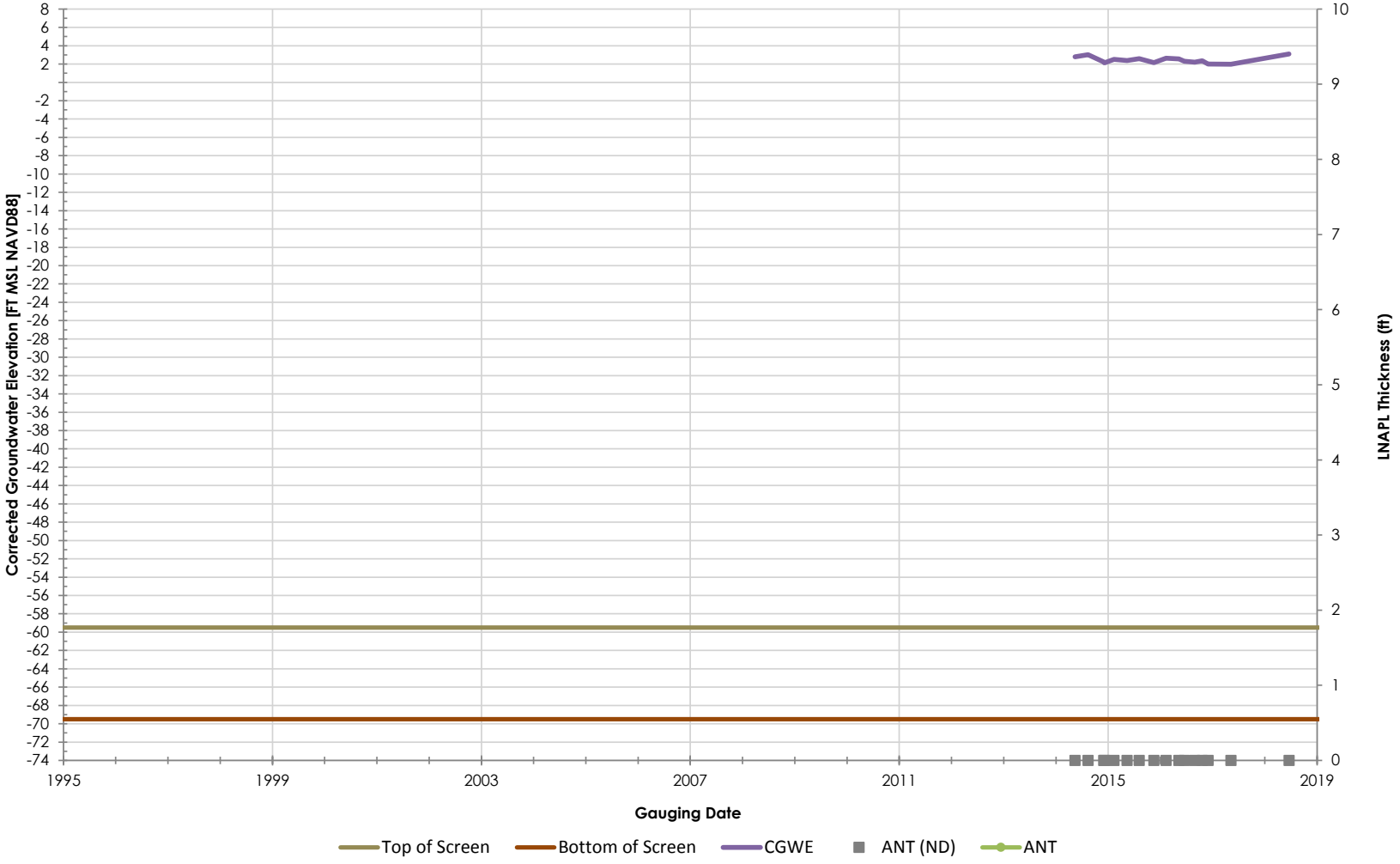
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-392D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

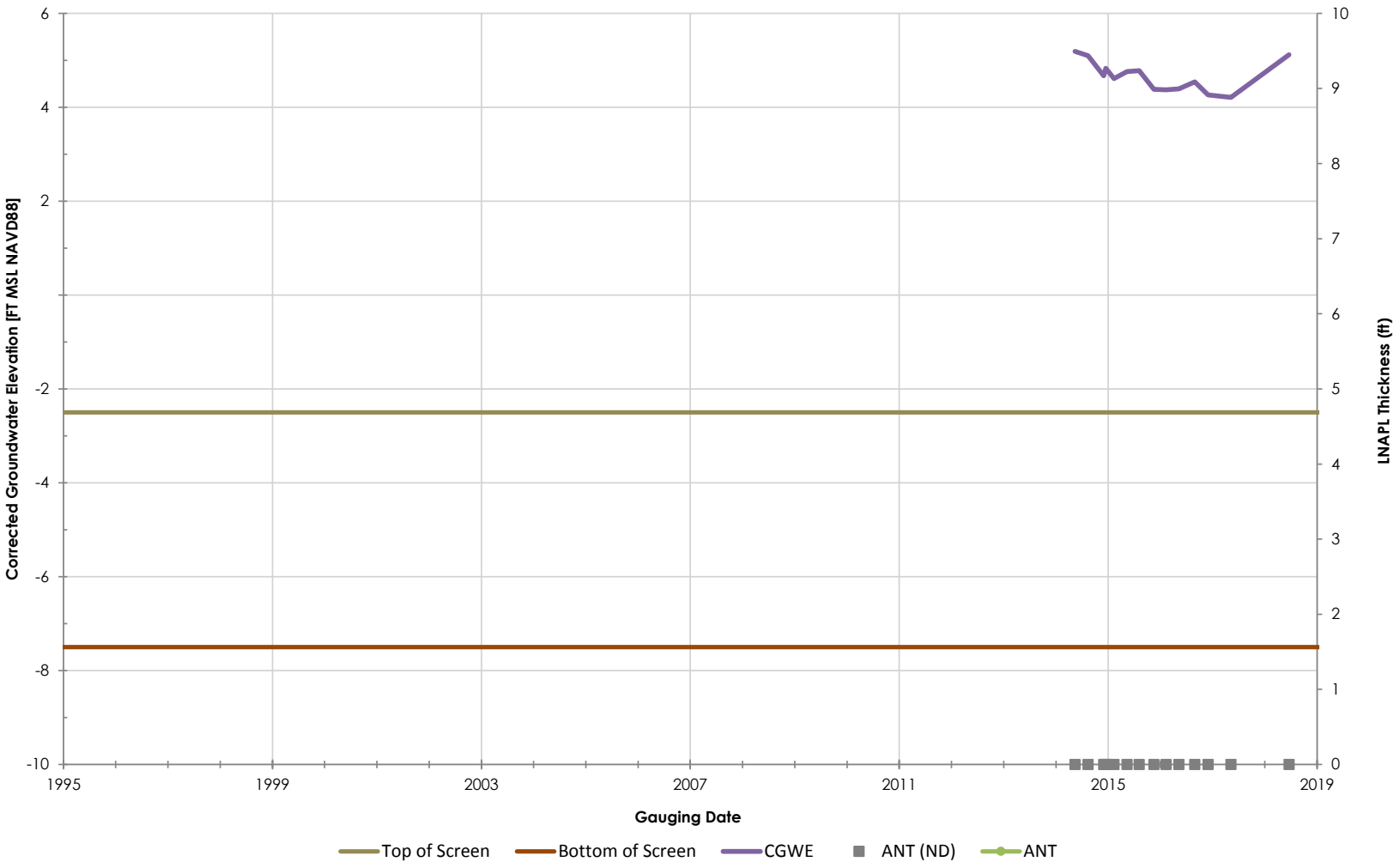
Stantec

Figure/Well No.

S-393D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

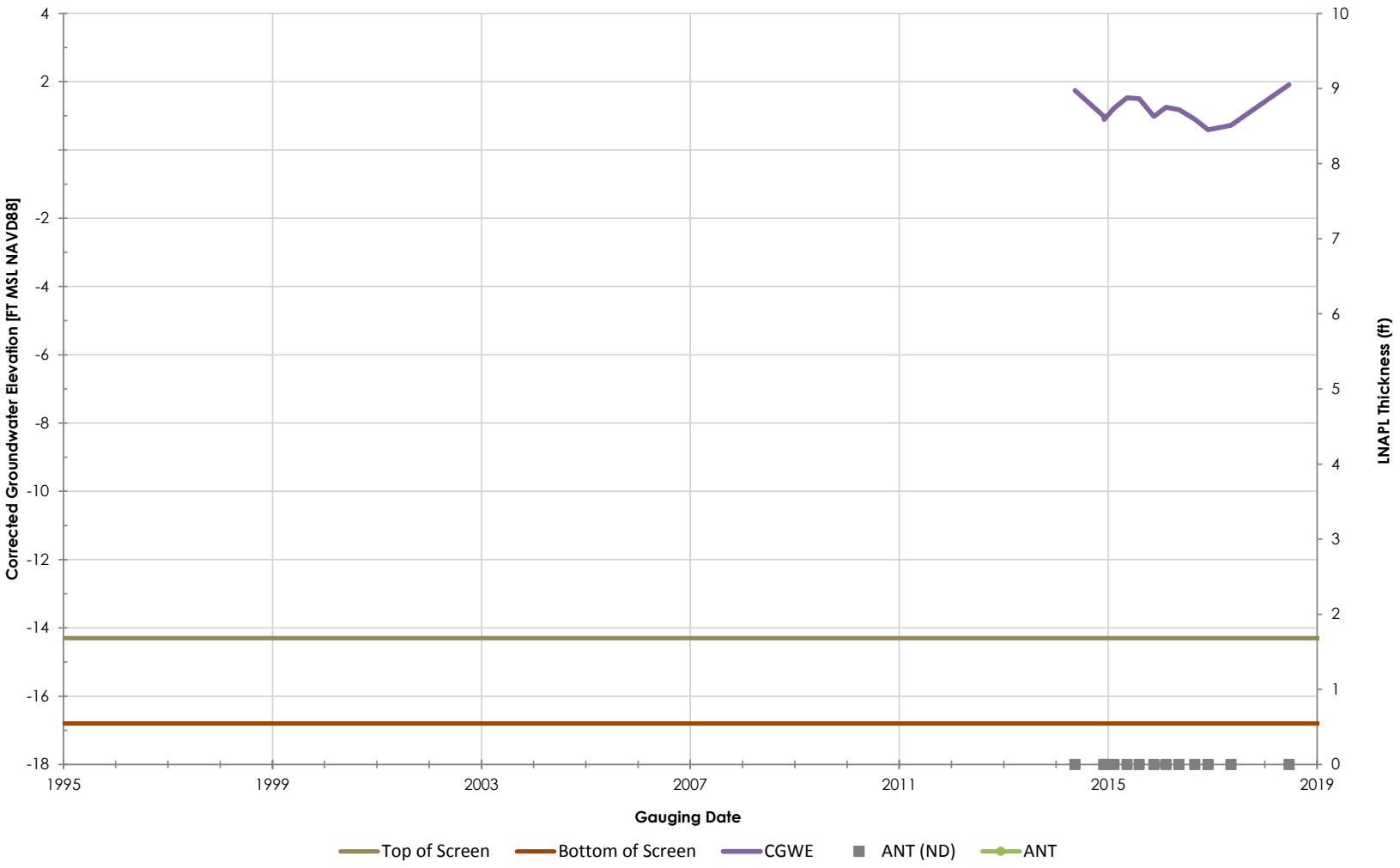
Stantec

Figure/Well No.

S-395

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

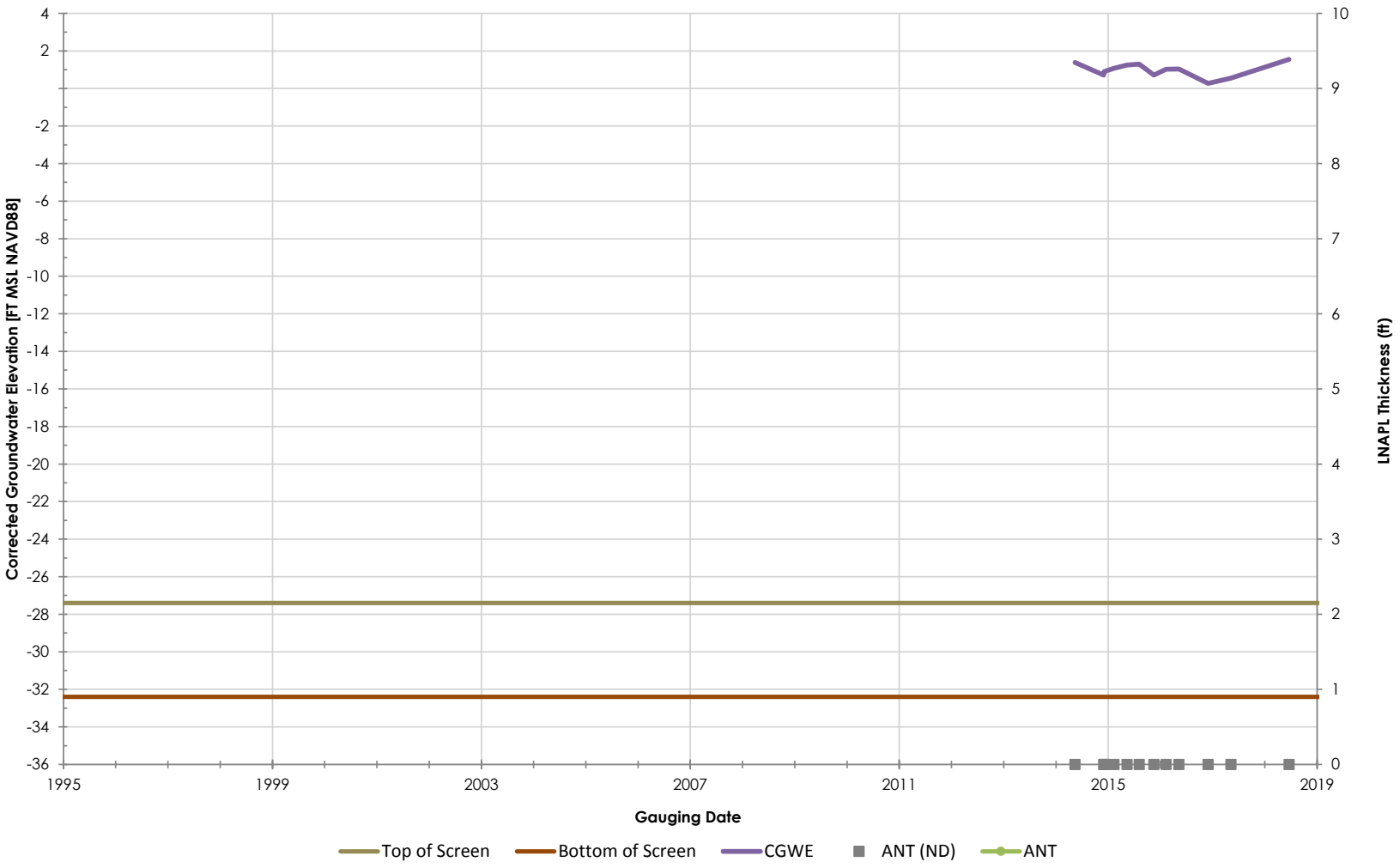
Stantec

Figure/Well No.

S-396

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

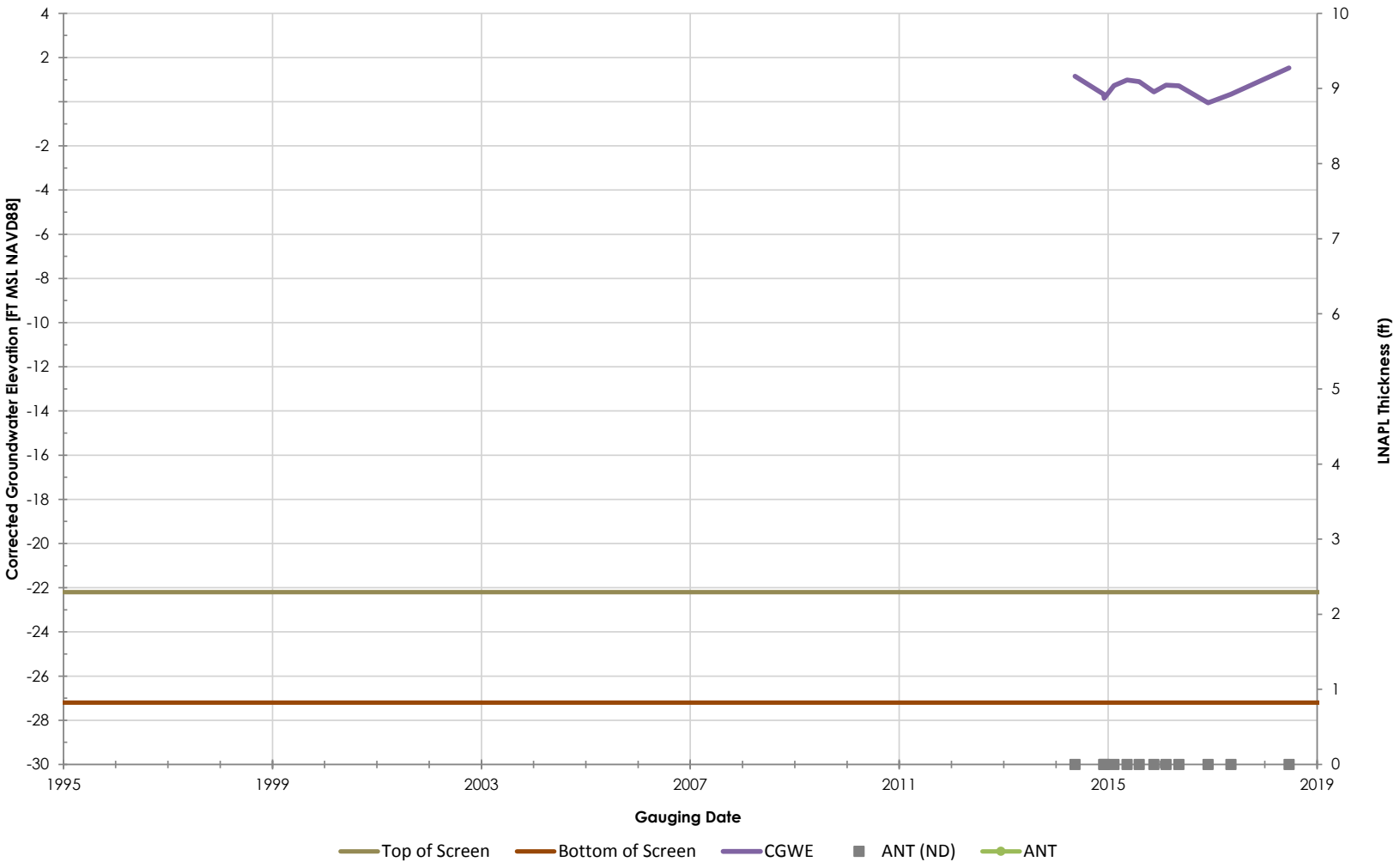
Stantec

Figure/Well No.

S-397

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

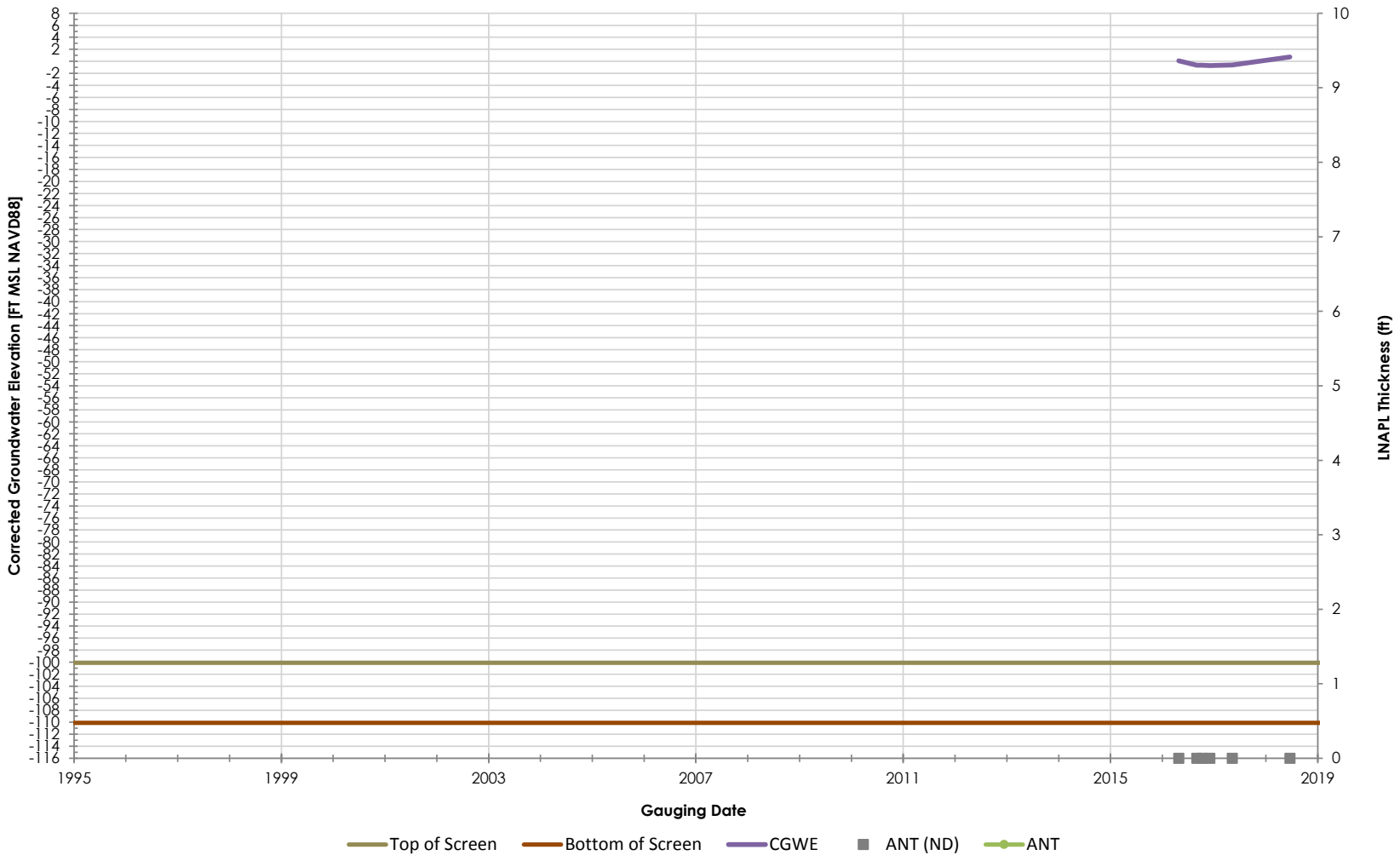
Stantec

Figure/Well No.

S-399

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

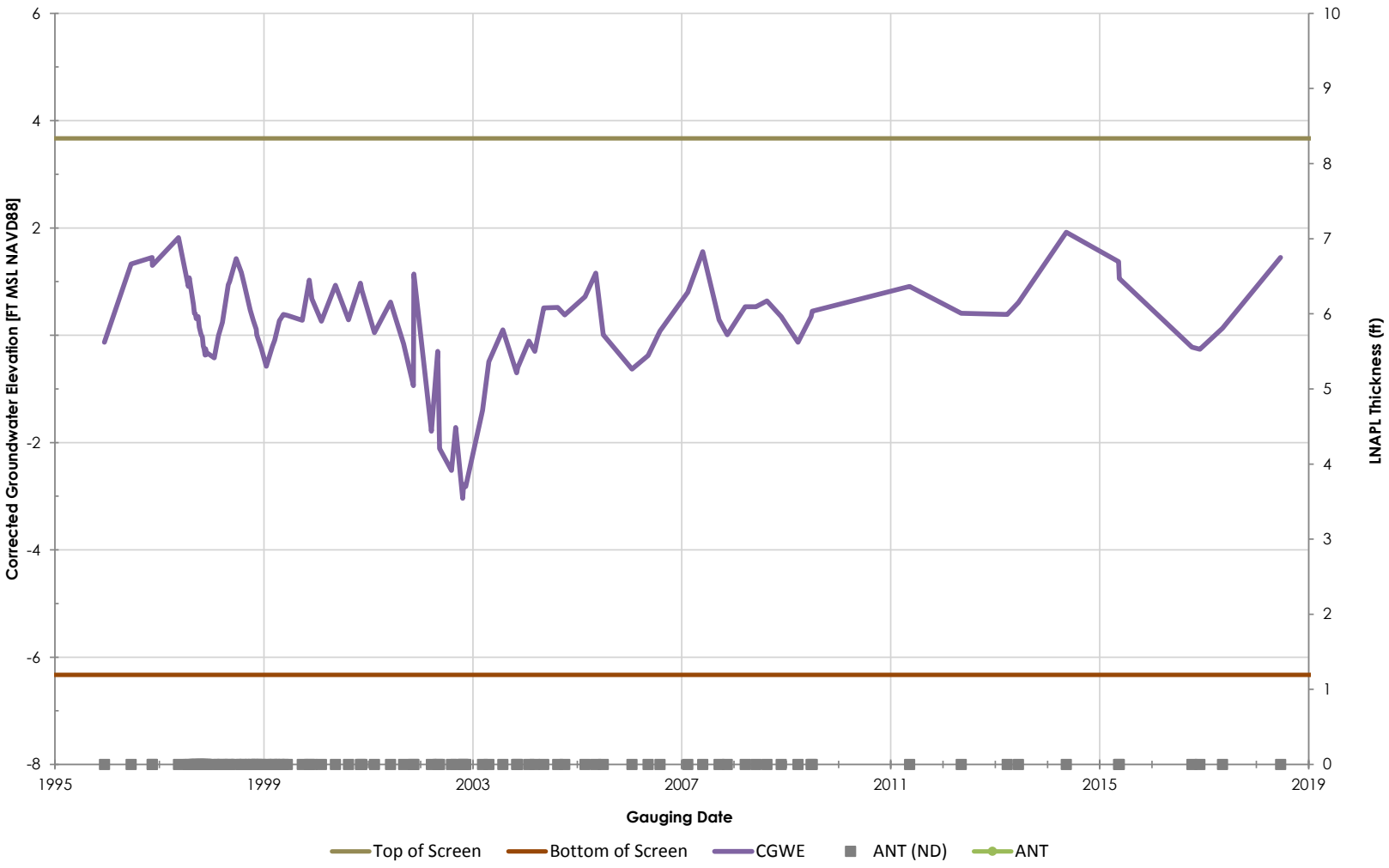
Stantec

Figure/Well No.

S-39D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

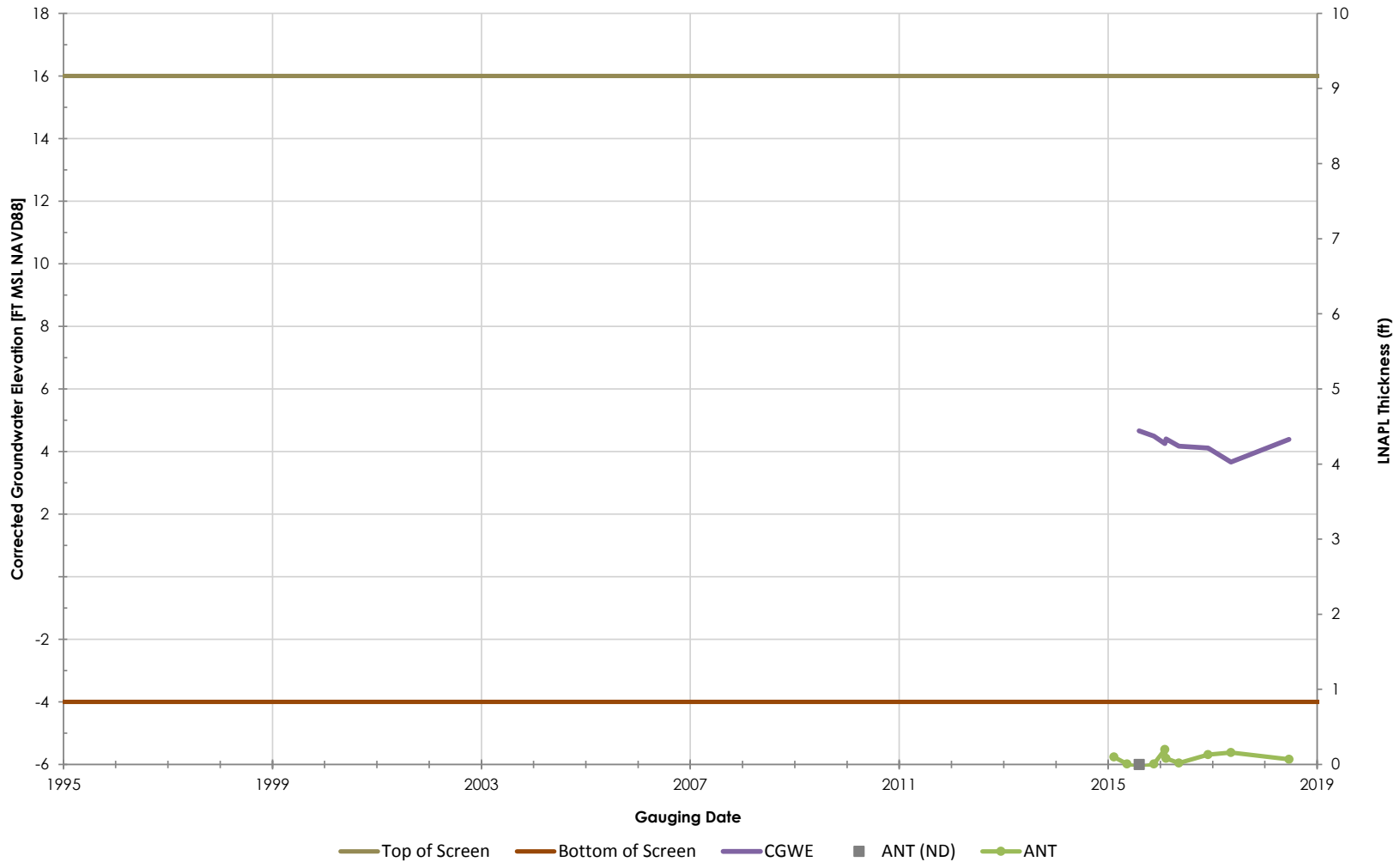
Stantec

Figure/Well No.

S-40

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

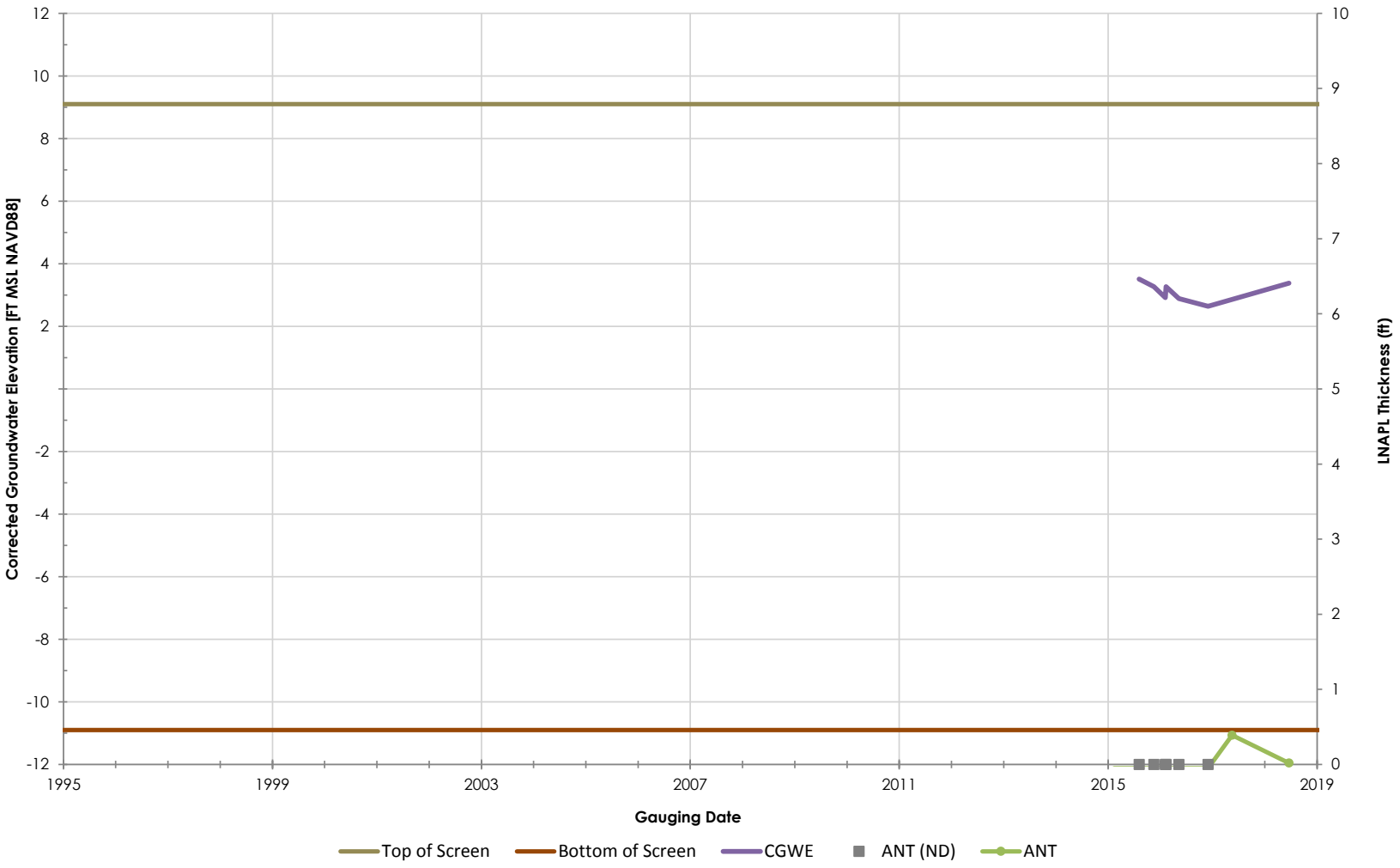
Stantec

Figure/Well No.

S-402

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

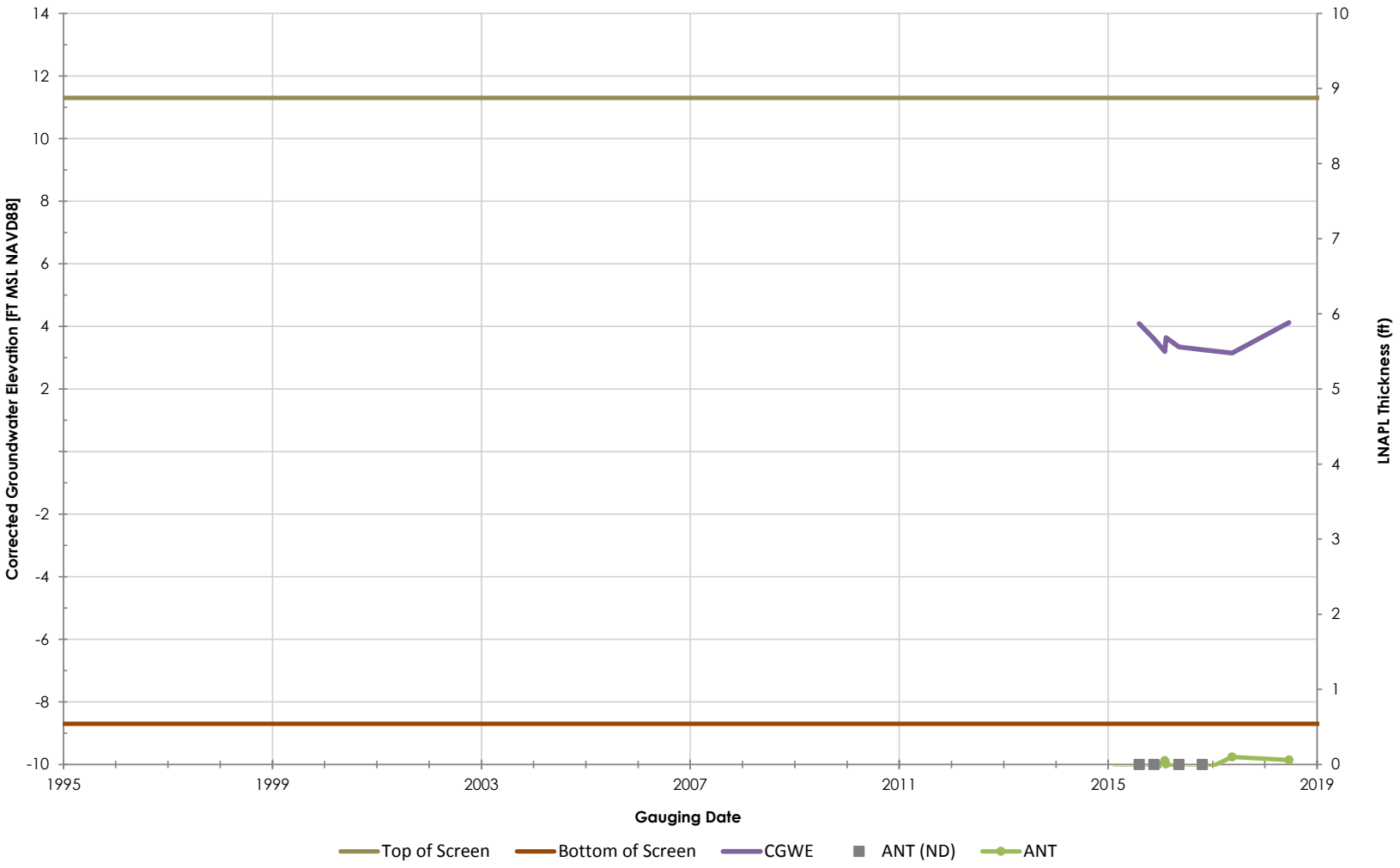
Stantec

Figure/Well No.

S-403

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

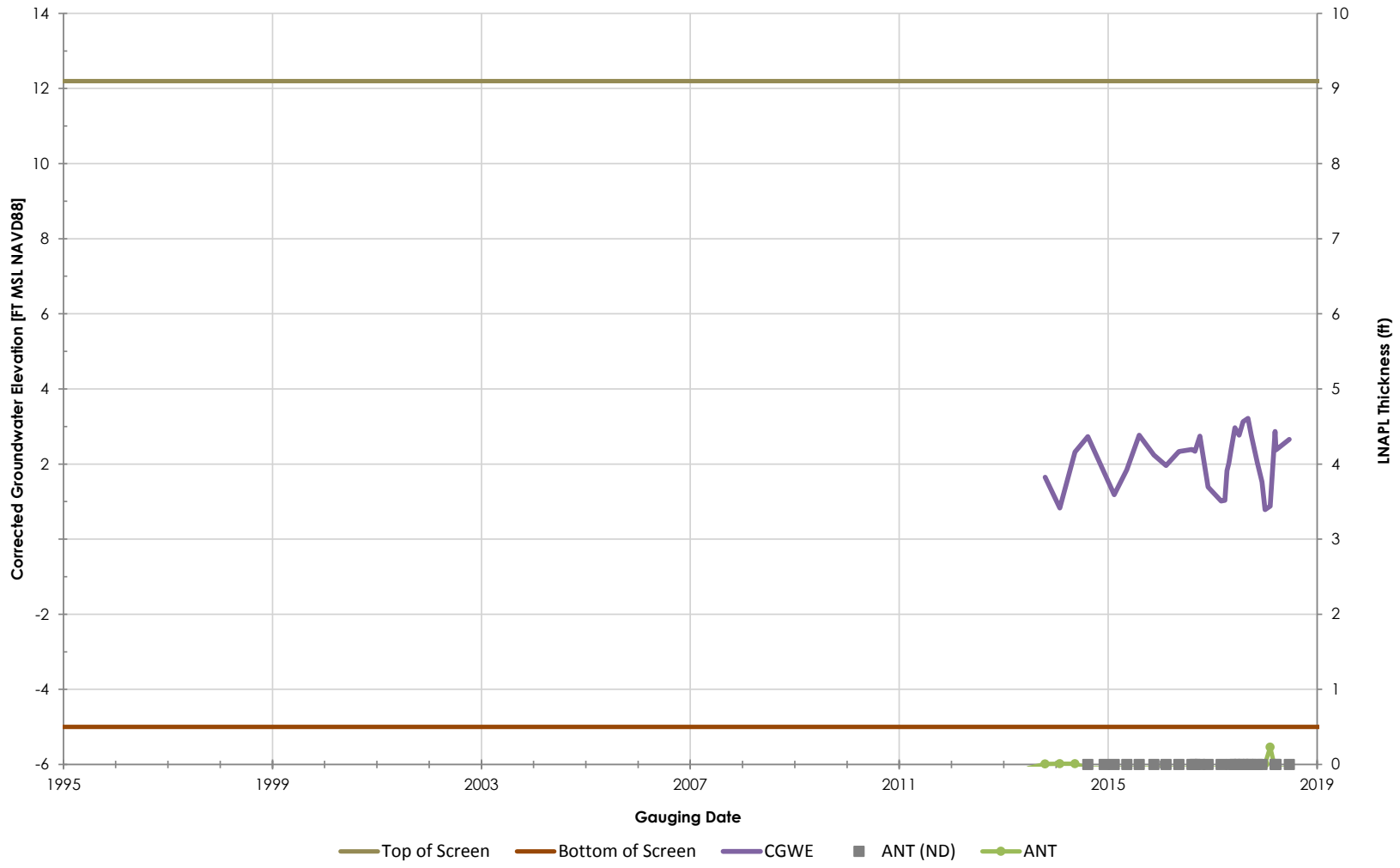
Stantec

Figure/Well No.

S-405

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

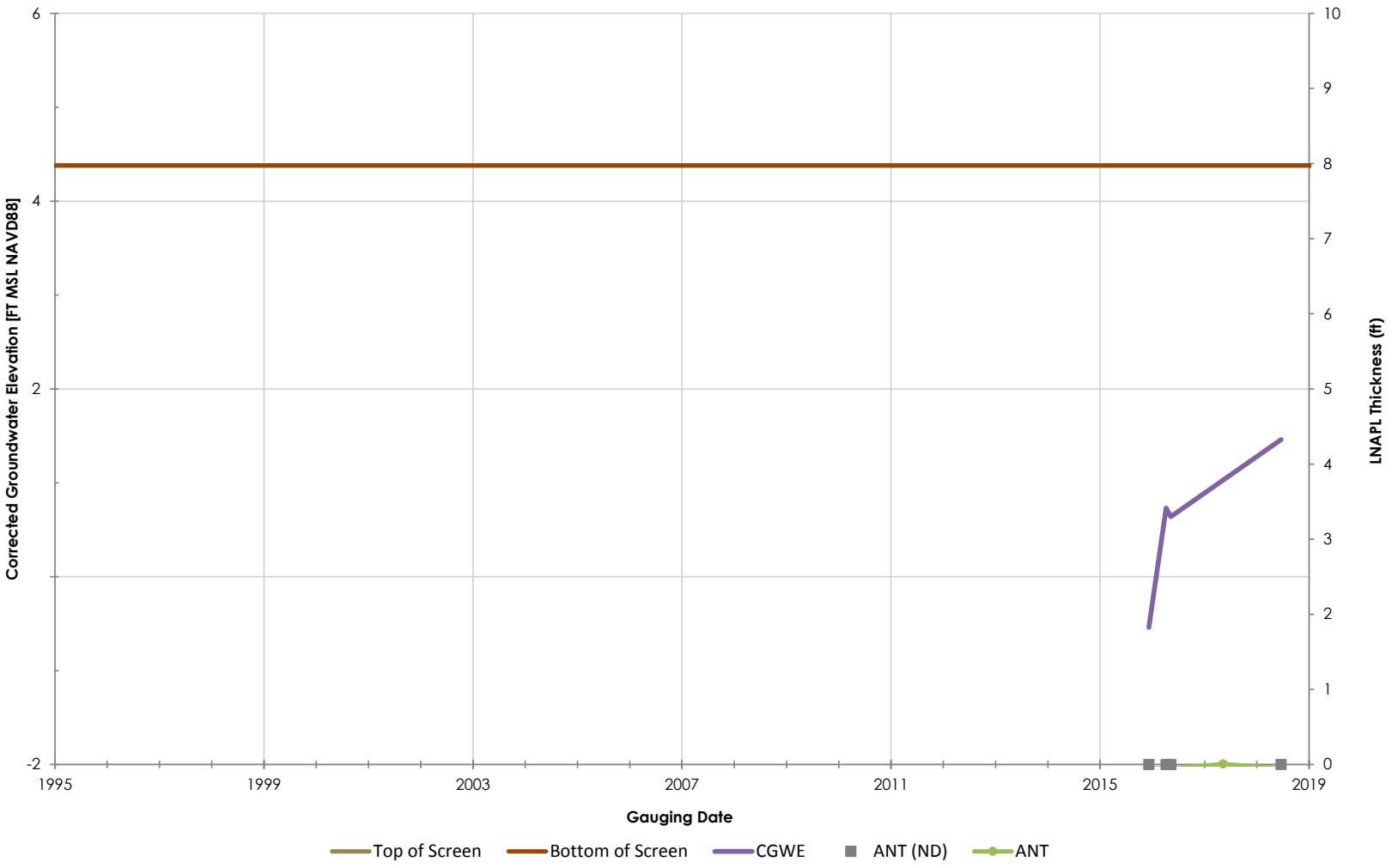
Stantec

Figure/Well No.

S-406

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

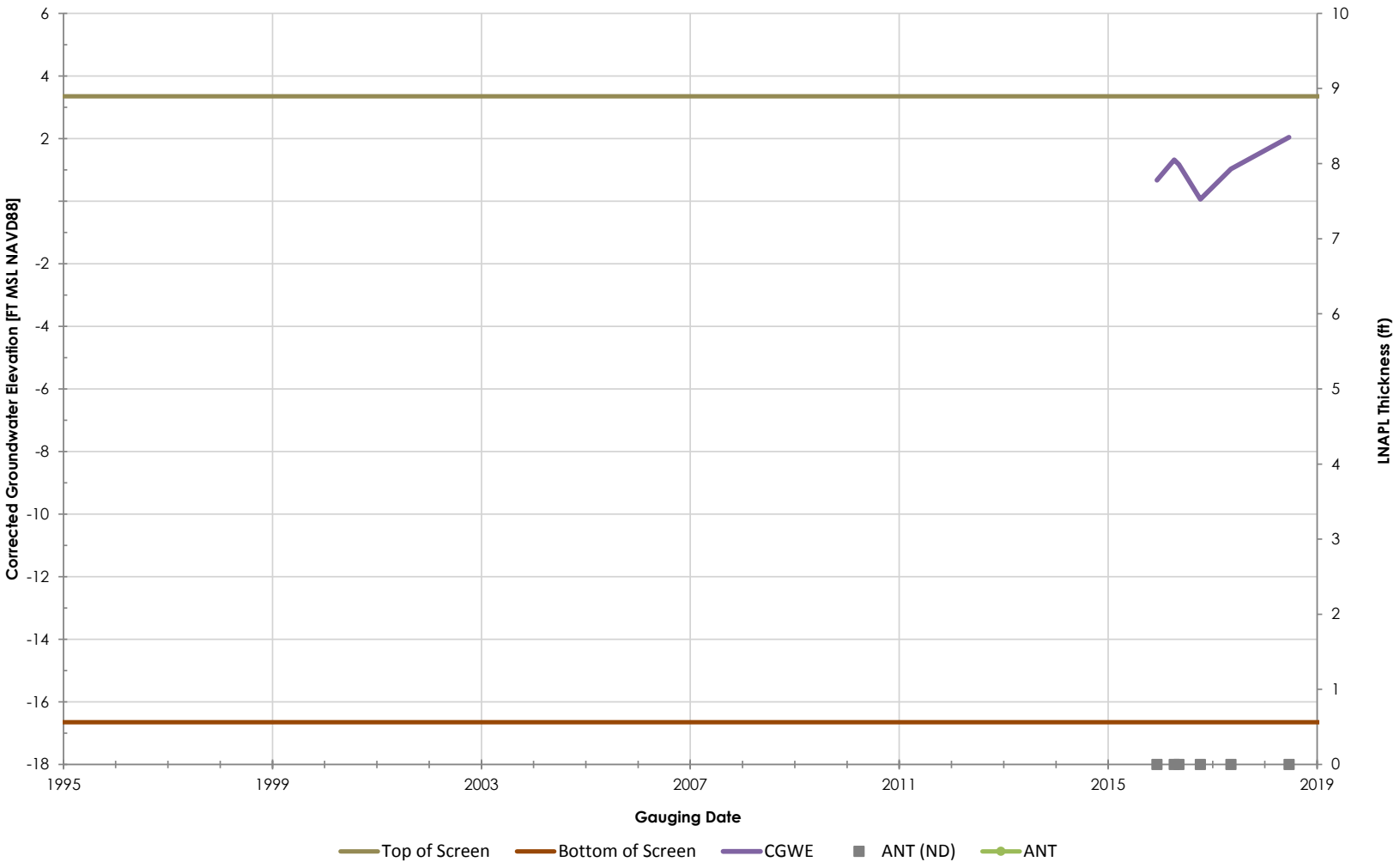
Stantec

Figure/Well No.

S-407

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

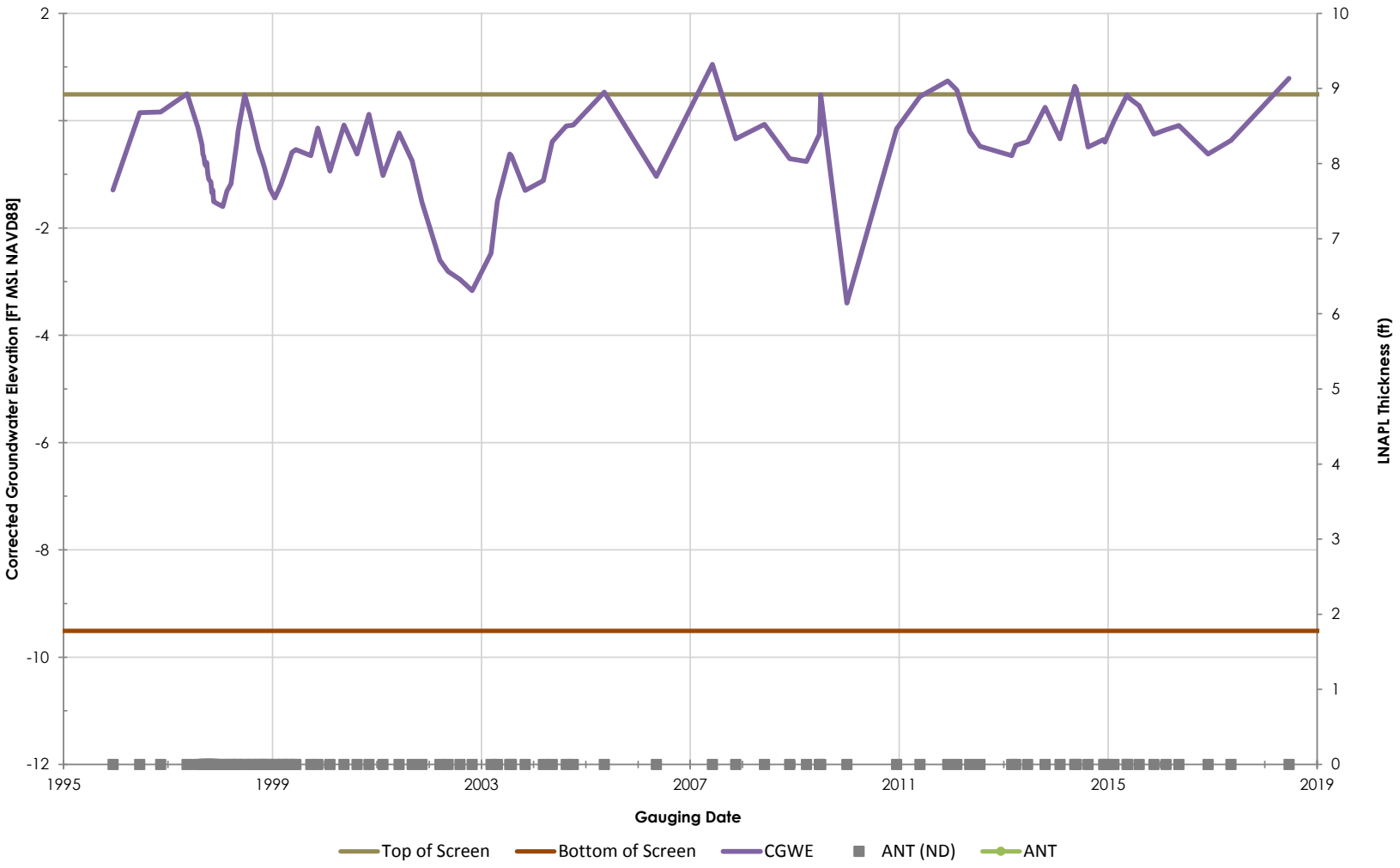
Stantec

Figure/Well No.

S-408

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

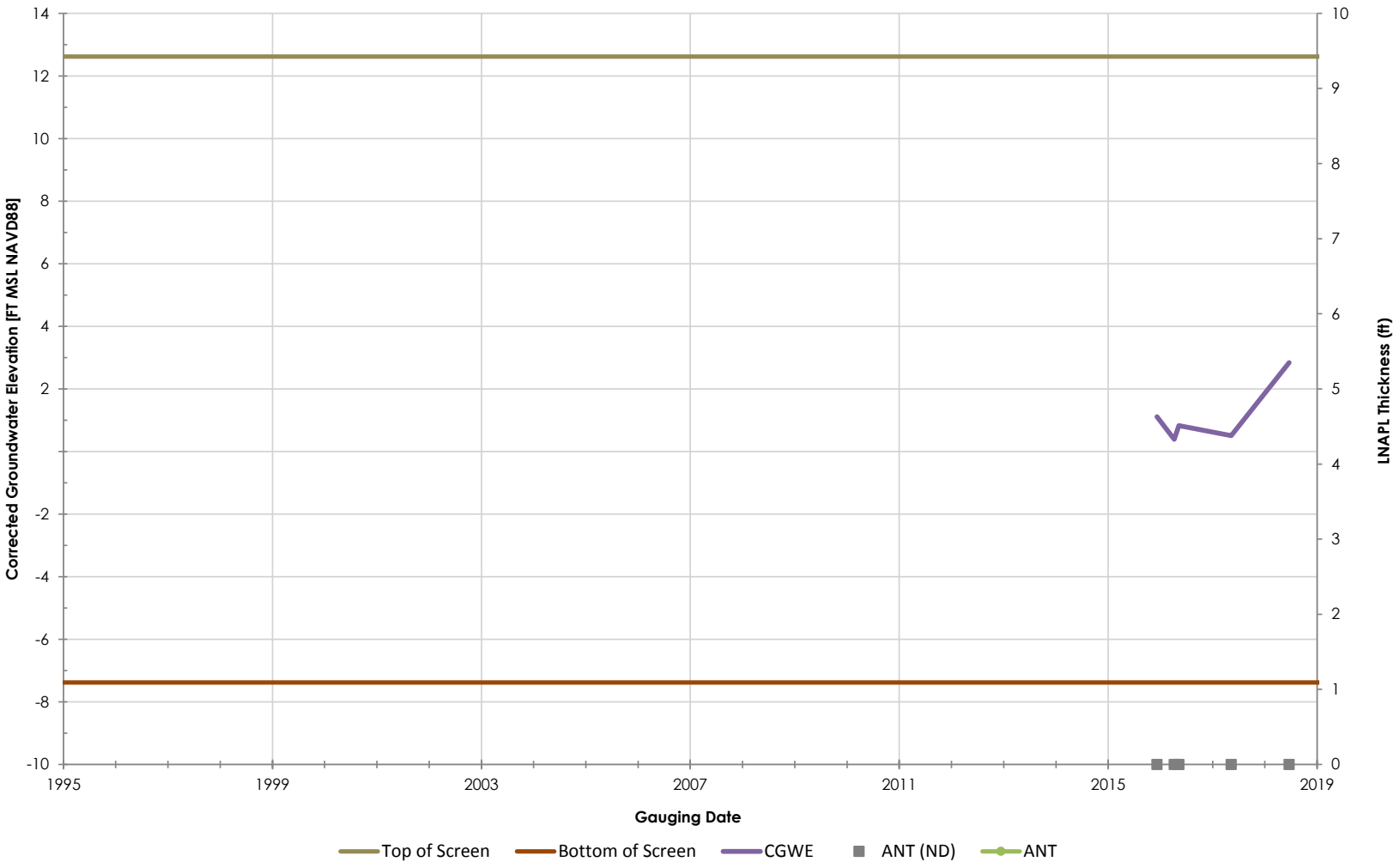
Stantec

Figure/Well No.

S-41

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

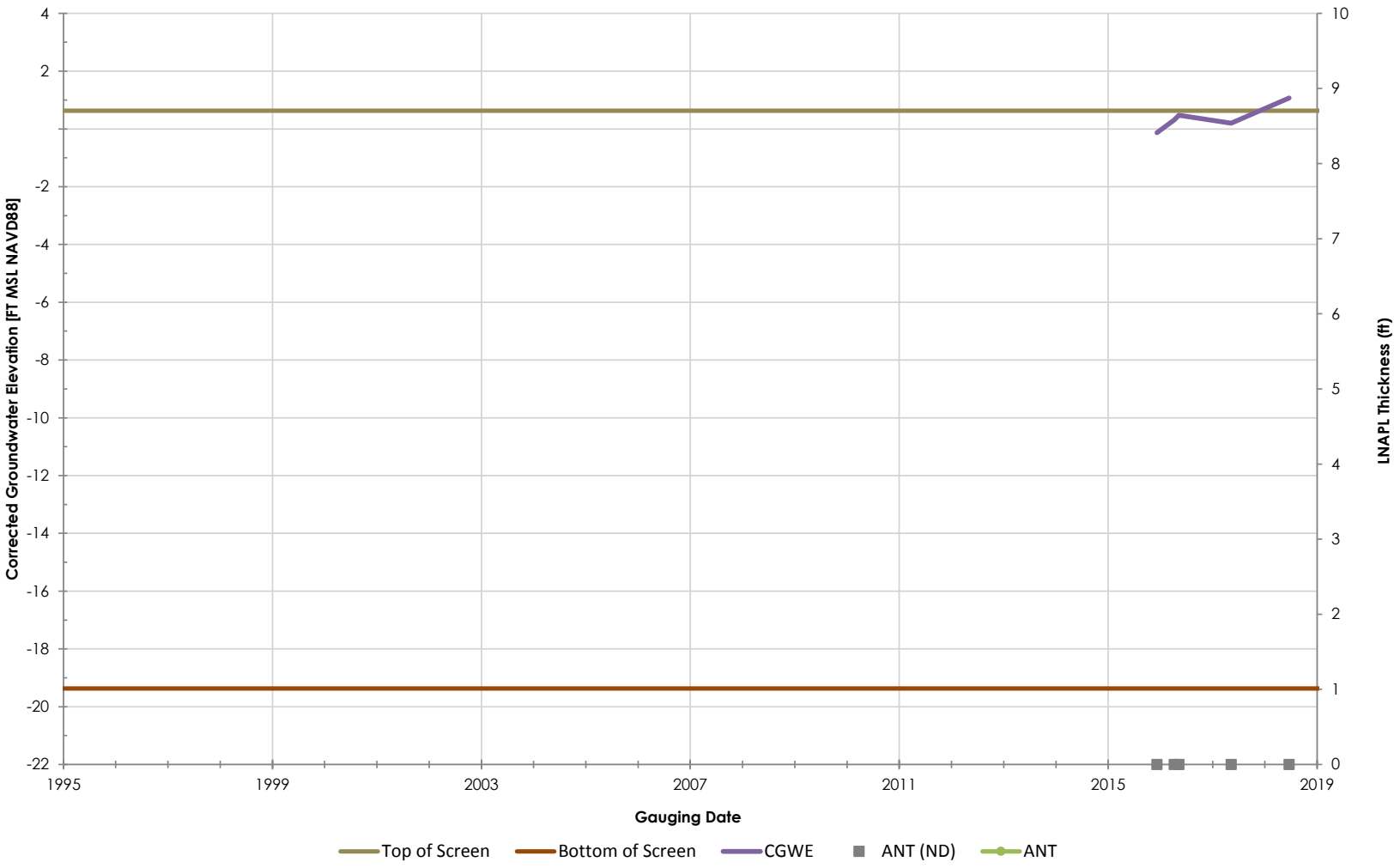
Stantec

Figure/Well No.

S-411

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

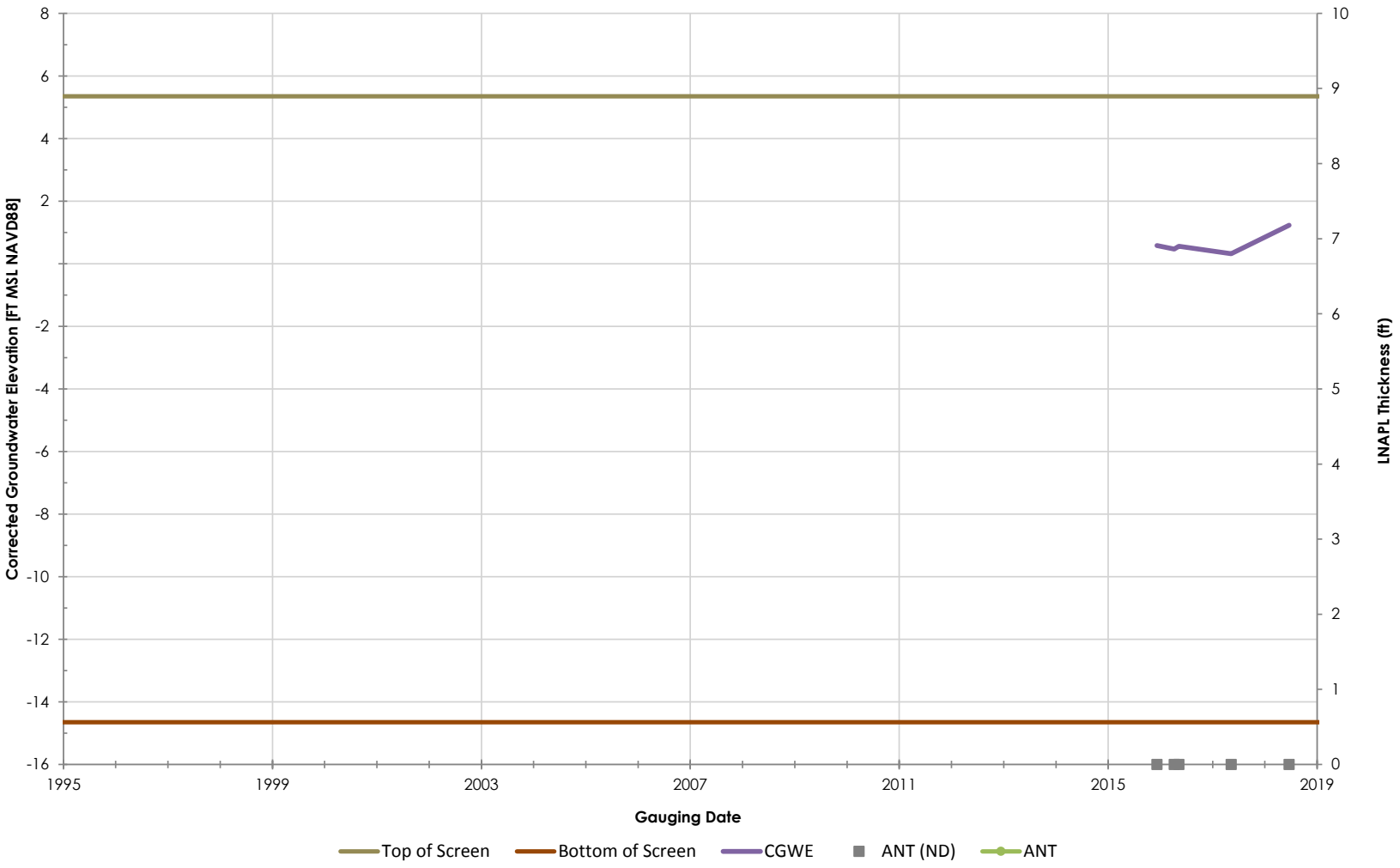
Stantec

Figure/Well No.

S-412

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

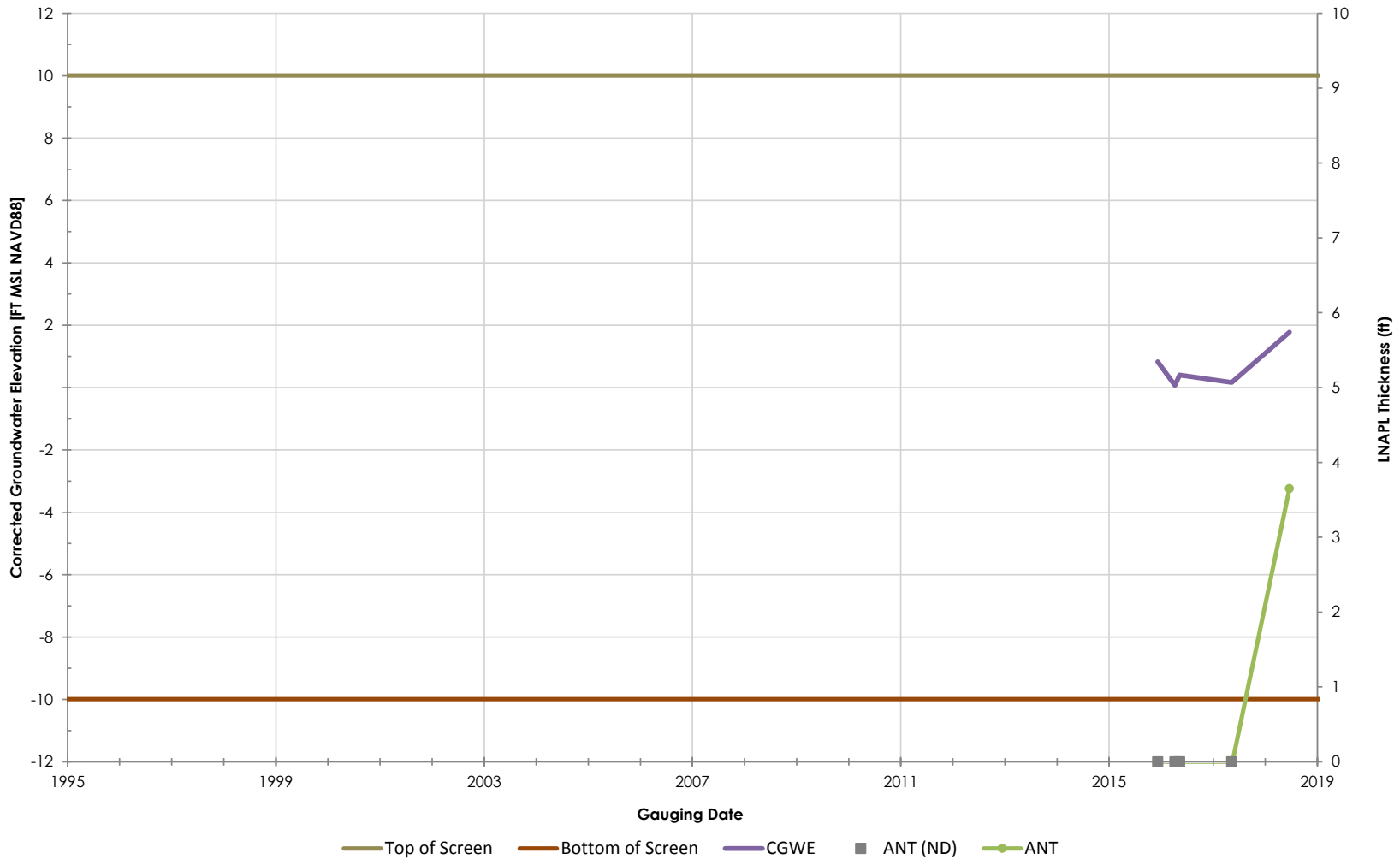
Stantec

Figure/Well No.

S-413

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

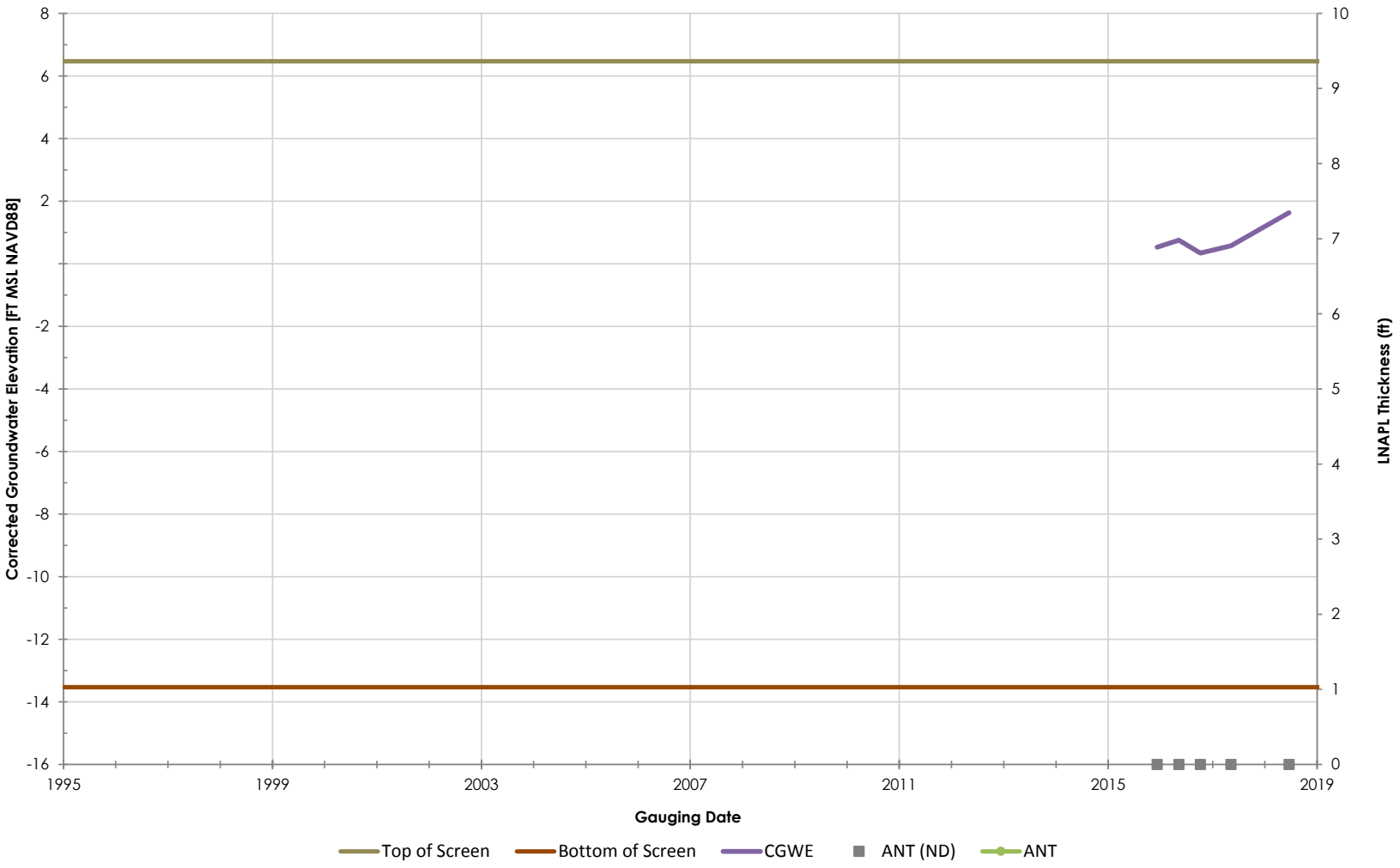
Stantec

Figure/Well No.

S-414

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

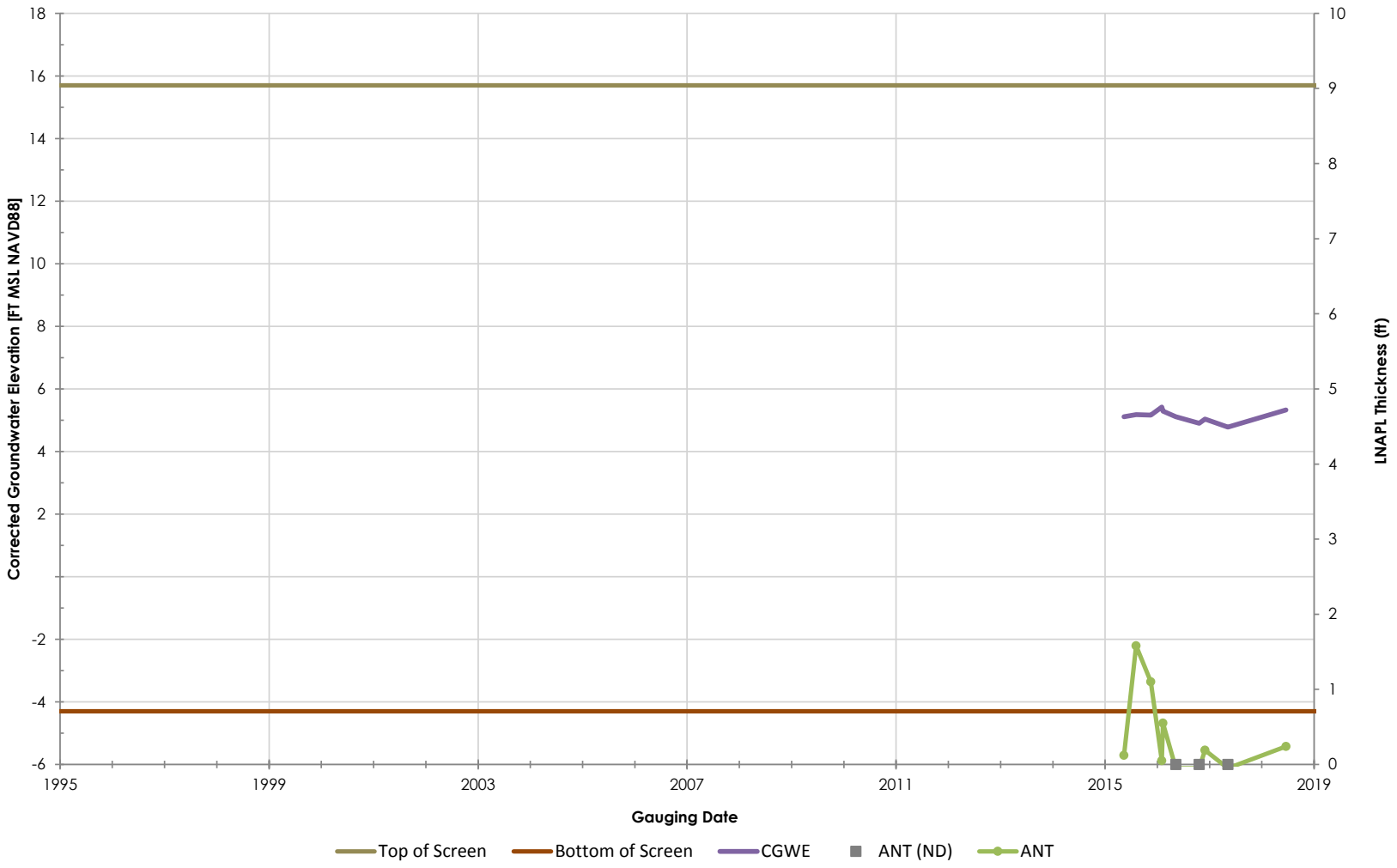
Stantec

Figure/Well No.

S-415

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

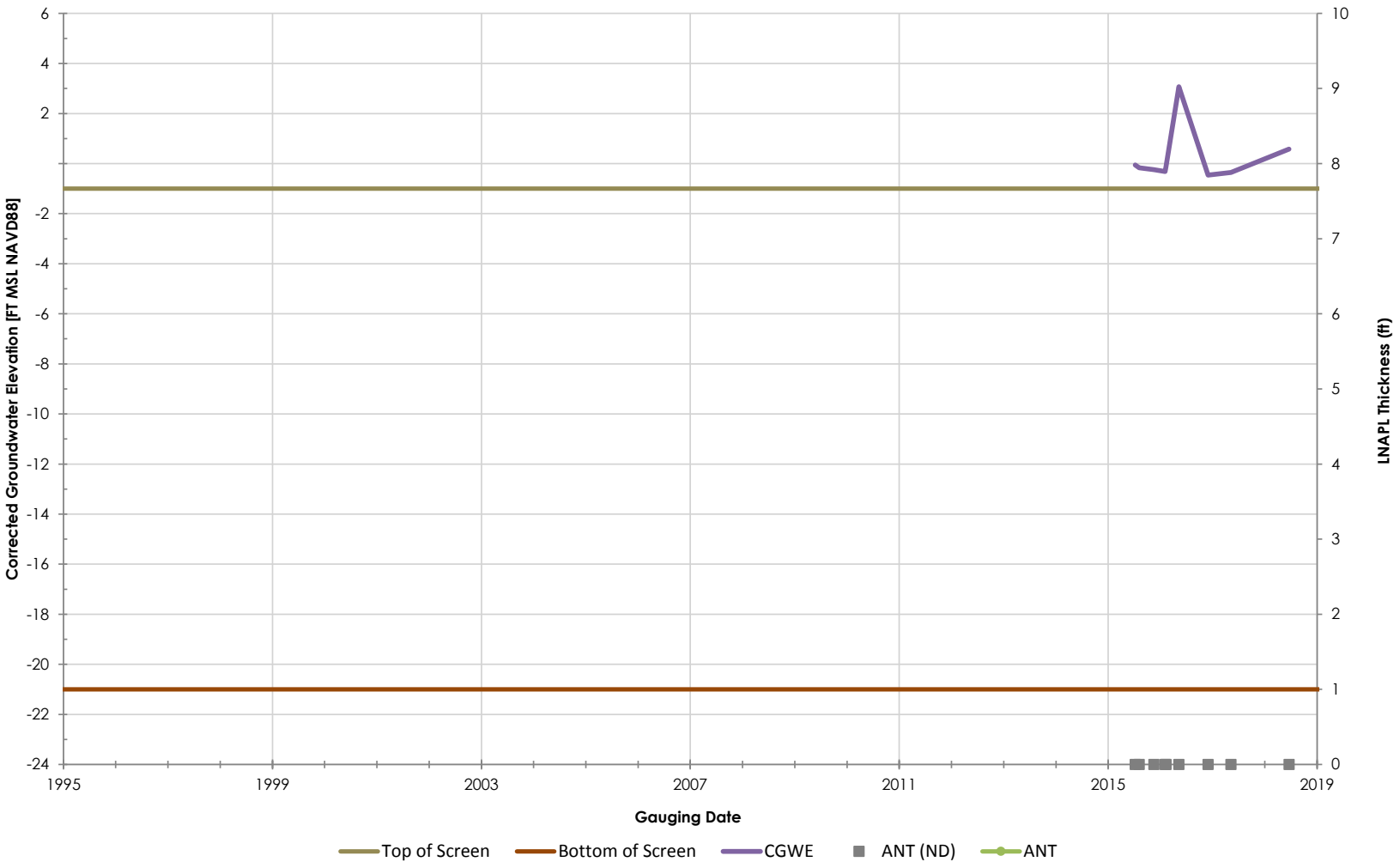
Stantec

Figure/Well No.

S-417

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

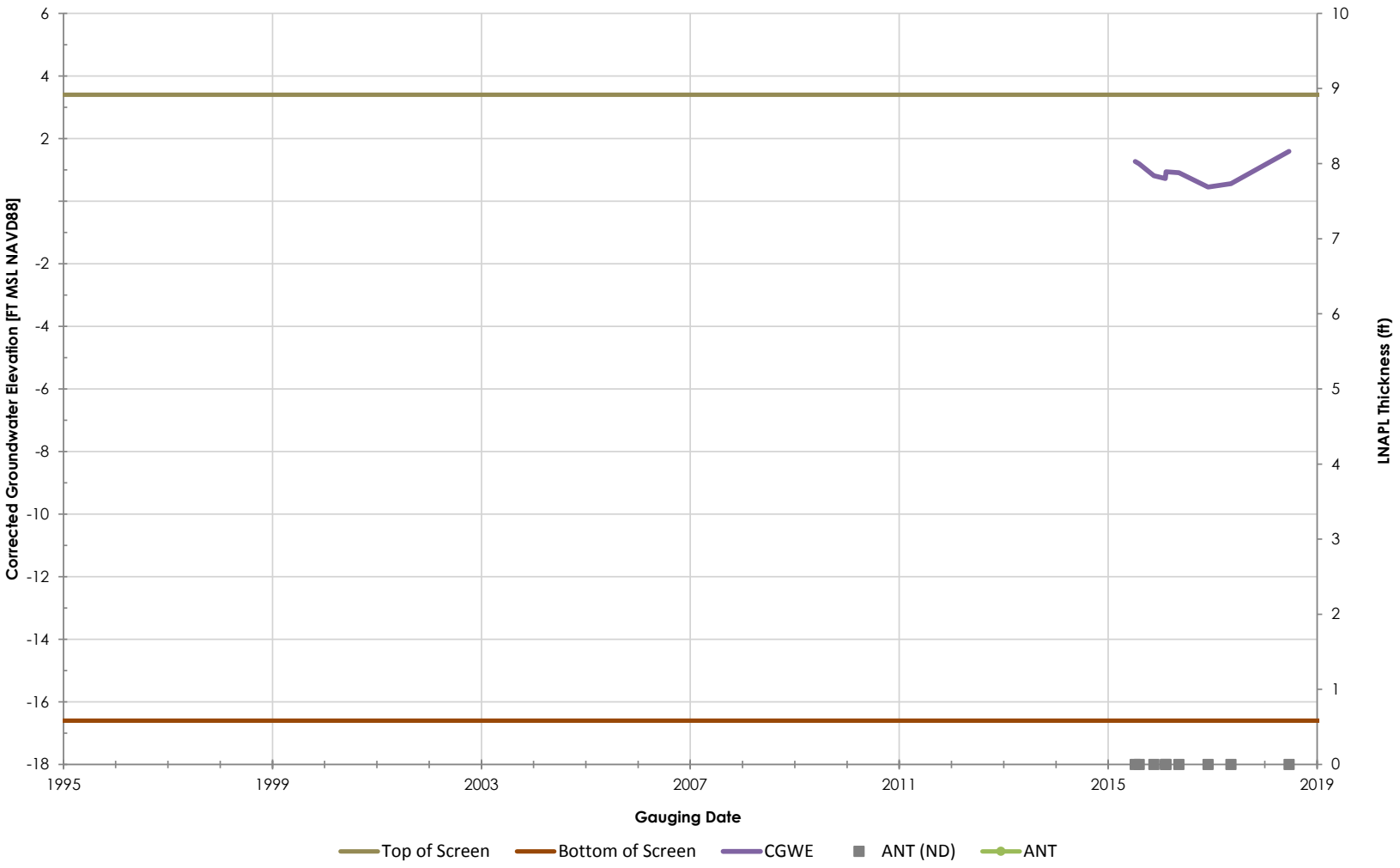
Stantec

Figure/Well No.

S-418

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

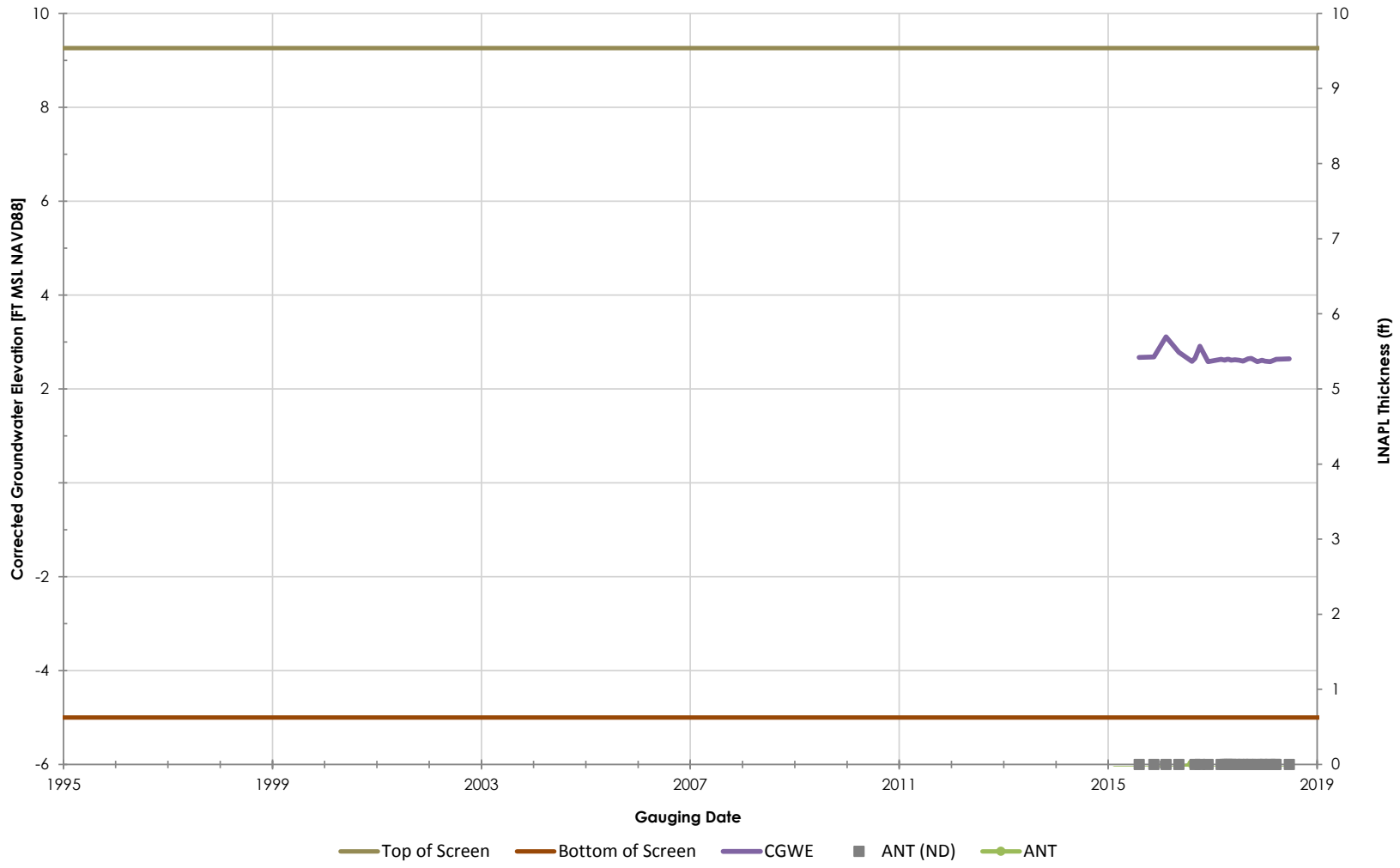
Stantec

Figure/Well No.

S-419

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

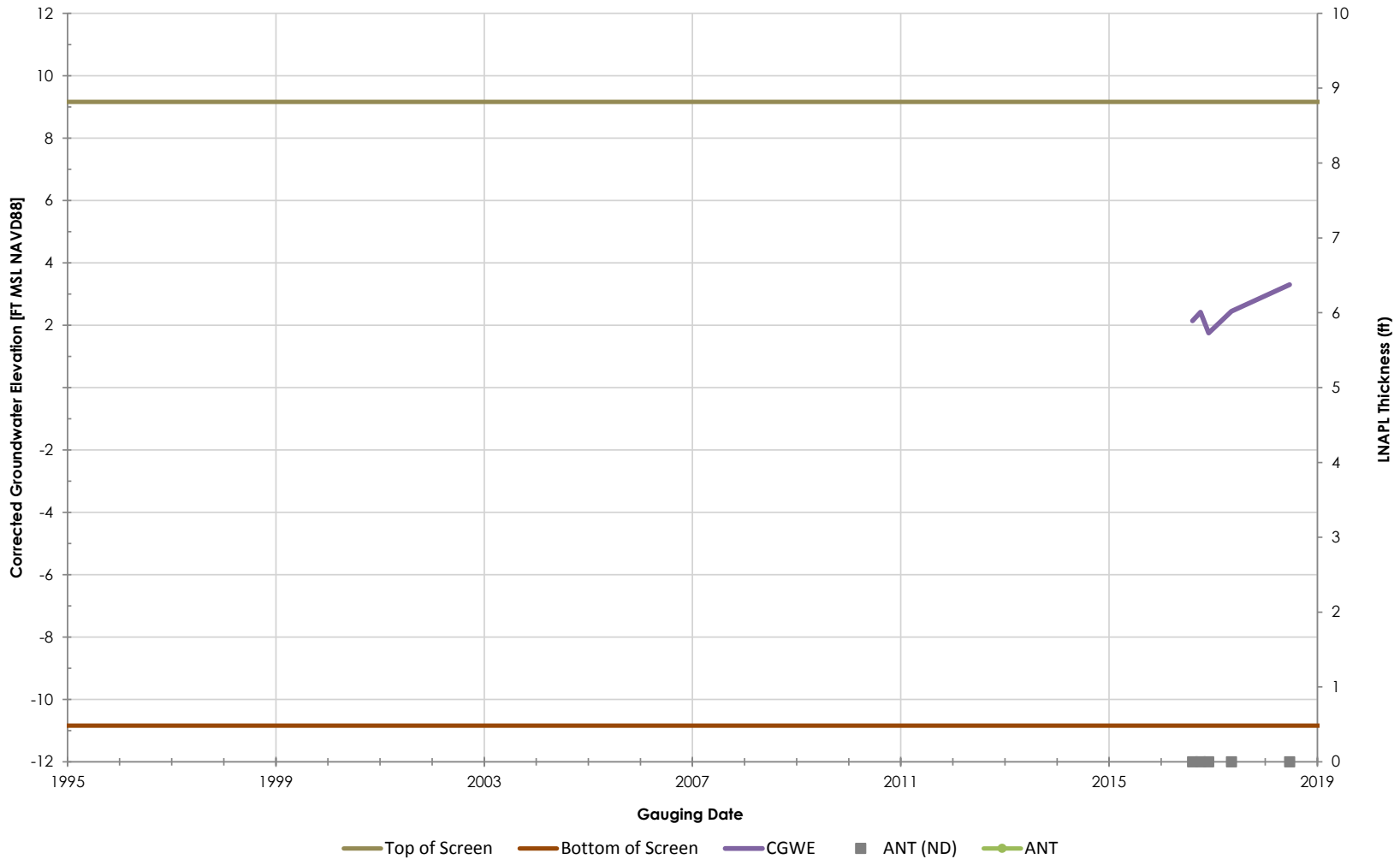
Stantec

Figure/Well No.

S-420

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

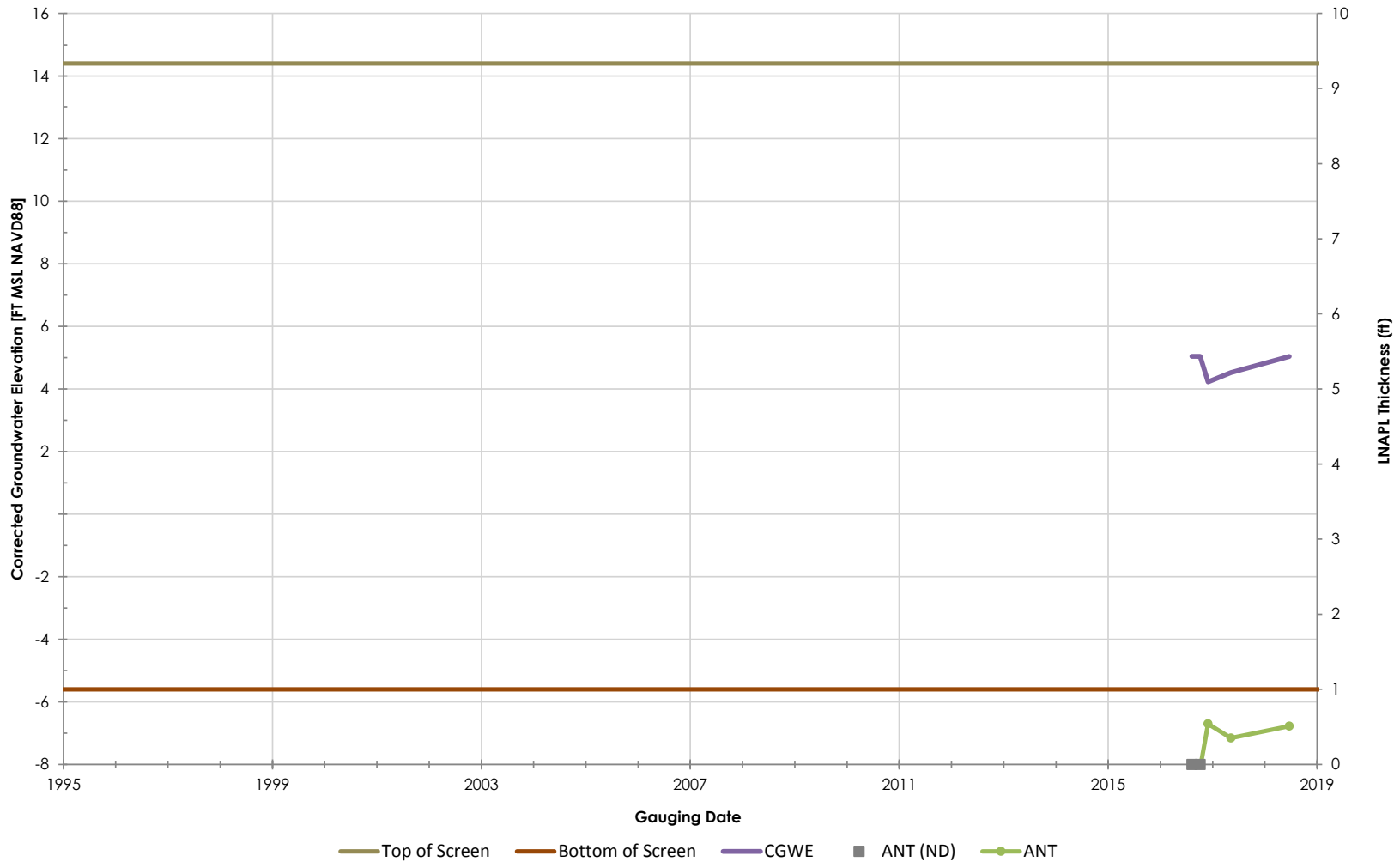
Stantec

Figure/Well No.

S-422

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

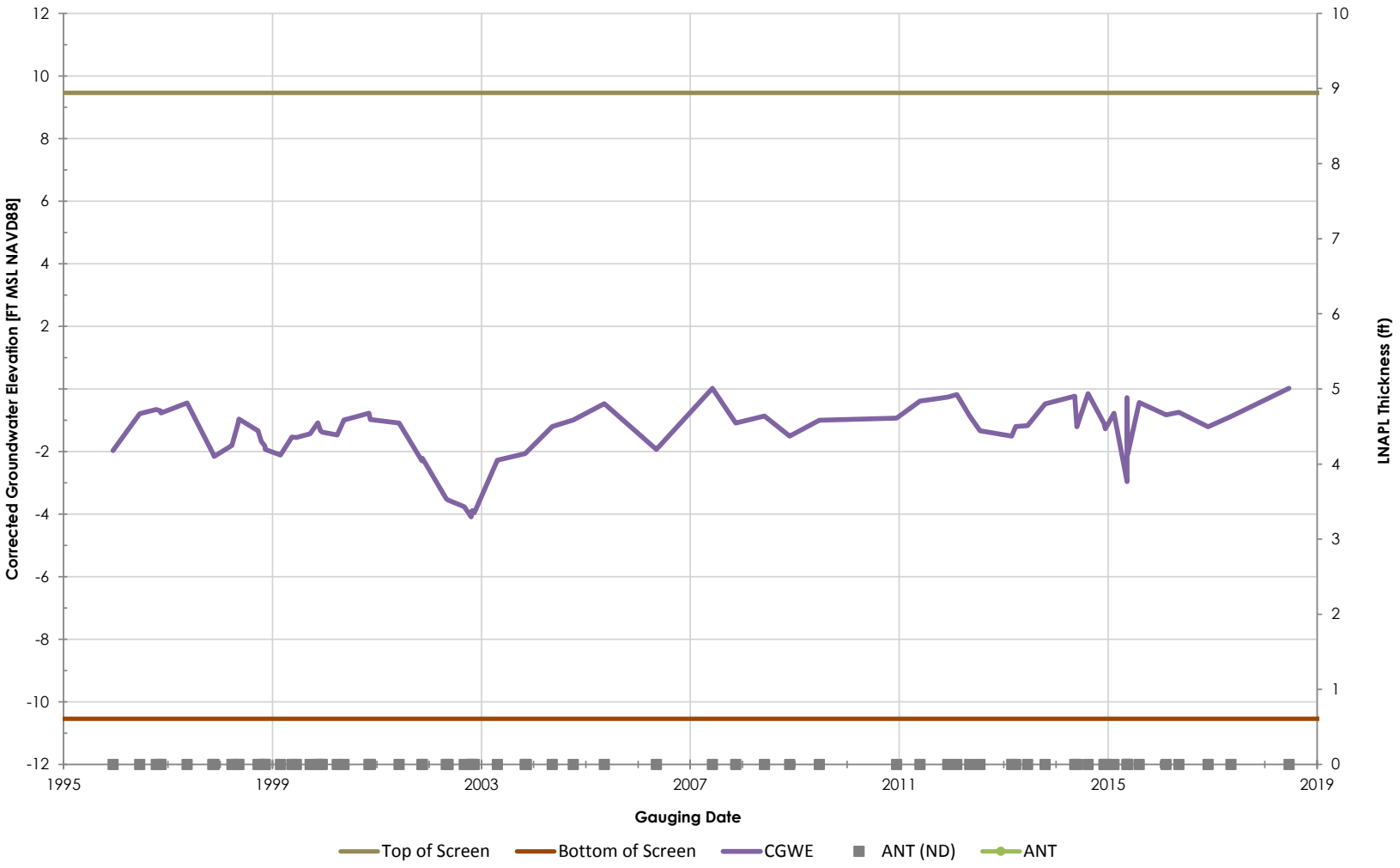
Stantec

Figure/Well No.

S-423

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

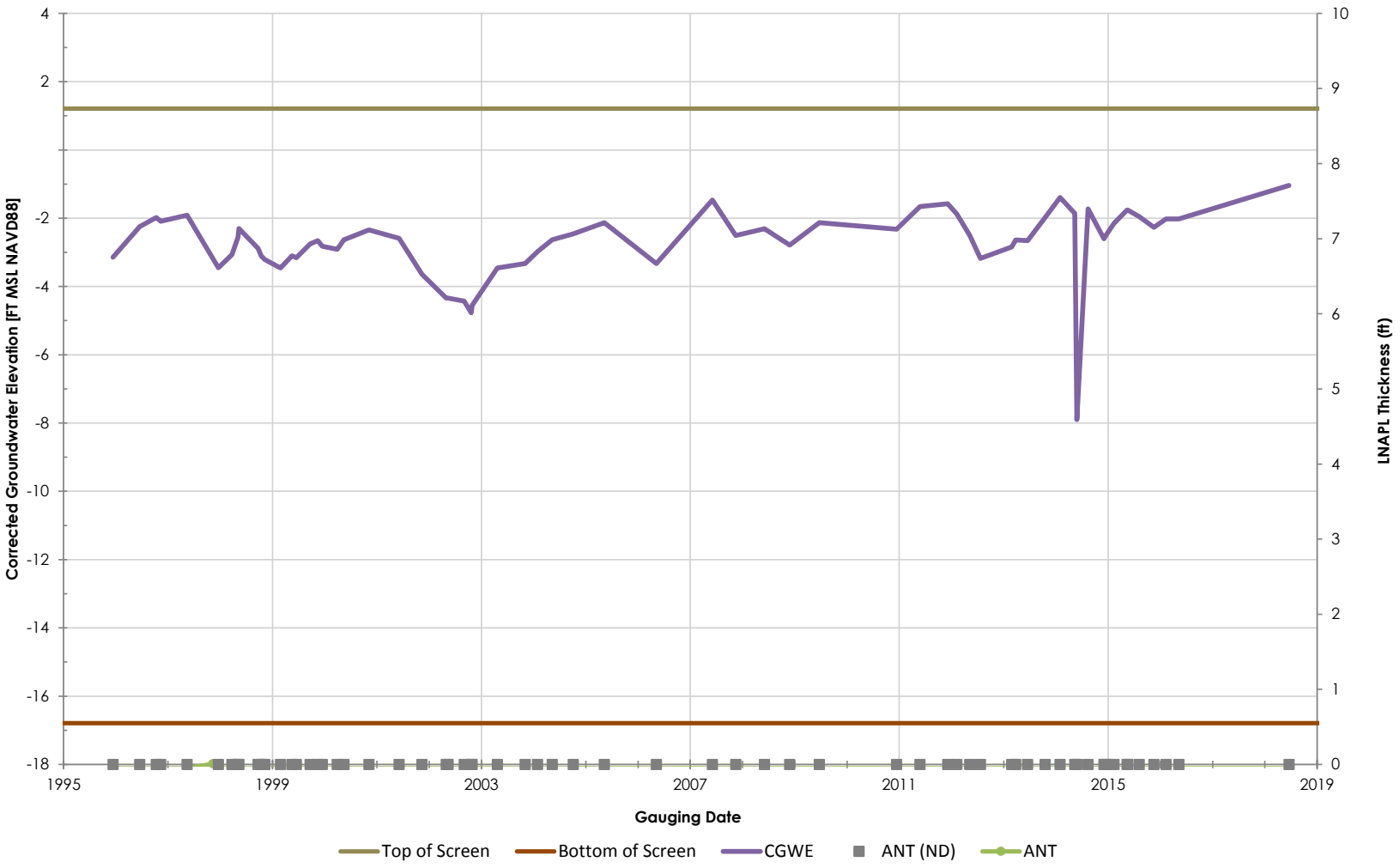
Stantec

Figure/Well No.

S-43

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

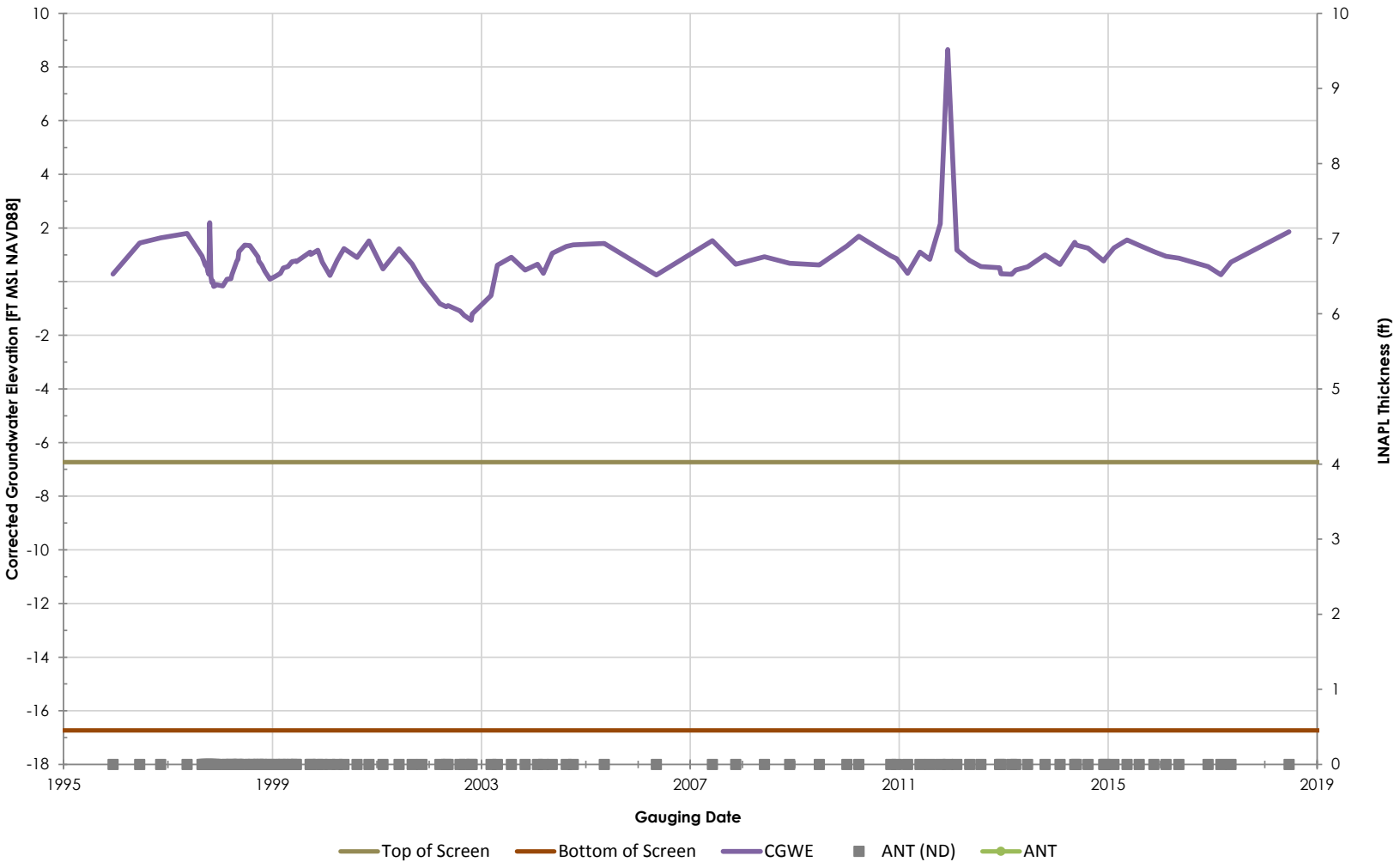
Stantec

Figure/Well No.

S-44

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

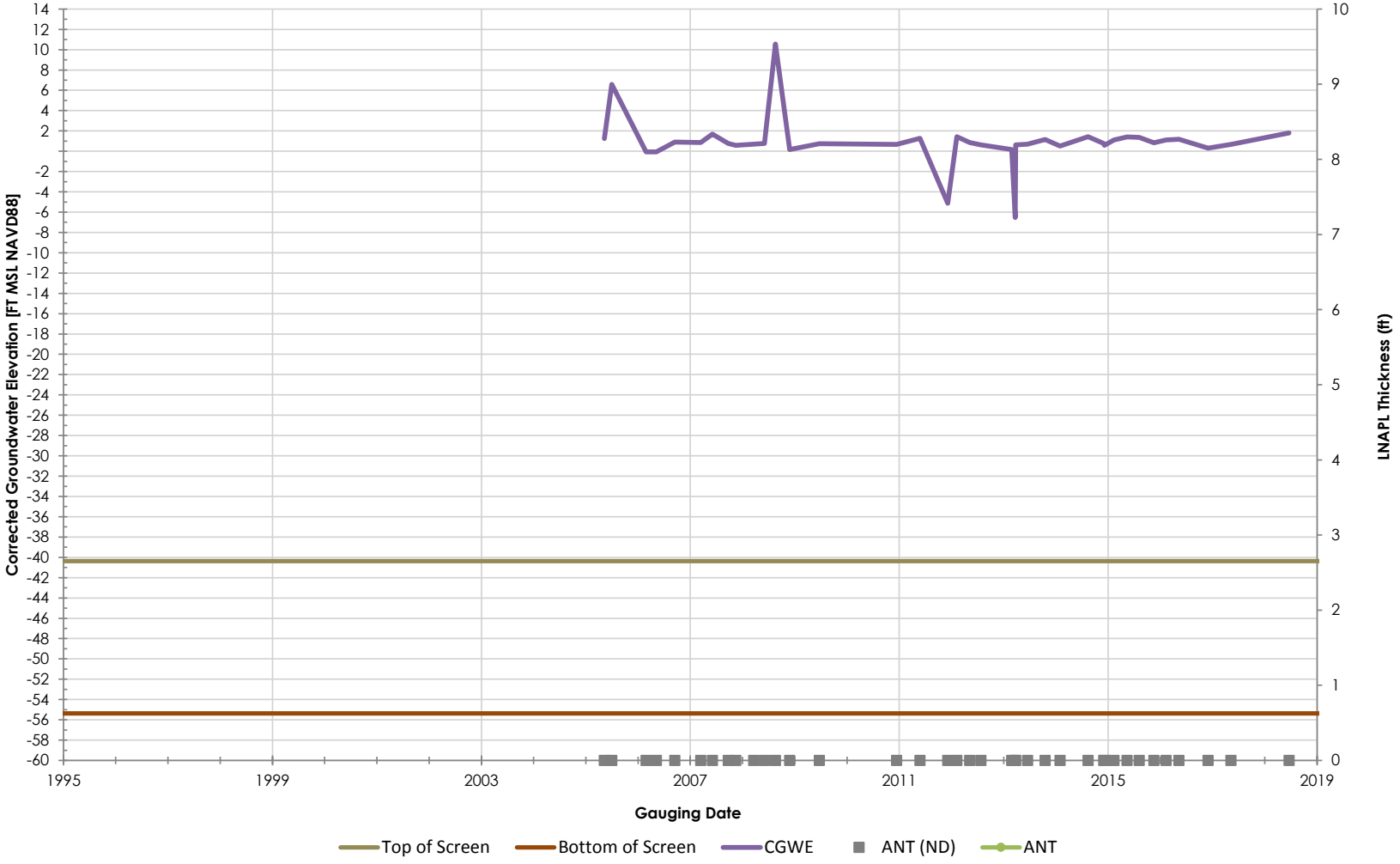
Stantec

Figure/Well No.

S-46

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

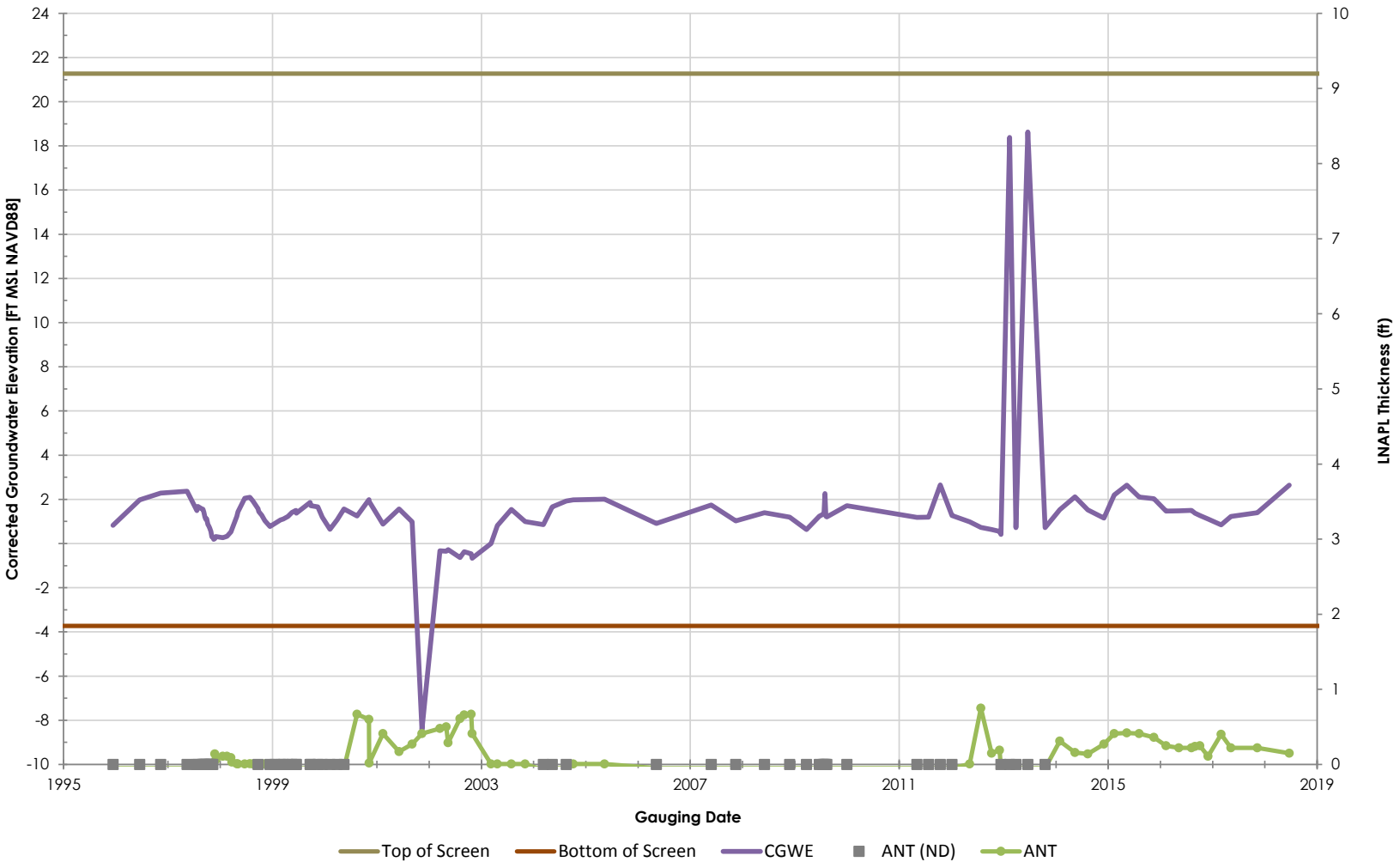
Stantec

Figure/Well No.

S-46D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

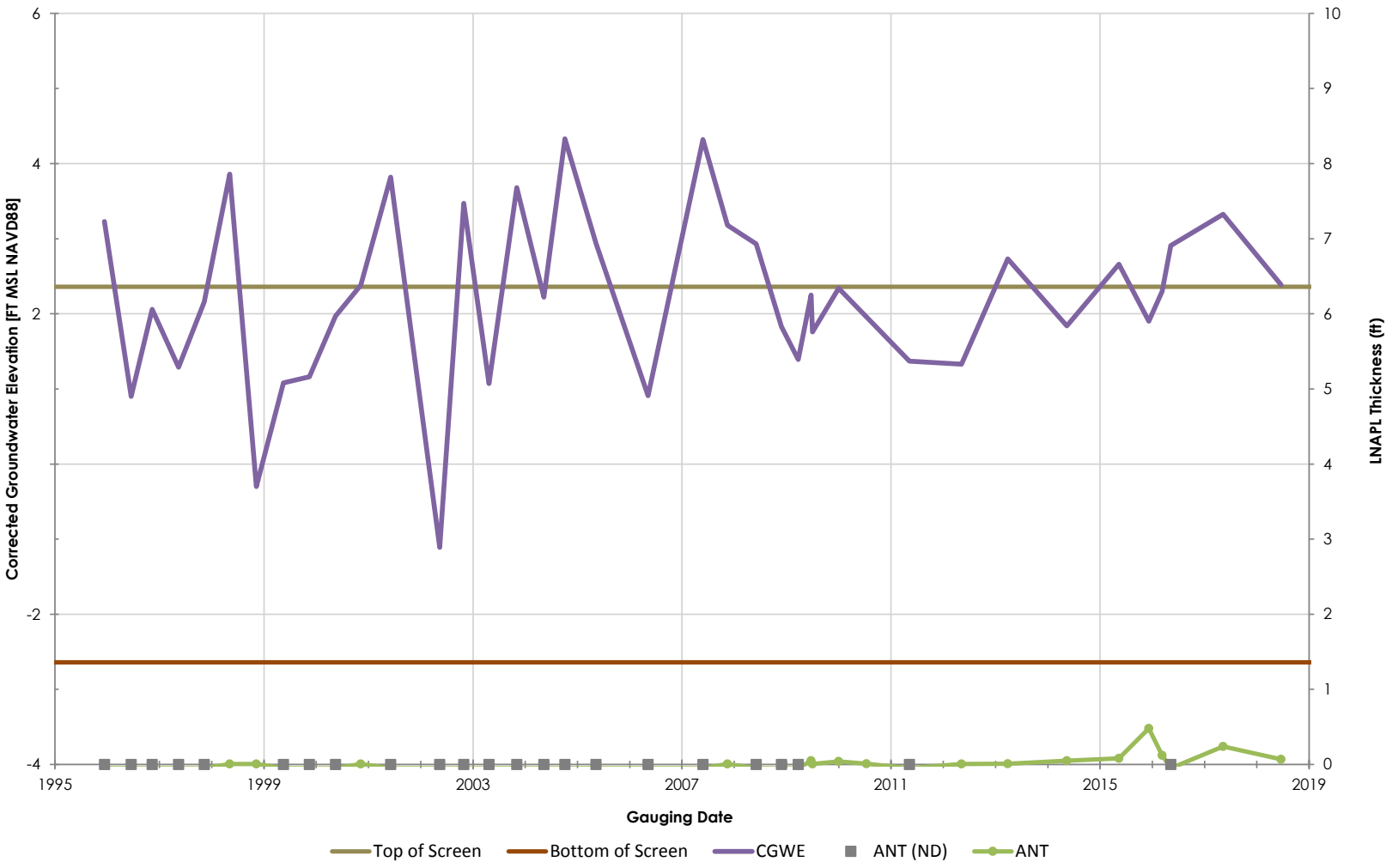
Stantec

Figure/Well No.

S-48

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

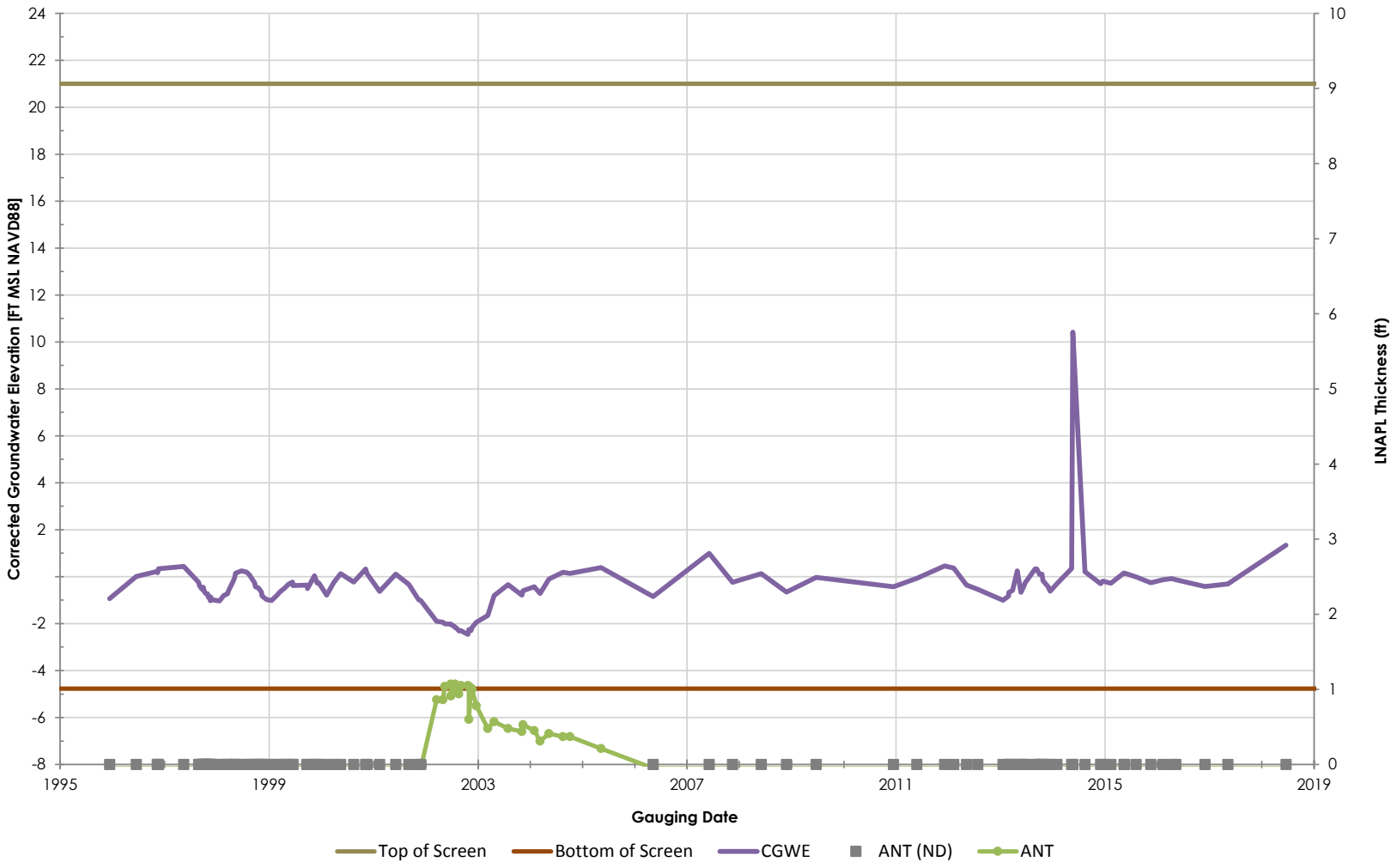
Stantec

Figure/Well No.

S-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

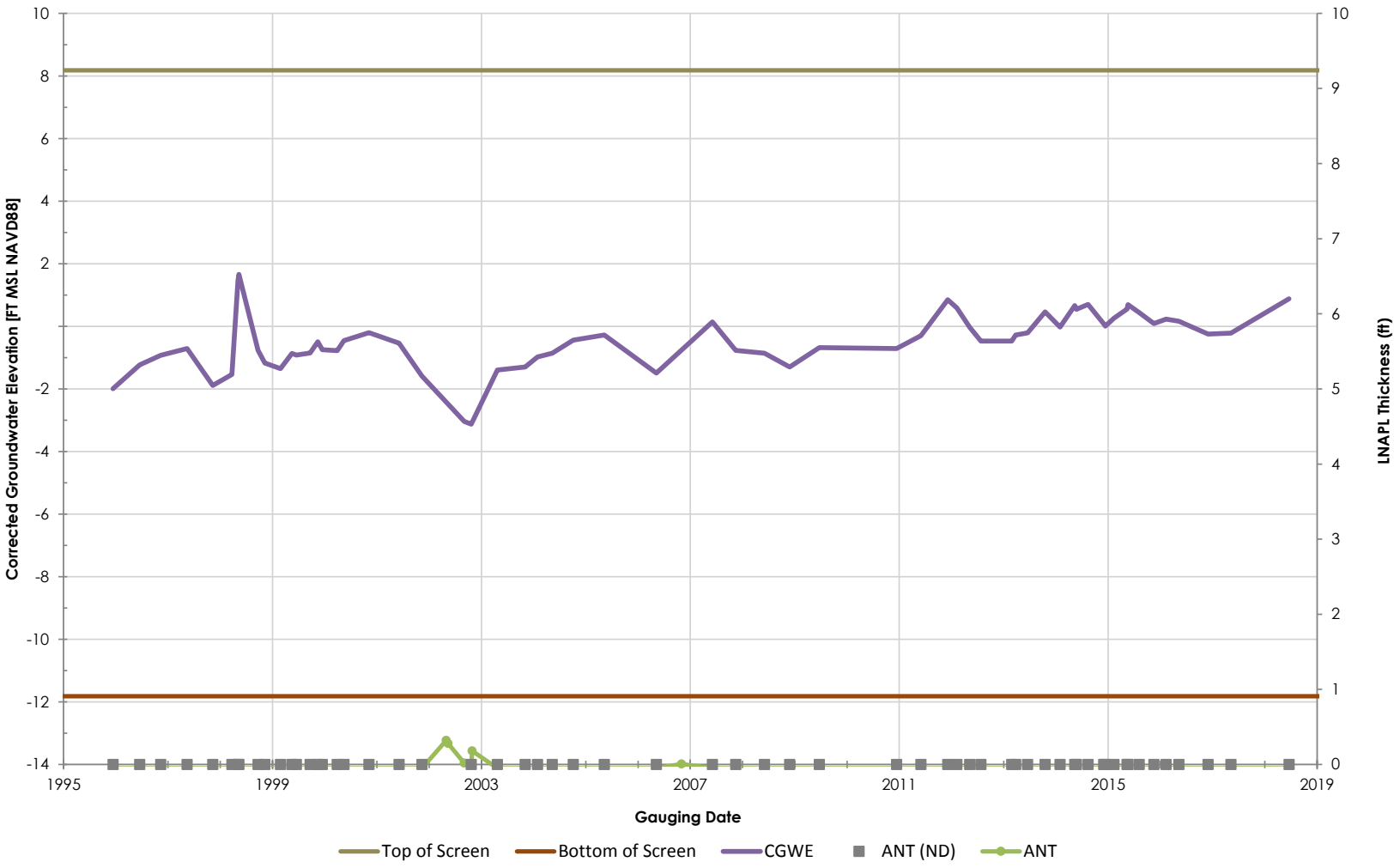
Stantec

Figure/Well No.

S-50

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

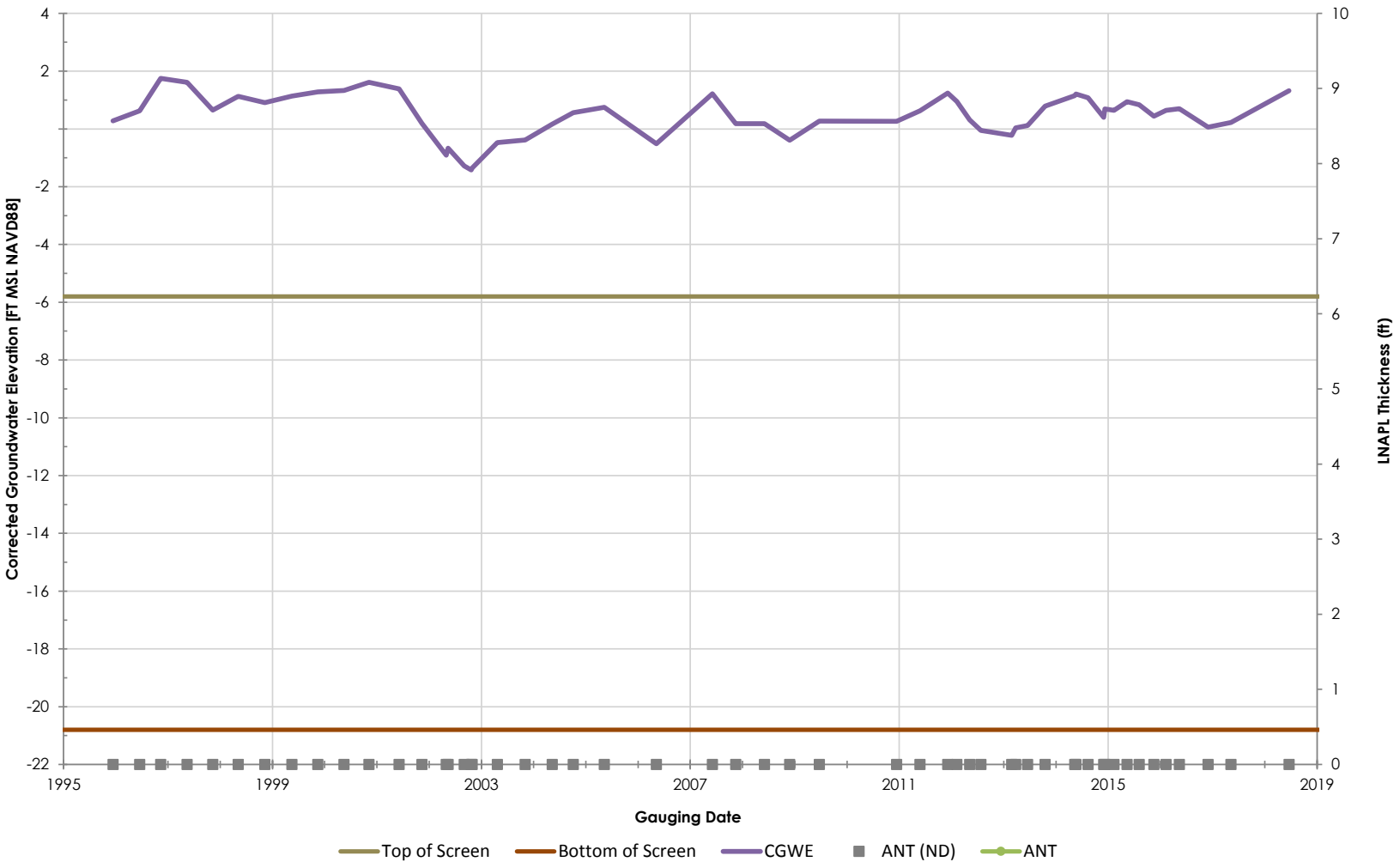
Stantec

Figure/Well No.

S-51

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

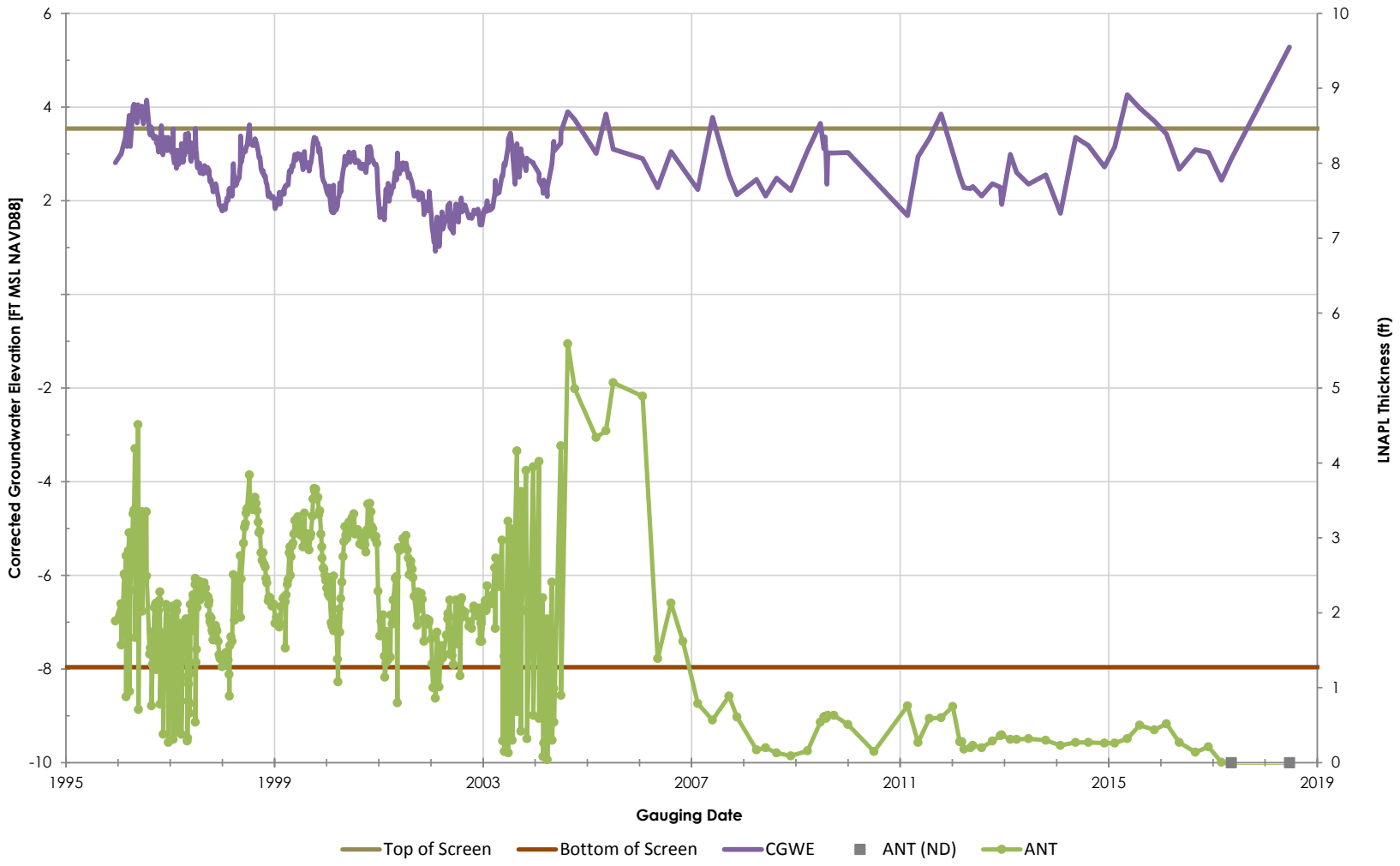
Stantec

Figure/Well No.

S-52

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

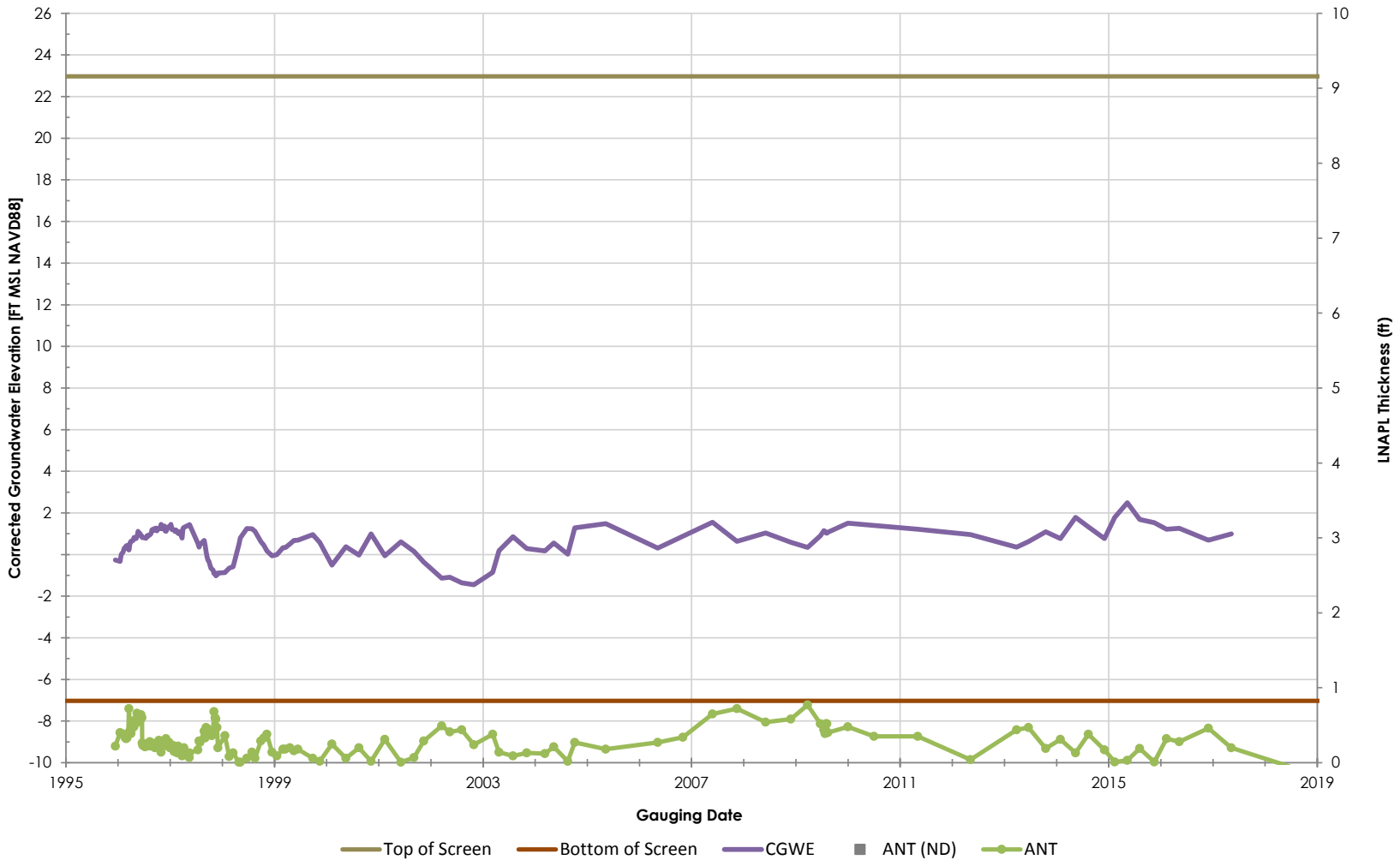
Stantec

Figure/Well No.

S-53

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

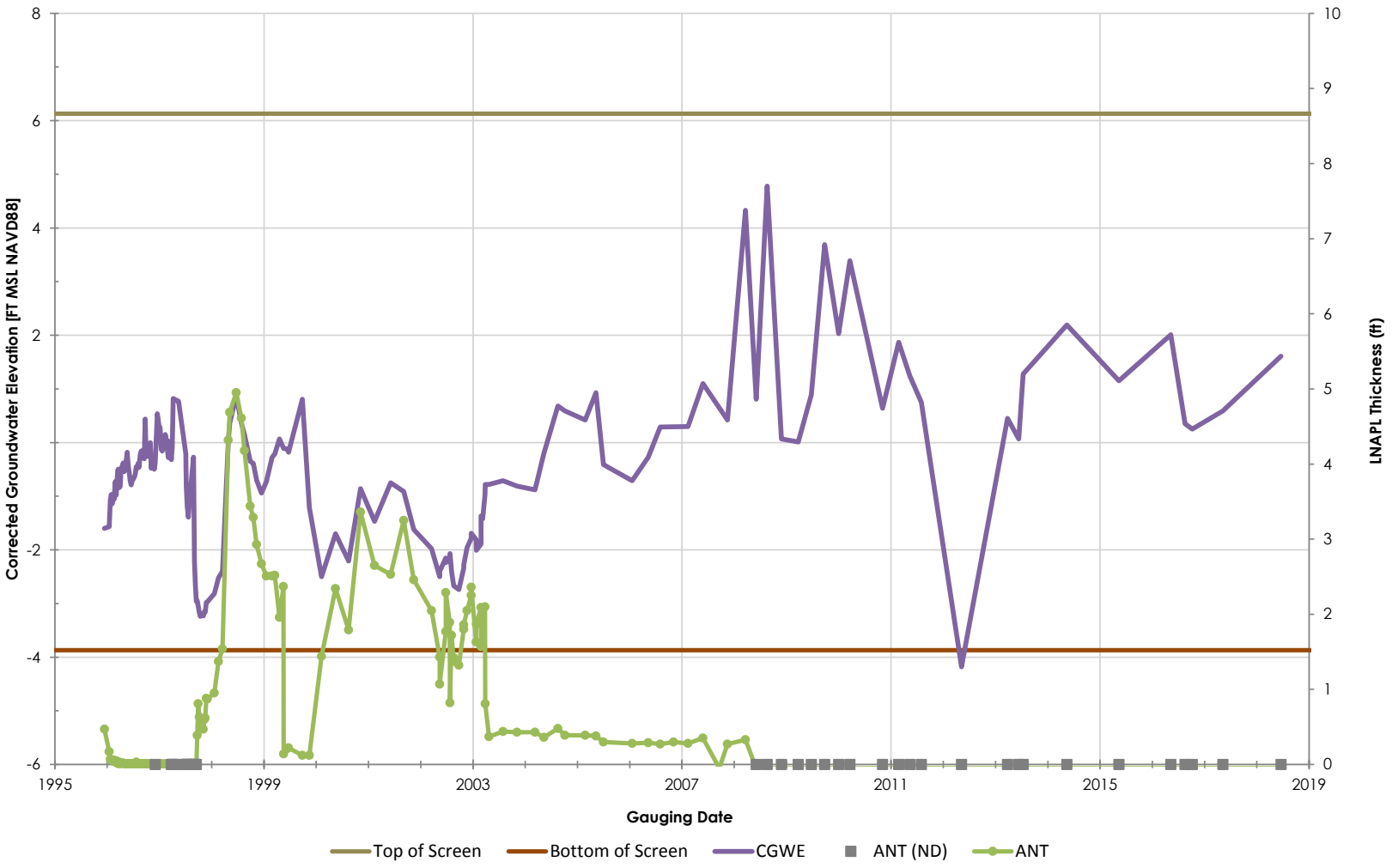
Stantec

Figure/Well No.

S-54

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

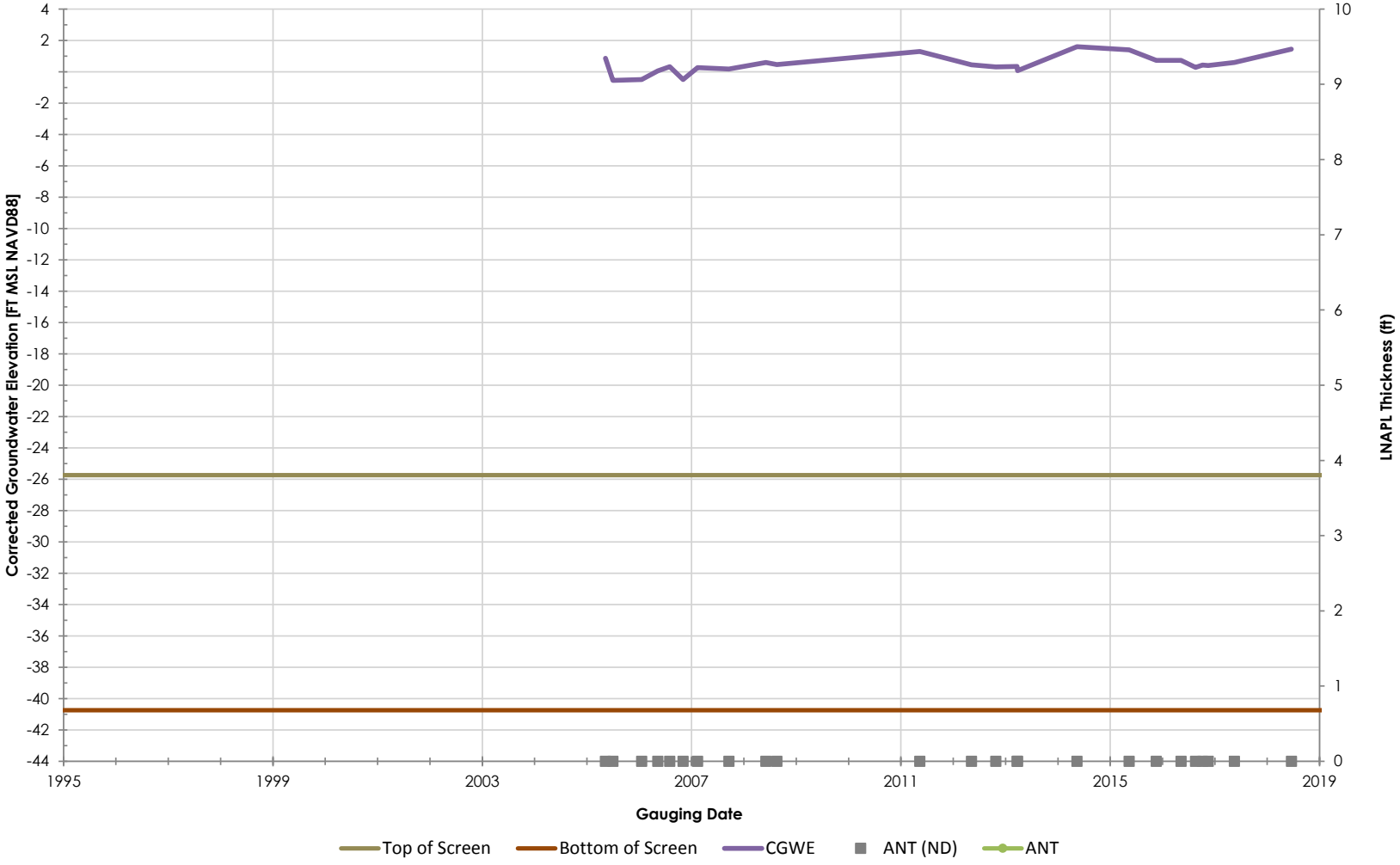
Stantec

Figure/Well No.

S-57

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

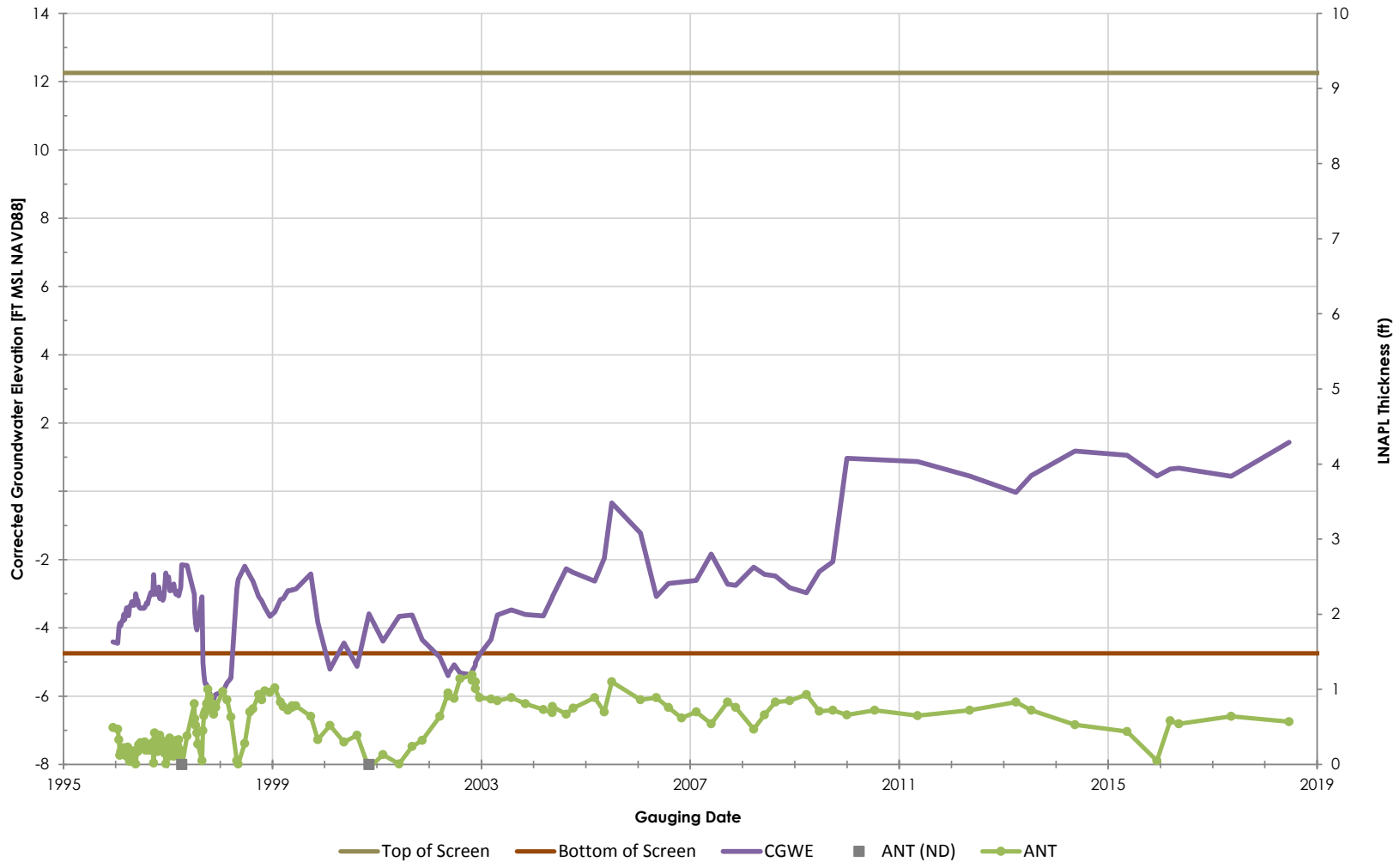
Stantec

Figure/Well No.

S-59D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

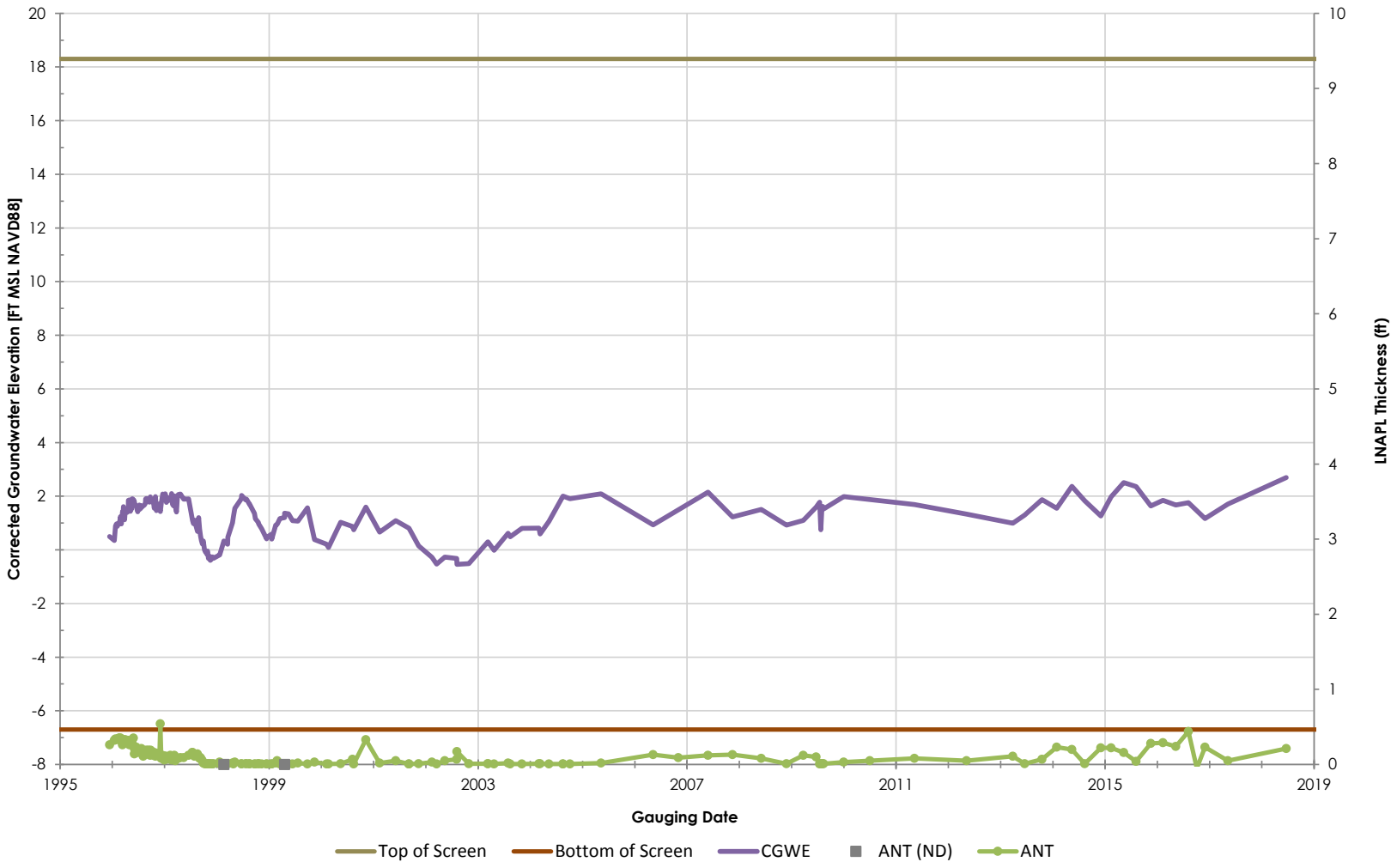
Stantec

Figure/Well No.

S-60

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

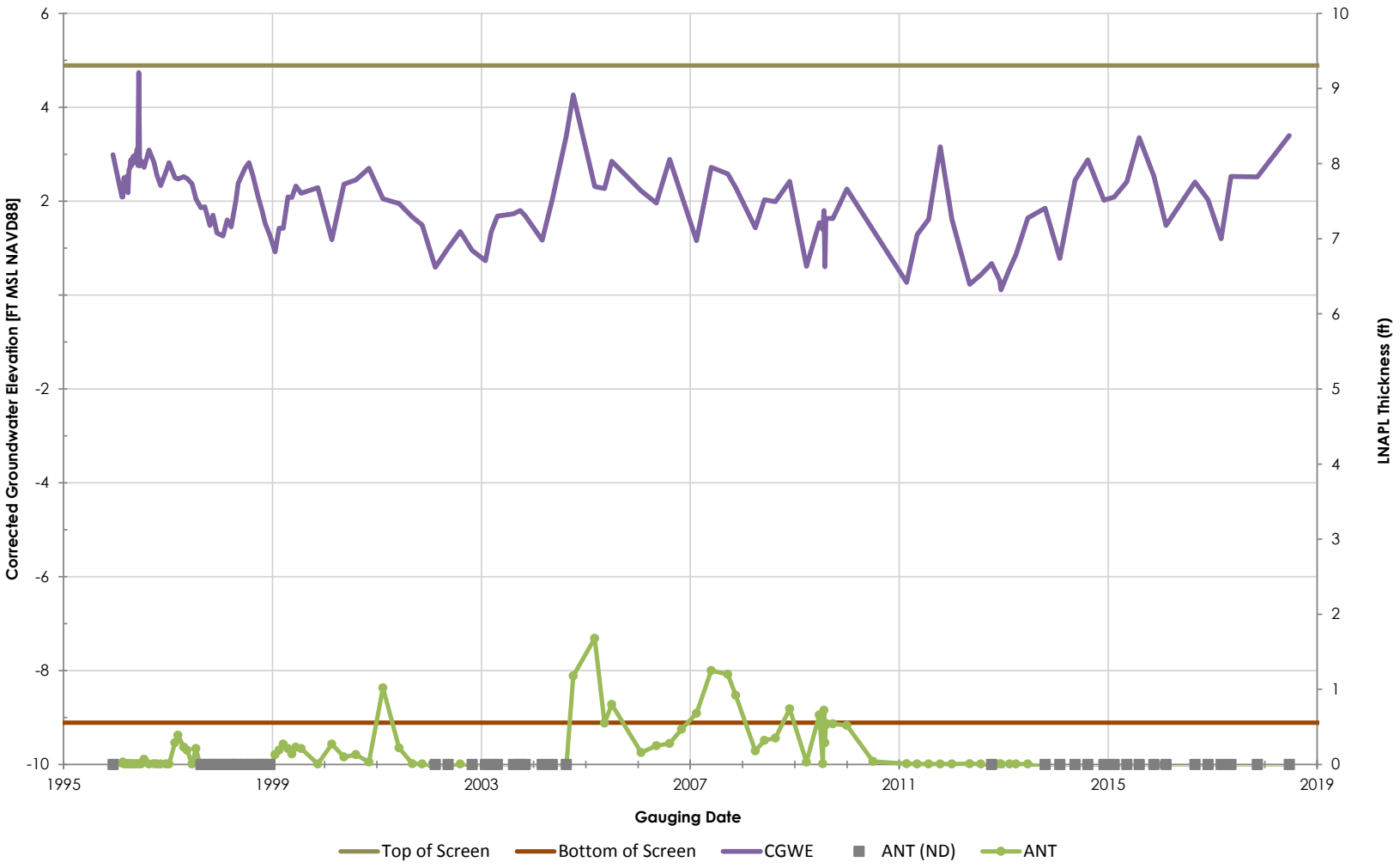
Stantec

Figure/Well No.

S-61

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

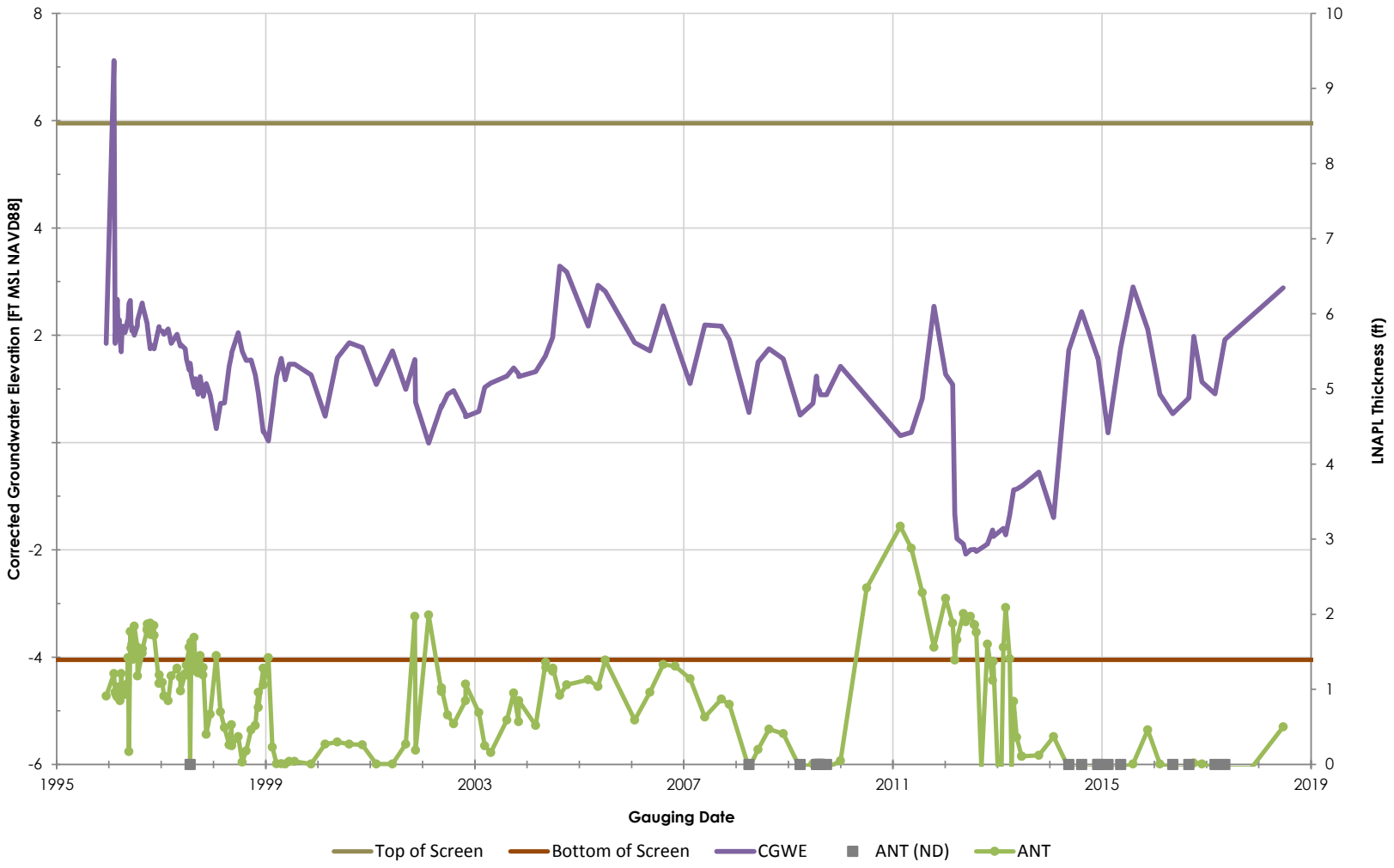
Stantec

Figure/Well No.

S-62

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

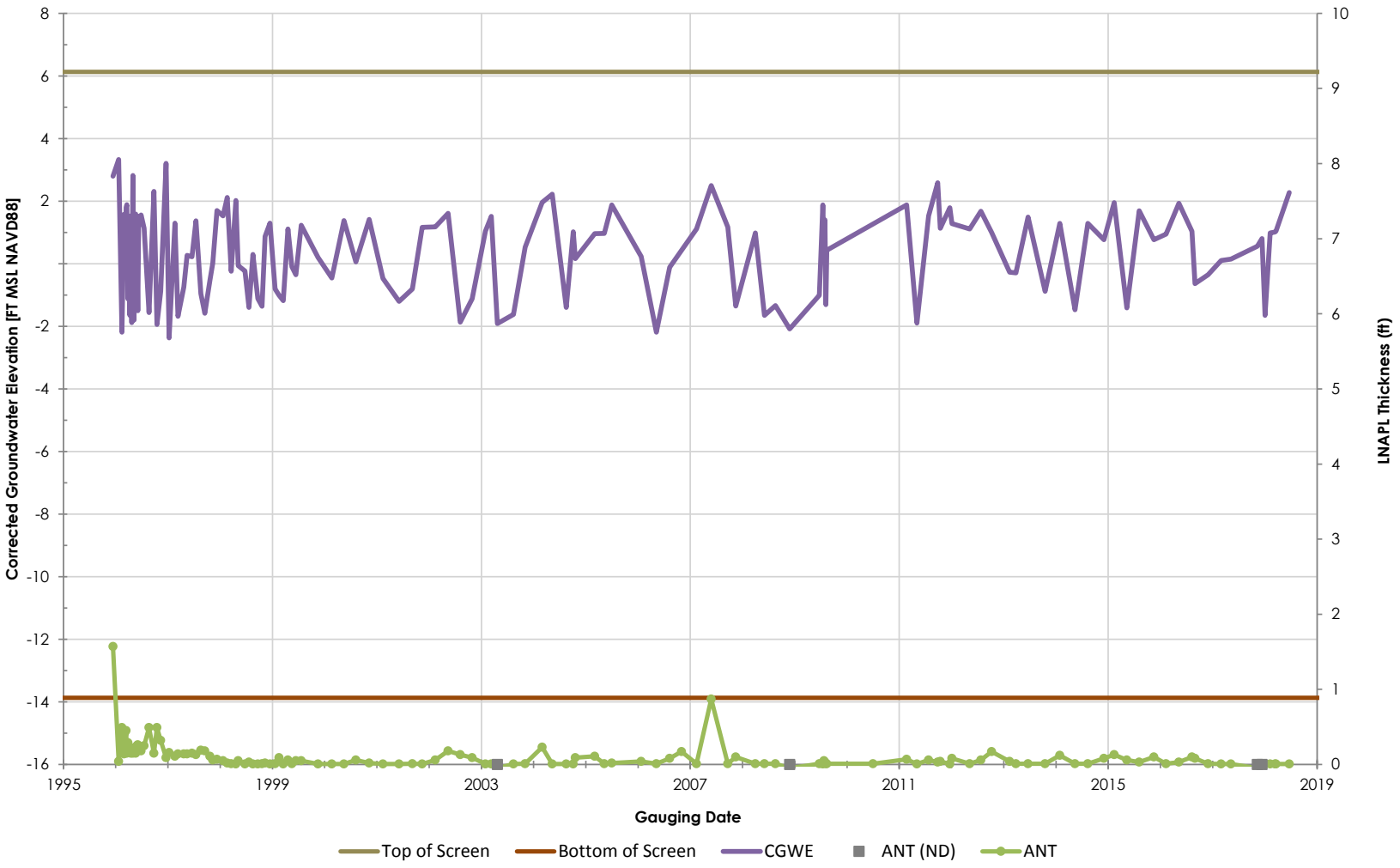
Stantec

Figure/Well No.

S-63

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

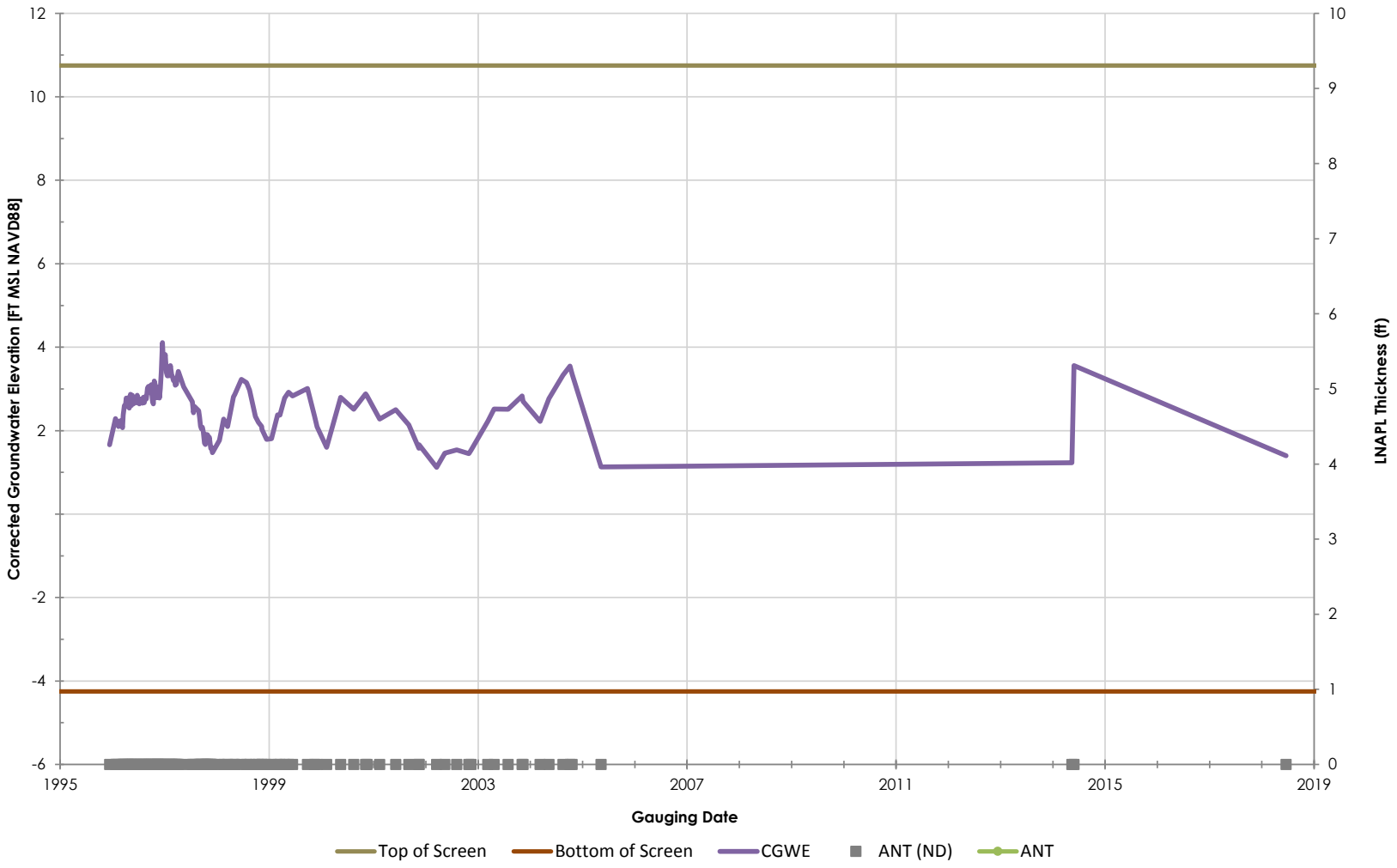
Stantec

Figure/Well No.

S-65

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

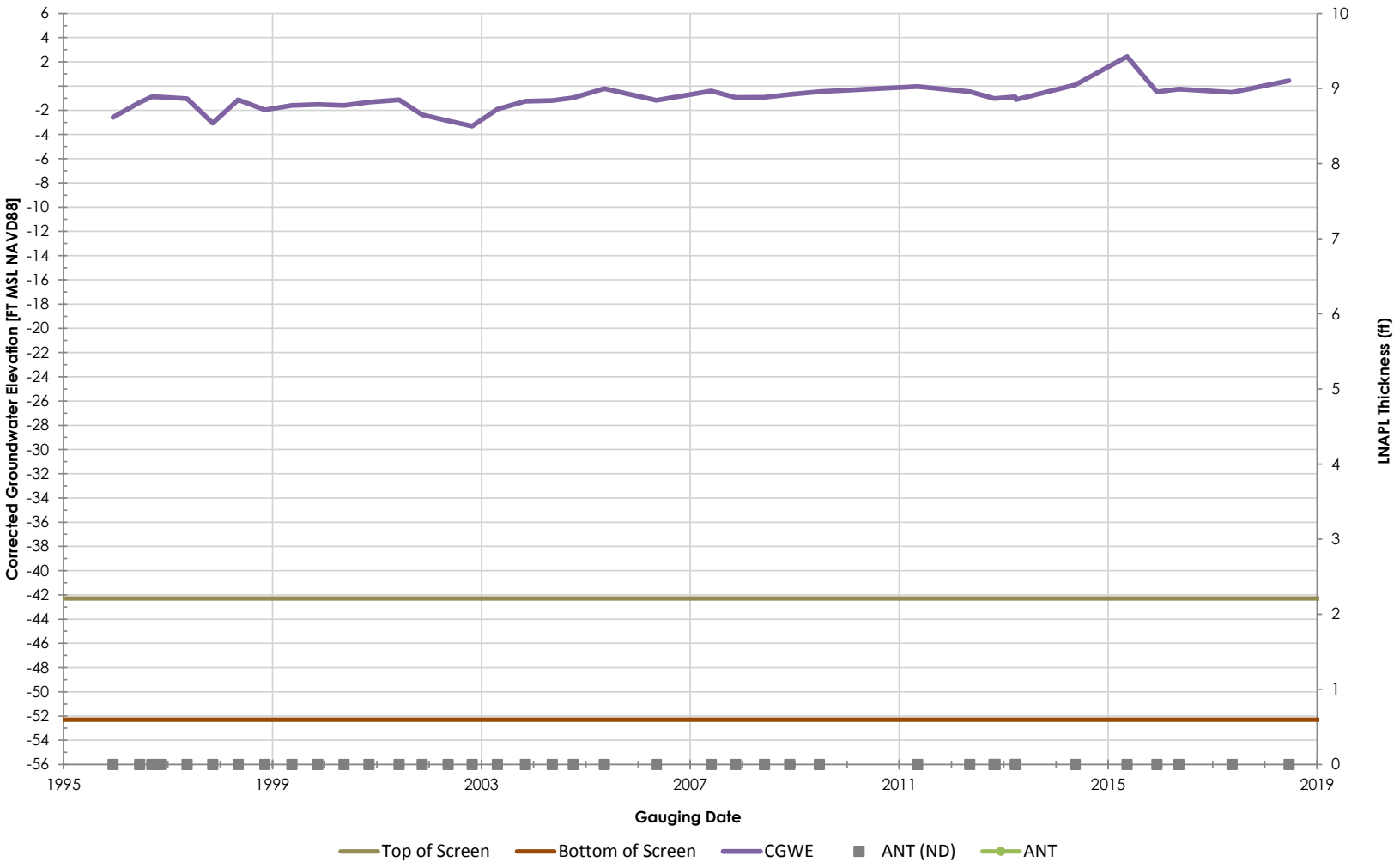
Stantec

Figure/Well No.

S-66

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

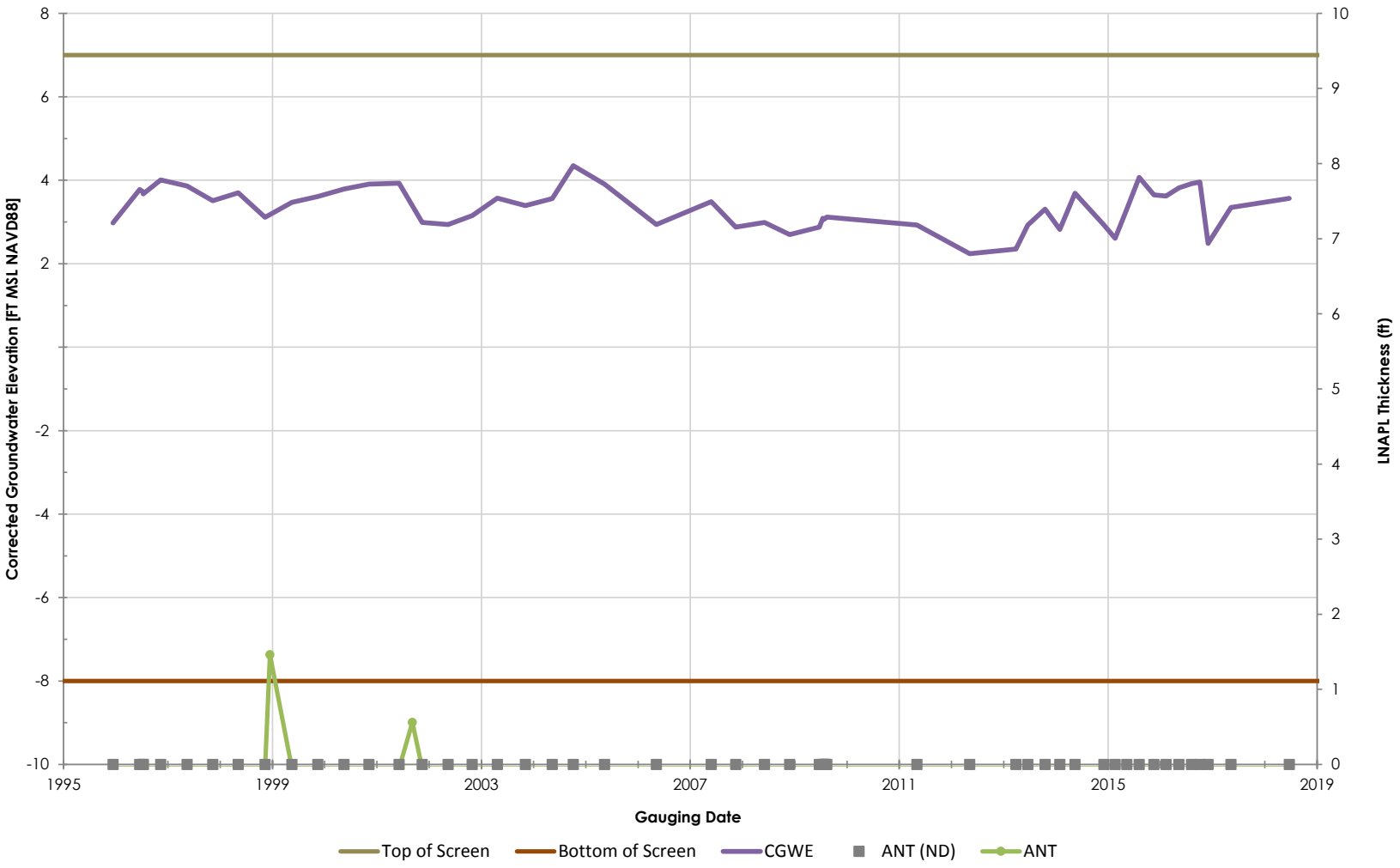
Stantec

Figure/Well No.

S-69D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

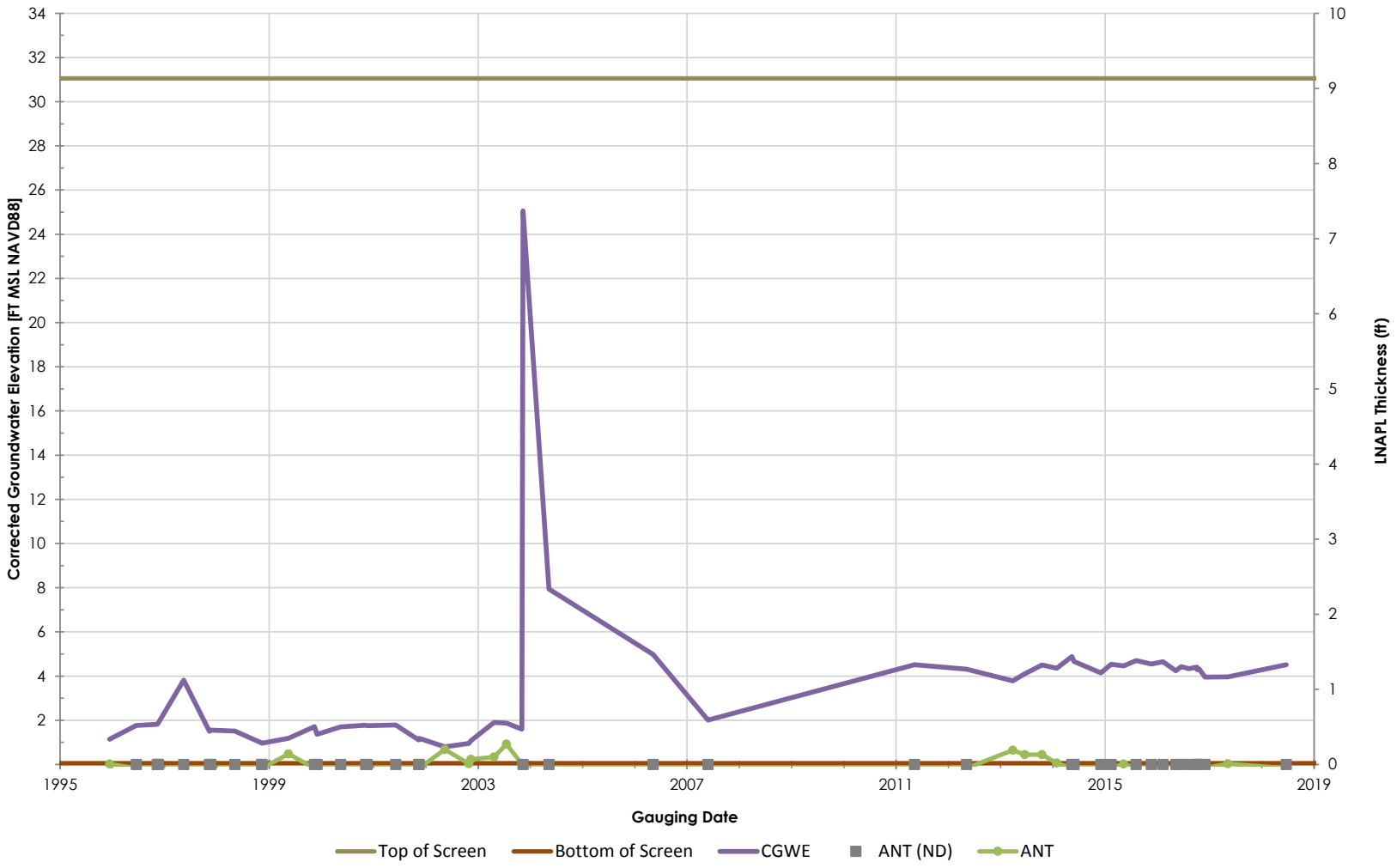
Stantec

Figure/Well No.

S-71

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

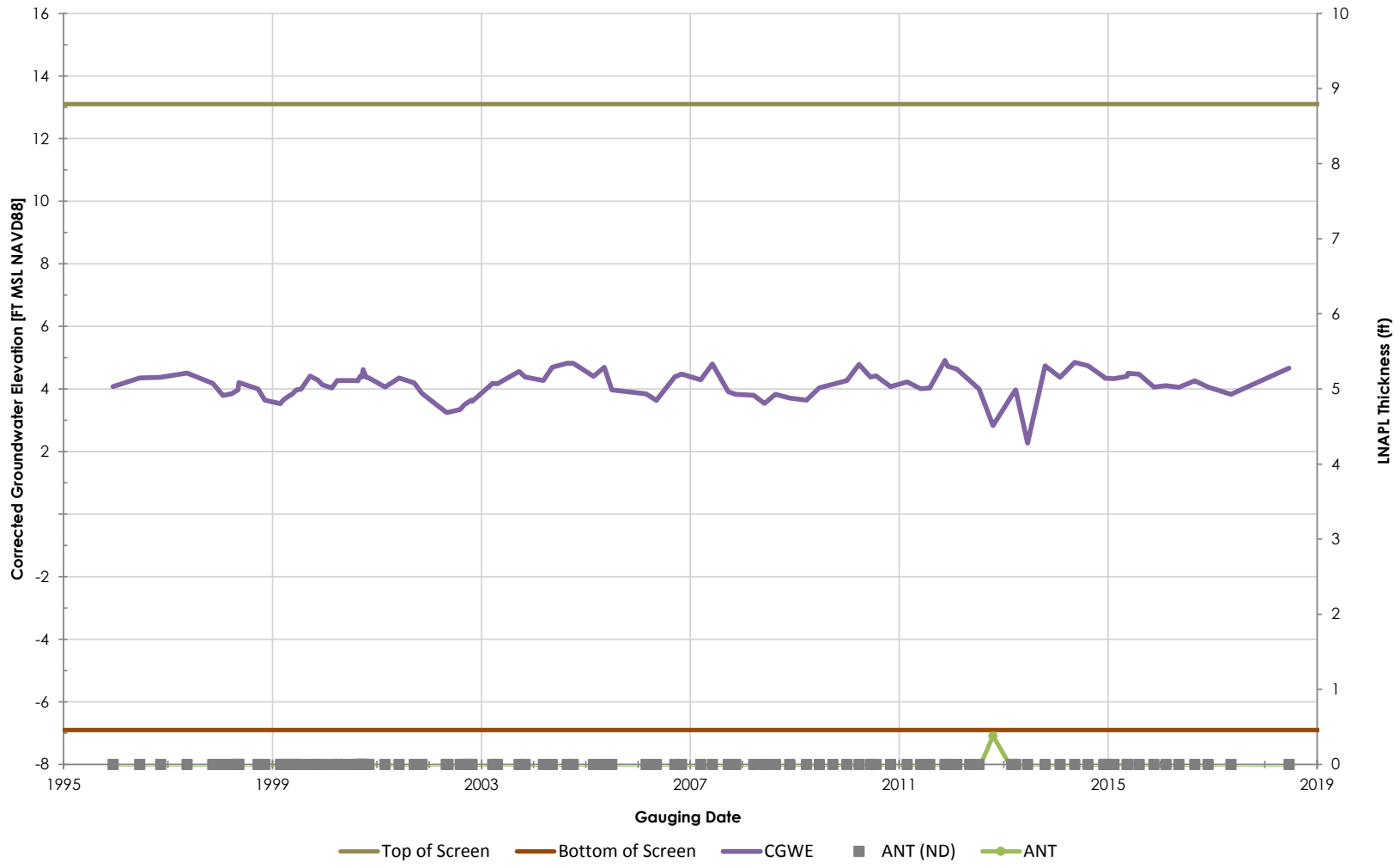
Stantec

Figure/Well No.

S-72

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

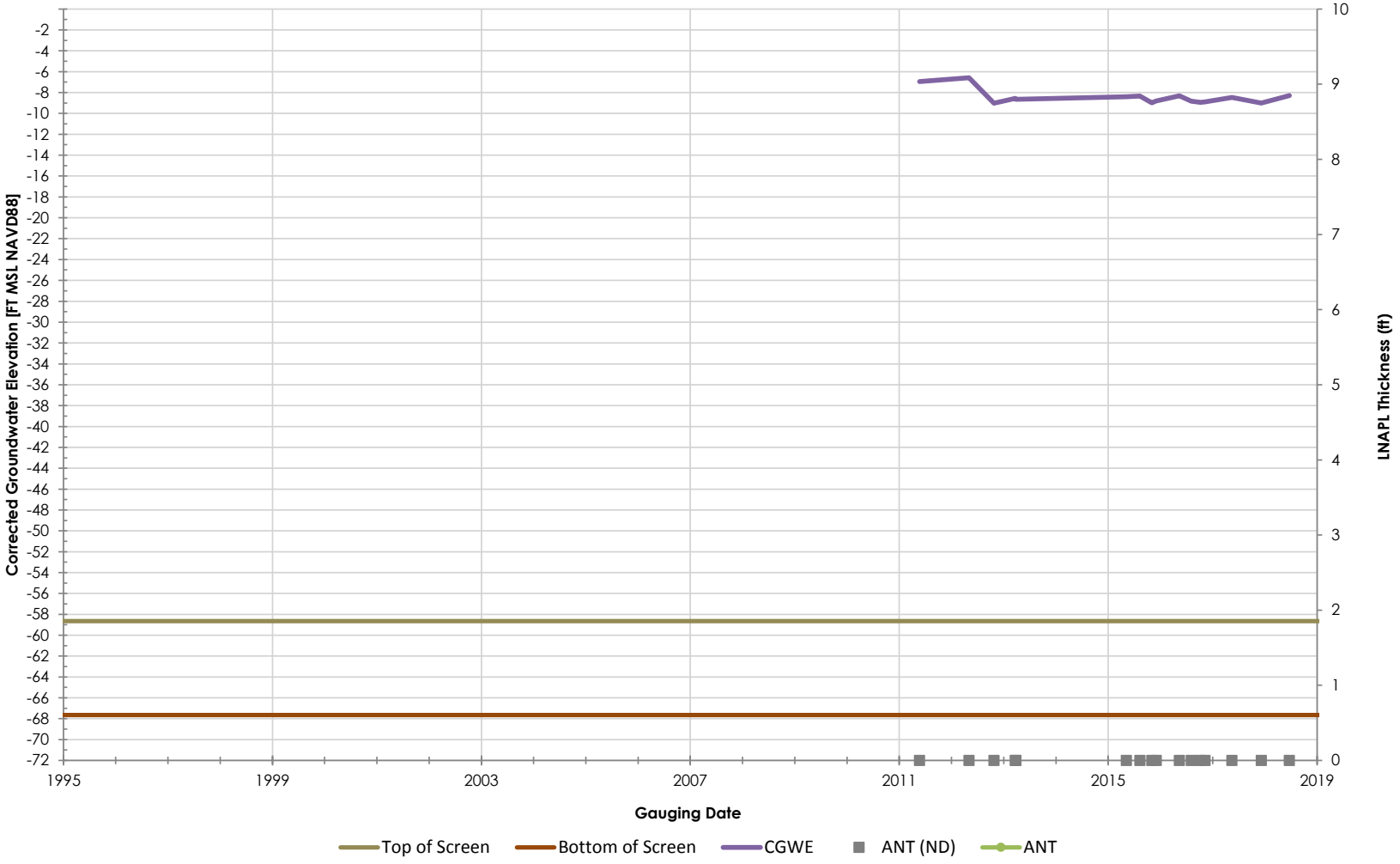
Stantec

Figure/Well No.

S-74

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



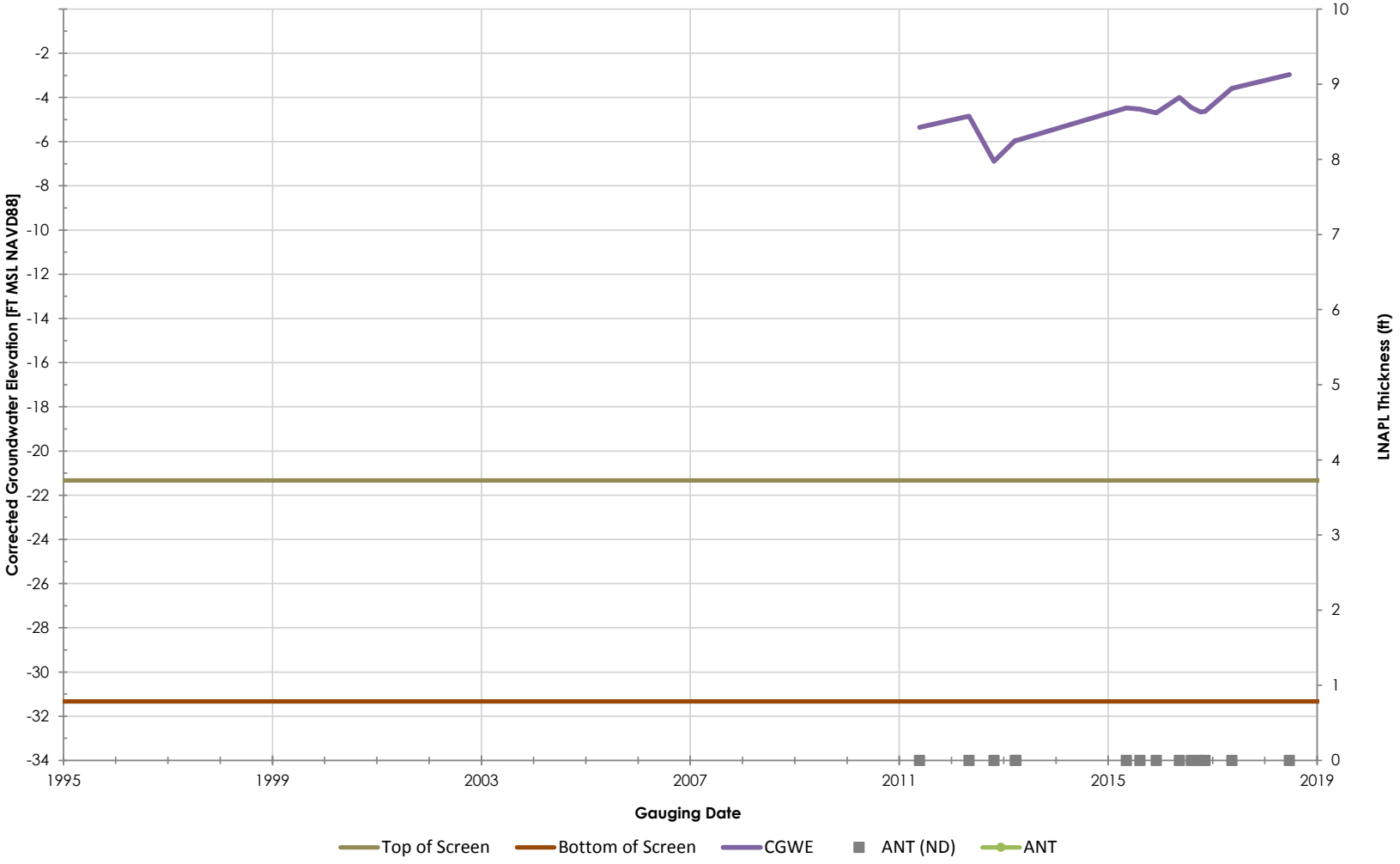
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-74D1SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



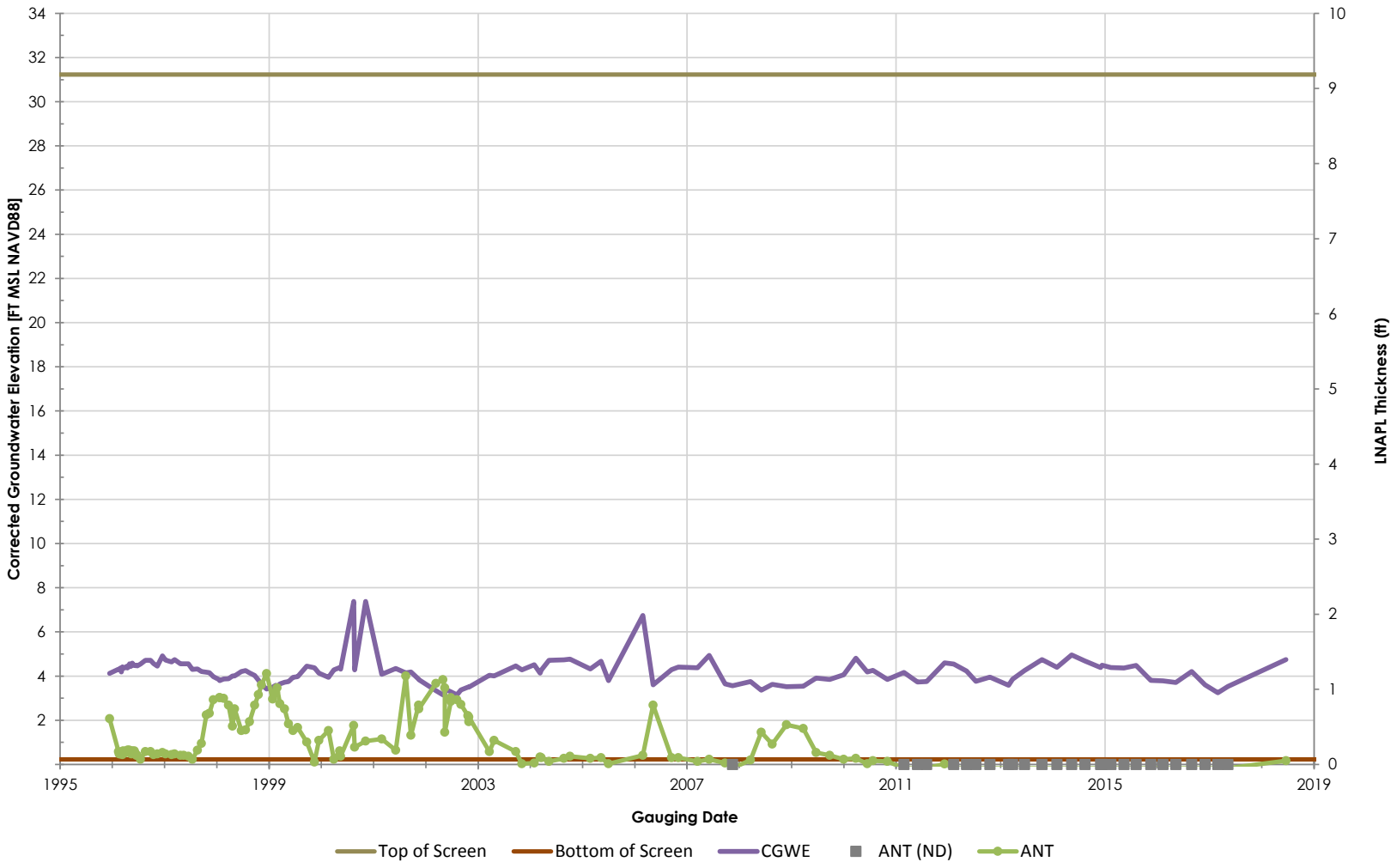
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-74D2SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

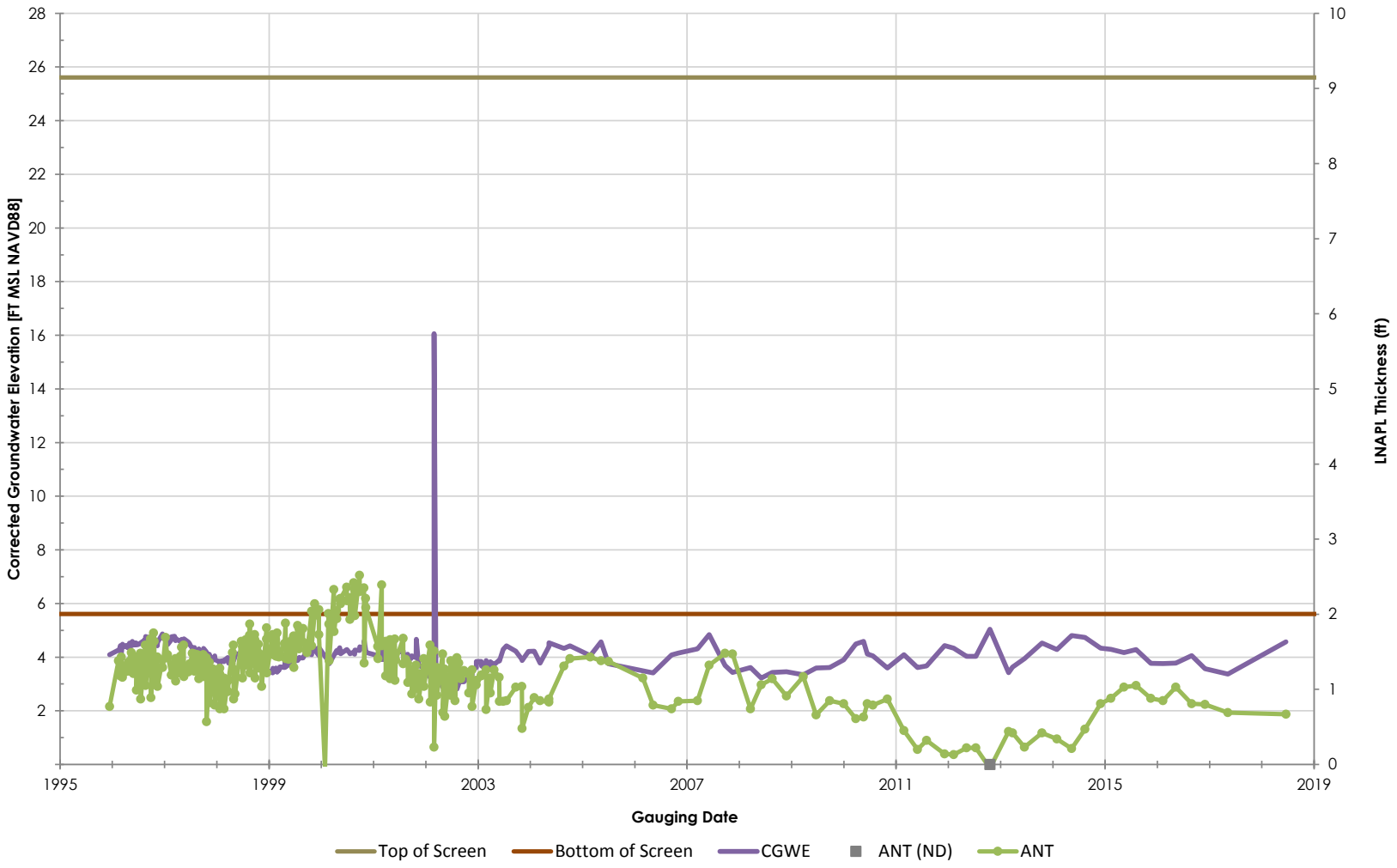
Stantec

Figure/Well No.

S-75

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

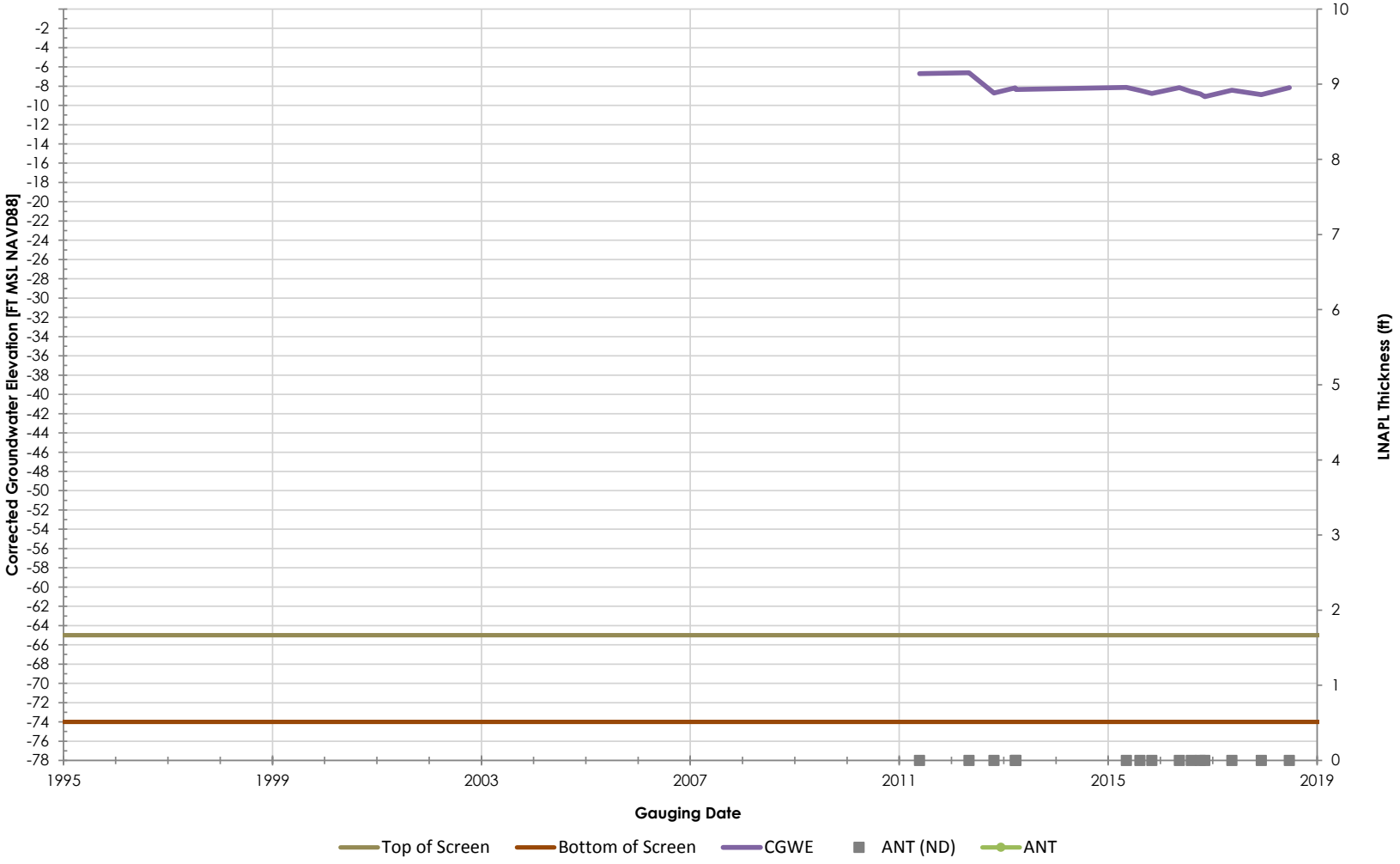
Stantec

Figure/Well No.

S-76

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

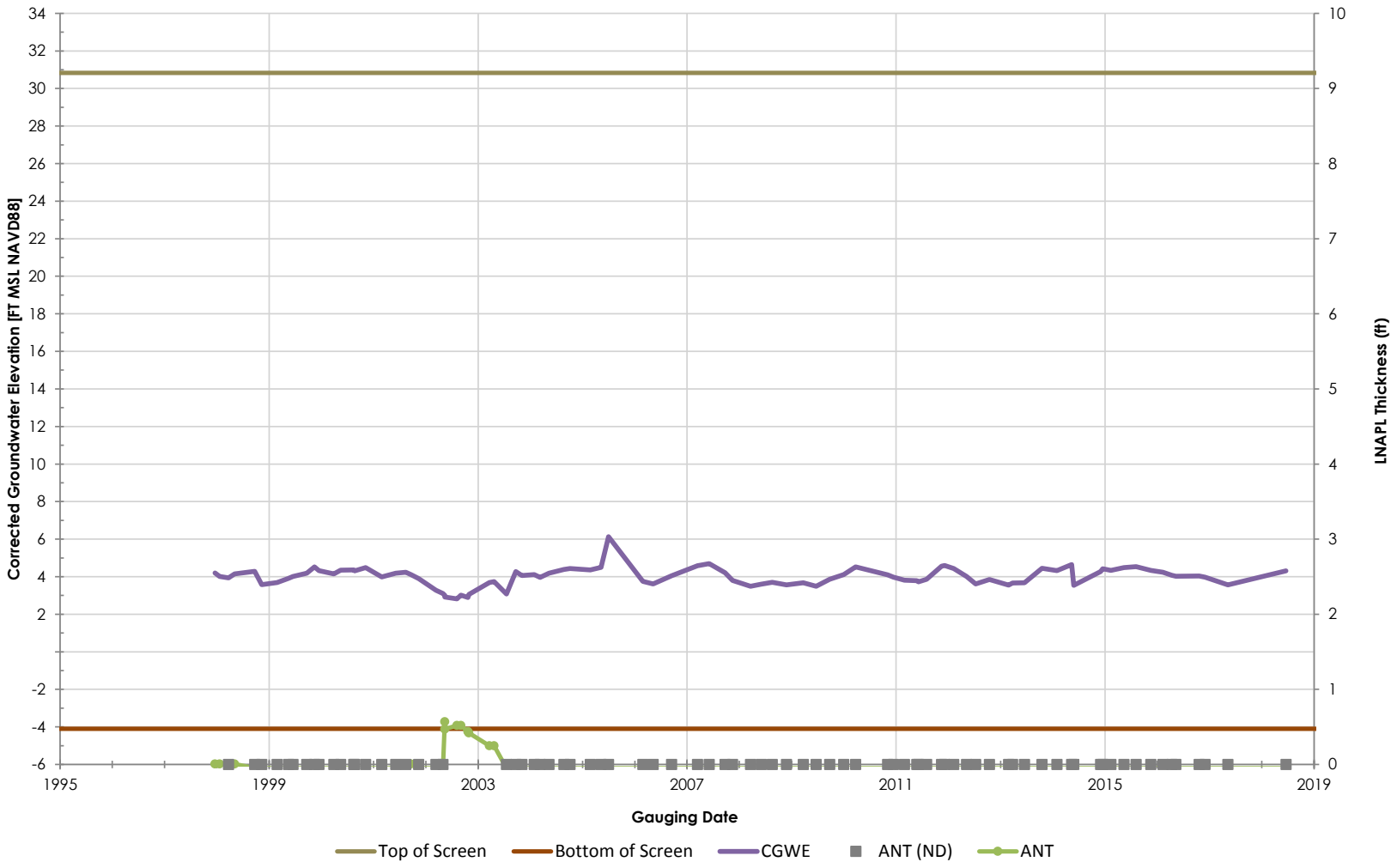
Stantec

Figure/Well No.

S-76DSRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

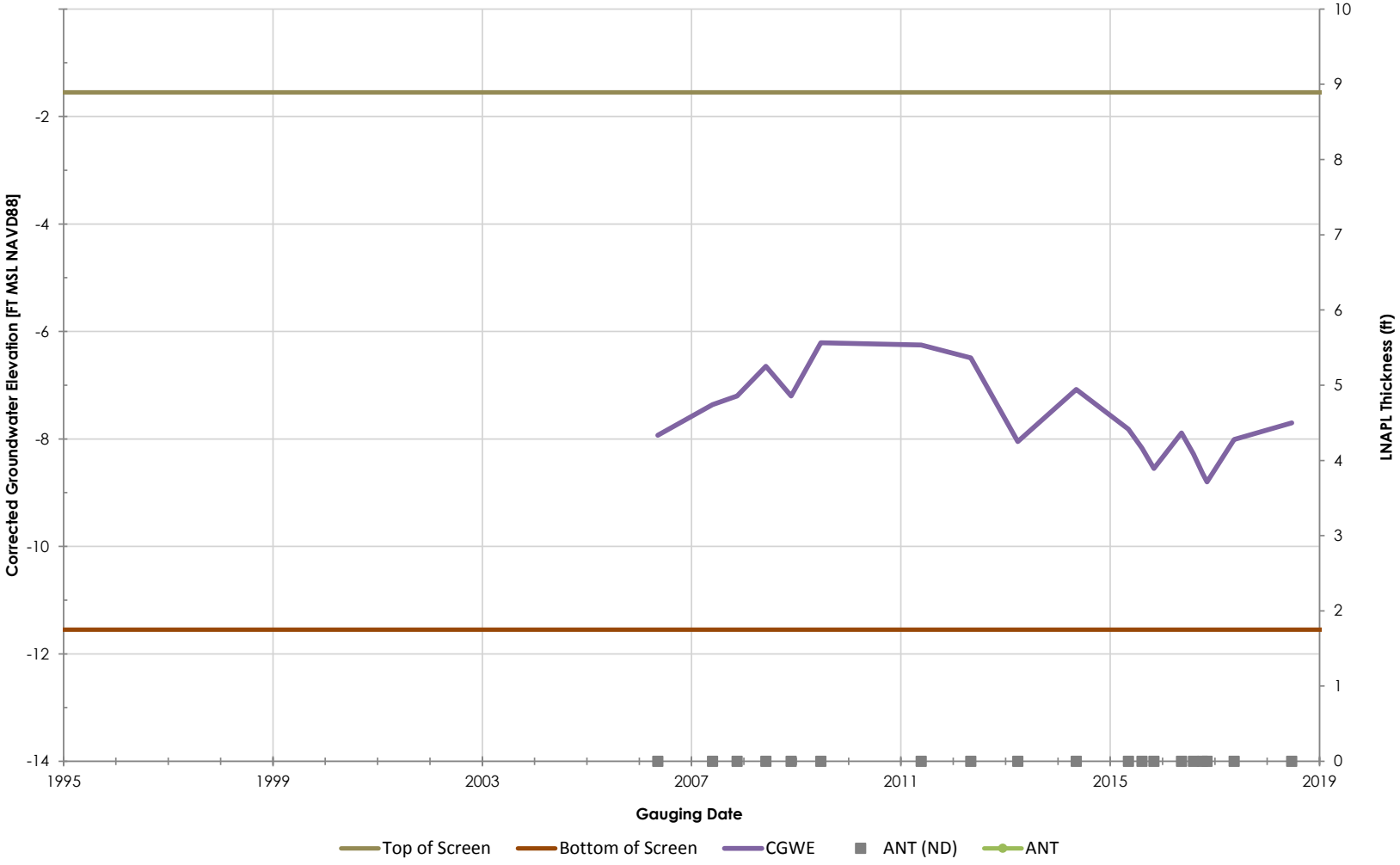
Stantec

Figure/Well No.

S-77P

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

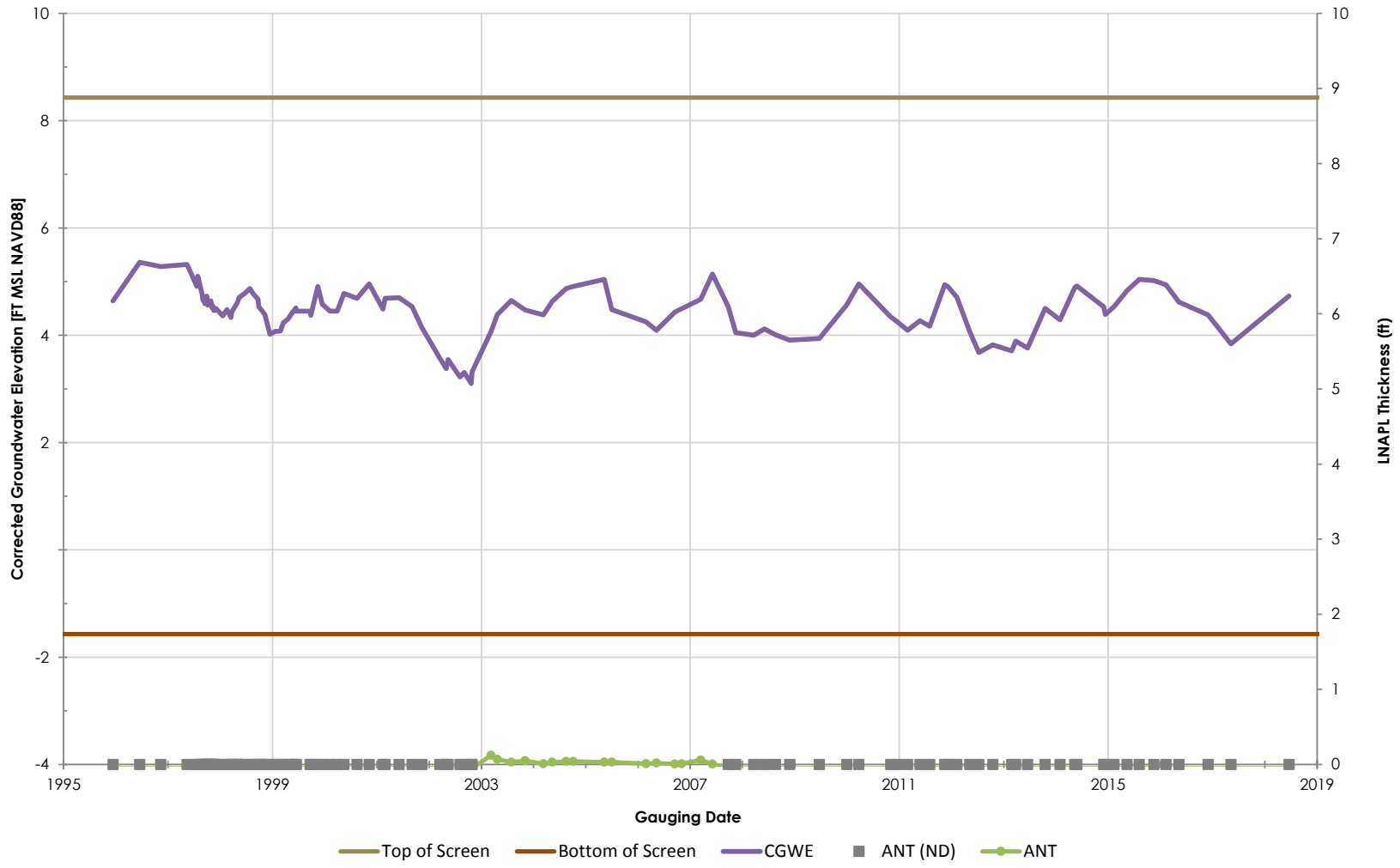
Stantec

Figure/Well No.

S-77SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

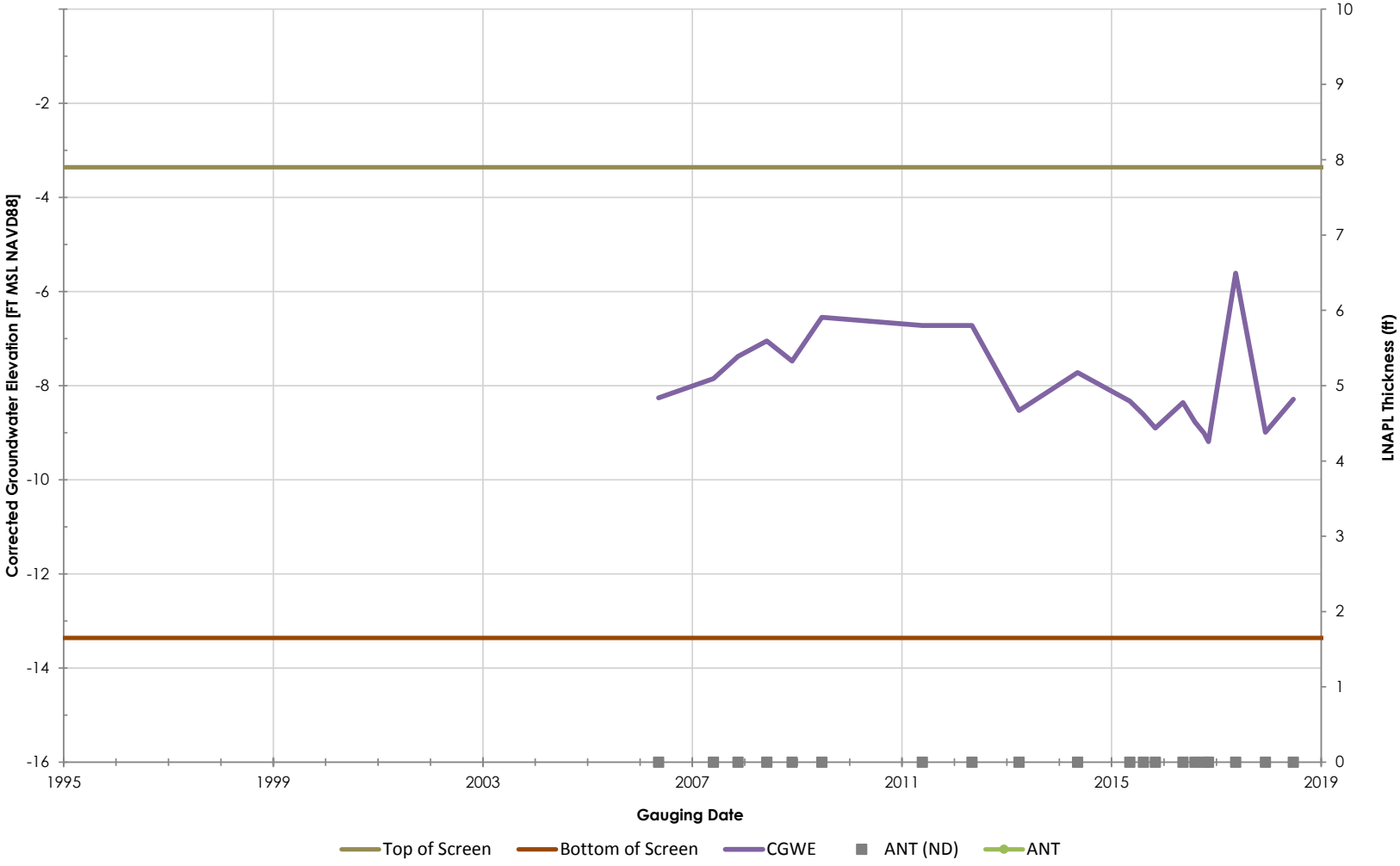
Stantec

Figure/Well No.

S-78

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

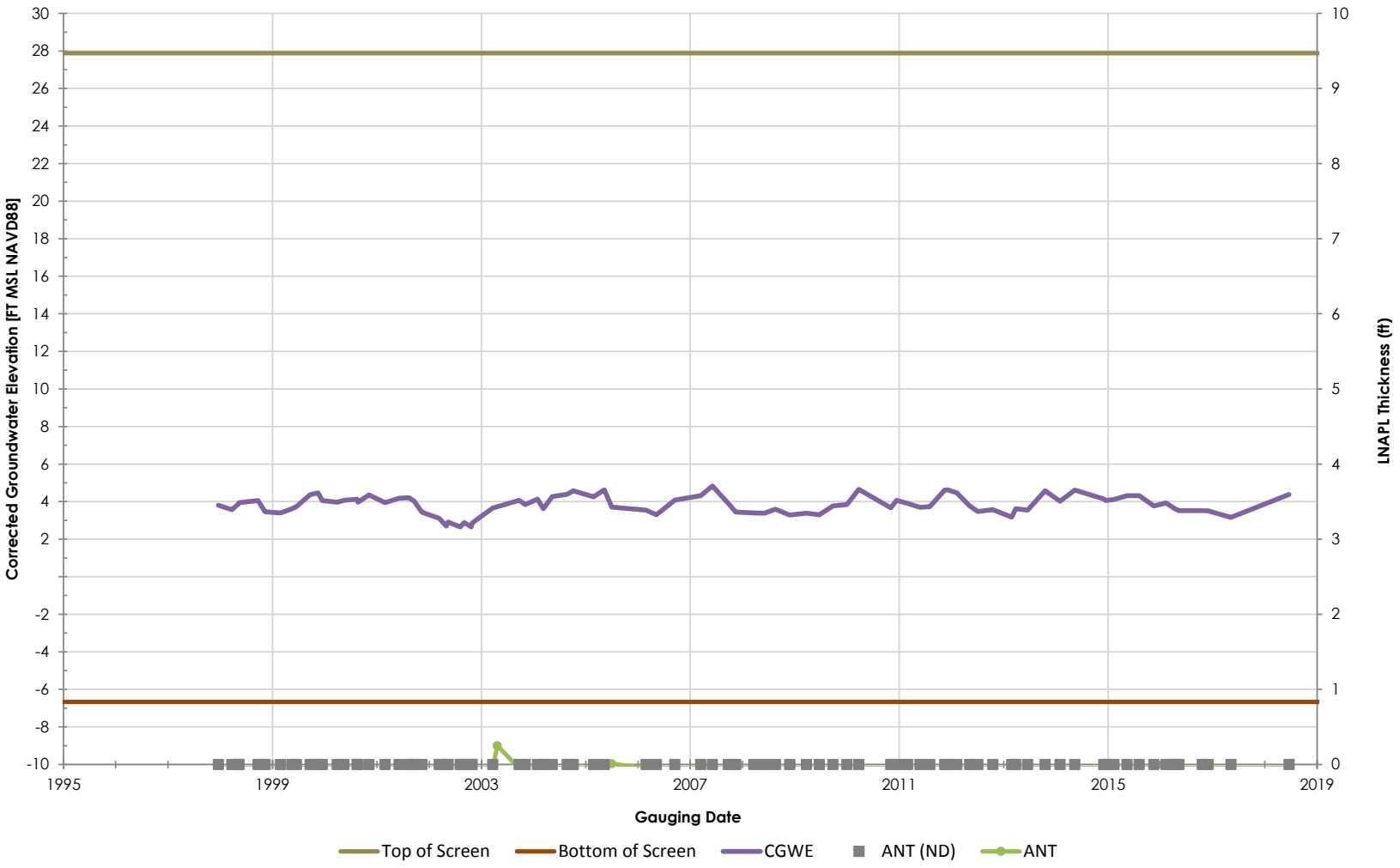
Stantec

Figure/Well No.

S-78SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

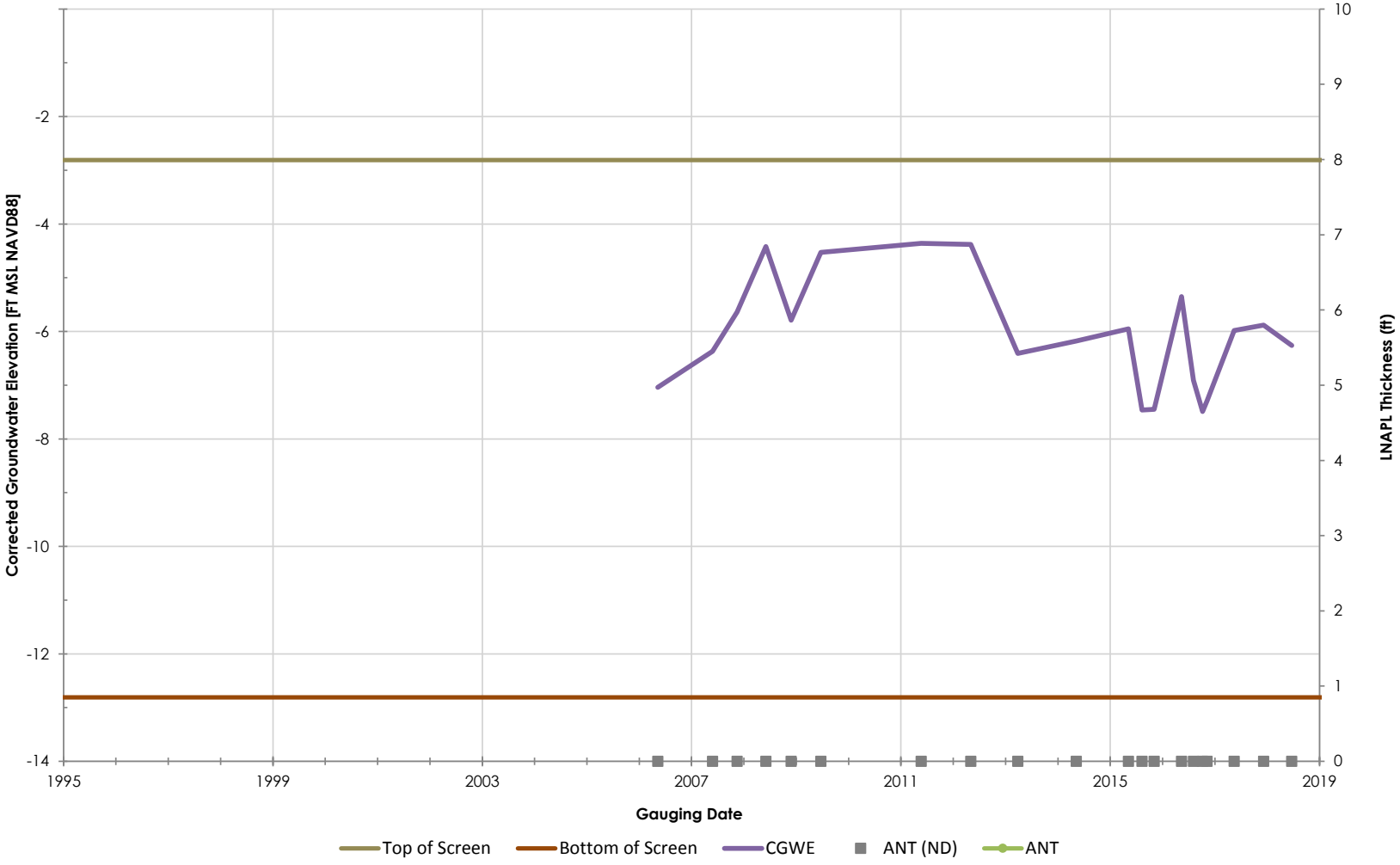
Stantec

Figure/Well No.

S-79P

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

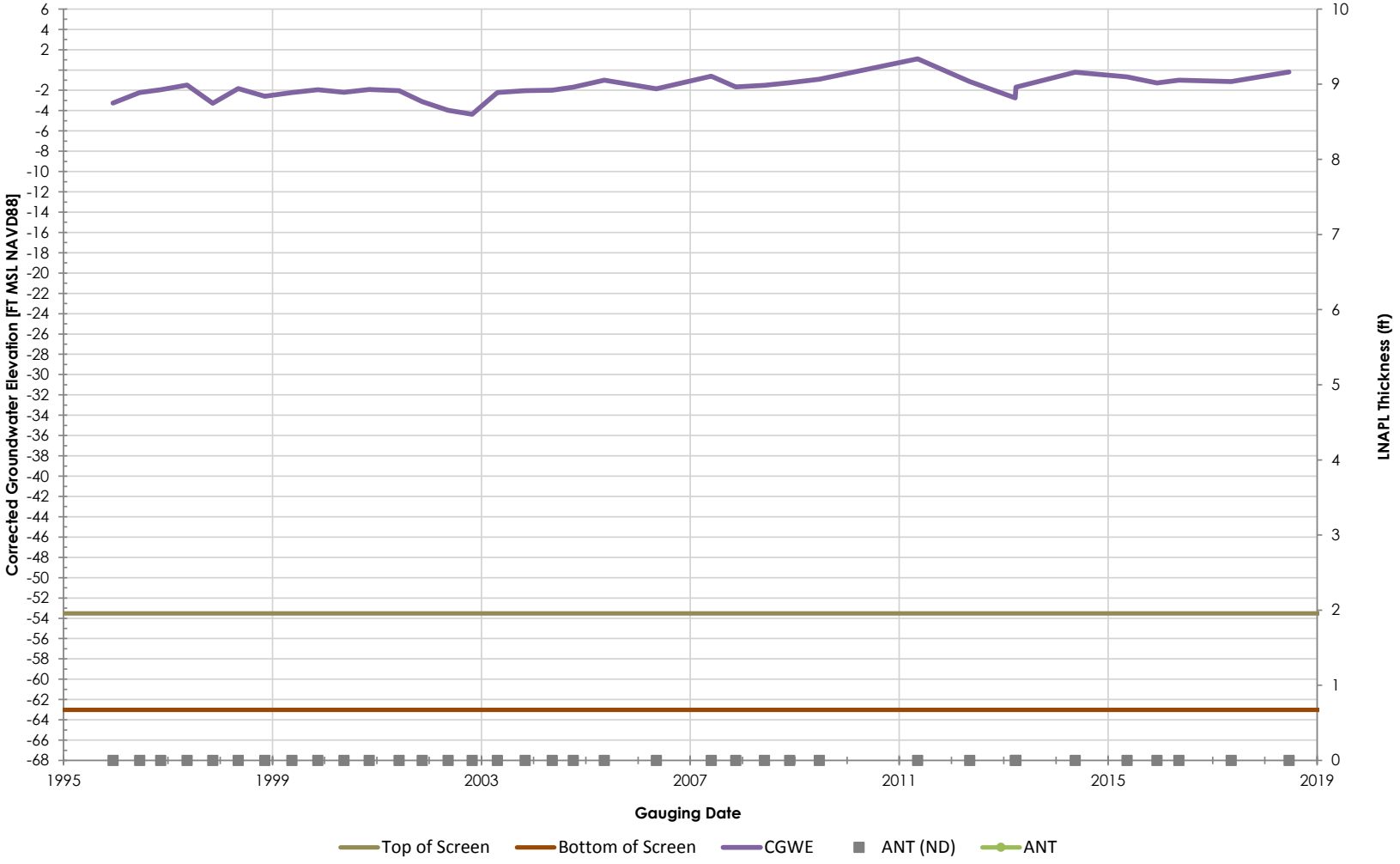
Stantec

Figure/Well No.

S-79SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

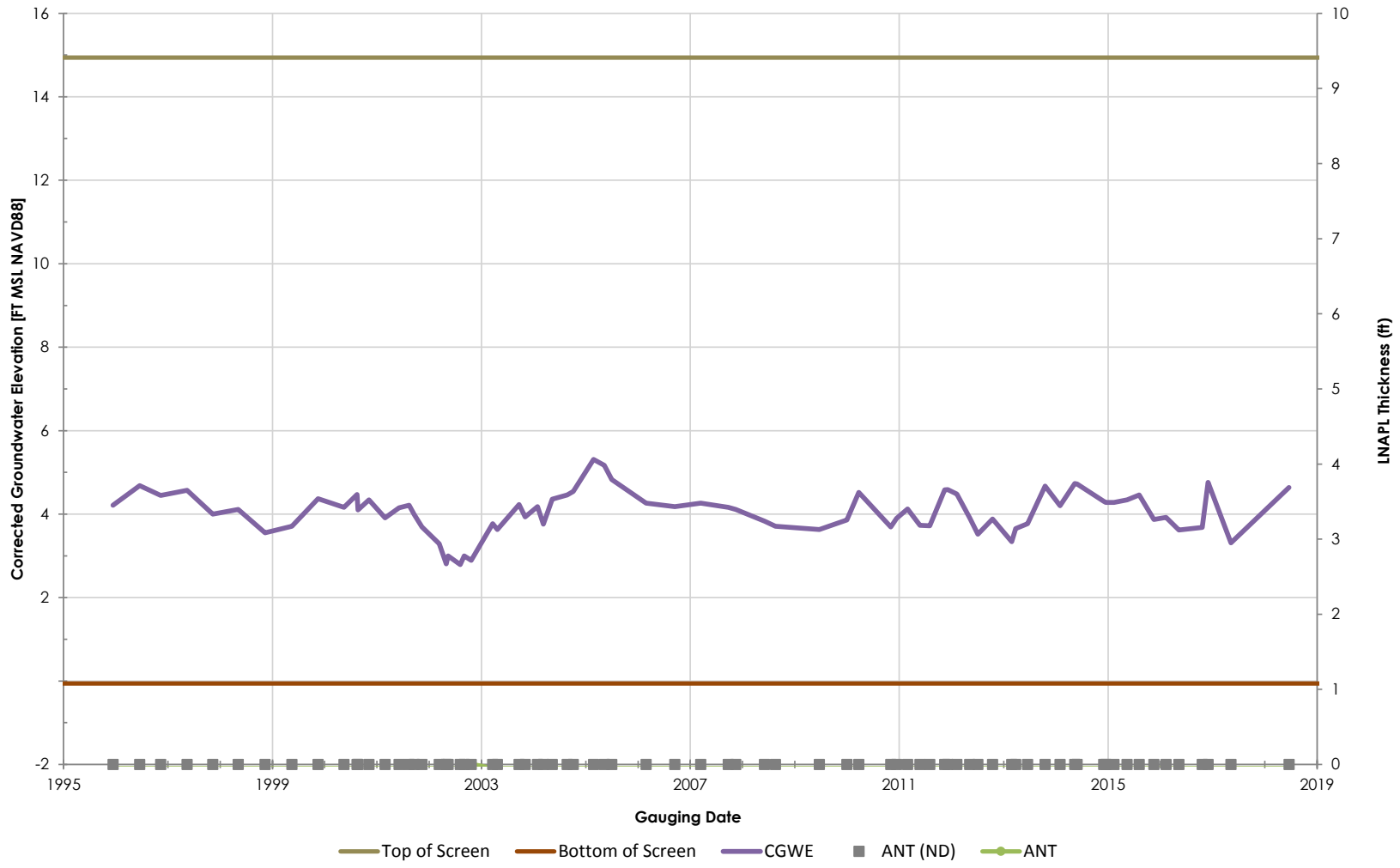
Stantec

Figure/Well No.

S-8

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Stantec

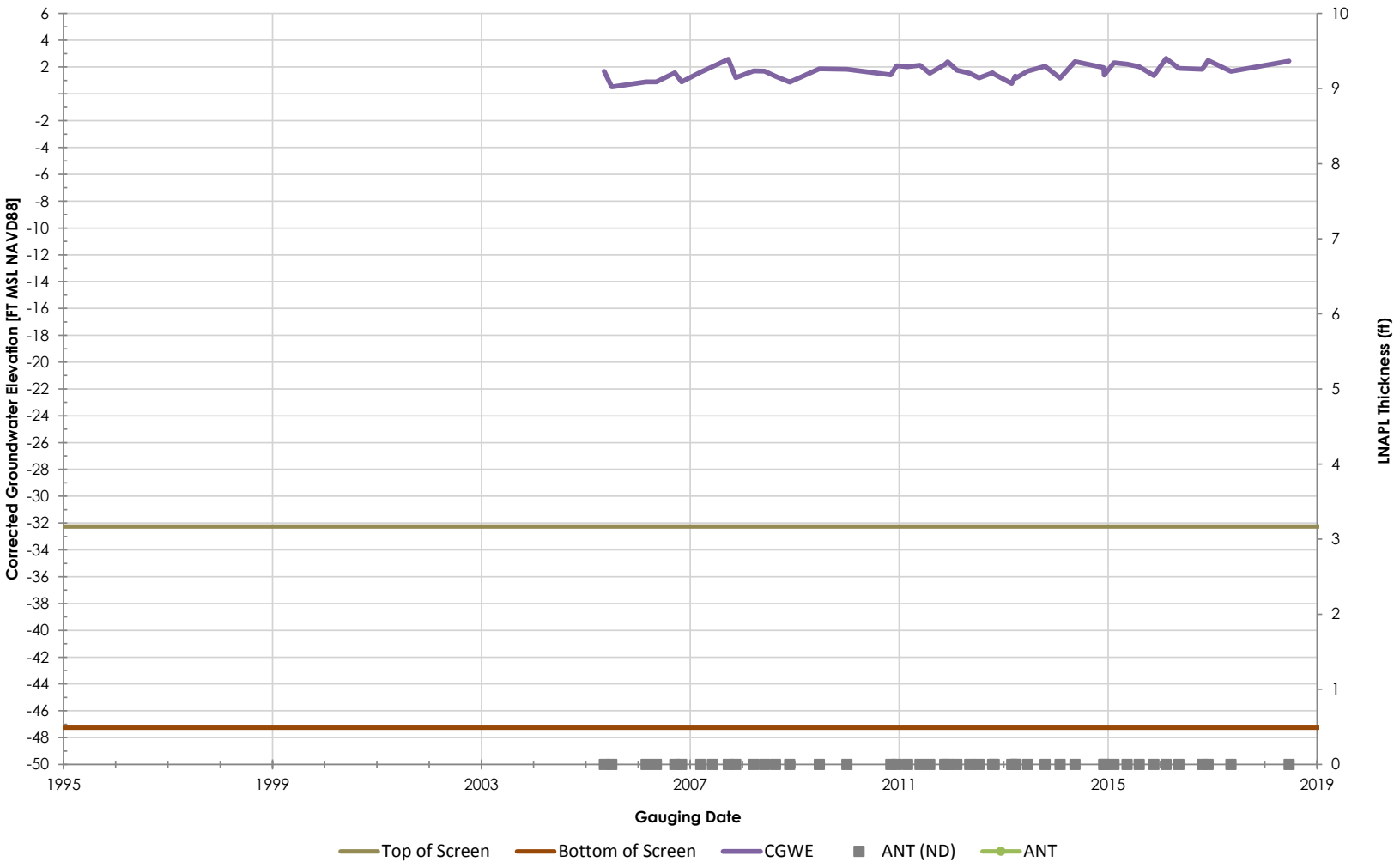
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-80

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



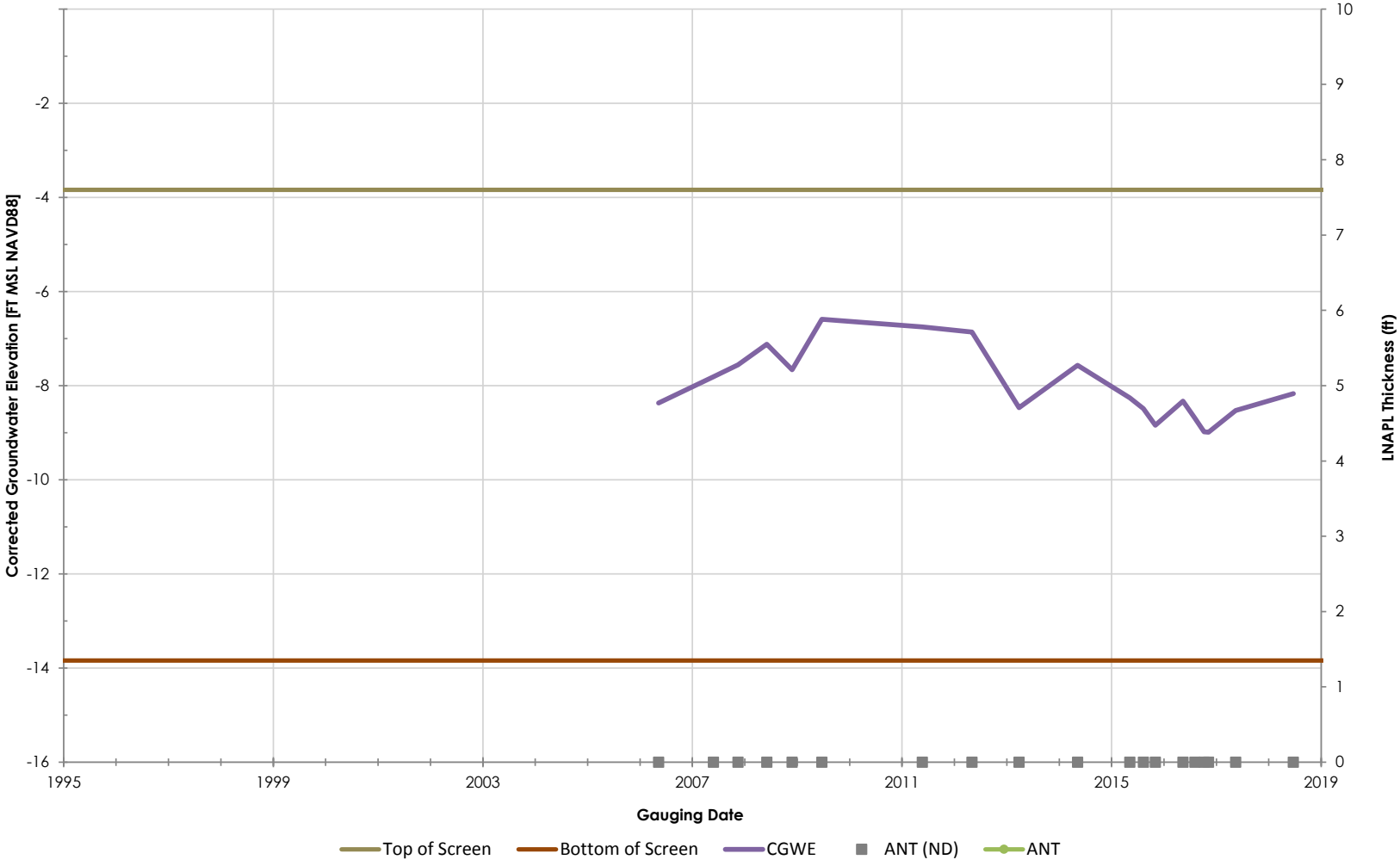
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

S-80D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

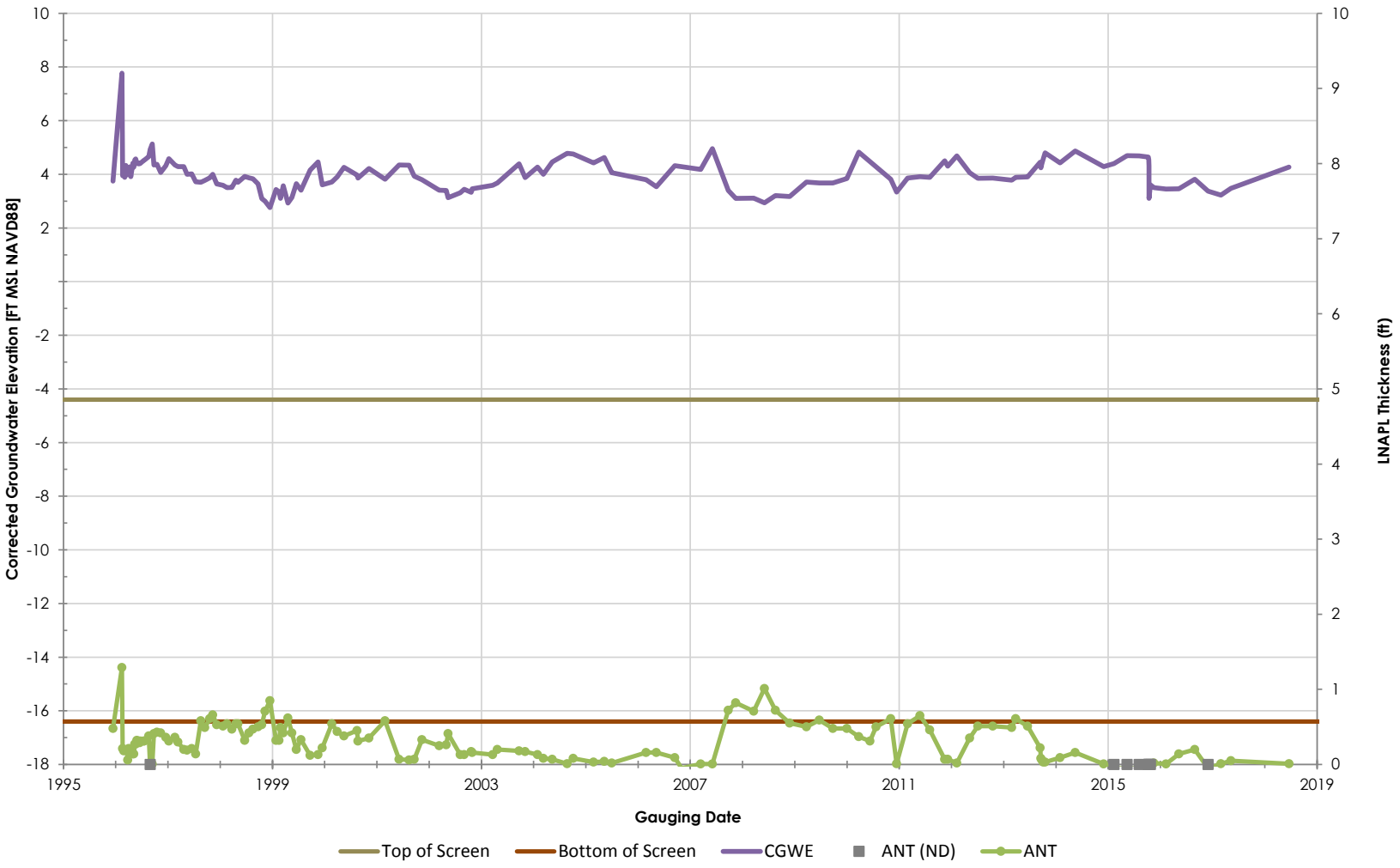
Stantec

Figure/Well No.

S-81SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

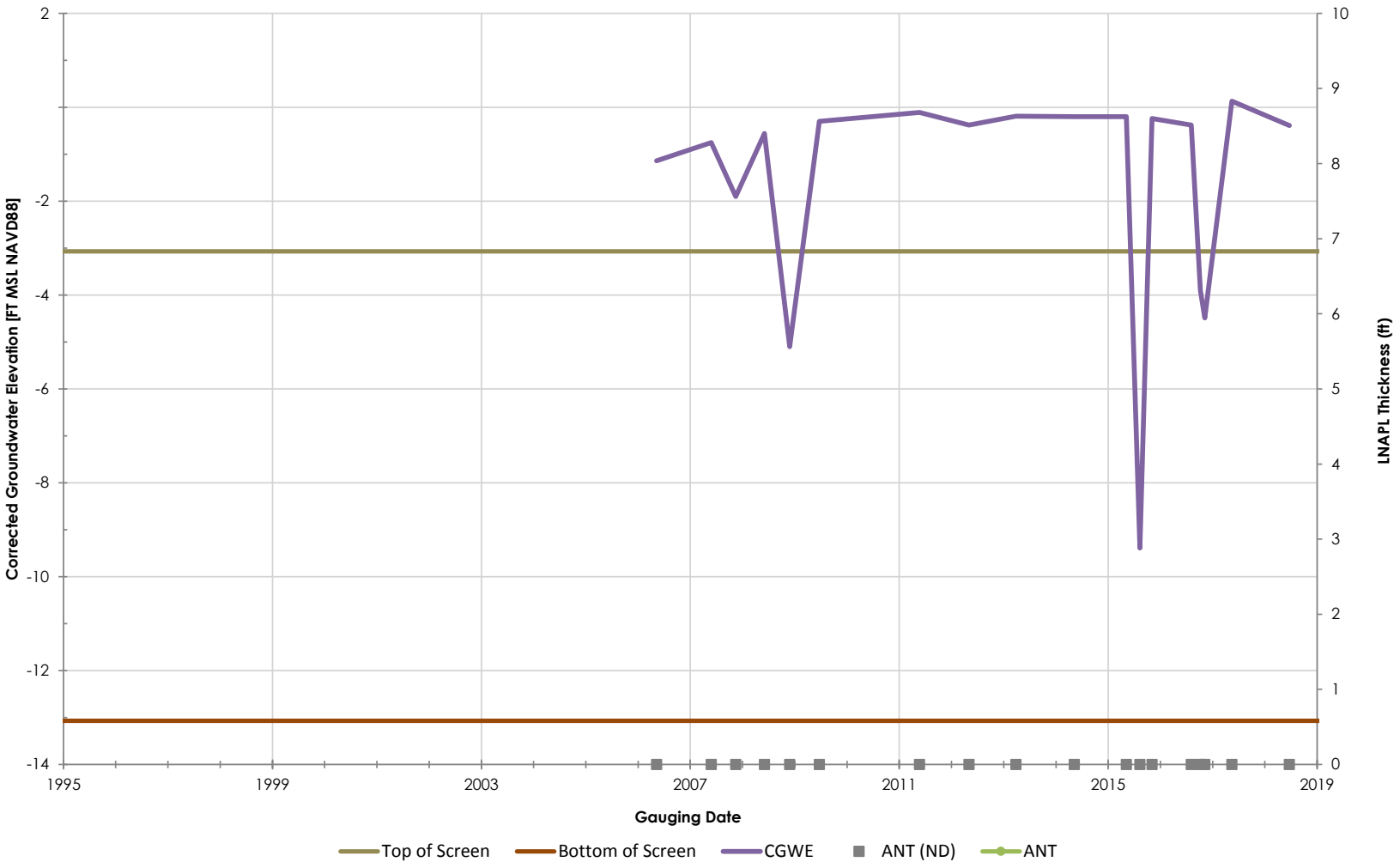
Stantec

Figure/Well No.

S-82

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

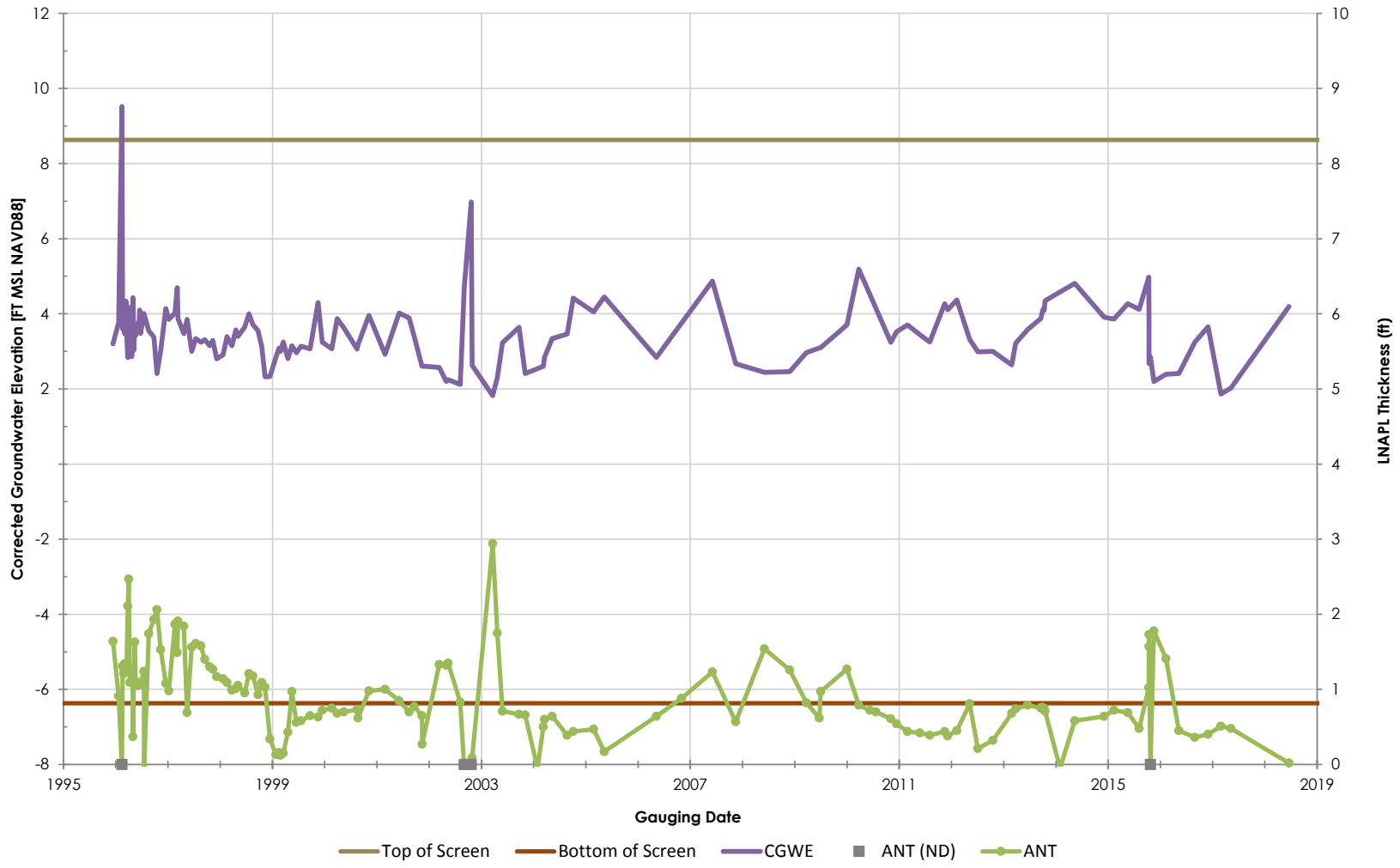
Stantec

Figure/Well No.

S-82SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

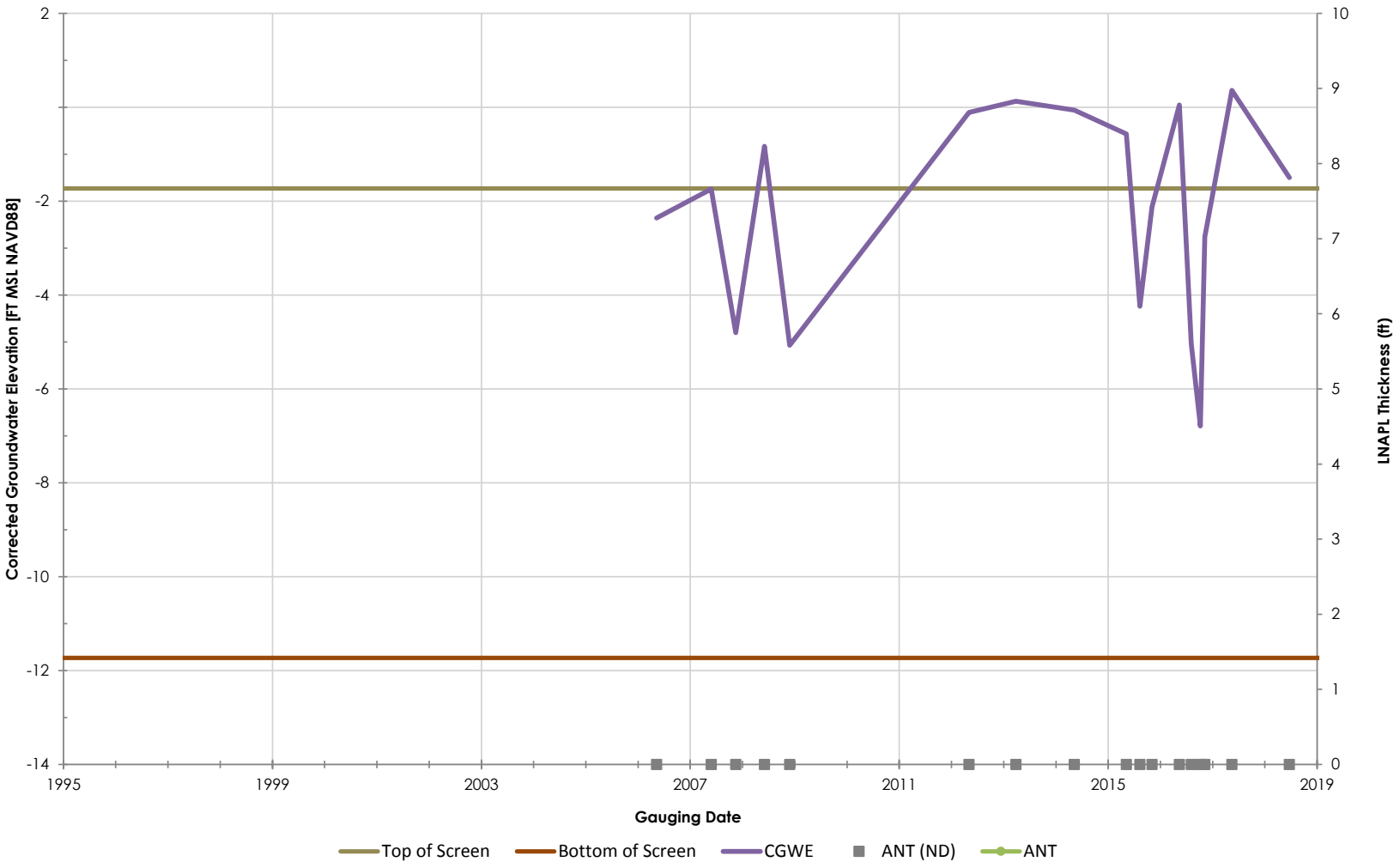
Stantec

Figure/Well No.

S-83

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

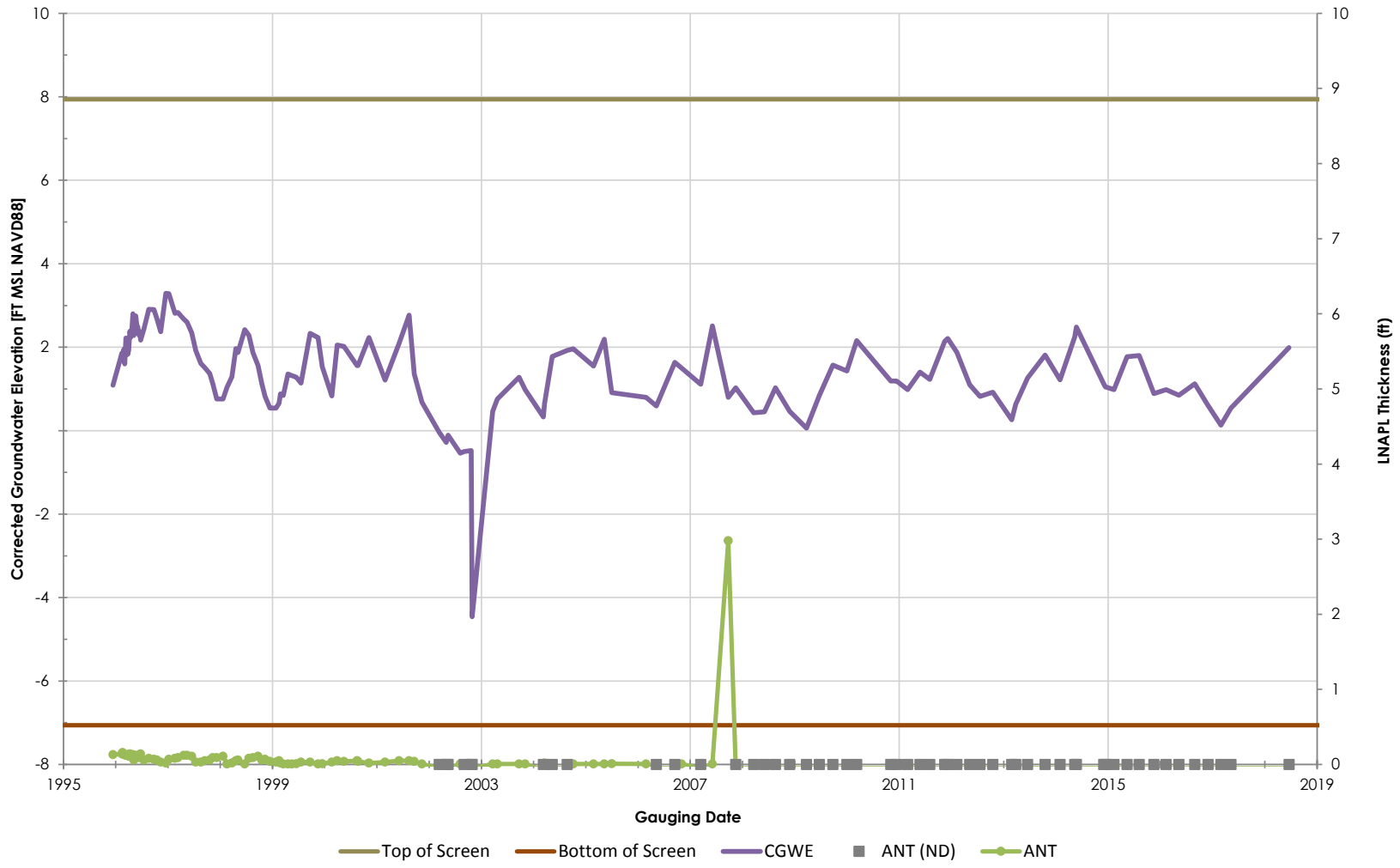
Stantec

Figure/Well No.

S-83SRTF

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

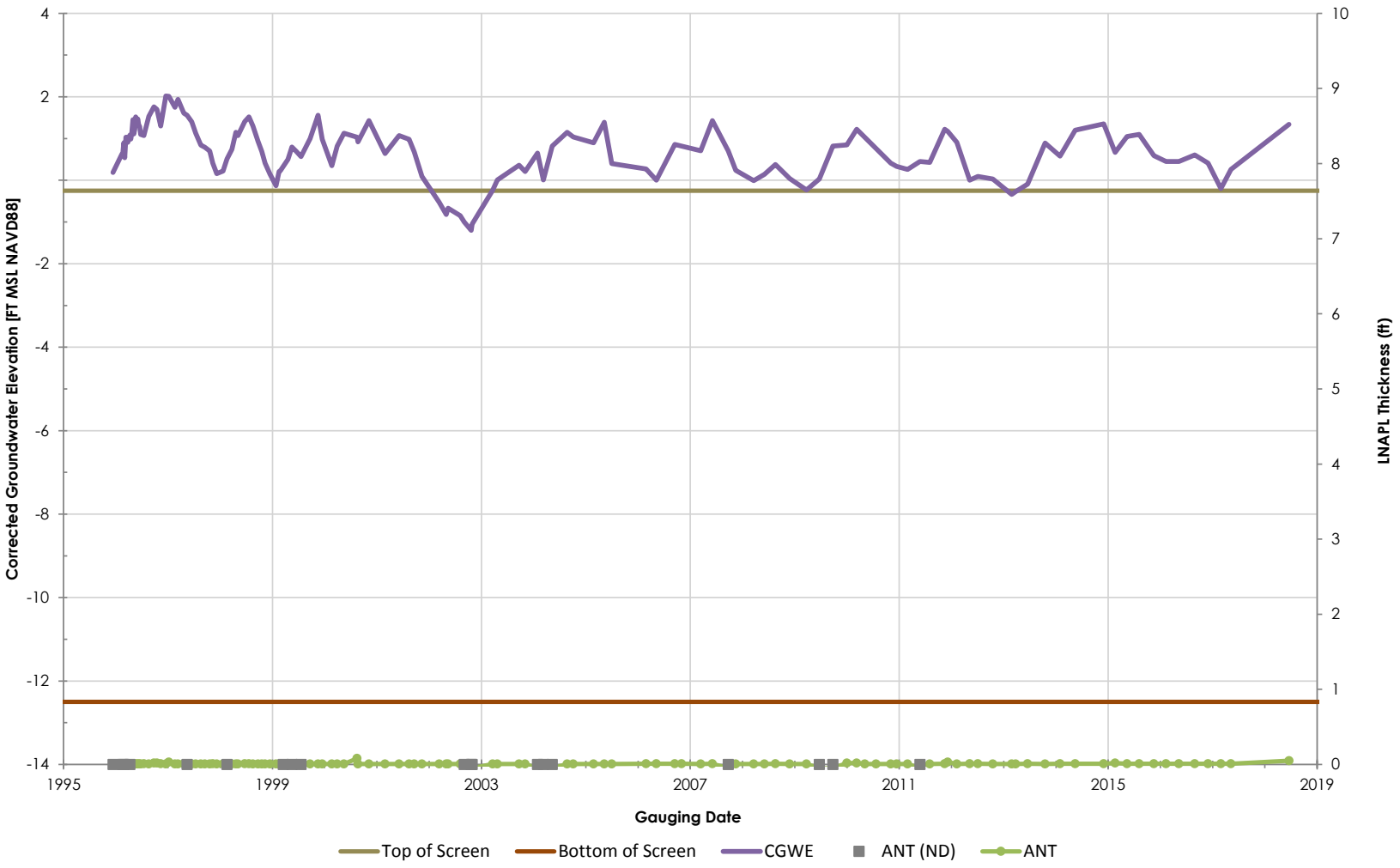
Stantec

Figure/Well No.

S-85

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

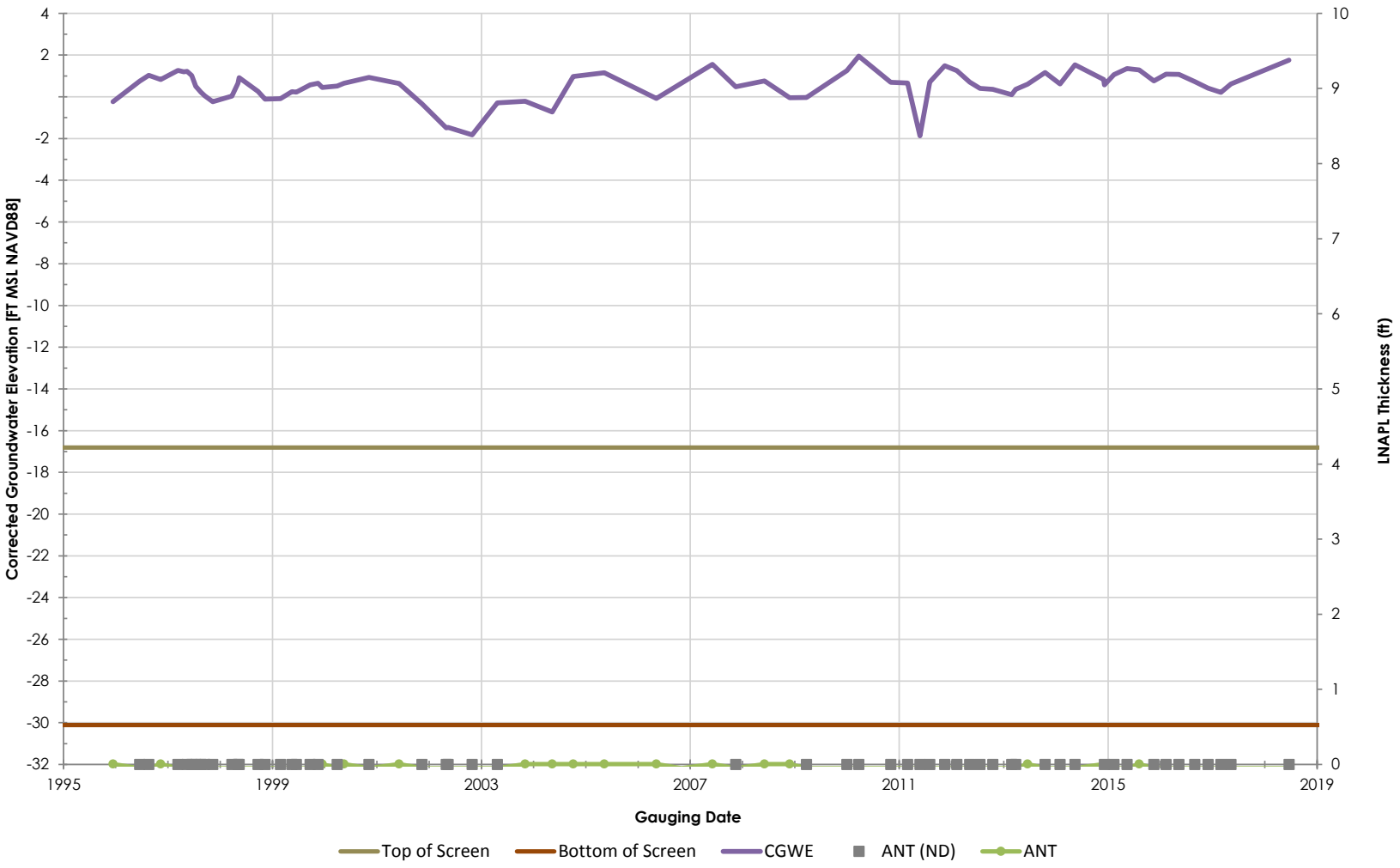
Stantec

Figure/Well No.

S-86

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

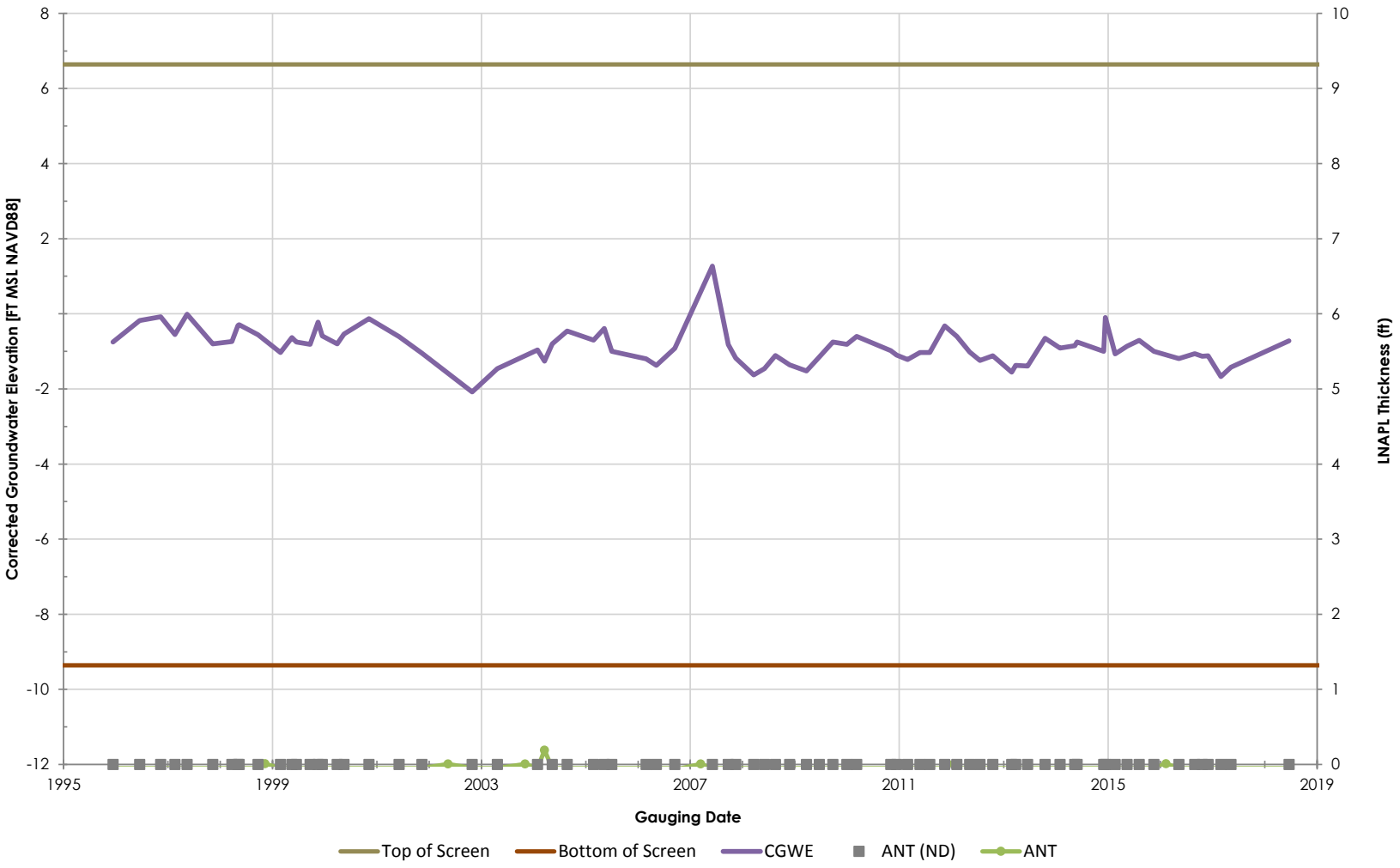
Stantec

Figure/Well No.

S-87I

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

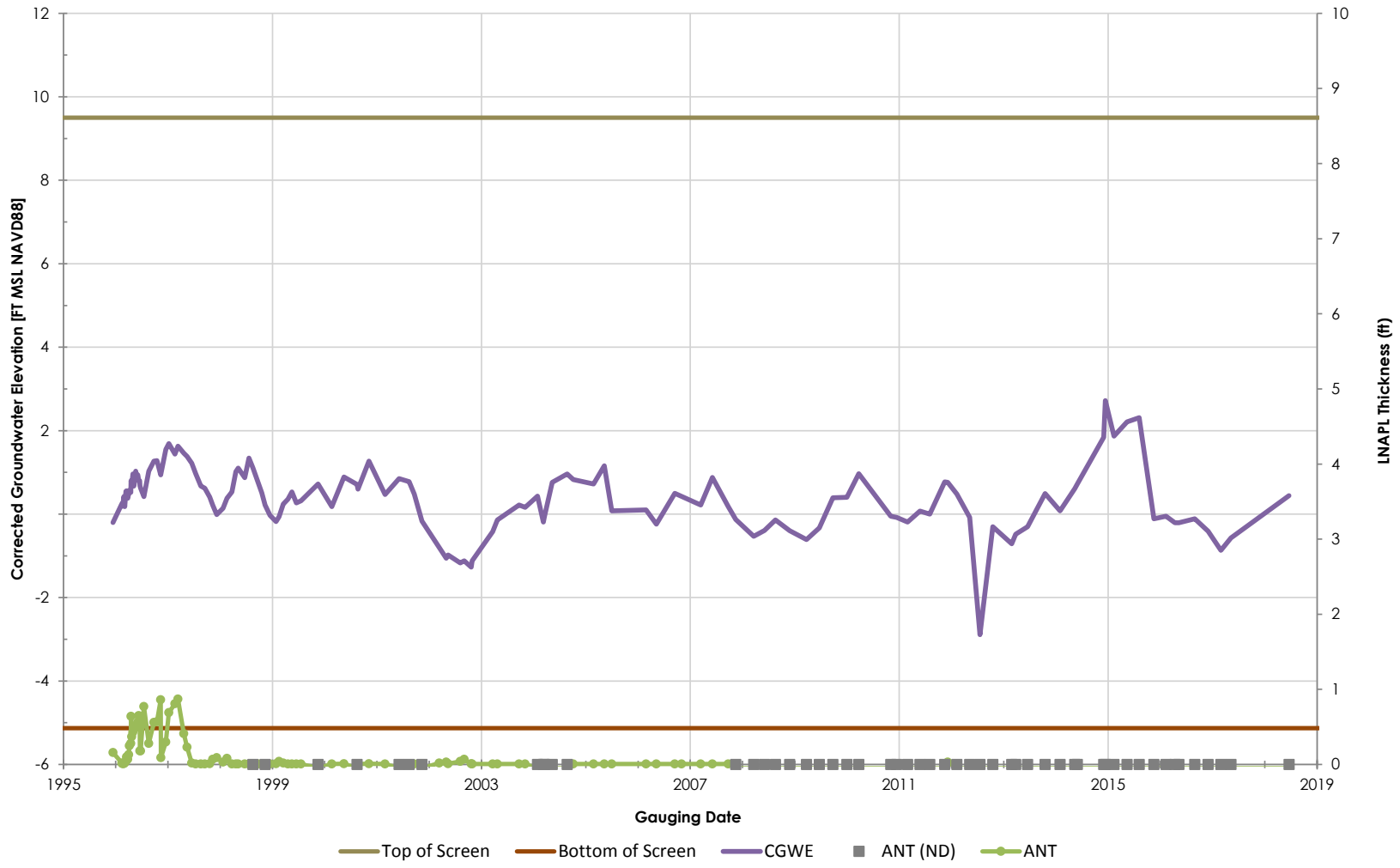
Stantec

Figure/Well No.

S-88

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

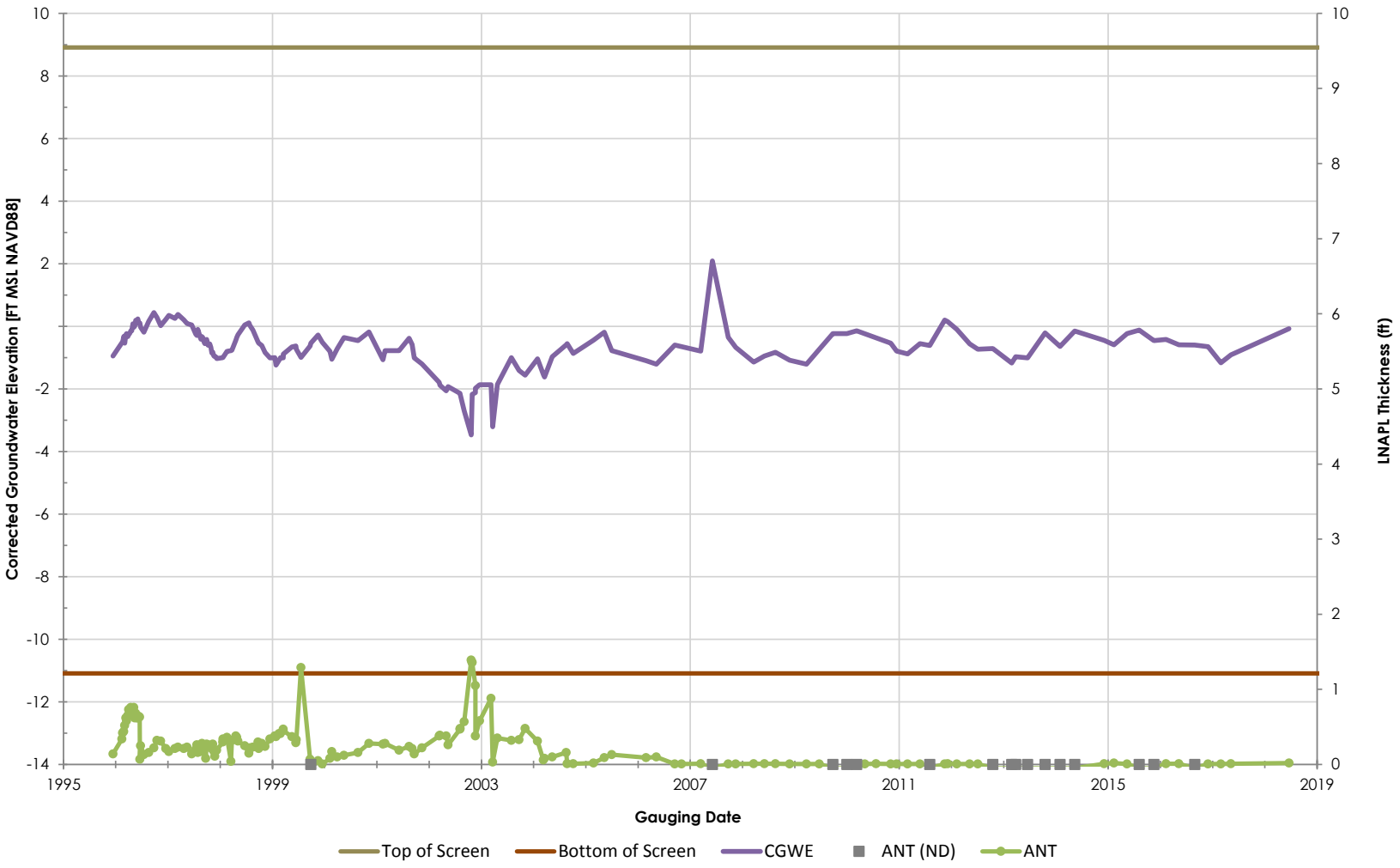
Stantec

Figure/Well No.

S-88A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

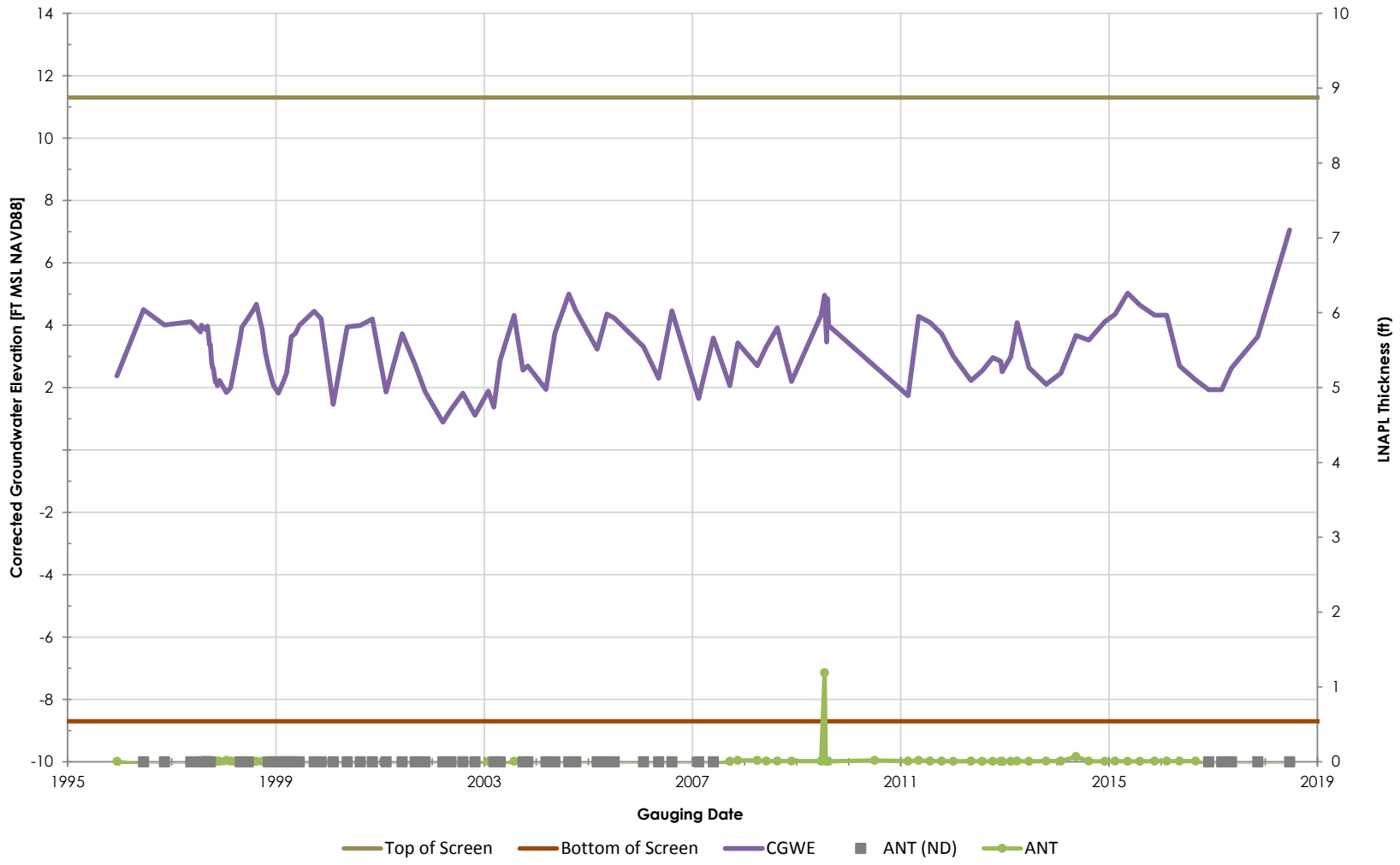
Stantec

Figure/Well No.

S-89

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

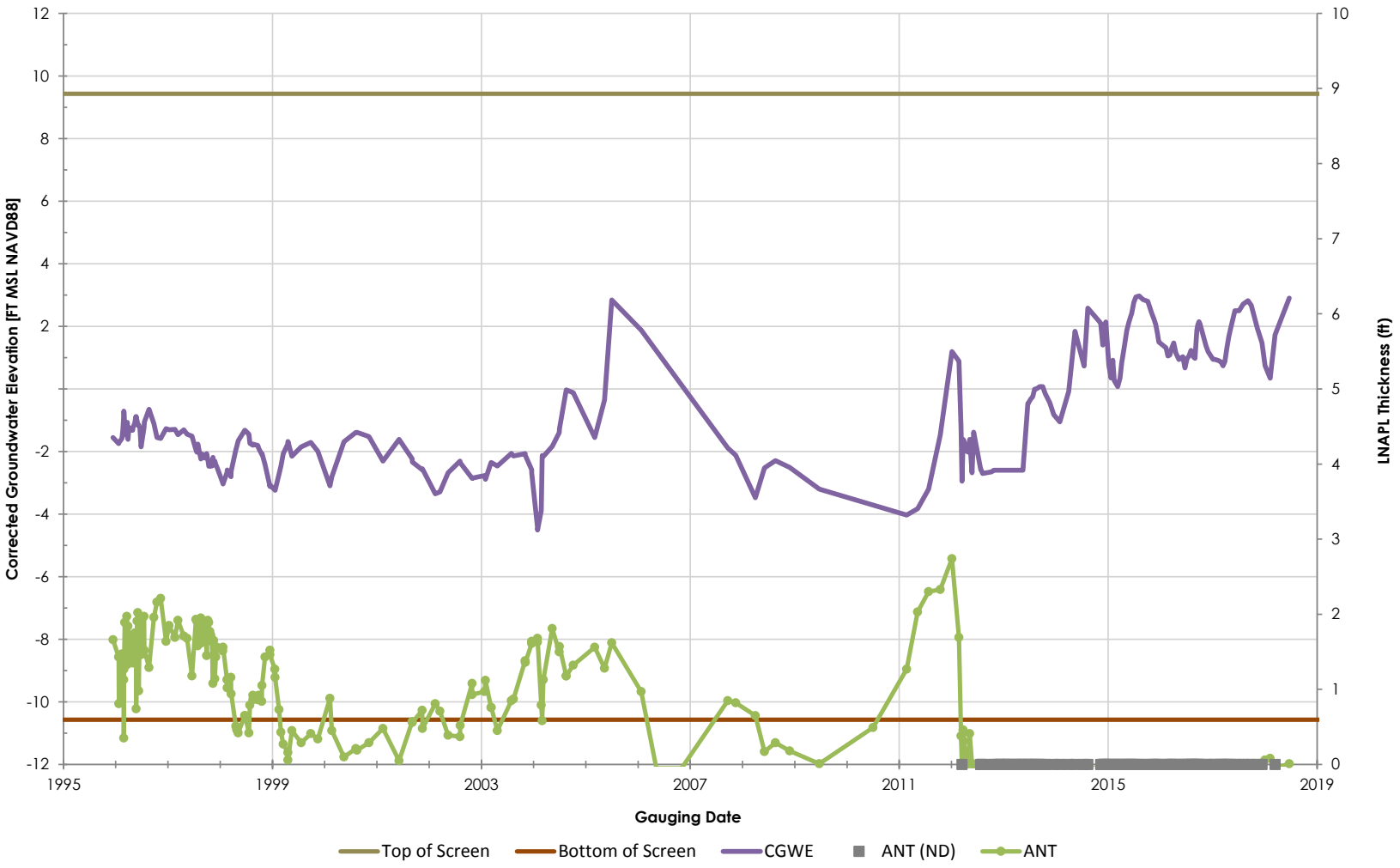
Stantec

Figure/Well No.

S-91

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

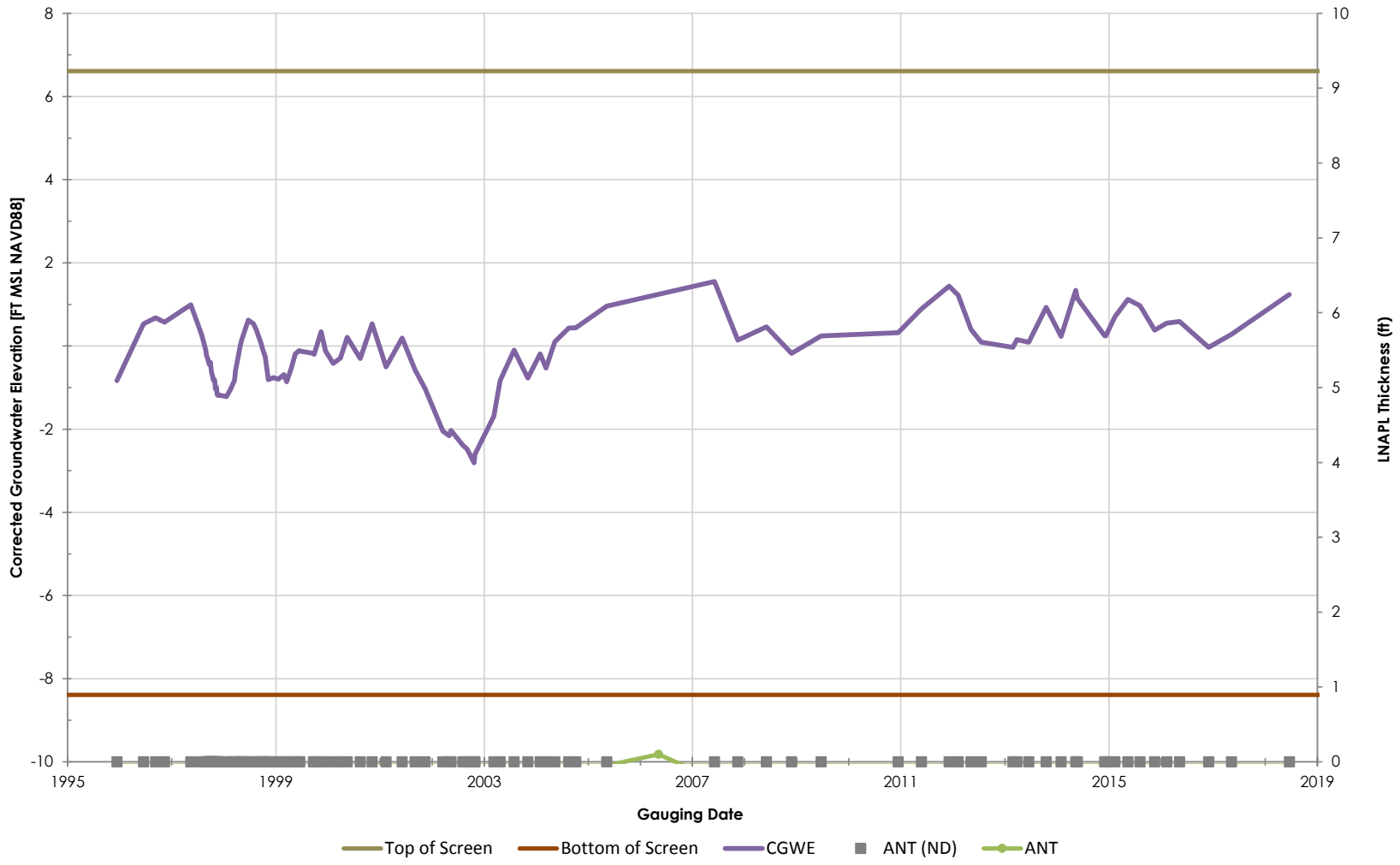
Stantec

Figure/Well No.

S-93

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

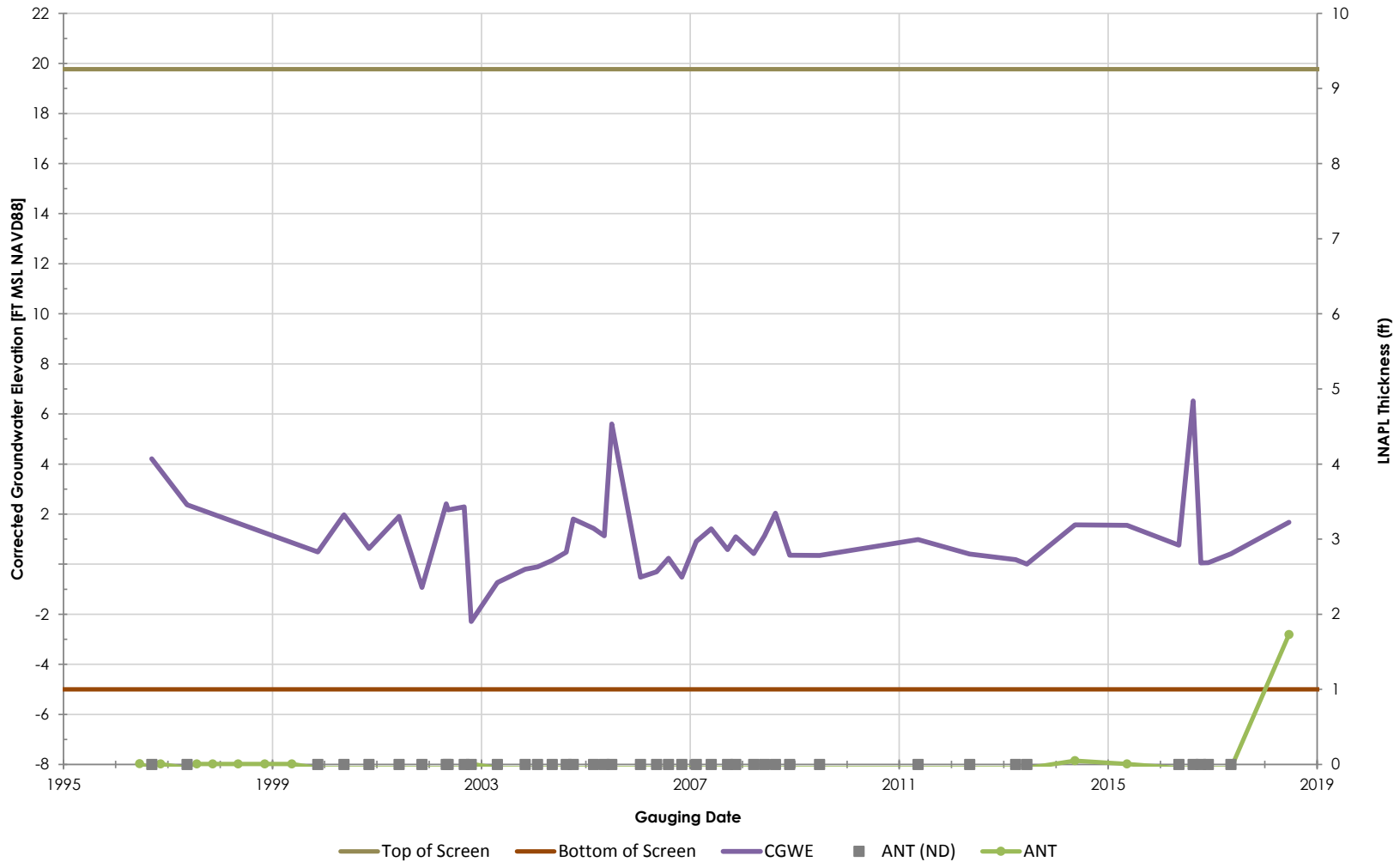
Stantec

Figure/Well No.

S-95

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

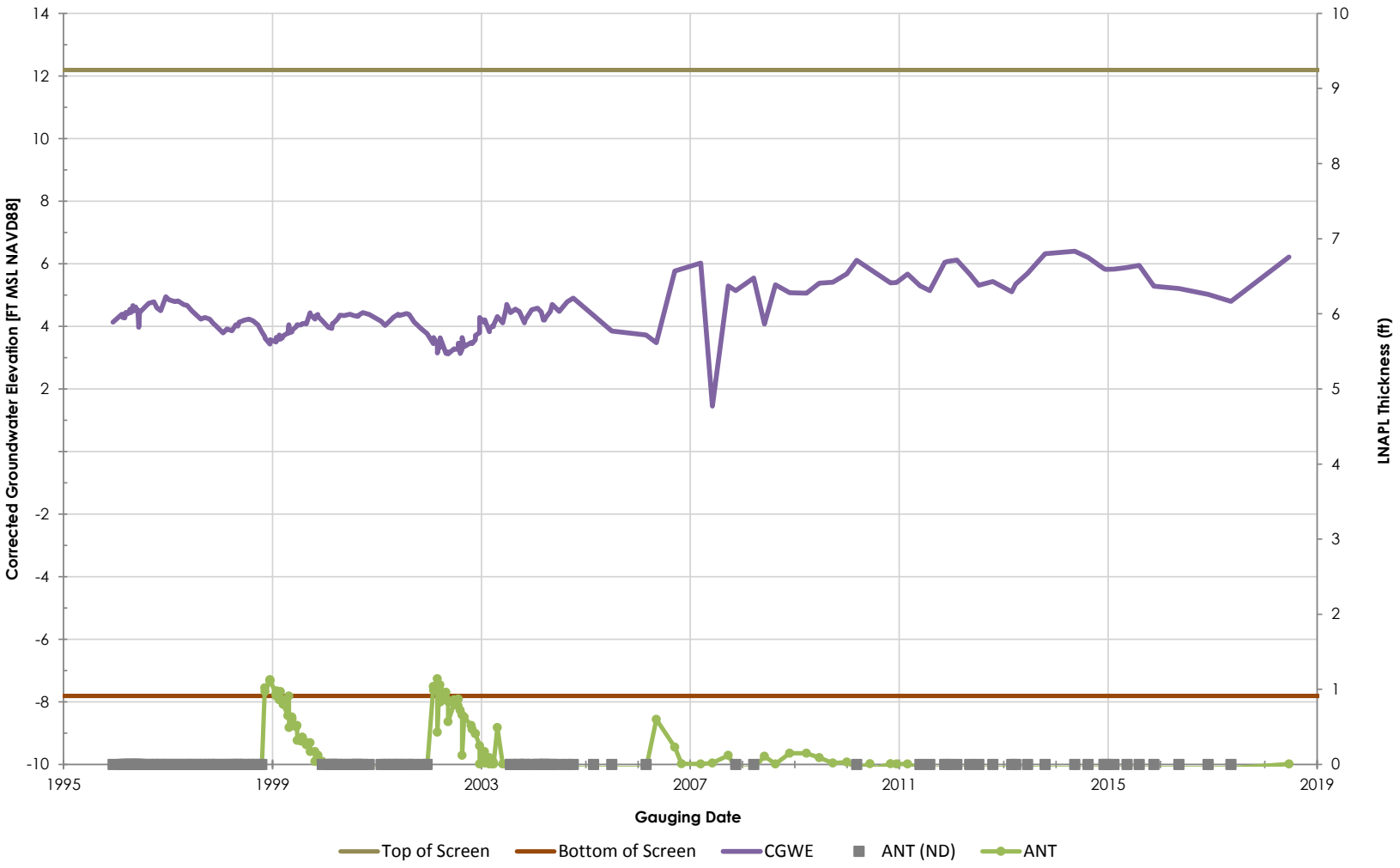
Stantec

Figure/Well No.

S-96

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

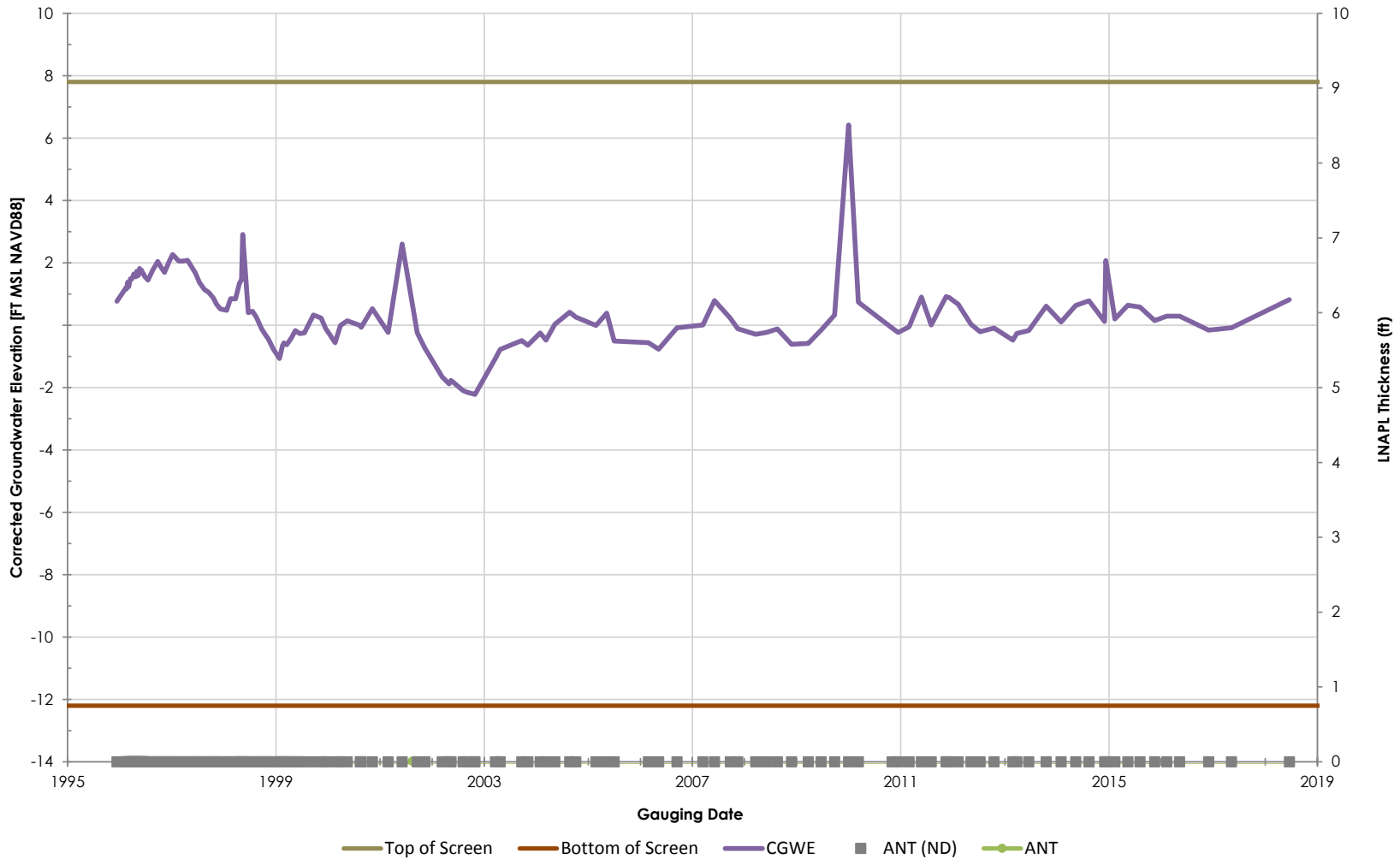
Stantec

Figure/Well No.

S-98

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

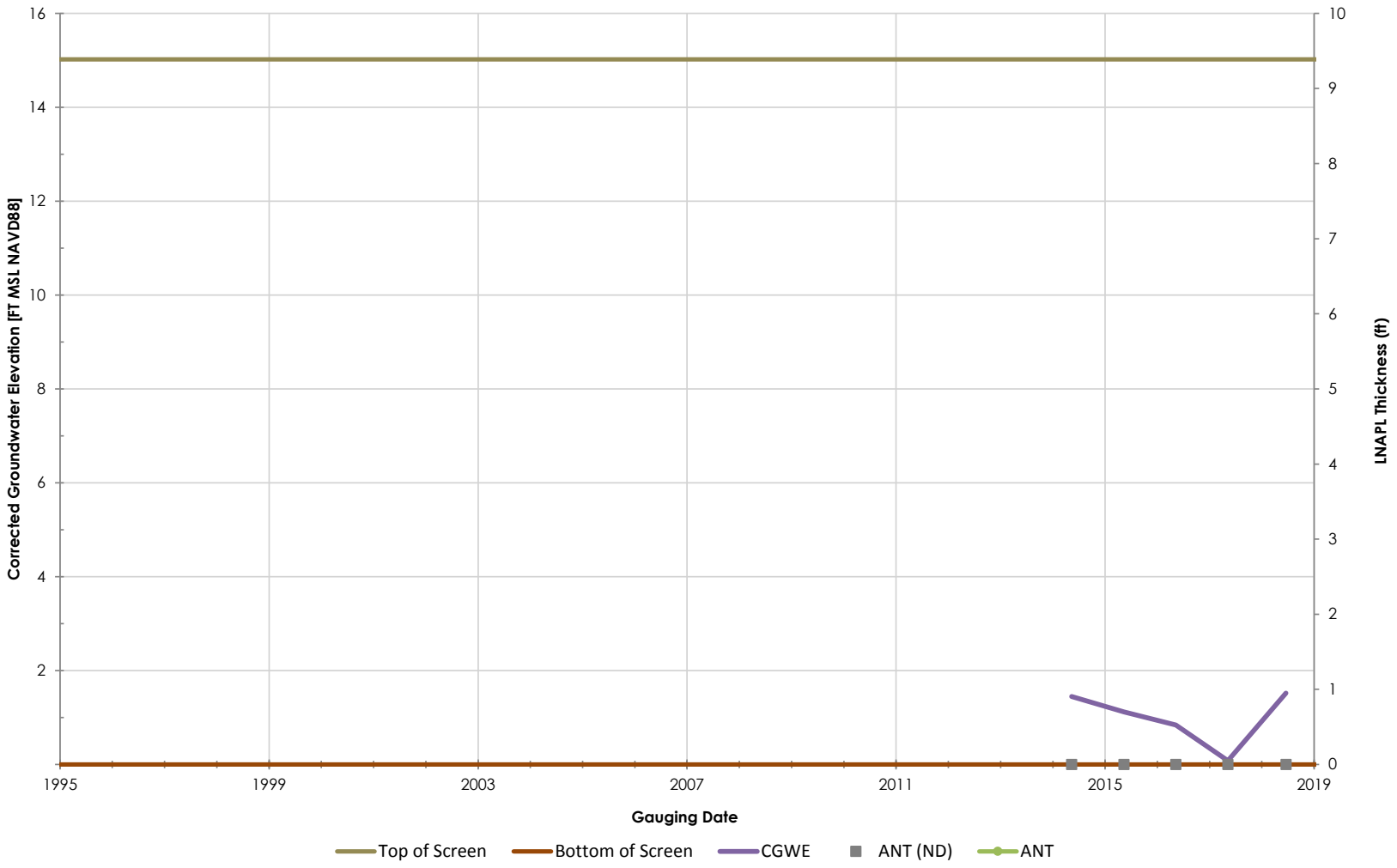
Stantec

Figure/Well No.

S-99

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

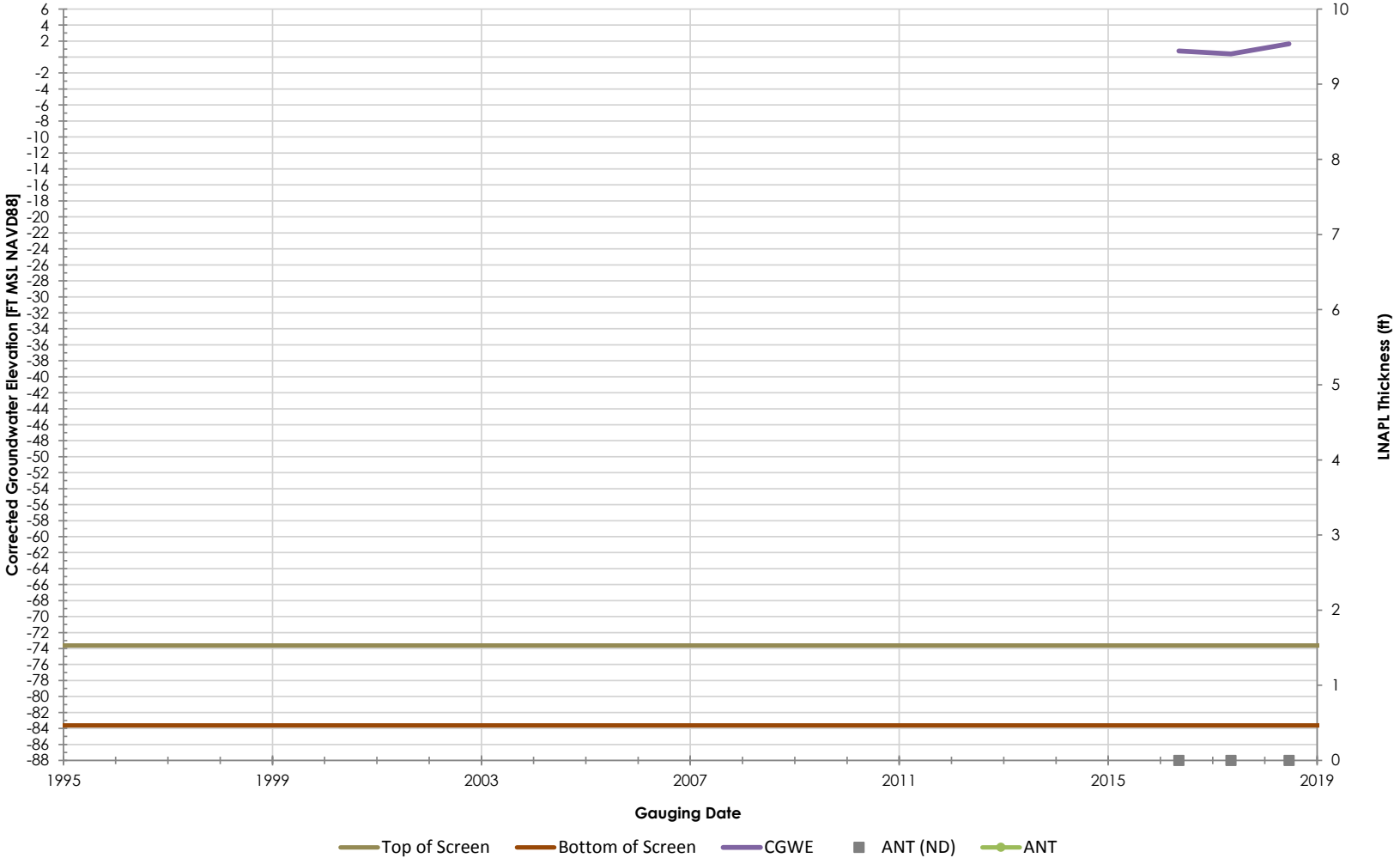
Stantec

Figure/Well No.

SSEPTA-PH-8

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



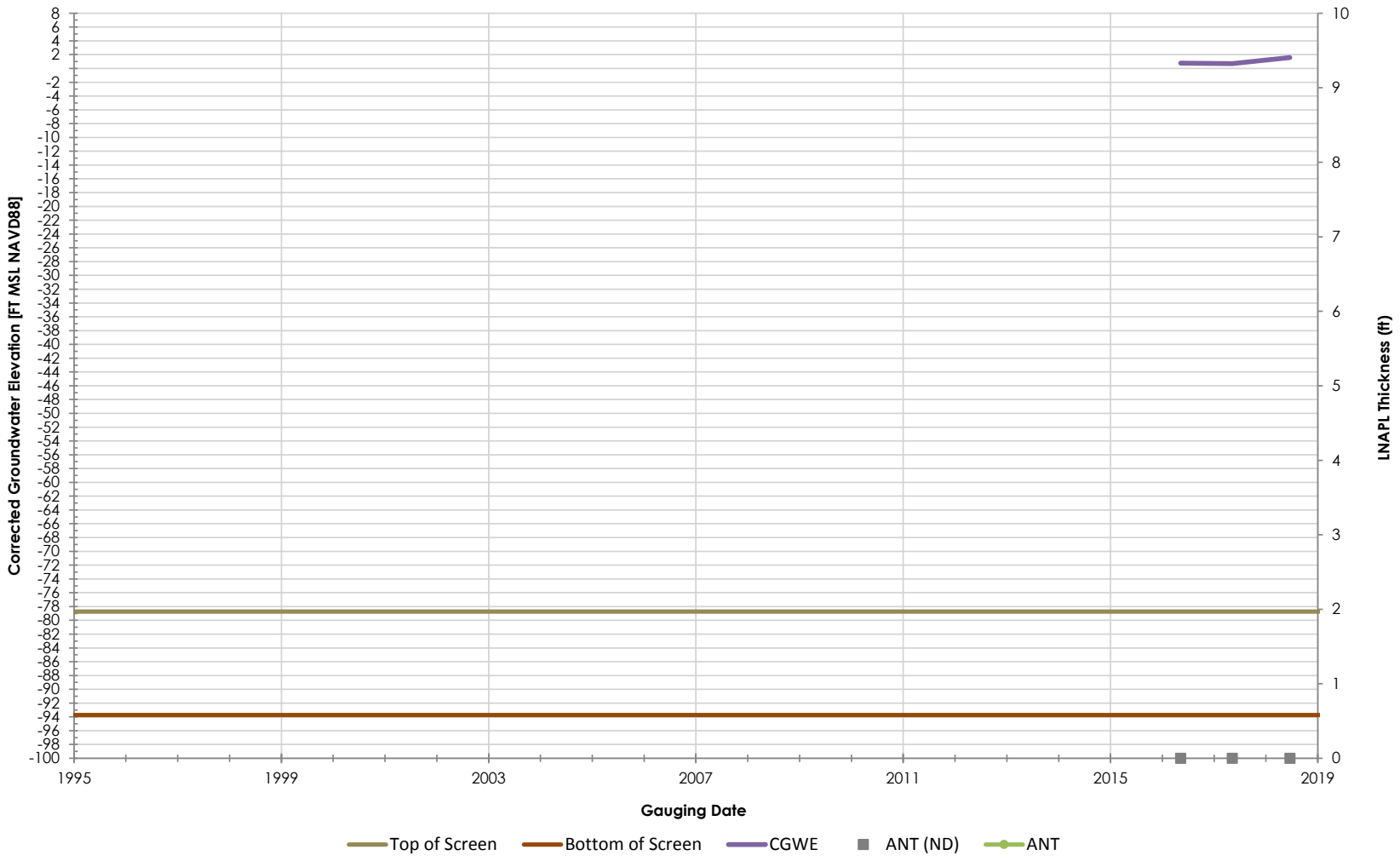
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

Steen-DW-07

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



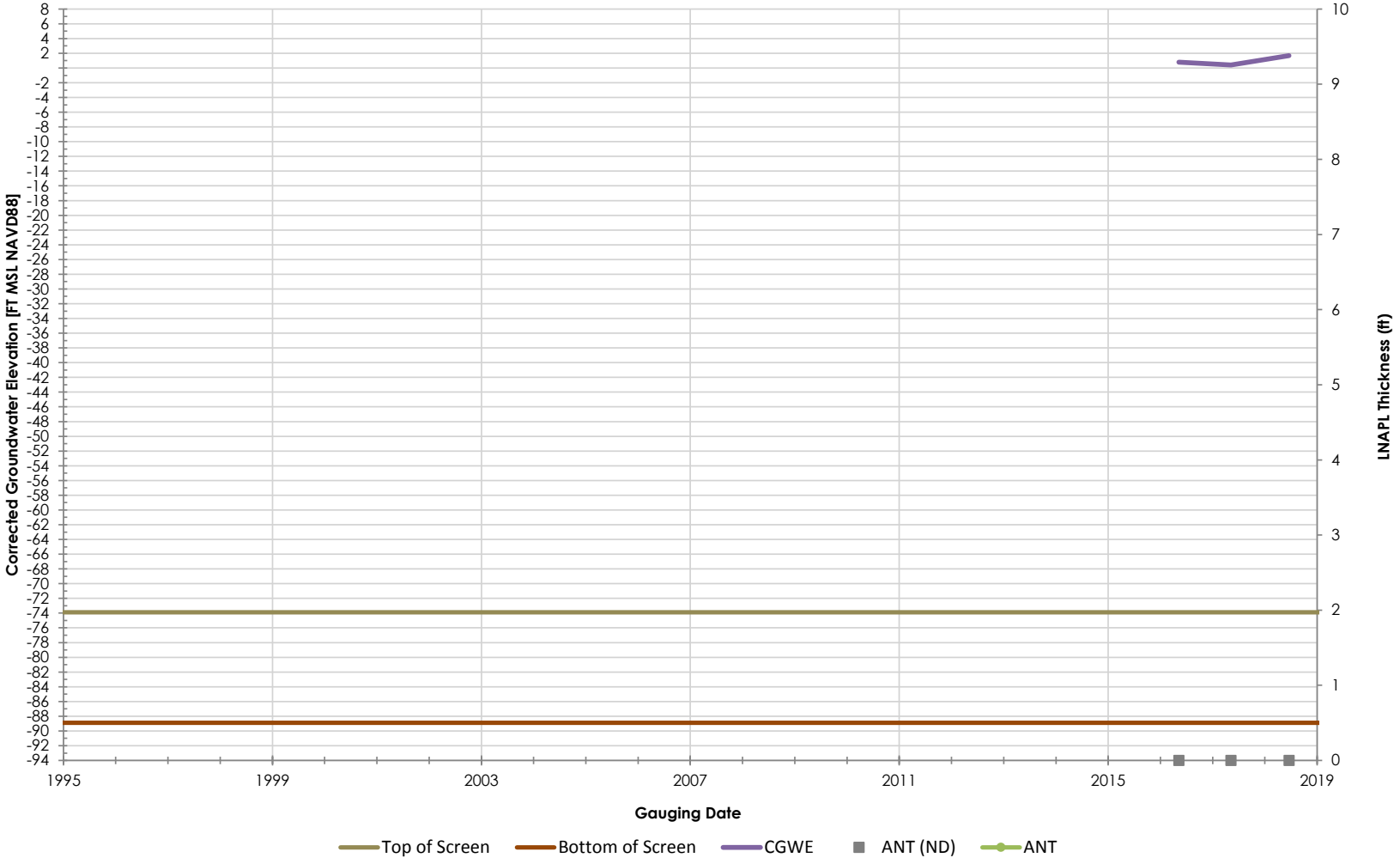
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

Steen-DW-08

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



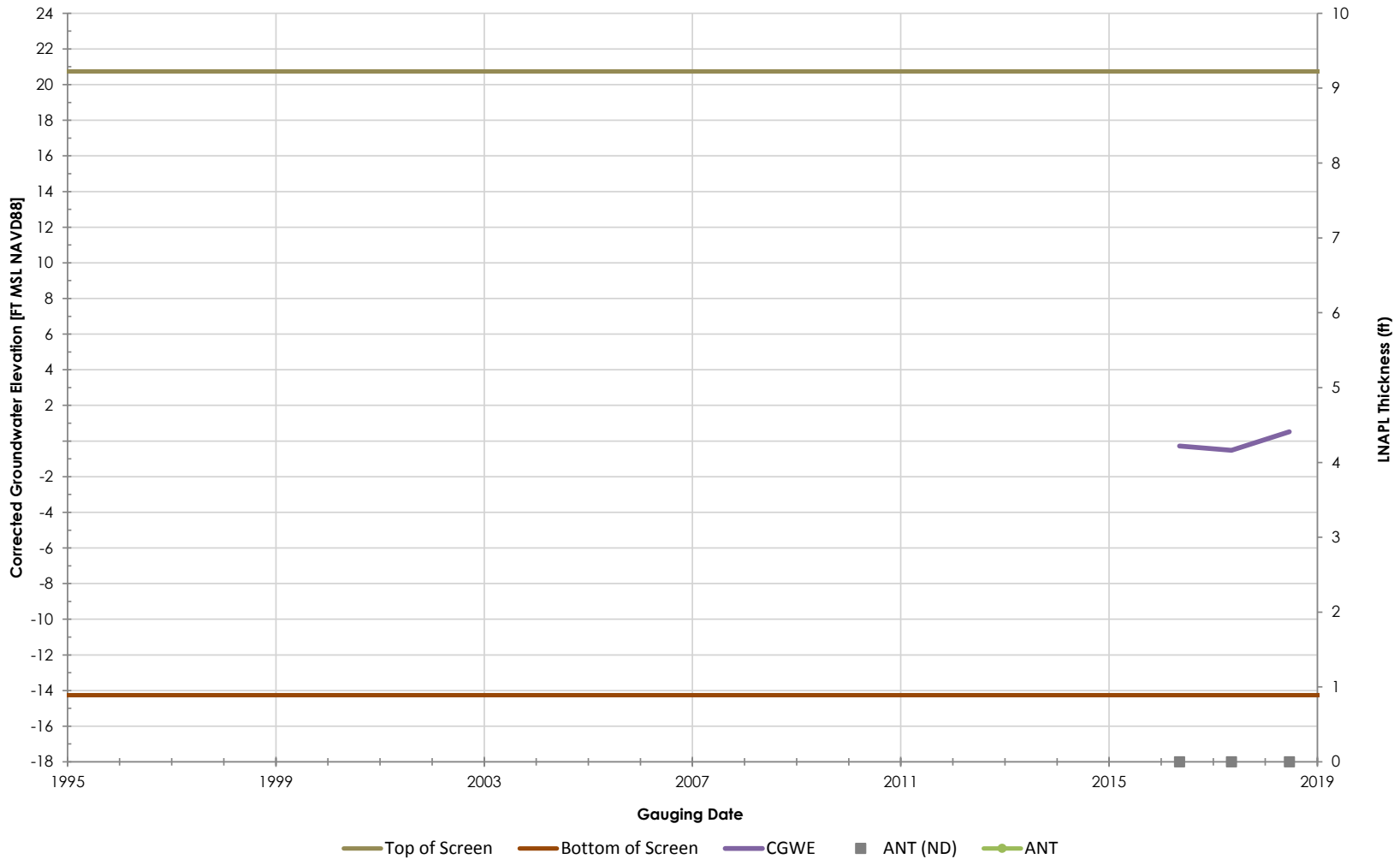
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

Steen-DW-09

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

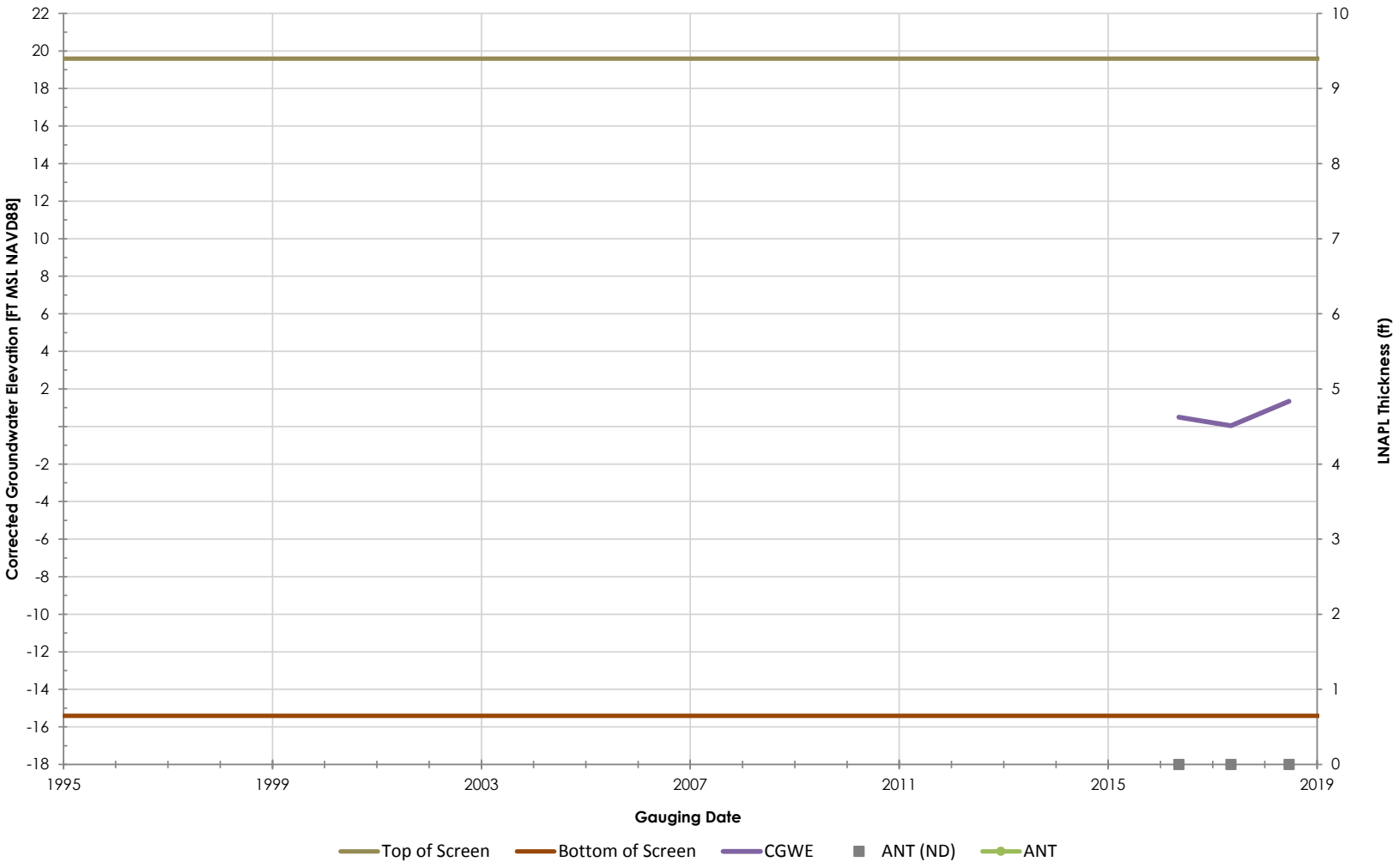
Stantec

Figure/Well No.

Steen-MW-61

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

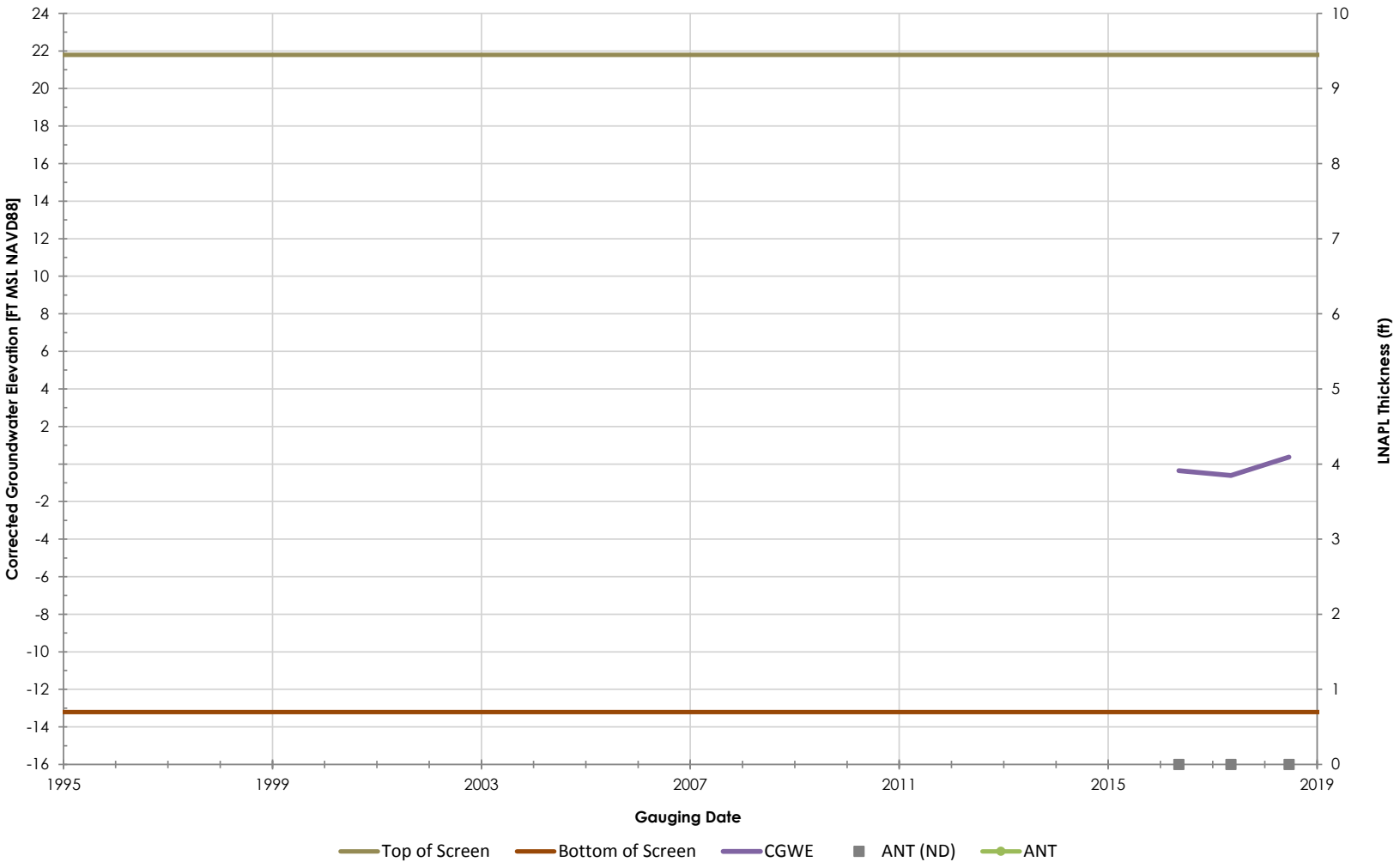
Stantec

Figure/Well No.

Steen-MW-62

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

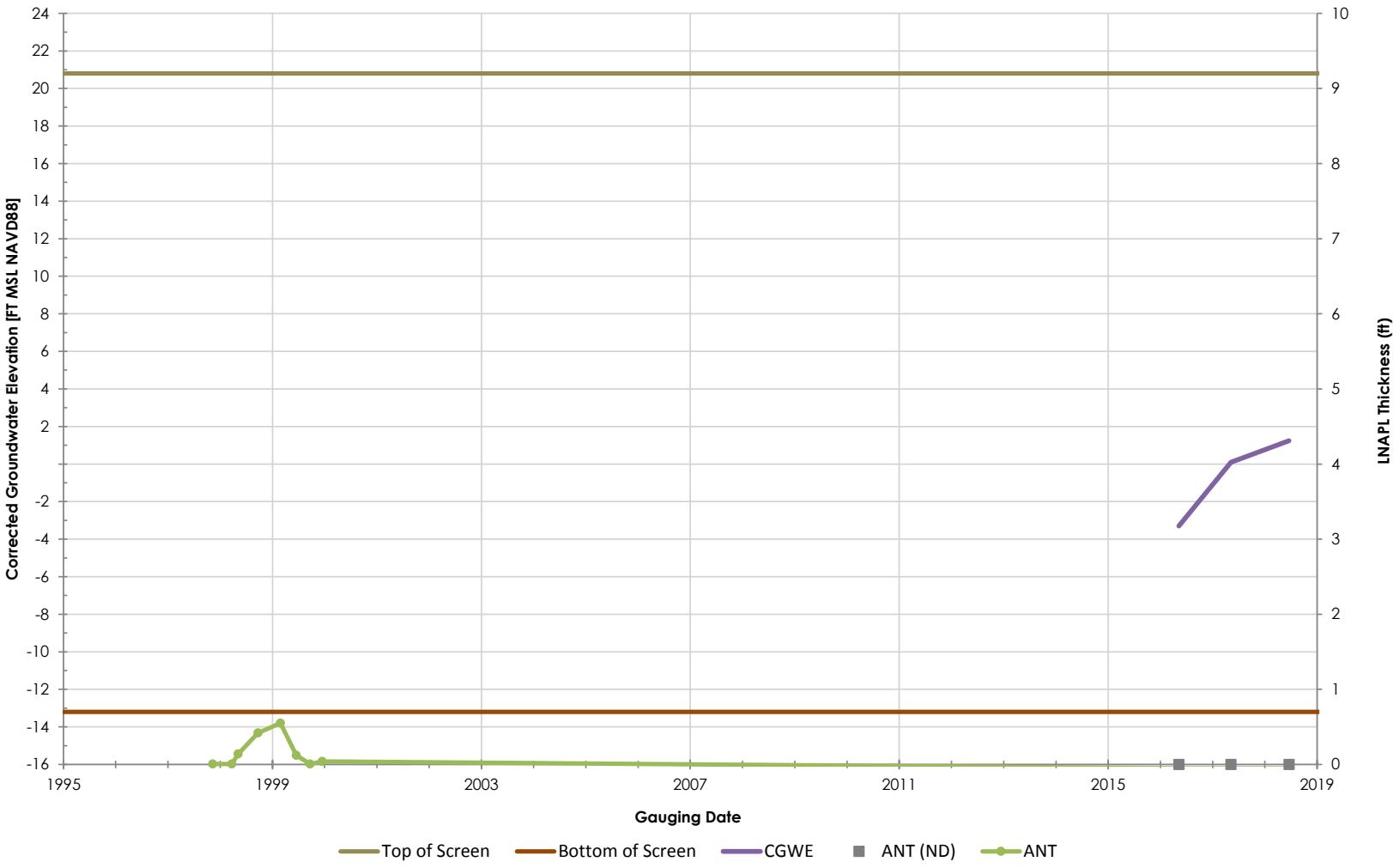
Stantec

Figure/Well No.

Steen-MW-64

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

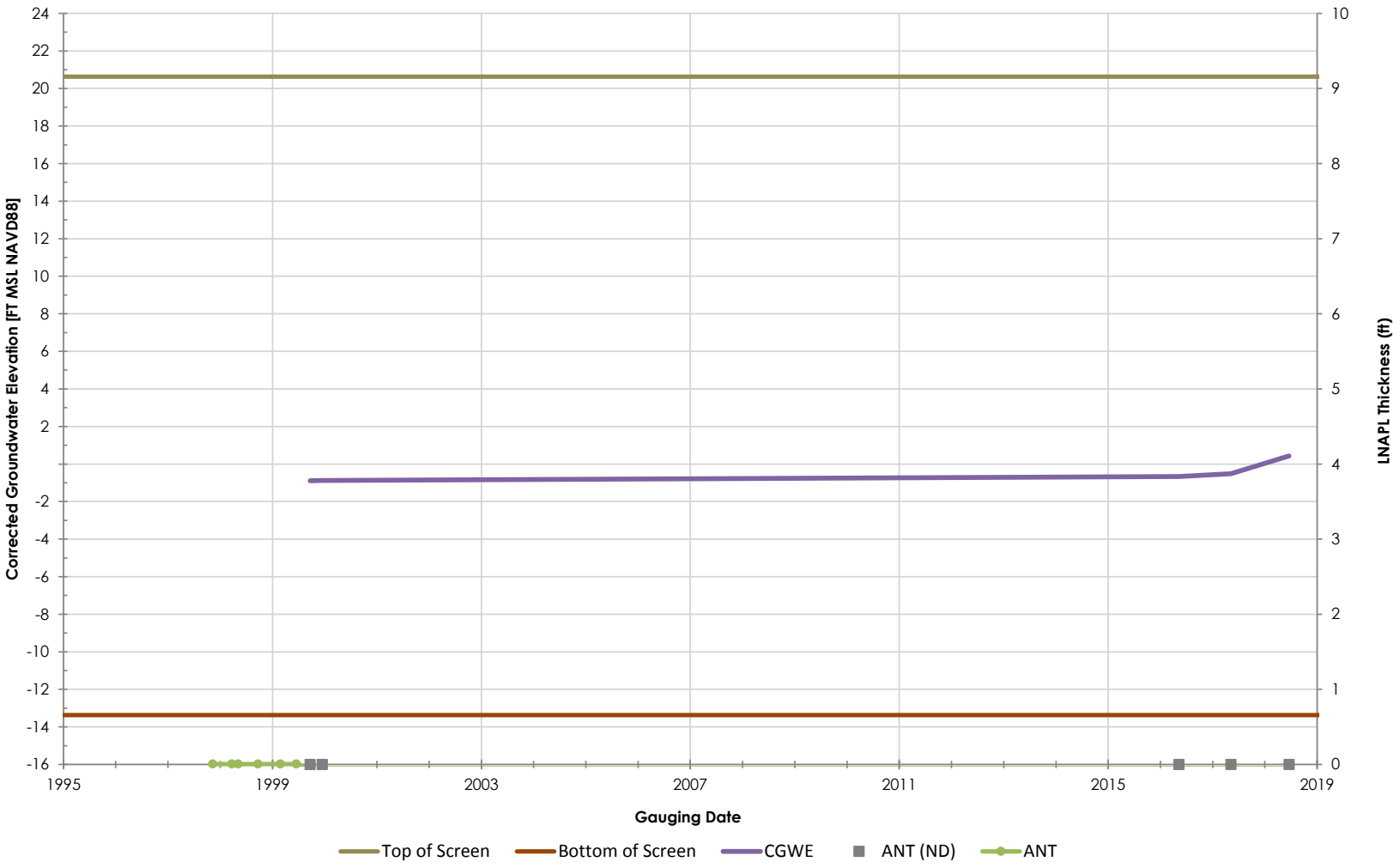
Stantec

Figure/Well No.

Steen-PH-10

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

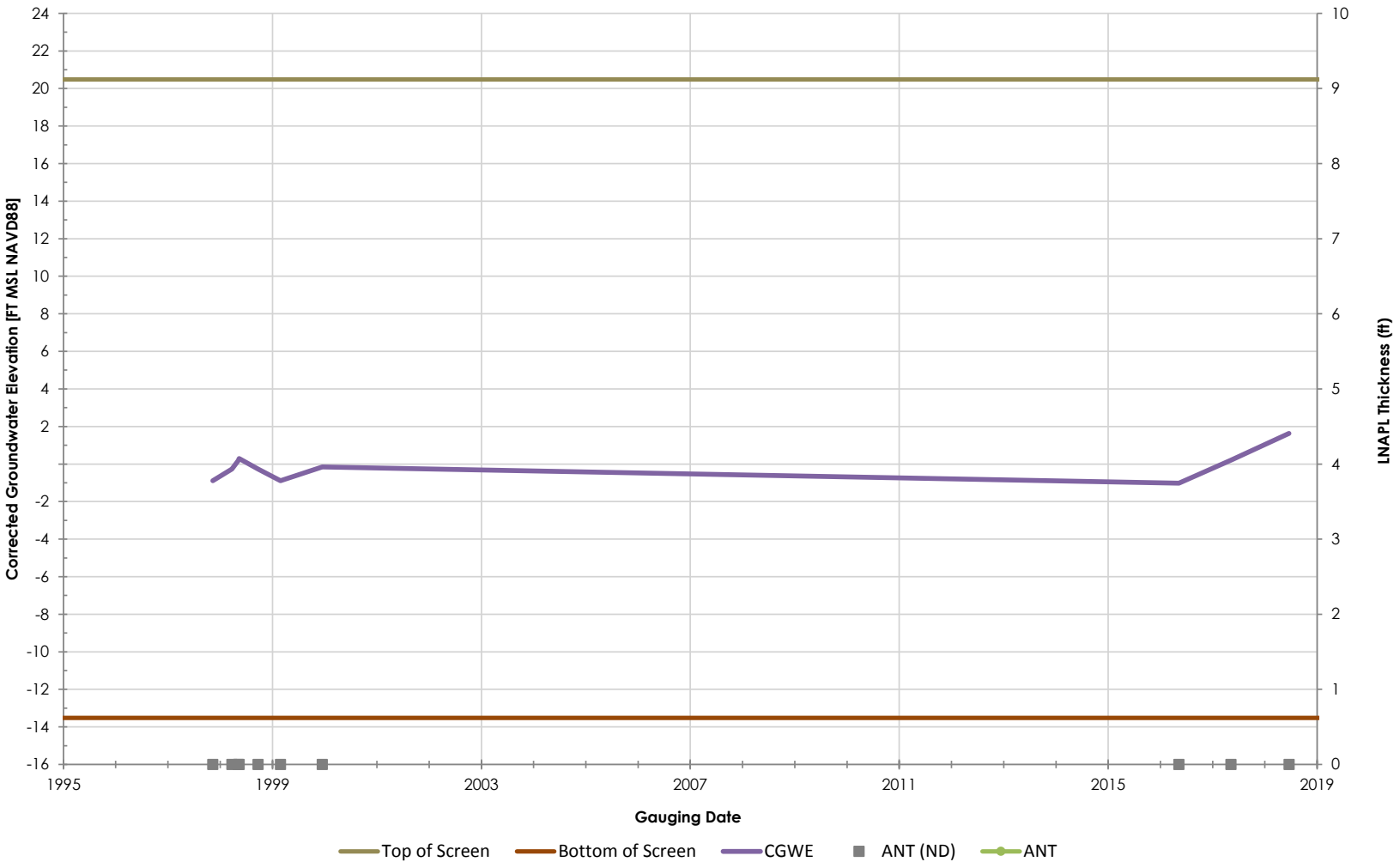
Stantec

Figure/Well No.

Steen-PH-11

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

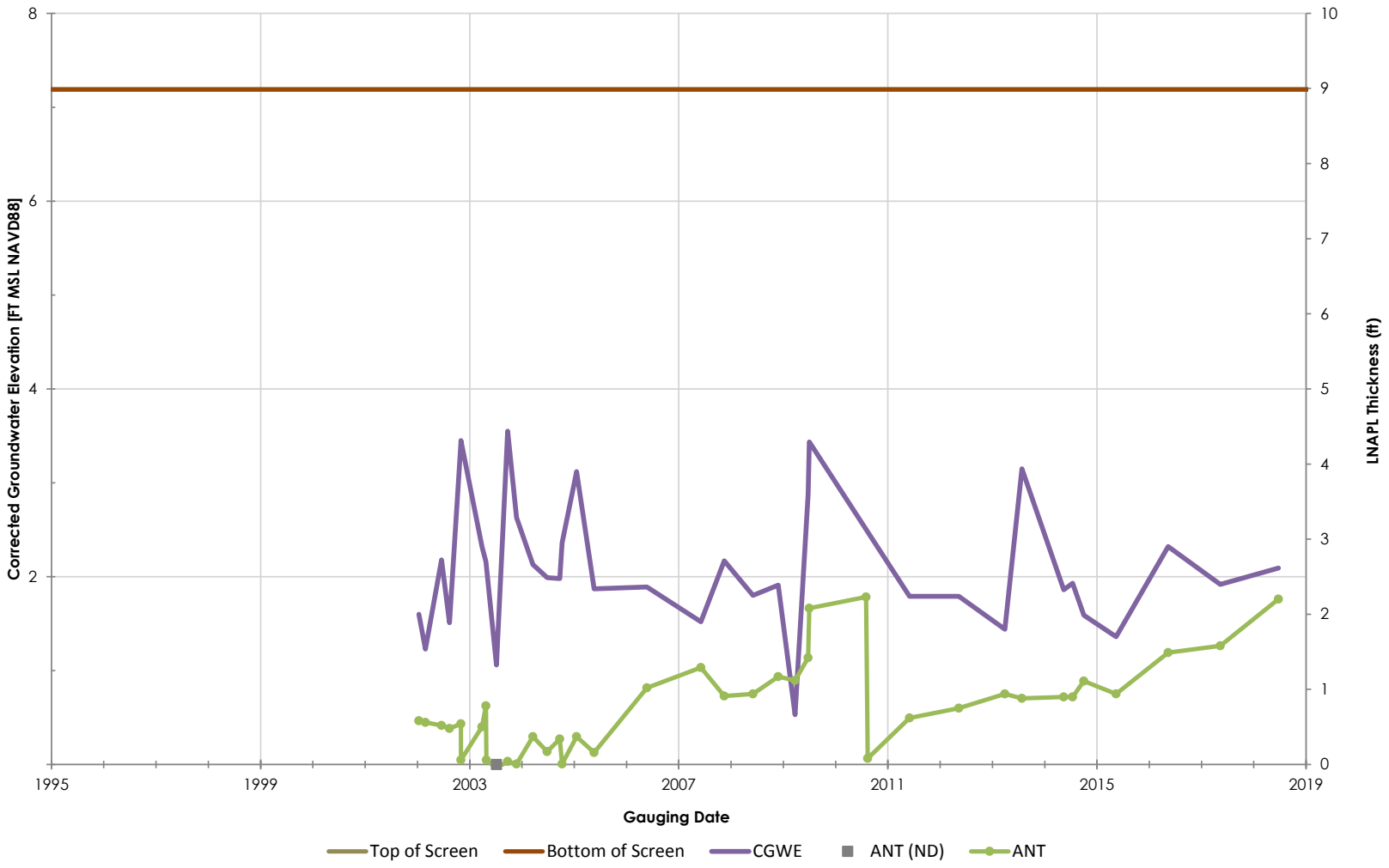
Stantec

Figure/Well No.

Steen-PH-12

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

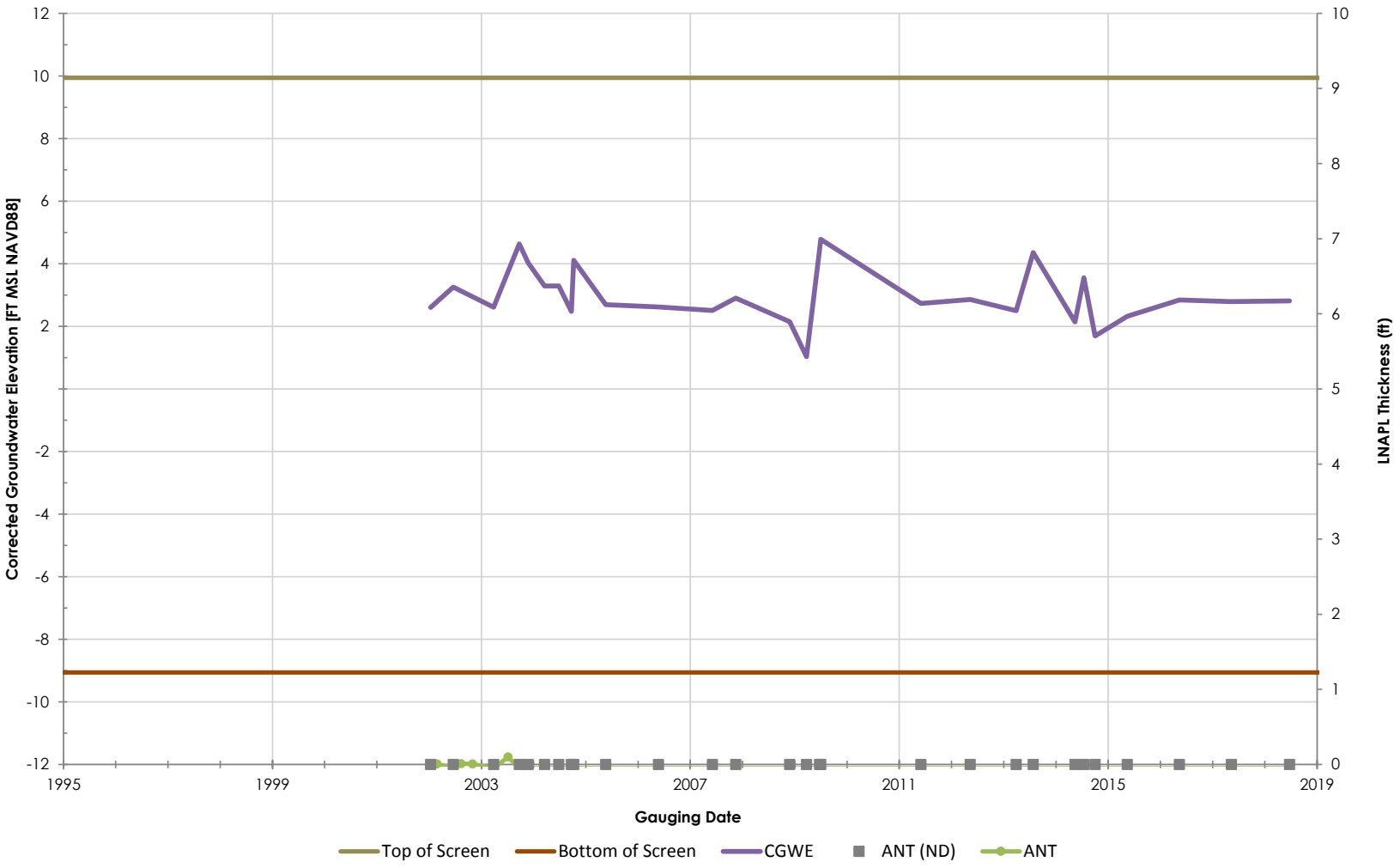
Stantec

Figure/Well No.

SW-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

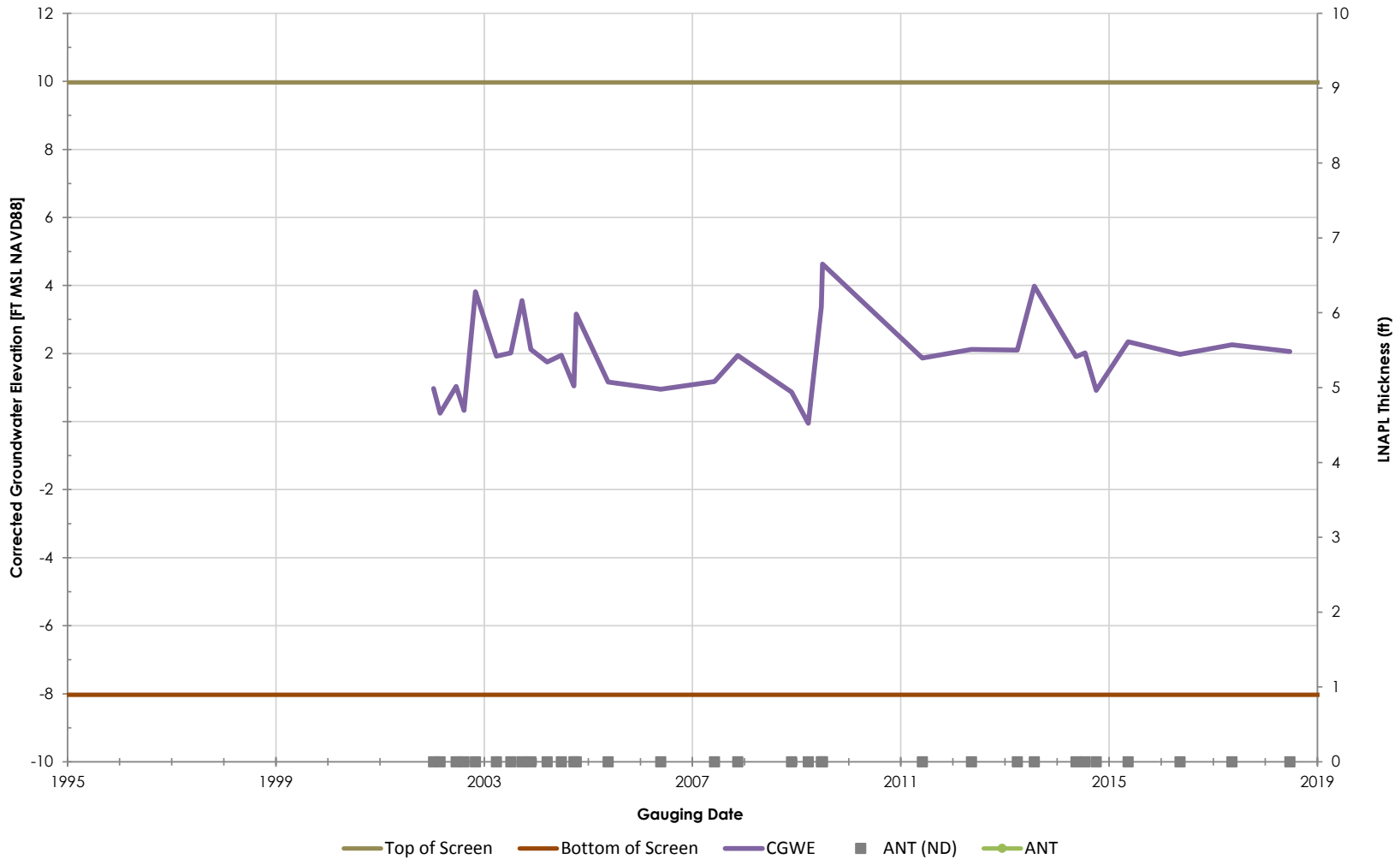
Stantec

Figure/Well No.

SW-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

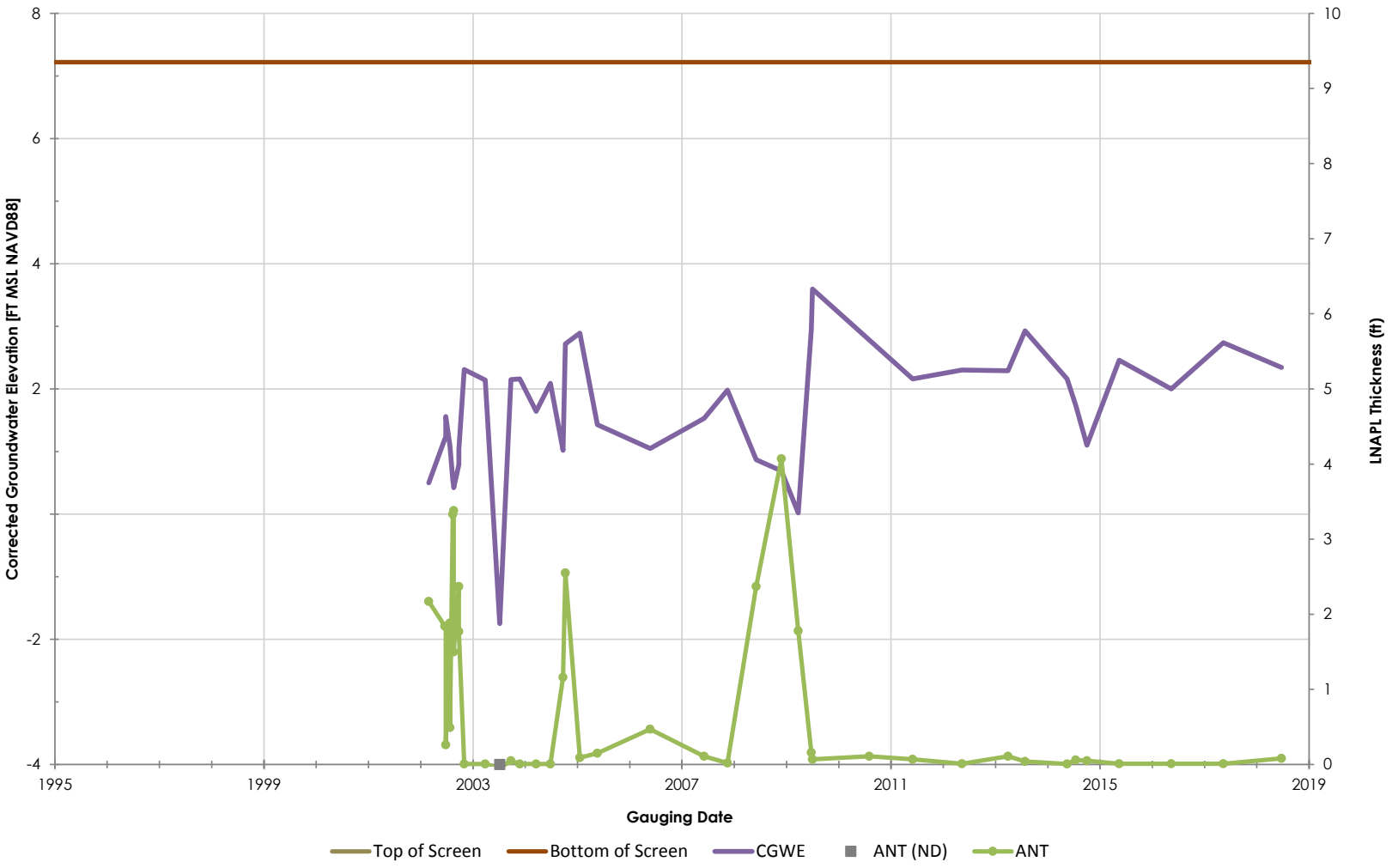
Stantec

Figure/Well No.

SW-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

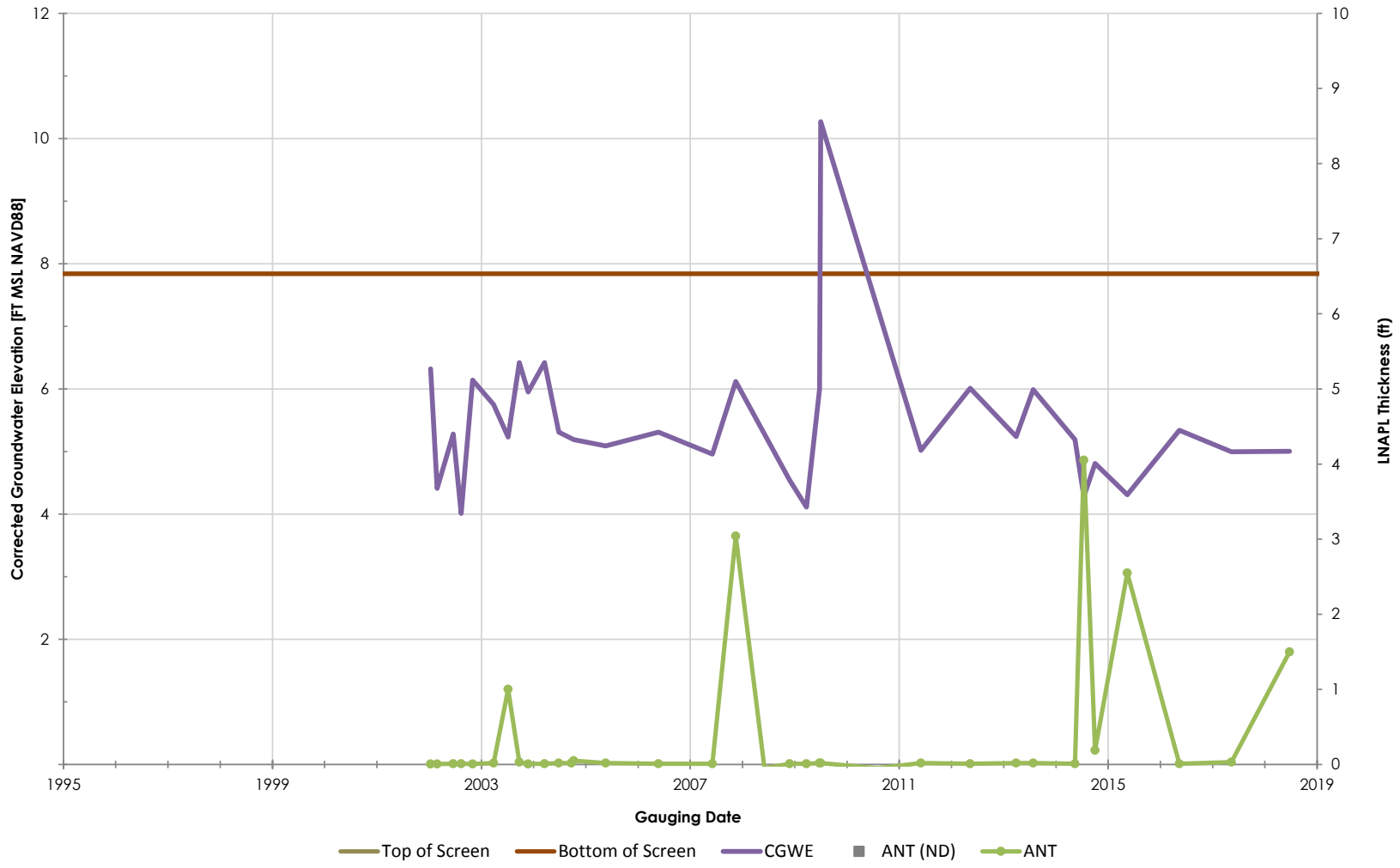
Stantec

Figure/Well No.

SW-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

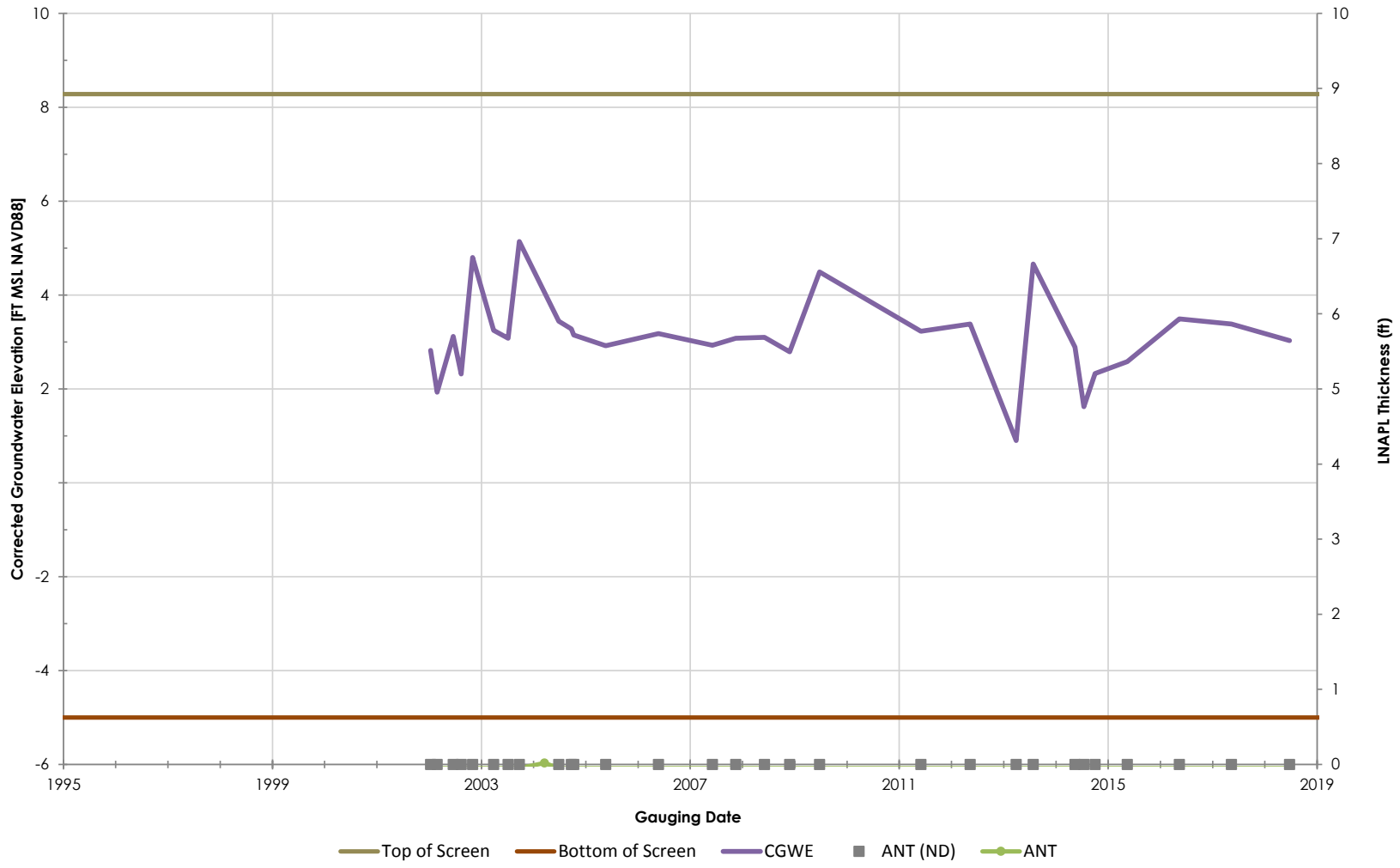
Stantec

Figure/Well No.

SW-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Stantec

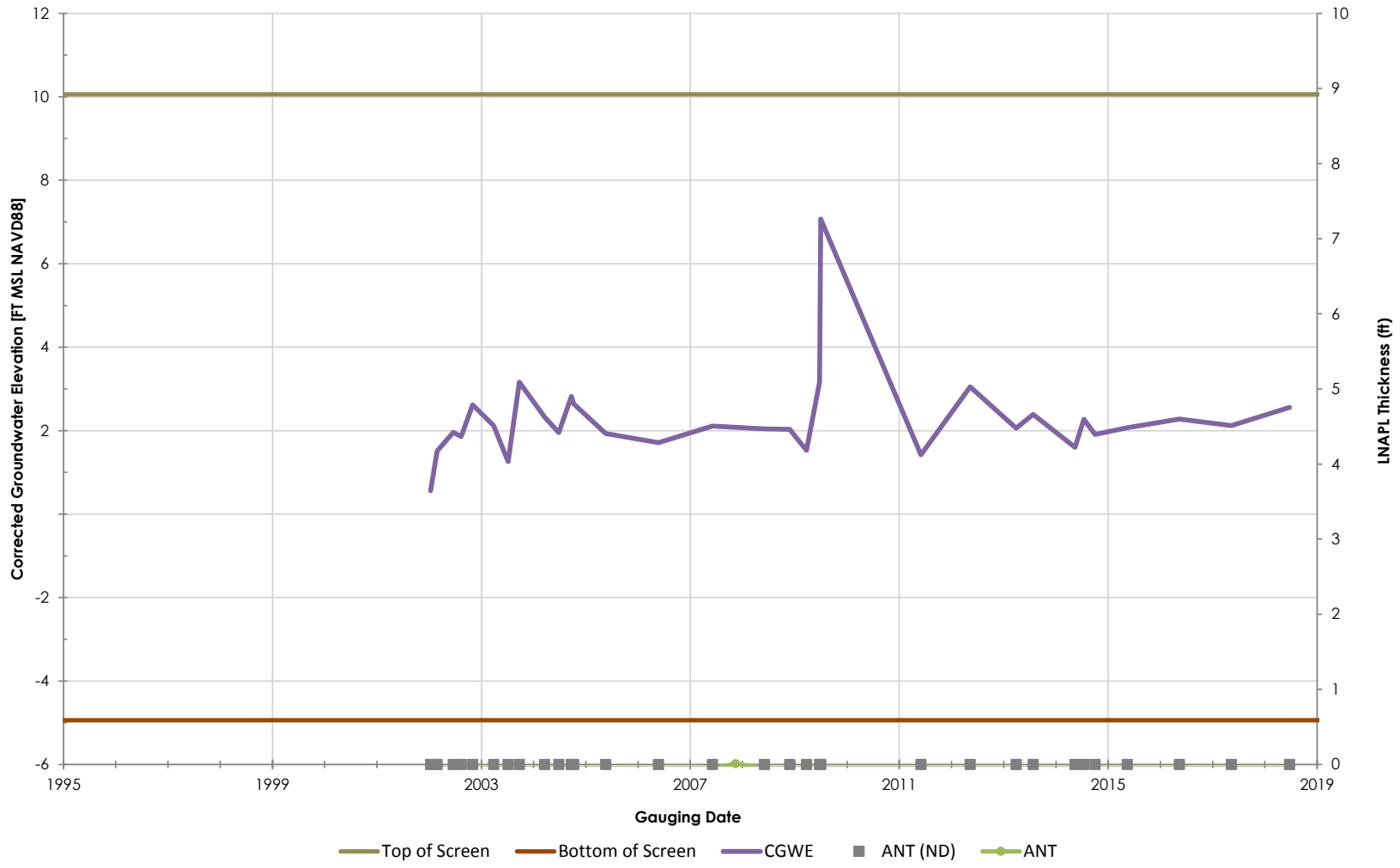
Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Figure/Well No.

SWR-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

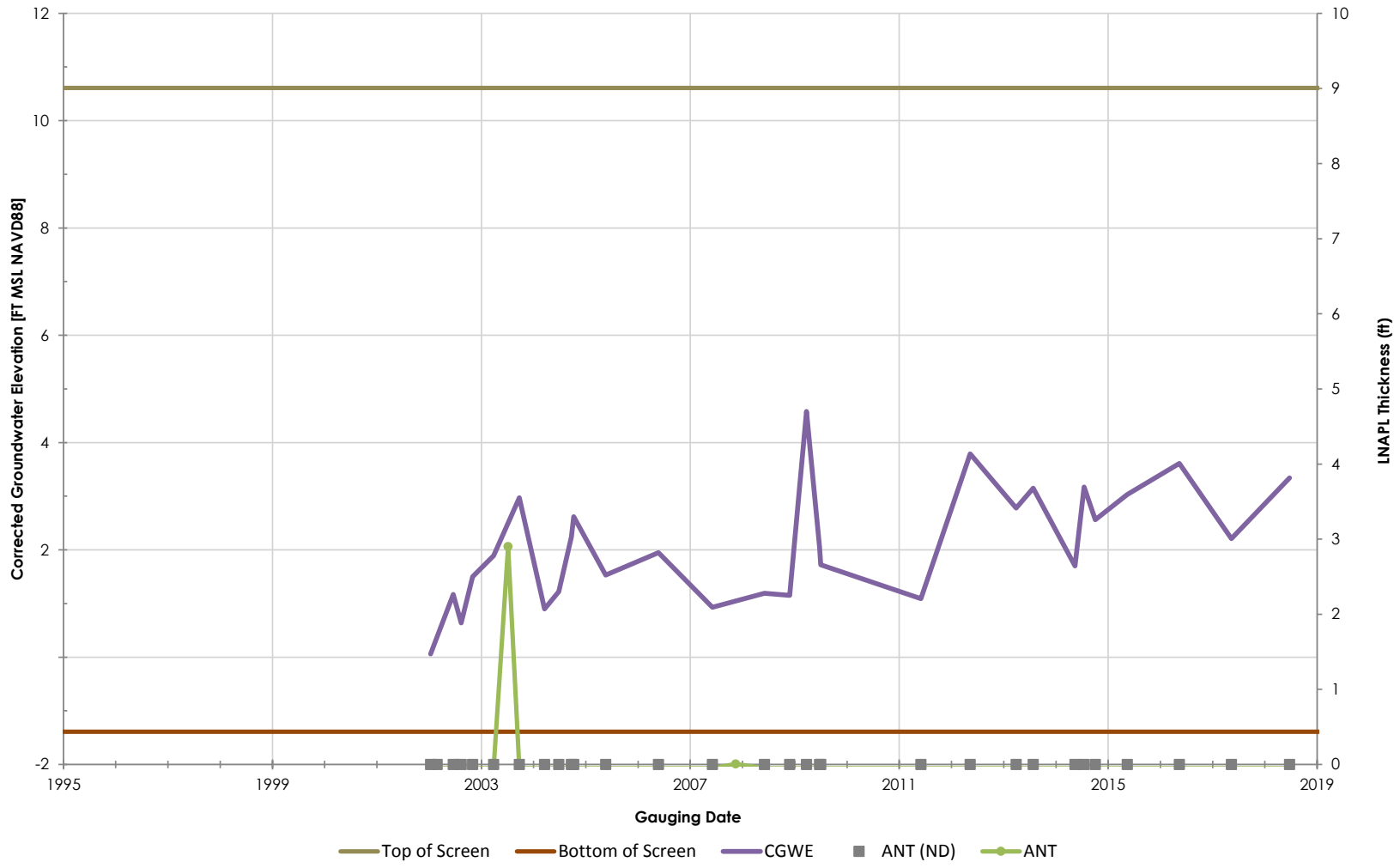
Stantec

Figure/Well No.

SWR-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

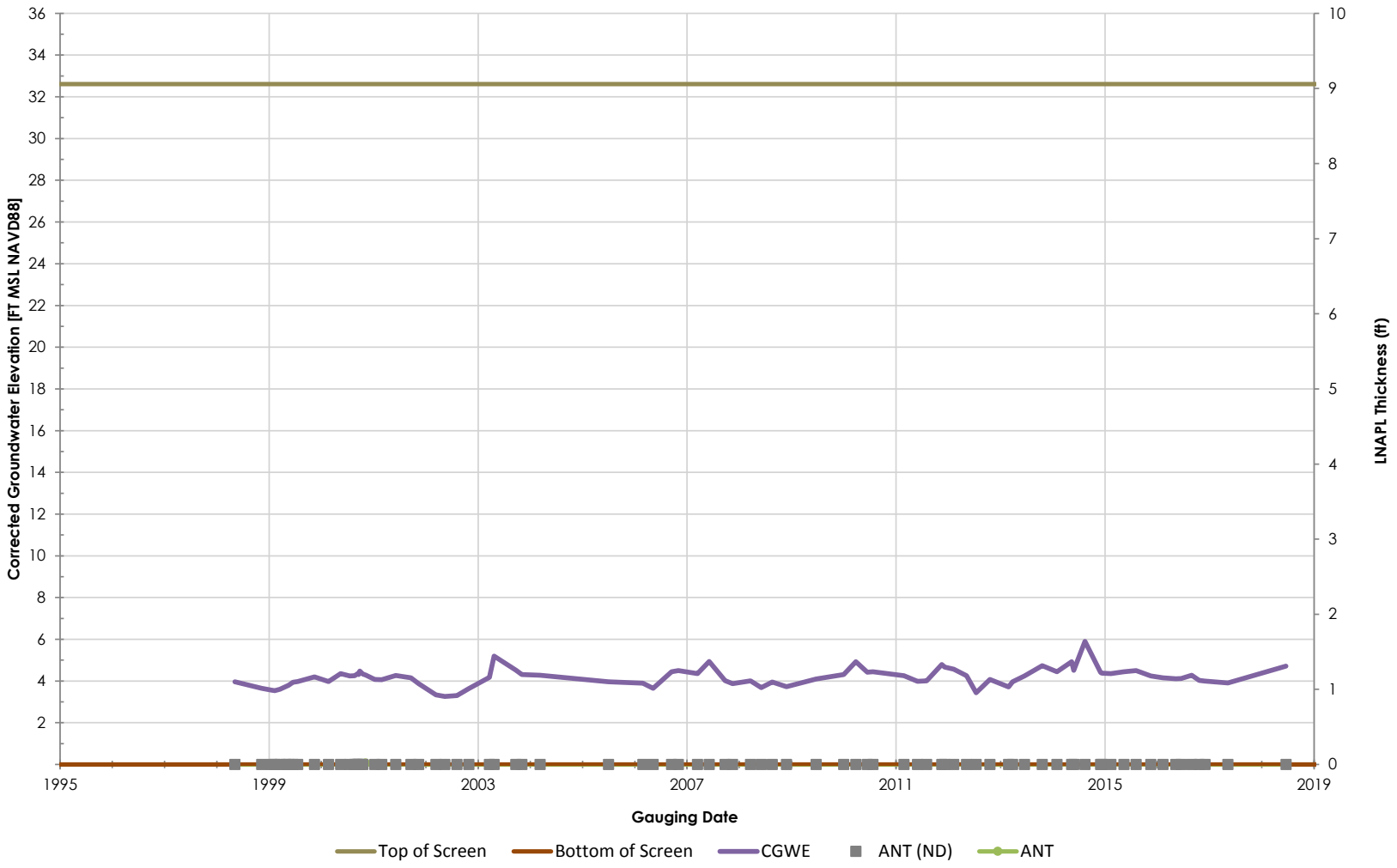
Stantec

Figure/Well No.

SWR-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

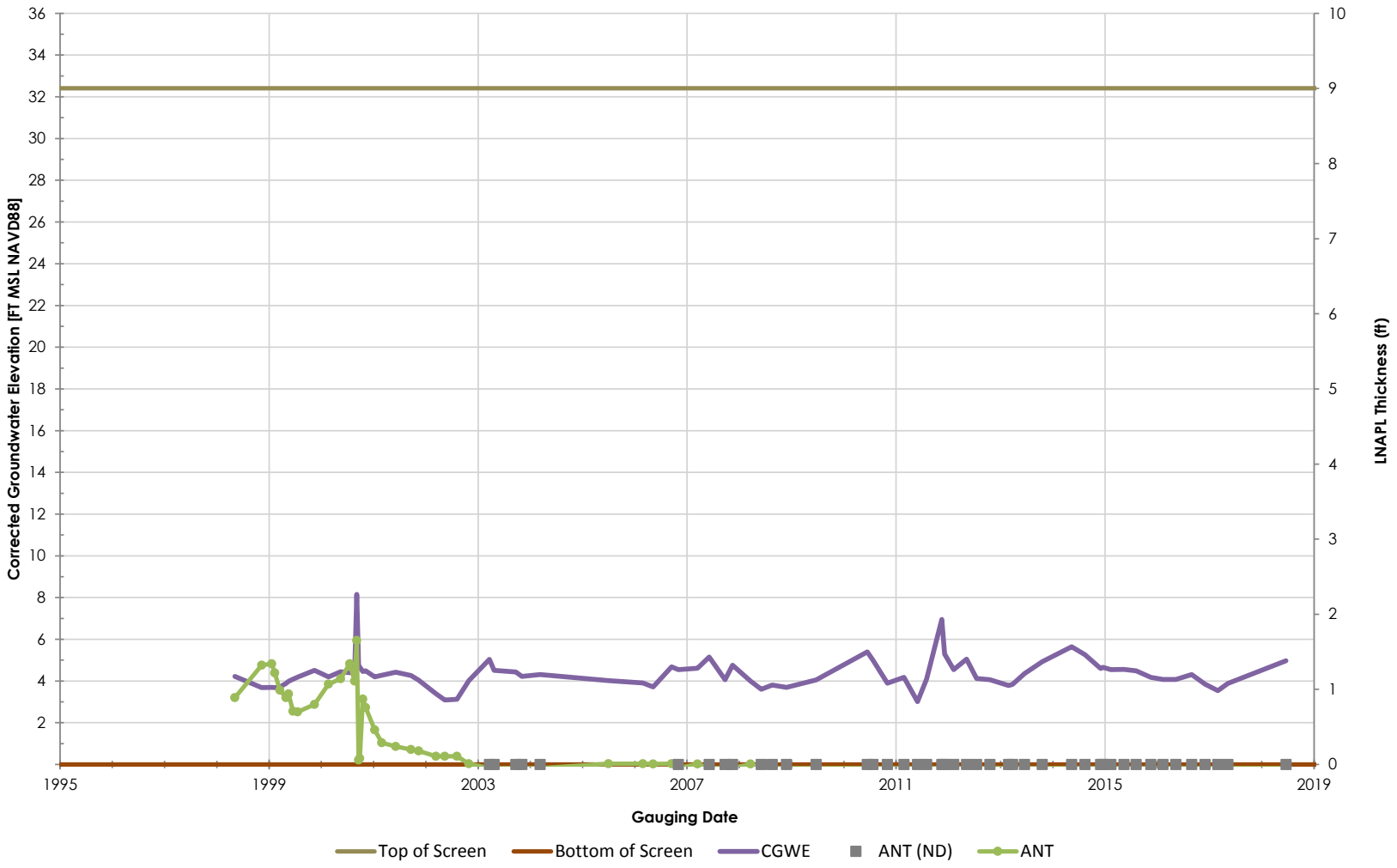
Stantec

Figure/Well No.

TW-11

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

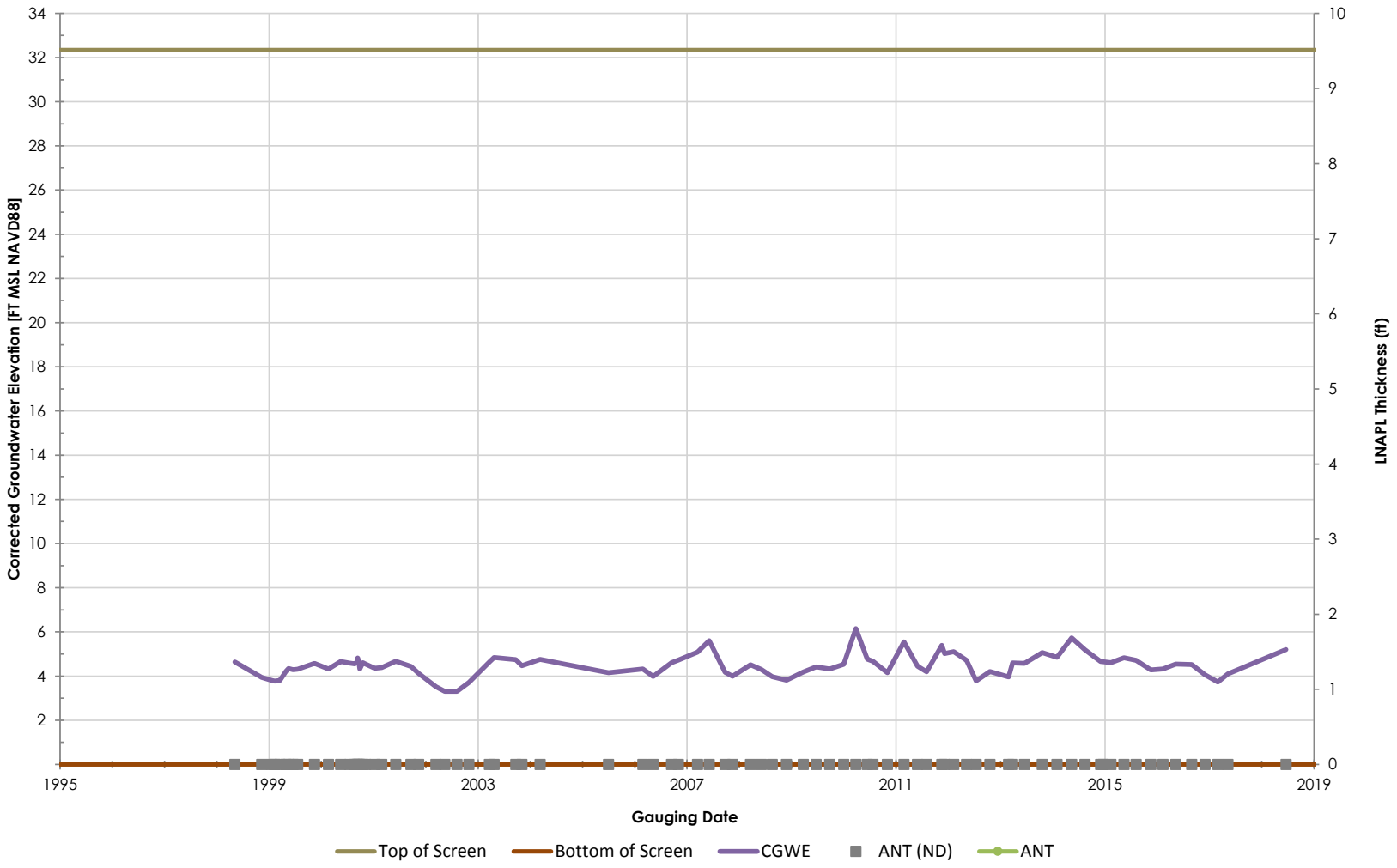
Stantec

Figure/Well No.

TW-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

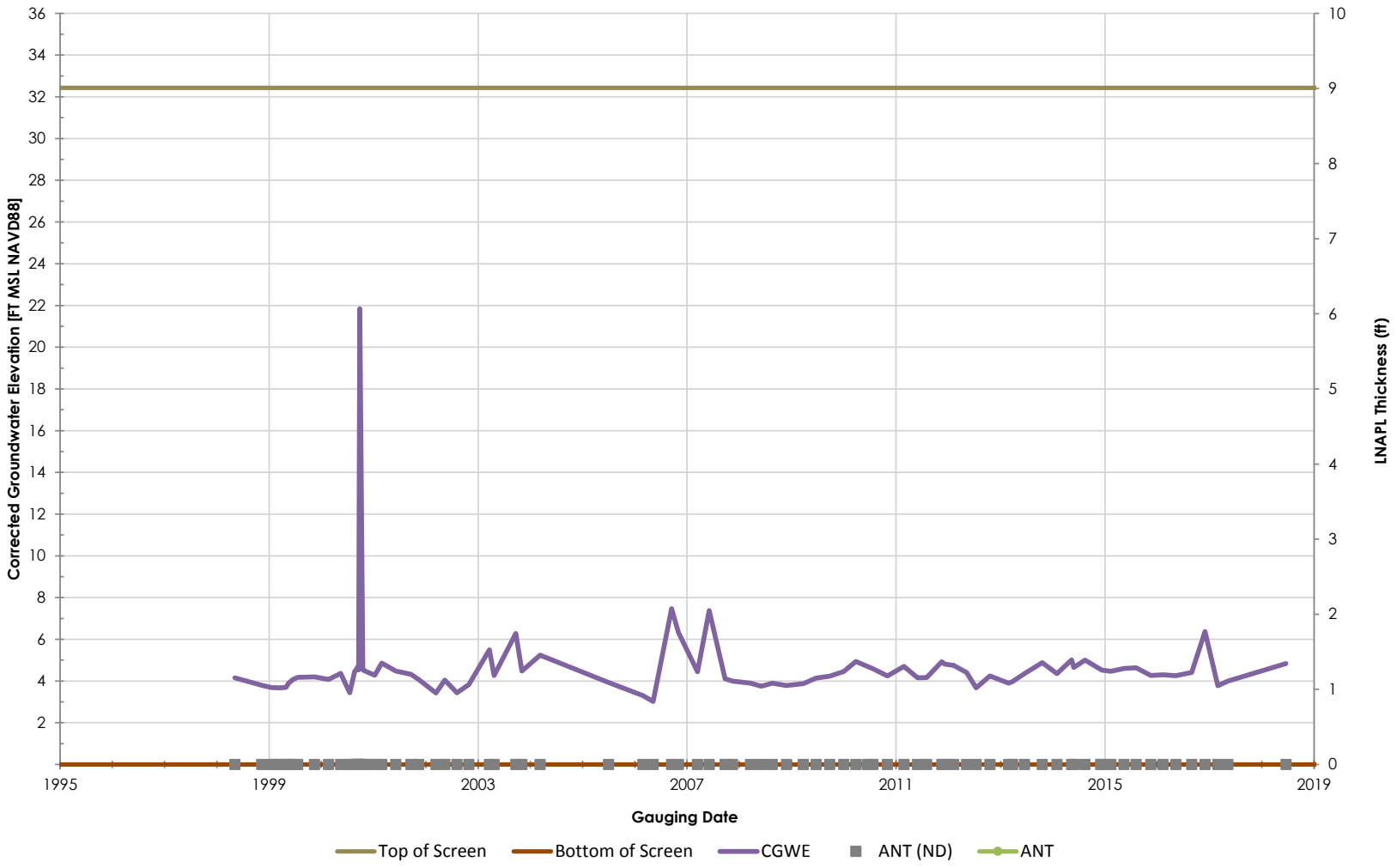
Stantec

Figure/Well No.

TW-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

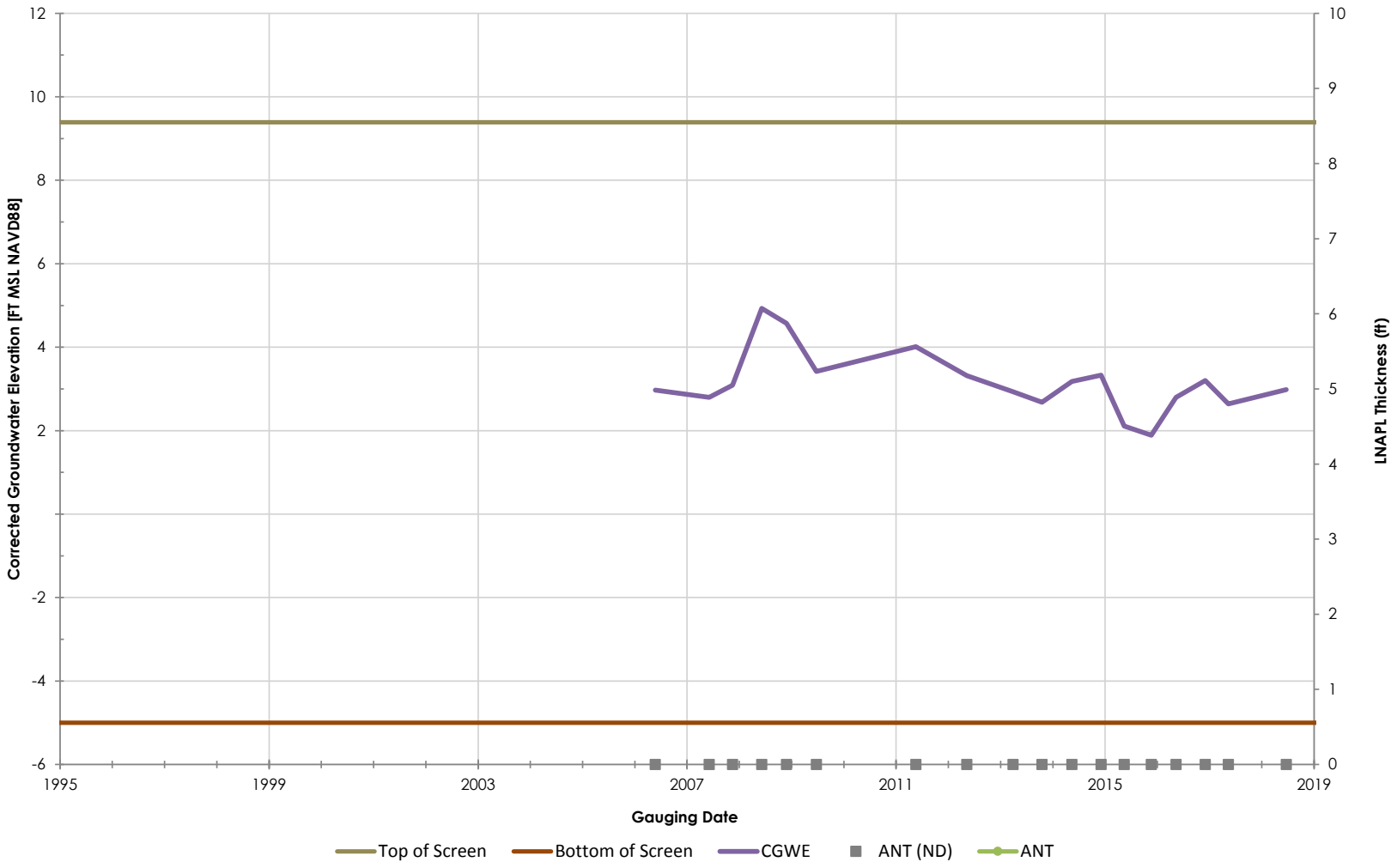
Stantec

Figure/Well No.

TW-9

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

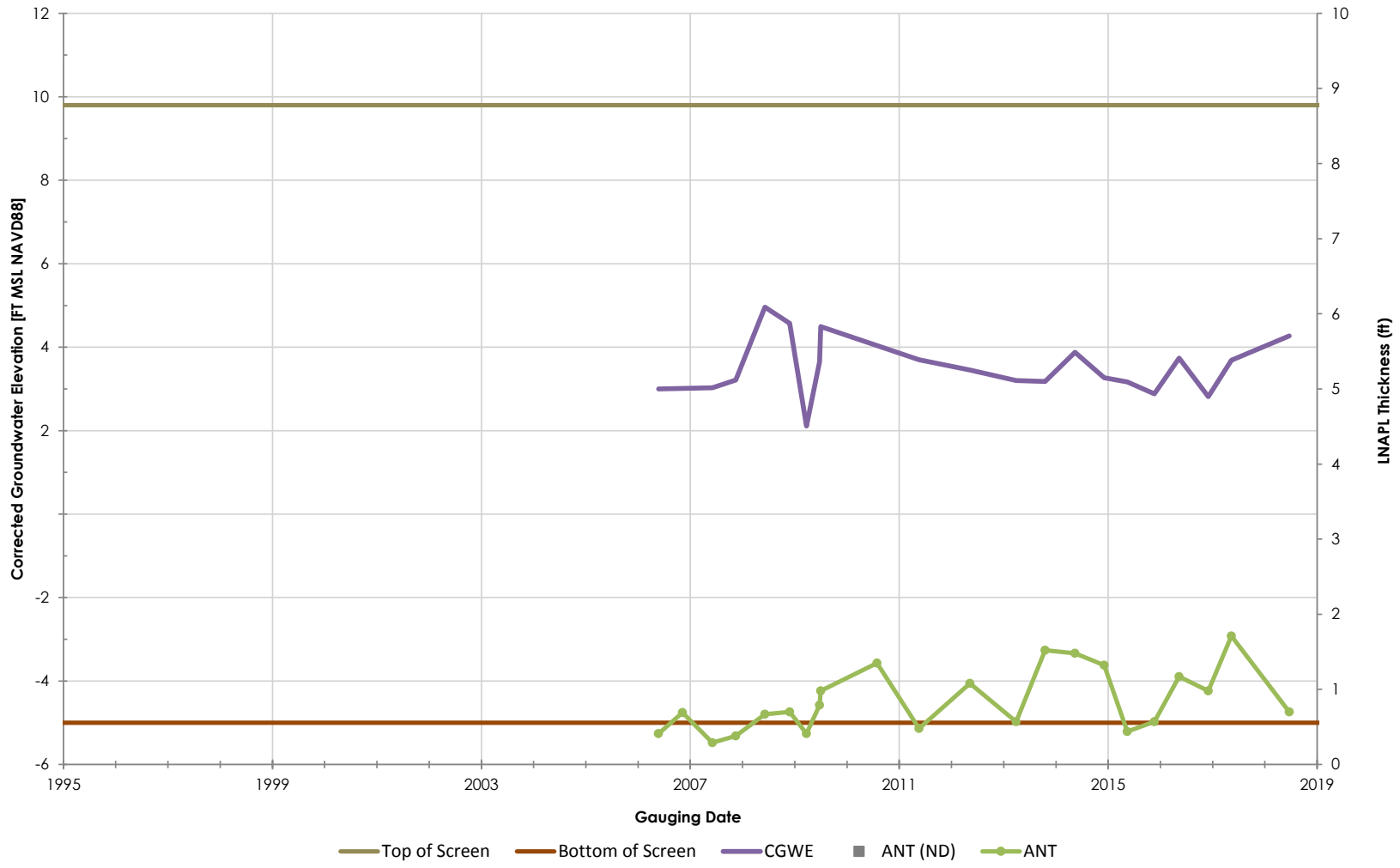
Stantec

Figure/Well No.

U-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

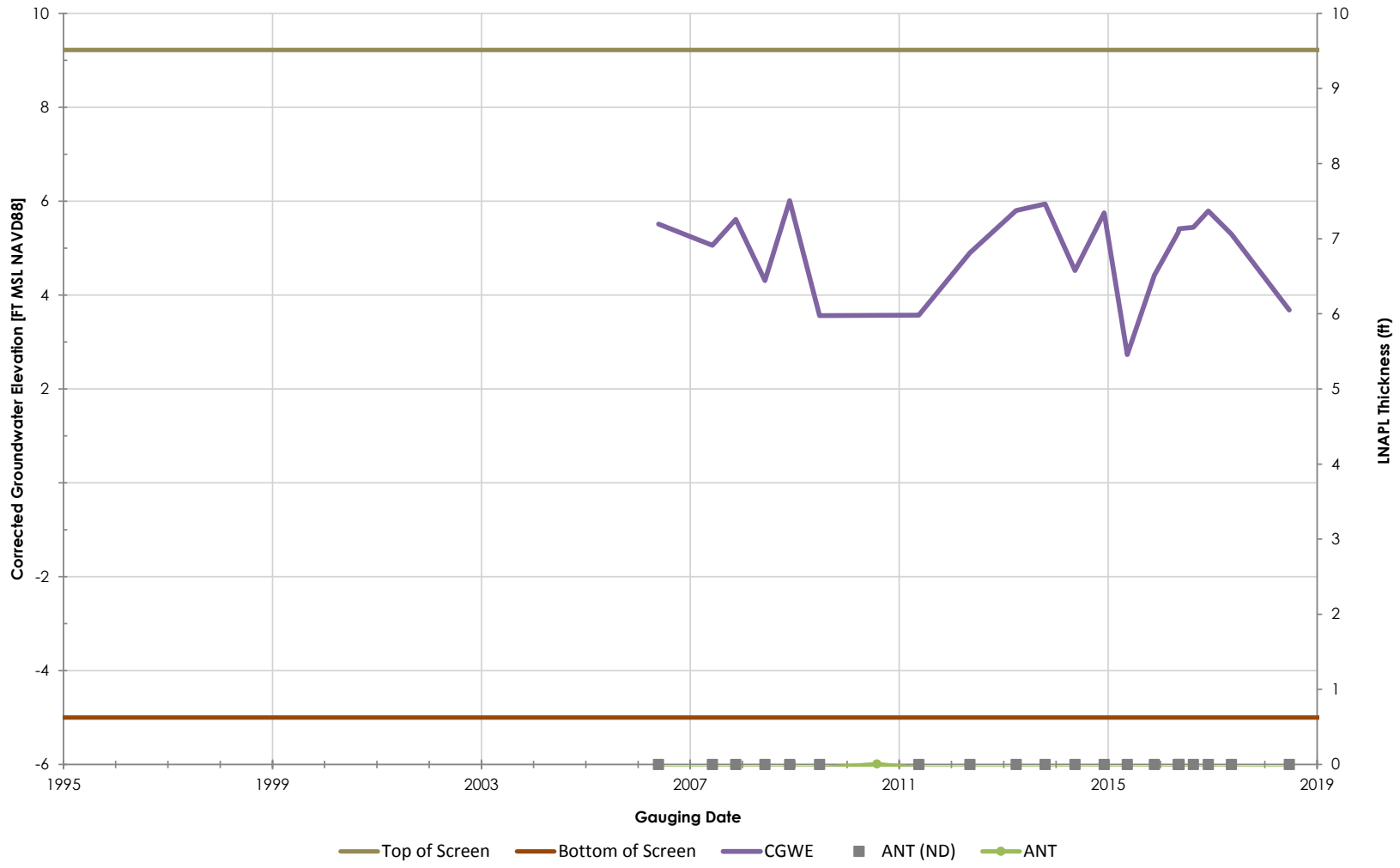
Stantec

Figure/Well No.

U-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

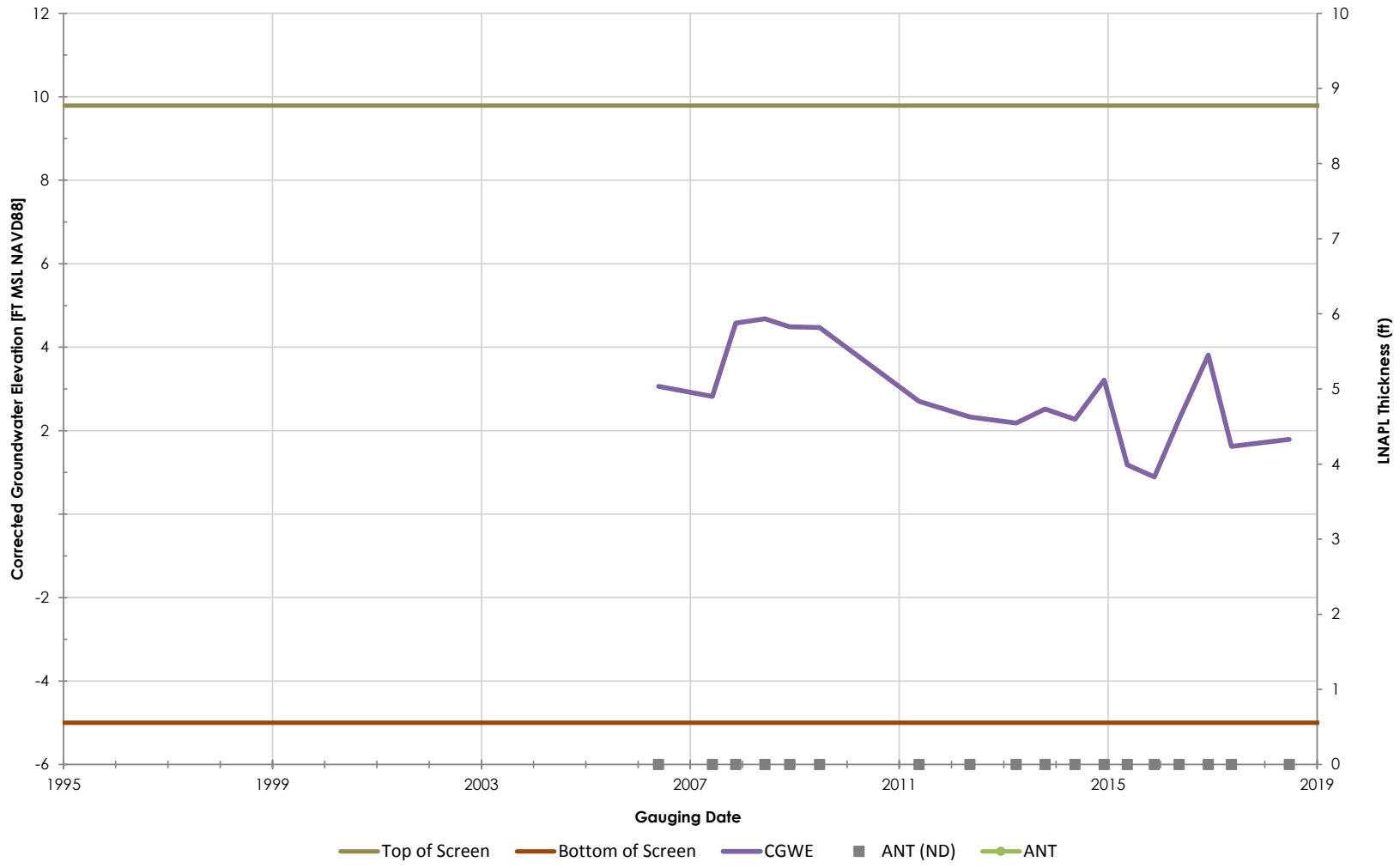
Stantec

Figure/Well No.

U-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

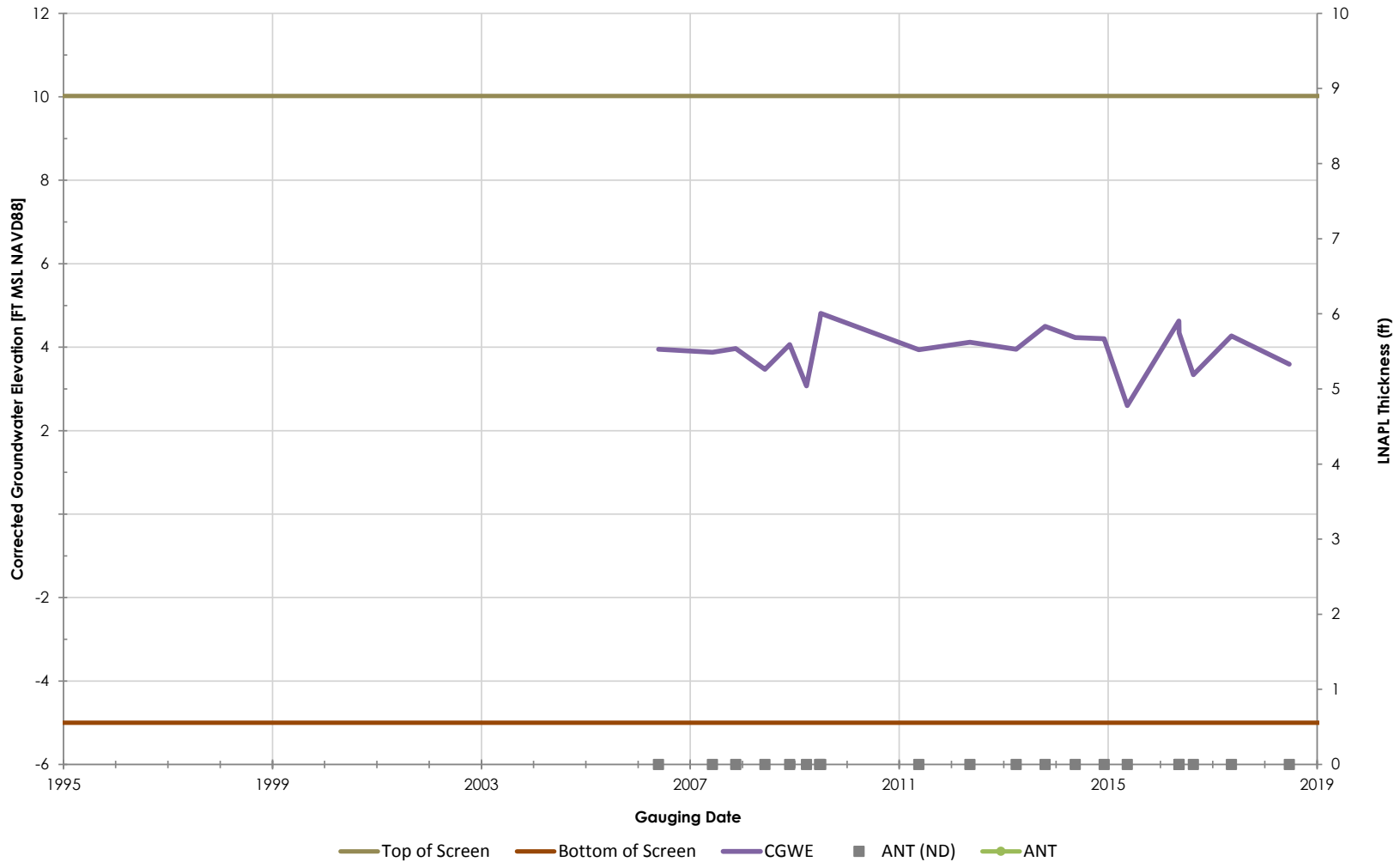
Stantec

Figure/Well No.

U-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

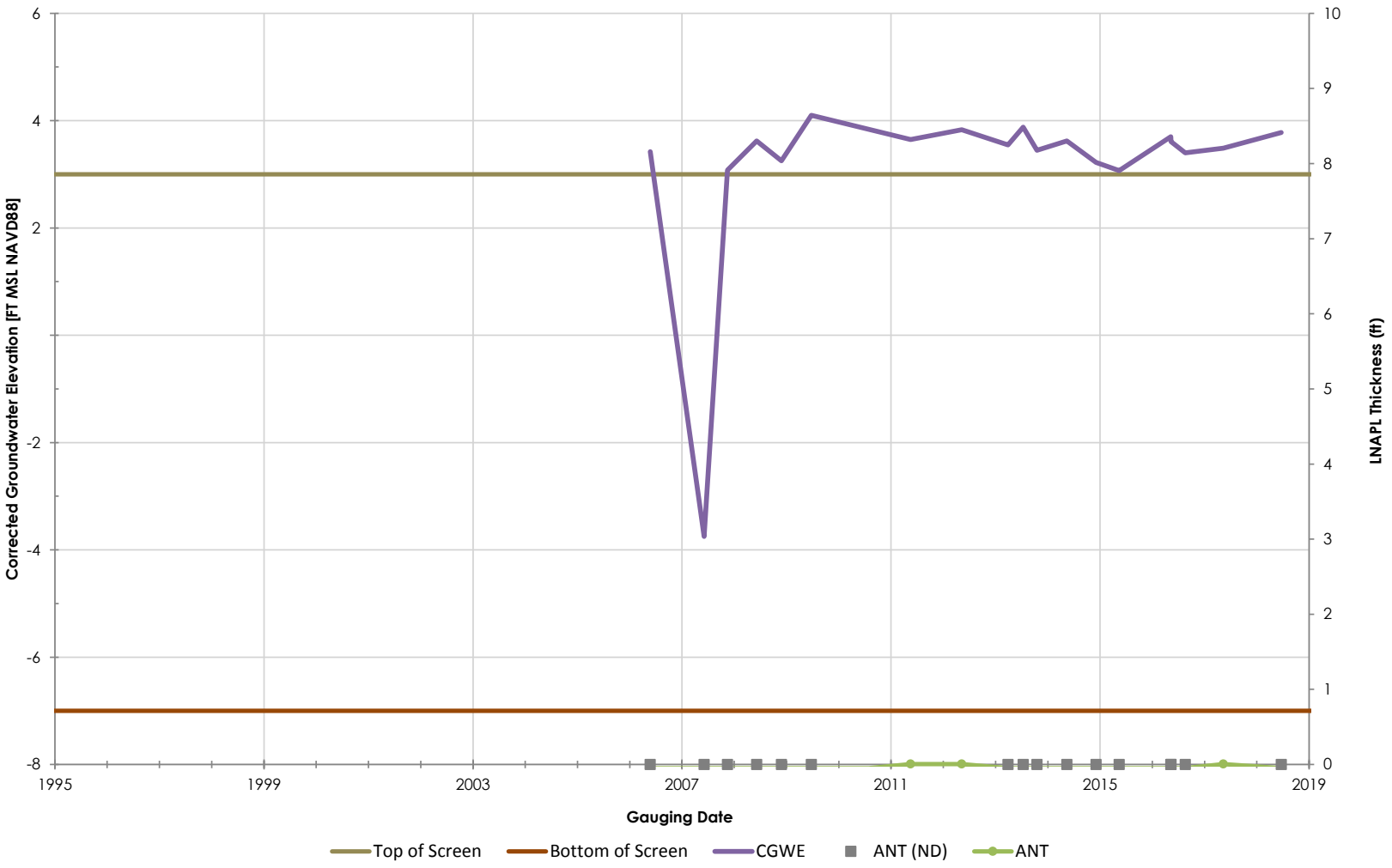
Stantec

Figure/Well No.

URS-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

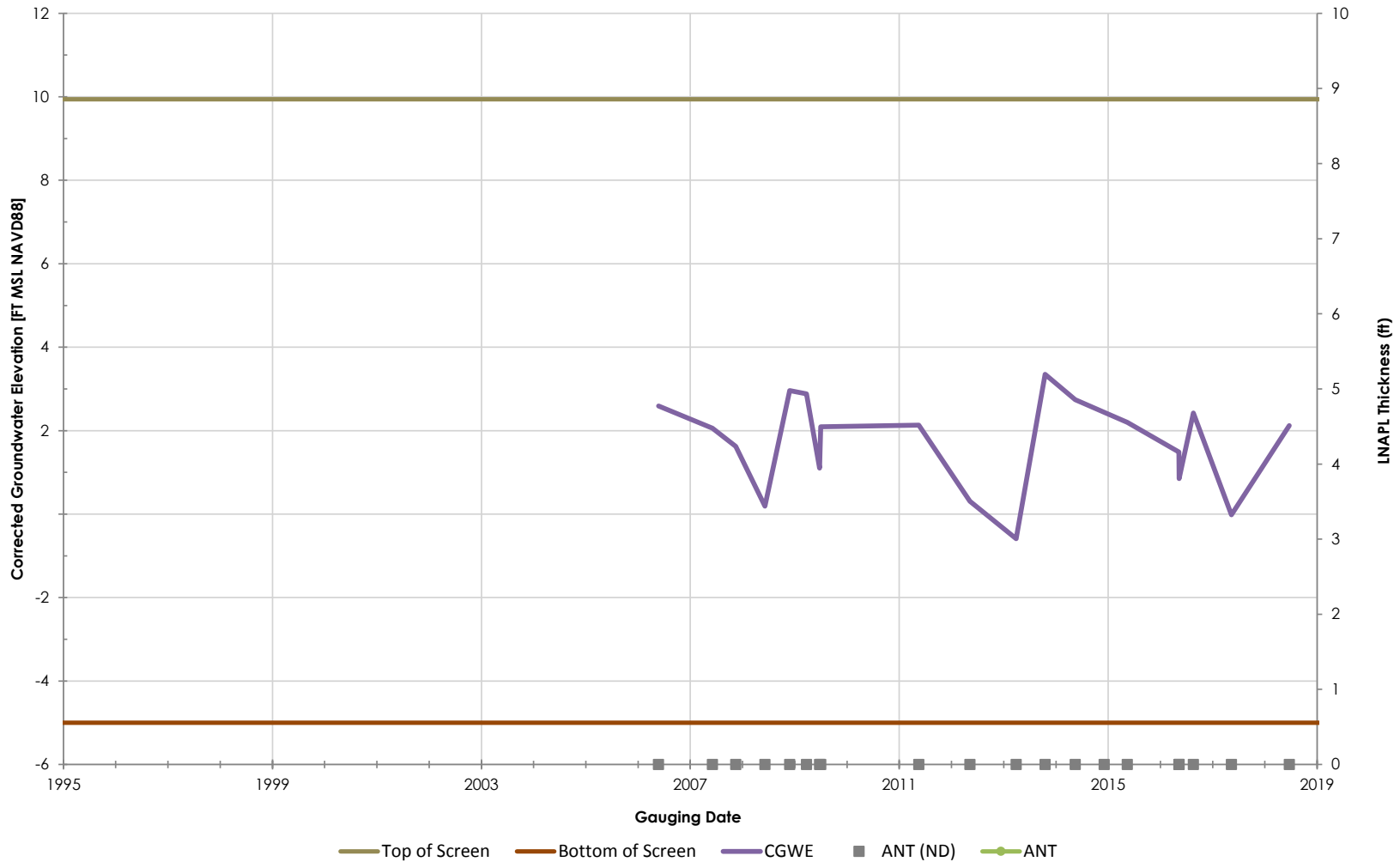
Stantec

Figure/Well No.

URS-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

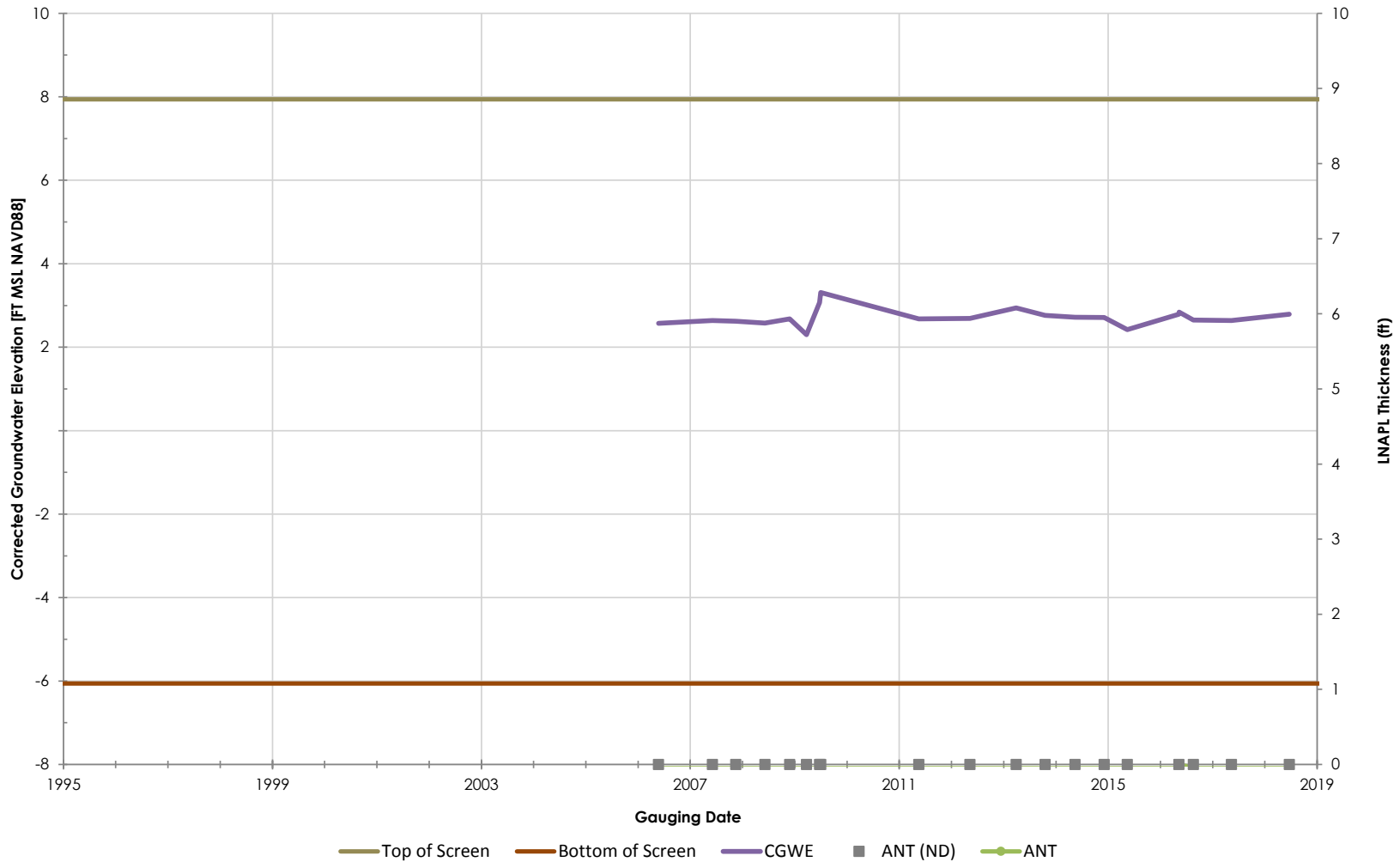
Stantec

Figure/Well No.

URS-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

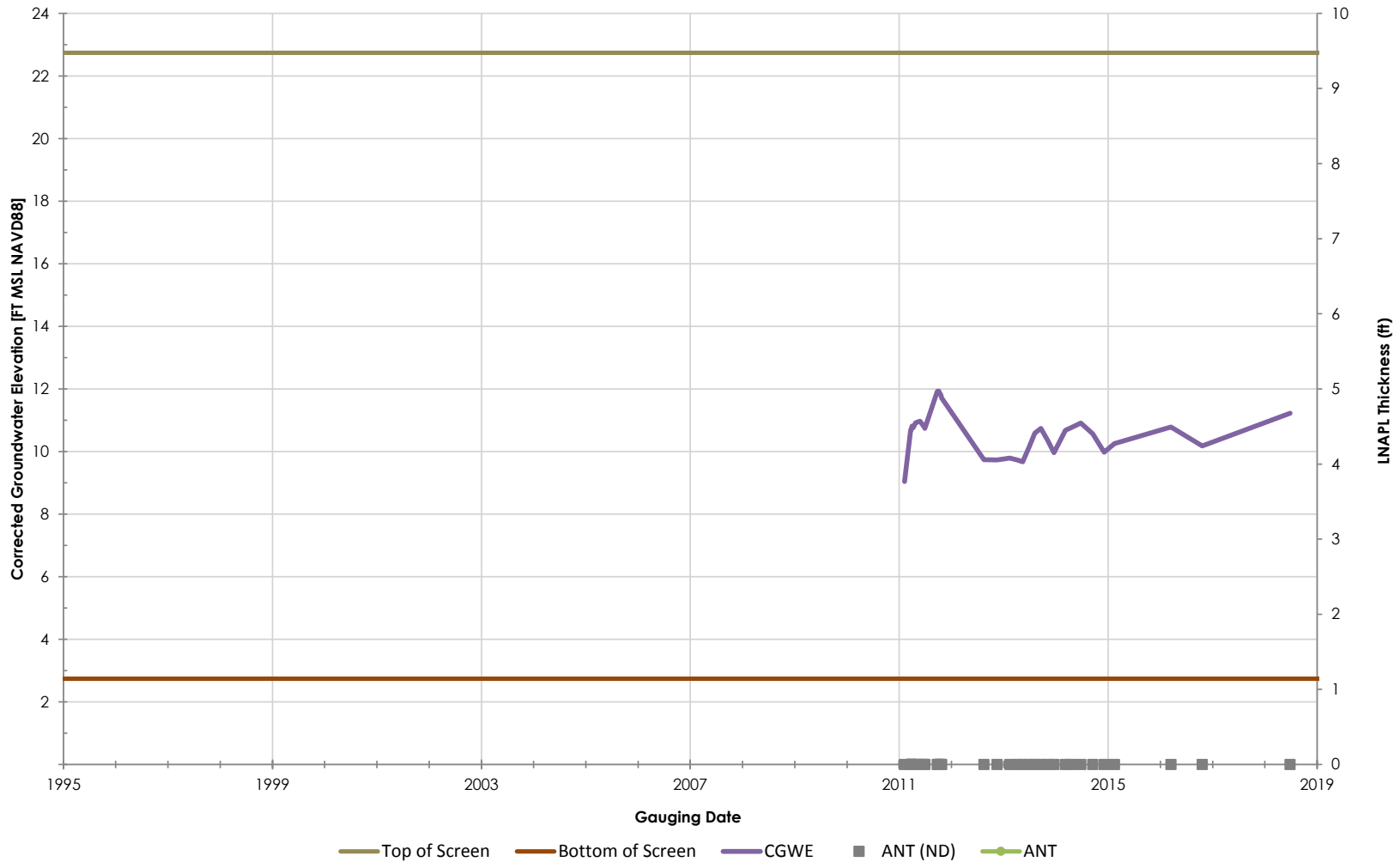
Stantec

Figure/Well No.

URS-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

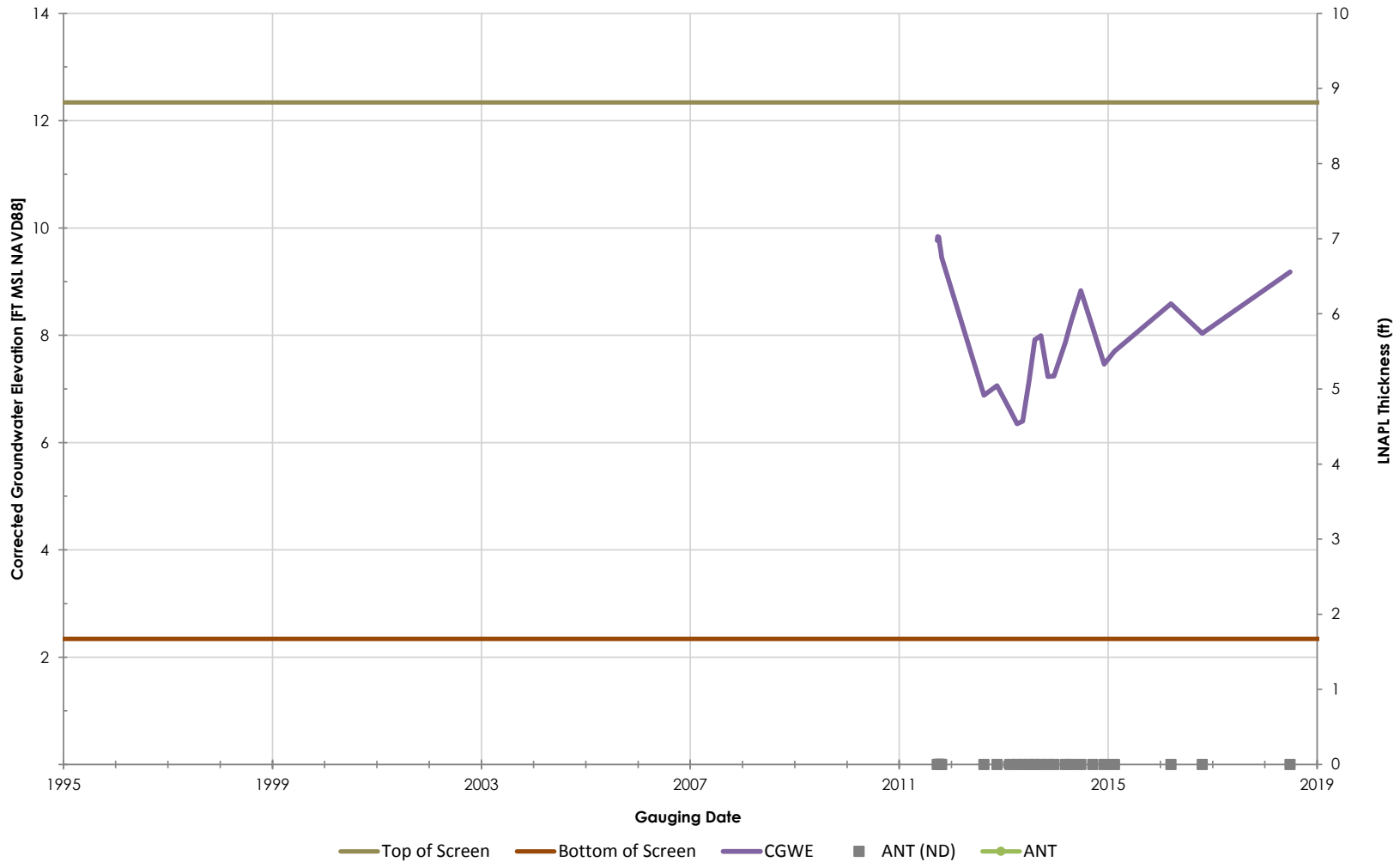
Stantec

Figure/Well No.

V-MW-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

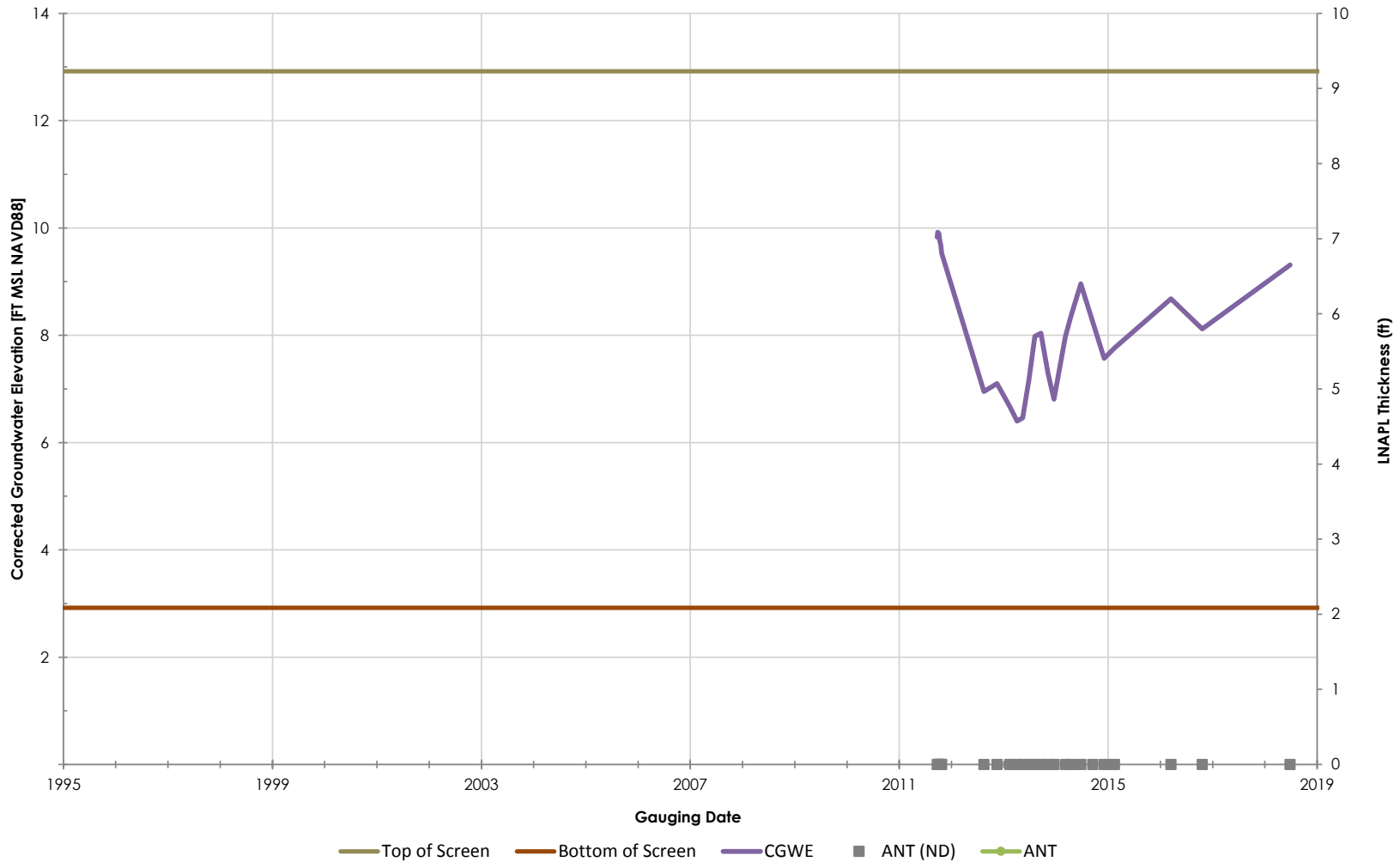
Stantec

Figure/Well No.

V-MW-10

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

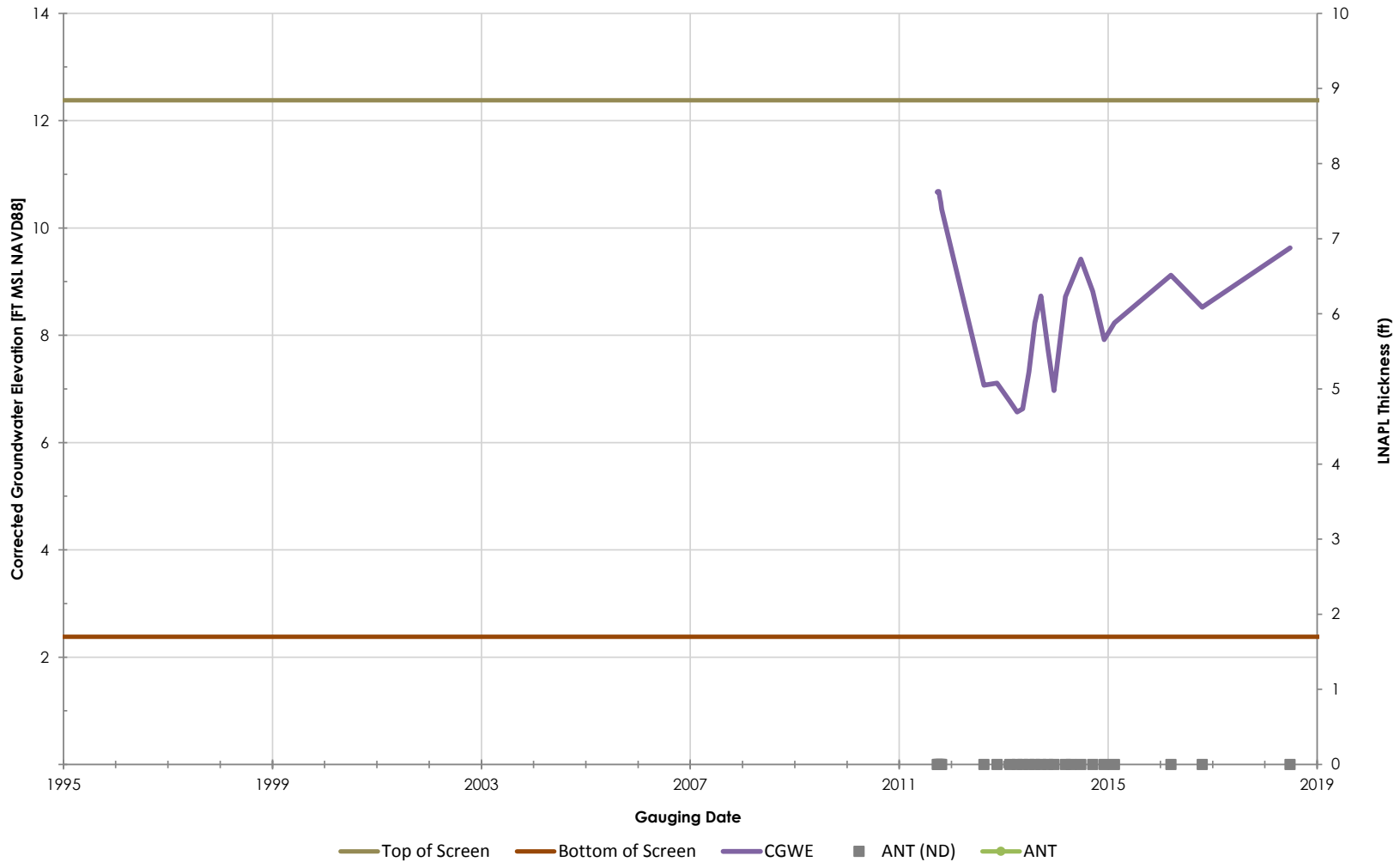
Stantec

Figure/Well No.

V-MW-11

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

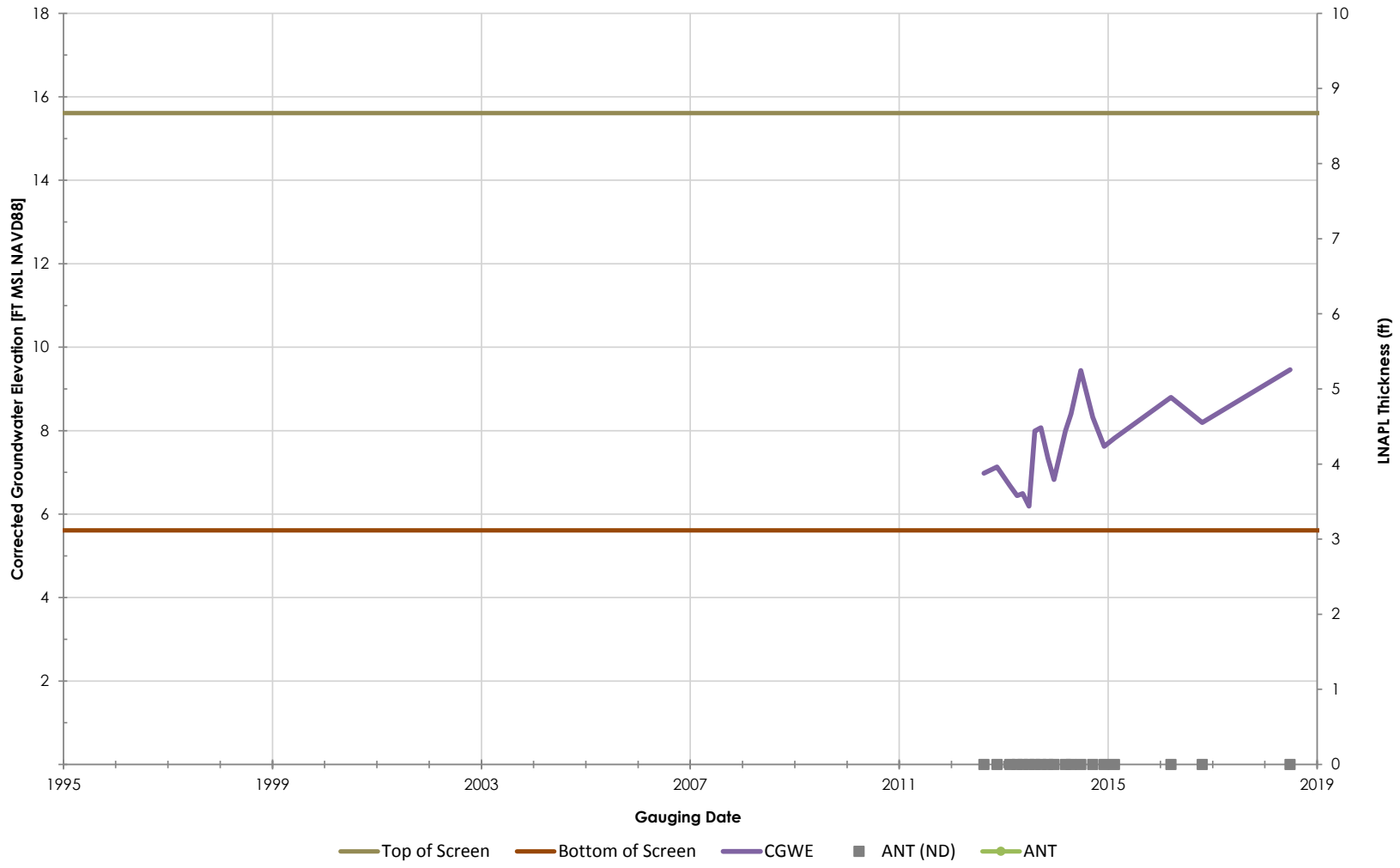
Stantec

Figure/Well No.

V-MW-12

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

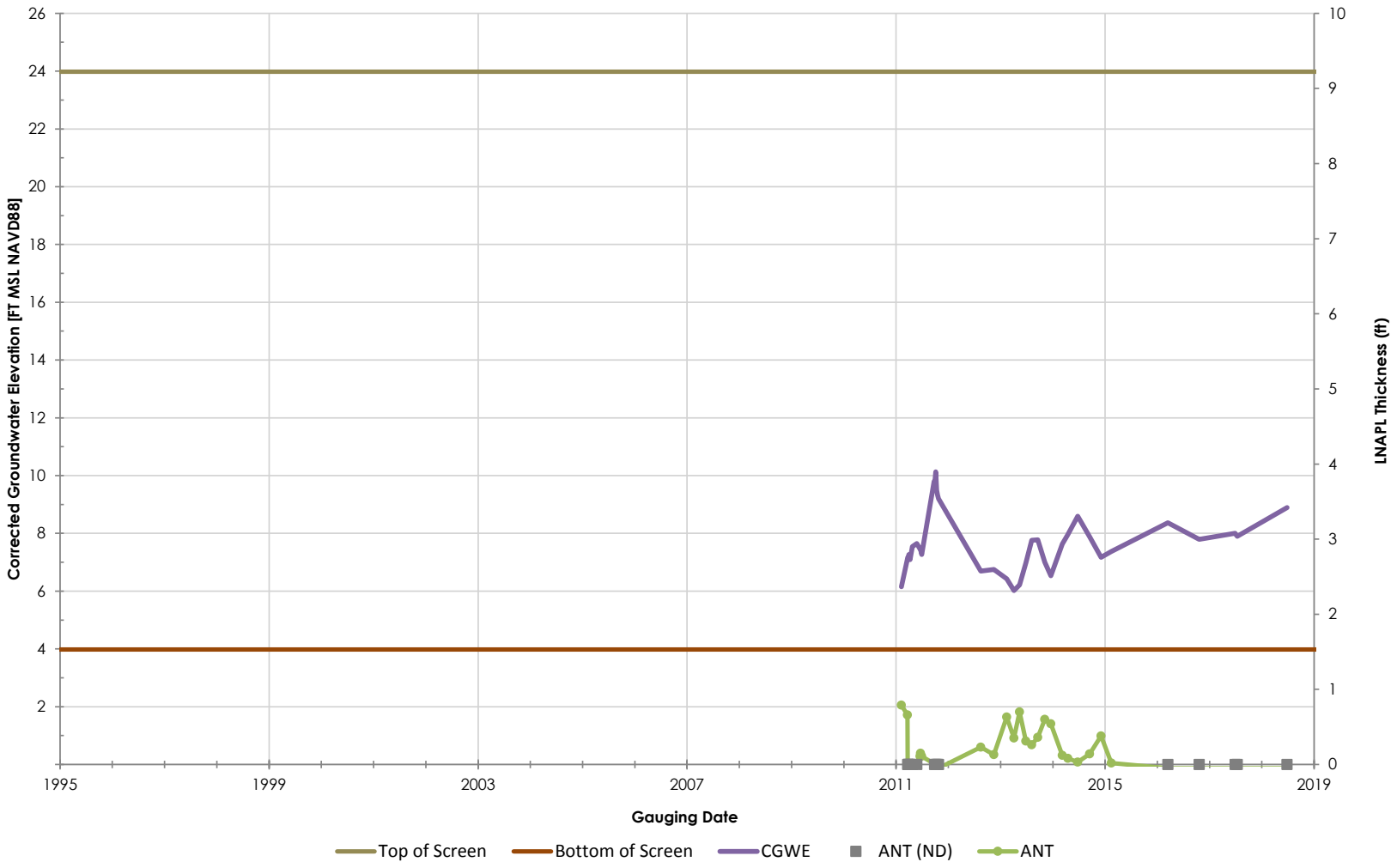
Stantec

Figure/Well No.

V-MW-16

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

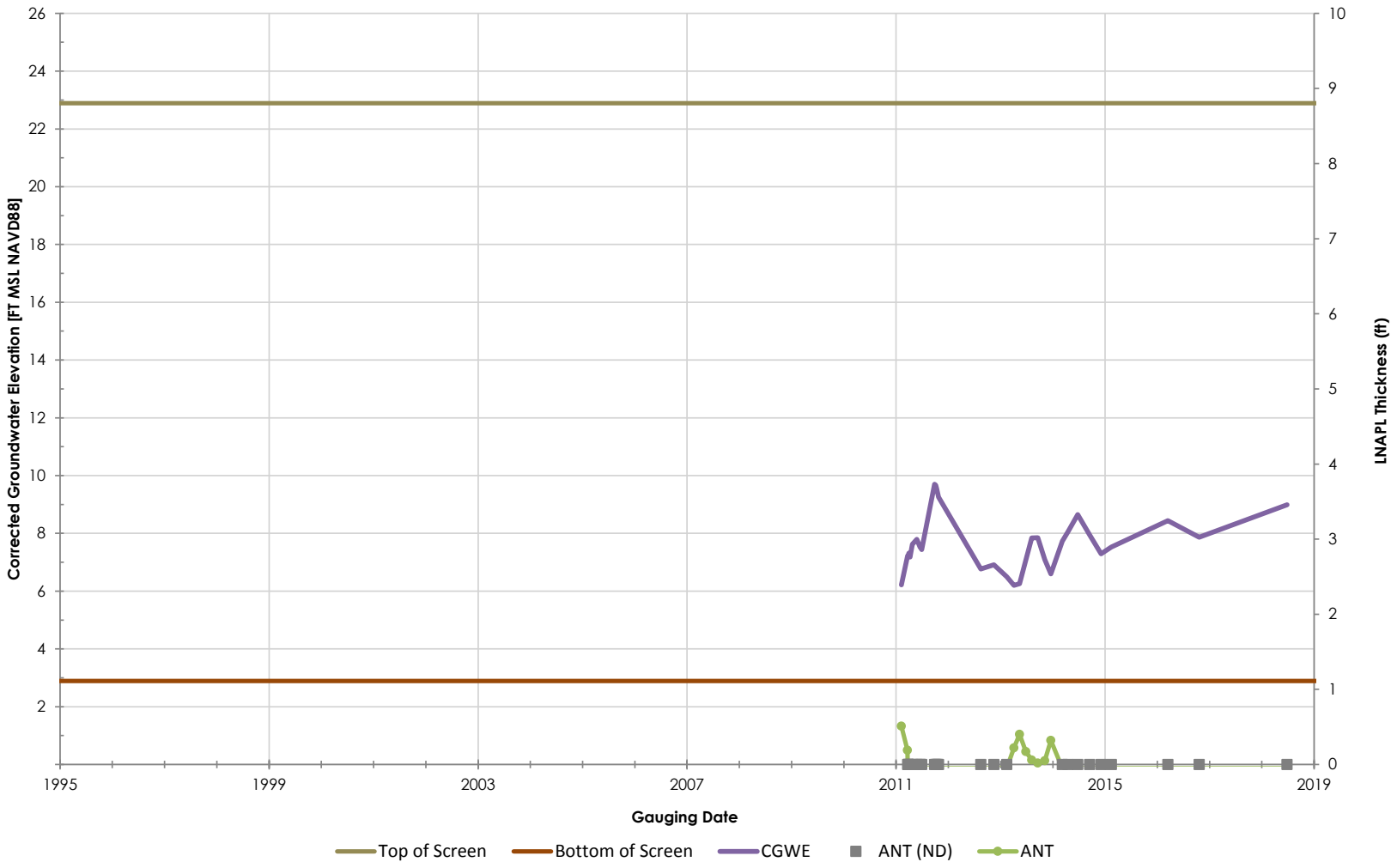
Stantec

Figure/Well No.

V-MW-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

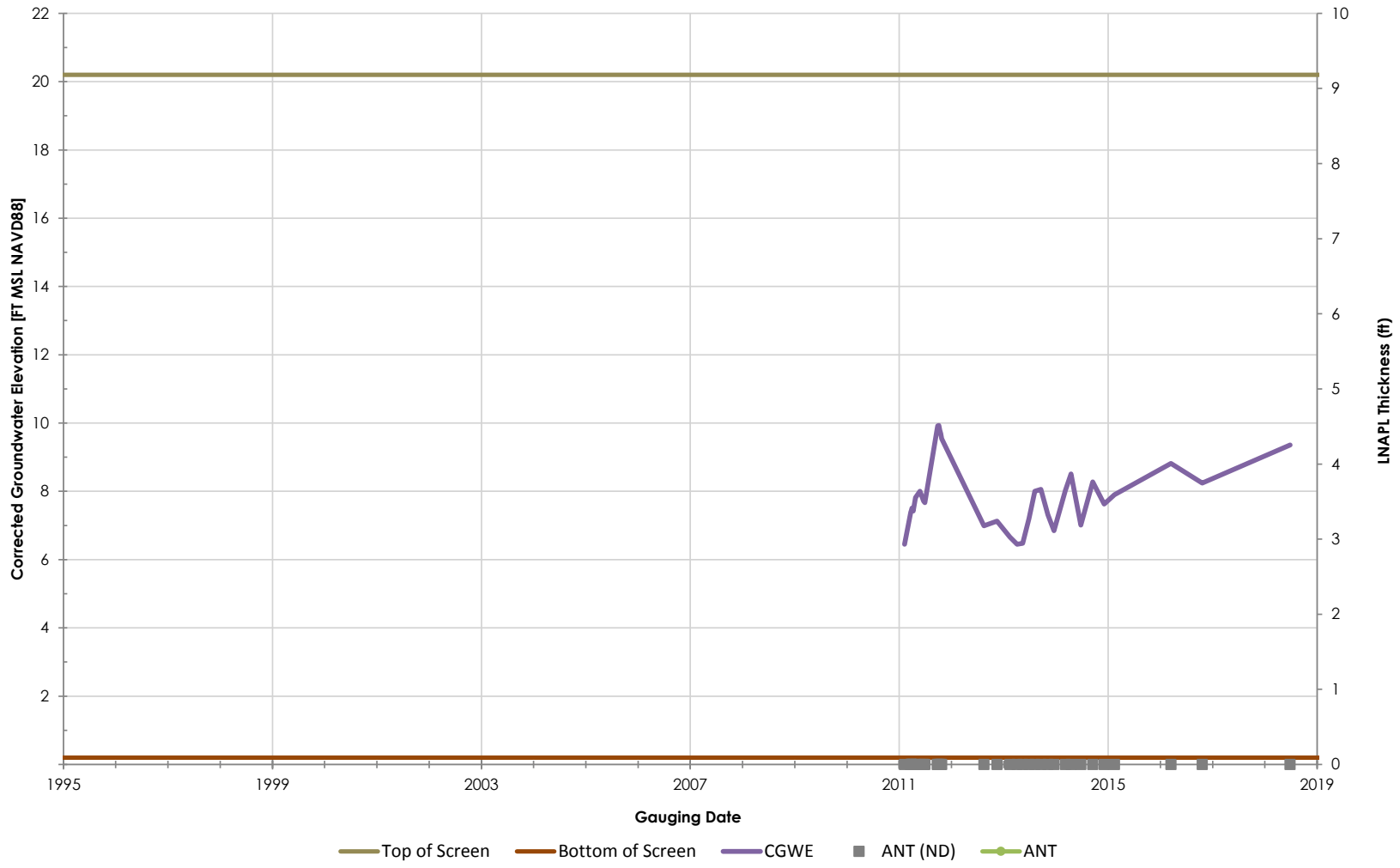
Stantec

Figure/Well No.

V-MW-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

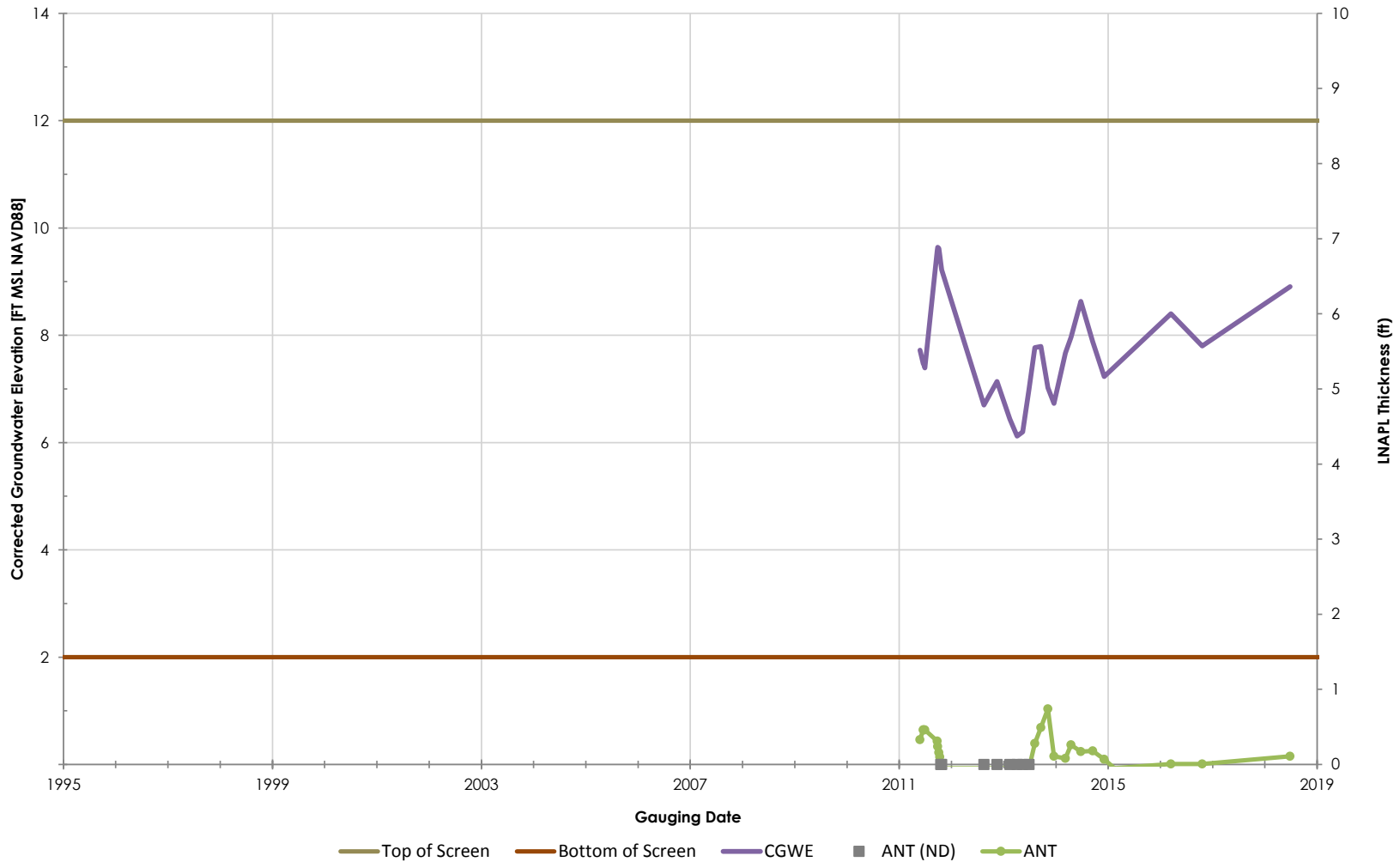
Stantec

Figure/Well No.

V-MW-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

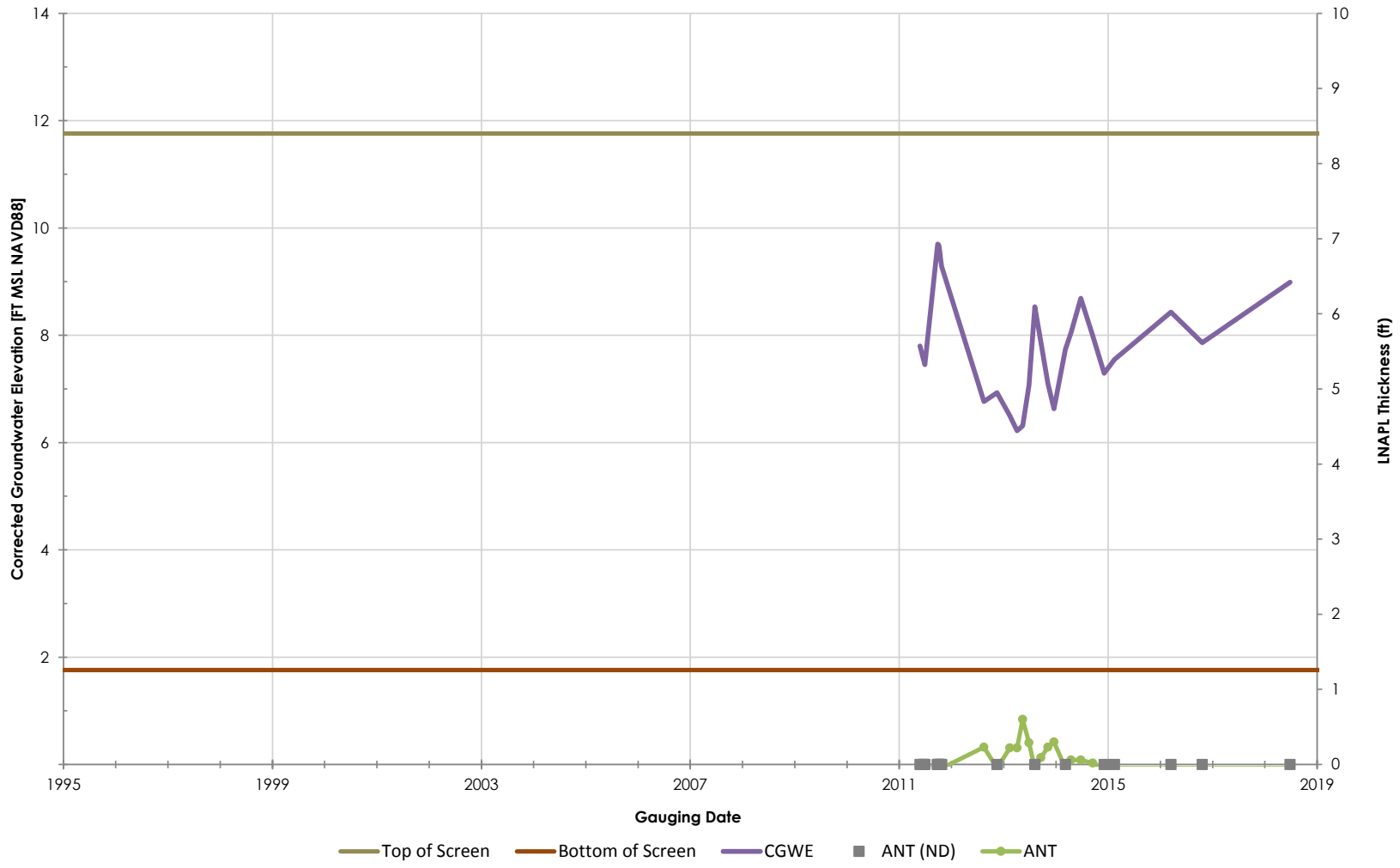
Stantec

Figure/Well No.

V-MW-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

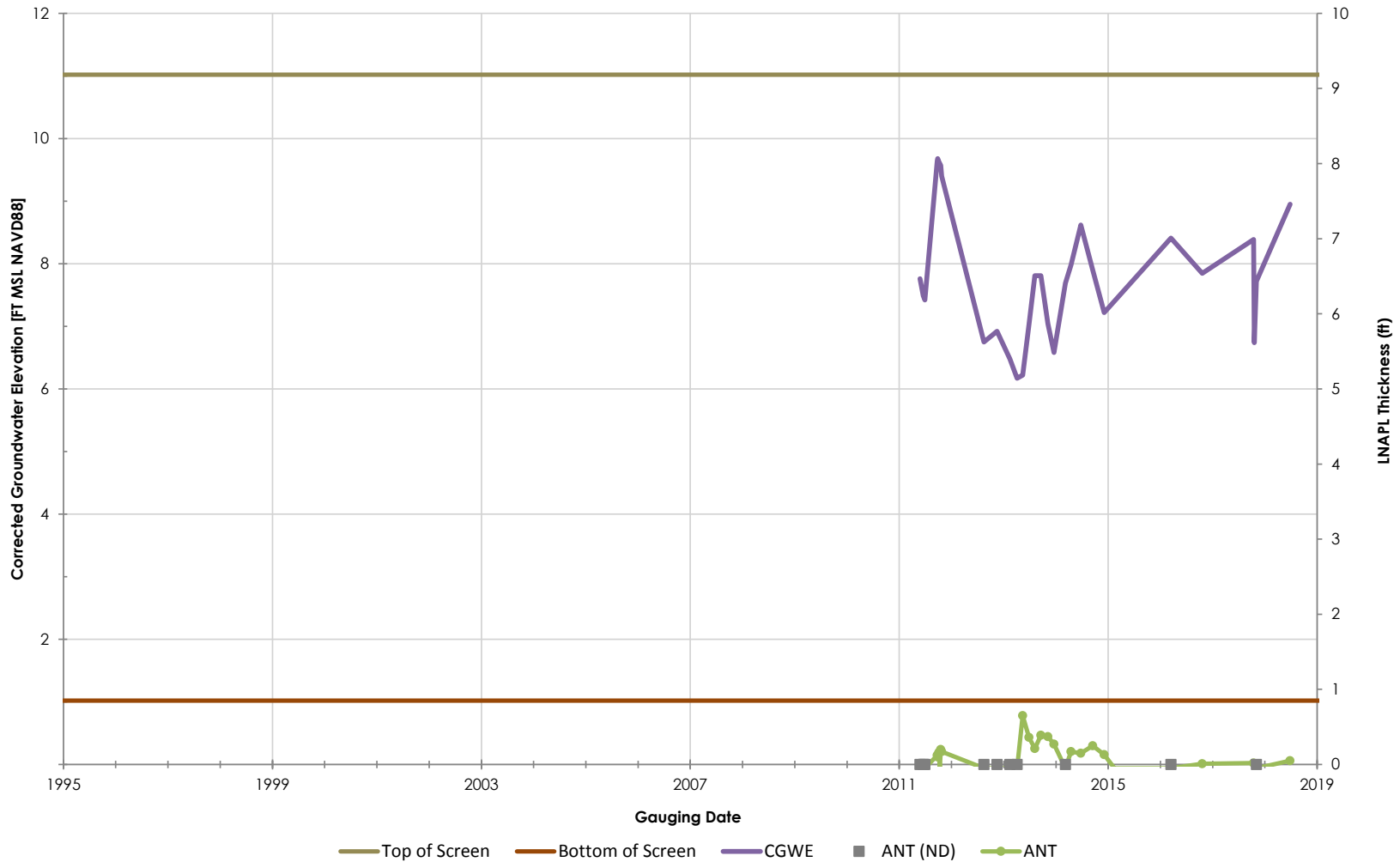
Stantec

Figure/Well No.

V-MW-6

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

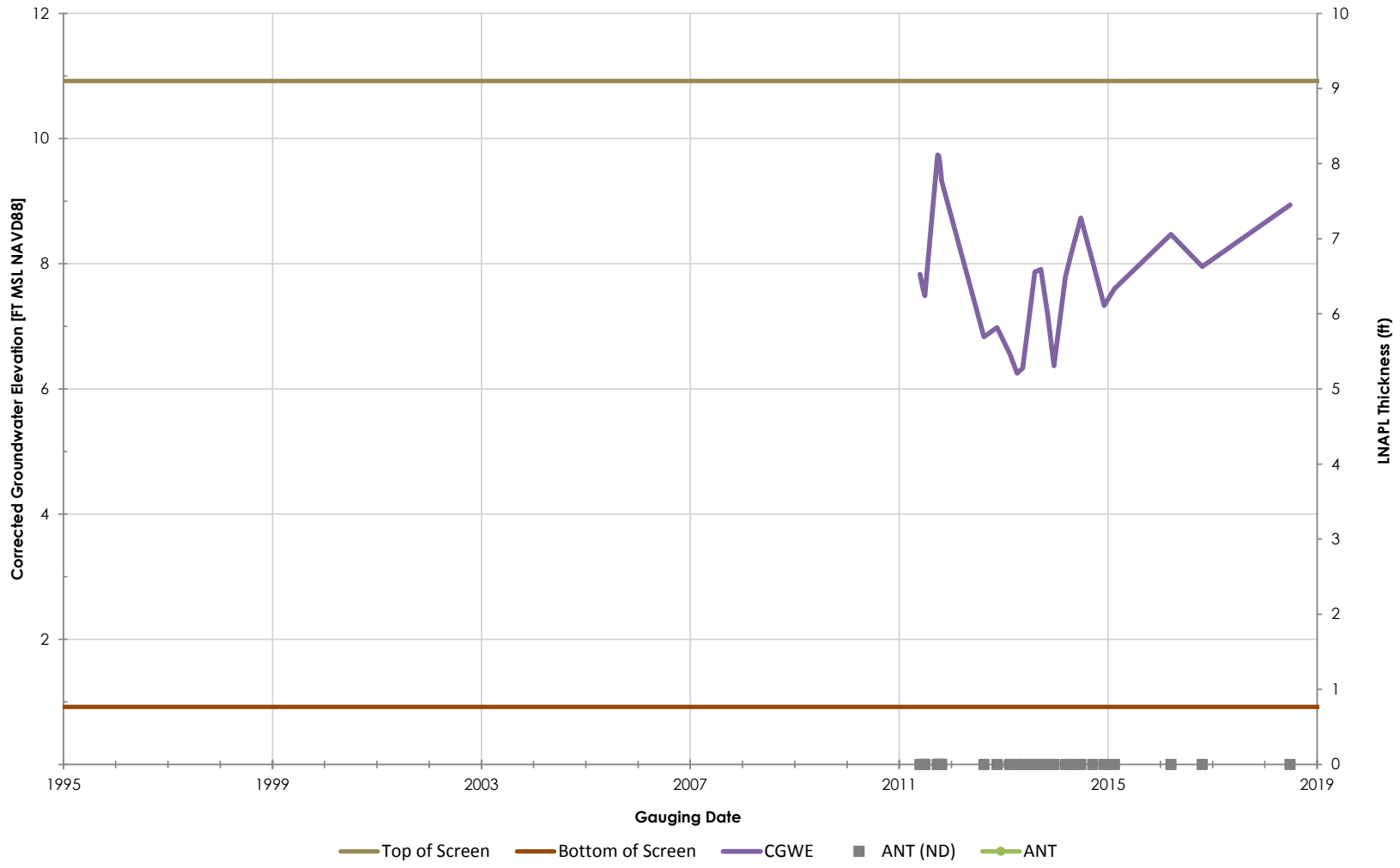
Stantec

Figure/Well No.

V-MW-7

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

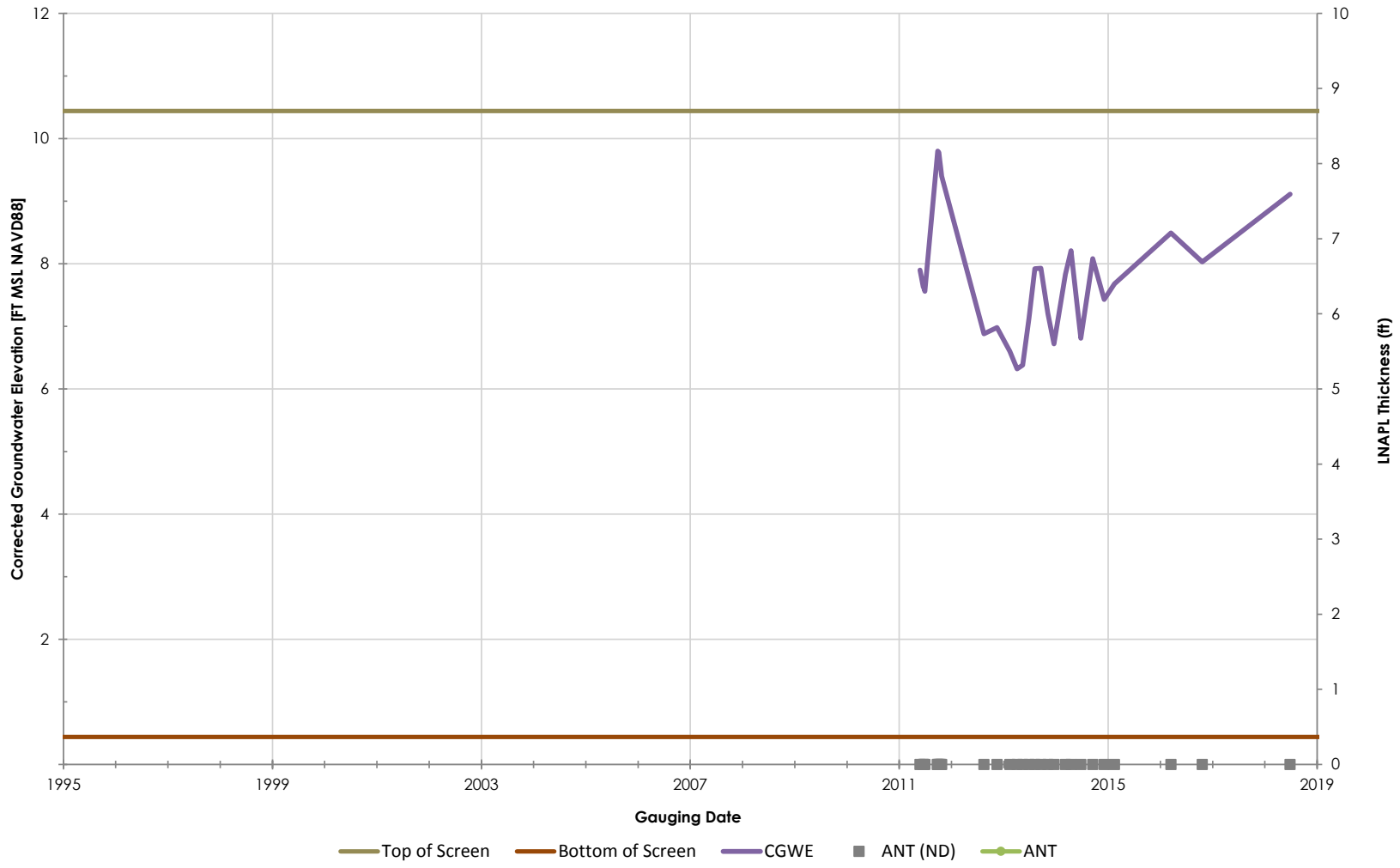
Stantec

Figure/Well No.

V-MW-8

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

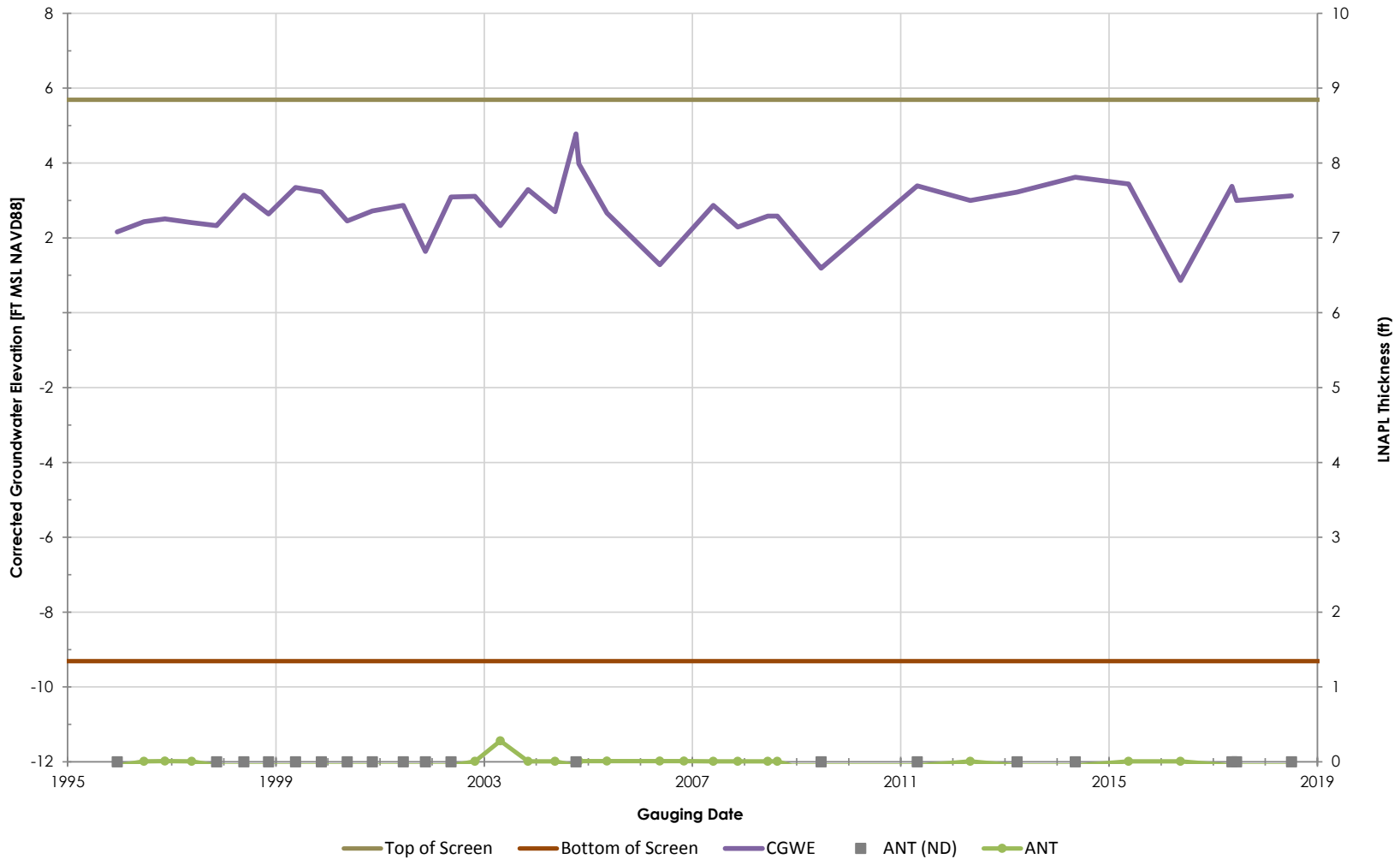
Stantec

Figure/Well No.

V-MW-9

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

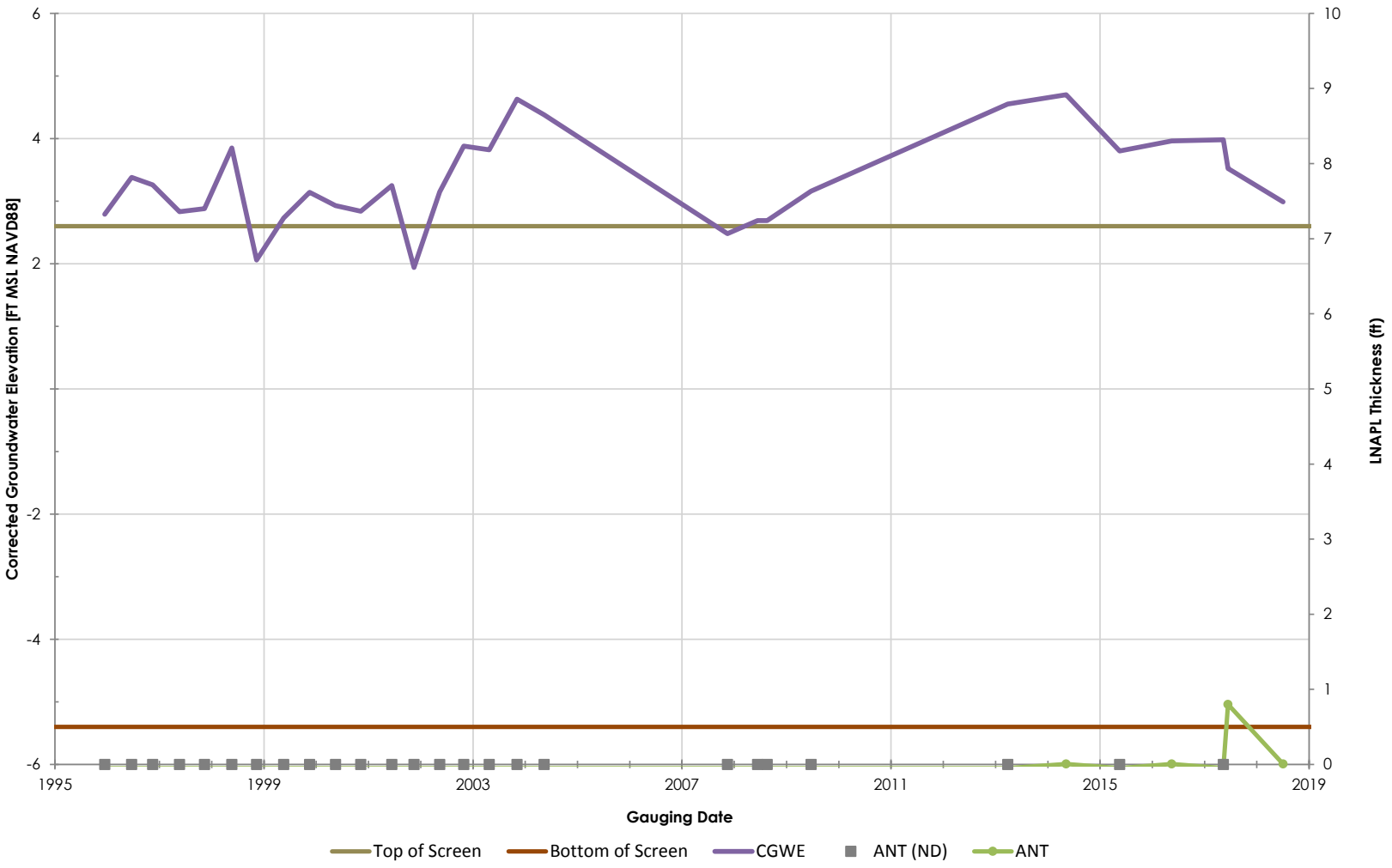
Stantec

Figure/Well No.

W-1

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

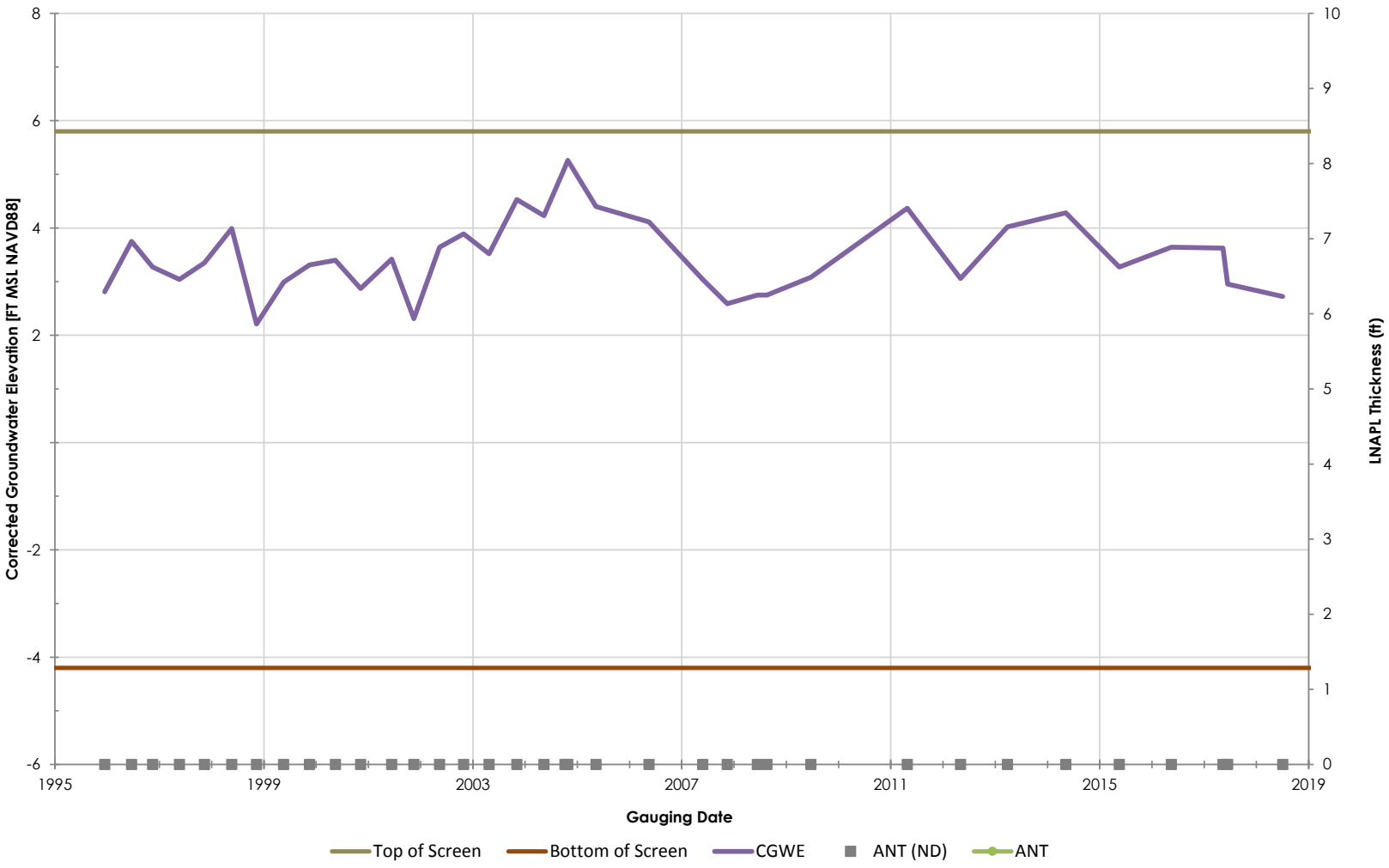
Stantec

Figure/Well No.

W-10

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

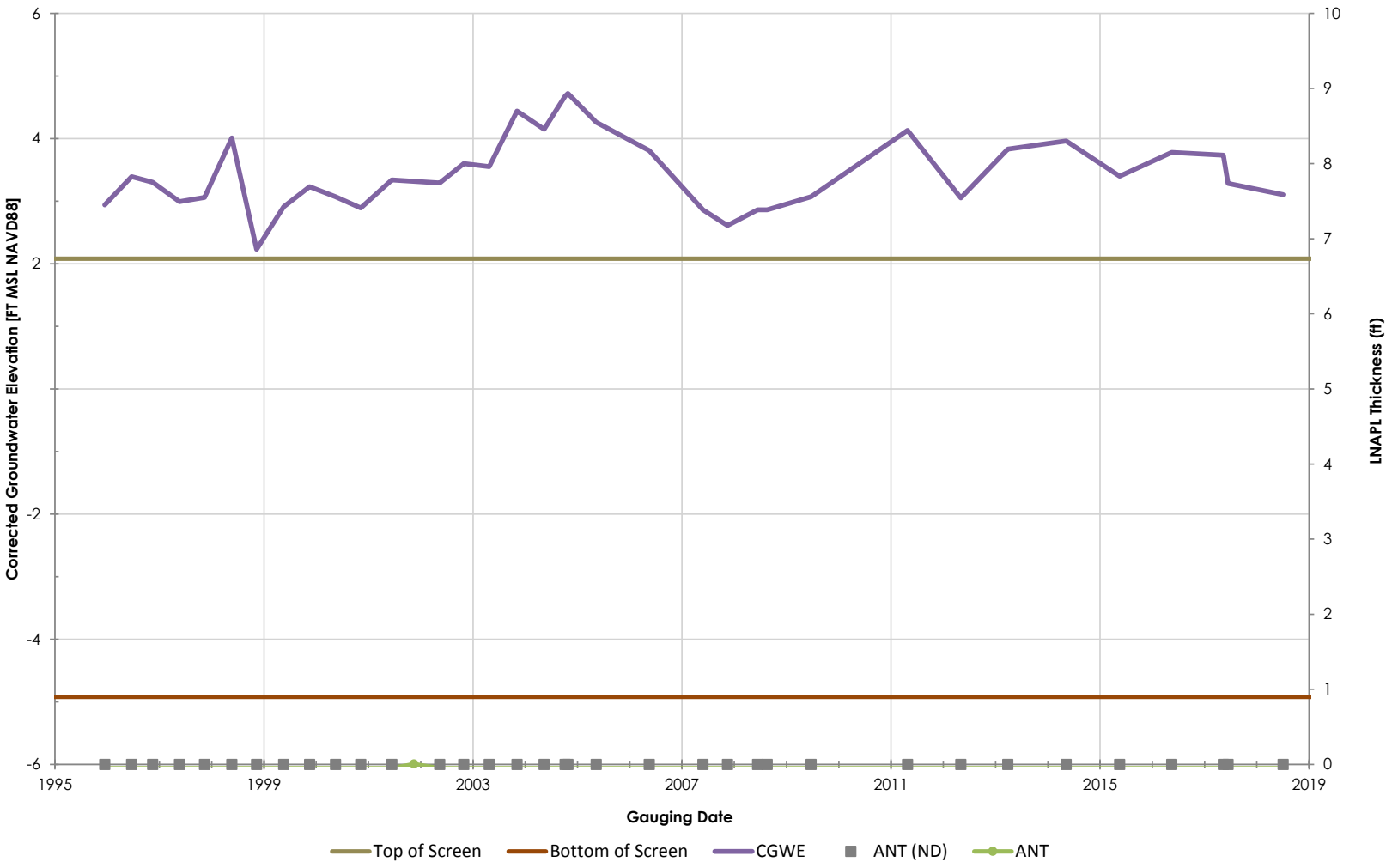
Stantec

Figure/Well No.

W-11

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

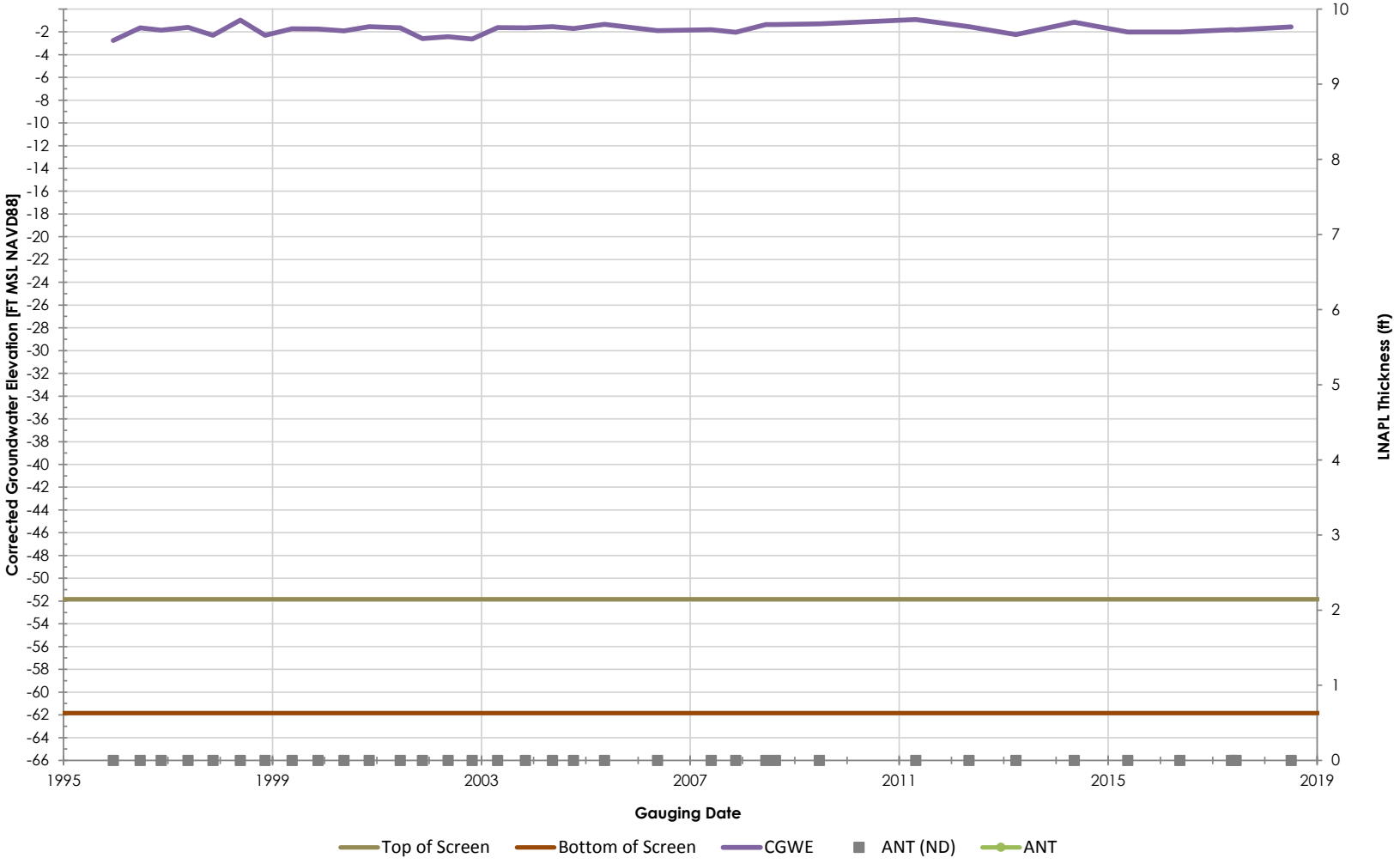
Stantec

Figure/Well No.

W-12

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

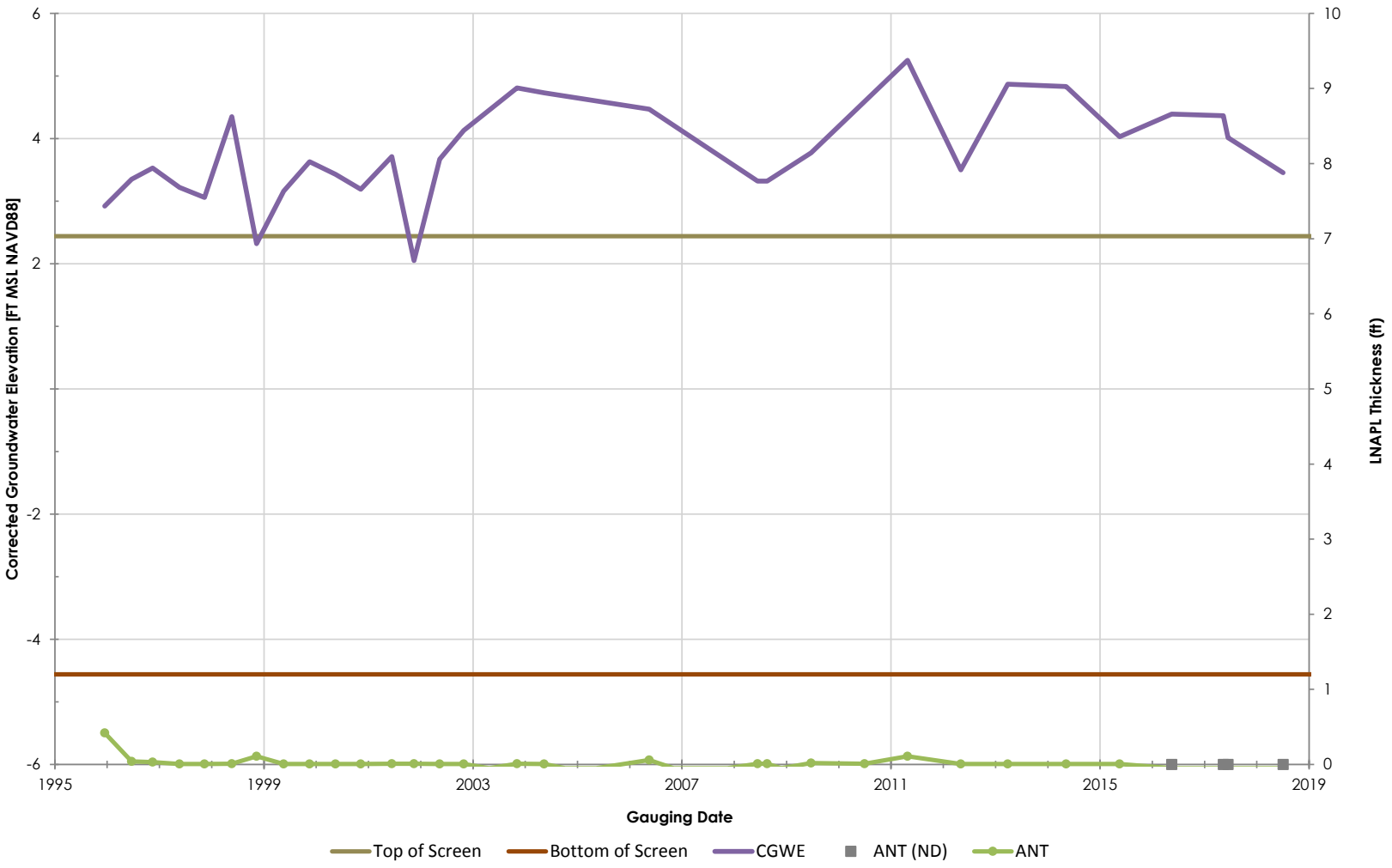
Stantec

Figure/Well No.

W-13

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

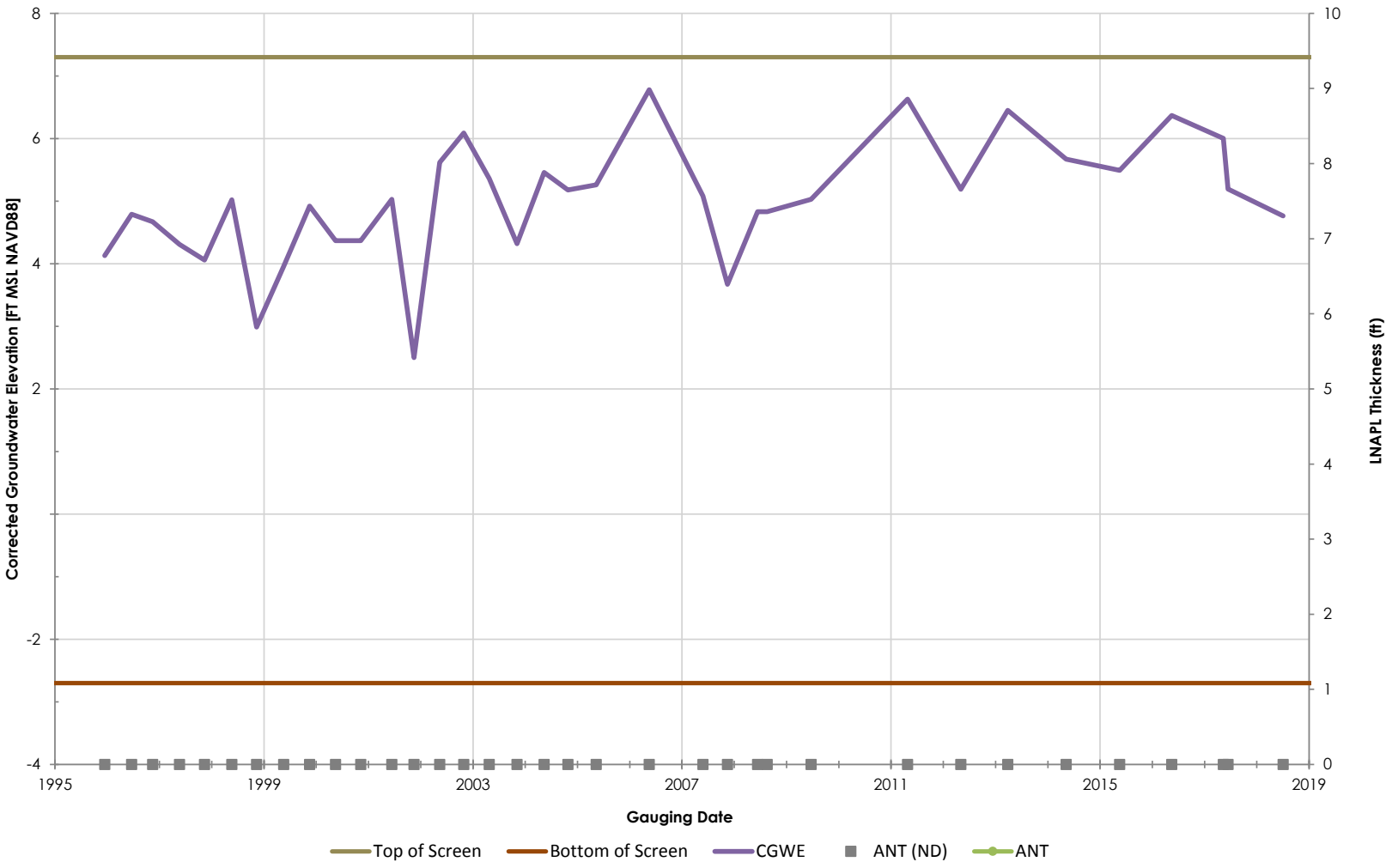
Stantec

Figure/Well No.

W-14

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

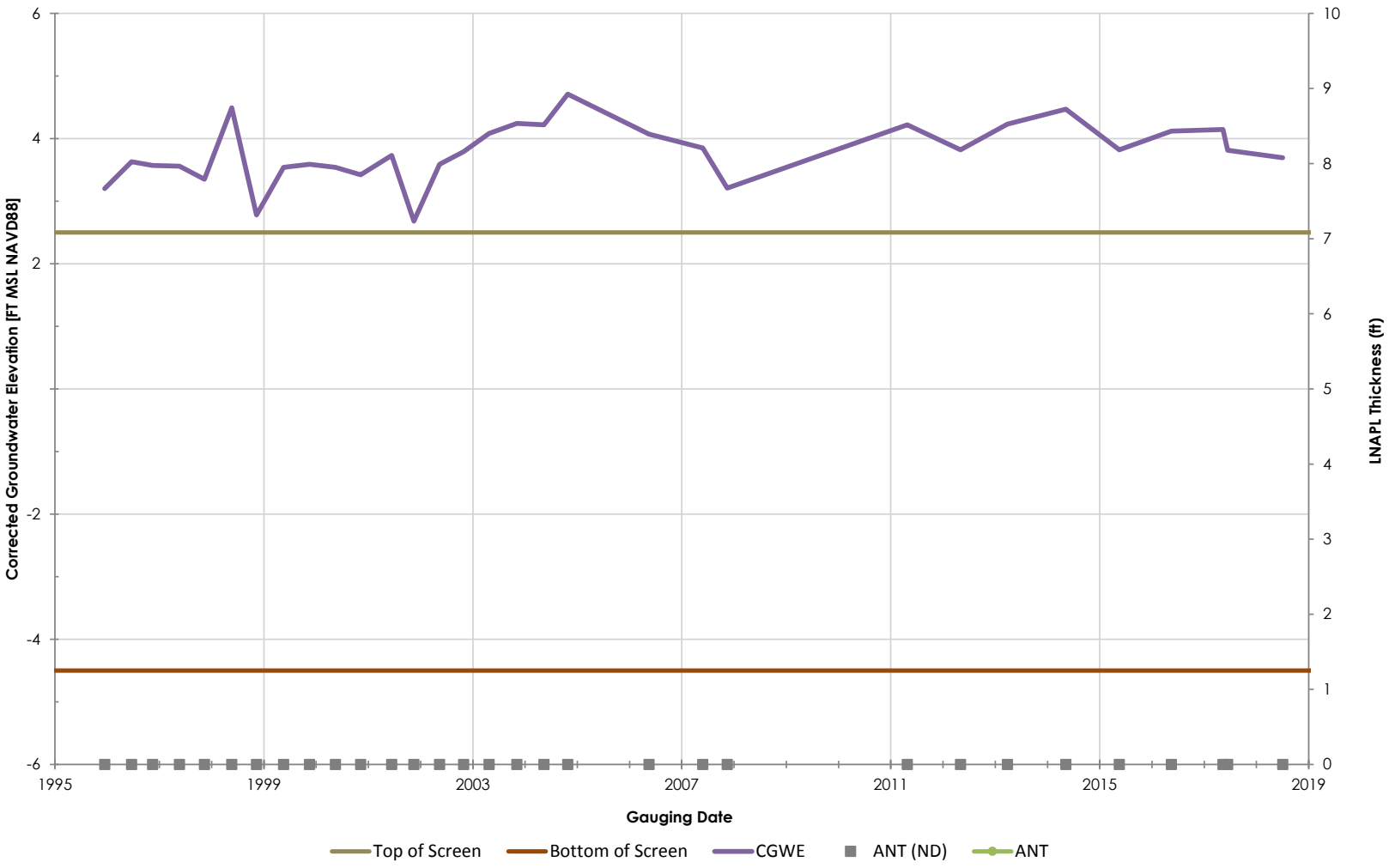
Stantec

Figure/Well No.

W-15

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

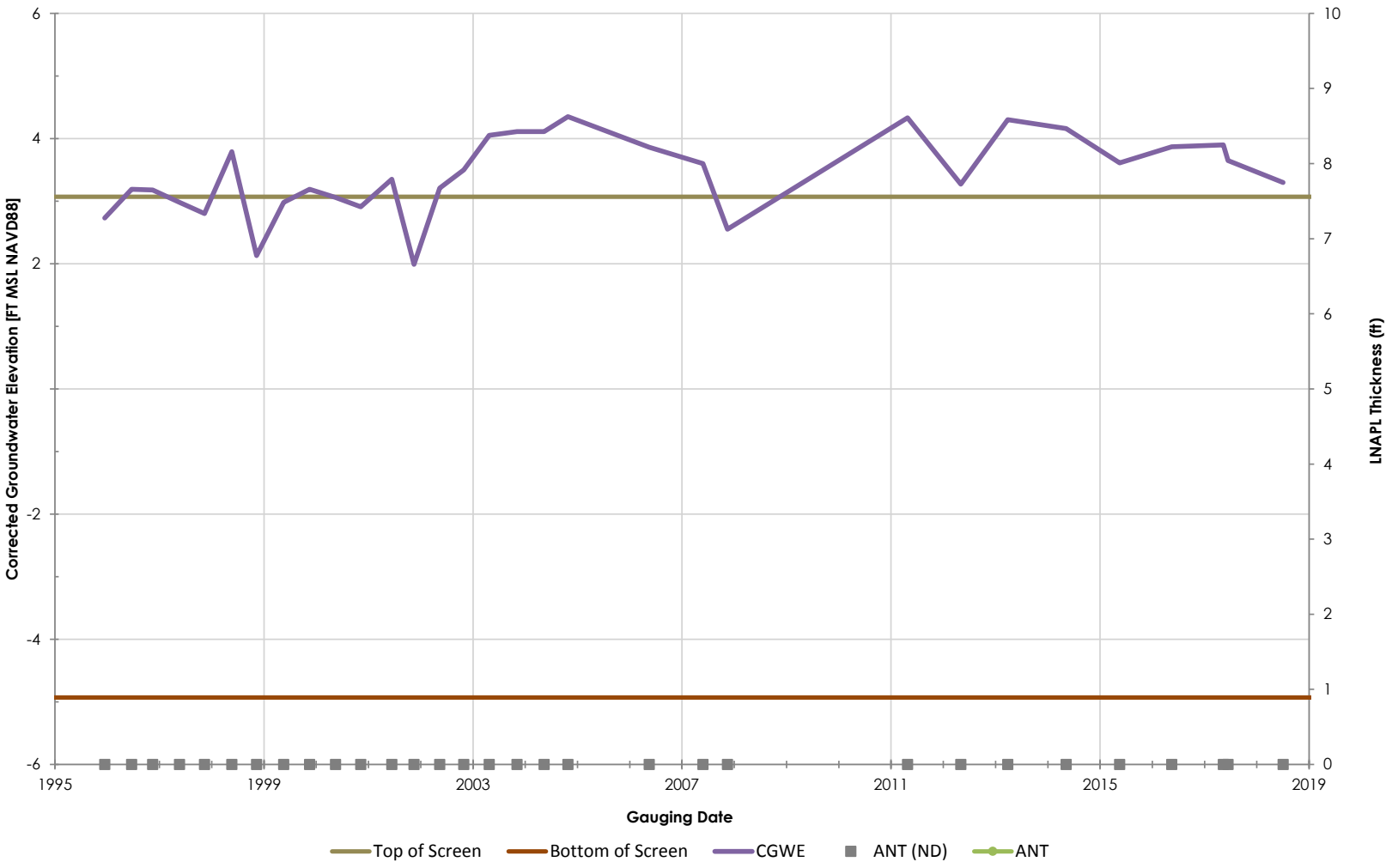
Stantec

Figure/Well No.

W-16

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

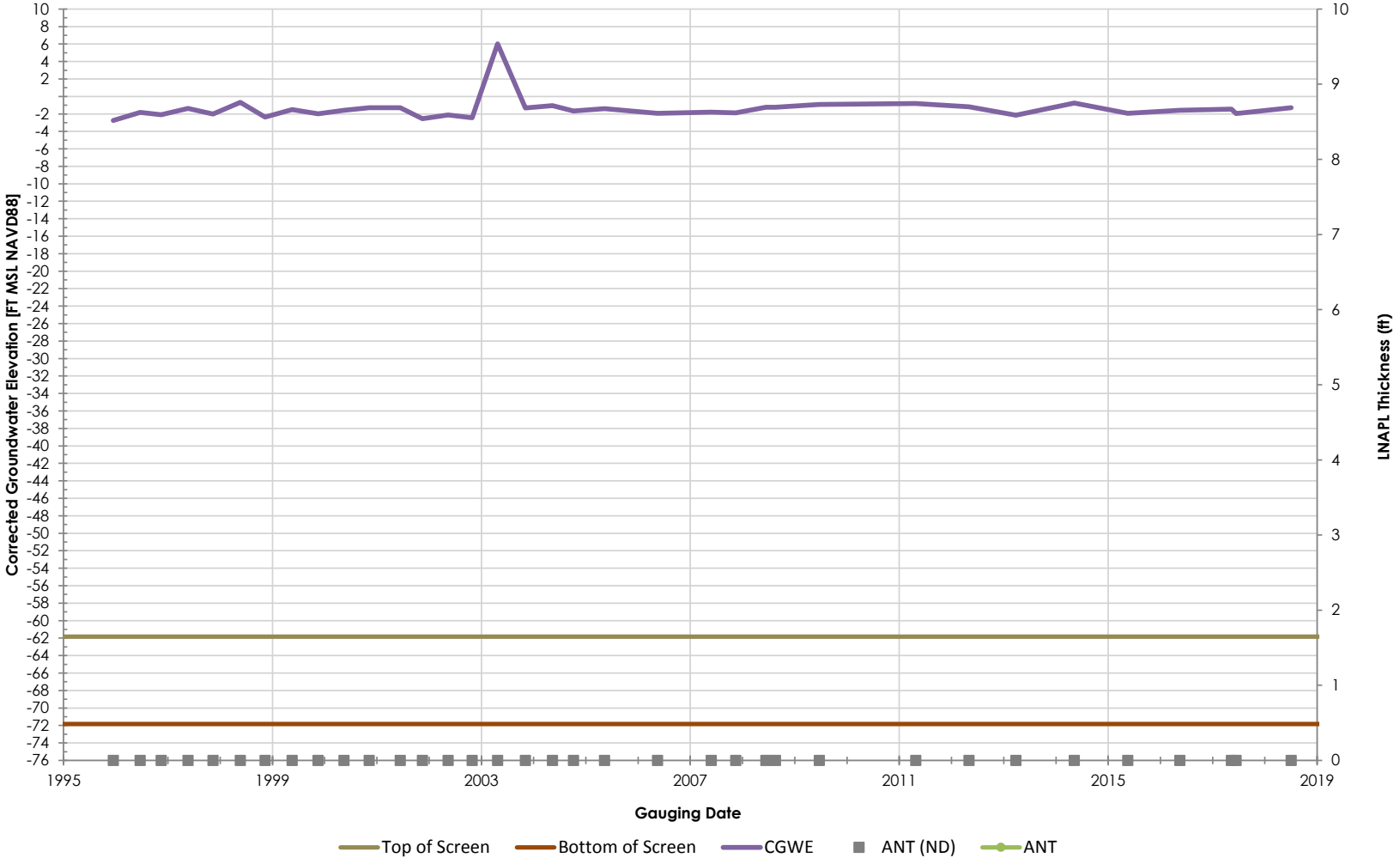
Stantec

Figure/Well No.

W-17

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

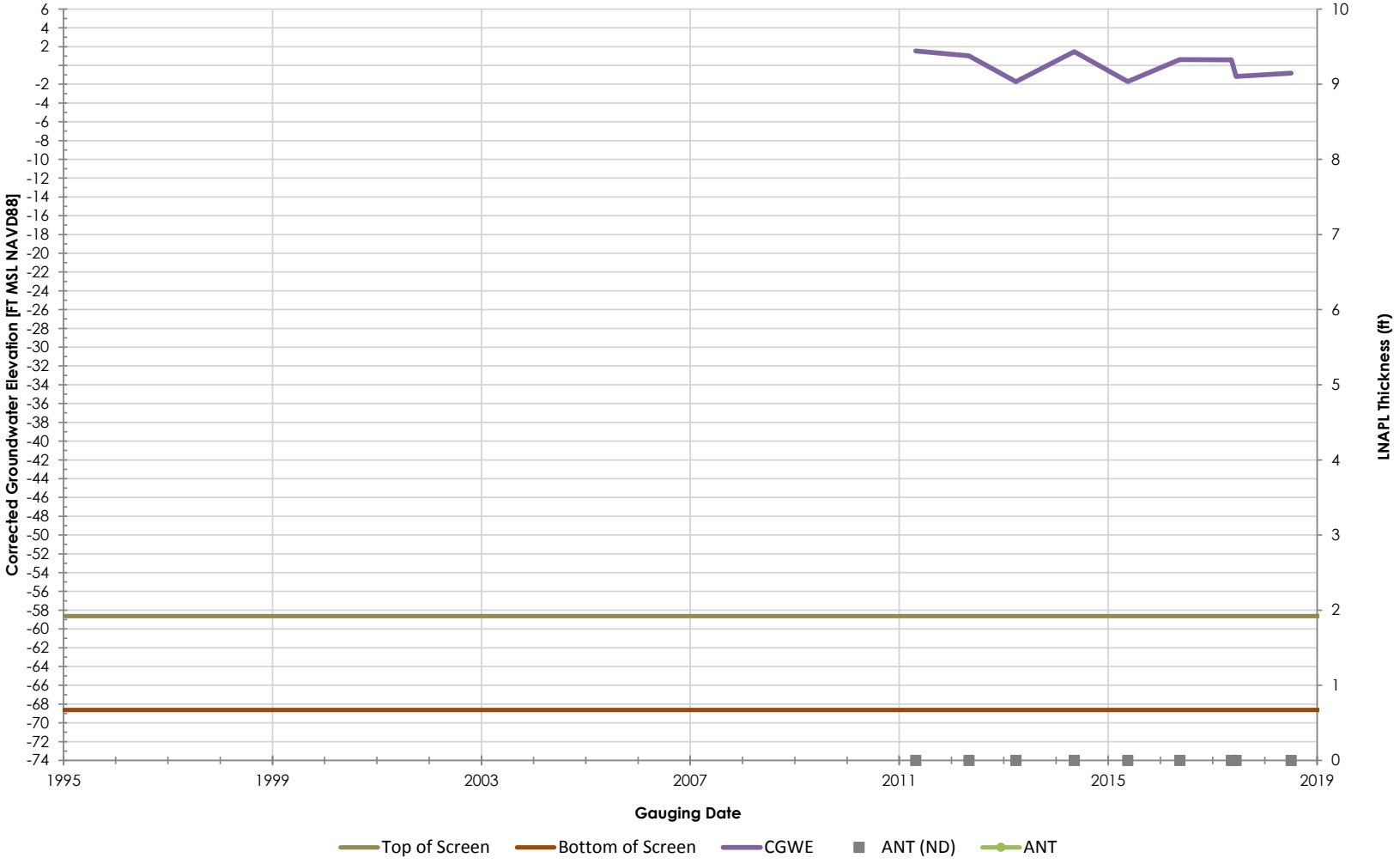
Stantec

Figure/Well No.

W-19

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

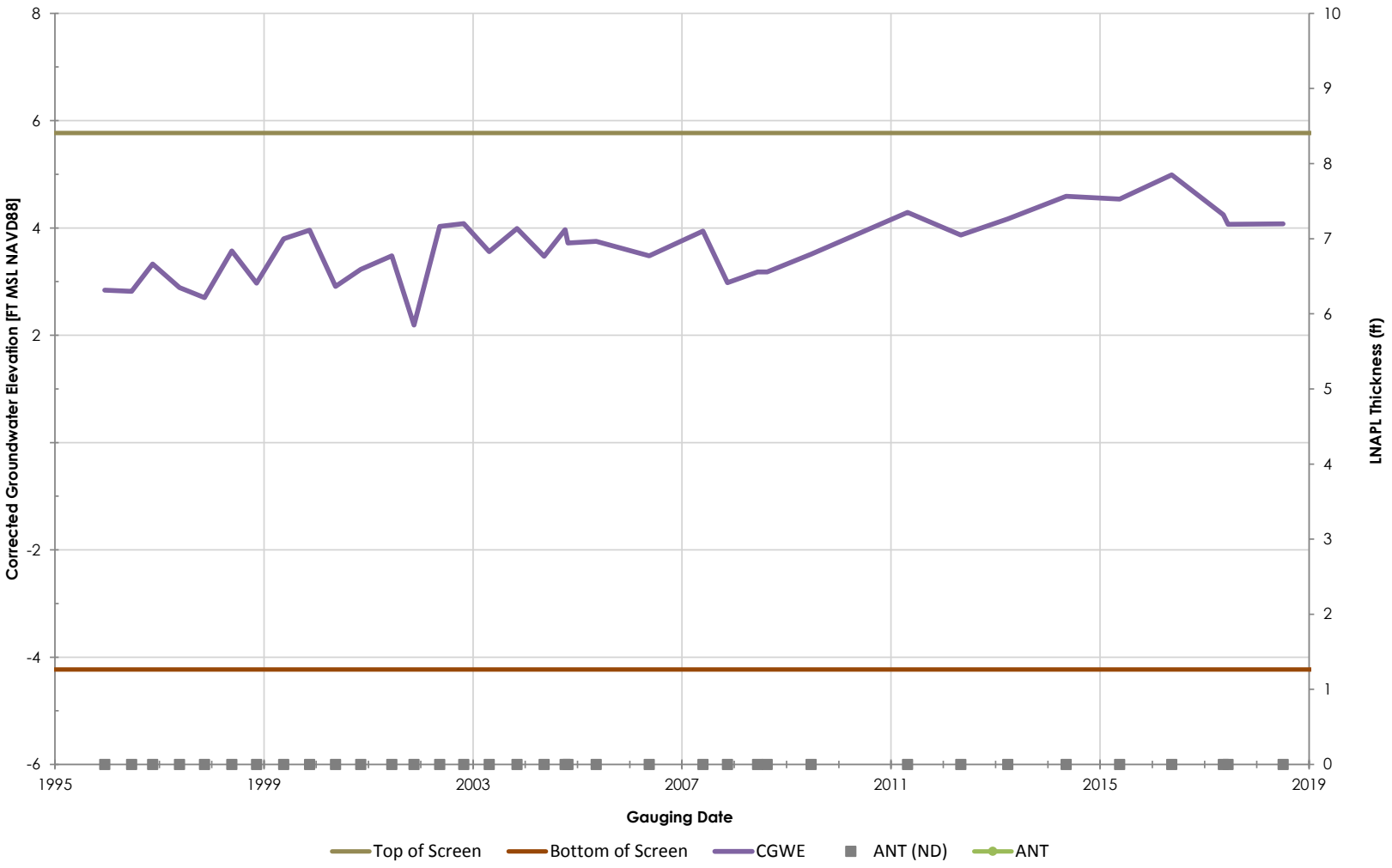
Stantec

Figure/Well No.

W-1D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

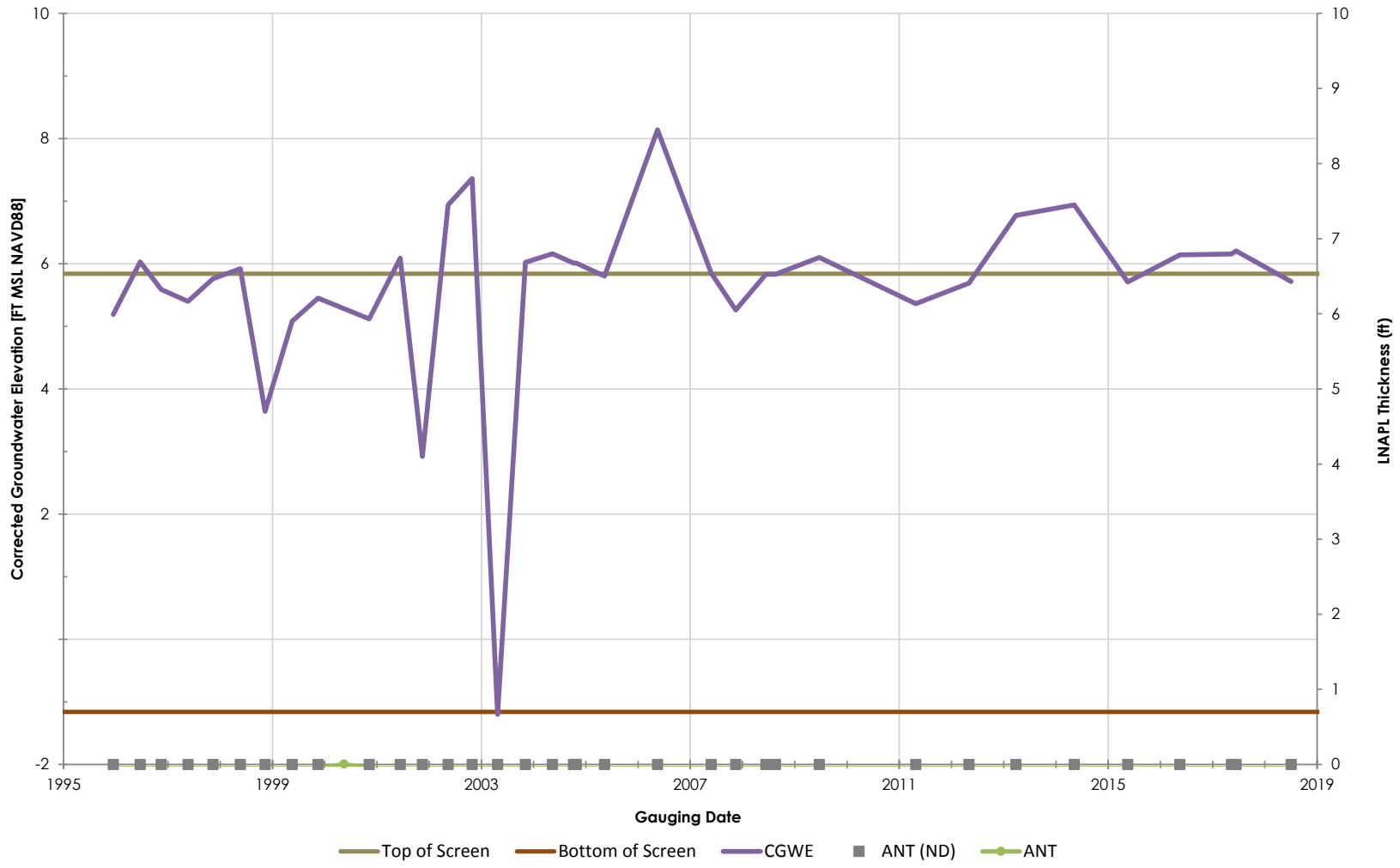
Stantec

Figure/Well No.

W-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

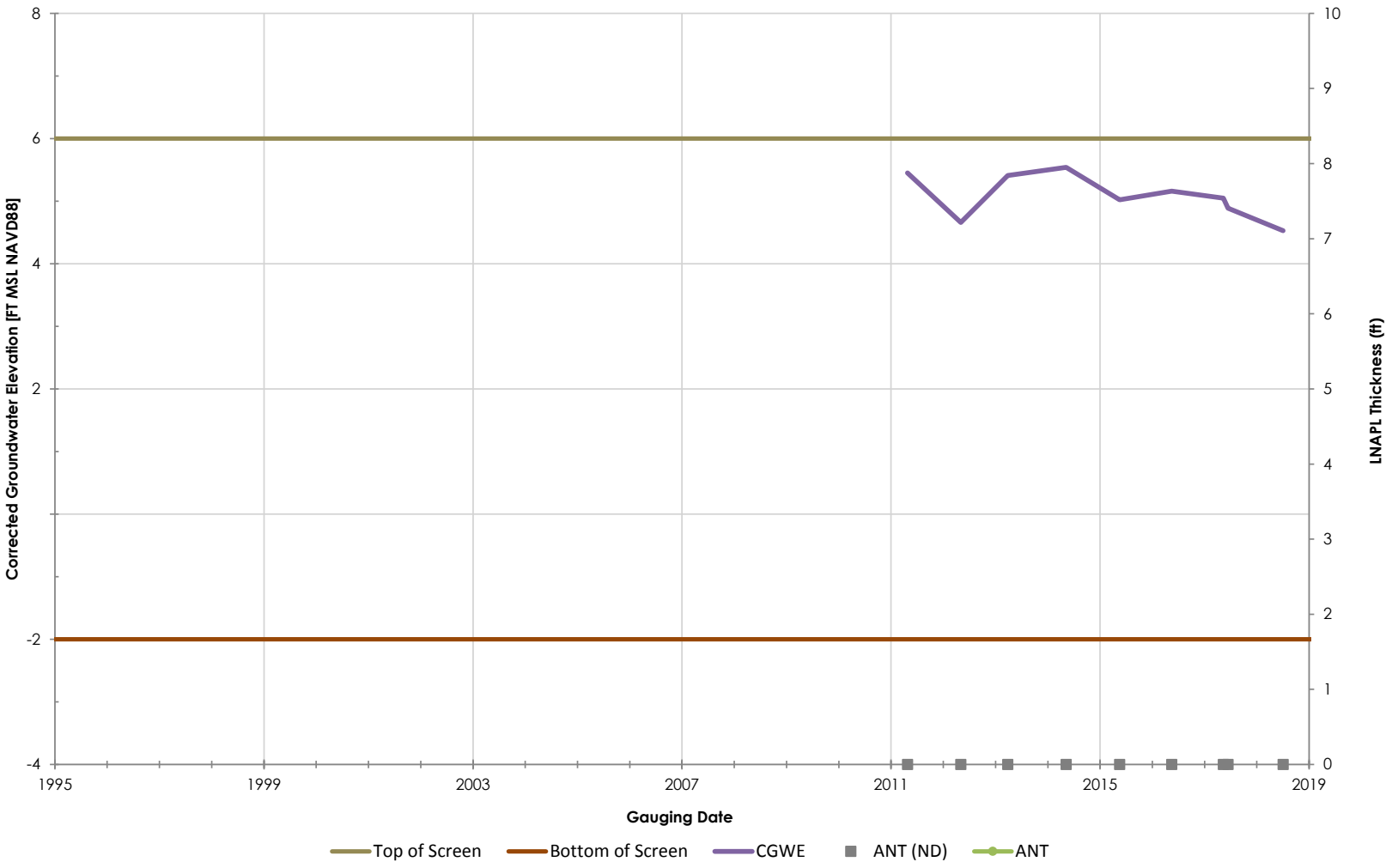
Stantec

Figure/Well No.

W-20

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

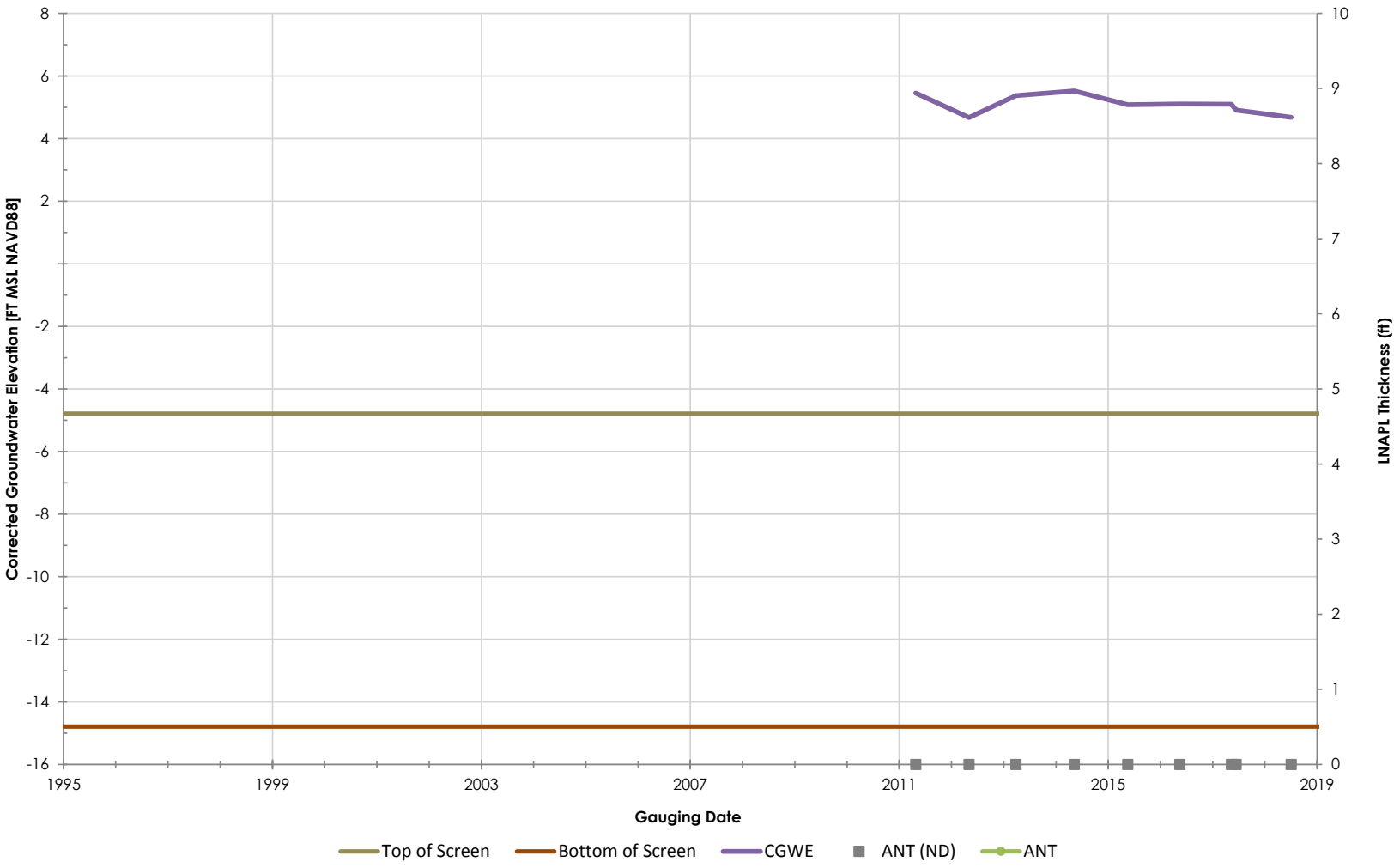
Stantec

Figure/Well No.

W-22

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

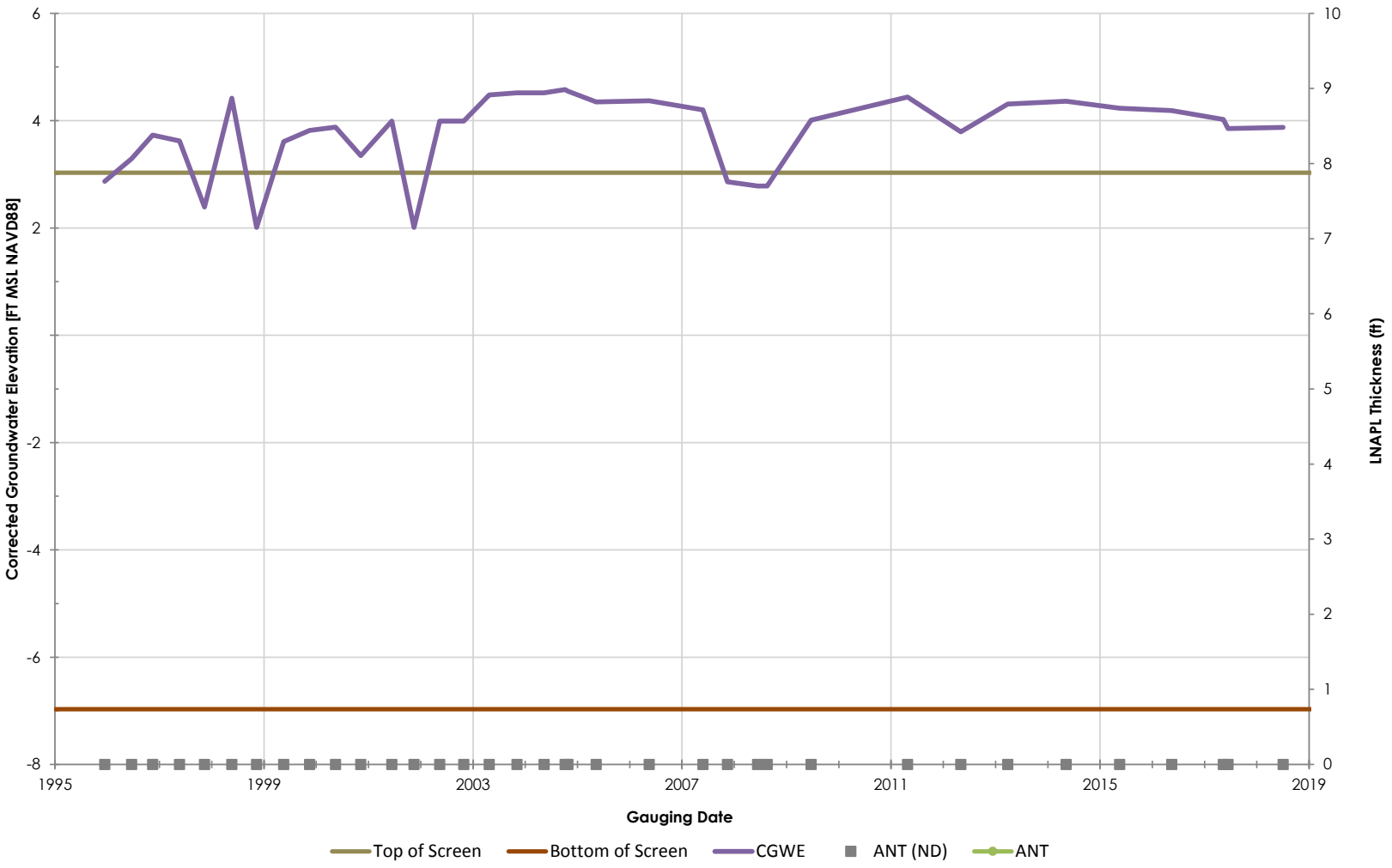
Stantec

Figure/Well No.

W-23

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

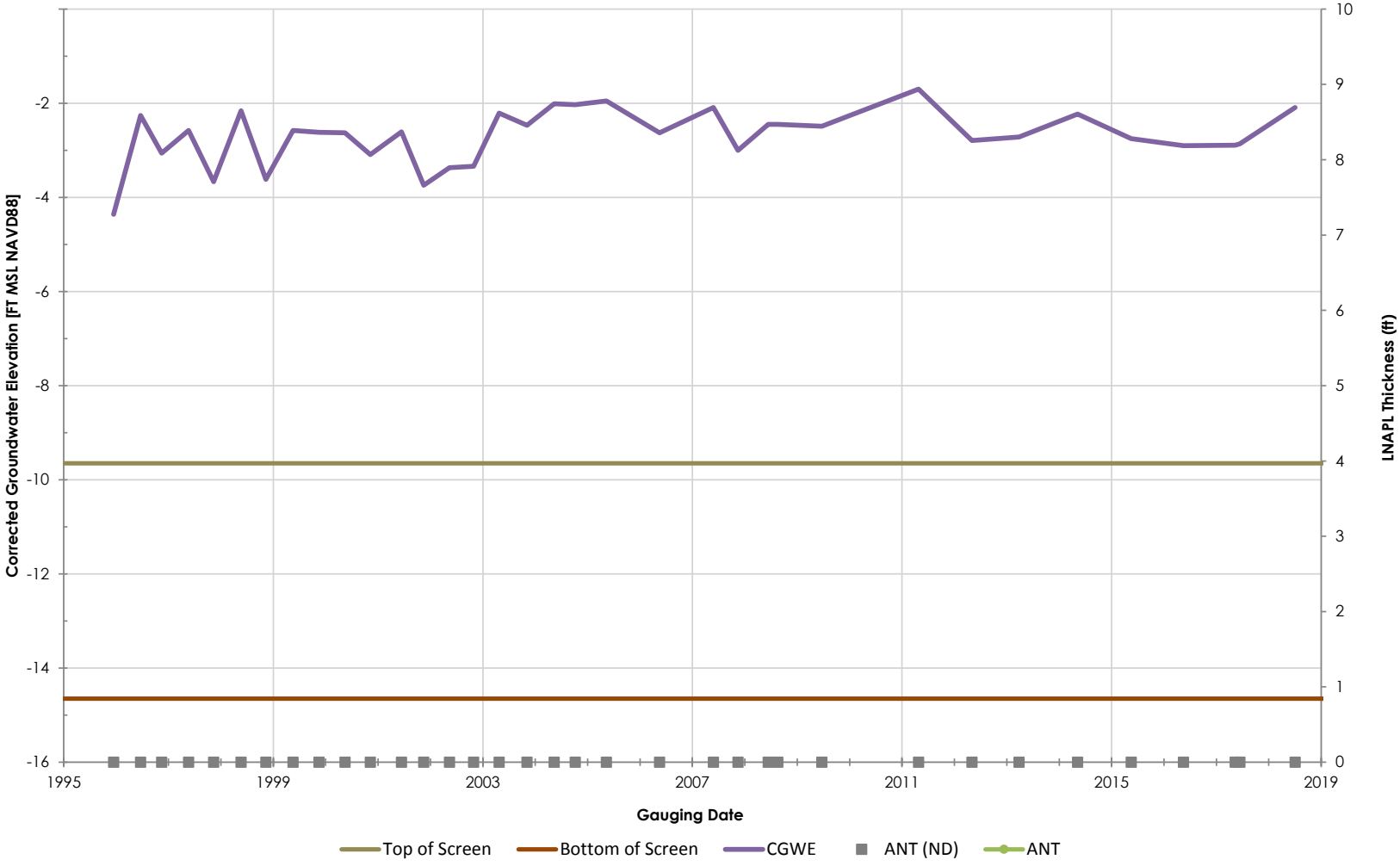
Stantec

Figure/Well No.

W-25

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

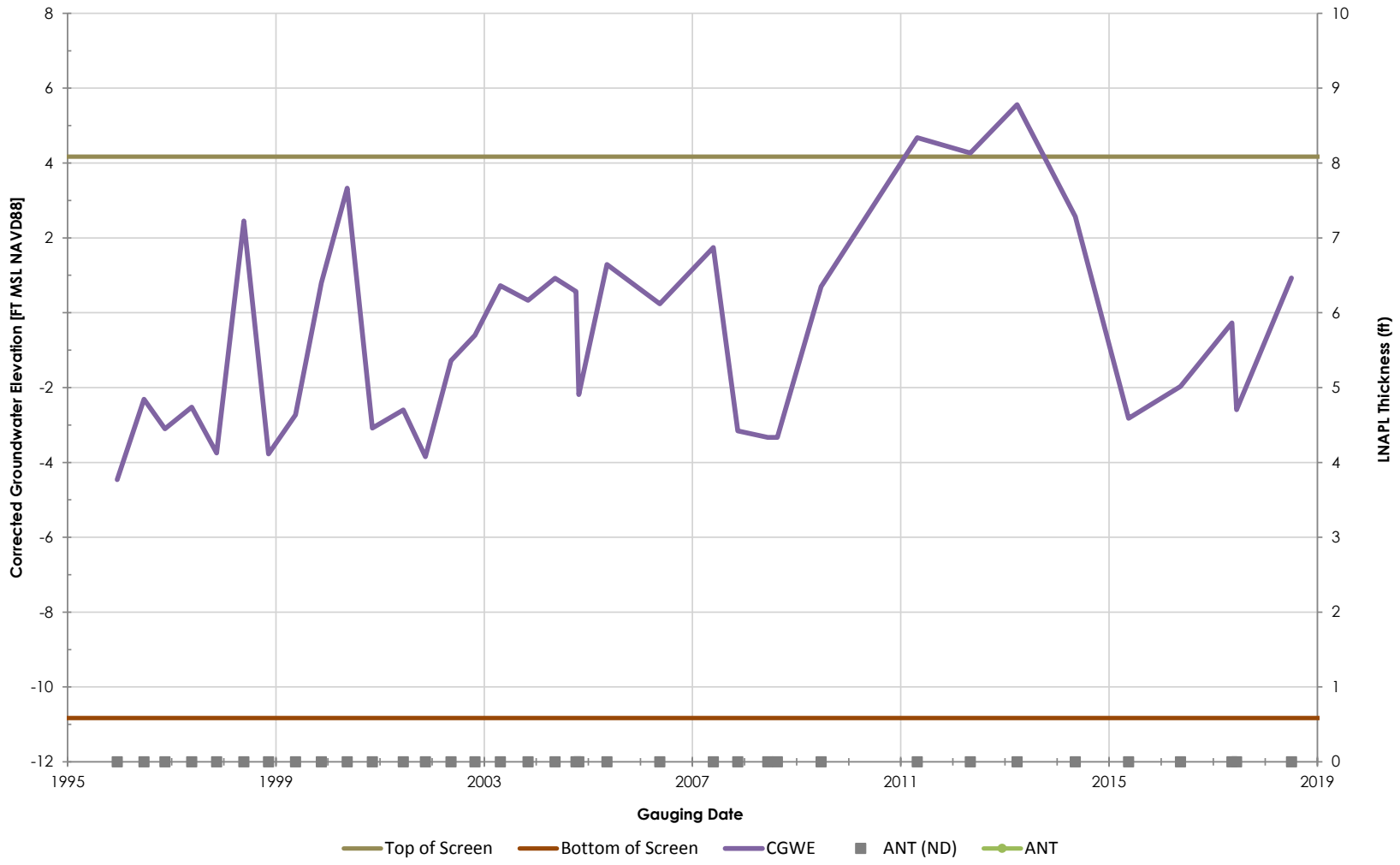
Stantec

Figure/Well No.

W-26

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

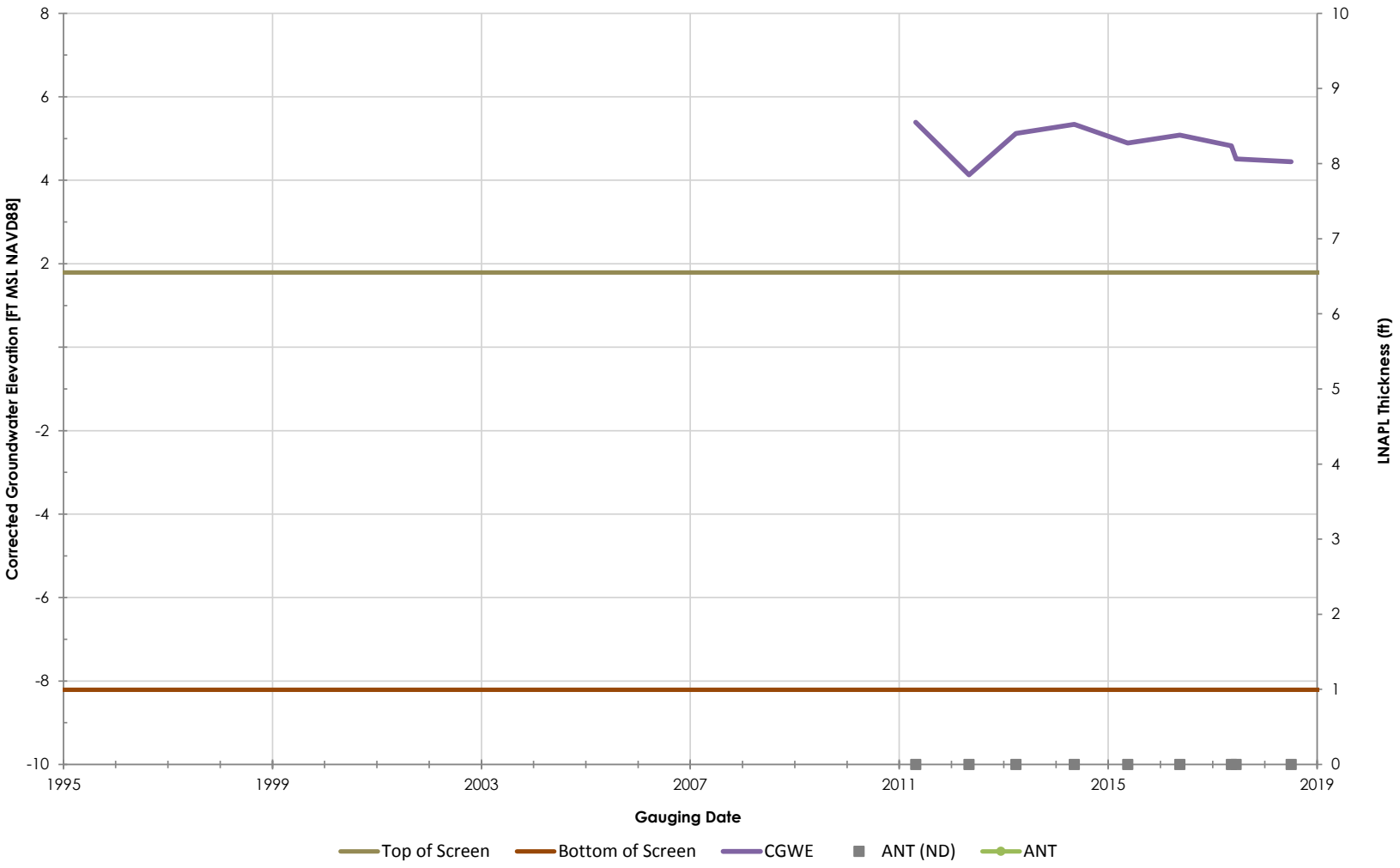
Stantec

Figure/Well No.

W-27

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

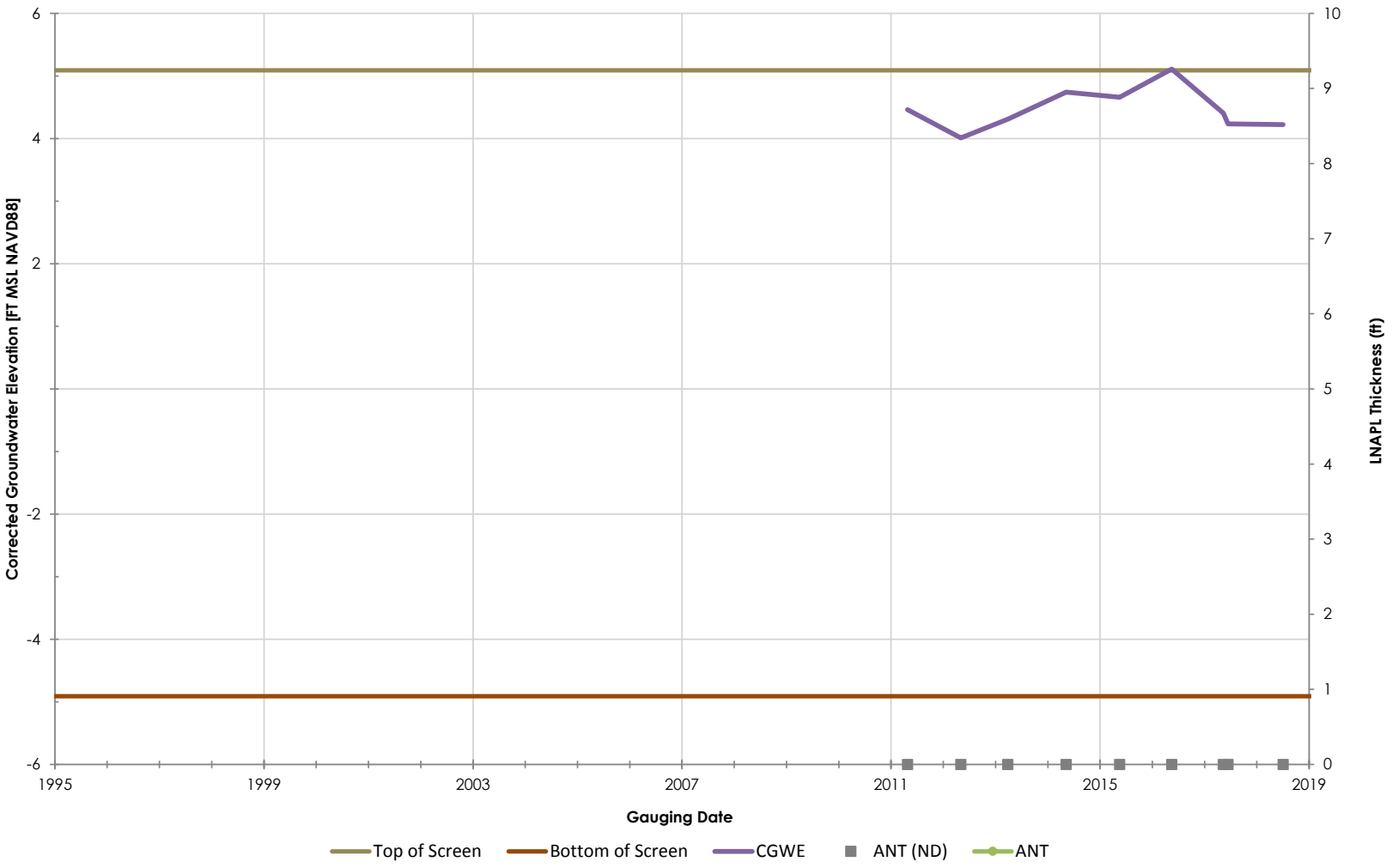
Stantec

Figure/Well No.

W-28

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

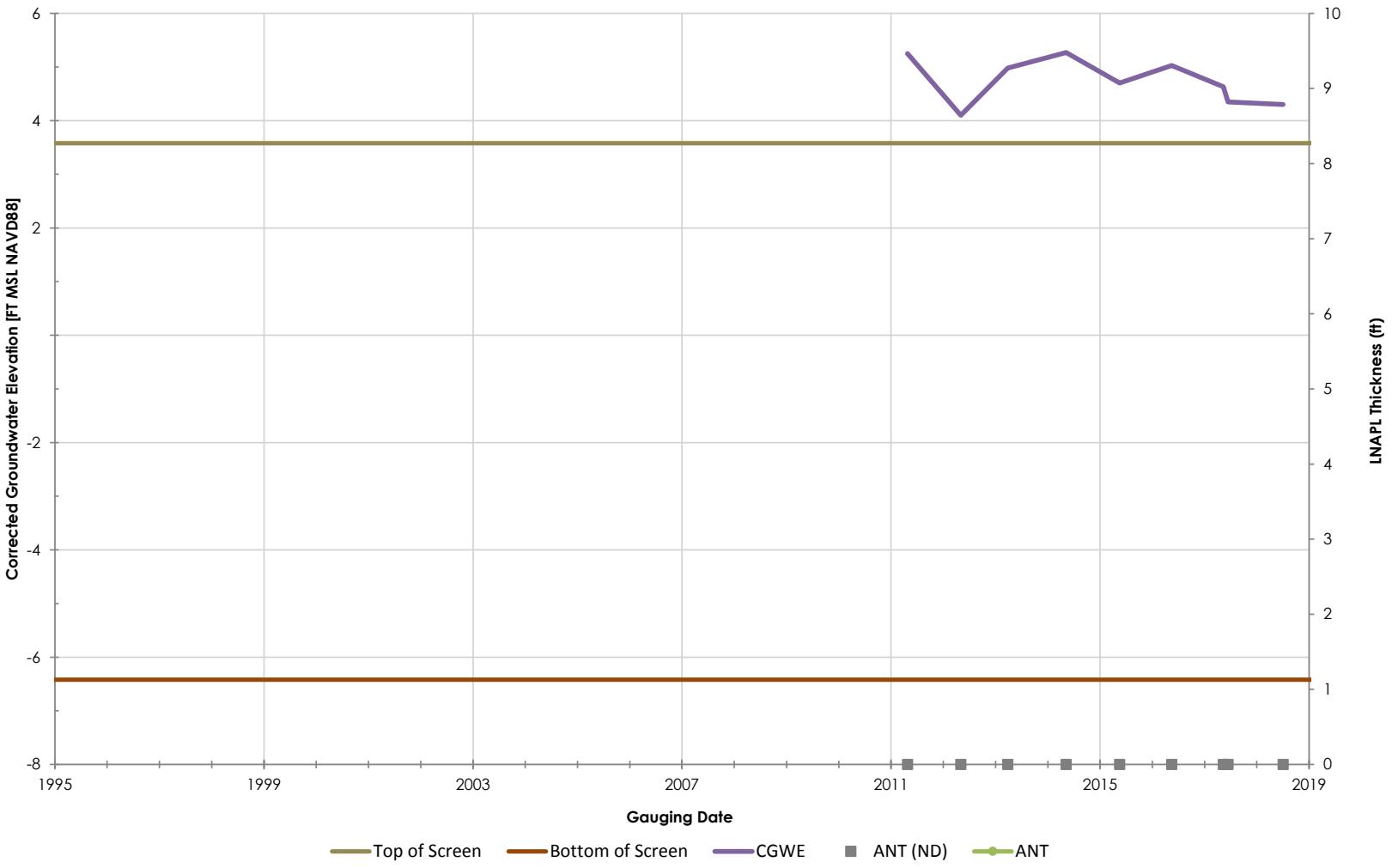
Stantec

Figure/Well No.

W-29

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

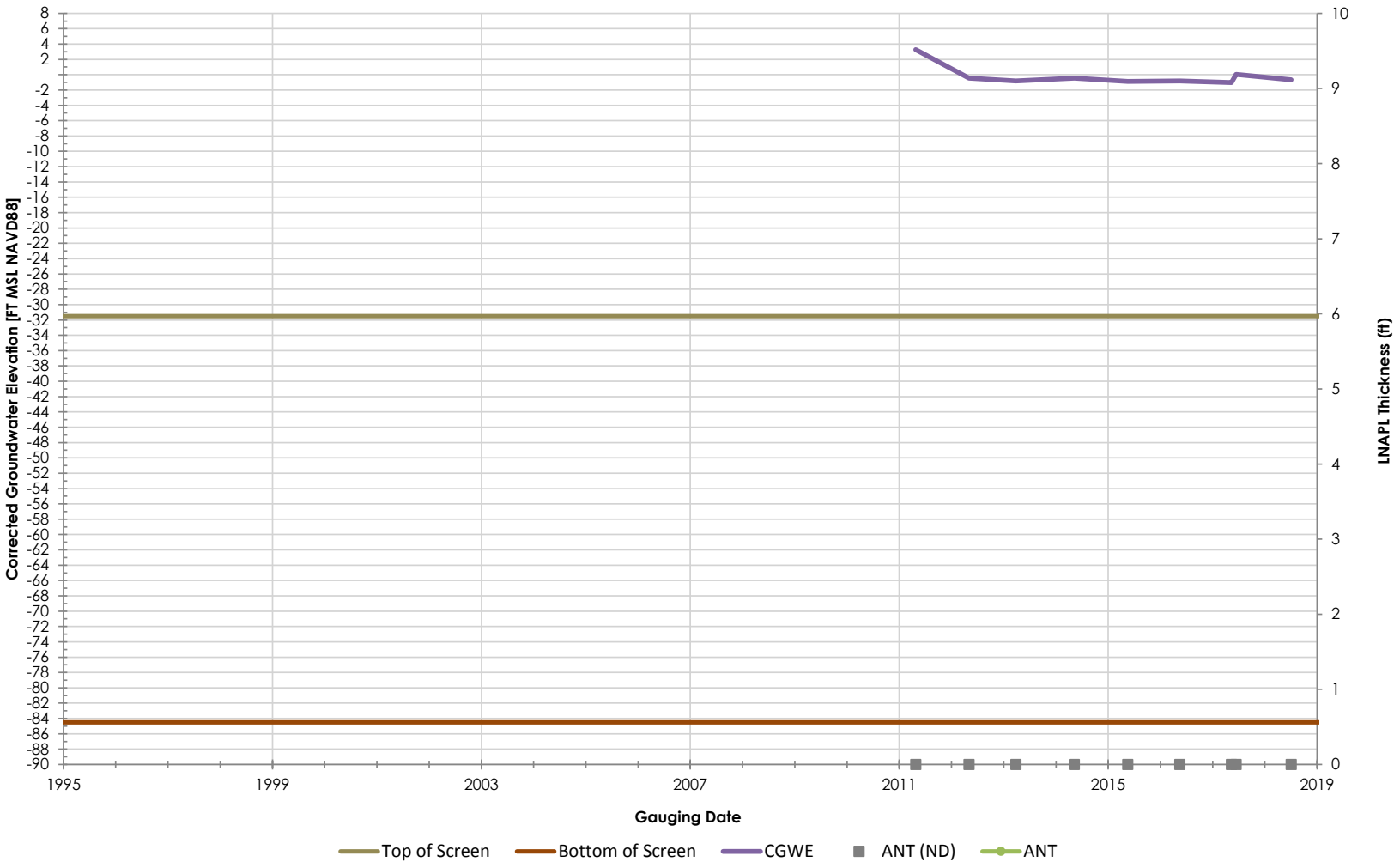
Stantec

Figure/Well No.

W-30

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

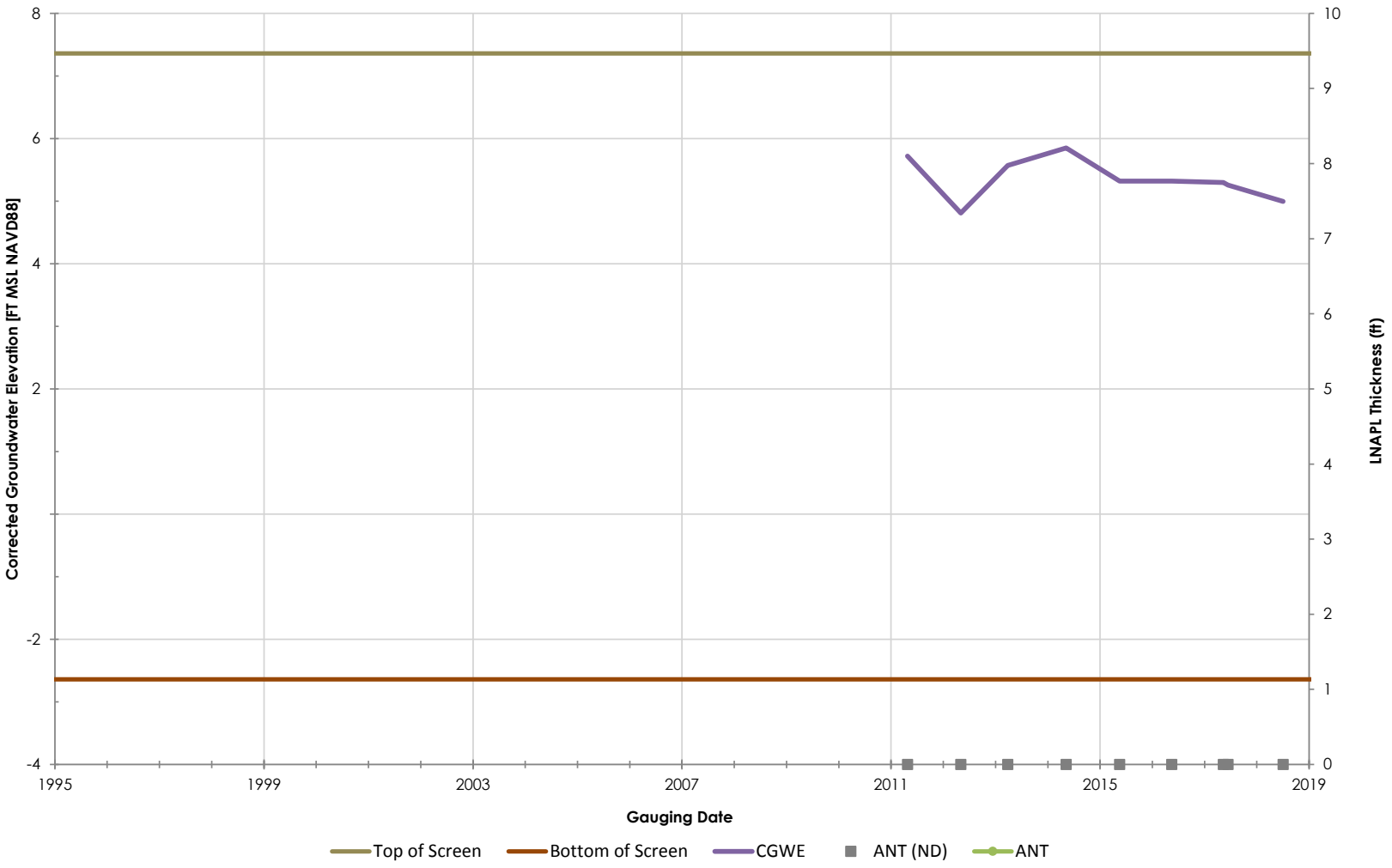
Stantec

Figure/Well No.

W-32D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

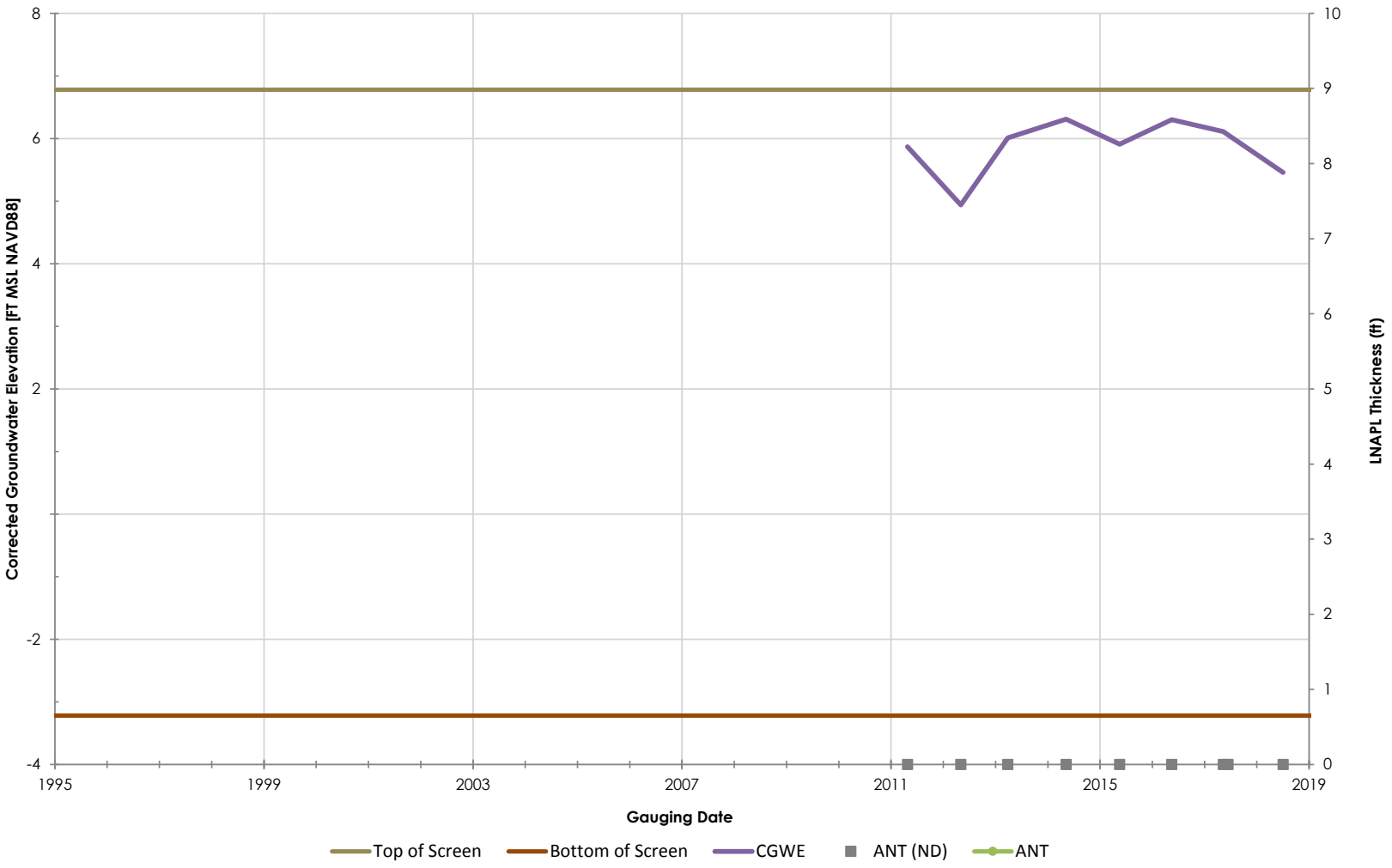
Stantec

Figure/Well No.

W-33

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



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Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

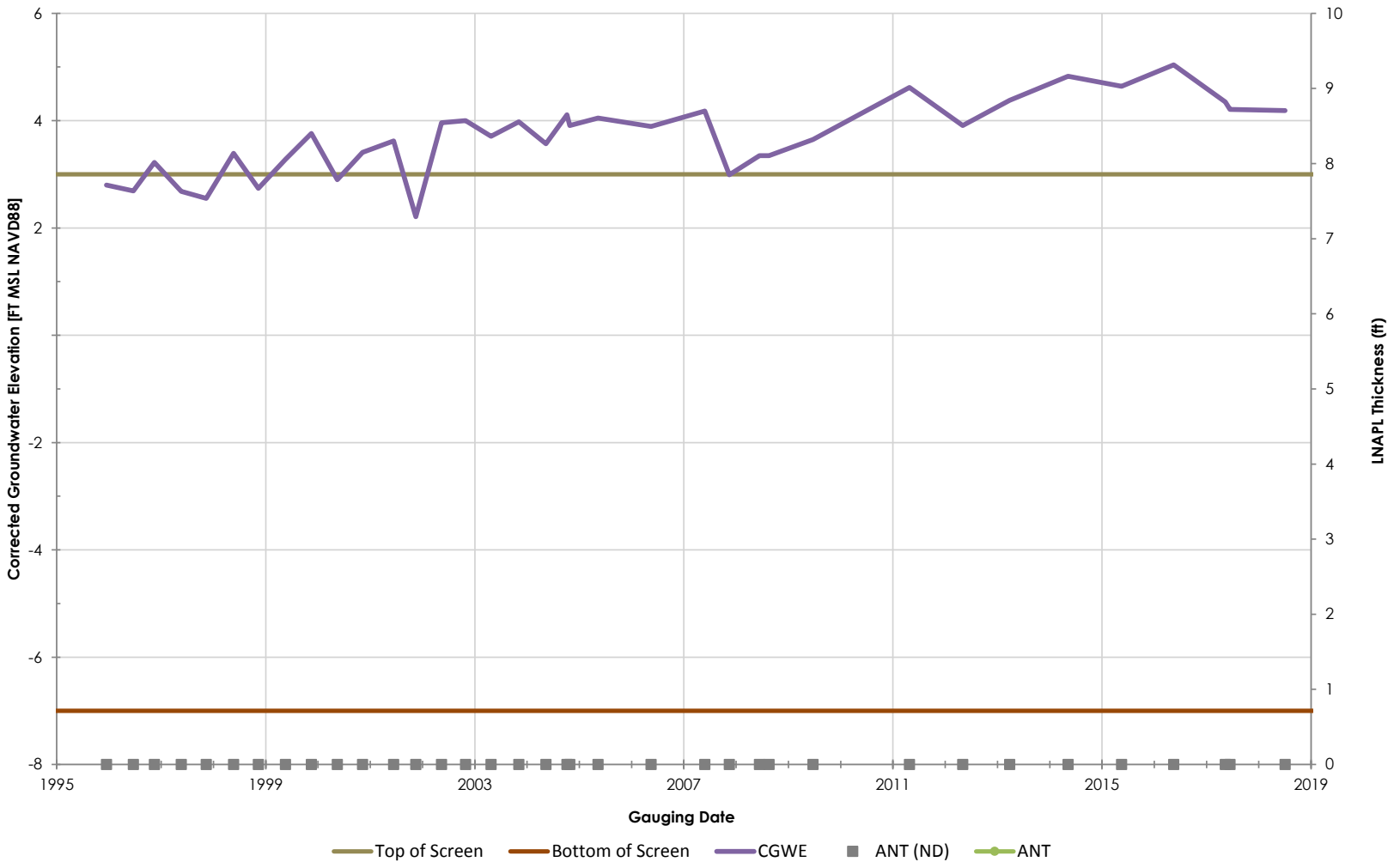
Stantec

Figure/Well No.

W-34

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



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Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

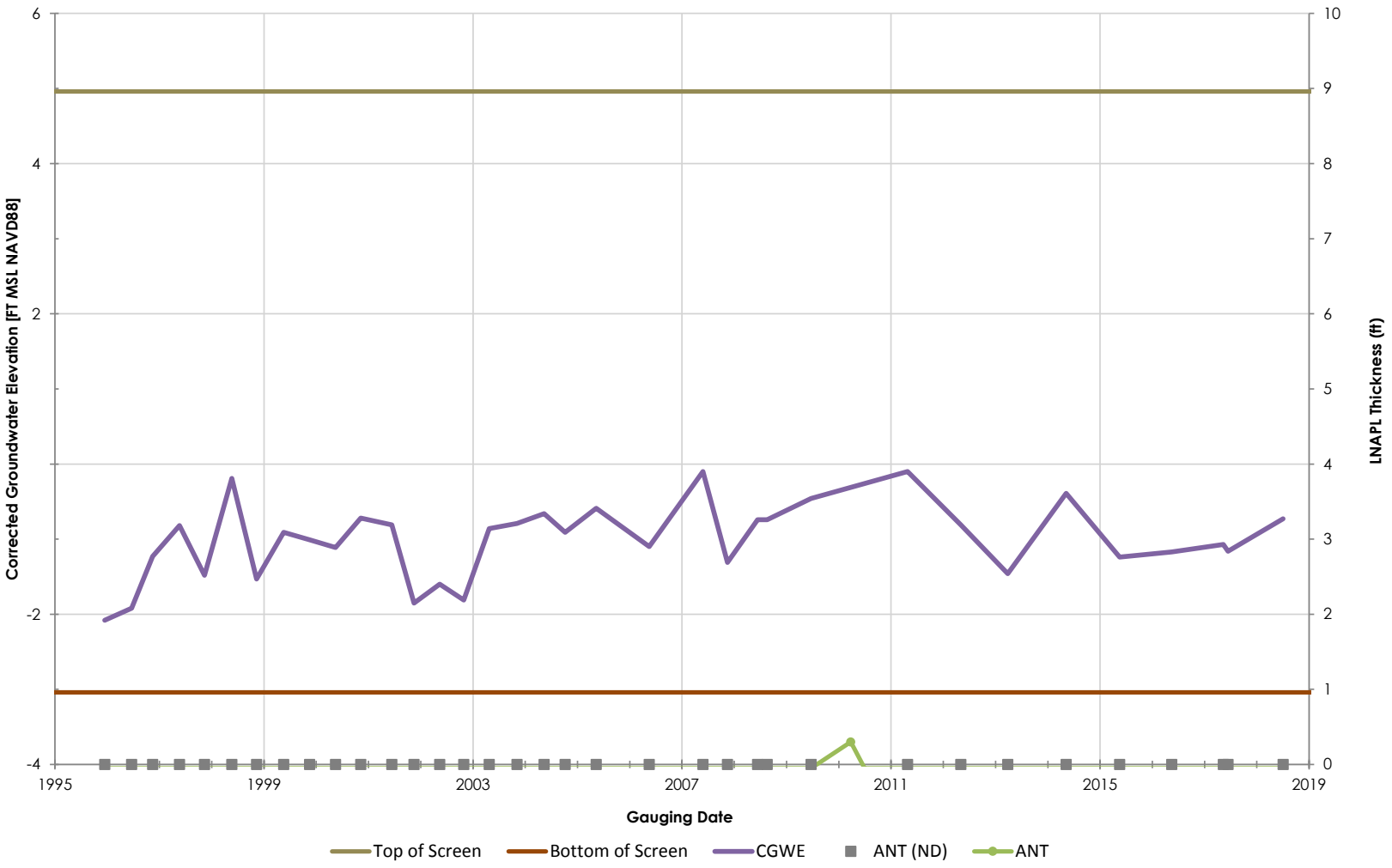
Stantec

Figure/Well No.

W-5

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

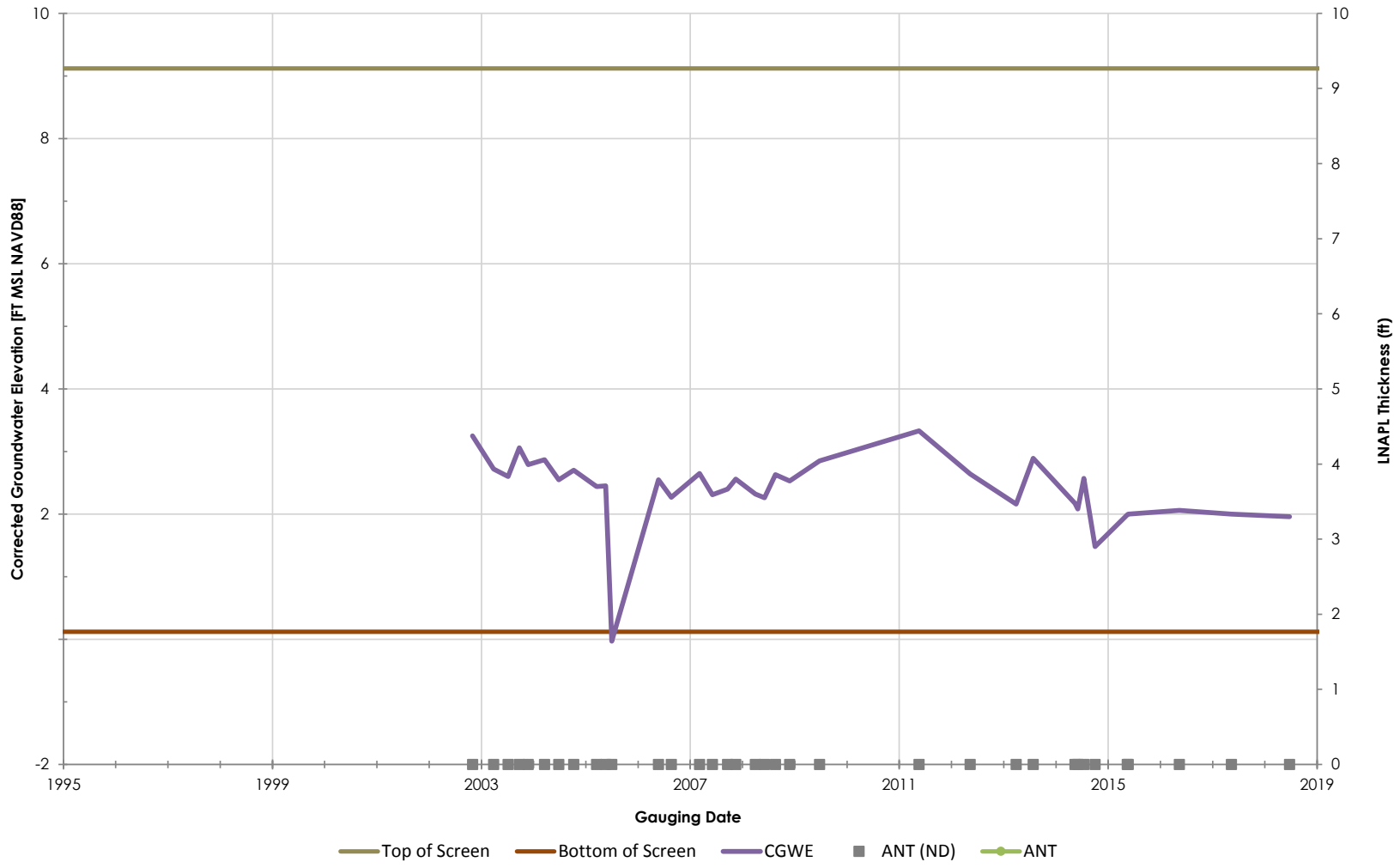
Stantec

Figure/Well No.

W-9

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

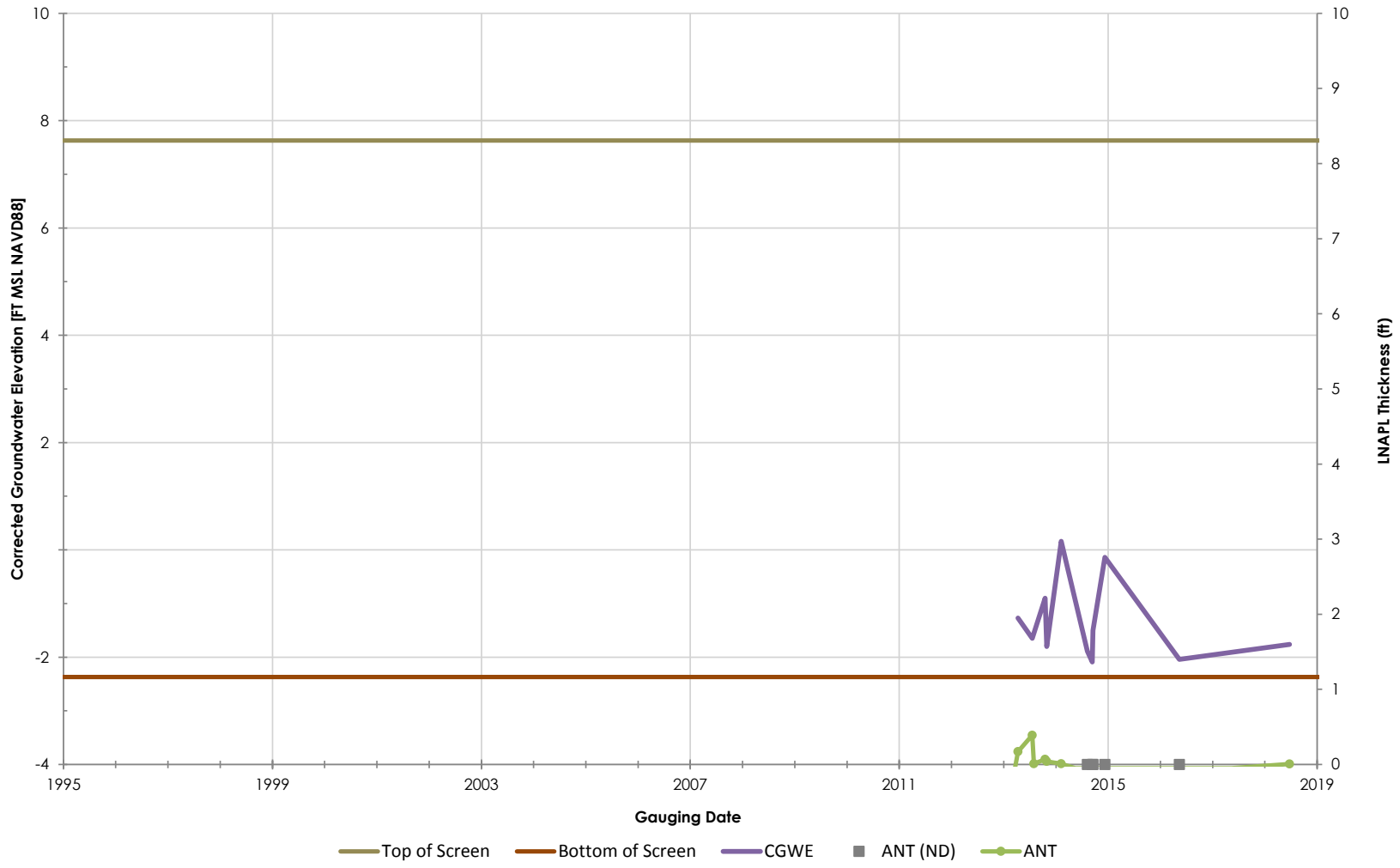
Stantec

Figure/Well No.

WP-14

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

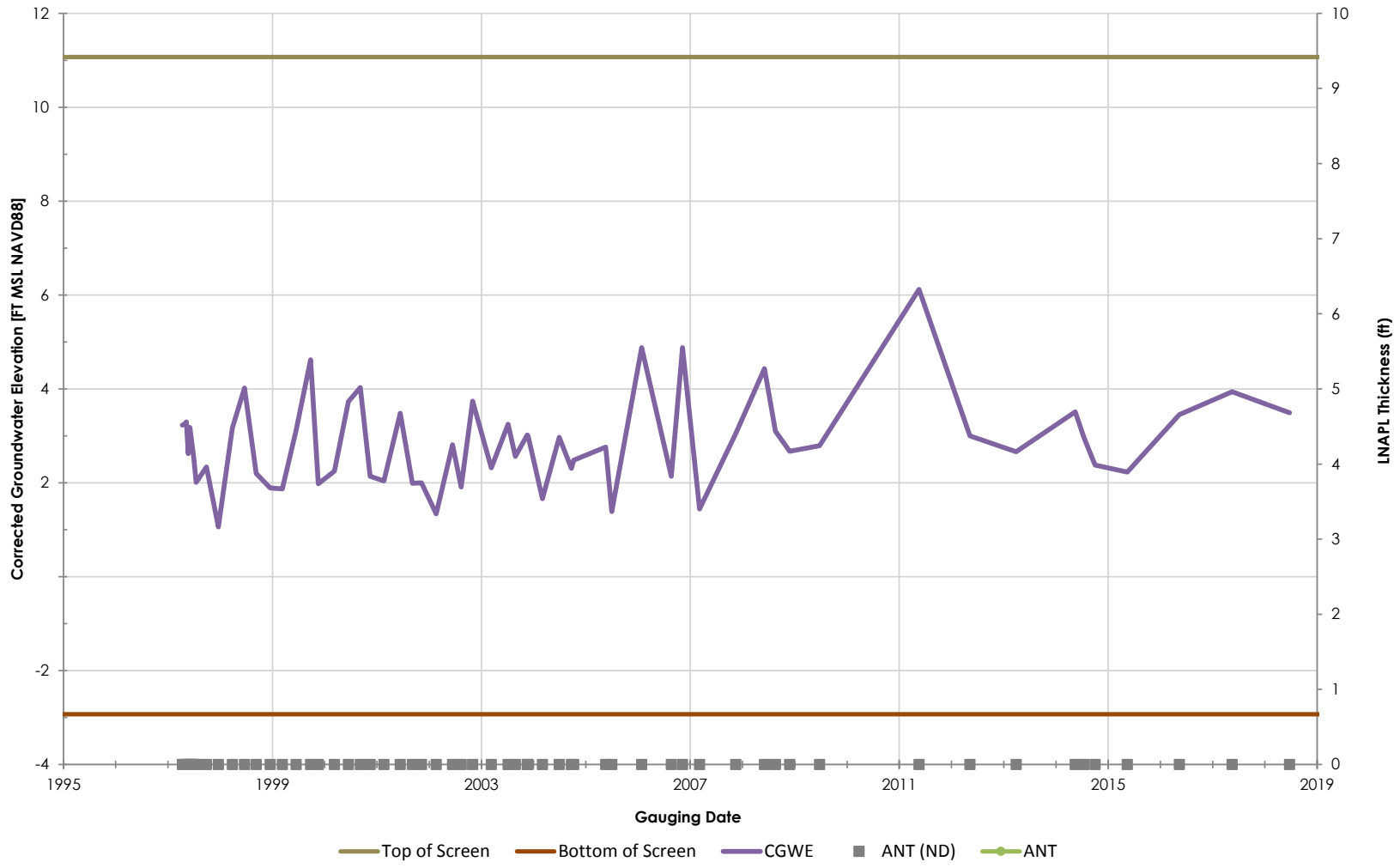
Stantec

Figure/Well No.

WP14-2

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

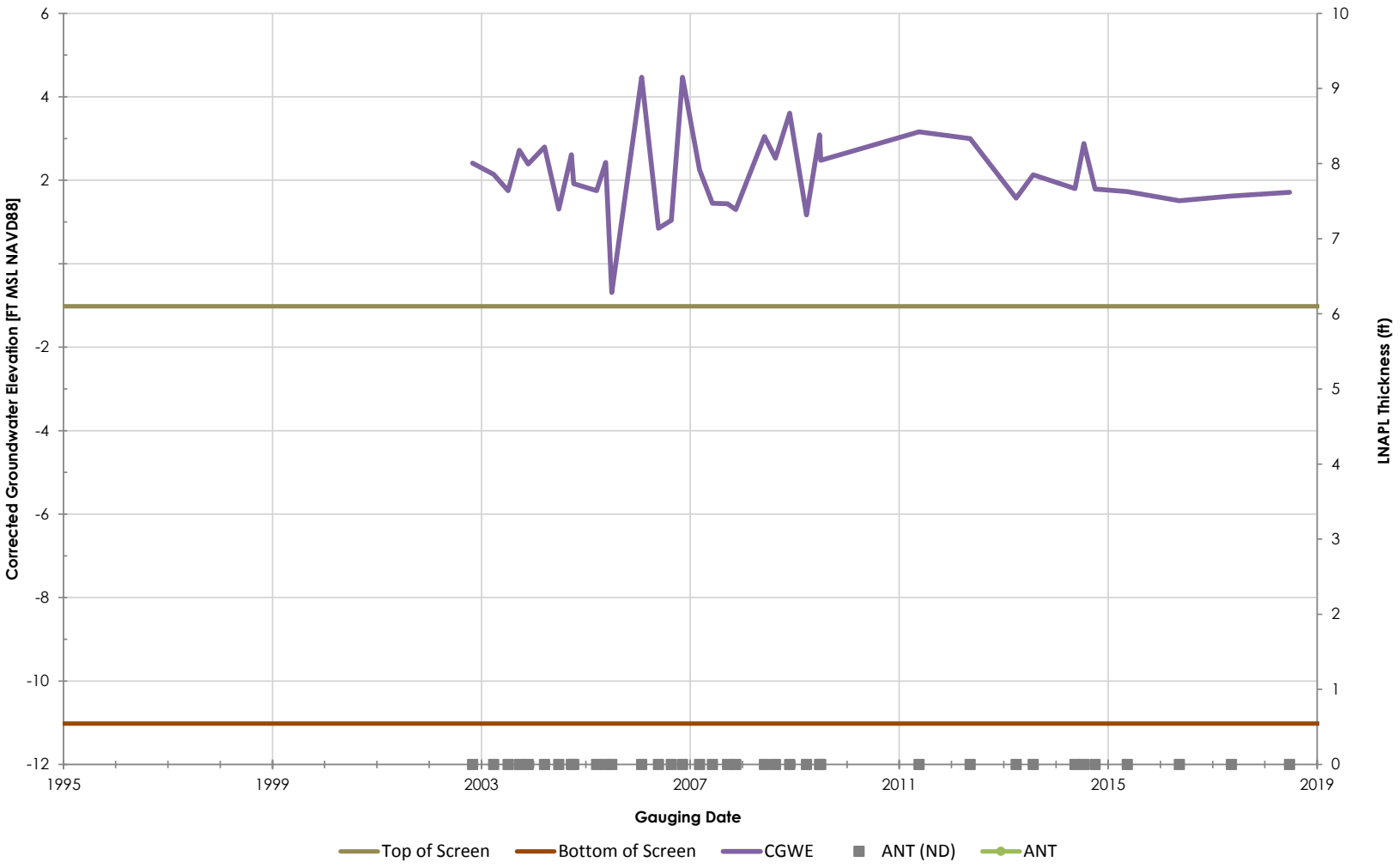
Stantec

Figure/Well No.

WP16-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

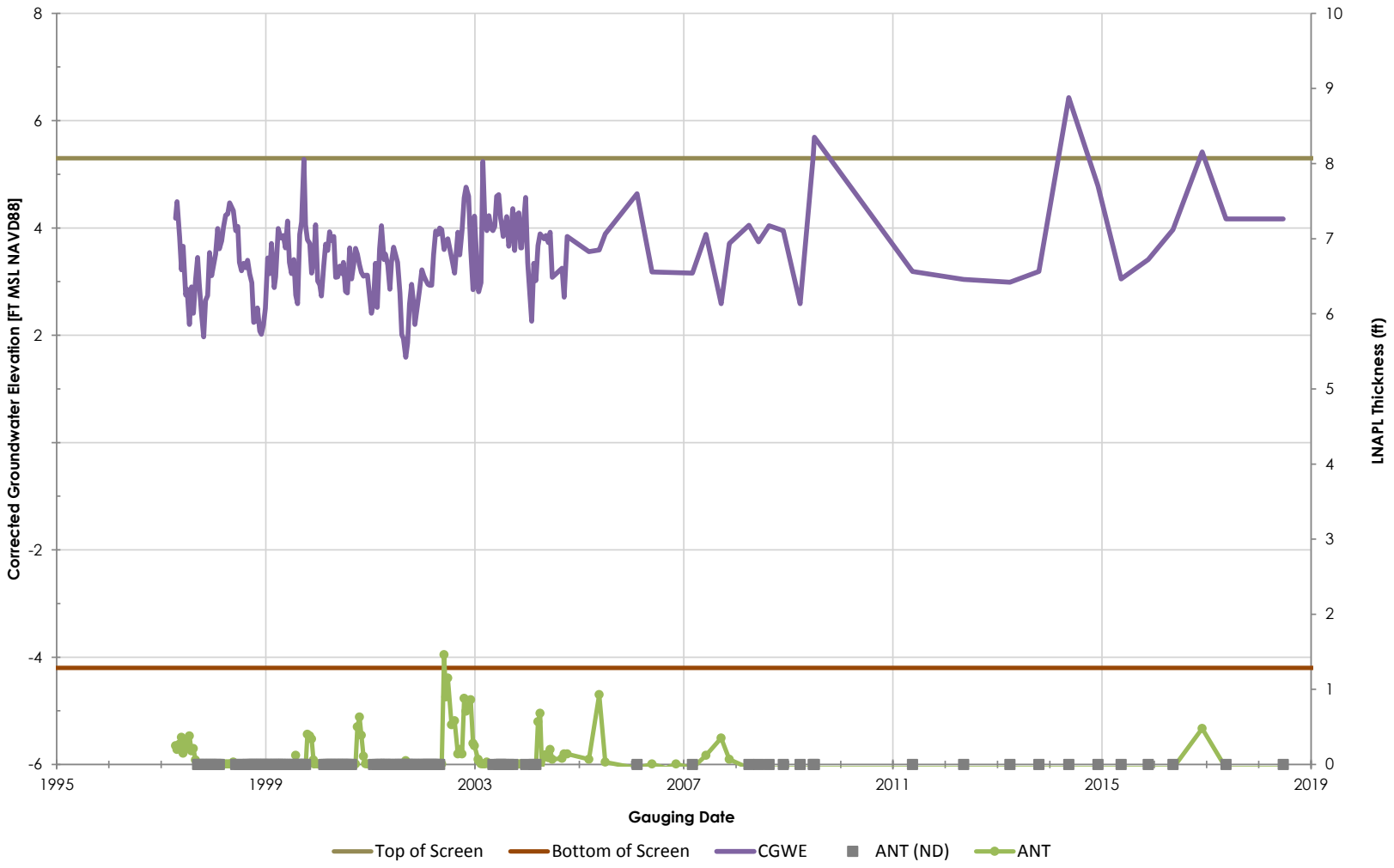
Stantec

Figure/Well No.

WP-8

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

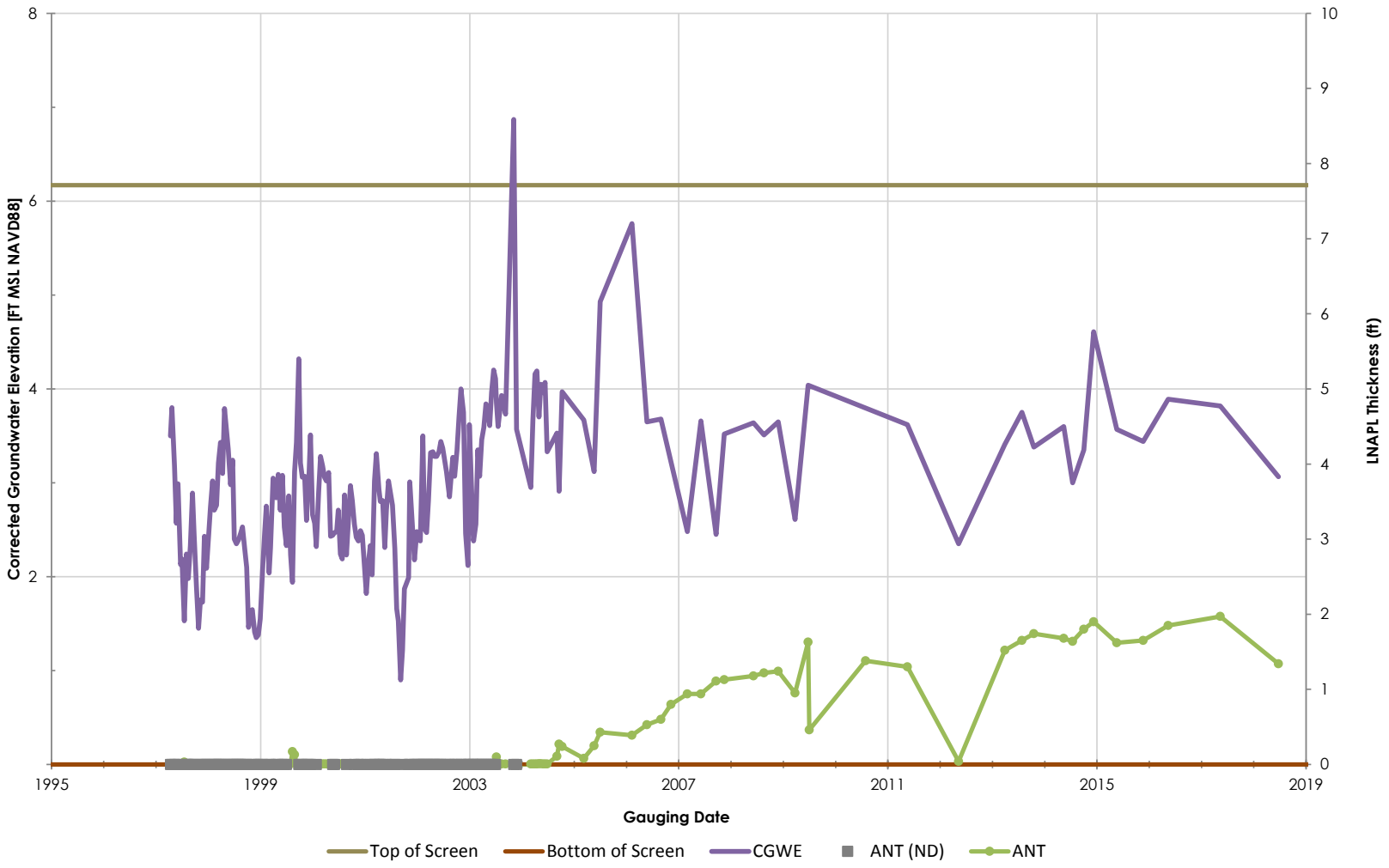
Stantec

Figure/Well No.

WP9-4

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

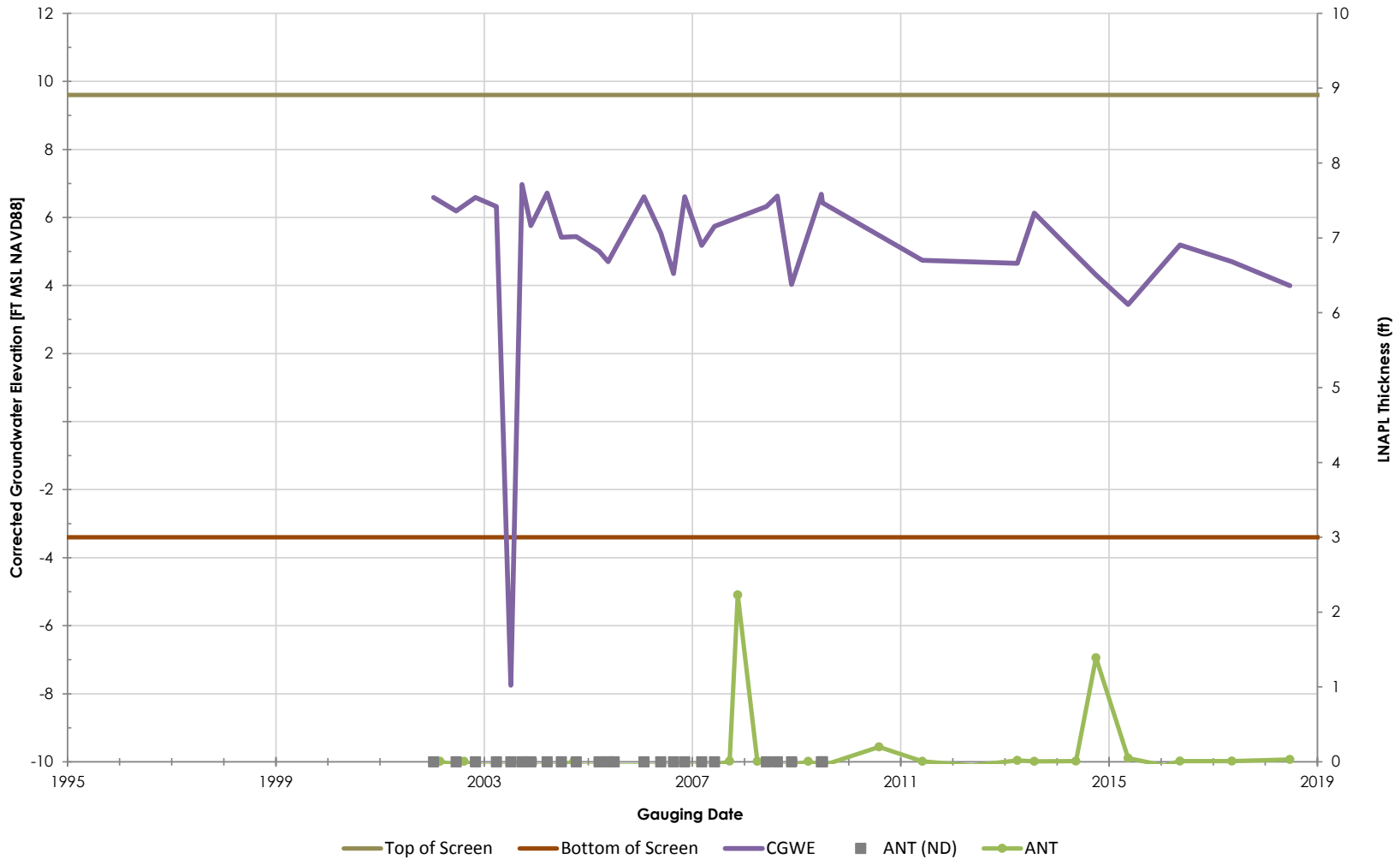
Stantec

Figure/Well No.

WP9-8

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

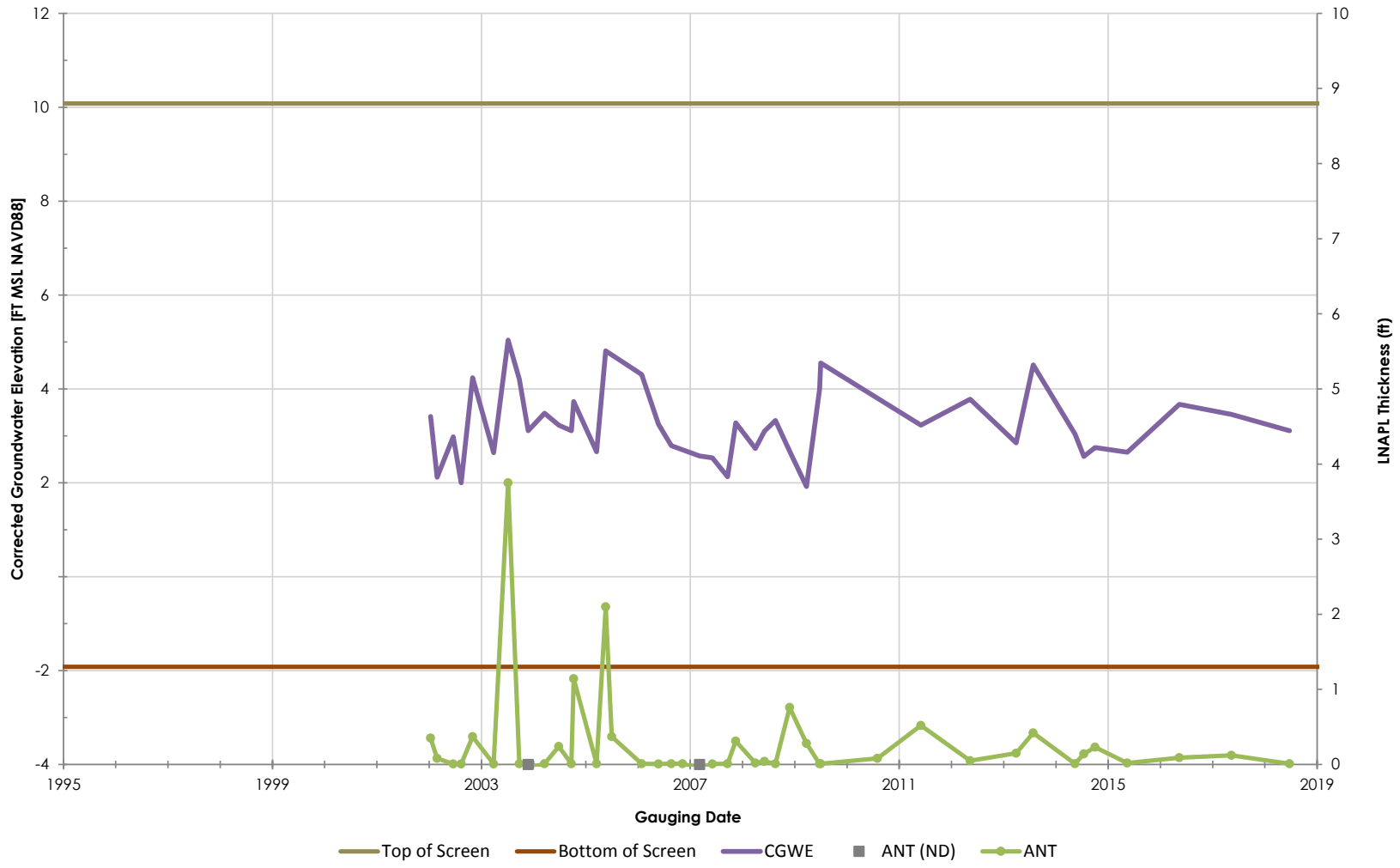
Stantec

Figure/Well No.

WP-A

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

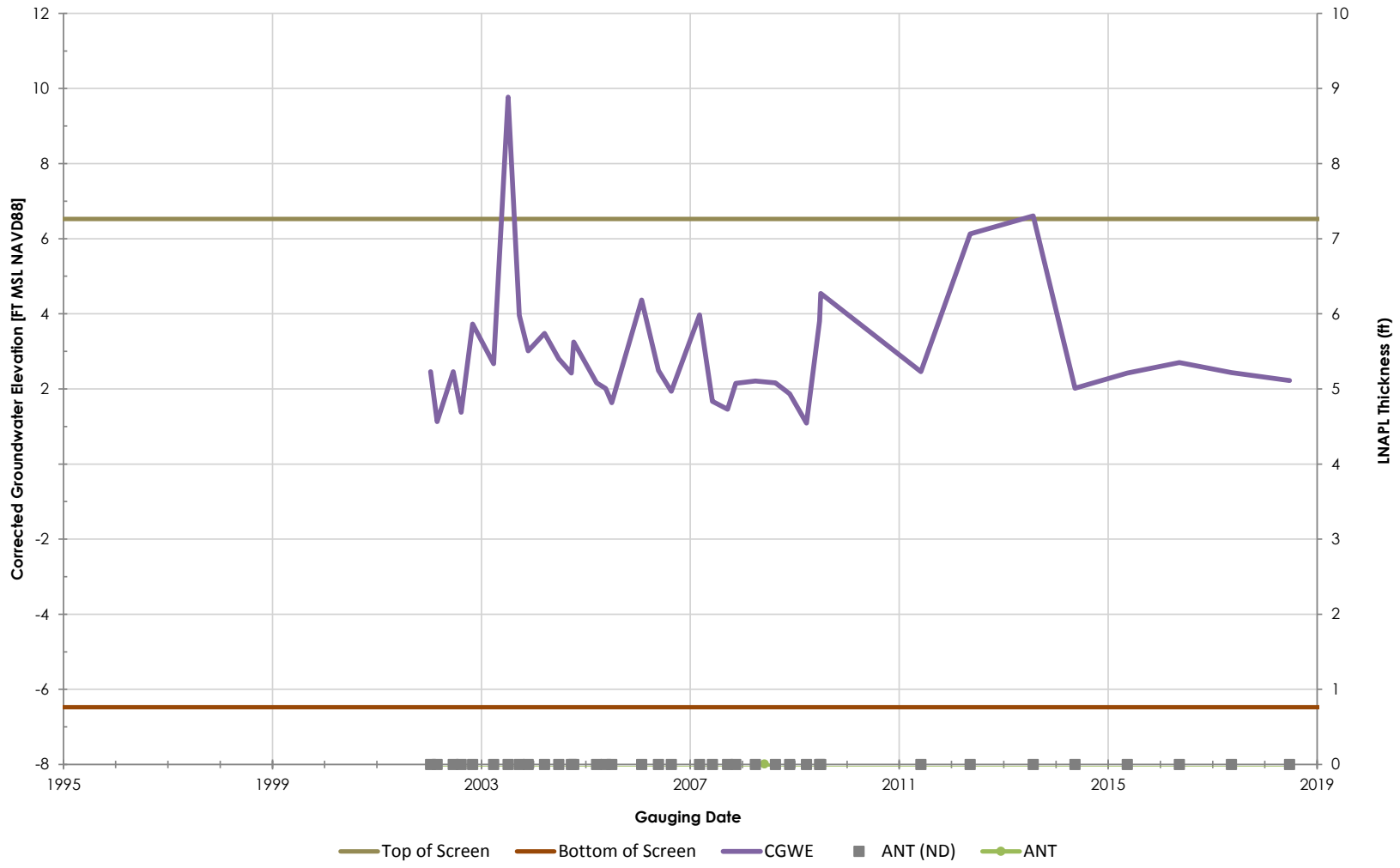
Stantec

Figure/Well No.

WP-B

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

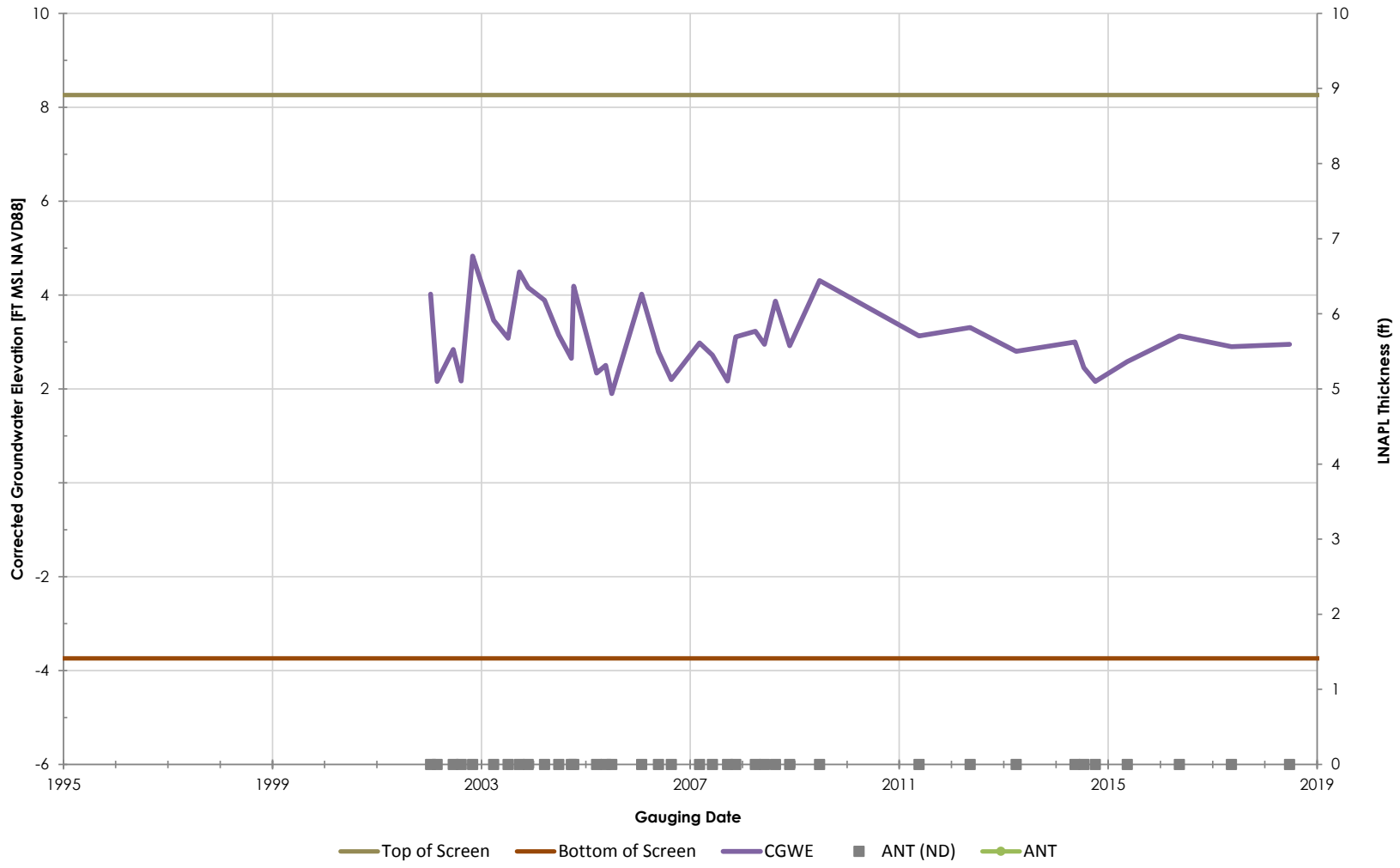
Stantec

Figure/Well No.

WP-C

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

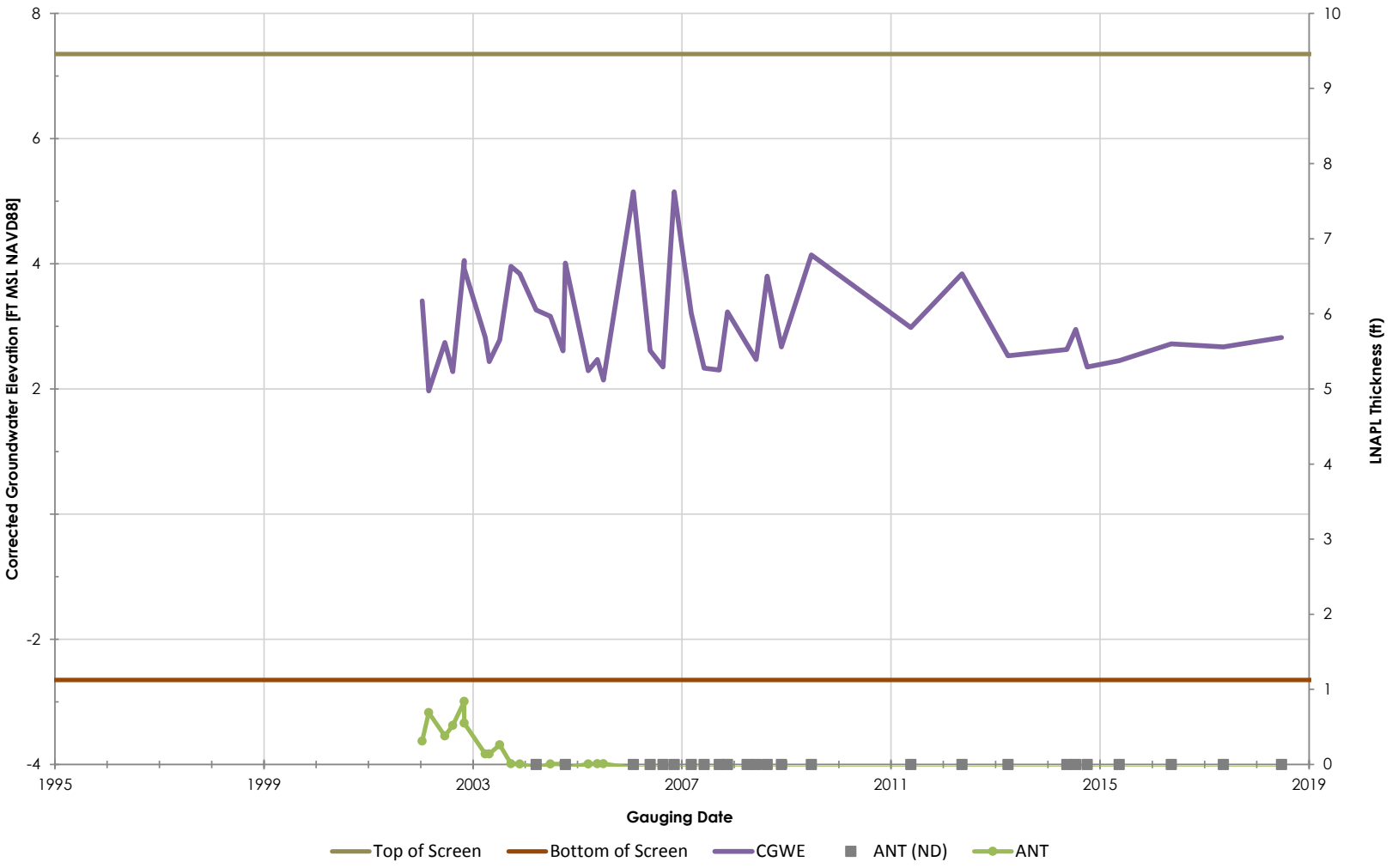
Stantec

Figure/Well No.

WP-D

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

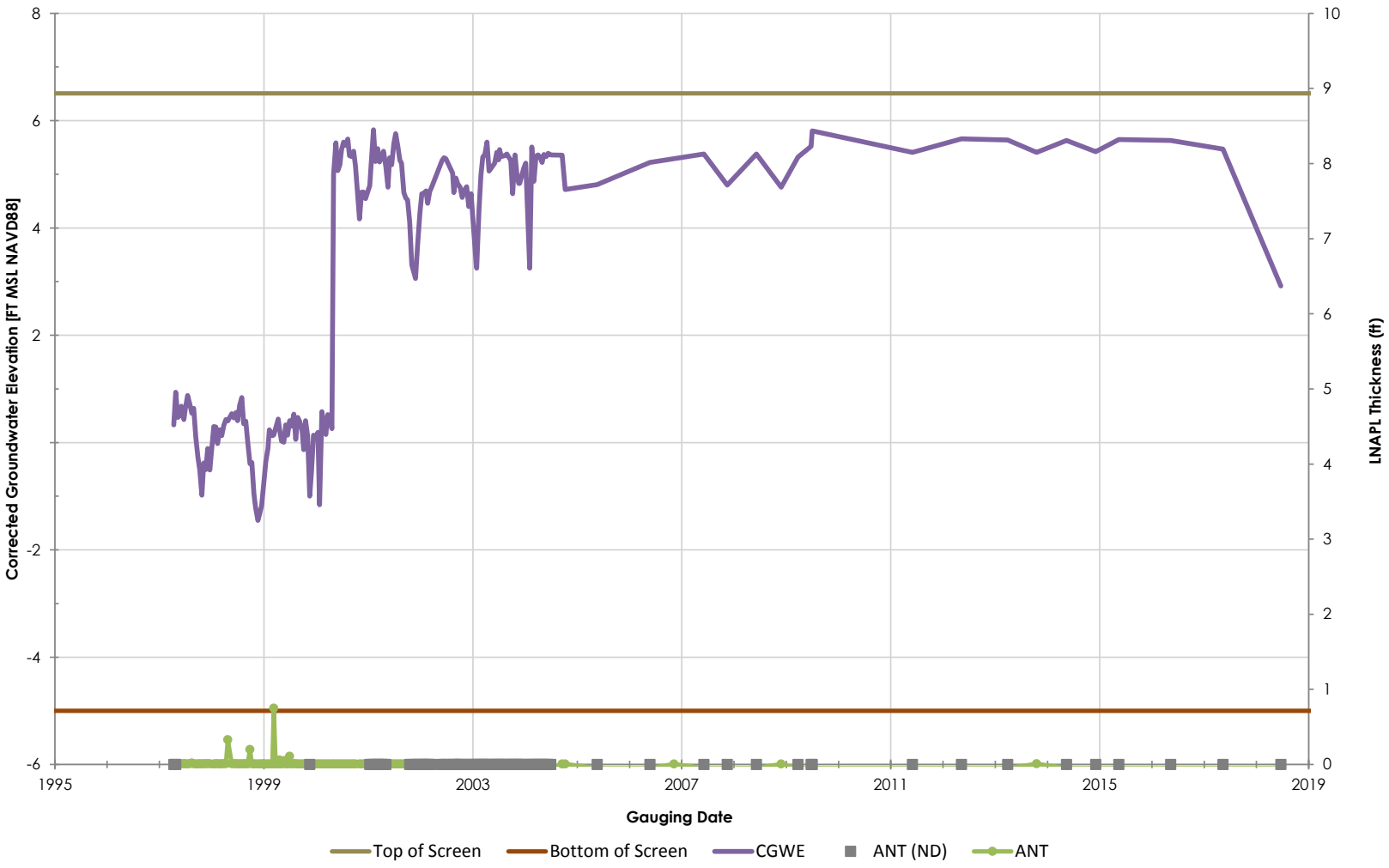
Stantec

Figure/Well No.

WP-E

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

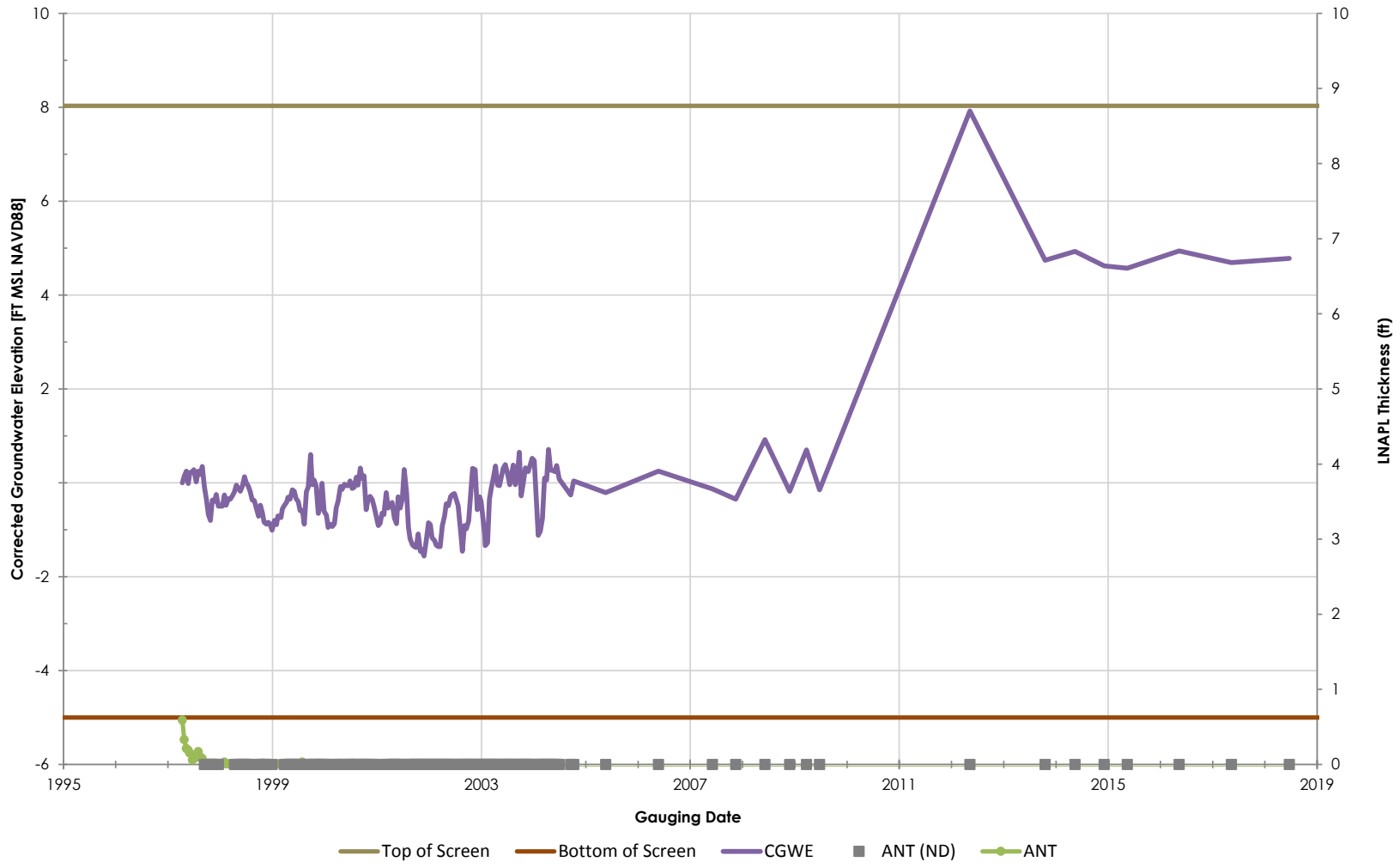
Stantec

Figure/Well No.

WPM-11

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness



Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC
Philadelphia Refining Complex
3144 Passyunk Avenue
Philadelphia, PA 19145

Stantec

Figure/Well No.

WPM-3

Title

Groundwater Elevation Hydrograph with Apparent LNAPL Thickness

APPENDIX C
PES BULKHEAD CONDITIONS SUMMARY (ANCHOR, 2017)

Sitewide Fate and Transport Remedial Investigation Report
Part 1 – Groundwater Flow Model
Former Philadelphia Refinery
Philadelphia, Pennsylvania
Philadelphia Refinery Operations,
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue, Philadelphia, Pennsylvania

Stantec

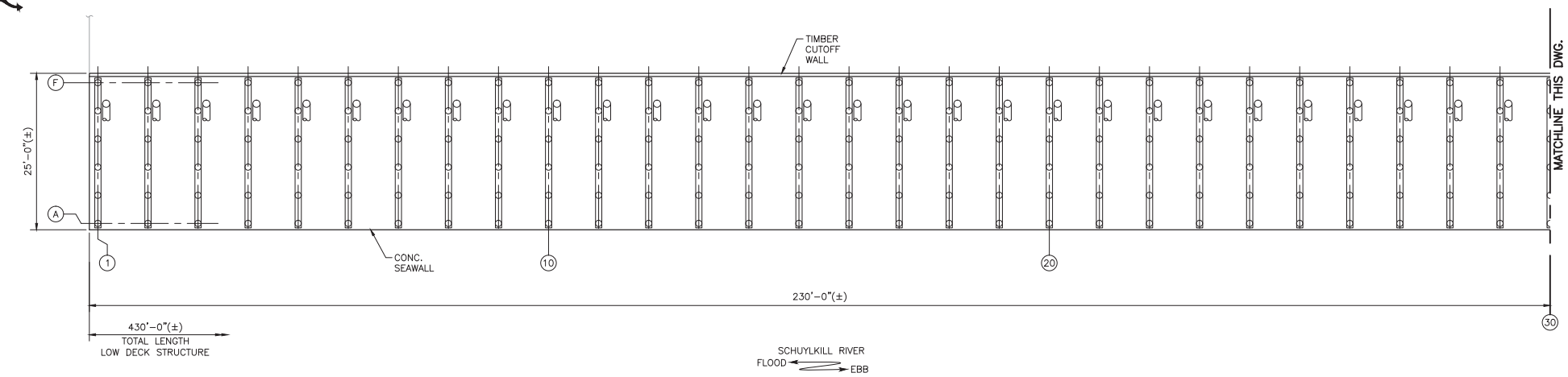
V. UPRIVER LOW DECK WHARF

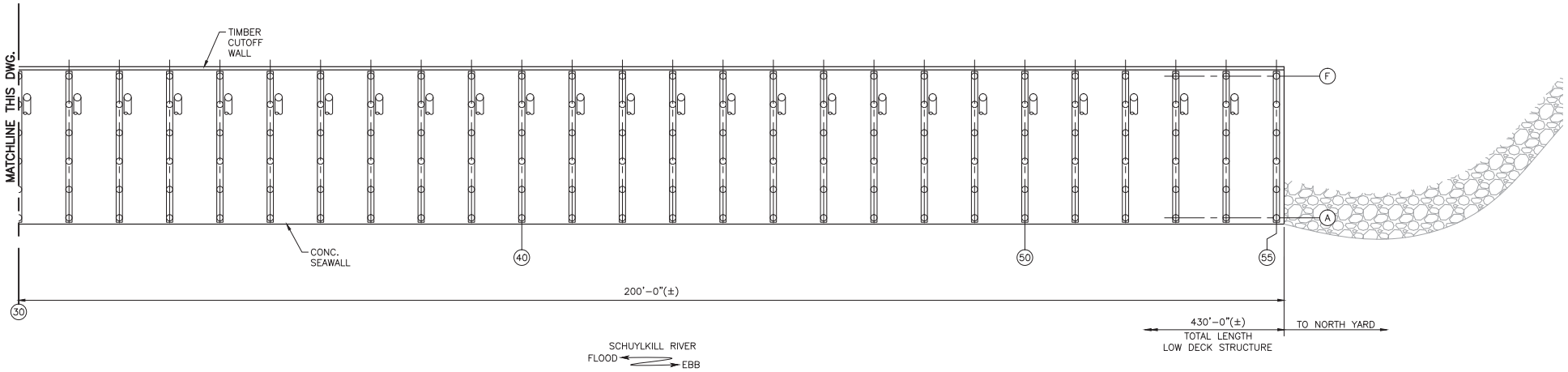
Photo 1: Upriver Low Deck Wharf. Picture taken from downriver, looking upriver.

Structure Description:

This wharf is located near the upriver (North) end of PES Property. The year of construction for the Upriver Low-Deck Wharf is unknown. The coordinates of this dock are 39°55'40.00"N and 75°12'38.00"W. The dock's original function was to accommodate the loading and unloading operations of vessels serviced at this dock. Currently, the structure is not used for vessel operations and is not subjected to vessel berthing and mooring loads. The dock is overgrown with vegetation and trees along the waterside edge of the dock. A 3 ft. high stockpile of fill material exists along almost the entire length of this wharf. The O/S toe of this stockpile is approx. 17 ft. I/S of the O/S face of the dock. The I/S toe of the stockpile is at approx. 85 ft. I/S of the O/S face of the dock. The presence of stockpile material discourages vehicular and personnel access to the dock structure. The dock is currently subjected to the surcharge loads from fill, trees and occasional personnel access.

The Upriver Low-Deck Wharf is approximately a 430 ft. x 25 ft. timber low deck wharf structure supported on timber pile bents. Approx. fifty-five (55) bents spanning in the I/S–O/S direction and spaced at an average of 8’-0” on center support the low deck. Each bent is composed of six (6) - 12” dia. timber plumb piles and one (1) batter pile. The plumb piles in each bent are shouldered and clamped using (2) – 6x12 timber clamps and two (2) - 1” dia. bolts, each. Plumb piles at each bent are also capped with a 6x12 timber cap. One (1) - 14” dia. timber batter pile, toed O/S, exists at each bent and is connected to the D/R clamp using two (2) 1” bolts. In this report, bents are numbered starting from the U/R end, continuing D/R. Plumb piles are lettered A through F from O/S to I/S. The timber pile bents support a timber low-deck comprised of 6x12 timber planks. Low deck is located at approx. elevation of +2’-0” MLW and supports earthen fill contained within the concrete seawall that runs along the O/S, U/R and D/R edge of the structure. The concrete seawall is approximately 7’-6” tall & 2’-0” wide at top. A timber cutoff wall exists approx. 25’-0” inboard of the outshore face of the concrete seawall and is comprised of 12” wide timber sheets. ML elevation at the face of the concrete seawall is approx. -4’-0” MLW at the U/R end and +2’-0” at D/R end; ML elevation at the cutoff wall is approx. -0’-6” MLW at the U/R end.





ISSUED FOR INFORMATION
DATE: 11-28-17

UPRIVER LOW DECK WHARF

SCALE: 1/8" = 1'-0"

LEGEND:

- ○ TIMBER PLUMB PILE
- TIMBER BATTER PILE

NOTES:

1. DRAWING ISSUED FOR INFORMATION ONLY. SHOWN EXIST DIMENSIONS & ELEVATIONS ARE APPROXIMATE.

CLIENT NAME:	PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.:	N/A
CLIENT LOCATION:	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	FNY	AN	11-28-17

UPRIVER LOW DECK WHARF

TRIENNIAL INSPECTION

SHEET NO.: 1 OF 2 DRAWING NO.: GA-1

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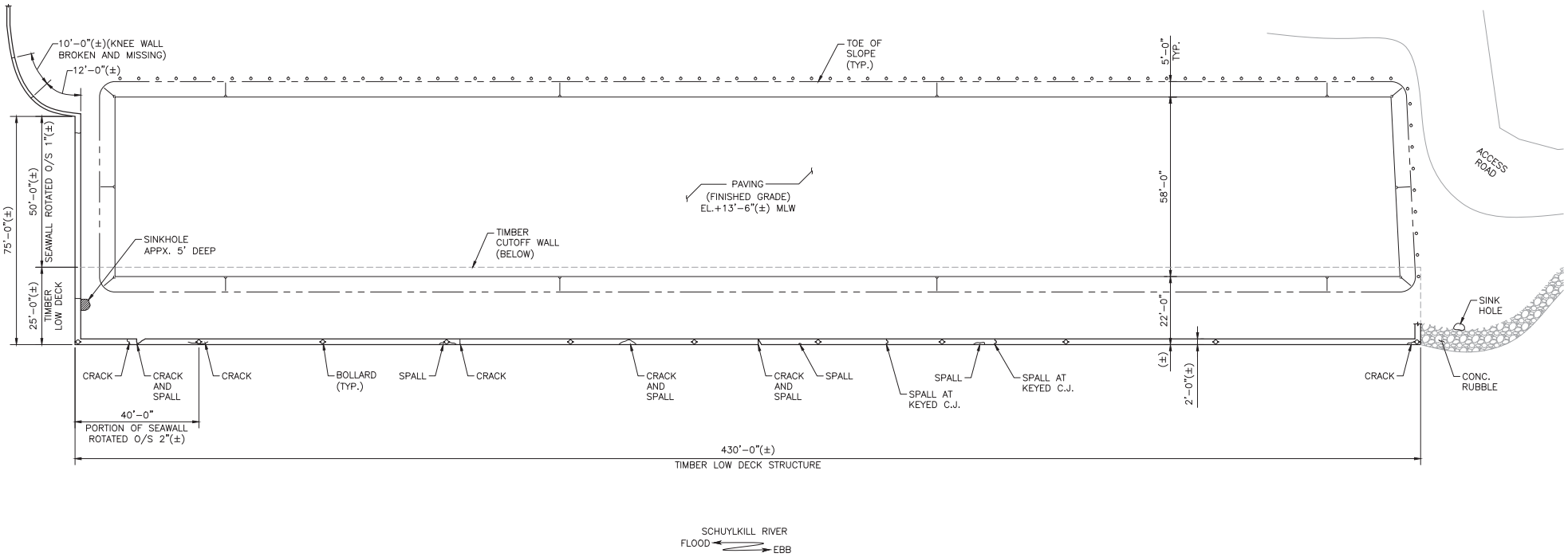
1224 BALTIMORE PIKE, SUITE: 205
CHADDS FORD, PA 19317
TEL. (610) 945-1839, FAX. (610) 945-2001

ANCHOR PROJECT NO.:	17-03-3036
DESIGNED BY:	APPROVED BY: AN
DRAWN BY: FNY	DATE: 11-28-17
SCALE: AS NOTED	



UPRIVER LOW DECK WHARF

SCALE: 1/16" = 1'-0"

ISSUED FOR INFORMATION
DATE: 11-28-17

LEGEND:

- DEPRESSIONS
- MOORING BOLLARD
- PIPE BOLLARD

NOTES:

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CLIENT PROJECT NO.:	N/A
CLIENT LOCATION:	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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A	ISSUED FOR INFORMATION	FNY	AN	11-28-17

UPRIVER LOW DECK WHARF
TOP SIDE FEATURES

TRIENNIAL INSPECTION

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DESIGNED BY:	APPROVED BY: AN
DRAWN BY: FNY	DATE: 11-28-17
SCALE: AS NOTED	

VI. NORTH YARD TERMINAL

Structure Description:

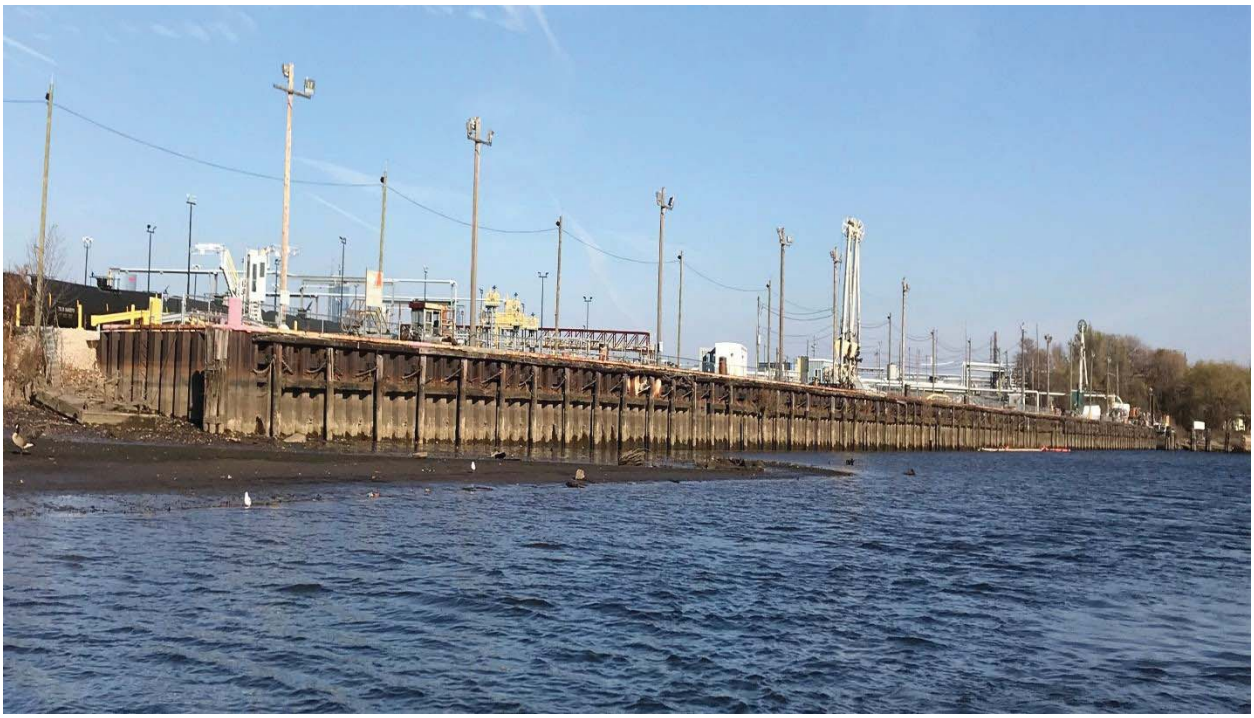
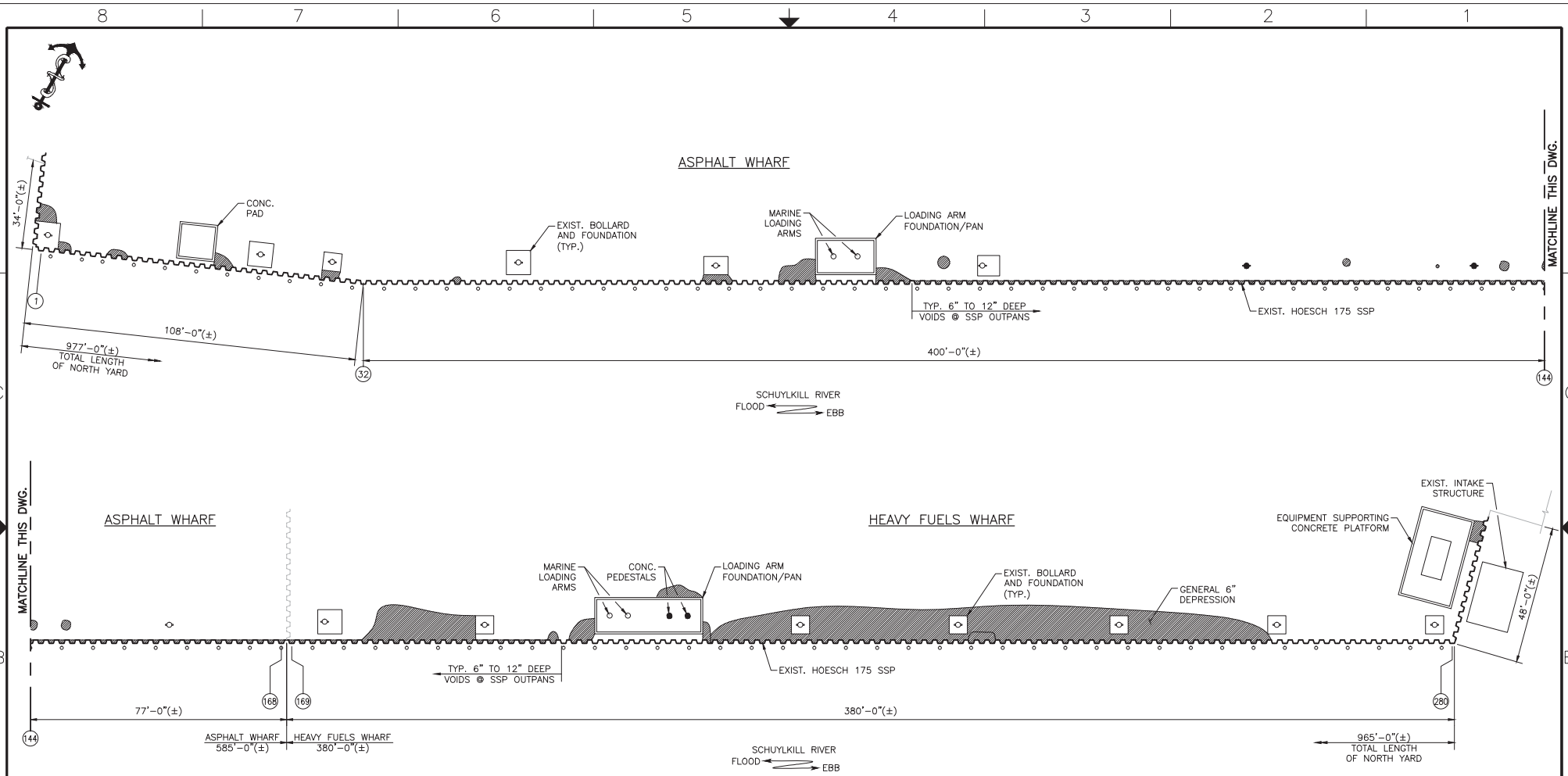


Photo 1: North Yard Terminal. Picture taken on downriver end, looking upriver.

PES North Yard Terminal is located on the North bank of the Schuylkill River, approx. 1,100 ft. upriver of the Passyunk Avenue Bridge. The coordinates of this wharf are 39°55'18.00"N and 75°12'22.00"W. The facility is approximately 965 LF long and consists of two docks, Asphalt Wharf (upriver 585 ft.) and Heavy Fuels Wharf (downriver 380 ft.). North Yard Wharf was originally a timber low deck structure supported on timber pile bents. Circa 1979, a steel sheet pile (SSP) bulkhead comprised of Hoesch 175 SSP sections was constructed to encapsulate the original timber low deck structure and the space between the timber low deck and mudline filled with un-compacted soil fill through holes cut in the timber low deck. Three (3) inch diameter tie-rods and a steel double channel wale bolted to the inshore face of the sheet piles tie the bulkhead to a landside pile supported anchor (not accessible during inspection). Tie-rods are spaced at 10’-4” on center and are located at an approximate elevation of +4’-0” MLW. Based on historical drawings, the top of the SSP is at an approximate elevation of +12’-3”. During inspection, the SSP outpans were numbered starting at the upriver end of the wharf. Mud-flats exist at low-tide at the upriver end of the wharf. Existing mudline elevations at the face of the wharf are estimated to range from +1’-0” to -11’-0”.

A total of five (5) timber pile clusters exist at the North Yard Terminal. Four (4) clusters are located at the downriver end between the North Yard Wharf and the Fire Boat Dock and one (1) cluster is located at the upriver end. These clusters are comprised of 12” to 14” diameter timber piles and the number of timber piles in each cluster varies from 7 to 11. Piles of a cluster are tied together at the top using six (6) or seven (7) wraps of steel wire ropes.

At one time, the North Yard wharves were used for berthing and mooring of vessels to accommodate loading and unloading of products via marine loading arms installed at the Asphalt and Heavy Fuels wharf, each. These wharves are currently not being used for the vessel operations, but are subjected to the self-weight, dead loads and loads associated with existing equipment. Topside finished grade is comprised of gravel. Numerous mooring bollards on concrete footings exist topside. Concrete platforms supporting the marine loading arms exist at Asphalt Wharf and Heavy Fuels Wharf. A new equipment supporting concrete platform also exists at the downriver end of North Yard. See drawing GA-1 for the facility layout.



ISSUED FOR INFORMATION
DATE: 01-01-18

NORTH YARD TERMINAL
SCALE: 1/16" = 1'-0"

LEGEND:

- DEPRESSIONS
- MOORING BOLLARD
- TIMBER FENDER PILES
- (X) OUTPAN DESIGNATION
- SSP STEEL SHEET PILE

NOTES:

1. DRAWING ISSUED FOR INFORMATION ONLY. SHOWN EXIST DIMENSIONS & ELEVATIONS ARE APPROXIMATE.
2. TIMBER FENDER SYSTEM CHOCKS AND WALES NOT SHOWN FOR CLARITY.

CLIENT NAME:	PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.:	N/A
CLIENT LOCATION:	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	FNY	AN	01-01-18

NORTH YARD TERMINAL

TRIENNIAL INSPECTION

SHEET NO.: 1 OF _ DRAWING NO.: GA-1

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CHADDS FORD, PA 19317
TEL. (610) 945-1839, FAX. (610) 945-2001

ANCHOR PROJECT NO.:	17-03-J036
DESIGNED BY:	APPROVED BY: AN
DRAWN BY: FNY	DATE: 11-12-17
SCALE: AS NOTED	

VII. PHILADELPHIA FIRE DEPARTMENT FIRE BOAT DOCK

Photo 1: PFD Fire Boat Dock. Picture taken from downriver end of Dock.

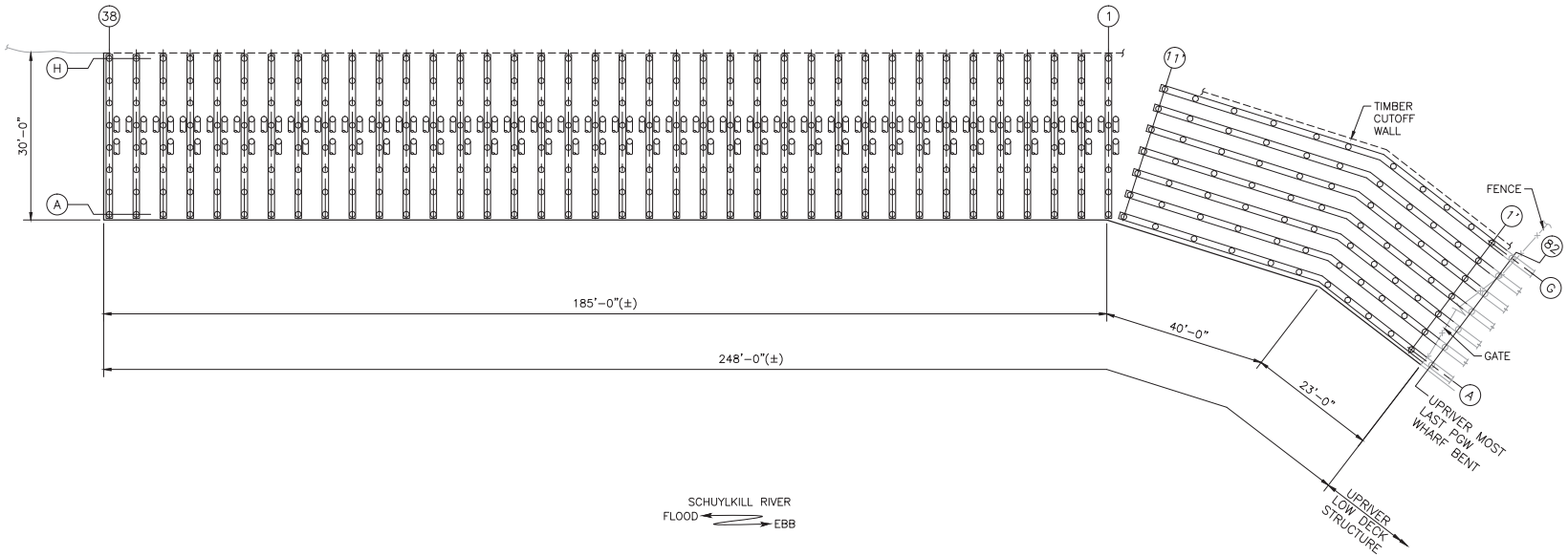
Structure Description:

The Philadelphia Fire Department (PFD) Fire Boat Dock is located on the East bank of Schuylkill River, approximately 825 ft. upriver of the Passyunk Avenue Bridge and immediately upriver of PGW Wharf. The coordinates of this dock are 39°55'18.50"N and 75°12'13.00"W. The Dock is currently used by the Philadelphia Fire Department to moor their Fire Boats. In addition to the self-weight and dead loads, the dock structure is subjected to live loads associated with pedestrian traffic and lateral loads from the mooring and breasting of Fire Boats.

The Fire Boat Dock is approximately a 248 ft. long timber low deck structure supported on timber pile bents. The D/R 63 ft. (±) of this wharf is a continuation of PGW Wharf Timber Low Deck structure where a total of seven (7) bents spanning in the U/R – D/R direction support the low deck. The U/R – D/R bents are designated with letters in this report, starting with Bent A at the outshore face. U/R-D/R bents are spaced at appx. 5 ft. with a cutoff wall located I/S of Bent G. Piles of each U/R – D/R bent are shouldered and

clamped with a pair of 6x12 timber clamps bolted to piles using 1” diameter bolt. Piles in each U/R – D/R bent are also capped with a 6x14 timber cap. The outshore-most U/R-D/R bent has eleven (11) - 12” dia. timber plumb piles within Fire Boat Dock property. Bent – A pile along with corresponding piles of interior U/R-D/R bents is referred to as a “Row” in this report. Pile Rows are numbered starting with Pile Row #1’ at the D/R end of Fire Boat Dock (first bent U/R of the fence between Fire Boat and PGW Wharves). An 8’-6” high seawall exists at this portion of the wharf. The low deck at this portion of the wharf consists of two (2) layers of 3x12 timber deck boards.

The upriver 185 ft. (±) of the Fire Boat Wharf is supported by pile bents that span in the I/S–O/S direction. Thirty-eight (38) bents spanning I/S–O/S exist at this portion of the dock and are numbered starting with #1 at the D/R end. Each I/S-O/S bent is composed of (8) - 12” dia. timber plumb piles lettered A through H from O/S to I/S and (3) - 14” dia. timber batter piles toed O/S. Two batter piles are connected to the D/R clamp while the third batter pile is connected to the U/R clamp using (1) - 1” dia. bolt, each. The plumb piles of each I/S-O/S bent are shouldered and clamped with 6x12 timber clamps bolted to the piles using 1” dia. bolts. Two (2) bolts have been used to connect each pile to the clamps. Plumb piles at each bent are capped with 6x16 timber cap. The bents support a timber low deck comprised of 12 inch wide timber deck boards and located at an approximate elevation of +3’-0” MLW. The low deck supports earthen fill contained within the concrete seawall running along the O/S and U/R edge of the structure. The concrete seawall is approximately 8’-0” tall and 2’-4” wide at top, at this portion of the dock. A timber cutoff wall exists inboard of the piles and is comprised of 12” wide timber sheets. Two 3x12 timber skirt boards exist below the seawall at the outshore face of the dock.



ISSUED FOR INFORMATION
DATE: 12-11-17

PHILADELPHIA FIRE DEPT. FIRE BOAT DOCK

SCALE: 3/32" = 1'-0"

NOTES:

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PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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PHILADELPHIA FIRE DEPT. FIRE BOAT DOCK

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SHEET NO.: 1 OF 1 DRAWING NO.: GA-1

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ANCHOR PROJECT NO.:	17-03-3036
DESIGNED BY:	APPROVED BY: AN
DRAWN BY: APB	DATE: 12-11-17
SCALE: AS NOTED	

VIII. PGW WHARF

Structure Description:

Photo 1: PGW Wharf. Picture taken from upriver end.

PGW Wharf is located on the east bank of the Schuylkill River, approximately 325 ft. upriver of the Passyunk Avenue Bridge and immediately downriver of the Philadelphia Fire Department Fire Boat Dock. The coordinates of this wharf are 39°55'17.00"N and 75°12'9.00"W. The facility is approximately 480 ft. long. The downriver, approximately 150 ft. length of this facility is a steel sheet pile bulkhead. The upriver, approximately 330 ft. length of the facility is a timber low deck structure. Top of structure elevation of approximately +11 ft. MLW was estimated based on field measurements. The timber low deck structure of PGW wharf may have originally been used for the loading and unloading operations of vessels however, no vessel mooring and berthing operations currently occur at this wharf. In addition to the self weight and dead loads, PGW wharf is presently subjected to loads associated with small existing buildings, temporary storage, pedestrian and occasional vehicular live loads. See drawing GA-1 for facility layout.

No historical drawings were available for the inspection. The structure description in this section is based on the observations made during our underwater investigation.

PGW Wharf Steel Sheet Pile Bulkhead

Photo 2: PGW Wharf Steel Sheet Pile Bulkhead. Picture taken from downriver end.

The downriver end of the approximately 150 linear ft. long steel sheet pile (SSP) bulkhead begins approximately 325 ft. upriver of the Passyunk Avenue Bridge. The downriver 100 ft. portion of the bulkhead consists of PZ32 steel sheet piles and is supported by twenty-five (25) HP-batter pile bents and single HP-batter piles, numbered upriver to downriver. Fifteen (15) bents consist of HP12x53 plumb and batter piles, four (4) bents consisting of HP8x36 plumb and batter piles and six (6) single HP14x89 batter piles support this portion of the bulkhead. The pile bents and batter piles are connected to an HP12 wale located at an approximate elevation of +5'-6" MLW. A discontinuous lower HP12 wale is present at elevation +3'-9" MLW, spanning from HP Bents #4 through #7, #8 through #18 and #19 through #22.

The remaining upriver 50 ft. portion of the steel sheet pile bulkhead is also comprised of PZ32 Sheet Piles. Approximately, 2" diameter bolts are visible at El. +5'-6" MLW at the inpans. These bolts are spaced at 3'-9" on center and are accompanied by a 1¼" thick

bearing plate. Most likely, these bolts tie the bulkhead back to a structure located inboard of the bulkhead. Sheet pile outpans were numbered starting with 1 at the upriver end of the bulkhead. A 4 ft. diameter sewer outfall pipe with concrete headwall (set inshore) and steel grate exists near the downriver end of upriver tied back bulkhead. Fabricated sheet piles constructed using riveted plate exist at the upriver tied back portion of the bulkhead. Mudline elevations ranging from -9 ft. MLW to -12 ft. MLW currently exist at the bulkhead. See Photo 2.

PGW Wharf Timber Low Deck Structure

Photo 3: PGW Wharf Timber Low Deck Structure. Picture taken from upriver end.

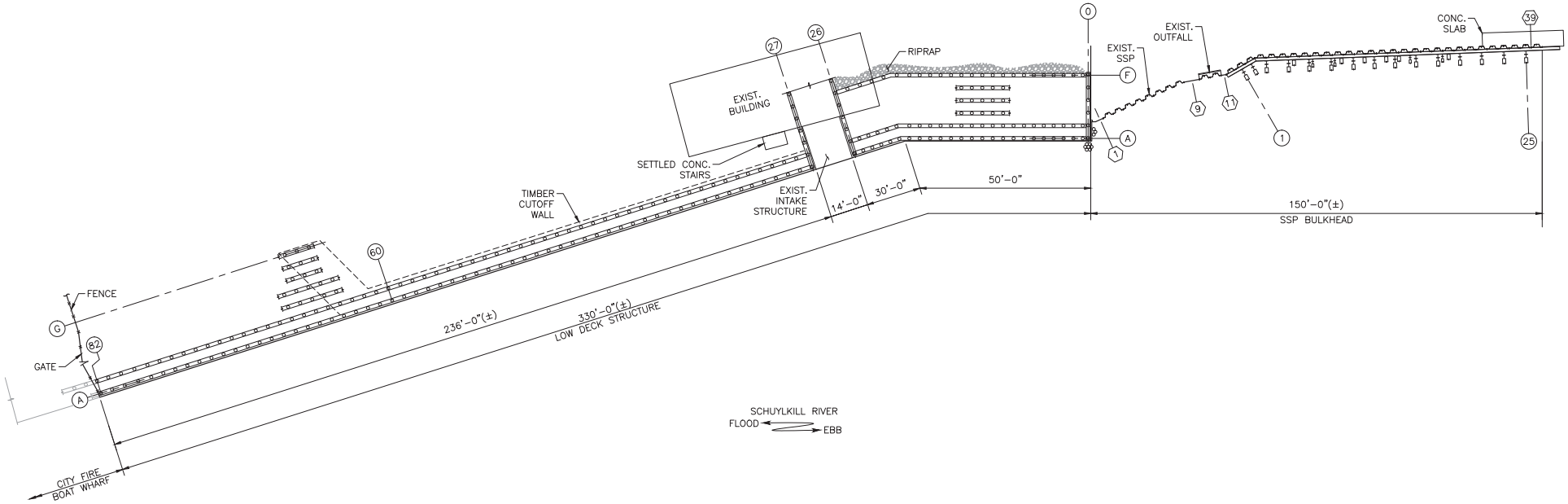
The PGW Wharf Timber Low Deck Structure is approximately 330 feet long and is supported on timber pile bents spanning in the upriver – downriver direction. A total of six (6) bents support the low deck and are lettered A thru F, outshore to inshore. The outshore-most bent spanning upriver – downriver was observed to be comprised of approximately eighty-two (82) 12” diameter timber plumb piles located at spacing varying from 1’-6” to 6’-0”. During inspection and for this report, front row piles were numbered starting at the downriver end. Corresponding piles of each bent, in the inshore – outshore direction, are referenced as a “Row” in this report. Three (3) bents spanning inshore to outshore were encountered at Pile Rows 1, 26 and 27. These bents were observed to be comprised of up to eight (8) - 12” diameter timber plumb piles and were located at the downriver end of the timber low deck structure and immediately upriver & downriver of the intake structure located approximately 80 ft. upriver of the downriver end of the timber low deck structure (Pile Rows 26 & 27).

Downriver of the intake structure, piles of Bent A are shouldered and clamped with a pair of 6x12 timber clamps bolted to piles with 1” diameter bolt. Piles in Bent A are also capped with 6x14 timber cap. The interior bents of the low deck structure, downriver of the intake structure are capped with a 12x12 cap. No clamps exist at the interior bents. No batter piles were encountered at the low deck, downriver of the intake structure. Stone rip-rap exists inboard of Bent F. A cutoff wall was observed inboard of the stone rip-rap between Pile Rows 24 and 26 however, the cut-off wall was inaccessible for inspection. See Photos 17 & 23.

Upriver of the intake structure, piles of Bent A and all interior bents are shouldered and clamped with a pair of 6x12 timber clamps bolted to piles with 1” diameter bolt. Piles in all bents are also capped with 6x14 timber cap. Batter piles, toed outshore & inshore were encountered between Bents A & B bolted to the outshore & inshore clamps of Bent B, respectively. Spacing of plumb and batter piles was observed to be inconsistent. A timber cutoff wall comprising of 12” timber sheets was encountered inboard of the pile bents at Pile Row 32. Cutoff wall typically runs parallel to concrete seawall but, its location is not consistent. Cutoff wall is located approximately 6 inches inboard of Bent B at majority of locations. Between Pile Rows 60 & 62, cutoff wall was encountered inboard of Bent F. Batter piles, toed inshore penetrate through the cutoff wall.

All timber pile bents of PGW low deck structure support a timber low-deck located at an approximate elevation of +2’-0” MLW. Decking appears to be comprised of two layers of 3x12 timber boards. See Photo 21. The timber low-deck supports earthen fill retained within the 8’-6” tall concrete seawall that runs along the entire face of the structure.

Fender system at this Wharf consists of 10x10 vertical and horizontal timber chocks bolted to the face of the concrete seawall. Horizontal chocks are spaced at 2’-0”along the height of the seawall. The vertical chocks are typically spaced at 5’-0” along the length of the concrete seawall.



PGW WHARF

SCALE: 1/16" = 1'-0"

LEGEND:

- (X) SSP OUTPAN NO.
- (X) BENT/PILE ROW NO.

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PGW WHARF

TRIENNIAL INSPECTION

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ANCHOR PROJECT NO.:	17-3-J036
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DRAWN BY: FNY	DATE: 01-01-17
SCALE: AS NOTED	

IX. CASE WHARF STRUCTURES

Photo 1: Case Wharf.

Structures Description:

Case Wharf is located on the East bank of the Schuylkill River, upriver of PES South Yard Terminal. The original Case Wharf was approximately a 550 linear feet timber low deck wharf starting at approximately 130 feet downriver of the currently existing Passyunk Avenue Bridge, extending downriver to the PES Short Wharf. The original construction of this wharf may have occurred prior to year 1910. Most of this wharf has collapsed over the years and has been replaced by stone rip-rap revetments and sheet pile bulkhead. An approximately 85 linear feet long timber low deck structure of the original Case Wharf remains at the upriver end of the wharf. The coordinates of the remaining timber low deck wharf are 39°55'10.00"N and 75°12'3.75"W. A concrete seawall marginal bulkhead exists at the upriver end of remaining timber low deck structure.

Timber Low Deck Structure

The remaining timber low-deck structure at PES Case Wharf is approximately 85 feet long. This wharf is currently not in use and has been barricaded to restrict personnel access. The Case Wharf timber low-deck structure is supported on seventeen (17) timber pile bents spanning in the inshore – outshore direction. Bents were numbered starting at the upriver end during our inspection. The spacing between bents is inconsistent and varies between 3'-0" to 5'-6". Historical drawings indicate that each bent is composed of seven (7) timber plumb piles labeled A through G, outshore to inshore. Only four (4) piles were observed during our inspection until a timber cut-off wall was encountered, which is not shown on the historical drawings. Plumb Piles - A are shouldered & clamped at outshore face only with a 3x12 timber clamp running in the upriver - downriver direction. Piles - A through D of each bent are clamped using only one 6x12 timber clamp bolted to the piles with a ¾" dia. bolt. The clamp is typically located on the downriver face of piles with a few exceptions. Piles of each bent are capped with a 12x14 timber cap running in inshore – outshore direction, which continues inshore of the timber cut-off wall. A timber cut off wall was encountered inboard of Pile D. During a 2014 inspection, a second timber cut off wall was encountered approx. 4'-0" inboard of the first cut off wall. The bents support a timber low deck composed of 12" wide deck boards, which support an approximately 7'-6" tall concrete coffer seawall consisting of concrete walls. One 3x14 timber skirt board is located below the concrete seawall and protects the A-row piles. The timber caps protrude through the skirt board. Mudline elevations at the face of the concrete seawall vary approx. between -2'-0" MLW to -20'-0" MLW. Shallow mudline was encountered at upriver end of the wharf.

The fender system of this wharf consists of a three (3) timber pile cluster located at the upriver end of the wharf and nine (9) - 8" to 10" diameter timber piles spaced at 10' c/c with a 10x12 timber high water chock bolted onto the outshore face of the concrete seawall.

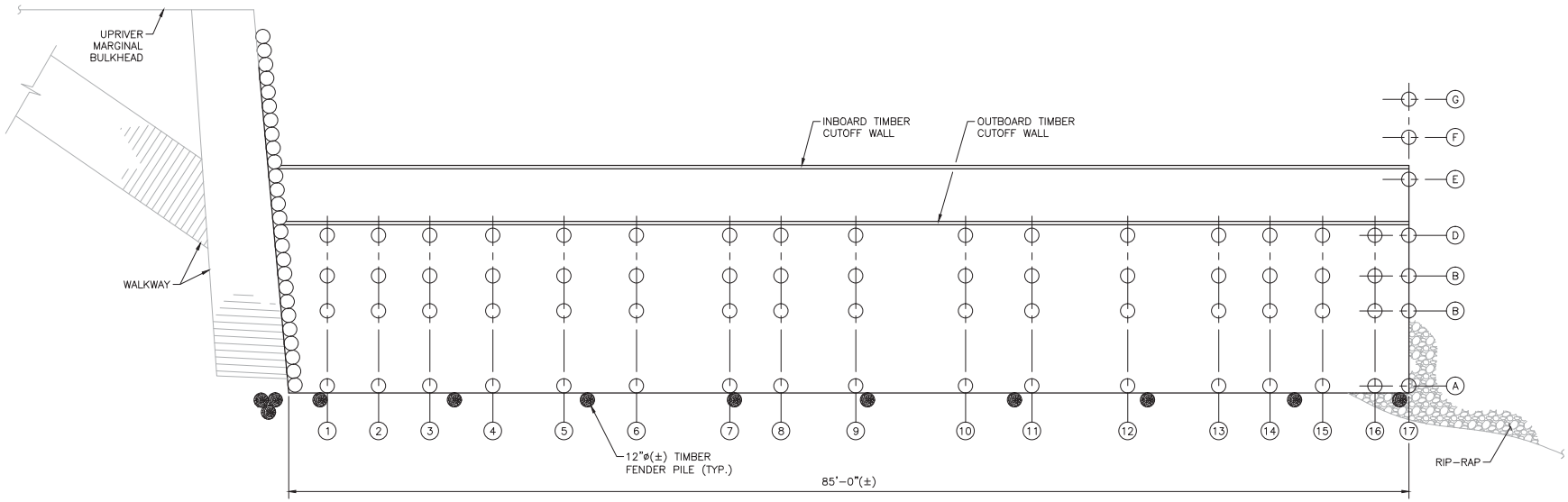
Rip-Rap Revetment

Stone rip-rap revetment was installed at the Case Wharf area of PES Refinery during two (2) separate collapse events. Stone rip-rap was installed at approximately 230 linear feet of shoreline immediately upriver of the Short Pier when a portion of the Case Wharf collapsed circa 2001 and is referred to as the "Downriver Stone Rip-Rap Revetment" in this report.

Another portion of Case Wharf, starting at approximately 210 feet downriver of the Passyunk Avenue Bridge (and immediately downriver of the timber low deck wharf) collapsed circa 2012. At this location, for approximately 130 linear feet of shoreline, rip-rap stone revetment was installed in 2012 and is referred to as the "Upriver Stone Rip-Rap Revetment" in this report.

Marginal Bulkhead

A Marginal Bulkhead exists landside of the upriver end of the Case Wharf. The marginal bulkhead consists of a concrete seawall with sand bags placed along the top of the wall that extends towards upriver and supports a steel stringer walkway that provides access to the upriver end of the case wharf. Another masonry wall exists just outshore of the bulkhead which also supports the steel stringer walkway. Masonry wall consists of masonry units, stone and mortar. Steel Stringer Walkway connects to an approximate 5' wide timber platform on the upriver end of Case Wharf.



CASE WHARF - PLAN

SCALE: 1/4" = 1'-0"

LEGEND:

○ TIMBER PLUMB PILE

NOTES:

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PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

CASE WHARF

SHEET NO.: 1 OF 1 DRAWING NO.: GA-1

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ANCHOR PROJECT NO.:	17-3-J036
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DRAWN BY: FNY	DATE: 01-05-18
SCALE: AS NOTED	

X. SOUTH YARD TERMINAL

Photo 1: South Yard Terminal steel sheet pile bulkhead. Picture near upriver end of wharf.

Structure Description:

PES South Yard Terminal is located on the East bank of the Schuylkill River, approximately 700 ft. downriver of the Passyunk Avenue Bridge. The coordinates of this wharf are 39°55'00.00"N and 75°12'7.00"W. The facility is approximately 1,140 ft. long and consists of two main wharves (Deloach Wharf and Short Wharf), Short Pier, Pollock Street Sewer, Water Intake Structure and a Combi-Wall. Deloach and Short wharves have an allowable dredge depth of 26 ft. plus 2 ft. and are used to service barges ranging from 200 ft. LOA to 365 ft. LOA.

An approximately 74 ft. long Short Pier exists at the upriver end of South Yard Terminal. This structure is a timber low deck structure with concrete seawall and supports pipe crossing under the river bed. The following downriver 450 linear feet of Terminal is referred to as the Short Wharf followed by approximately 450 linear feet of wharf referred to as the Deloach Wharf. Both wharves are constructed as a continuous marginal bulkhead. These wharves were originally constructed as timber low deck structures. Circa 1980, a SSP bulkhead was installed along the O/S edge of low deck structures and the space between the mudline and finished low deck filled with un-compacted fill. These wharves were rehabilitated again in year 2014 when additional W18x97 soldier piles spaced at 10'-4", a new fender system and stone rip-rap for scour protection were installed along the outshore face of the wharves. Pollock Street Sewer structure abuts the downriver end of Deloach wharf followed by an appx. 136 ft. long Combi-wall. The Combiwall was installed circa 2014 to renew a failed section of bulkhead at this location. A Water Intake structure forms the downriver end of this Terminal.

See Photo 1 and Drawing GA-1 for the layout of South Yard Terminal.

South Yard Terminal Steel Sheet Pile Bulkhead

The sheet pile bulkhead forming the outshore face of Short Wharf and Deloach Wharf is a tied-back steel sheet pile (SSP) bulkhead comprising of Hoesch 175 SSP sections. 3" dia. tie-rods and a wale bolted to the inshore face of the sheet piles (not visible during inspection). The tie rods connect the SSPs to various types of anchors located inland. Based on historical drawings, top of SSP and dock finished grade is at an approximate elevation of +13'-3" MLW. Tie-rods are spaced at 10'- 4" on center and are located at elev. +5'-0" & +7'-3" MLW. Hoesch 175 SSP section has original flange thickness of 0.550" and original web thickness of 0.390". Fifteen (15) mooring bollards, marine loading arms and hoses supported on concrete foundations are present topside. The topside finished grade consisting of gravel. South Yard Terminal wharves are subjected to loads due to self-weight, dead loads associated with existing building structure, product pipes and other light structures, pedestrian and light vehicular traffic loads, and berthing and mooring loads of vessels. Mudline elevations ranging from -34 ft. MLW to -37 ft. MLW currently exist at these wharves.

Remnants of an old timber fender system at South Yard Terminal wharves still exist and is comprised of Timber Fender Piles of various size anchored to the SSP bulkhead using chains and padeyes. Fender piles are backed by 10"x10" extruded rubber fender elements. Rubber fender elements are mounted to a steel plate spanning three (3) SSP outpans. Fender system has an upper timber wale at +13'-0" MLW and lower timber

chocks spanning between fender piles at elev. +5’-0” and +7’-3” MLW, but the upper timber wale is mostly missing. A newer engineered fender system was installed during a rehabilitation project circa 2014 which is comprised of 800 mm arch fenders spaced at approximately 31’-0”.

Short Pier Timber Low Deck Structure

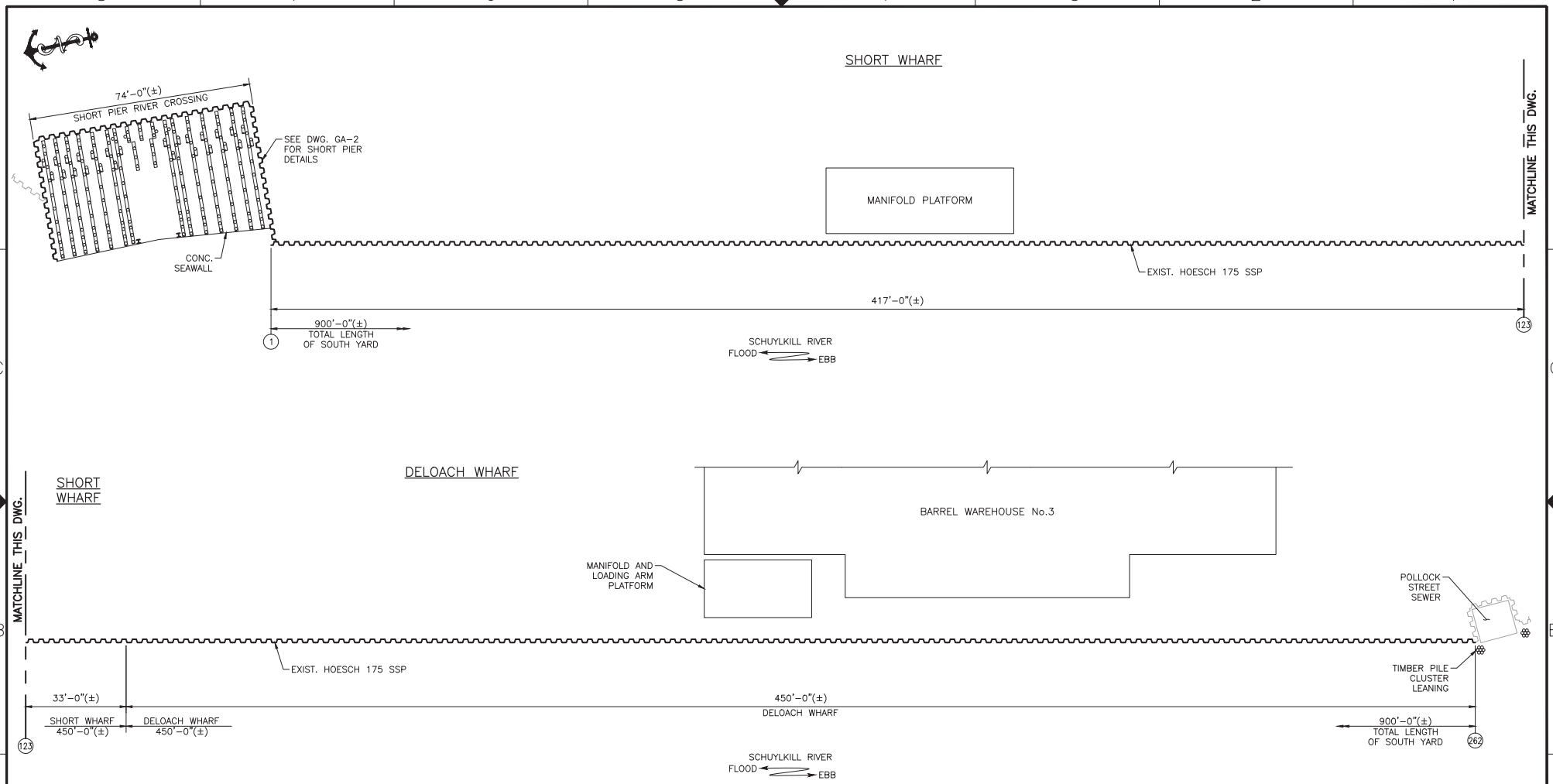
Short Pier was constructed as an approximately 74 ft. long and 40 ft. wide (I/S-O/S direction) timber low deck structure with steel sheet pile cut off walls circa 1939. The structure is supported on fourteen (14) timber pile bents spanning in the I/S-O/S direction. With the exception of few closely spaced bents, the bents are typically spaced at 4’-3” to 4’-9” on centers. For purposes of this study, bents were designated with numbers starting with Bent 1 at the U/R end to Bent 14 at the D/R end of the Pier. Each bent consists of eleven (11) - 12” dia. timber plumb piles lettered A through K starting from O/S end to the I/S end and two (2) - 12” to 14” dia. timber batter piles with toe pointed O/S. In each bent, plumb piles are spaced at a spacing varying from 2’-6” to 4’-4”. Plumb piles in each bent are shouldered and clamped with a pair of 6x12 timber clamps bolted to piles using (1) - 1” dia. bolt. Plumb piles at each bent are capped with a 6x16 timber cap. One batter pile is connected to each clamp of a bent between Piles H & I and I & J using one (1) - 1” dia. bolt. The bents support a timber low deck comprised of 6x12 timber boards spanning in the U/R – D/R direction. The top of low deck is located at approx. elev. +2’-8” MLW. The low deck supports earthen fill retained by an approximately 8’-0” tall concrete seawall located along the O/S edge of the low deck structure. An MZ32 steel sheet pile bulkhead encompasses the low deck along the upriver, downriver & inshore edges of the pier. Original web and flange thickness of MZ32 is 0.500 inch. Approximate mudline elevation at Row A of piles at the O/S face of pier varies from -32 ft. MLW at the upriver end to -35 ft. MLW at the downriver end. See Photo 2 and Drawing GA-2 showing the general construction of Short Pier.

Product pipes cross the Schuylkill River through a 15’ x 33’ opening in the Short Pier low deck. Concrete walls exist around the opening to retain the low deck fill. A timber pile supported large concrete block located at the inshore end of this opening acts as a thrust block for product pipes crossing the river. The portion of pier seawall forming the O/S edge of the opening bridges across the opening and is supported by (1) HP pile located on each side of the opening between Bents 7 and 8.

Photo 2: Short Pier Timber Low Deck. Taken from downriver end of structure at interface with SSP bulkhead.

Combiwall Bulkhead

Combiwall Bulkhead (Combiwall) was installed circa 2014 to renew an original Hoesch 175 steel sheet pile bulkhead near the downriver end of South Yard Terminal. The original bulkhead had failed with significant deflection. Combiwall Bulkhead is approximately 136 linear feet long and is comprised of sixteen (16) - 48”φ x 0.75” pipe piles with AZ-38-700N sheet pile pairs between the pipe piles. Pipe piles are spaced at approximately 8’-9” center to center. The area between the Combiwall and original Hoesch 175 SSP bulkhead has been filled with un-compacted gravel fill. The Combiwall is not equipped with a fender system. See Photo 3.



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SOUTH YARD TERMINAL
SCALE: 1/16" = 1'-0"

LEGEND:

- DEPRESSIONS
- (X) OUTPAN DESIGNATION
- SSP STEEL SHEET PILE

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SOUTH YARD TERMINAL

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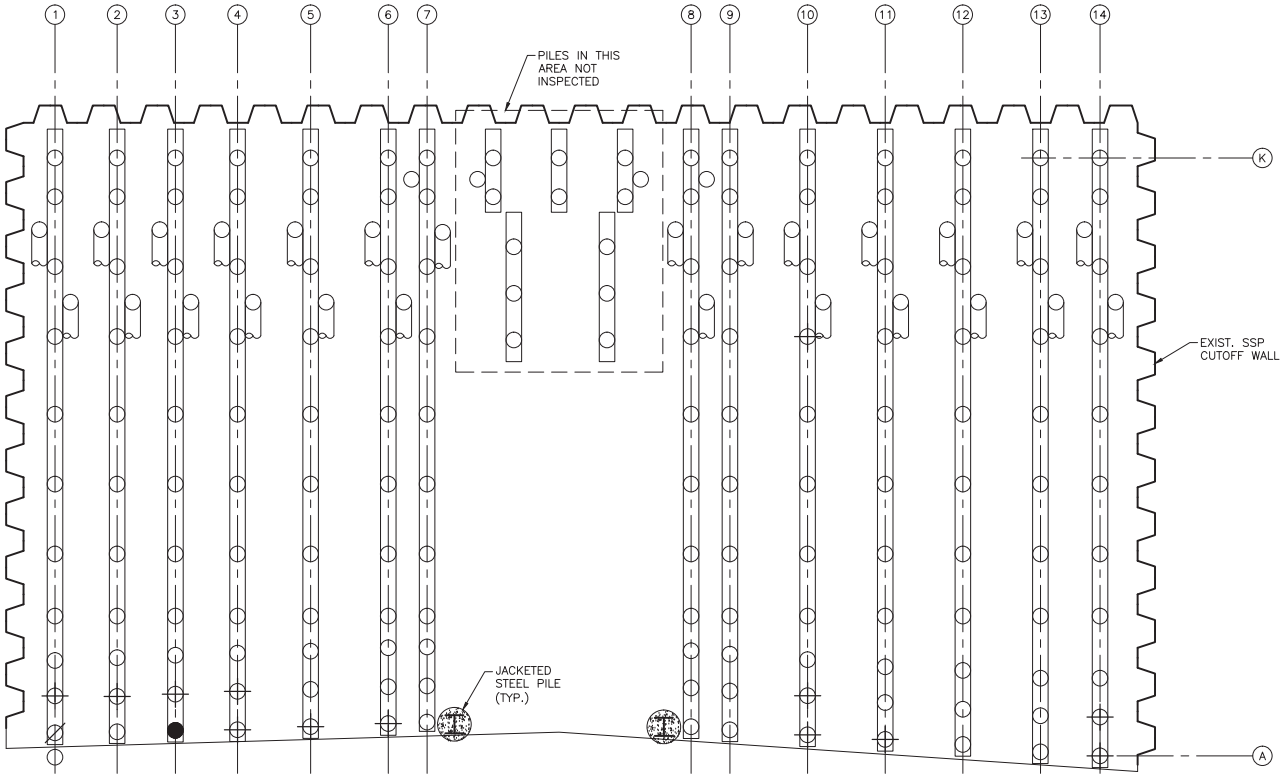

SCHUYLKILL RIVER
FLOOD ← → EBB

LEGEND:

SSP	STEEL SHEET PILE
○	TIMBER PILE
⊕	LEANING PILE
⊘	SPLIT PILE
●	MISSING PILE

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SOUTH YARD TERMINAL - SHORT PIER

SCALE: 1/4" = 1'-0"

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SOUTH YARD TERMINAL - SHORT PIER

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SHEET NO.: 2 OF 2 DRAWING NO.: GA-2

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ANCHOR PROJECT NO.: 17-03-3036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-04-17
SCALE: AS NOTED

XI. GIRARD POINT WHARF #1

Photo 1: Girard Point Wharf #1. Picture taken from upriver end of Wharf.

Structure Description:

Girard Point Wharf #1 (GP Wharf #1) is located approximately 200 ft. downriver of Girard Point Wharf #2 and in continuation of the upriver end of Girard Point Wharf #3. The coordinates of this wharf are 39°53'43.00" N, 75°12'15.00" W. The wharf is a concrete high deck structure equipped with four manifolds with hoses (Spillways 4 to 8) where loading and unloading of petrochemical products from the moored vessels occur. GP Wharf #1 has an allowable dredge depth of 32 ft. plus 2 ft. and is utilized for the berthing and mooring of vessels up to 650 ft. LOA. In addition to the self-weight, the concrete high deck structure is subjected to dead loads associated with product pipes, pipe support structures and other light structures, as well as pedestrian and occasional vehicular live loads.

GP Wharf #1 was constructed circa 1919. According to historical drawings, the concrete high deck structure is approximately 55 ft. wide and approximately 836 ft. long and is

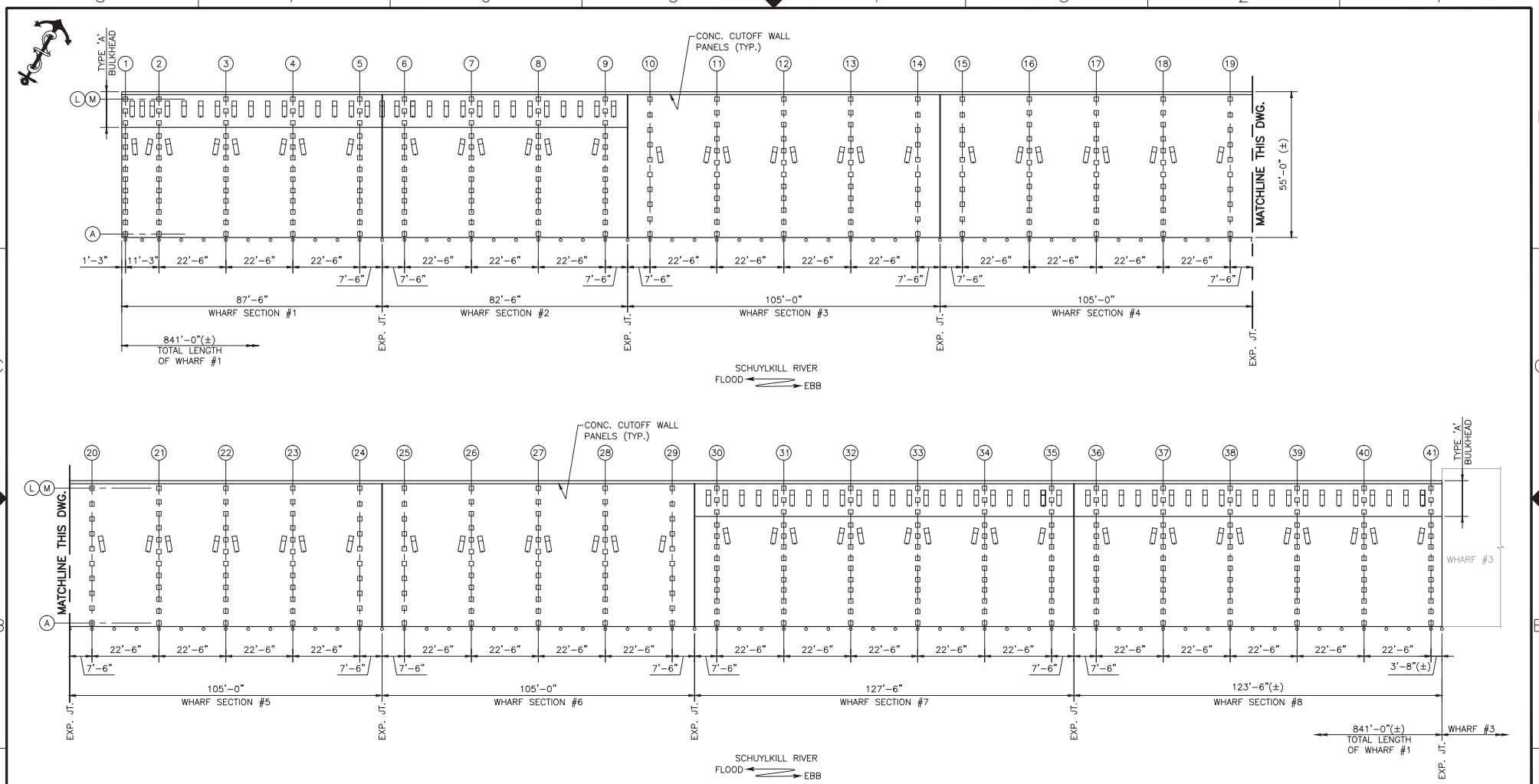
comprised of forty-one (41) bents spanning in the inshore-outshore direction. The bents are spaced at 22'-6" on center. For this inspection, the bents were numbered starting from upriver to downriver. The high deck is made up of eight (8) Wharf Sections numbered upriver to downriver, each separated by expansion joints. As indicated on historical drawings, dated 1919, the original structure consisted of "Type A Bulkhead" only at Sections 1, 2, 7 and 8 of varying length and concrete high deck structure at Sections 3, 4, 5 and 6, each 105 ft. long. Sometime following the original construction, the wharf was expanded and concrete high deck structures were added outshore of the Type A Bulkhead in Wharf Sections 1, 2, 7 and 8 to match the outshore face of Wharf Sections 3, 4, 5 and 6. Refer to drawing GA-1 for Girard Point Wharf #1 Sections and pile plan.

Constructed circa 1919, Type A Bulkhead in Wharf Sections 1, 2, 7 and 8 is approximately 11'-0" wide and consists of bents spanning in the inshore-outshore direction, spaced at 22'-6" on center. These bents are comprised of three (3) plumb piles each, spaced at 4'-0" on center. A concrete sheetpile cutoff wall is located along the inshore edge of the bulkhead to retain earth on the landside. Typically, four (4) batter piles are located between interior bents and three (3) batter piles are located between end bents (adjacent to structure expansion joints). These batter piles are aligned with the inshore-most plumb piles of Type A Bulkhead. The three (3) Type A Bulkhead plumb piles make up the inshore-most three (3) plumb piles of the present concrete high deck structure main bents in Wharf Sections 1, 2, 7 and 8. Bents of the concrete high deck structure in these sections contain ten (10) plumb piles, making a total of twelve (13) plumb piles per bent, lettered A through M, outshore to inshore. Expansion joints are present between Type A Bulkhead and abutting outshore concrete high deck.

Bents in the concrete high deck structure of Wharf Sections 3, 4, 5 and 6 are typically comprised of twelve (12) 18"x18" reinforced concrete plumb piles, lettered A through L, outshore to inshore and two (2) 18"x20" reinforced concrete batter piles each, referred to as upriver/downriver batter pile. Batter piles are located immediately upriver and downriver of the bent and are toed in the outshore direction. End bents (adjacent to structure expansion joints) of these Wharf Sections consist of ten (10) plumb piles and one (1) batter pile each, located at the inboard side of the bent. The top of plumb piles in each bent is embedded in a concrete cap. Ten (10) – 1'-2" wide by 4'-0" deep reinforced concrete beams spaced at 6'-8" span upriver-downriver between the caps of each bent. For this inspection, beams were numbered outshore to inshore. The nine (9) bays of concrete deck between the beams were also numbered outshore to inshore. The high deck structure is equipped with a timber fender system comprised of a total of one-hundred and eleven (111) timber fender piles. Extruded rubber fenders are located between the outshore edge of concrete deck and timber fender piles. Timber chocks span

between fender piles. The timber fender piles are anchored to the face of the concrete wharf using galvanized steel chains and padeyes. Timber pile cluster exists at the U/R end of the wharf. This cluster is comprised of three (3) timber piles wrapped using galvanized steel wire.

The high deck structure of Girard Point Wharf #1 is comprised of a total of approximately 497 plumb piles (includes Type A Bulkhead and high deck structure), 66 batter piles under the high deck structure and approximately 75 batter piles of the original Type A Bulkhead of Wharf Sections 1, 2, 7 and 8. Current mudline depth at front row piles ranging from -25 ft. to -28 ft. MLW were recorded during our inspection at this wharf. Refer to Drawing GA-1 for Pile Layout Plan of the high deck structure at GP Wharf #1.



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GIRARD POINT WHARF #1

SCALE: 1/16" = 1'-0"

LEGEND:

- CONC. PLUMB PILE
- CONC. BATTER PILE
- TIMBER FENDER PILE

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CLIENT LOCATION:	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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GIRARD POINT WHARF #1

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XII. GIRARD POINT WHARF # 2

Photo 1: Girard Point Wharf #2. Picture taken from downriver end of Wharf.

Structure Description:

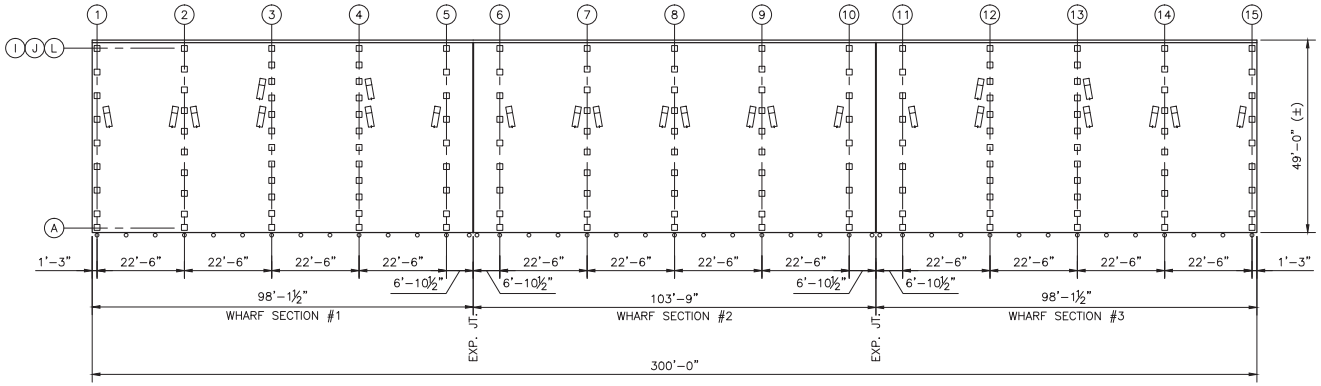
Concrete High Deck Structure

Girard Point Wharf #2 (GP Wharf #2) is the upriver most Girard Point Wharf. The coordinates of this wharf are 39°53'45.50"N and 75°12'25.00"W. GP Wharf #2 has an allowable dredge depth of 32 ft. plus 2 ft. and is used for the berthing and mooring of vessels up to 750 ft. LOA. The wharf consists of a concrete high deck structure, a timber pile mooring cluster located downriver of the high deck structure and a landside concrete mooring dolphin located upriver of the high deck structure. The concrete high deck structure is equipped with three (3) active manifolds with hoses (Berths 9, 10 and 11) where loading and unloading of petrochemical products from the moored vessels occur. In addition to the self weight, the concrete high deck structure is subjected to dead loads associated with product pipes, pipe support structures and other light structures as well as pedestrian live loads. The timber pile cluster and the landside concrete mooring dolphin are subjected to mooring line loads from the vessels.

GP Wharf #2 was constructed circa 1930. According to historical drawings, the concrete high deck structure is approximately 49 ft. wide and approximately 300 ft. long and is comprised of fifteen (15) bents spanning in the inshore-outshore direction, spaced at 22'-6". For this inspection, the bents were numbered upriver to downriver. The high deck is made up of three (3) Sections numbered upriver to downriver, each separated by an expansion joint. Pipe galleries (concrete enclosure walls) supported by Bents 3 & 4 and Bents 12 & 13 exist below the deck at Sections 1 and 3 to protect the pipes below deck from flotsam. The bottom of these concrete enclosures is approximately at MLW.

Interior Bents 2, 7, 8, 9 & 14 of the high deck structure are comprised of ten (10) 18"x18" reinforced concrete plumb piles, lettered A through J, outshore to inshore and two (2) 18"x20" reinforced concrete batter piles, each. Batter piles are located upriver and downriver of plumb Pile G and are toed in the outshore direction. End bents of each Section (Bents 1, 5, 6, 10, 11 & 15) are comprised of nine (9) reinforced concrete plumb piles and have only one (1) batter pile, each, located on the inboard side of the bents, between Piles F and G. Bents supporting the pipe galleries (Bents 3, 4, 12 & 13) are comprised of twelve (12) reinforced concrete plumb piles, lettered A through L, outshore to inshore and two (2) batter piles located at the outboard of the pipe galleries and toed outshore. The top of plumb piles in each bent is embeded in a concrete cap. Eight (8) - 1'-2" wide by 2'-9" deep reinforced concrete beams spaced at 6'-8" span upriver-downriver between the caps of each bent. For this inspection, these beams were numbered outshore to inshore. The seven (7) bays of concrete deck between the beams were also numbered outshore to inshore for this inspection. The high deck structure is equipped with timber fender system comprised of a total of forty-five (45) timber piles, extruded rubber fender components are located between the outshore edge of concrete deck & timber fender piles. Timber chocks span between fender piles. The timber fender piles are anchored to the face of the concrete deck using galvanized steel chains and padeyes.

The high deck structure of Girard Point Wharf #2 is comprised of approximately 152 plumb piles and 24 batter piles. Current mudline depths at front row piles ranging from elevations -21 ft. to -25 ft. MLW were recorded during our inspection at this wharf. Refer to Drawing GA-1 for the Pile Layout Plan of high deck structure at GP Wharf #2.



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GIRARD POINT WHARF #2

SCALE: 1/16" = 1'-0"

LEGEND:

- CONC. PLUMB PILE
- CONC. BATTER PILE
- TIMBER FENDER PILE

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GIRARD POINT WHARF #2

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SCALE: AS NOTED	

XIII. GIRARD POINT WHARF #3

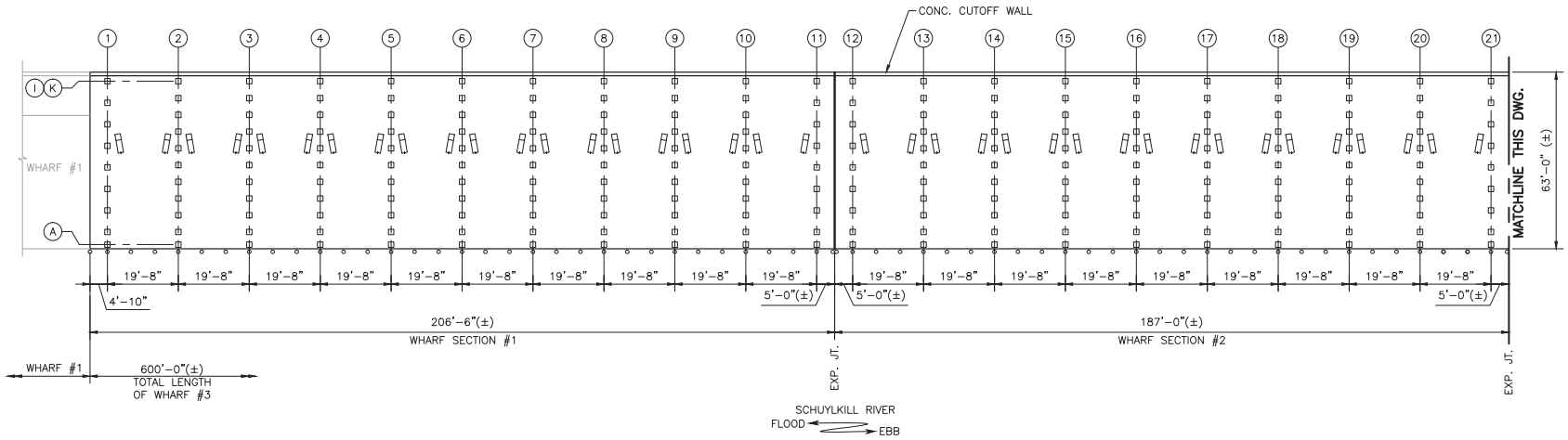
Photo 1: Girard Point Wharf #3. Picture taken from upriver end of Wharf.

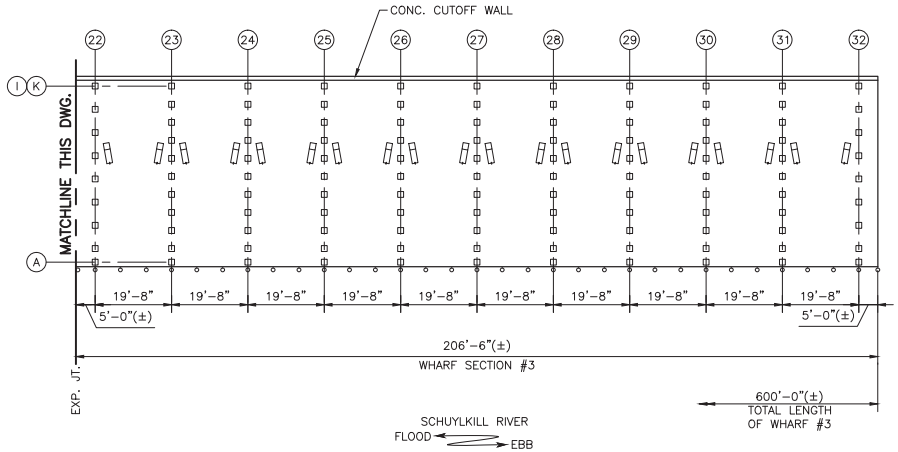
Structure Description:

Girard Point Wharf #3 (GP Wharf #3) is the downriver most Girard Point Wharf, situated immediately downriver and in continuation with Girard Point Wharf #1. The coordinates of this wharf are 39°53'42.00"N and 75°12'6.00"W. GP Wharf #3 has an allowable dredge depth of 32 ft. plus 2 ft. and is used for the berthing and mooring of vessels up to 600 ft. LOA. The wharf is equipped with one (1) active manifold with hoses (Spillway No. 2) where loading and unloading of petrochemical products from the moored vessels occur. In addition to the self-weight, the high deck structure is subjected to dead loads associated with product pipes, pipe support structures and other light structures as well as pedestrian and occasional vehicular live loads.

GP Wharf #3 was constructed circa 1947. According to historical drawings, the concrete high deck structure is approximately 63 ft. wide and approximately 600 ft. long and is comprised of thirty-two (32) bents spanning in the inshore-outshore direction, spaced at 19'-8". For this inspection, the bents were numbered starting from upriver to downriver. The high deck is made up of three (3) Sections numbered upriver to downriver, each separated by expansion joints. Bents in the high deck structure are typically comprised of eleven (11) 18"x18" reinforced concrete plumb piles, lettered A through K, outshore to inshore and two (2) 18"x20" reinforced concrete batter piles each. Batter piles are located immediately upriver and downriver of the bent and are toed in the outshore direction. End bents of each Section (adjacent to expansion joints) are comprised of nine (9) reinforced concrete plumb piles and only one (1) batter pile each, located at the inboard side of the bent. The top of plumb piles in each bent is embedded in a concrete cap spanning in the inshore-outshore direction. Eleven (11) reinforced concrete beams span upriver to downriver between the caps of each bent. For this inspection, beams were numbered outshore to inshore. An approximately 6" thick concrete deck is supported by the beams. The ten (10) bays of the underside of deck between the beams were numbered outshore to inshore during inspection. A cutoff wall comprising of concrete sheet piles exists along the inboard edge of the wharf. The high deck structure is equipped with a timber fender system comprised of seventy-seven (77) timber piles. Extruded rubber fenders are located between the outshore edge of concrete deck and timber fender piles. Timber chocks span between fender piles. The timber fender piles are anchored to the face of the concrete wharf using galvanized steel chains and padeyes. Timber pile cluster exists at the D/R end of the wharf. This cluster is comprised of three (3) timber piles wrapped using galvanized steel wire.

Girard Point Wharf #3 is comprised of approximately 340 plumb piles and 58 batter piles. Current average mudline depths at front row piles ranging from -24 to -28 ft. MLW were recorded at Row A piles during our inspection at this wharf. See Drawing GA-1 for the pile layout of Girard Point Wharf #3.





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GIRARD POINT WHARF #3

SCALE: 1/16" = 1'-0"

LEGEND:

- CONC. PLUMB PILE
- CONC. BATTER PILE
- TIMBER FENDER PILE

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GIRARD POINT WHARF #3

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II. GIRARD POINT BULKHEAD DESCRIPTION:

The Philadelphia Energy Solutions (PES) Refinery in Philadelphia is located along the eastern shore of the Schuylkill River, approximately 1.15 miles upriver of the confluence with the Delaware River. The physical address of the facility is 3144 West Passyunk Avenue, Philadelphia, PA – 19145. PES Girard Point Bulkhead extends for approximately 8,200 linear feet (see Figure 1 for a Location Map) and typically consists of a continuous steel sheet pile bulkhead, laterally supported by a series of batter piles & pile bents on the water side.

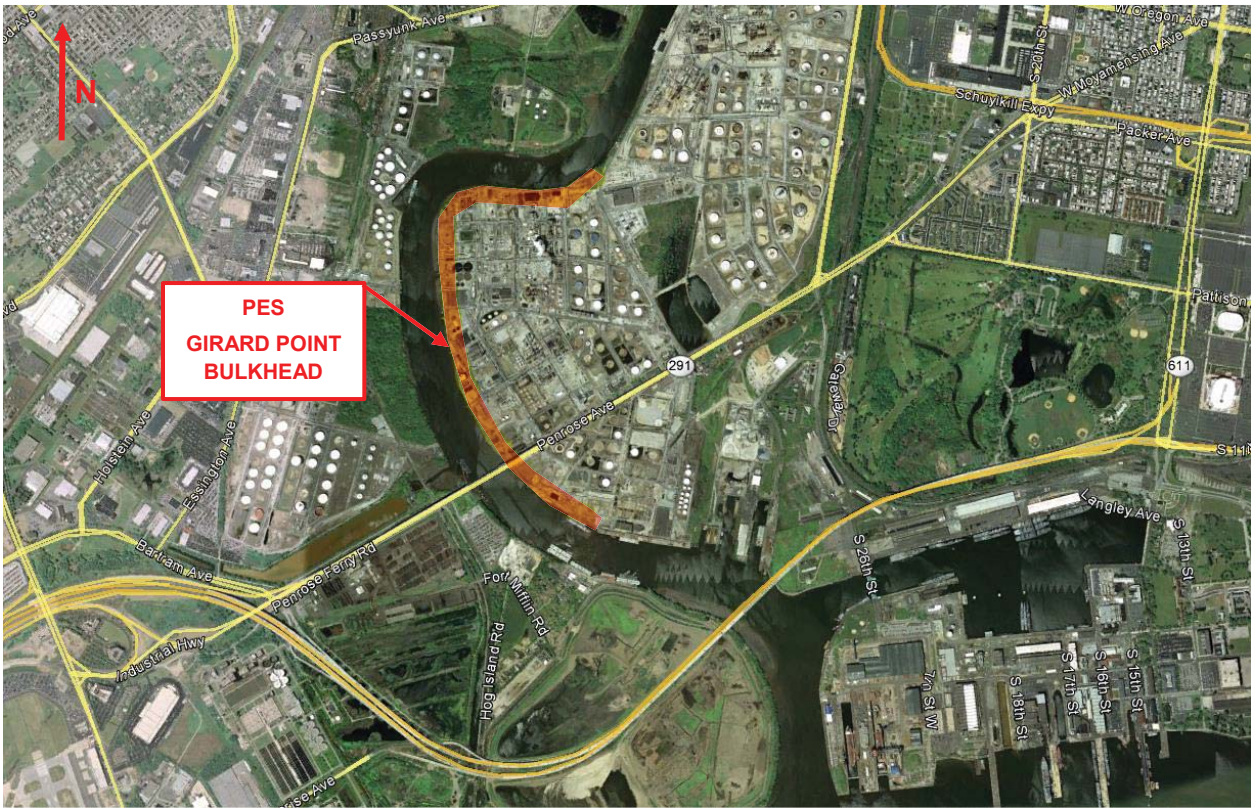

Figure 1: Location Map, showing extent of PES Girard Point Bulkhead (Courtesy of Google Earth).

The original bulkhead was constructed in the early 1900's as a timber bulkhead comprised of 6x12 timber sheeting with 12x12 low-water and high-water wales. Bents, typically consisting of 10" diameter timber plumb and batter piles supported the timber bulkhead at a spacing of approximately 5 to 6 feet. A plumb and a batter pile laterally supported the timber high-water wale while a batter pile laterally supported the low-water wale.

Circa mid-1950s, the timber bulkhead was trimmed down to the low-water wale at approximate elevation of +2'-6" to +3'-0" mean-low water (MLW), including timber sheeting and the plumb and batter piles supporting the high water wale. PZ-27 steel sheet piles with a cut-off elevation of approximately +14'-0" MLW were installed approximately 1'-6" to 3'-0" inshore of the timber sheet piles and the space between the timber sheet piles and steel sheet piles was typically filled with concrete. A 10" diameter steel pipe sleeve was installed on top and bolted onto the trimmed timber batter pile supporting the original high water wale (referred to as composite batter pile in this report) to support the new PZ-27 sheet pile through a continuous HP12x53 wale welded to the sheet piles at an approximate elevation of +11'-6" MLW. The connection between the original timber pile and steel pipe sleeve is referred to as the 'joint' in this report. The original horizontal timber member connecting the composite batter pile to the timber plumb pile supporting the original low water timber wale is referred to as the 'strut' in this report. The construction described above and as shown in Figure 2 below has been referred to as the "typical construction" of Girard Point Bulkhead" in this report.

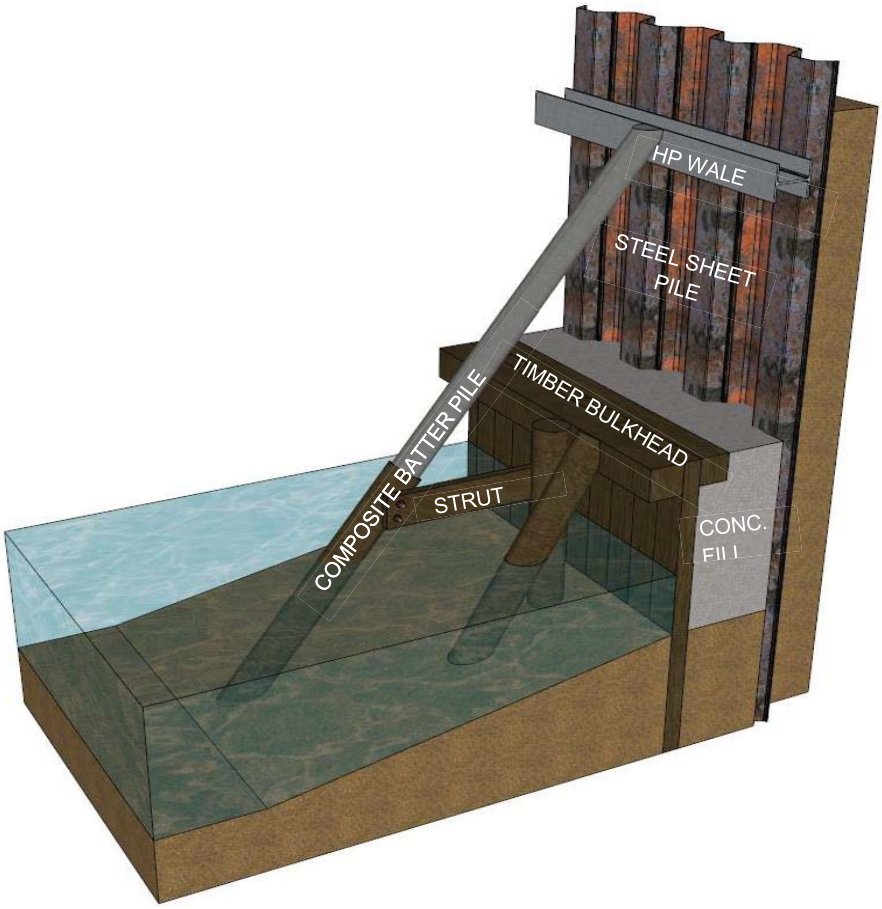

Figure 2: Typical construction of Girard Point Bulkhead.

The Girard Point Bulkhead is divided into twenty-two (22) individual sections labeled A through V, starting at the upriver end. Labels O and U have not been utilized in these designations. A “Rock/Stone Masonry Section” exists beneath and just upriver of the Passyunk Avenue Bridge. An “Anchor Section” exists between bulkhead Sections P and Q. The bulkhead section designation typically changes at locations where the bulkhead bends along the river.

Below is a summary of the lengths and number of supports within each bulkhead section:

- **Rock/Stone Masonry Section** is an approx. 400 ft. long rock and stone masonry retaining structure.

- **Section - A** is approx. 277 ft. long and is supported by forty two (42) supports. Twenty-one (21) steel pipe batter piles, nineteen (19) HP12x53 batter piles and two (2) HP12x53 pile bents support this bulkhead section.

- **Section - B** is approx. 245 ft. long and supported by sixty-four (64) supports. Twenty-four (24) composite batter piles, twenty-five (25) HP12x53 batter piles and fifteen (15) HP12x53 pile bents support this bulkhead section.

- **Section - C** is approx. 475 ft. long and supported by one-hundred twenty-six (126) supports. Sixty-eight (68) composite batter piles, twenty-five (25) HP12x53 batter piles and thirty-three (33) HP8x36 batter piles support this bulkhead section.

- **Section - D** is approx. 787 ft. long and supported by fifty-nine (59) steel pipe pile bent supports.

- **Section - E** is approx. 415 ft. long and supported by twenty-nine (29) steel pipe pile bent supports.

- **Section - F** is approx. 370 ft. long and supported by sixty-seven (67) composite batter piles only. These supports are currently being renewed.

- **Section - G** is approx. 385 ft. long and supported by seventy-seven (77) composite batter piles only.

- **Section - H** is approx. 1220 ft. long and supported by two-hundred thirty-nine (239) supports. Two-hundred thirty-three (233) composite batter piles and six (6) HP12x53 batter piles support this bulkhead section.

- **Section - I** is approx. 62 ft. long and is supported by six (6) HP12x53 pile bents only.

- **Section - J** is approx. 518 ft. long and is supported by one-hundred two (102) composite batter piles only.

- **Section - K** is approx. 558 ft. long and is supported by one-hundred nine (109) composite batter piles only.

- **Section - L** is approx. 673 ft. long and is supported by one-hundred thirty-four (134) supports. One-hundred twenty-nine (129) composite batter piles, three (3) - 16" diameter steel pipe batter piles and two (2) HP pile bents support this bulkhead section.

- **Section - M** is approx. 210 ft. long and is supported by sixteen (16) supports. Twelve (12) recently installed 16" diameter steel pipe batter piles and four (4) recently installed HP14 pile bents, each consisting of one (1) HP14 plumb pile and one (1) HP14 batter pile support Bulkhead Section M. Two (2) recently installed steel trusses support the bulkhead at the two pipe-crossings located at this section of the bulkhead.

- **Section - N** is approx. forty (40) ft. long and is supported by seven (7) supports. Five (5) recently installed 16" diameter steel pipe batter piles and two (2) recently installed HP14 pile bents, each consisting of one (1) HP14 plumb pile and one (1) HP14 batter pile support Bulkhead Section N.

- **Section - P** is approx. 335 ft. long and is supported by thirty-six (36) supports. Thirty-five (35) steel pipe batter piles and one (1) temporary HP12 batter pile support this bulkhead section.

- **Anchor Section** is approx. 84 ft. long and is laterally supported by a landside anchor with thirteen (13) - 1.5" dia. tie rods.

- **Section - Q** is approx. 48 ft. long and is supported by four (4) HP12x53 pile bents.

- **Section - R** is approx. 27 ft. long and is supported by four (4) HP12x53 batter piles.

- **Section - S** is approx. 554 ft. long and is supported by one-hundred thirteen (113) supports. One (1) HP12x53 batter pile and one-hundred twelve (112) composite batter piles support this bulkhead section.

- **Section - T** is approx. 545 ft. long and is supported by fifty-six (56) supports. Two (2) composite batter piles, thirty-seven (37) HP12x53 pile bents, fifteen (15) HP12x53 batter piles and two (2) 16”Φ pipe pile bents support this bulkhead section.

- **Section - V** is approx. 182 ft. long and is supported by nineteen (19) supports. Ten (10) HP12x53 pile bents, five (5) HP plumb and pipe batter pile bents and five (5) 14”Φ pipe pile bents support this bulkhead section.

Bulkhead Sections - A, B, C, D, E, H, I, M, N, P, Q, R, S, T & V have been strengthened or partially/completely rehabilitated in the past by installing pipe batter piles, pipe pile bents, HP batter piles and/or HP pile bents to compensate for the deteriorated condition of composite batter piles. Bulkhead Section F is currently under repair.

Refer to Drawing GA-1 for the general layout of Girard Point Bulkhead and the location of bulkhead Sections. Refer to Drawing GA-2 for sections of typical bulkhead supports. Detailed layout drawings for each Bulkhead Section have also been included in individual Bulkhead Section Reports. Drawing GA-31, found in Appendix A, summarizes the condition assessment rating of each Bulkhead Section.

GIRARD POINT BULKHEAD - LOCATION PLAN

SCALE: 1" = 200'-0"

0 200' 400'

NOTES:

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PES REFINERY
GIRARD POINT BULKHEAD SECTIONS
LOCATION PLAN

PLANT TITLE: PHILADELPHIA REFINERY

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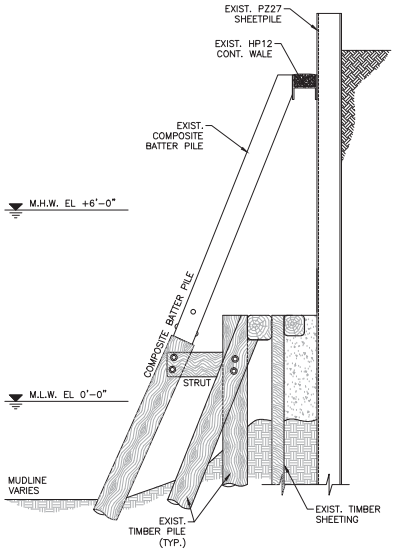
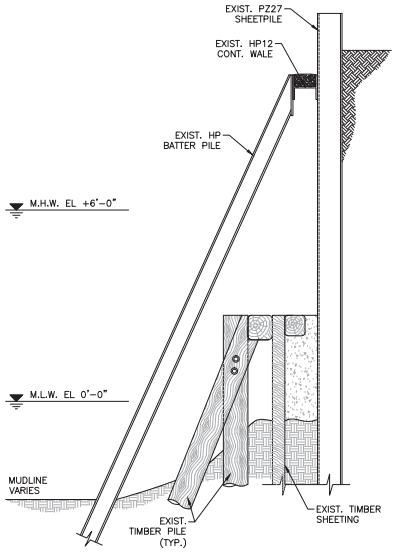
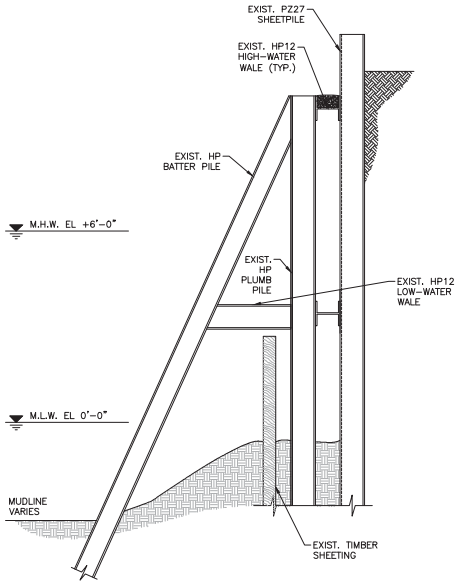


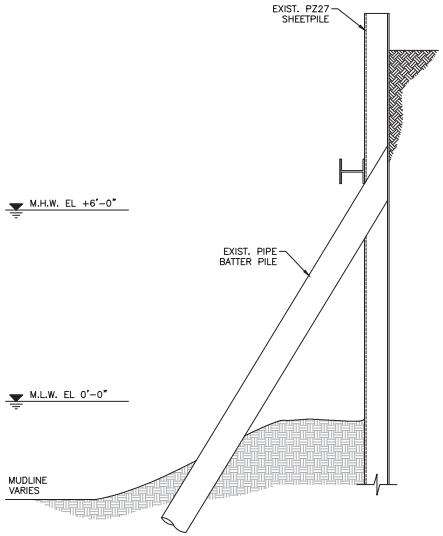
COMPOSITE BATTER PILE



HP BATTER PILE



HP PILE BENT



STEEL PIPE BATTER PILE
(AT SECTION – A ONLY)

BULKHEAD SECTIONS

SCALE: NTS

ISSUED FOR INFORMATION
DATE: 01-22-18

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS					
CLIENT PROJECT NO.: N/A					
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145					
PROJECT LOCATION 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145	A	ISSUED FOR INFORMATION	FNY	AN	01-22-18
	REV.	REVISION DESCRIPTION	BY	CHKD	DATE

ROUTINE INSPECTION OF GIRARD POINT BULKHEAD

TYPICAL BULKHEAD SECTIONS

SHEET NO.: 2 OF 31 DRAWING NO.: GA-2

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ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY: AN APPROVED BY: AN
DRAWN BY: FNY DATE: 12-16-14
SCALE: AS NOTED

ROCK/STONE MASONRY BULKHEAD

Photo 1: Stone Masonry Bulkhead, downriver end of Stone Bulkhead.

Structure Description:

The PES Rock/Stone Masonry Bulkhead is an approximately 400 linear feet long rock and stone masonry retaining structure located along the East bank of the Schuylkill River, beneath and upriver of the Passyunk Avenue Bridge. The approximate coordinates of this structure are 39°55’13.0”N and 75°12’4.4” W. During inspection, it was observed that the bulkhead has two (2) different types of construction. The upriver end of the bulkhead is referred to as Rock Retaining Structure and is composed of rocks ranging in size from cobble to boulder. The downriver end of the bulkhead is referred to as Stone Masonry Retaining Structure and is composed of relatively smaller, regularly cut stone and mortar. Depth in the inshore-outshore direction of the two (2) stone bulkheads is not known. Pipe rack & pipe rack support foundations exist at the sloped embankment inshore of the stone bulkhead. Riprap stones of approximately, up to 2 ft. size were observed 10 ft. outshore of the stone bulkhead structures. Mudline elevations immediately outshore of the masonry bulkhead varied from +1’-0” to -3’-0” MLW.

GIRARD POINT BULKHEAD SECTION - A

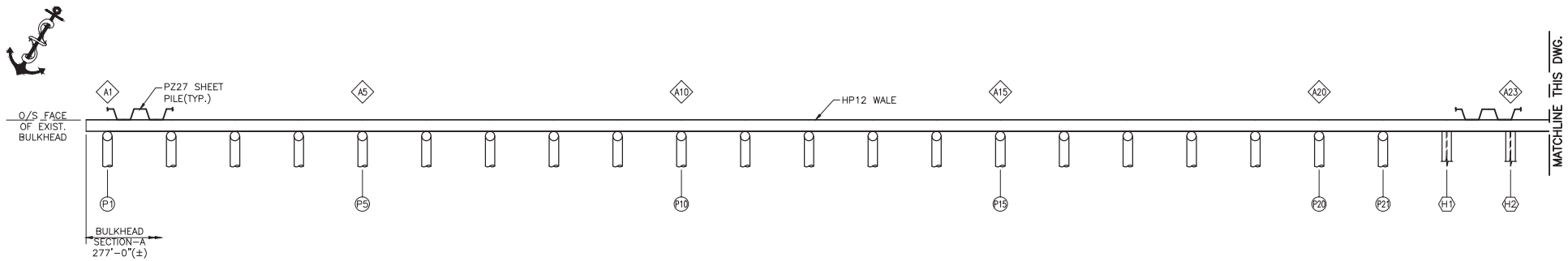
Photo 1: Girard Point Section - A. Looking upriver.

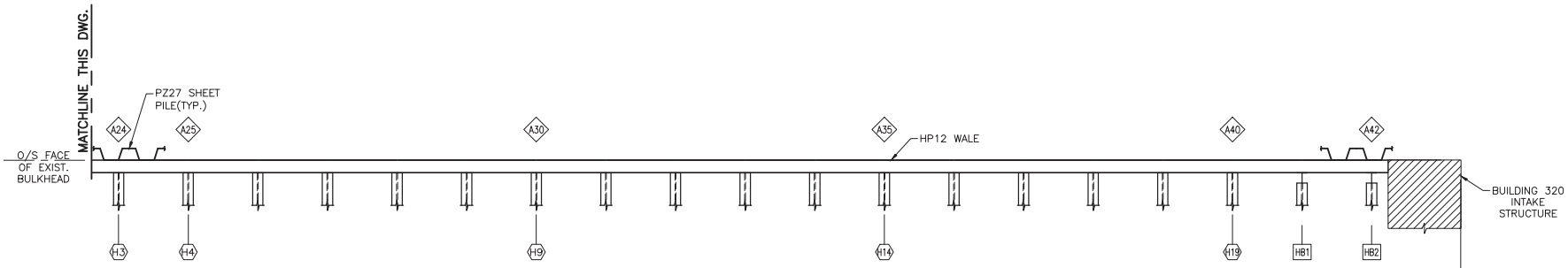
Description:

Section - A is the upriver most section of Girard Point Bulkhead and is located upriver of Building 320 Intake structure. Section - A is **approximately 277 ft. long**, extending from STA. 0+00 to STA. 2+77. The construction of Section - A bulkhead differs from the typical construction of Girard Point Bulkhead. No composite piles remain at this section. Mudline elevation at Section - A varies approximately from -8'-0" to -12'-0" MLW.

The steel sheet pile bulkhead at Section - A is laterally supported using **forty-two (42) supports** (Support Designation: A1 to A42, U/R to D/R) on the water side. The **upriver twenty-one (21) supports are 14" dia. steel pipe batter piles**, labeled P1 thru P21 from upriver to downriver. These piles have been driven through an opening made in the inpans of steel sheet piles with an HP wale located at the outshore face of sheet piles. The wale is located at approximately 5 ft. below the top of SSP. The **following downriver nineteen (19) supports are HP12x53 batter piles**, labeled H1 thru H19 - upriver to

downriver. These HP piles are welded to a high-water and a low-water HP12x53 wale. The high water wale is located 1'-6" below the top of SSP and the low water wale is located at approximately 8'-3" below the top wale. The connection to low water wale is through a HP12 strut. A wide flange strut also connects the HP batter piles to the sheet piles at an approximate elevation of +9'-0". The **remaining two (2) downriver-most supports are bents consisting of a plumb and a batter HP12x53 pile**. These bents are labeled HB1 & HB2, upriver to downriver. Plumb pile of HP pile bents is welded to the high-water and the low water HP12x53 wales. Refer to Drawing GA-3 for the support layout at Section - A. The original timber bulkhead is non-existent at most of steel pipe pile supported Section - A bulkhead, but is existent outboard of the remaining downriver portion of Section - A.





LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

NOTES:

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SECTION - A
SCALE: 3/16" = 1'-0"

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DATE: 01-22-18

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CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-A - PLAN

SHEET NO.: 3 OF 31 DRAWING NO.: GA-3

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ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-20-17
SCALE: AS NOTED

GIRARD POINT BULKHEAD SECTION - B

Photo 1: Girard Point Bulkhead Section - B. Picture taken from downriver end looking upriver.

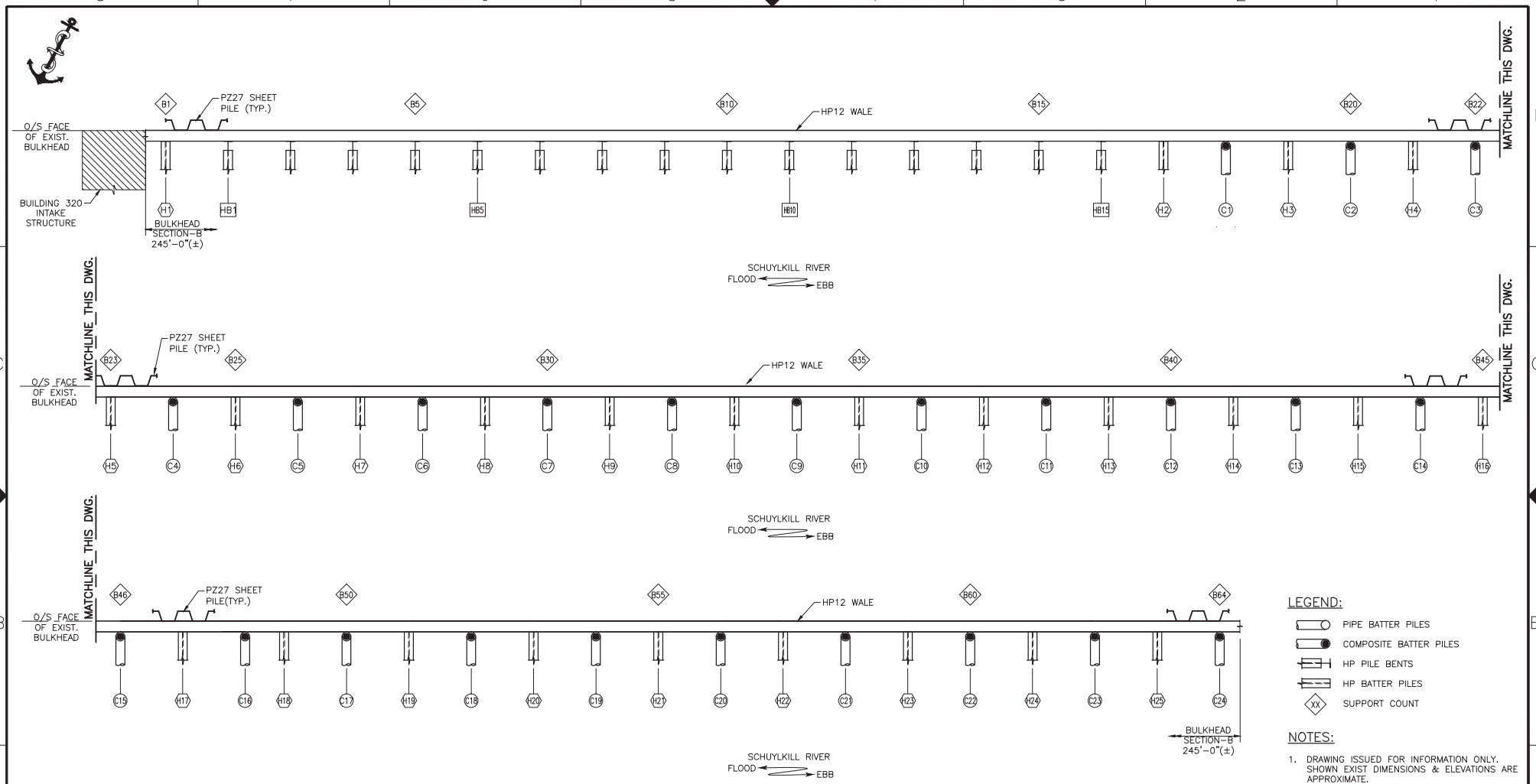
Description:

Section - B bulkhead begins immediately downriver of Building 320 Intake structure and is **approximately 245 ft. long**, extending from STA. 2+77 to STA. 5+22. The construction of approximately 120 linear feet of upriver end of Section - B bulkhead differs from the typical construction of Girard Point Bulkhead. The timber bulkhead including timber and composite pile supports in this region have been demolished and replaced with HP batter piles and HP pile bents. The remaining downriver portion of Section - B bulkhead is of typical construction however, repair HP batter piles have been installed alternately with composite piles to compensate for the deteriorated condition of existing composite batter piles. The bulkhead has a bend between supports HB-5 and HB-6 and between HB-10 an HB-11. Mudline elevation at Section - B varies from approximately -1'-6" to -3'-6" MLW.

The steel sheet pile bulkhead at Section - B is laterally supported using **sixty-four (64) supports** (Support Designation: B1 to B64, U/R to D/R) located on the water side of sheet piles. The **upriver-most support is an HP12x53 batter pile** labeled H1. The **following fifteen (15) downriver supports are pile bents, each consisting of a plumb and a batter HP12x53 pile**, labeled HB1 thru HB15, upriver to downriver. Two high water wales

exist between Pile H1 to Bent HB15. The higher high water wale is the original wale of PZ27 steel sheet piles installed circa mid-1950 and is located 2'-6" below the top of SSP. The lower high water wale appears to be the newer wale installed at the time of HP pile bent installation and is located 4'-6" below the top of SSP. HP plumb pile of the bents are welded to this lower high water wale. The plumb piles of bents are not connected to the higher high water wale.

The **remaining downriver forty-eight (48) supports consist of composite batter piles** (labeled C1 thru C24, upriver to downriver) **alternating with HP12x53 batter piles** (labeled H2 thru H25, upriver to downriver). Only one high water wale (original wale circa 1950) exists in this region of the bulkhead. HP & composite batter piles are welded to this high water wale. Refer to Drawing GA-4 for the support layout of bulkhead Section - B. The original timber bulkhead is located outboard of the steel sheet piles of Section - B bulkhead. The space between the steel sheet pile & timber sheet pile bulkhead is filled with concrete.



ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - B

SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

NOTES:

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PHILADELPHIA ENERGY SOLUTIONS

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CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-B - PLAN

SHEET NO.: 4 OF 31 DRAWING NO.: GA-4

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ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 01-01-18
SCALE: AS NOTED

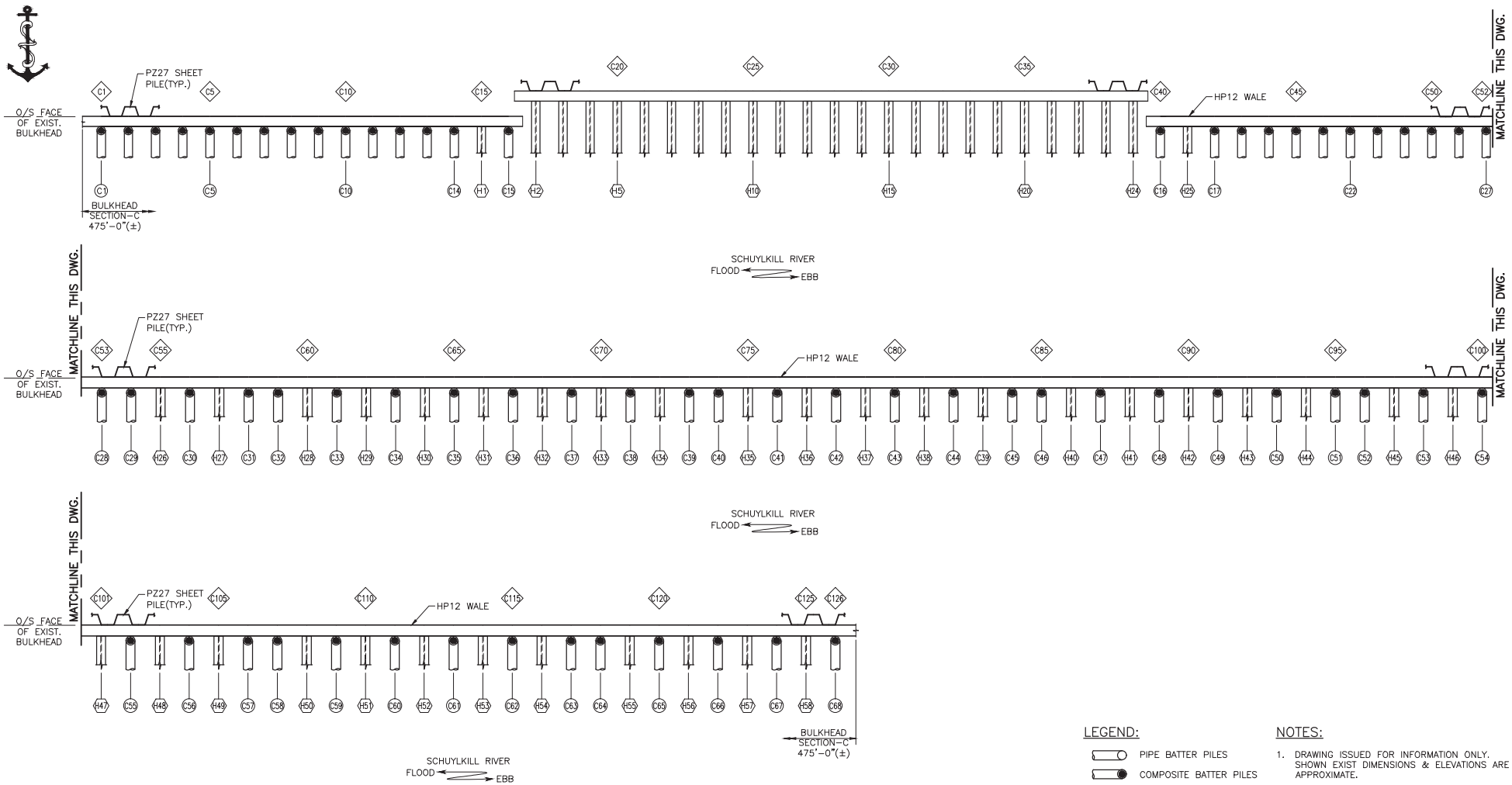
GIRARD POINT BULKHEAD SECTION - C

Photo 1: Girard Point Bulkhead Section - C. Picture taken at the downriver 200 ft. of Section - C.

Description:

Section - C is **approximately 475 ft. long**, extending from STA. 5+22 to STA. 9+97. The steel sheet piles at bulkhead Section - C are laterally supported using **one-hundred twenty-six (126) supports** (Support Count: S1 to S126, U/R to D/R) on the water side. **The upriver, approximately 70 linear feet of this bulkhead is constructed as the typical construction of Girard Point Bulkhead and is supported by fifteen (15) composite batter piles** labeled C1 thru C15, upriver to downriver. The **following, approximately 140 linear feet of circa mid-1950 bulkhead has been repaired by installing a relatively new PZ27 steel sheet pile bulkhead, approximately 4 ft. inshore of the circa mid-1950 steel sheet piles. The mid-1950 sheet piles were notched to install twenty-five (25) HP12 batter piles**, labeled H1 thru H25, upriver to downriver, to laterally support the new bulkhead. See Photo 2. These HP12x53 batter piles are welded to a high-water HP12 wale connected to the outshore face of the new sheet piles. Composite piles were demolished to accommodate the installation of the new HP12x53 batter piles. **The next downriver, approximately 65 linear feet of bulkhead Section - C is of typical construction and is supported by fourteen (14) composite**

batter piles labeled C16 thru C29, upriver to downriver. The **remaining approximately 200 linear feet of bulkhead is also constructed as typical construction supported by thirty-nine (39) composite batter piles (C30 thru C68), however, thirty-three (33) HP8x36 batter piles (labeled H26 thru H58) have been installed in between composite piles as additional support piles.** Composite & HP8x36 batter piles are welded to a high-water HP12x53 concrete filled wale, which is connected to the outshore face of the steel sheet piles. Refer to Drawing GA-5 for the support layout of bulkhead Section - C. The original timber bulkhead was observed to be located outboard of the steel sheet pile bulkhead throughout the length of Section - C, except at the location of repair ssp. The gap between the steel sheet pile & timber sheet pile is filled with concrete. Mudline elevation at Section - C varies from approximately -2'-0" MLW to -11'-0" MLW with greater depths near the upriver end.



ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - C

SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

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PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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A	ISSUED FOR INFORMATION	PG	AN	01-22-18

ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-C - PLAN

SHEET NO.: 5 OF 31 DRAWING NO.: GA-5

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ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
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DRAWN BY: FNY
DATE: 12-16-14
SCALE: AS NOTED

GIRARD POINT BULKHEAD SECTION - D

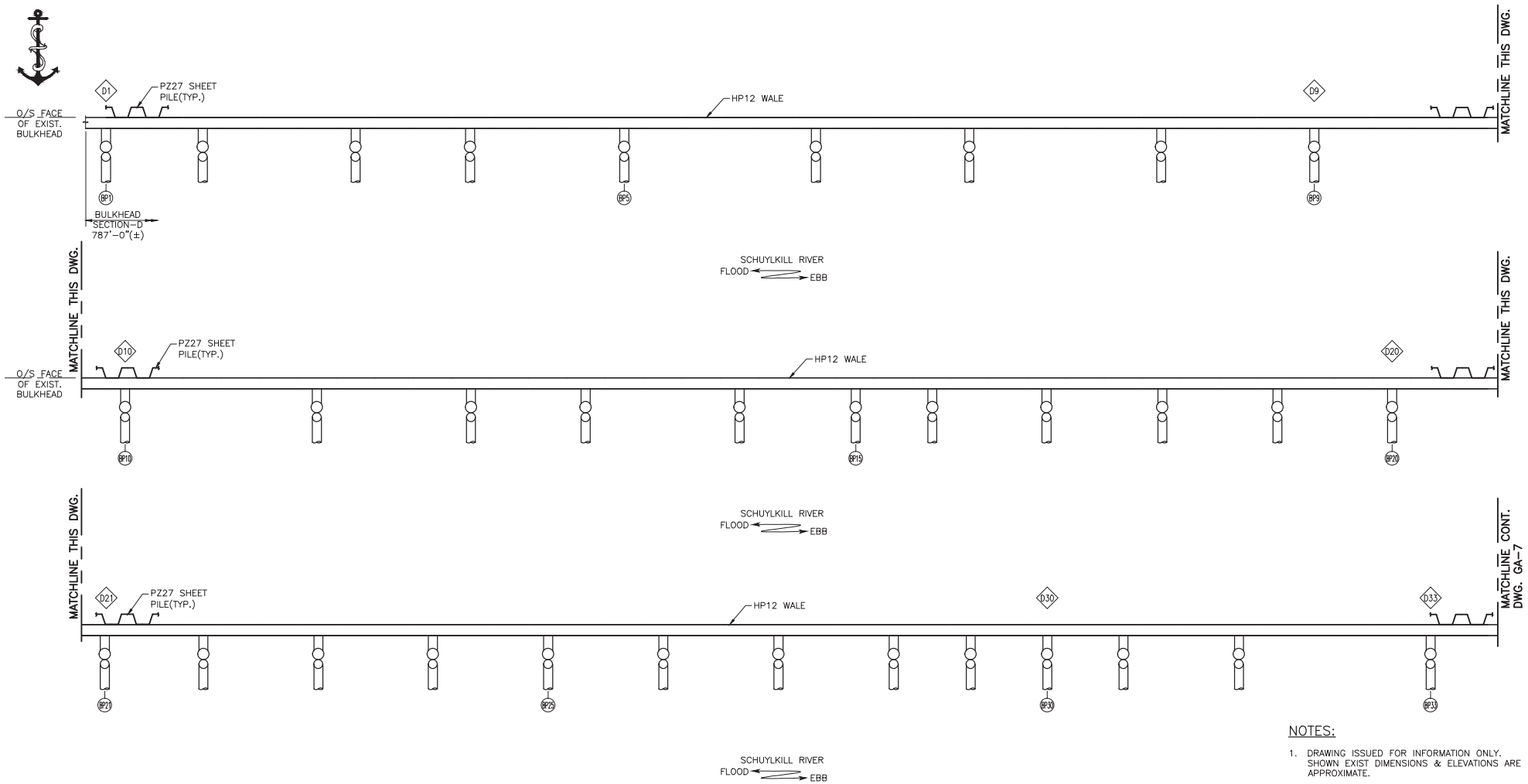
Photo 1: Girard Point Bulkhead Section - D. Picture taken looking upriver.

Description:

Section - D is **approximately 787 ft. long**, extending from STA. 9+97 to STA. 17+84. Bulkhead Section D has the typical construction of Girard Point Bulkhead except that steel pipe pile bents have recently been installed along the entire length of bulkhead Section D to renew composite batter piles. Earlier, the PZ-27 steel sheet piles were laterally supported using one-hundred eighty (180) supports consisting of one-hundred fifty-six (156) composite batter piles and twenty-four (24) HP8x36 batter piles located on the waterside. The HP piles existed at the upriver, approximately 150 ft. length of bulkhead. During 2017, these supports were replaced with **fifty-nine (59) steel pipe pile support bents** with varying spacing up to approximately 15 feet (Support Designation: D1 to D59, U/R to D/R) on the water side.

Each pipe pile support bent consists of a plumb and a batter pipe pile. The new pile bents are connected to the original steel sheet piel bulkhead using a low water and a high water HP strut. A new concrete cap has been installed over the original concrete fill between

the timber bulkhead and the steel sheet pile bulkhead. A concrete cap has also been installed over the original high water HP12x53 wale of the bulkhead. Refer to Drawing GA-6 & GA-7 for the support layout of bulkhead Section - D.



SECTION - D

SCALE: 3/16" = 1'-0"

ISSUED FOR INFORMATION
DATE: 01-22-18

LEGEND:

PIPE PILE BENT

XX SUPPORT COUNT

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CLIENT PROJECT NO.: N/A

CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-D - PLAN

SHEET NO.: 6 OF 31 DRAWING NO.: GA-6

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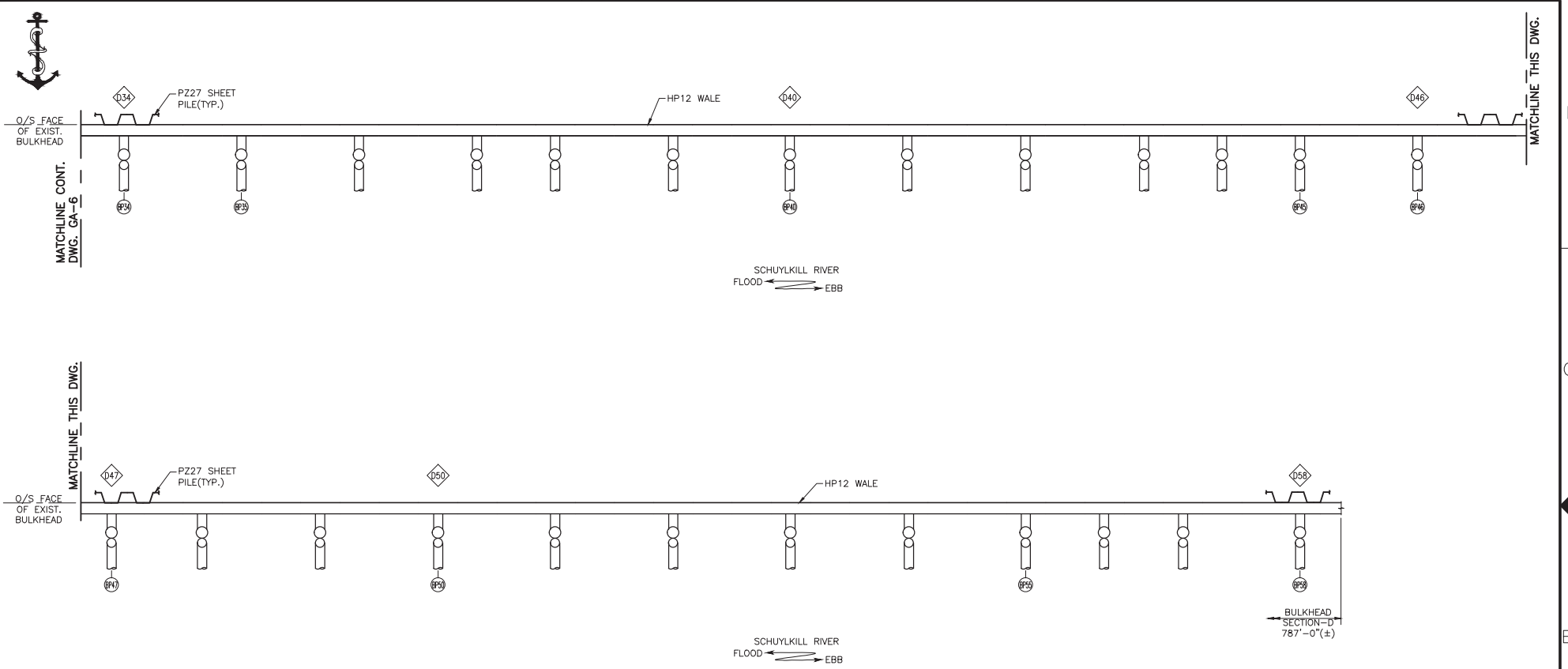
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-20-17
SCALE: AS NOTED



ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - D

SCALE: 3/16" = 1'-0"

LEGEND:

PIPE PILE BENT

XX SUPPORT COUNT

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CLIENT PROJECT NO.: N/A

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-D - PLAN

SHEET NO.: 7 OF 31 DRAWING NO.: GA-7

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DRAWN BY: FNY
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SCALE: AS NOTED

GIRARD POINT BULKHEAD SECTION - E

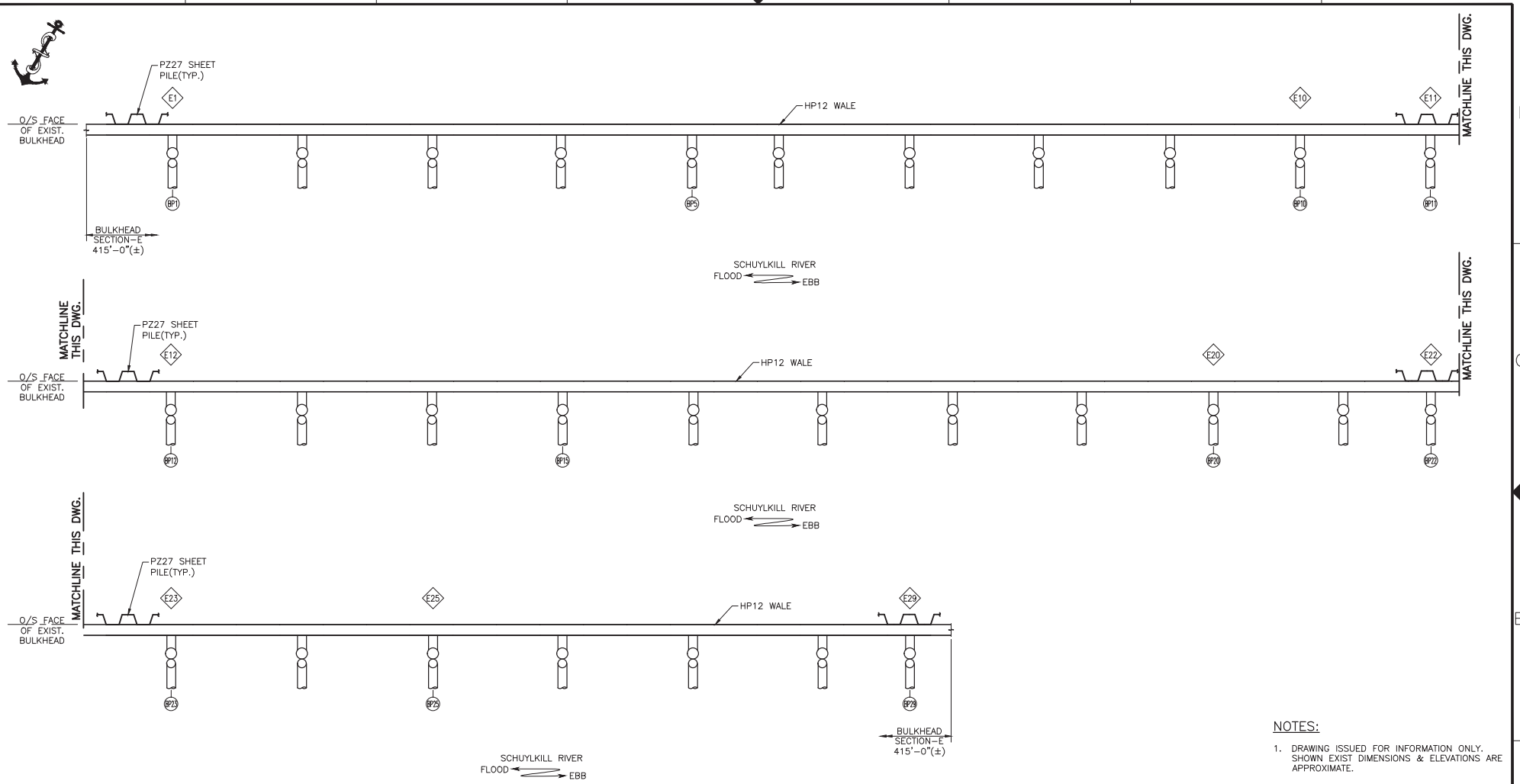
Photo 1: Girard Point Bulkhead Section - E. Picture taken looking upriver.

Description:

Section - E is **approximately 415 ft. long**, extending from STA. 17+84 to STA. 21+99. Bulkhead Section E has the typical construction of Girard Point Bulkhead except that steel pipe pile bents have recently been installed along the entire length of bulkhead Section E to renew composite batter piles. Earlier, the PZ-27 steel sheet piles were laterally supported using eighty-four (84) composite batter piles located on the waterside. During 2017, these supports were replaced with **twenty-nine (29) steel pipe pile support bents** spaced at approximately 15 feet (Support Designation: E1 to E29, U/R to D/R) on the water side.

Each pipe pile support bent consists of a plumb and a batter pipe pile. The new pile bents are connected to the original steel sheet pile bulkhead using a low water and a high water double channel strut. A new concrete cap has been installed over the original concrete fill between the timber bulkhead and the steel sheet pile bulkhead. A concrete cap has

also been installed over the original high water HP12x53 wale of the bulkhead. Refer to Drawing GA-8 for the support layout of bulkhead Section - E.



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DATE: 01-22-18

SECTION - E
SCALE: 3/16" = 1'-0"

LEGEND:

PIPE PILE BENT

XX SUPPORT COUNT

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-E - PLAN

SHEET NO.: 8 OF 31 DRAWING NO.: GA-8

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TEL. (610) 945-1839, FAX. (610) 945-2001

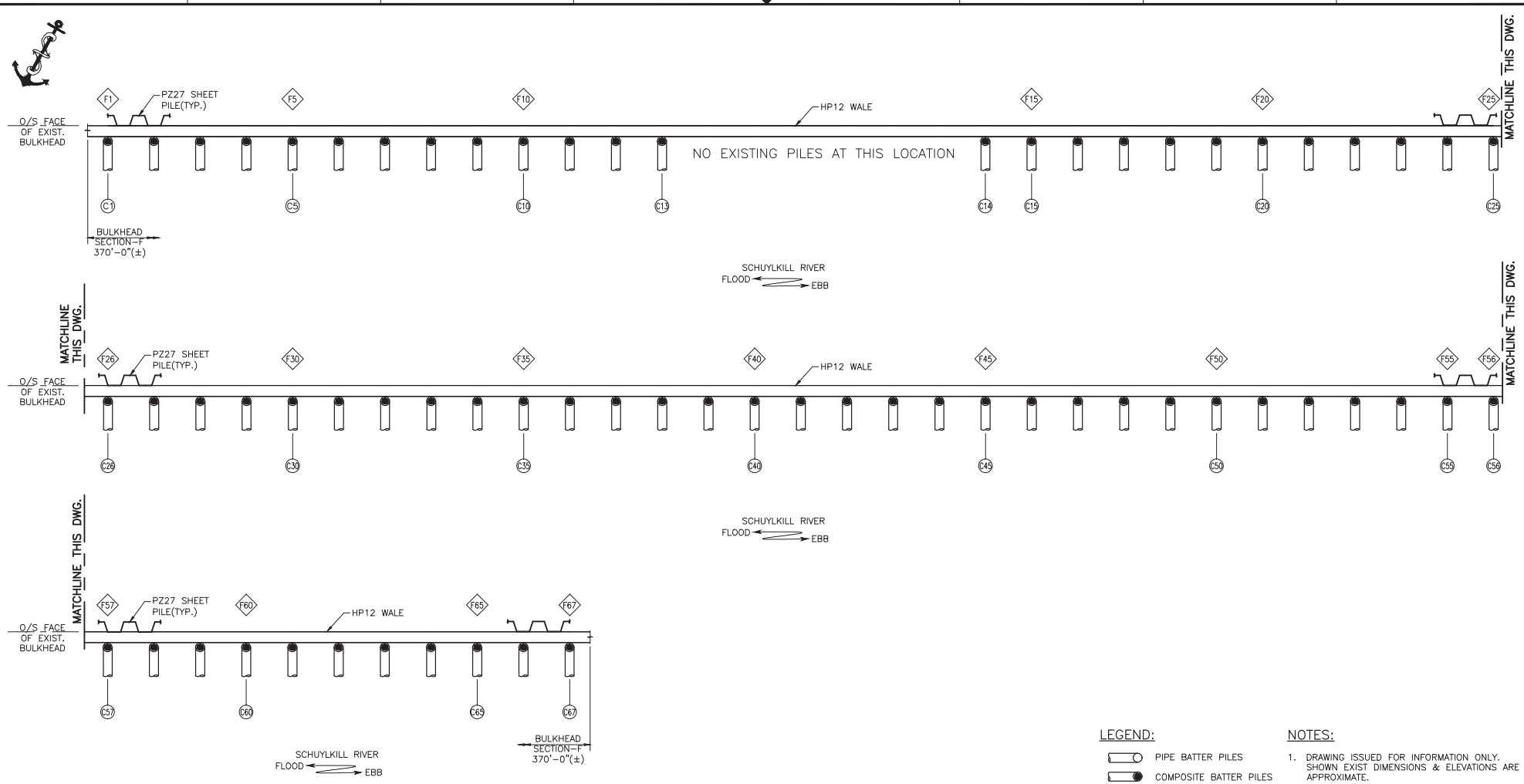
ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-20-17
SCALE: AS NOTED

GIRARD POINT BULKHEAD SECTION - F

Photo 1: Girard Point Bulkhead Section - F. Picture taken from downriver end looking upriver.

Description:

Section - F is **approximately 370 ft. long**, extending from STA. 21+99 to STA. 25+69. During the last triennial inspection, the steel sheet pile bulkhead of Section - F was laterally supported using **sixty-seven (67) composite batter piles** (Support Designation: F1 to F67 or Composite Pile Designation C1 thru C67, U/R to D/R) located on the waterside of the bulkhead. Composite batter piles were welded to a high-water HP12x53 concrete filled wale which was connected to the outshore face of the sheet pile bulkhead. The original timber bulkhead was located outboard of the steel sheet pile bulkhead throughout the length of Section - F. The gap between the steel sheet pile & timber sheet pile was filled with concrete.



LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

NOTES:

1. DRAWING ISSUED FOR INFORMATION ONLY. SHOWN EXIST DIMENSIONS & ELEVATIONS ARE APPROXIMATE.
2. CURRENT PILE CONDITIONS ARE NOT SHOWN. THIS DWG REPRESENTS THE ORIGINAL LAYOUT OF NEW AND OLD PILES. FEW OF THE SHOWN PILES MAY NOT CURRENTLY EXIST AS A RESULT OF DAMAGE OR DETERIORATION.
3. THIS DWG. & SHOWN PILE SPACING ARE NOT TO SCALE AND DO NOT REPRESENT FIELD CONDITIONS.

ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - F
SCALE: 3/16" = 1'-0"

CLIENT NAME:	PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.:	N/A
CLIENT LOCATION:	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	PG	AN	01-22-18

ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-F - PLAN

SHEET NO.: 9 OF 31 DRAWING NO.: GA-9

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ANCHOR PROJECT NO.:	17-03-J036
DESIGNED BY:	APPROVED BY: AN
DRAWN BY: FNY	DATE: 12-16-14
SCALE: AS NOTED	

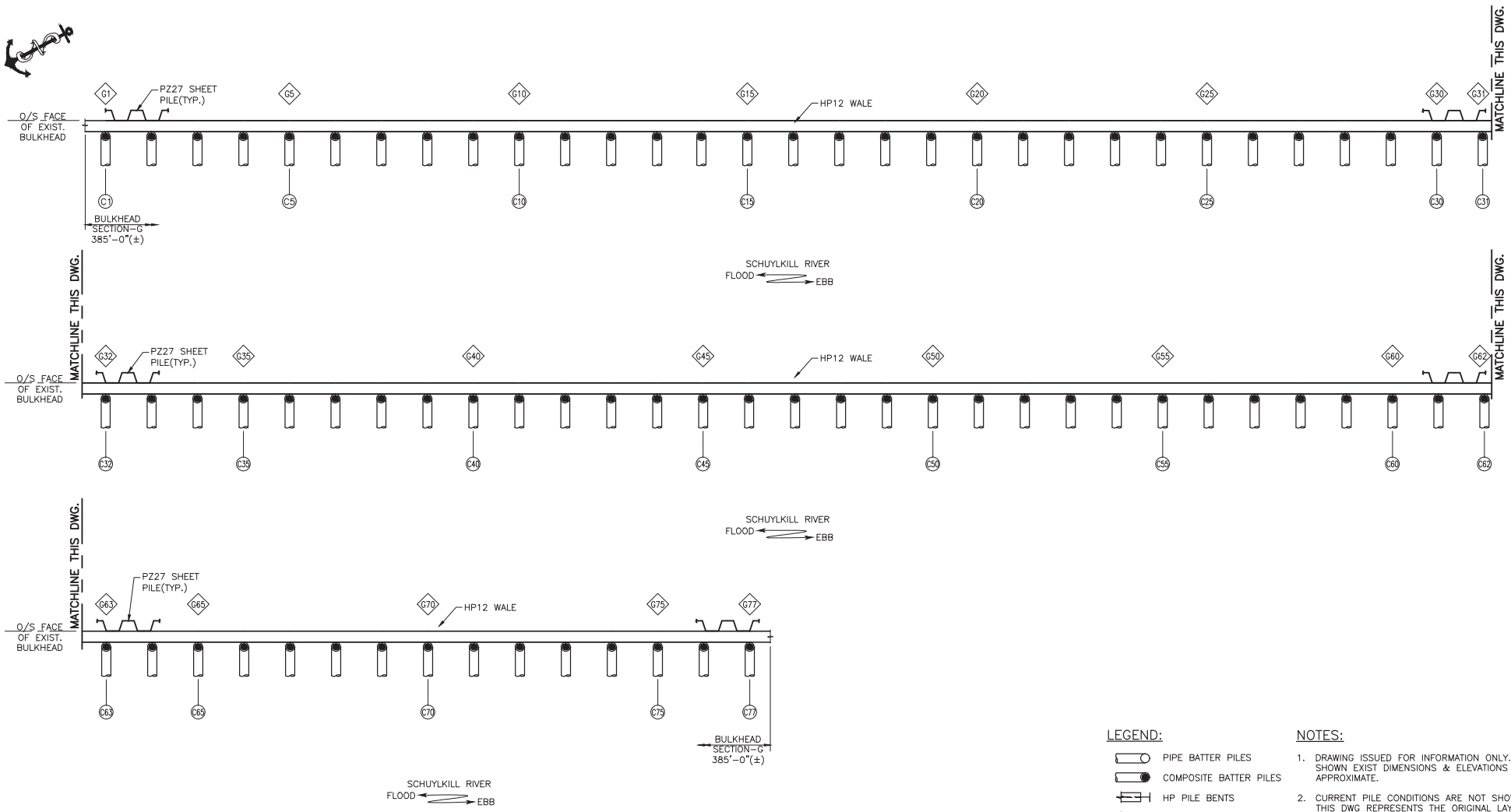
GIRARD POINT BULKHEAD SECTION - G

Photo 1: Girard Point Bulkhead Section - G. Picture taken from downriver looking upriver.

Description:

Section - G is **approximately 385 ft. long**, extending from STA. 25+69 to STA. 29+54. Section - G of the bulkhead has the typical construction of Girard Point Bulkhead.

The steel sheet pile bulkhead is laterally supported using **seventy-seven (77) composite batter piles** (Support Designation: G1 to G77, U/R to D/R) on the waterside, labeled C1 to C77, U/R to D/R. Composite batter piles are welded to a high-water HP12x53 concrete filled wale which is connected to the outshore face of the bulkhead. Refer to Drawing GA-10 for the support layout of Section - G. The original timber bulkhead was observed to be located outboard of the steel sheet pile bulkhead throughout the length of Section - G. The gap between the steel sheet pile & timber sheet pile is filled with concrete.



ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - G

SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

NOTES:

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PHILADELPHIA ENERGY SOLUTIONS

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS

CLIENT PROJECT NO.: N/A

CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	PG	AN	01-22-18

ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-G - PLAN

SHEET NO.: 10 OF 31 DRAWING NO.: GA-10

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ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-16-14
SCALE: AS NOTED

GIRARD POINT BULKHEAD SECTION - H

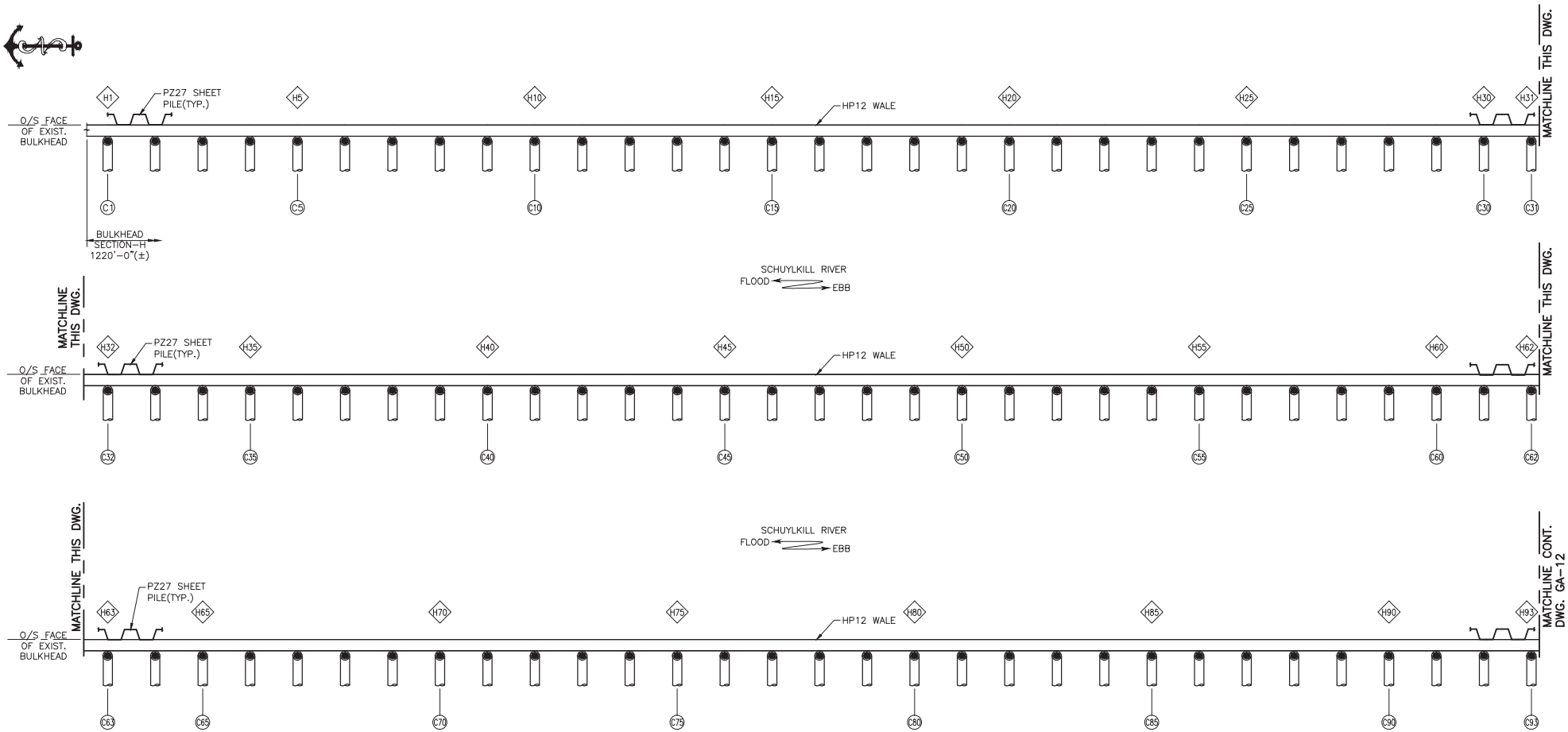
Photo 1: Girard Point Bulkhead Section - H.

Description:

Section - H is located upriver of Building 540 Intake Structure. Section - H is **approximately 1220 ft. long** and extends from STA. 29+54 to STA. 41+74. Bulkhead Section - H has the typical construction of Girard Point Bulkhead except at the downriver 60 linear ft. where composite batter piles have been demolished and renewed with HP pile bents. Mudline elevation at Section - H varies appx. from +1'-0" to -1'-0" MLW.

The steel sheet pile bulkhead is laterally supported using **two-hundred thirty-nine (239) supports** (Support Designation: H1 to H239, U/R to D/R) on the water side. The **upriver two-hundred thirty-three (233) supports are composite batter piles** labeled C1 thru C233, upriver to downriver. Composite batter piles are welded to a high-water HP12x53 concrete filled wale which is connected to the outshore face of the bulkhead. The **remaining six (6) supports downriver of pile C233 are pile bents consisting of a plumb and a batter HP12x53 pile,** labeled HB1 thru HB6, upriver to downriver. Plumb piles of HP pile bents are welded to an HP12x53 high-water & low water wale. The plumb and batter piles of each bent are connected using an HP12x53 strut. Refer to Drawing

GA-11 to GA-13 for the support layout of Section - H. The original timber bulkhead was observed to be located outboard of the steel sheet pile bulkhead throughout the length of Section - H. The gap between the steel sheet pile & timber sheet pile is filled with concrete at the location of composite piles; no fill exists between the bulkheads at the location of HP pile bents.



ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - H
SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

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PHILADELPHIA ENERGY SOLUTIONS

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	PG	AN	01-22-18

ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-H - PLAN

SHEET NO.: 11 OF 31 DRAWING NO.: GA-11

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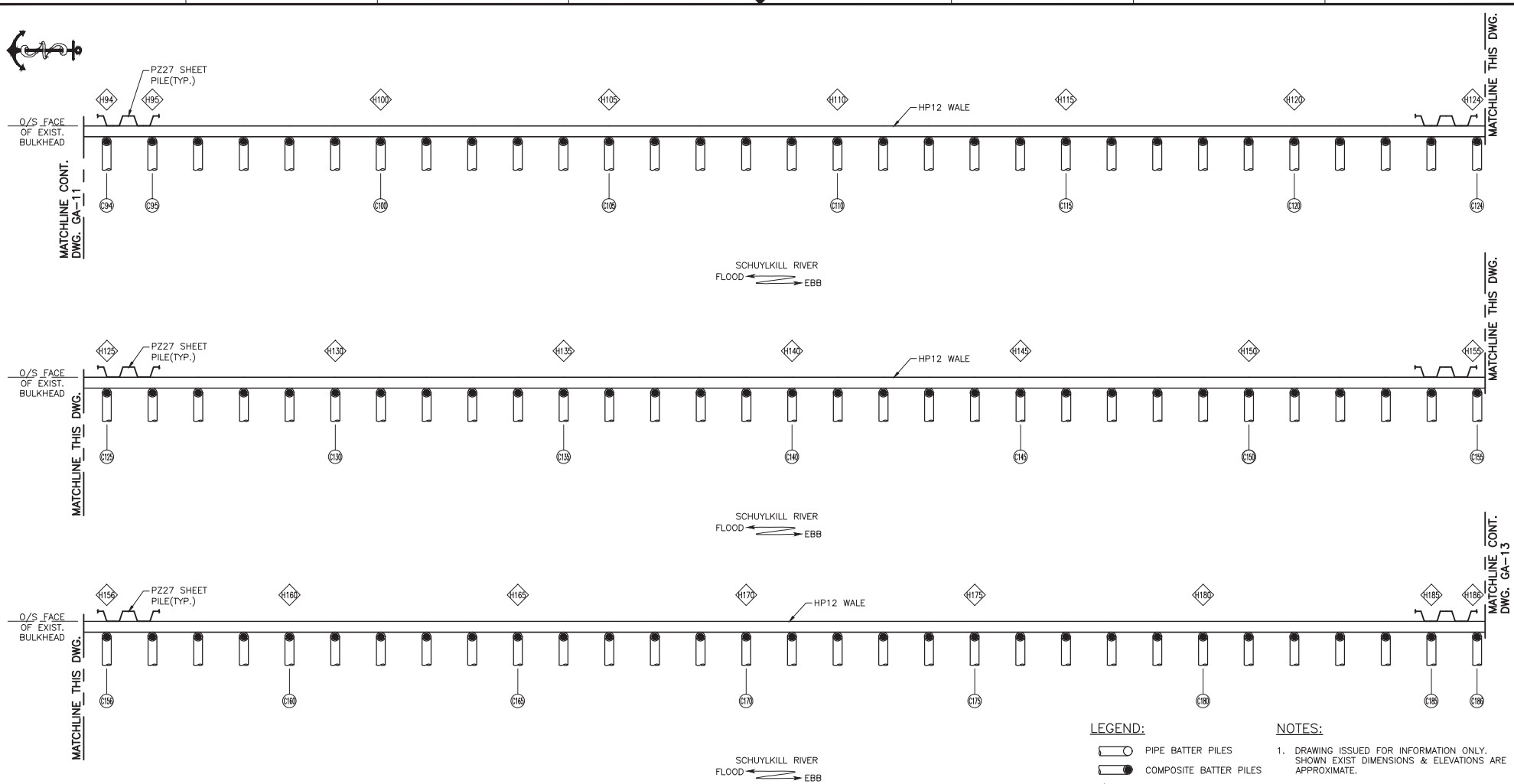
SCALE: AS NOTED



ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - H

SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

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PHILADELPHIA ENERGY SOLUTIONS

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-H - PLAN

SHEET NO.: 12 OF 31 DRAWING NO.: GA-12

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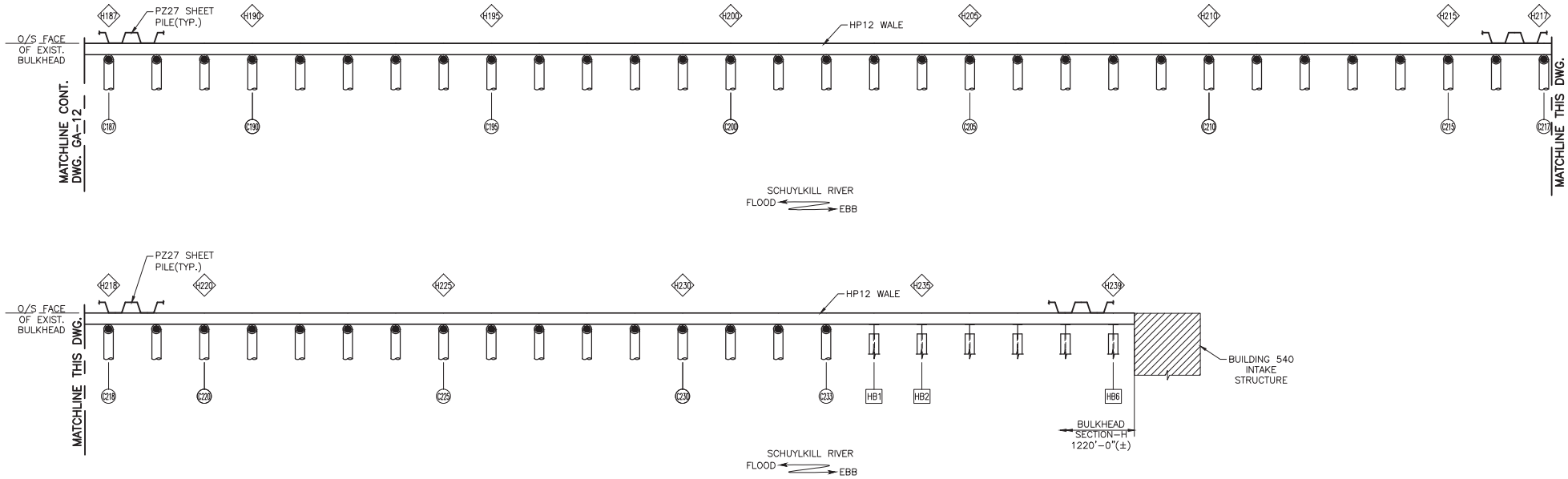
DRAWN BY: FNY
DATE: 12-16-14
SCALE: AS NOTED



LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

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ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - H
SCALE: 3/16" = 1'-0"

CLIENT NAME:	PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.:	N/A
CLIENT LOCATION:	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-H - PLAN

SHEET NO.: 13 OF 31 DRAWING NO.: GA-13

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ANCHOR PROJECT NO.:	17-03-J036
DESIGNED BY:	APPROVED BY: AN
DRAWN BY: FNY	DATE: 12-16-14
SCALE: AS NOTED	

GIRARD POINT BULKHEAD SECTION - I

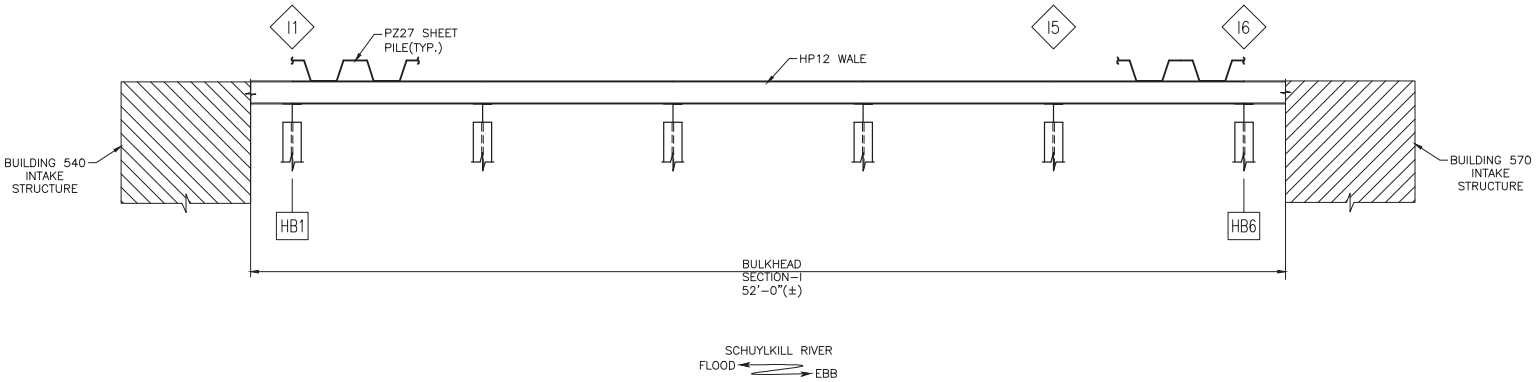
Photo 1: Girard Point Bulkhead Section - I. Picture taken from upriver looking downriver.

Description:

Section - I is located downriver of Building 570 Intake Structure and upriver of Building 540 Intake Structure. Section - I is **approximately 62 ft. long**, extending from STA. 42+07 to STA. 42+69. The construction of Section - I of the bulkhead differs from the typical construction of Girard Point Bulkhead. This section of bulkhead is supported by HP pile bents only. Mudline elevation at Section - I varies from approximately -1'-0" to -2'-0" MLW.

The steel sheet pile (SSP) bulkhead is laterally supported using **six (6) HP12x53 bents** (Support Designation: I1 to I6 and Bent Designation: HB-1 to HB-6, U/R to D/R) located on the water side of bulkhead. Each bent consists of a plumb and a batter HP12x53 pile. HP pile bents are welded to a high-water & a low-water HP12x53 wale. Wales are welded to the outshore face of SSP and the inshore flange of plumb pile of each bent. The high-water wale is located 1'-6" below the top of SSP and low water wale is located approximately 4'-6" below the top wale. At the elevation of low-water wale, plumb and

batter piles are connected using an HP12x53 strut. The timber sheeting of the original timber bulkhead was observed to be located outboard of the steel sheet pile bulkhead throughout the length of Section – I. No concrete ledge or fill exists between the timber sheet piles and the steel sheet piles at this section.



SECTION - I

SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

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DATE: 01-22-18

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-I - PLAN

SHEET NO.: 14 OF 31 DRAWING NO.: GA-14

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ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-16-14
SCALE: AS NOTED

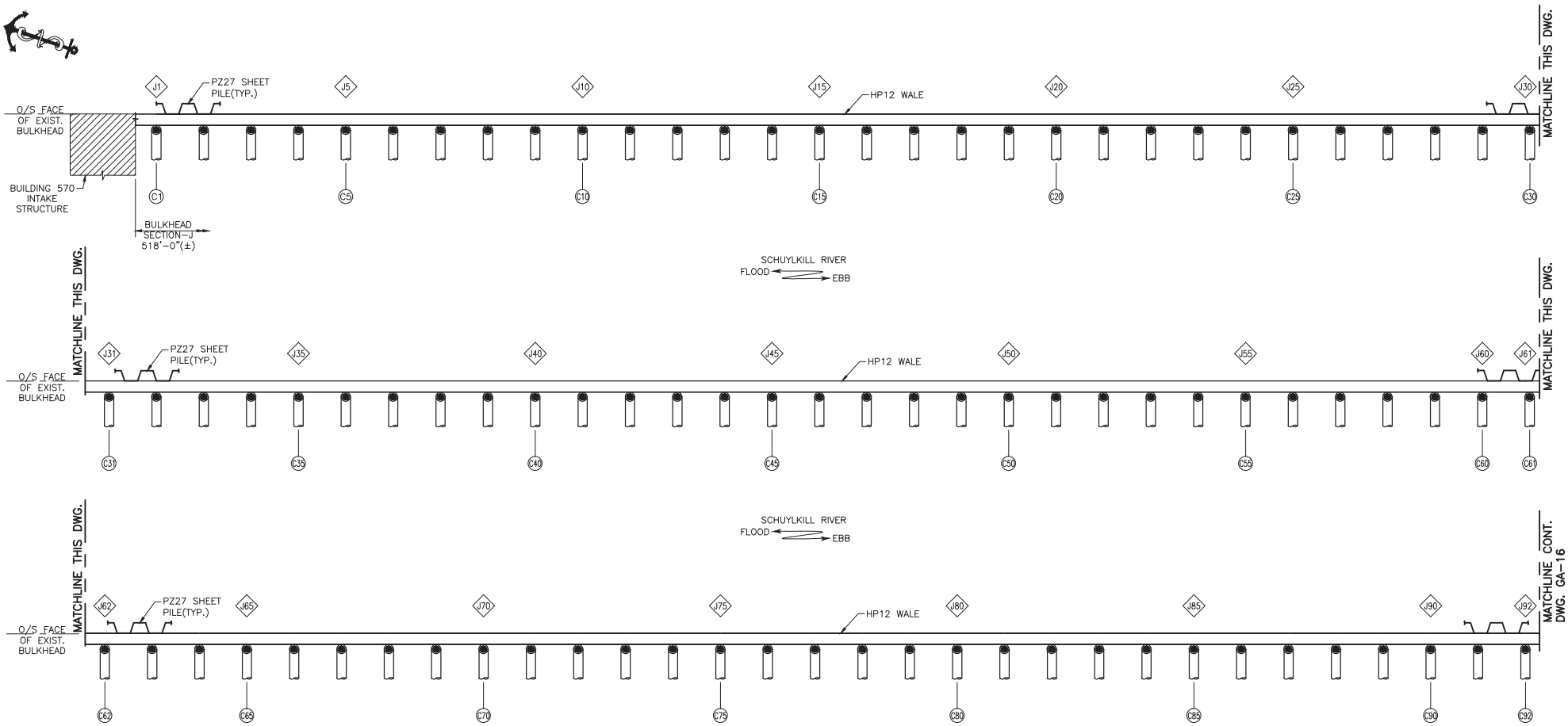
GIRARD POINT BULKHEAD SECTION - J

Photo 1: Girard Point Bulkhead Section - J.

Description:

Section - J is located downriver of Building 540 Intake Structure and upriver of Building 640 Intake Structure. Section - J is **approximately 518 ft. long**, extending from STA. 42+92 to STA. 48+10. Section - J of the bulkhead has the typical construction of Girard Point Bulkhead.

The steel sheet pile bulkhead is laterally supported using **one-hundred two (102) composite batter piles** (Support Designation: J1 to J102, U/R to D/R) on the water side, labeled C1 thru C102, upriver to downriver. Composite batter piles are welded to a high-water HP12x53 concrete filled wale which is connected to the outshore face of the sheet piles. Refer to Drawing GA-15 & GA-16 for the support layout of Section - J. The original timber bulkhead was observed to be located outboard of the steel sheet pile bulkhead throughout the length of Section - J. The gap between the steel sheet pile & timber sheet pile is filled with concrete.



ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - J
SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

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PHILADELPHIA ENERGY SOLUTIONS

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-J - PLAN

SHEET NO.: 15 OF 31 DRAWING NO.: GA-15

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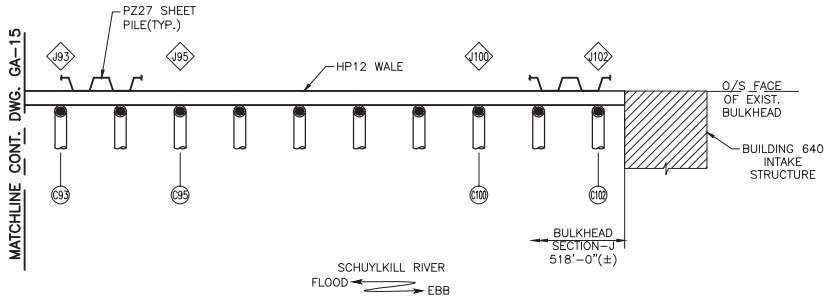

SECTION - J
SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

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ISSUED FOR INFORMATION
DATE: 01-22-18

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-J - PLAN

SHEET NO.: 16 OF 31 DRAWING NO.: GA-16

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DRAWN BY: FNY
DATE: 12-16-14
SCALE: AS NOTED

GIRARD POINT BULKHEAD SECTION - K

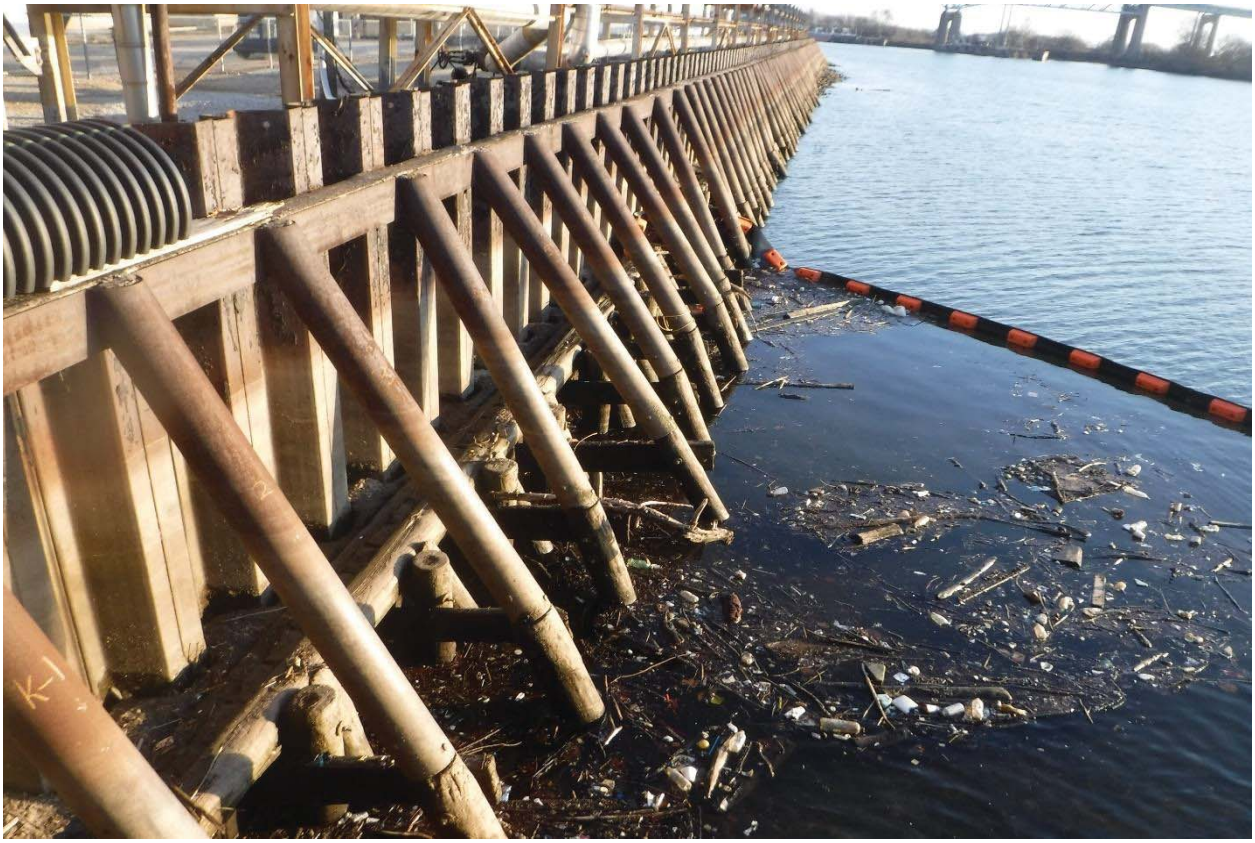
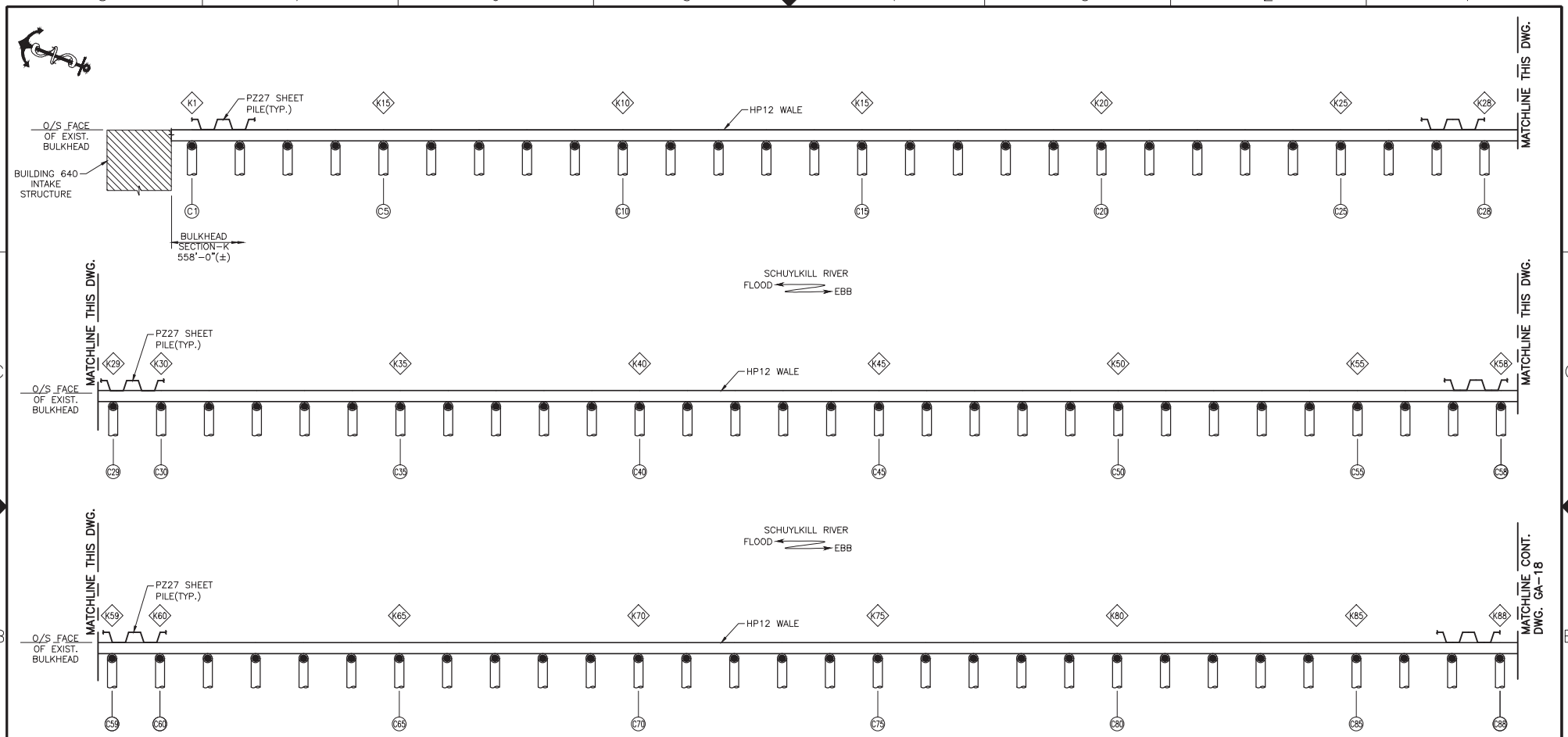


Photo 1: Girard Point Bulkhead Section - K. Picture taken from upriver end looking downriver.

Description:

Section - K is located downriver of Building 640 Intake Structure and is approximately 558 ft. long, extending from STA. 48+34 to STA. 53+92. Section - K of the bulkhead has the typical construction of Girard Point Bulkhead.

The steel sheet pile bulkhead is laterally supported using **one-hundred nine (109) composite batter piles** (Support Designation: K1 to K109, U/R to D/R) on the water side, labeled C1 thru C109, upriver to downriver. Composite batter piles are welded to a high-water HP12x53 concrete filled wale which is connected to the outshore face of the steel sheet piles. Refer to Drawing GA-17 & GA-18 for the support layout of Section - K. The original timber bulkhead was observed to be located outboard of the steel sheet pile bulkhead throughout the length of Section - K. The gap between the steel sheet pile & timber sheet pile is filled with concrete. Riprap was encountered immediately outshore of the timber bulkhead from pile C49 to pile C109.



ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - K

SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

NOTES:

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3. THIS DWG. & SHOWN PILE SPACING ARE NOT TO SCALE AND DO NOT REPRESENT FIELD CONDITIONS.

PHILADELPHIA ENERGY SOLUTIONS

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	PG	AN	01-22-18

ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-K - PLAN

SHEET NO.: 17 OF 31 DRAWING NO.: GA-17

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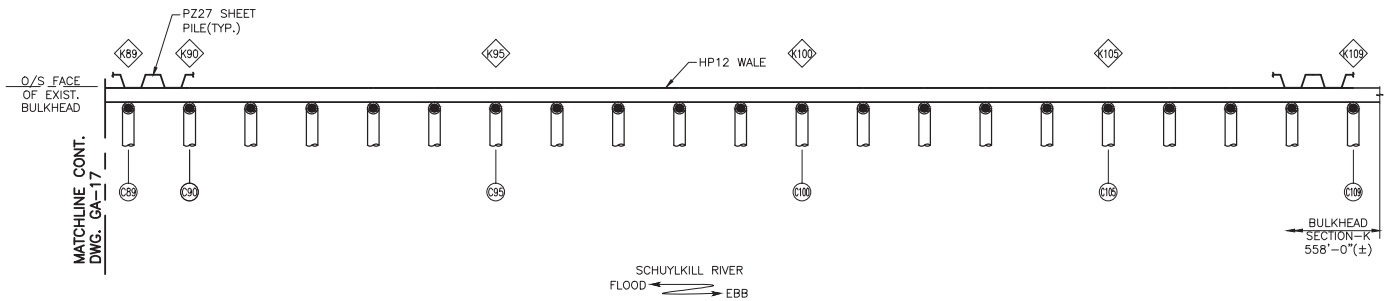
1224 BALTIMORE PIKE, SUITE: 205
CHADDS FORD, PA 19317
TEL. (610) 945-1839, FAX. (610) 945-2001

ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-16-14
SCALE: AS NOTED



SECTION - K

SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

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DATE: 01-22-18

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	PG	AN	01-22-18

ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-K - PLAN

SHEET NO.: 18 OF 31 DRAWING NO.: GA-18

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CHADDS FORD, PA 19317
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ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-16-14
SCALE: AS NOTED

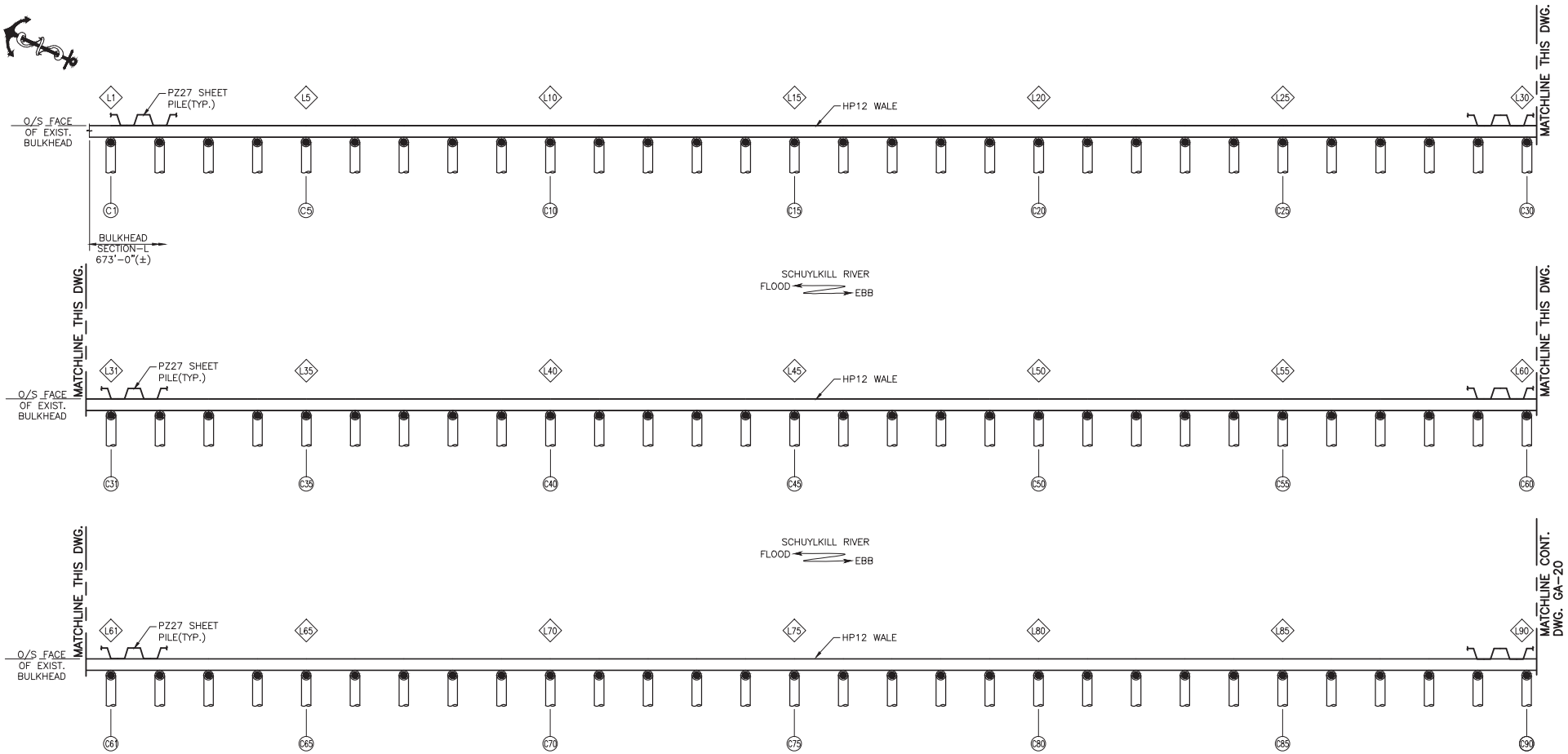
GIRARD POINT BULKHEAD SECTION - L

Photo 1: Girard Point Bulkhead Section - L.

Description:

Section - L is **approximately 673 ft. long**, extending from STA. 53+92 to STA. 60+65 and has the typical construction of Girard Point Bulkhead. Bulkhead Section - L has the typical construction of Girard Point Bulkhead except that steel pipe piles and HP14 pile bents have recently been installed at approximately 20 linear feet length of this bulkhead at the downriver end, during the rehabilitation of Bulkhead Section – M in year 2017. The PZ-27 steel sheet piles at Section - L were laterally supported using using one-hundred thirty-two (132) composite batter piles (Support Designation: L1 to L132, U/R to D/R). In year 2017, during the rehabilitation of Bulkhead section – M, Piles L130 to L132 were demolished and renewed with 16” diameter pipe piles and HP14 pile bents. Currently, Bulkhead Section – L is supported by **one hundred thirty four (134) new supports** (Support Designation: L1 to L134, U/R to D/R) located on the waterside. One-hundred twenty nine (129) composite batter piles (Support Designation: L1 to L129 or Pile

Designation C1 to C129 U/R to D/R), **three (3) - 16" diameter steel pipe batter piles** (Support Designation: L130, L132 and L133 or Pile Designation P1 to P3 U/R to D/R) and **two (2) HP pile bents,** (Support Designation: L131 and L134 or Pile Designation HB1 and HB2 U/R to D/R) support Bulkhead Section - L. Composite batter piles and steel pipe piles are welded to a high-water HP12x53 concrete filled wale which is connected to the outshore face of the sheet piles. Refer to Drawing GA-19 & GA-20 for the support layout of Section - L. Timber pile clusters exists at Pile C13 and Pile C33. Six (6) outfall pipes were encountered at this section, located near Piles C6, C15, C30, C34, C37 and C42. The original timber bulkhead was observed to be located outboard of the bulkhead throughout the length of Section - L. The gap between the steel sheet pile & timber sheet pile is filled with concrete.



ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - L
SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

NOTES:

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PHILADELPHIA ENERGY SOLUTIONS

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-L - PLAN

SHEET NO.: 19 OF 31 DRAWING NO.: GA-19

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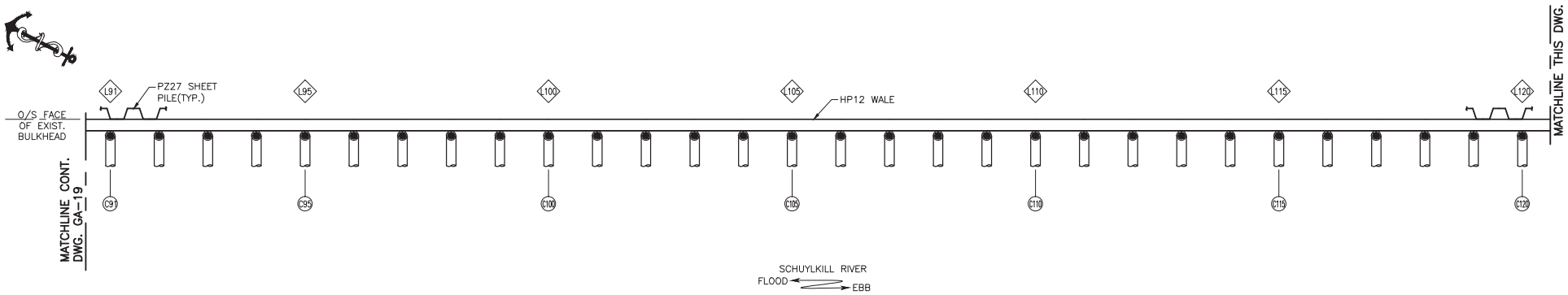
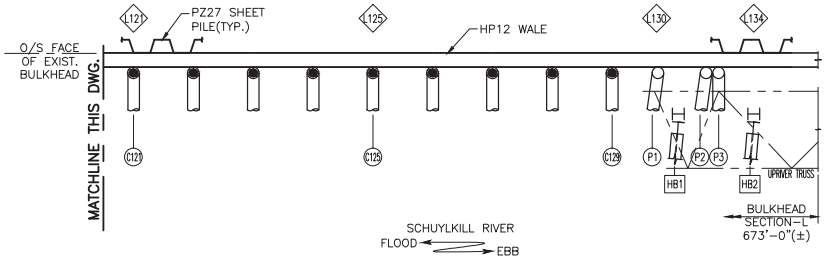
ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-16-14
SCALE: AS NOTED





LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

NOTES:

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ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - L
SCALE: 3/16" = 1'-0"

CLIENT NAME:	PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.:	N/A
CLIENT LOCATION:	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-L - PLAN

SHEET NO.: 20 OF 31 DRAWING NO.: GA-20

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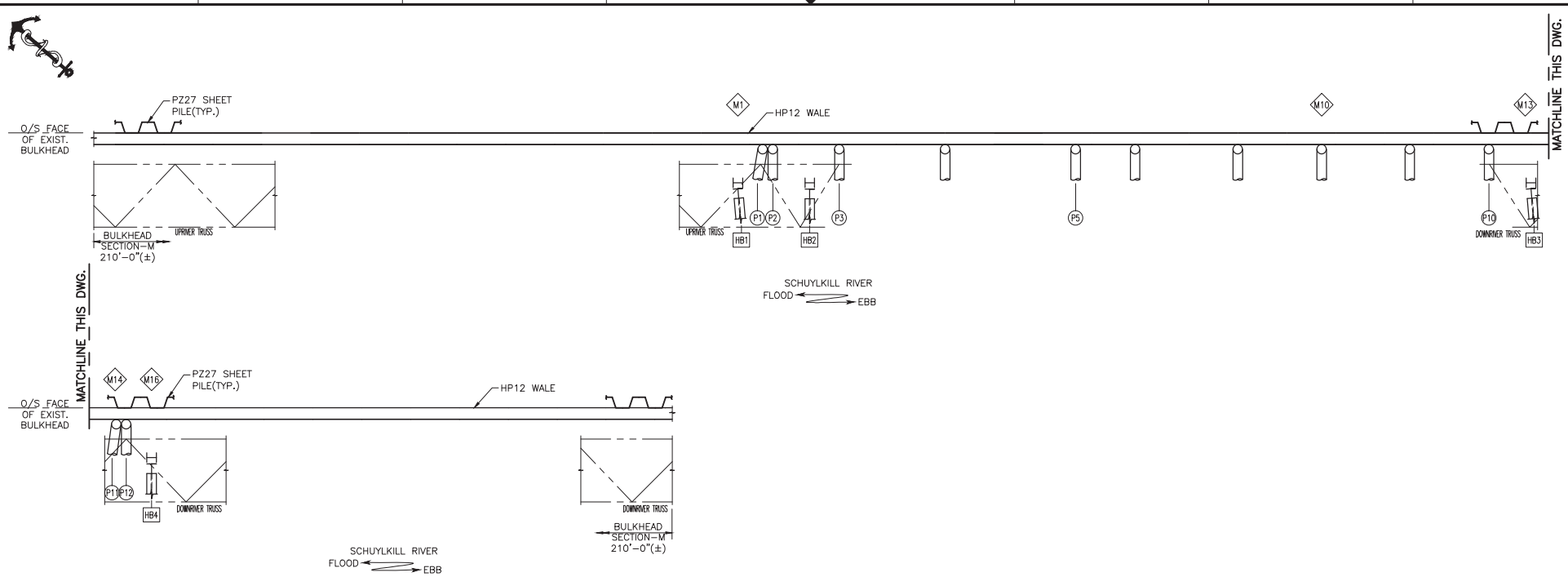
ANCHOR PROJECT NO.:	17-03-J036
DESIGNED BY:	APPROVED BY: AN
DRAWN BY: FNY	DATE: 12-16-14
SCALE: AS NOTED	



SECTION - M

SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

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ISSUED FOR INFORMATION
DATE: 01-22-18

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-M - PLAN

SHEET NO.: 21 OF 31 DRAWING NO.: GA-21

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ANCHOR PROJECT NO.: 17-03-J036
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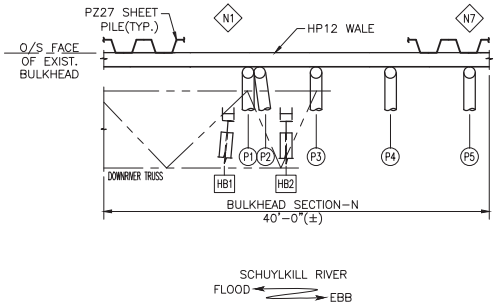
APPROVED BY: AN
DRAWN BY: FNY
DATE: 01-01-18
SCALE: AS NOTED



SECTION - N

SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

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PHILADELPHIA ENERGY SOLUTIONS

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS

CLIENT PROJECT NO.: N/A

CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-N - PLAN

SHEET NO.: 22 OF 31 DRAWING NO.: GA-22

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ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 01-01-18
SCALE: AS NOTED

GIRARD POINT BULKHEAD SECTION - P

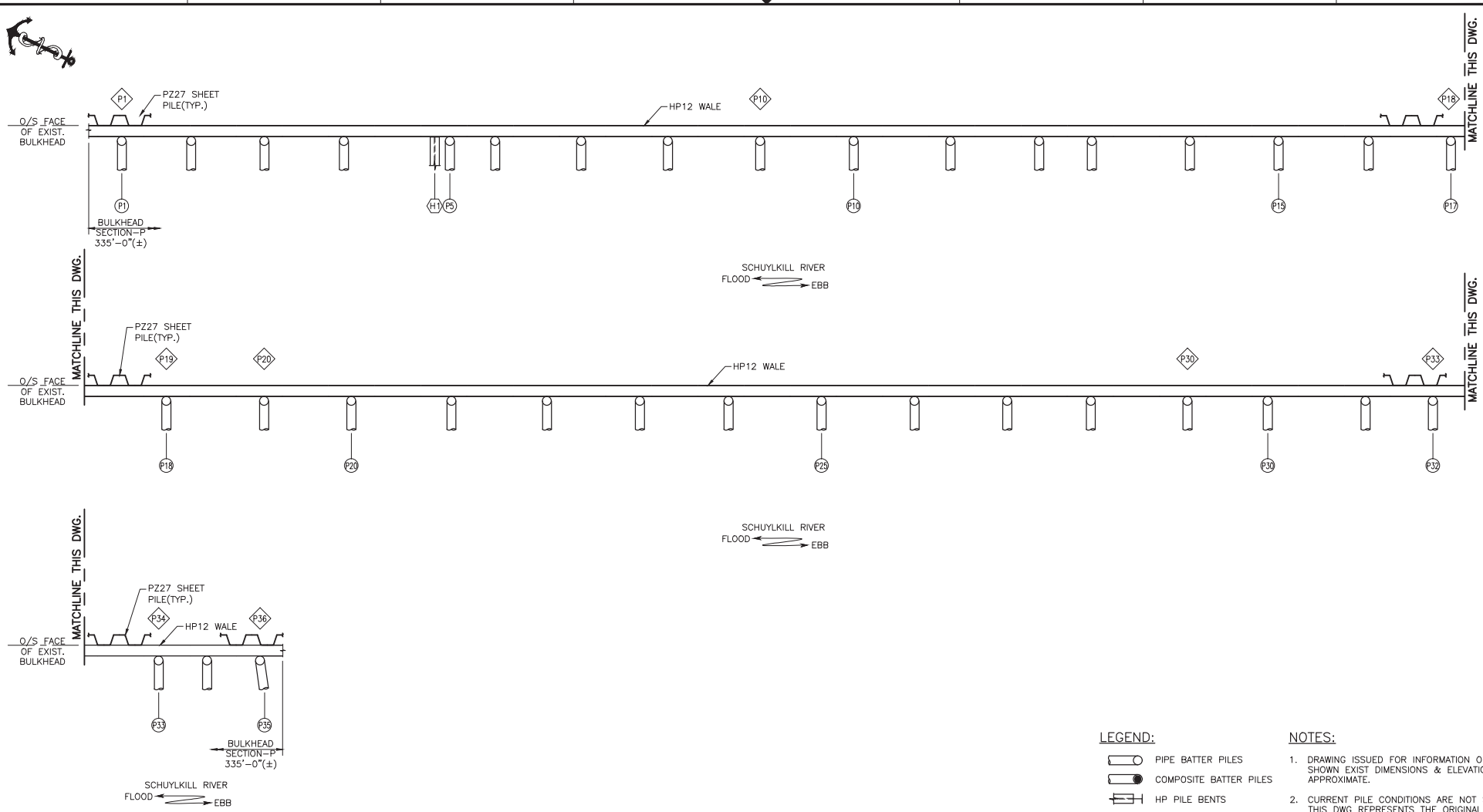
Photo 1: Girard Point Bulkhead Section - P. New repair pipe piles installed at this section.

Description:

Bulkhead Section - P have the typical construction of Girard Point Bulkhead. Section - P is **approximately 335 ft. long**, extending from STA. 63+15 to 66+50. Bulkhead Section - P has the typical construction of Girard Point Bulkhead except that steel pipe piles have recently been installed along the entire length of bulkhead Section – P to renew composite batter piles. The PZ-27 steel sheet piles at Section - P were laterally supported using sixty-five (65) composite batter piles located on the waterside. During years 2014 - 2017, these supports were replaced with **thirty-six (36) new supports** (Support Designation: P1 to P36, U/R to D/R) located on the waterside. **Thirty-five (35) - 16" diameter steel pipe batter piles** labeled P1 to P35, upriver to downriver **support bulkhead Section - P.** A HP12 batter pile temporary support (labeled H1) also exists between piles P4 and P5**.**

Steel pipe piles of Section - P are welded to a high-water HP12x53 concrete filled wale, which is connected to the outshore face of the sheet piles and directly to the SSPs. The

original timber bulkhead was observed to be located outboard of the steel sheet pile bulkhead throughout the length of Section - P. The gap between the steel sheet pile & timber sheet pile is filled with concrete.



ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - P
SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

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CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-P - PLAN

SHEET NO.: 23 OF 31 DRAWING NO.: GA-23

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TEL. (610) 945-1839, FAX. (610) 945-2001

ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 01-01-18
SCALE: AS NOTED

GIRARD POINT BULKHEAD ANCHOR SECTION

Photo 1: Girard Point Anchor Section. Picture looking at downriver end of section.

Description:

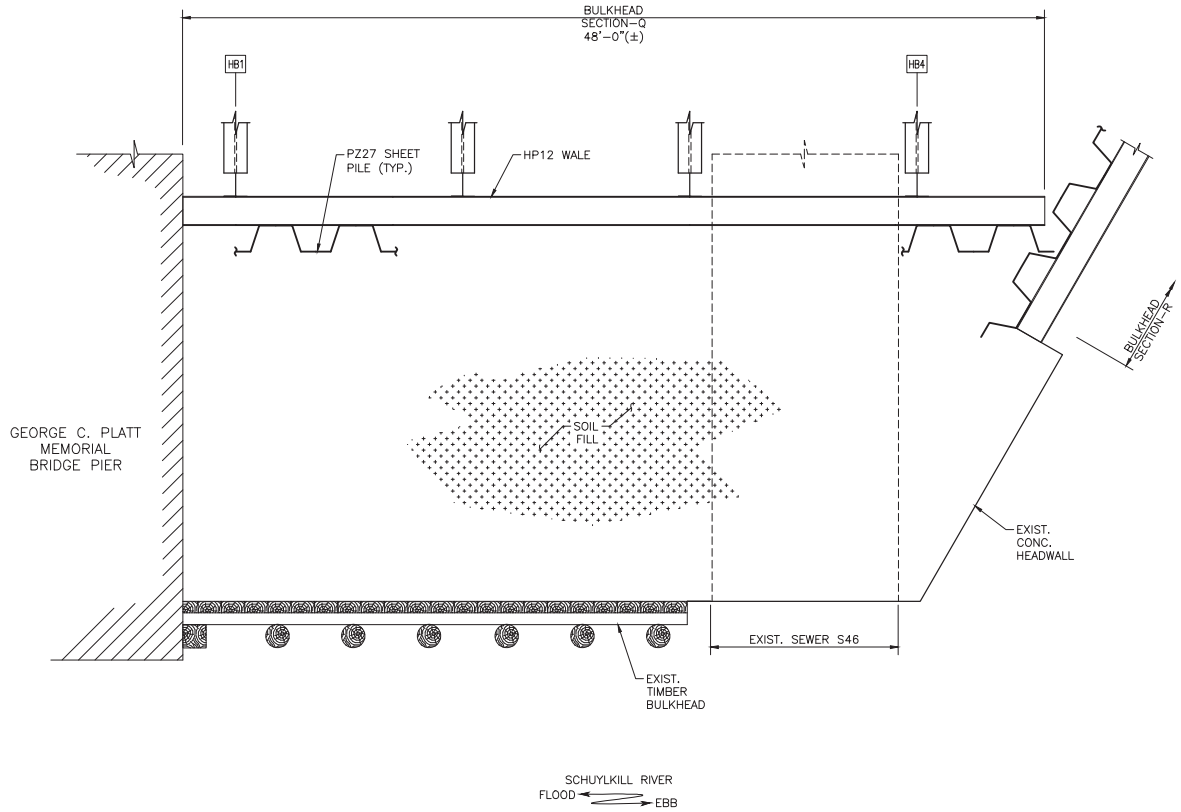
Anchor Section is **approximately 84 ft. long**, extending from STA. 66+50 to STA. 67+34. The construction of Anchor Section of the bulkhead differs from the typical construction of Girard Point Bulkhead. The steel sheet piles at Anchor Section are tied back using fourteen (14) - 1.5” diameter tie rods spaced approximately at 8 to 9 feet center to center. The steel wale for the tie rods is comprised of two steel C10 channels at an approximate elevation of +11’-0” MLW. The original timber bulkhead is completely non-existent at Anchor Section.

GIRARD POINT BULKHEAD SECTION - Q

Photo 1: Girard Point Bulkhead Section - Q.

Description:

Bulkhead Section - Q is located immediately downriver of George C. Platt Memorial Bridge and is **approximately 48 ft. long**, extending from STA. 68+09 to STA. 68+57. The construction of Section - Q bulkhead differs from the typical construction of Girard Point Bulkhead. A timber sheet pile bulkhead exists at the outshore face, along the river. In addition, a steel sheet pile bulkhead also exists approximately 15 ft. inshore and parallel to the timber bulkhead. The steel sheet pile bulkhead consists of PZ27 steel sheet piles supported by **four (4) HP pile bents** (Support Designation: Q1 to Q4 or Bent Designation HB1 to HB4, U/R to D/R) located along the inboard face of PZ27 sheet piles with the batter piles of the bent toed inshore. Each bent consists of a plumb and a batter HP12x53 pile. An HP12x53 wale connects the sheet piles to the bents. The gap between the timber and steel sheet pile bulkhead is filled with soil and riprap. Refer to Drawing GA-24 for the layout of Section - Q bulkhead.



LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES

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ISSUED FOR
INFORMATION
DATE: 01-22-18

SECTION - Q
SCALE: 3/8" = 1'–0"

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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A	ISSUED FOR INFORMATION	APB	AN	01-22-18

ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-Q - PLAN

SHEET NO.: 24 OF 31 DRAWING NO.: GA-24

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ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-20-17
SCALE: AS NOTED

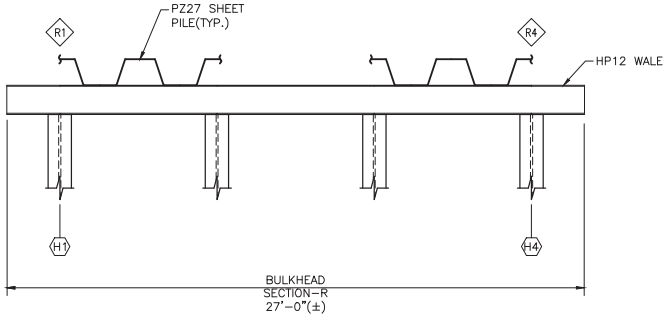
GIRARD POINT BULKHEAD SECTION - R

Photo 1: Girard Point Bulkhead Section - R. Picture taken from downriver looking upriver.

Description:

Bulkhead Section - R is **approximately 27 ft. long**, extending from STA. 68+57 to STA. 68+84. The construction of Section - R of the bulkhead differs from the typical construction of Girard Point Bulkhead.

The steel sheet pile (SSP) bulkhead at Section – R is laterally supported by **four (4) HP batter piles** (labeled Supports R1 to R4 or HP 12x53 Piles H-1 t H4 - U/R to D/R) and is located immediately inshore of the original timber bulkhead. The HP batter piles are located at the outboard face of the sheet piles with the batter piles toed outboard. An HP12x53 wale located approximately 1'-0" below the top of SSP connects the sheet piles to the batter HP piles. Refer to Drawing GA-25 for the support layout of Section - R.



SECTION - R
SCALE: 3/8" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

NOTES:

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3. THIS DWG. & SHOWN PILE SPACING ARE NOT TO SCALE AND DO NOT REPRESENT FIELD CONDITIONS.

ISSUED FOR INFORMATION
DATE: 01-22-18

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	APB	AN	01-22-18

ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-R - PLAN

SHEET NO.: 25 OF 31 DRAWING NO.: GA-25

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SEAL:

ANCHOR CONSULTANTS, LLC
1224 BALTIMORE PIKE, SUITE: 205
CHADDS FORD, PA 19317
TEL. (610) 945-1839, FAX. (610) 945-2001

ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY: APPROVED BY: AN
DRAWN BY: FNY DATE: 01-01-18
SCALE: AS NOTED

GIRARD POINT BULKHEAD SECTION - S

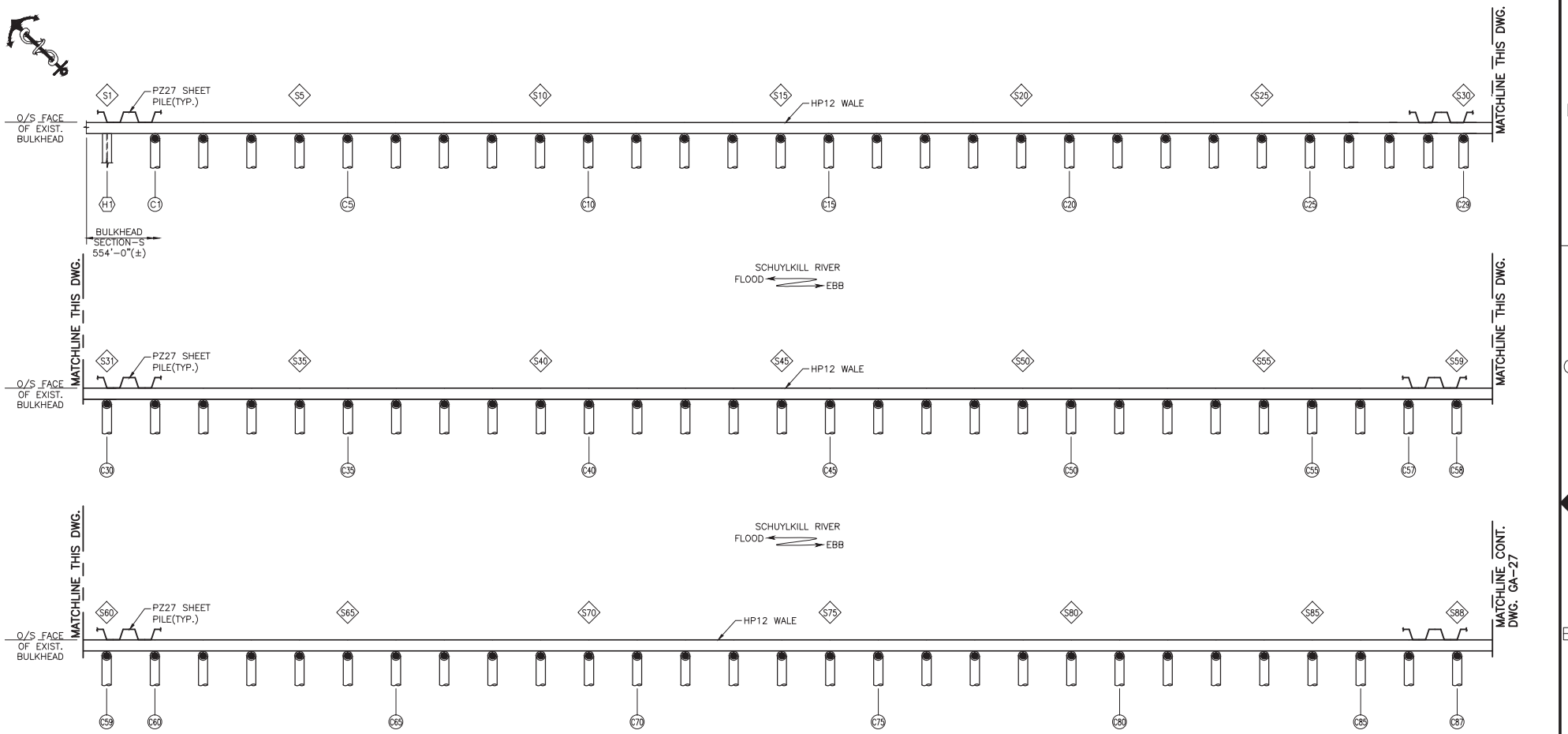
Photo 1: Girard Point Bulkhead Section - S. Picture taken looking upriver.

Description:

Section - S **is approximately 554 ft. long**, extending from STA. 68+84 to STA. 74+38. Section - S of the bulkhead has the typical construction of Girard Point Bulkhead, except for the upriver-most support, which is an HP12x53 batter pile.

The steel sheet pile bulkhead at Section - S is laterally supported using **one-hundred thirteen (113) supports** (Support Designation: S1 to S113, U/R to D/R) on the water side. The **upriver-most support is an HP12x53 batter pile** labeled H1. The **following one-hundred twelve (112) supports are composite batter piles** labeled C1 thru C112, upriver to downriver. HP & composite batter piles are welded to a high-water HP12x53 concrete filled wale which is connected to the outshore face of the bulkhead. Refer to Drawing GA-26 & GA-27 for the support layout of Section - S. The original timber

bulkhead was observed to be located outboard of the steel sheet pile bulkhead throughout the length of Section - S. The gap between the steel sheet pile & timber sheet pile is filled with concrete. Mudline elevation at Section - S varies approximately from -2’-0” to -5’-0” MLW.



LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

NOTES:

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ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - S
SCALE: 3/16" = 1'-0"

CLIENT NAME:	PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.:	N/A
CLIENT LOCATION:	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	PG	AN	01-22-18

ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-S - PLAN

SHEET NO.: 26 OF 31 DRAWING NO.: GA-26

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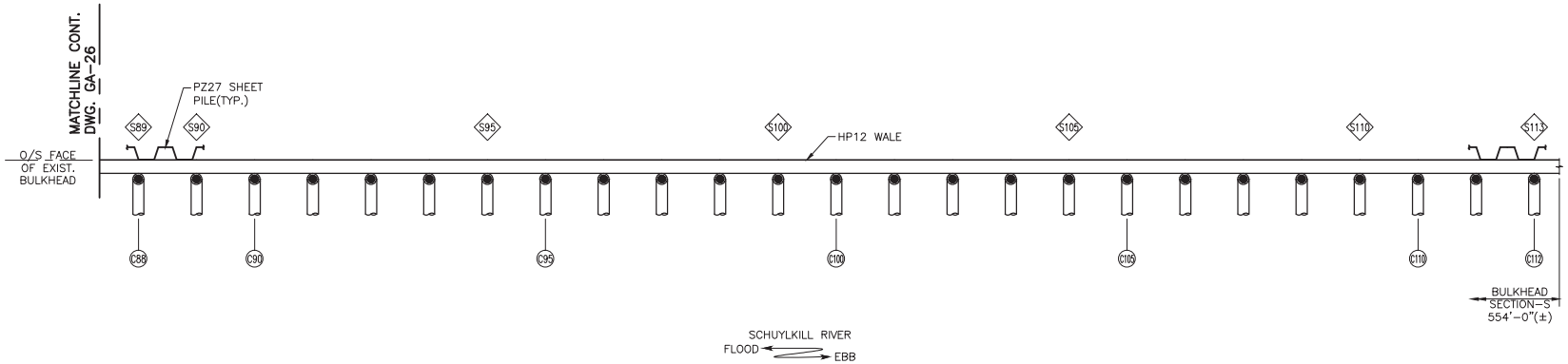
CHADDS FORD, PA 19317
TEL. (610) 945-1839, FAX. (610) 945-2001

ANCHOR PROJECT NO.:	17-03-J036
DESIGNED BY:	APPROVED BY: AN
DRAWN BY: FNY	DATE: 12-16-14
SCALE: AS NOTED	



SECTION - S

SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- XX SUPPORT COUNT

NOTES:

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ISSUED FOR INFORMATION
DATE: 01-22-18

PHILADELPHIA ENERGY SOLUTIONS

CLIENT NAME: PHILADELPHIA ENERGY SOLUTIONS

CLIENT PROJECT NO.: N/A

CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	PG	AN	01-22-18

ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-S - PLAN

SHEET NO.: 27 OF 31 | DRAWING NO.: GA-27

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TEL. (610) 945-1839, FAX. (610) 945-2001

ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-16-14
SCALE: AS NOTED

GIRARD POINT BULKHEAD SECTION - T

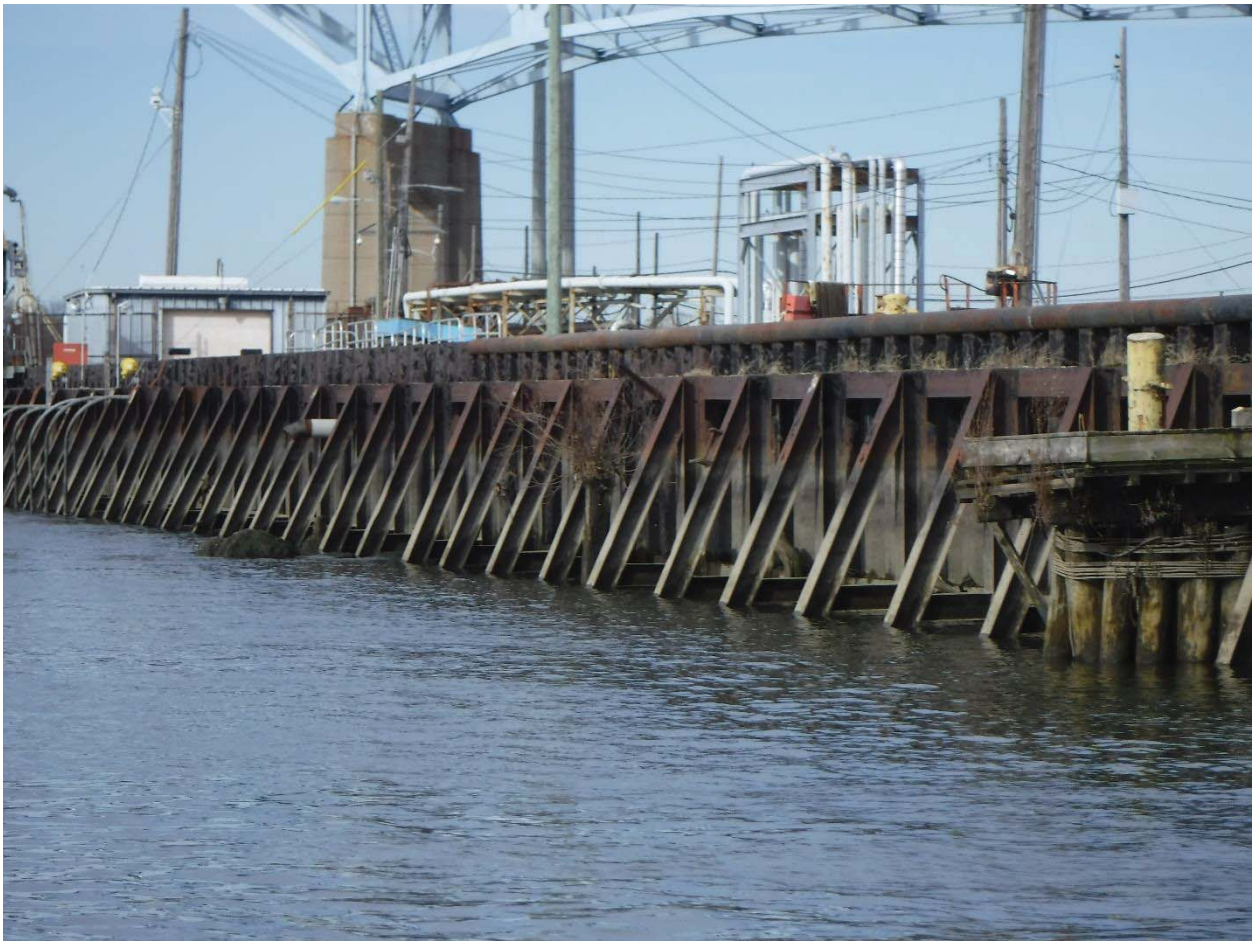


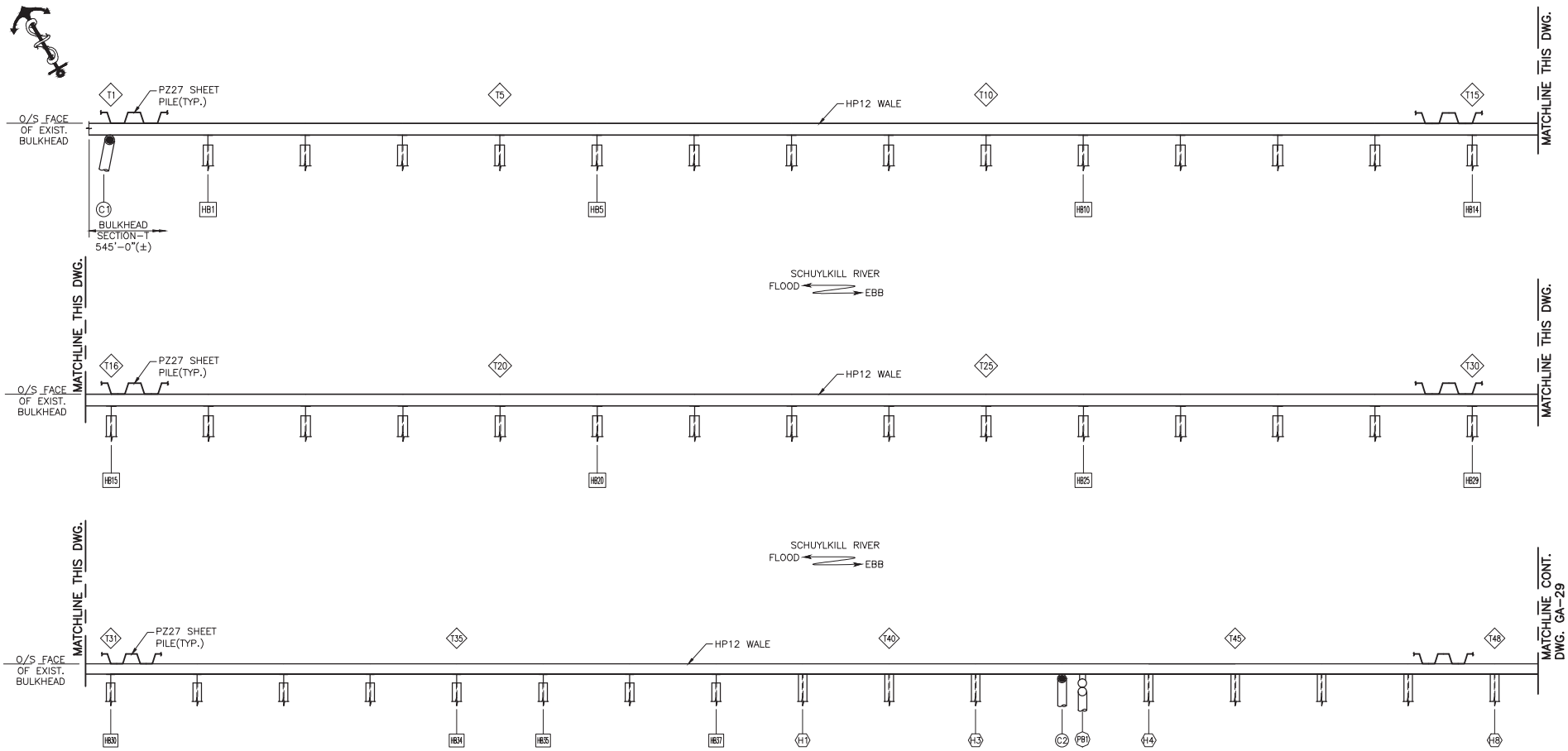
Photo 1: Girard Point Section -T. Picture taken looking upriver.

Description:

Section - T is **approximately 545 ft. long**, extending from STA. 74+38 to STA. 79+83. The construction of Section - T of the bulkhead differs from the typical construction of Girard Point Bulkhead. Only two (2) composite piles remain at this section. Mudline elevation at Section - T varies from approximately +1'-6" to -4'-0" MLW.

The PZ-27 steel sheet pile bulkhead is laterally supported using **fifty-six (56) supports** on the water side (Support Designation: T1 to T56, U/R to D/R). The **upriver-most support is a composite batter pile** labeled C1. The **following downriver thirty-seven (37) supports are bents** consisting of one plumb and one batter HP12x53 pile, each, labeled HB1 to HB37, upriver to downriver. Plumb pile of HP pile bents is welded to a

high-water and a low-water HP12x53 wale. The **subsequent downriver three (3) supports are HP12x53 batter piles** labeled H1 to H3 **followed by a composite batter pile, labeled C2**. The **next twelve (12) supports are HP12x53 batter piles** labeled H4 to H15. HP and composite batter piles are connected to an HP12x53 high-water wale. Two (2) 16” diameter pipe pile bents have been installed between supports C2 & H4 and between supports H12 & H13. These pipe pile bents are labeled PB1 and PB2, upriver to downriver. An HP strut connects the pipe plumb piles to the high-water wale. Refer to Drawings GA-28 & GA-29 for the support layout at Section - T. The original timber bulkhead is non-existent at portion of Section - T supported by HP pile bents, but was observed to exist outboard of the remainder of Section - T. The gap between the steel sheet pile & timber sheet pile is filled with concrete.



LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- PIPE BENT
- XX SUPPORT COUNT

NOTES:

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3. THIS DWG. & SHOWN PILE SPACING ARE NOT TO SCALE AND DO NOT REPRESENT FIELD CONDITIONS.

ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - T
SCALE: 3/16" = 1'-0"

CLIENT NAME:	PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.:	N/A
CLIENT LOCATION:	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-T - PLAN

SHEET NO.: 28 OF 31 DRAWING NO.: GA-28

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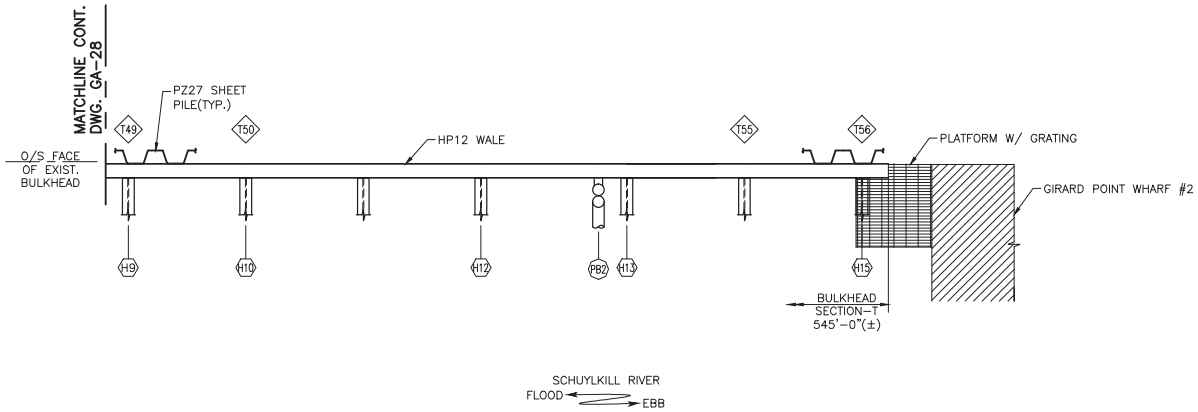
TEL. (610) 945-1839, FAX. (610) 945-2001

ANCHOR PROJECT NO.:	17-03-J036
DESIGNED BY:	APPROVED BY: AN
DRAWN BY: FNY	DATE: 12-16-14
SCALE: AS NOTED	



SECTION - T

SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE BATTER PILES
- COMPOSITE BATTER PILES
- HP PILE BENTS
- HP BATTER PILES
- PIPE BENT
- XX SUPPORT COUNT

NOTES:

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ISSUED FOR INFORMATION
DATE: 01-22-18

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CLIENT PROJECT NO.: N/A
CLIENT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION: 3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
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ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-T - PLAN

SHEET NO.: 29 OF 31 DRAWING NO.: GA-29

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ANCHOR PROJECT NO.: 17-03-J036
DESIGNED BY:
APPROVED BY: AN
DRAWN BY: FNY
DATE: 12-16-14
SCALE: AS NOTED

GIRARD POINT BULKHEAD SECTION - V

Photo 1: Girard Point Bulkhead Section – V, upriver of Building Intake 699.

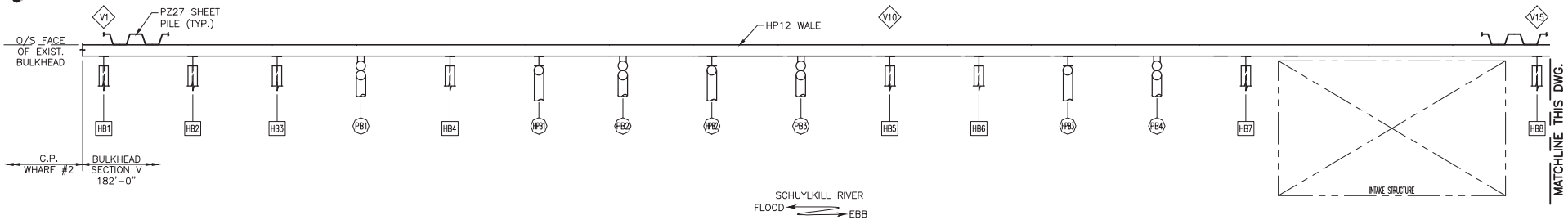
Description:

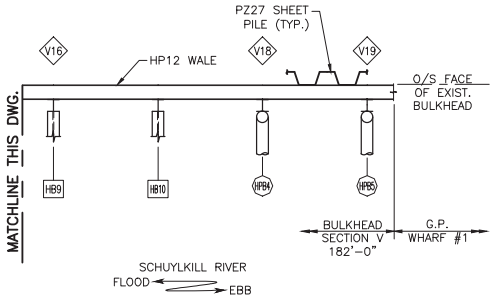
Section - V is located between Girard Point Wharf #2 (Upriver) and Girard Point Wharf #1 (Downriver). Section - V is **approximately 182 ft. long**, extending from STA. 82+83 to STA. 84+65. The construction of Section - V bulkhead differs from the typical construction of Girard Point Bulkhead. No composite piles remain at this section. Mudline elevation was measured at the downriver most bent of Section – V and was found to be approximately from -7'-0" MLW.

The steel sheet pile bulkhead at Section - V is laterally supported using **Nineteen (19) supports** (Support Designation: V1 to V19, U/R to D/R) on the water side. These supports were strengthened or renewed circa 2012. **Ten (10) of the nineteen (19) supports are HP pile bents labeled HB1 to HB10 (U/R to D/R), each consisting of a plumb and a batter HP12x53 pile**. Plumb pile of HP pile bents is welded to a high-water and a low water HP12x53 wale. Batter pile of HP pile bents is welded to the HP plumb pile at the high-water wale level. A welded HP12 strut also connects the plumb and batter piles at the low water wale level. **Five (5) of the nineteen (19) supports are pile bents**

consisting of an HP12x53 plumb pile and a 14" diameter steel pipe batter pile, labeled as HPB1 to HPB5. The HP plumb pile is welded to the high-water and low water wales, while the pipe pile is connected to the HP plumb pile through HP12 struts at the high water and low water wale elevation. See Photo 2 below. **The remaining four (4) supports are pile bents consisting of a plumb and a batter 14" diameter steel pipe pile**. These bents are labeled as PB1 thru PB4 from upriver to downriver. Plumb pile of pipe pile bents is welded to the high-water and the low water HP12x53 wales, while the batter pile is connected to the plumb pile at high water wale elevation with a steel gusset plate. Refer to Drawing GA-30 for the support layout at Section - V.

Photo 2: Picture showing various types of pile bent supports at bulkhead Section - V.





ISSUED FOR INFORMATION
DATE: 01-22-18

SECTION - V
SCALE: 3/16" = 1'-0"

LEGEND:

- PIPE PILE BENT
- HP AND PIPE PILE BENT
- HP PILE BENTS

NOTES:

1. DRAWING ISSUED FOR INFORMATION ONLY. SHOWN EXIST DIMENSIONS & ELEVATIONS ARE APPROXIMATE.

CLIENT NAME:	PHILADELPHIA ENERGY SOLUTIONS
CLIENT PROJECT NO.:	N/A
CLIENT LOCATION:	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145
PROJECT LOCATION	3144 W. PASSYUNK AVE., PHILADELPHIA, PA 19145

REV.	REVISION DESCRIPTION	BY	CHKD	DATE
A	ISSUED FOR INFORMATION	PG	AN	01-22-18

ROUTINE INSPECTION - GIRARD POINT BULKHEAD

GP BULKHEAD SECTION-V - PLAN

SHEET NO.: 30 OF 31 DRAWING NO.: GA-30

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TEL. (610) 945-1839, FAX. (610) 945-2001

ANCHOR PROJECT NO.:	17-03-J036
DESIGNED BY:	APPROVED BY: AN
DRAWN BY: FNY	DATE: 12-16-14
SCALE: AS NOTED	

APPENDIX D
MODEL CALIBRATION PLOTS – 2014 THROUGH 2016, 2019, 2021

Sitewide Fate and Transport Remedial Investigation Report
Part 1 – Groundwater Flow Model
Former Philadelphia Refinery
Philadelphia, Pennsylvania
Philadelphia Refinery Operations,
a series of Evergreen Resources Group, LLC
3144 Passyunk Avenue, Philadelphia, Pennsylvania

Stantec

Figure No.
D-1

Title
2014 CALIBRATION TARGET RESIDUAL PLOT (BUBBLE PLOT)

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,200 2,400 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Facility Area of Interest (AOI) Boundary
- River Boundary

2014 Calibration Well (Target) Residual (feet)

- < -12.5
- -12.5 - -10.0
- -9.0 - -7.5
- -7.5 - -5.0
- -5.0 - -2.5
- -2.5 - 0.0
- 0.0 - 2.5
- 2.5 - 5.0
- 5.0 - 7.5
- 7.5 - 10.0
- 10.0 - 12.5
- > 12.5

Number of Observations	850
Residual Mean	0.21 ft
Residual Std. Deviation	1.70 ft
Scaled RMS Error	6.95%

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet; ft = feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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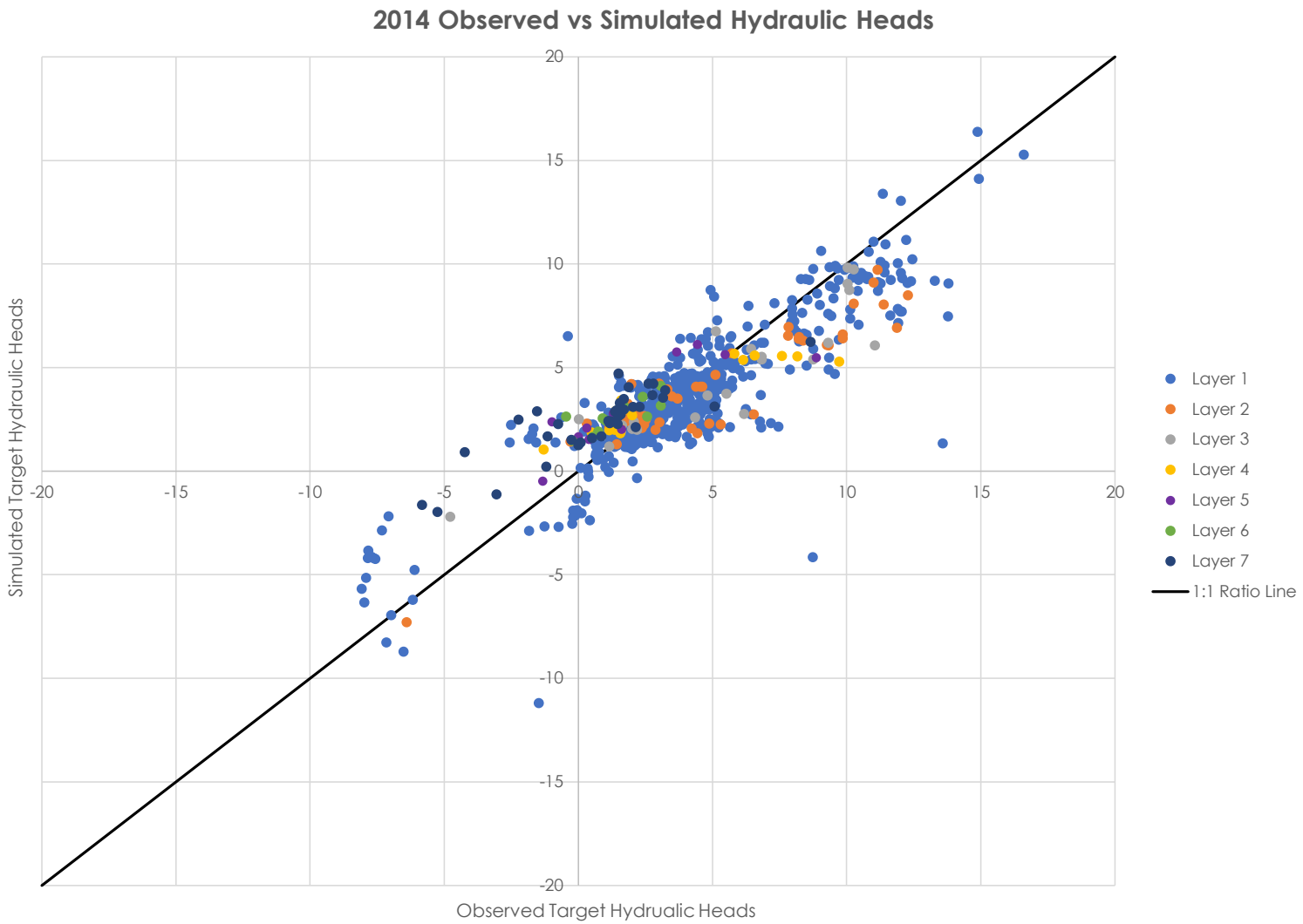

Figure No.
D-2

Title
2014 CALIBRATION OBSERVED VERSUS SIMULATED CHART

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

Number of Observations	850
Residual Mean	0.21 ft
Residual Std. Deviation	1.70 ft
Scaled RMS Error	6.95%

Notes:
1. Sources: Stantec
2. GWF Model simulated and observed hydraulic heads from well gauging measurements are provided in units of feet (ft).
3. GWF Model layers 1 through 7 are color coded to intersecting well locations based on the legend shown.

Stantec

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Figure No.
D-3

Title
2015 CALIBRATION TARGET RESIDUAL PLOT (BUBBLE PLOT)

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,200 2,400 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Facility Area of Interest (AOI) Boundary
- River Boundary

2015 Calibration Well (Target) Residual (feet)

- < -10.0
- -10.0 - -7.5
- -7.5 - -5.0
- -5.0 - -2.5
- -2.5 - 0.0
- 0.0 - 2.5
- 2.5 - 5.0
- 5.0 - 7.5
- 7.5 - 10.0
- > 10.0

Number of Observations	862
Residual Mean	0.19 ft
Residual Std. Deviation	1.67 ft
Scaled RMS Error	7.40%

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet; ft = feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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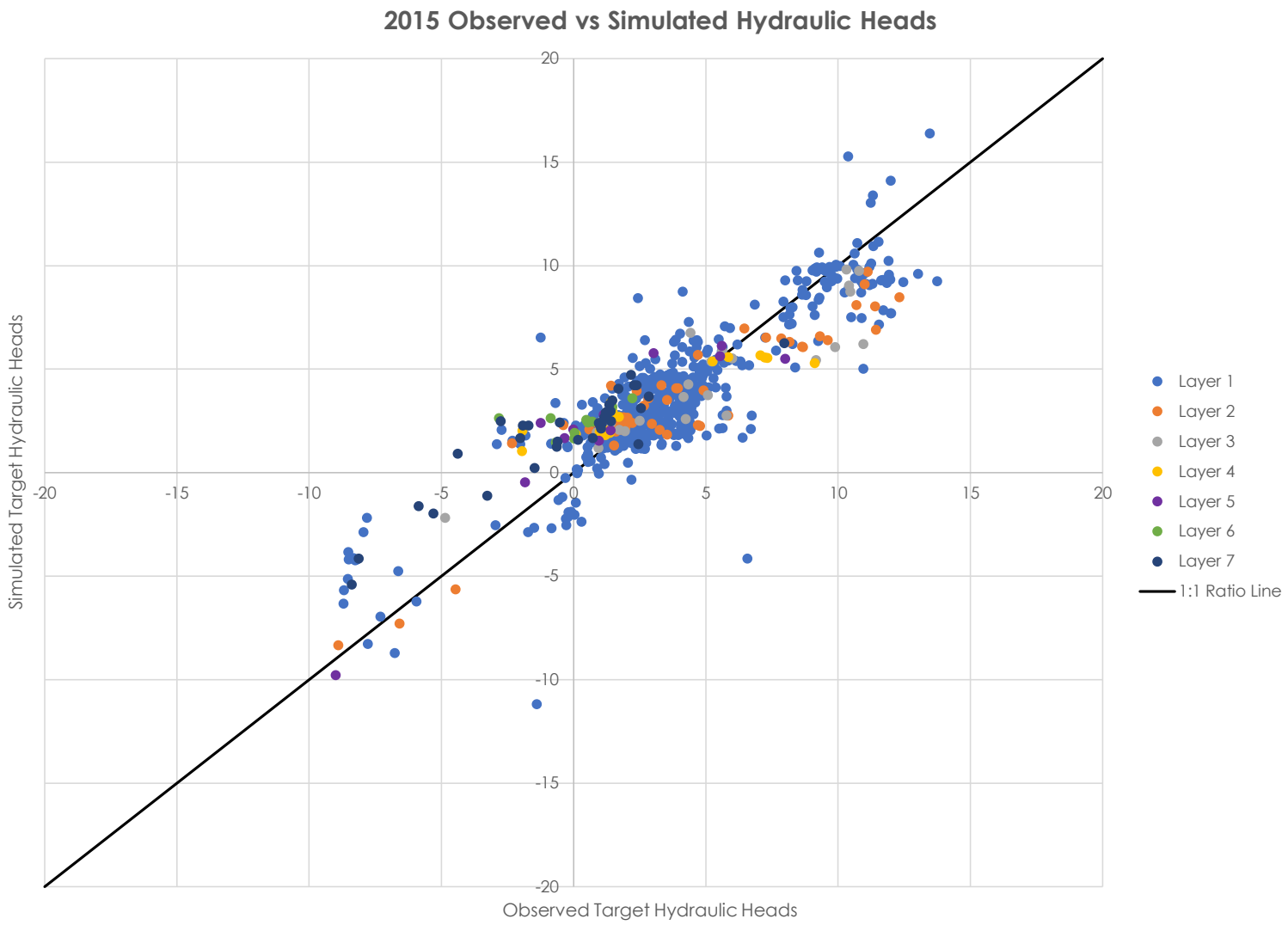

Figure No.
D-4

Title
2015 CALIBRATION OBSERVED VERSUS SIMULATED CHART

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

Number of Observations	862
Residual Mean	0.19 ft
Residual Std. Deviation	1.67 ft
Scaled RMS Error	7.40%

Notes:
1. Sources: Stantec
2. GWF Model simulated and observed hydraulic heads from well gauging measurements are provided in units of feet (ft).
3. GWF Model layers 1 through 7 are color coded to intersecting well locations based on the legend shown.

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Figure No.
D-5

Title
2016 CALIBRATION TARGET RESIDUAL PLOT (BUBBLE PLOT)

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,200 2,400 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Facility Area of Interest (AOI) Boundary
- River Boundary

2016 Calibration Well (Target) Residual (feet)

- < -10.0
- -10.0 - -7.5
- -7.5 - -5.0
- -5.0 - -2.5
- -2.5 - 0.0
- 0.0 - 2.5
- 2.5 - 5.0
- 5.0 - 7.5
- 7.5 - 10.0
- > 10.0

Number of Observations	920
Residual Mean	0.36 ft
Residual Std. Deviation	1.81 ft
Scaled RMS Error	7.56%

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet; ft = feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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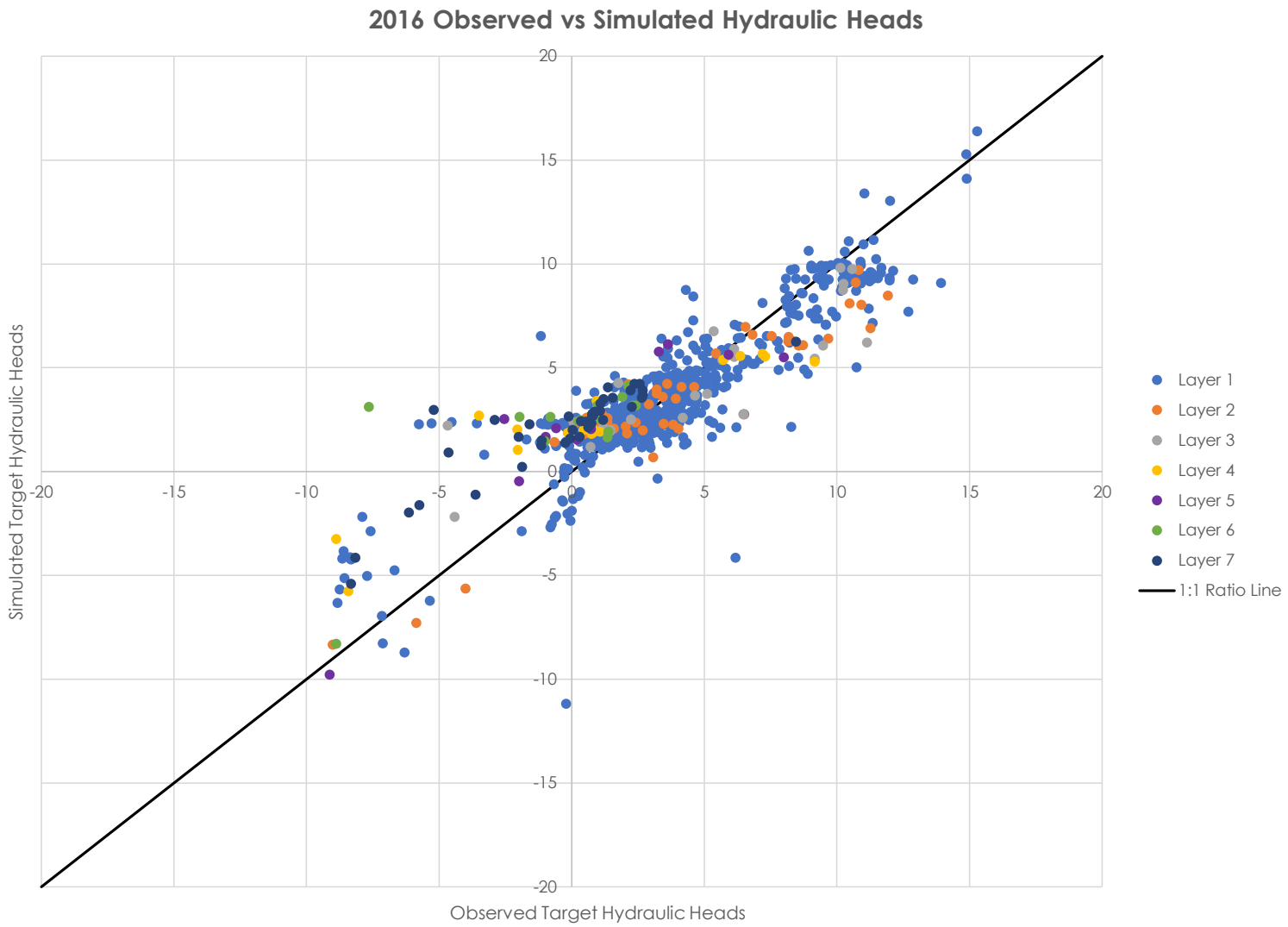

Figure No.
D-6

Title
2016 CALIBRATION OBSERVED VERSUS SIMULATED CHART

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

Number of Observations	920
Residual Mean	0.36 ft
Residual Std. Deviation	1.81 ft
Scaled RMS Error	7.56%

Notes:
1. Sources: Stantec
2. GWF Model simulated and observed hydraulic heads from well gauging measurements are provided in units of feet (ft).
3. GWF Model layers 1 through 7 are color coded to intersecting well locations based on the legend shown.

Stantec

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Figure No.
D-7

Title
2019 CALIBRATION TARGET RESIDUAL PLOT (BUBBLE PLOT)

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,200 2,400 Feet
1:18,000 (At Original document size of 11x17)

N

Legend

- Facility Area of Interest (AOI) Boundary
- River Boundary

2019 Calibration Well (Target) Residual (feet)

- < -10
- -10 - -7.5
- -7.5 - -5.0
- -5.0 - -2.5
- -2.5 - 0
- 0 - 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 - 10
- >10

Number of Observations	1009
Residual Mean	0.44 ft
Residual Std. Deviation	1.94 ft
Scaled RMS Error	7.88%

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet; ft = feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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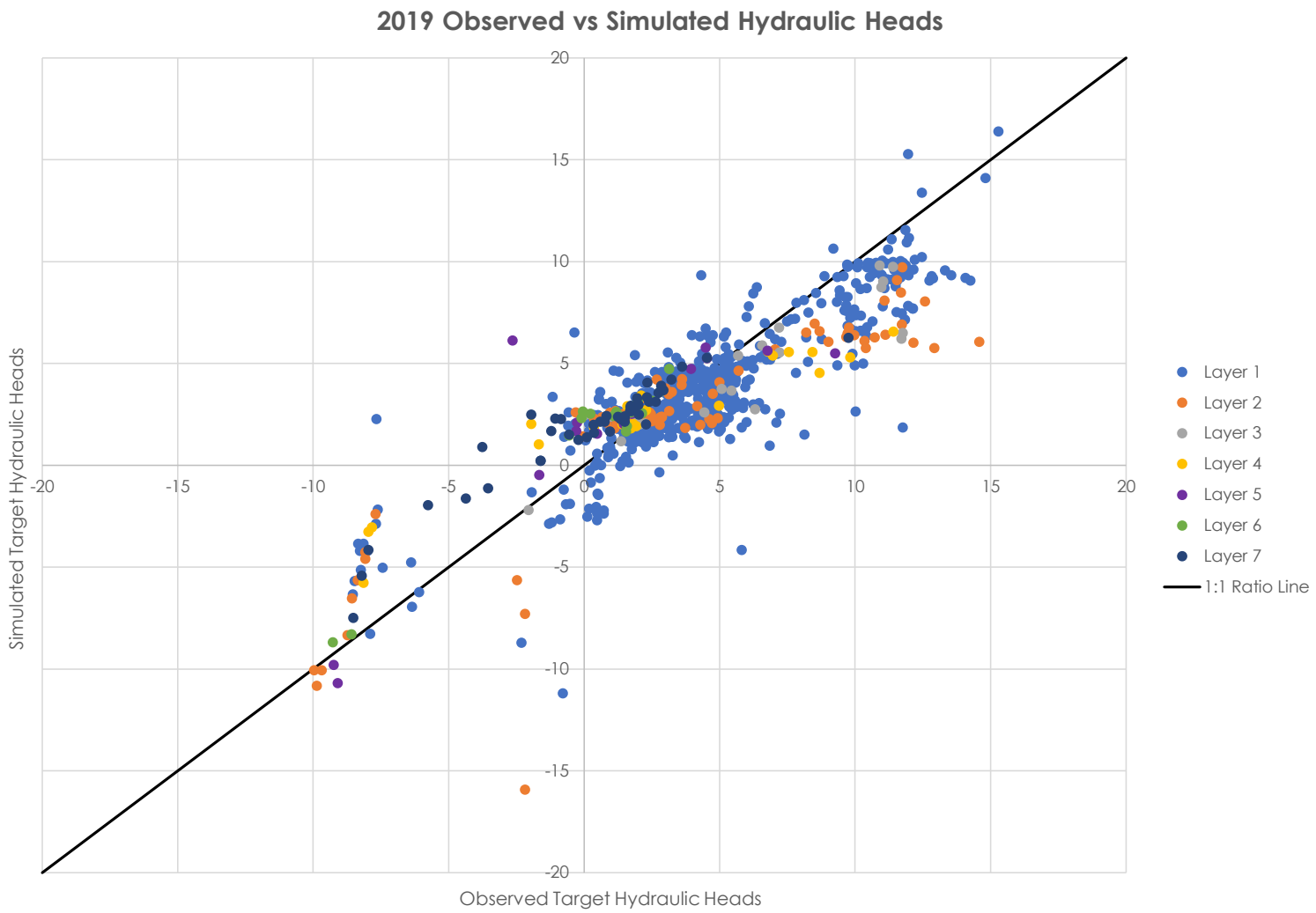

Figure No.
D-8

Title
2019 CALIBRATION OBSERVED VERSUS SIMULATED CHART

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

Number of Observations	1009
Residual Mean	0.44 ft
Residual Std. Deviation	1.94 ft
Scaled RMS Error	7.88%

Notes:
1. Sources: Stantec
2. GWF Model simulated and observed hydraulic heads from well gauging measurements are provided in units of feet (ft).
3. GWF Model layers 1 through 7 are color coded to intersecting well locations based on the legend shown.

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Figure No.
D-9

Title
2021 CALIBRATION TARGET RESIDUAL PLOT (BUBBLE PLOT)

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

0 1,200 2,400 Feet
1:18,000 (At Original document size of 11x17)

N

Legend
- Facility Area of Interest (AOI) Boundary
- River Boundary

2021 Calibration Well (Target) Residual (feet)
- < -10
- -10 - -7.5
- -7.5 - -5.0
- -5.0 - -2.5
- -2.5 - 0
- 0 - 2.5
- 2.5 - 5
- 5 - 7.5
- 7.5 - 10
- >10

Number of Observations	878
Residual Mean	0.23 ft
Residual Std. Deviation	1.82 ft
Scaled RMS Error	7.55%

Notes:
1. Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet; ft = feet
2. Sources: Stantec
3. Service Layer Credits: Copyright:© 2013 National Geographic Society, i-cubed
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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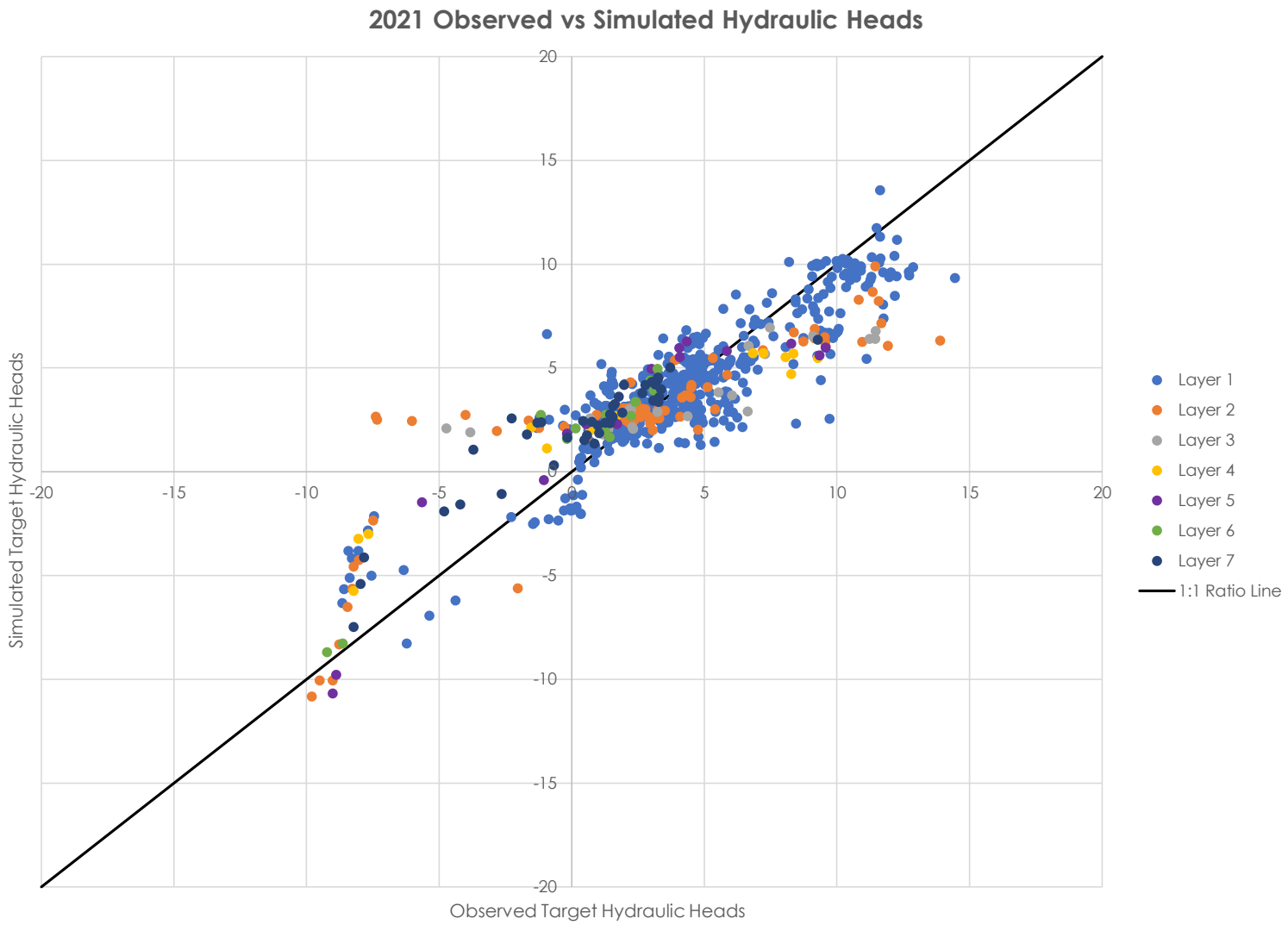

Figure No.
D-10

Title
2021 CALIBRATION OBSERVED VERSUS SIMULATED CHART

Client/Project
PHILADELPHIA REFINERY OPERATIONS, A SERIES OF EVERGREEN RESOURCES GROUP, LLC
FORMER PHILADELPHIA REFIN REFINERY
3144 PASSYUNK AVENUE, PHILADELPHIA, PA 19145

Project Location:
City of Philadelphia, Pennsylvania

213402454
Prepared by CNK/AAH on 08/20/2018
Technical Review by JT on 10/1/2018
Independent Review by JLM on 10/20/2018

Number of Observations	878
Residual Mean	0.23 ft
Residual Std. Deviation	1.82 ft
Scaled RMS Error	7.55%

Notes:
1. Sources: Stantec
2. GWF Model simulated and observed hydraulic heads from well gauging measurements are provided in units of feet (ft).
3. GWF Model layers 1 through 7 are color coded to intersecting well locations based on the legend shown.

Stantec

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