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**Annual Groundwater Monitoring and Operations,
Maintenance, & Monitoring Report 2022/2023
Halesite Former MGP Site**

Town of Huntington, Suffolk County,
Long Island, New York
Site ID No. 152173

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A. Oxygen Injection System OM&M Data

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Abbreviations, Acronyms, and Measurements

AKRF	Allee King Rosen & Fleming
AWQS	Ambient Water Quality Standards
BTEX	Benzene, Toluene, Ethylbenzene, and total Xylenes
°C	Degrees Celsius
DER	Division of Environmental Remediation
DNAPL	Dense NonAqueous Phase Liquid
DO	Dissolved Oxygen
DTW	DepthtoGroundwater
D&B	Dvirka and Bartilucci
ft bgs	feet below ground surface
GEI	GEI Consultants, Inc., P. C.
GM	Groundwater Monitoring
LNAPL	Light NonAqueous Phase Liquid
mg/L	milligrams per liter
MGP	Manufactured Gas Plant
mS/cm	microSiemens per centimeter
MSL	Mean Sea Level
mV	millivolts
NAPL	NonAqueous Phase Liquid
NYSDEC	New York State Department of Environmental Conservation
OM&M	Operations Maintenance & Monitoring
ORP	oxidation reduction potential
PAH	Polycyclic Aromatic Hydrocarbon
pH	potential Hydrogen
PSEGLI	Public Service Electric and Gas Company – Long Island
Q1	First Quarter
Q2	Second Quarter
Q3	Third Quarter
Q4	Fourth Quarter
RAP	Remedial Action Plan
RIR	Remedial Investigation Report
TOGS	Technical and Operational Guidance Series
TSDF	Treatment, Storage, and Disposal Facility
µg/L	micrograms per liter
USDOT	United States Department of Transportation
VHB	Vanasse Hangen Brustlin, Inc.
WLE	Water Level Elevation

1. Introduction

This annual report presents the results of the groundwater monitoring (GM) and operations, maintenance, and monitoring (OM&M) work completed during this reporting period (Q4 2022 through Q3 2023) for the Halesite Former Manufactured Gas Plant (MGP) Site (the Site) located on North New York Avenue in Halesite, within the Town of Huntington, Suffolk County, New York (Fig. 1).

The sampling and data collection procedures were conducted in general accordance with the New York State Department of Environmental Conservation (NYSDEC) approved OM&M Plan (GEI Consultants, Inc. [GEI], 2009) and in accordance with the approved reduction criteria detailed in the July 2014 letter titled, “Long Term Groundwater Monitoring Program Reductions and Remediation System Shutdown Criteria.” This report has been prepared in accordance with the requirements of Section 6 of Division of Environmental Remediation, Technical Guidance for Site Investigation and Remediation (DER10), and Order on Consent, Index No. D100019811 signed by KeySpan Corporation (currently known as National Grid) and the NYSDEC.

GM and OM&M activities included GM, nonaqueous phase liquid (NAPL) monitoring and recovery, and OM&M of the oxygen injection system.

This report is organized as follows:

- **Section 1:** Site Background and Geology.
- **Section 2:** NAPL Monitoring and Recovery.
- **Section 3:** Groundwater Monitoring.
- **Section 4:** Conclusions and Recommendations.

1.1 Site Background

The Site is approximately one acre in size and is located along North New York Avenue, approximately 200 feet east of Huntington Harbor. The topography of the Site generally slopes towards the harbor. The elevation of the Site ranges from approximately 15 feet above mean sea level (MSL) near the western boundary in the lowland area to approximately 85 feet above MSL at the eastern boundary in the upland area. The undeveloped upland area rises sharply eastward from approximately 20 to 60 feet above MSL and continues to slope upwards to a high point near the northeast corner of the property.

The former MGP Site is believed to have initiated operations around 1892 and continued to operate through approximately 1918. The MGP structures were later dismantled and

removed from the Site. The results of the investigations and discussion of the Site history are presented in the Final Remedial Investigation Report (RIR), dated April 2004.

Currently, an active Public Service Enterprise Group Long Island (PSEGLI) electric substation is located on the western third, or lowland area, of the Site. The remaining eastern two-thirds of the property, or upland area, is undeveloped land that is characterized by a steep slope. The slope was formerly heavily vegetated but was cleared and stabilized with new plantings during Site remediation. The surrounding area is currently primarily residential with a mixture of commercial properties along New York Avenue.

The final Remedial Action Plan (RAP) prepared by GEI in which shallow source area soil excavation, construction of an engineered cap across the two DNAPL tar source areas in the Upland Area, and the construction of a groundwater treatment system in the Lowland Area was selected as the final remedy for the Site, was submitted by National Grid (KeySpan) and approved by the NYSDEC in March 2006. A summary of the Site investigation and remedial activities in addition to those selected in the RAP is presented below in Table 1a.

Table 1a. Summary of Site Investigation and Remedial Activities

Date	Remedial Activity	Activity Detail	Conducted By
1997	Phase I Site Investigation	Piezometer and monitoring well installation, soil, and groundwater sampling	Fluor Daniel GTI
2001 to 2004	Remedial Investigations	Included soil, soil vapor and groundwater sampling, monitoring well installations	D&B VHB
August 2005	Substation Clean Utility Corridor Installation Project	Removal of approximately 180 tons of soil and other material from the substation area	GEI
October 2008	Shallow Soil Excavation	Removal of approximately 400 tons of impacted soil, including the top two feet of soil in the upland area	AKRF/Creamer
November 2008 to February 2009	Onsite Impacted Soil Excavation	Removal of approximately 5,800 tons of impacted soil from four onsite source areas	AKRF/Creamer
February 2009	DNAPL Delineation Program	Soil borings	GEI
February to March 2009	Offsite Impacted Soil Excavation	Removal of approximately 1,150 tons of offsite impacted soil from adjacent office building parking lot	AKRF/Creamer
May 2009	Oxygen Injection System (Including Additional Monitoring Well Installations)	Installed in the lowland area, to treat groundwater impacted by residual soil contamination	AKRF/GEI
2009 to Current	DNAPL Recovery	See Section 2	GEI

Notes:

- DNAPL: Dense NonAqueous Phase Liquid
- D&B: Dvirka and Bartilucci
- VHB: Vanasse Hangen Brustlin, Inc.
- AKRF: Allee King Rosen & Fleming

1.2 Site Geology

The subsurface sediments underlying the Site and surrounding area are comprised of a relatively thick sequence of sand, gravel, silt, and clay.

From the ground surface, four distinct stratigraphic units exist, and consist of topsoil/fill material, a shallow sand unit, a finegrained unit, and a glacial sand unit. The finegrained unit is generally continuous onsite and is encountered at depths ranging from approximately 8 to 70 feet below ground surface (ft bgs) in the lowland and upland areas of the Site, respectively, with thicknesses of up to 8 feet in the upland area. This unit is not present in the extreme western portion of the lowland area and immediately downgradient of the Site. Additional information regarding Site geology is available in the April 2004 RIR.

2. NAPL Monitoring and Recovery

2.1 Program Scope and Purpose

Thirteen passive NAPL recovery wells (RW-1 through RW-11, RW-5D, and RW-9D) exist along the perimeter of the lowland area. These recovery wells, along with monitoring wells MW-03, HHMW-05S2R, HHMW-09S2, and HHMW-22S1 are monitored for the presence of NAPL.

Monitoring wells HHMW-15S and HHMW-22S1 have historically exhibited measurable thicknesses of NAPL; however, based on recent observations, it appears that the well screen at these wells have become clogged. As such, as previously recommended, these wells were redeveloped during Q3 2023 in an attempt to rehabilitate them and make them viable for continued NAPL monitoring and/or sampling. Well locations are depicted on Fig. 2.

Recovery wells RW-5D and RW-9D and monitoring wells MW-03, HHMW-05S2, HHMW-09S2, HHMW-15S, HHMW-22S1 are monitored quarterly. The remaining recovery wells are monitored annually due to limited detections of NAPL. **Recovery is conducted from wells with greater than one foot of DNAPL during these monitoring events.** It should be noted that the recovery wells were constructed with a 2-foot sump, designed to immobilize any DNAPL which may accumulate within the wells.

A summary of maximum historical NAPL monitoring results and current monitoring frequencies at the Site is provided below in Table 2a.

Table 2a. NAPL Monitoring Summary

Well	Location	Historical Maximum NAPL Thickness (feet)	Period Measured (Start)	Current Well Status	Current Monitoring Frequency	Comments
HMMW-12	Upland	0.4*	Q2 2005	Abandoned	NA	Abandoned – Replaced by HMMW-16 Cluster**
HMMW-10	Lowland – substation	2.3	Q2 2005	Abandoned	NA	Replacement for HHRW-01
HHRW-01	Lowland – substation		NA	Destroyed	NA	Replaced by HMMW-10
HMMW-05S2R	Lowland	0.2	Q3 2012	Active	Quarterly	
HMMW-09S2	Lowland	3.68	Q4 2008	Active	Quarterly	
HMMW-15S	Lowland – substation	2.6	Q4 2011	Active	Quarterly	Replacement for HHRW-10
HMMW-22S1	Lowland – offsite office bldg.	3.8	Q3 2009	Active	Quarterly	
RW-5D	Lowland	1.25	Q4 2009	Active	Quarterly	
RW-9D	Lowland	3.0	Q1 2017	Active	Quarterly	
MW-03	Lowland	0.02	Q3 2014	Active	Quarterly	

Notes:

- *: Light nonaqueous phase liquid (LNAPL), all other measurements are dense nonaqueous phase liquid (DNAPL).
- ** : No evidence of NAPL has been observed at the HMMW-16 cluster.
- NA: Not Applicable.

Wells with measurable thickness had recently been limited to recovery wells RW-5D and RW-9D but included monitoring well HMMW-15S during Q3 2023 following redevelopment of the well.

2.2 NAPL Monitoring and Recovery Data

Historically, DNAPL has been observed in nine onsite recovery and monitoring wells and one offsite monitoring well (HMMW-22S1). LNAPL has only been observed in one well in the historical monitoring period. The well in which the LNAPL was detected was abandoned during remedial activities and replaced by new wells. No LNAPL has been detected in the new wells since they were installed. Since completion of the remedial excavations, NAPL has not been detected in the Upland area. However, as the substation is still active, remedial excavations have not been able to be completed within the substation and, as a result, DNAPL has continued to be detected within and in the vicinity of the substation area. DNAPL has either not been observed or has been only identified at trace levels at offsite monitoring well HMMW-22S1 since Q4 2015.

Recovery wells continue to exhibit the greatest DNAPL thicknesses. DNAPL was observed in four wells during this reporting period, ranging from trace levels to 1.76 feet (recovery well RW-9D). It should be noted that, following redevelopment of well HHMW-15S and HHMW-22S1 during Q3 2023, well HHMW-15S exhibited measurable thickness of NAPL during this reporting period, while NAPL was not observed following redevelopment in well HHMW-22S1.

DNAPL thickness measurements for this and recent historical reporting periods, as well as DNAPL recovery totals for this reporting period (approximately 6.5 gallons), are provided on Table 2b.

Table 2b. Summary of Recent DNAPL Thickness and Recovery Totals

Well ID	Screen Interval	Average DNAPL Thickness (feet)				Approximate Total Volume Recovered this Reporting Period (gallons)	Approximate Cumulative Total Volume Removed (gallons)
		(feet)	2020	2021	2022		
RW-5D	15-25	0.29	0.19	0.29	0.2	0	11.5
RW-9D	14-24	0.95	1.76	1.04	0.95	6.5	124.7
HHMW-05S2R	18-28	0.03	0.03	0.05	0.02	0	0.45
HHMW-09S2	17.5-27.5	NO	0.01	0.005	NO	0	0.88
HHMW-15S	7.5-12.5	0.01	0.01	NM	0.17	0	4.65
HHMW-22S1 (offsite)	7.5-12.5	0.01	0.01	NO	NO	0	8
Totals						6.5	150.18

Notes:

*: Values represent the first three quarters (Q1, Q2, and Q3) of 2023.

NO: Not observed

Trace amounts of DNAPL are estimated as 0.01 feet when calculating averages.

2.3 Waste Management

The DNAPL and associated purge water recovered during this reporting period were staged in properly labeled 55gallon drums located in a designated area onsite for subsequent offsite disposal by a licensed liquid hazardous waste transporter at an approved treatment, storage, and disposal facility (TSDF).

3. Oxygen Injection System OM&M and Groundwater Monitoring

3.1 Oxygen Injection System OM&M

3.1.1 Program Purpose and Scope

An oxygen injection system exists at the Site, which injects oxygen around the perimeter of the lowland area to promote microbial reduction of groundwater impacts due to residual soil MGP-related impacts at the Site. As described above, these residual MGP-related impacts could not be excavated due to accessibility issues associated with the steep slopes in the upland area and the active electrical substation in the lowland area. The oxygen injection system became operational on May 4, 2009, and its location is depicted on Fig. 2.

3.1.2 Current Monitoring Activities

A list of monitoring wells and current sampling frequencies (annual or semiannual) are provided on Table 3-1. Current oxygen injection system monitoring activities are summarized below in Table 3a.

Table 3a. Description and Location of Analytical and Monitoring Results

Current Activity	Description	Frequency	Location of Results
Oxygen System Monitoring	Routine inspection, operational parameter monitoring, and system optimization	Monthly	Appendix A (field logs not included)
Performance Monitoring of Oxygen Injection System*	Monitoring of groundwater chemistry parameters	Semiannually	Table 3-2
	Groundwater sampling	Semiannually	Tables 3-4, 3-5, 3-6

To ensure that system runtime is maximized between onsite monitoring events, a telemetry system provides remote access to system parameters and settings. This system also transmits email alerts of alarms, signaling that the system is down.

3.1.3 Oxygen Injection System OM&M Data

System Operational Data

The oxygen injection system operated for approximately 333 out of 365 days during this reporting period. The majority of system downtime occurred during Q3 2023, which was due to a compressor leak that was repaired prior to the end of the quarter.

The system injected between approximately 4,961 pounds (Q3 2023) to 13,913 pounds (Q4 2022) of oxygen during each quarter and 580,596 pounds since system startup in May 2009. Calculated injected oxygen mass is provided in Appendix A.

Groundwater Parameters

Groundwater parameters including dissolved oxygen (DO), oxidation reduction potential (ORP), pH, conductivity, and temperature are monitored to evaluate system performance.

The oxygen injection system has historically been generally effective at increasing DO concentrations and ORP in groundwater. DO and ORP values in groundwater were lower than the baseline values in downgradient wells during the current annual monitoring period; however, this is largely due to the elimination of numerous wells with historically higher ORP values and low concentrations of benzene, toluene, ethylbenzene, and total xylenes (BTEX) and polycyclic aromatic hydrocarbon (PAHs). Table 3b summarizes these parameters, as well as pH, conductivity, and temperature, for this reporting period.

Table 3b. Summary of Groundwater Parameters

Parameter	Area	Baseline Value Average	Operational Value Average	Q1 2023 Average	Q3 2023 Average
DO (mg/L)	Upgradient	3.21	7.30	NM	7.38
	Injection Area	4.78	17.09	13.04	18.50
	Downgradient	5.17	4.06	0.86	0.87
ORP (mV)	Upgradient	204	285	NM	156
	Injection Area	170	204	55	59
	Downgradient	125	97	-57	-146
pH	Upgradient	5.30	5.10	NM	5.45
	Injection Area	5.75	5.54	6.17	5.95
	Downgradient	5.93	5.86	5.97	6.05
conductivity (mS/cm)	Upgradient	0.233	0.424	NM	0.387
	Injection Area	0.589	0.502	0.200	0.566
	Downgradient	0.574	0.544	0.254	0.593
Temperature (°C)	Upgradient	12.61	13.55	NM	17.26
	Injection Area	10.40	13.49	11.09	17.68
	Downgradient	11.73	14.39	11.05	21.42

Notes:

mg/L: milligrams per liter

mV: millivolts

mS/cm: micro Siemens per centimeter

°C: degrees Celsius

NM: Not Measured

Baseline values were established during the April 2009 sampling round, prior to system startup.

Green highlight indicates increase from baseline value.

A complete summary of groundwater parameter data is included in Table 3-2.

3.2 Groundwater Monitoring

3.2.1 Program Purpose and Scope

GM is completed on a semiannual basis to monitor groundwater quality and oxygen injection system effectiveness. Well locations and geographic boundaries of the Site are depicted on Fig. 2.

The Site has been divided into three separate areas: the upland area on-site, upgradient of the oxygen injection system; the oxygen injection area on-site; and downgradient of the Site. A fourth offsite sidegradient area also exists to the south of the Site (see Fig. 2). In addition, the wells are divided into two hydrogeologic zones (shallow and intermediate). The boundary between the two hydrogeologic zones is defined by the finegrained unit, which is present throughout the majority of the Site and downgradient areas. Monitoring wells are typically sampled across the tidal cycle given the close proximity of the Site to Huntington Harbor.

Ten monitoring wells within the well network are included in the annual sampling scope; however, HHMW-15S and HHMW-22S1 (Q1 2023 only) were not sampled due to the presence of DNAPL within these wells.

As approved by NYSDEC on March 22, 2021, depthtgroundwater (DTW) measurements and groundwater elevation calculations are currently completed on an annual basis.

3.2.2 Site Activity

The following GM activities were conducted during the annual monitoring period:

- DTW measurements were collected from 31 monitoring wells on August 31, 2023 (Table 3-3).
- Groundwater samples were collected for laboratory analysis from five monitoring wells during the Q1 2023 semiannual sampling event.
- Groundwater samples were collected for laboratory analysis from nine monitoring wells during the Q3 2023 annual sampling event.

3.2.3 Groundwater Elevation Data

Measured groundwater levels and calculated elevations are provided in Table 3-3. Groundwater contour maps representing groundwater flow during the Q3 2023 monitoring period are provided on Figs. 3 through 6. The groundwater flow direction at the Site is generally westward, towards Huntington Harbor.

3.2.4 Groundwater Analytical Data

Of the 10 wells currently comprising the groundwater sampling program, only oxygen system area well HHMW-15S was not sampled during either sampling event during this reporting period due to the presence of DNAPL within the well. HHMW-22S1 was only sampled during the Q3 2023 event due to the presence of DNAPL in the Q1 2023 event.

Groundwater analytical data (BTEX and PAH) generated during this reporting period are presented on Table 3-4, while historical total BTEX and PAH results are presented on Tables 3-5 and 3-6, respectively. Contaminant concentrations are compared to New York State Technical and Operational Guidance Series (TOGS), 1.1.1 – Ambient Water Quality Standards and Guidance Values (AWQS) for Class GA groundwater.

3.2.4.1 BTEX and PAH Concentrations and Trends

BTEX

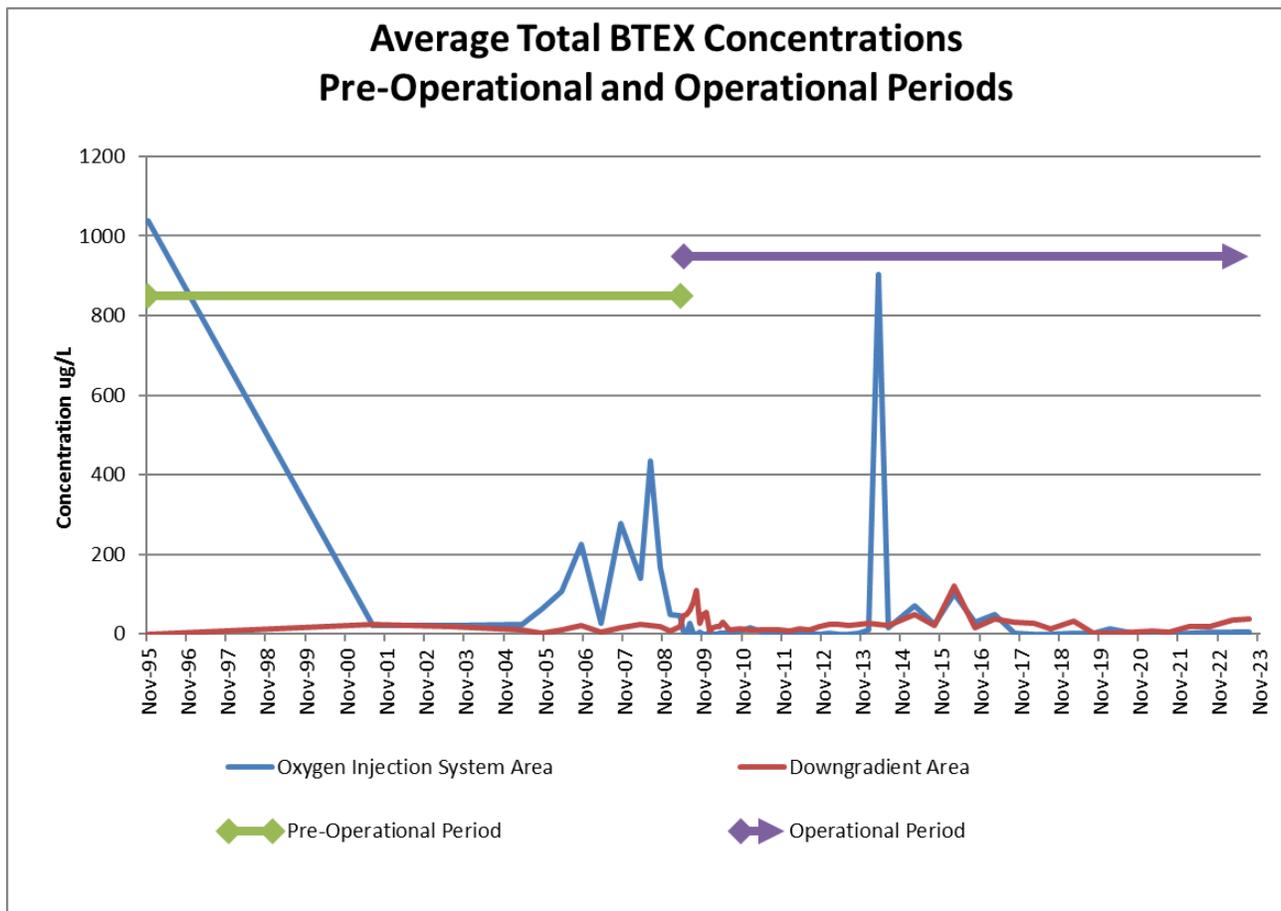
Exceedances of the AWQS for BTEX were identified in five of the nine monitoring wells during this reporting period, as summarized below.

- Upland (upgradient) well HHMW-16S1 exhibited total xylene at a concentration of 6.4 micrograms per liter ($\mu\text{g/L}$). The AWQS for total xylene is 5 $\mu\text{g/L}$.
- Oxygen Injection Area wells HHMW-09S1 and MW-03 exhibited total xylene ranging from 5.7 $\mu\text{g/L}$ to 6.3 $\mu\text{g/L}$ in well HHMW-09S1 and ranging from 4.6 $\mu\text{g/L}$ to 7.2 $\mu\text{g/L}$ in well MW-03.
- Downgradient well HHMW-19S1 exhibited benzene concentrations ranging from 1.0 $\mu\text{g/L}$ to 1.4 $\mu\text{g/L}$, as well as ethylbenzene ranging from 28 $\mu\text{g/L}$ to 32 $\mu\text{g/L}$. The AWQS for benzene and ethylbenzene are 1 $\mu\text{g/L}$ and 5 $\mu\text{g/L}$, respectively.
- Sidegradient well HHMW-22S1 exhibited all BTEX compounds at concentrations well above their respective AWQS, with total BTEX identified at a concentration of 1,122 $\mu\text{g/L}$.

Historical average total BTEX concentrations at and downgradient of the Site are presented in the graph below. Concentrations represented in the graph have only included shallow wells since 2016, at which time sampling of intermediate wells in these areas was discontinued in accordance with the approved reduction criteria. It is noted that side-gradient monitoring well HHMW-22S1 is not included in the graph.

In general, average total BTEX concentrations have remained low, and have exhibited a marked reduction in the oxygen injection system area following startup of the system in May 2009. Temporary increases are likely the result of new monitoring wells being installed in targeted areas, temporarily increasing average BTEX concentrations in those areas.

Similarly, the slight increase noted in 2016 is likely attributable to the elimination of wells exhibiting historically low concentrations.



Note: Graph does not include monitoring well HHMW-15S due to the historical presence of DNAPL.

Excluding HHMW-19S1, total BTEX concentrations in downgradient wells have generally remained low since oxygen injection system startup in May 2009. However, total BTEX concentrations in HHMW-19S1 have decreased substantially since Q1 2016 (283 µg/L), exhibiting concentrations of only 34 µg/L and 37 µg/L, respectively during this reporting period.

Side-gradient well HHMW-22S1, which was redeveloped in Q3 2023 due to a clogged screen, exhibited the highest BTEX concentrations. However, as this well exhibited poor recharge during sampling, its redevelopment does not appear to have been effective for groundwater sampling purposes, which likely adversely affected the representativeness of this groundwater sample.

PAHs

Exceedances of the AWQS for PAHs were identified in eight of the nine monitoring wells located throughout the Site during this reporting period. The greatest concentrations of

PAHs were identified in sidegradient well HHMW-22S1, followed by upland area well HHMW-18S1, as further detailed below.

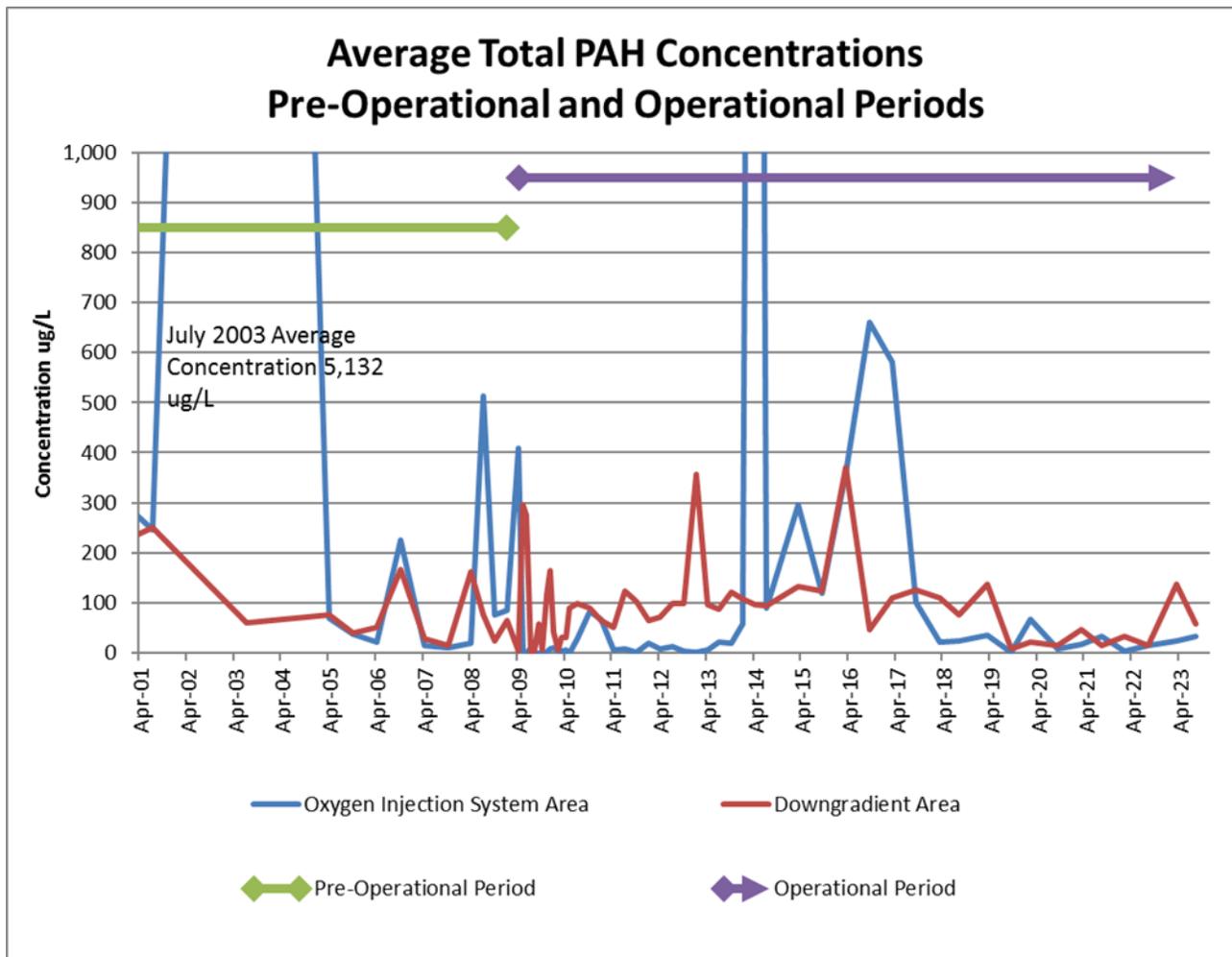
Analytical results from this reporting period are summarized by area as follows:

- Upland (upgradient) wells HHMW-13, HHMW-14, HHMW-16S1, and HHMW-18S1 exhibited several PAH compounds at concentrations slightly to significantly above their respective AWQS during this reporting period. Total PAHs ranged in concentration from 11.5 µg/L in HHMW-16S1 to 707 µg/L in HHMW-18S1.
- Oxygen system area wells HHMW-05S2R and HHMW-09S1 exhibited several PAH compounds at concentrations slightly to marginally above their respective AWQS during this reporting period. Total PAHs ranged in concentration from non-detect in well HHMW-05S2R to 58.7 µg/L in well HHMW-09S1.
- Downgradient well HHMW-19S1 exhibited limited PAH compounds at concentrations marginally above their respective AWQS during this reporting period. Total PAHs ranged in concentration from 57 µg/L to 138 µg/L.
- Sidegradient well HHMW-22S1 exhibited multiple PAH compounds at concentrations well above their respective AWQS, with total PAHs identified at a concentration of 2,657 µg/L.

Historical average total PAH concentrations at and downgradient of the Site are presented in the graph below. Concentrations represented in the graph have only included shallow wells since 2016, at which time sampling of intermediate wells in these areas was discontinued in accordance with the approved reduction criteria. It is noted that side-gradient monitoring well HHMW-22S1 is not included in the graph.

Overall, PAH concentrations have remained generally low in the majority of the wells in the area of the oxygen injection system, including this reporting period, resulting in the elimination of several wells from the sampling program, in accordance with the approved reduction criteria.

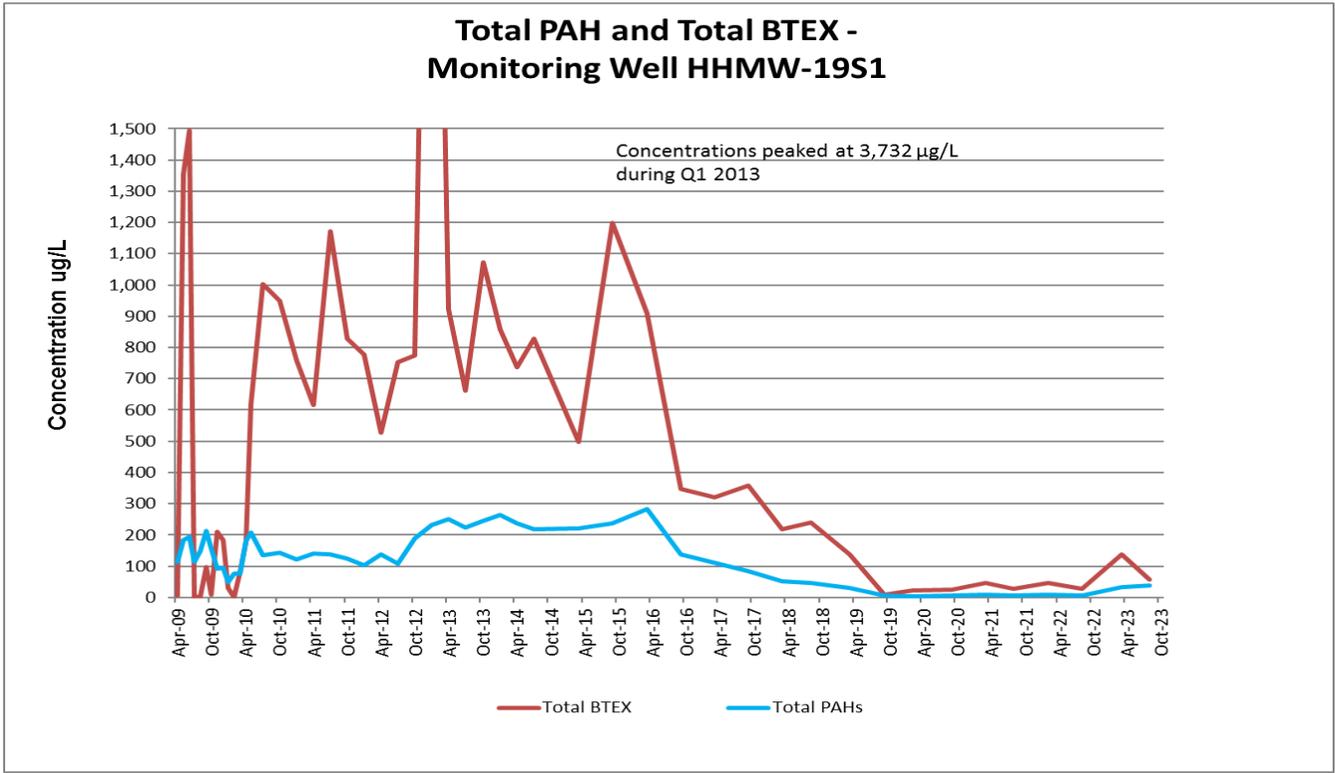
Average total PAH concentrations at and downgradient of the Site have been trending downward since 2016 to 2017, when a temporary marked increase in average PAH concentrations was noted, which is likely attributable to the sampling of several wells that have historically exhibited measurable thicknesses of DNAPL (MW03 and HHMW-05S2R). Since this time, total PAH concentrations have decreased, as these wells have not shown the presence of measurable thicknesses of DNAPL in recent events.



Note:
Does not include data from any monitoring wells with measurable thicknesses of DNAPL at the time of sampling.

Similar to total BTEX concentrations, high total PAH concentrations were observed at side-gradient well HHMW-22S1. Side-gradient well HHMW-22S1, which was redeveloped in Q3 2023 due to a clogged screen, exhibited the highest total PAH concentrations. However, as this well exhibited poor recharge during sampling, its redevelopment does not appear to have been effective for groundwater sampling purposes, which likely adversely affected the representativeness of this groundwater sample.

Elevated PAH concentrations in the downgradient area have generally been limited to well HHMW-19S1, which increased during the semiannual (Q1 2023) event to the highest concentration observed since Q1 2019. However, similar to total BTEX, the total PAH concentrations in well HHMW-19S1 decreased in Q3 2023, continuing the general downward trend from the historical high of 3,732 $\mu\text{g/L}$ in Q1 2013, as shown in the graph below.



4. Conclusions and Recommendations

4.1 Conclusions

The oxygen injection system at the Site is operating as designed. DNAPL continues to be observed in limited onsite wells, with select recovery wells continuing to exhibit the greatest thicknesses and recovery totals. DNAPL was observed in only four wells during this reporting period, ranging from a trace to 1.76 feet (recovery well RW-9D). DNAPL recovery at the Site is limited, with a total of approximately 6.5 gallons recovered during this reporting period.

Operation of the oxygen injection system and DNAPL recovery efforts at the Site have resulted in the reduction of historical total BTEX and total PAH concentrations of over an order-of-magnitude at and downgradient of the Site. Marginal downgradient exceedances of limited BTEX and PAH compounds in HHMW-19S1 were observed during this reporting period, with BTEX and PAH concentrations continuing to decrease over time.

As previously recommended, monitoring wells HHMW-15S and HHMW-22S1 were redeveloped during Q3 2023 in an attempt to rehabilitate them and make them viable for continued DNAPL monitoring and/or sampling. Given that DNAPL was observed within wells HHMW-15S and HHMW-22S1 during this reporting period, it appears that redevelopment of these wells was effective for DNAPL monitoring and recovery purposes only at this time.

Following redevelopment, sidegradient well HHMW-22S1 was sampled and exhibited several BTEX and PAH compounds at concentrations well above their respective AWQS. As this well exhibited poor recharge during sampling, its redevelopment does not appear to have been effective for groundwater sampling purposes, which likely adversely affected the representativeness of this groundwater sample.

4.2 Recommendations

Based on review of the above well gauging and associated analytical results, it is recommended to continue GM and oxygen injection system OM&M activities per the current schedule and in accordance with the approved reduction criteria detailed in the July 2014 letter titled, “Long Term Groundwater Monitoring Program Reductions and Remediation System Shutdown Criteria,” as follows:

- As identified in Section 2.1, recovery wells RW-5D and RW-9D and monitoring wells MW-03, HHMW-05S2, HHMW-09S2, HHMW-22S1 will be monitored for

DNAPL on a quarterly basis, with the remaining recovery wells monitored annually.

- Oxygen injection system OM&M will be completed per the frequencies identified on Table 3a.
- As identified in Section 3.2.1, DTW measurements and groundwater elevation calculations will be completed on an annual basis.
- The current list of monitoring wells will be sampled per the frequencies (annual or semiannual) identified on Table 3-1. **Modifications to the sample frequencies for the next sampling round (Q1 2024) are limited to a change from annual to semi-annual in monitoring well HHMW-18S1.** If DNAPL is observed within a well during gauging, that well will not be sampled.
- Given the slow recharge observed at well HHMW-22S1 during groundwater sampling activities and as DNAPL was observed within this well during Q1 2023, well HHMW-22S1 should only be used for DNAPL monitoring and recovery purposes at this time.

5. References

- AKRF (2010). "Draft Final Engineering Report, Halesite Former Manufactured Gas Plant Site," March 31.
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- GEI (2009). "DNAPL Delineation Report, Halesite Former Manufactured Gas Plant Site," June 30.
- GEI (2009). "Groundwater Monitoring Report, Second Quarter 2009, Halesite Former Manufactured Gas Plant Site, Halesite, New York," August 31.
- GEI (2010). "Oxygen Injection System Startup Summary Report, Halesite Former Manufactured Gas Plant Site, Halesite, New York," March 30.
- New York State Department of Health (2006). Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October.
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Tables

Table 2-1. NAPL Gauging Summary
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2009											
	5/11/2009	5/14/2009	5/18/2009	5/21/2009	5/26/2009	6/11/2009	7/7/2009	8/7/2009	9/8/2009	10/29/2009	11/17/2009	12/2/2009
DNAPL Thickness (in feet)												
RW-1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-5	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-5D	NO	~0.25	~ 0.38	~ 0.2	~0.1	Trace	Trace	0.5	1.0	0.83	1.08	1.25
RW-6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-7	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-9	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-9D	NO	NO	NO	NO	NO	NO	NO	Trace	0.4	0.5	0.875	1.08
RW-10	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-11	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HMMW-09S2	NM	NM	NM	NM	NM	7.48*	NM	NM	0.5	0.42	0.67	0.67
HMMW-15S	NM	NM	NM	NM	NM	NM	NM	NM	NM	0.67**	NM	NM
HMMW-05S2R	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-03	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

Table 2-1. NAPL Gauging Summary
Halesite Former MGP Site
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Well ID	2010											
	1/29/2010	3/2/2010	3/26/2010	4/30/2010	5/28/2010	6/18/2010	7/28/2010	8/31/2010	10/4/2010	10/29/2010	11/30/2010	12/30/2010
DNAPL Thickness (in feet)												
RW-1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-5	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-5D	NM ⁽¹⁾	NM ⁽¹⁾	NM ⁽¹⁾	Trace	Trace	NM ⁽¹⁾	NM ⁽¹⁾	0.08	0.08	0.08	0.08	Trace
RW-6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-7	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-9	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-9D	NM ⁽¹⁾	NM ⁽¹⁾	NM ⁽¹⁾	0.11	0.3	NM ⁽¹⁾	NM ⁽¹⁾	0.42	0.58	0.75	0.75	0.83
RW-10	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-11	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HMMW-09S2	NM ⁽¹⁾	NM ⁽¹⁾	NM ⁽¹⁾	0.11	Trace	NM ⁽¹⁾	NM ⁽¹⁾	NO	NO	0.08	0.08	Trace
HMMW-15S	0.33**	NM	NM	0.12**	NM	NM	0.97**	NM	NM	0.71**	NM	NM
HMMW-05S2R	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
MW-03	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

Table 2-1. NAPL Gauging Summary
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2011											
	1/24/2011	2/18/2011	3/29/2011	4/29/2011	5/20/2011	6/22/2011	7/19/2011	8/29/2011	9/30/2011	10/20/2011	11/15/2011	12/23/2011
DNAPL Thickness (in feet)												
RW-1	NO	NO	NO									
RW-2	NO	NO	NO									
RW-3	NO	NO	NO									
RW-4	NO	NO	NO									
RW-5	NO	NO	NO									
RW-5D	0.17	0.04	0.08	0.08	0.08	0.08	0.04	0.08	0.08	0.08	0.04	0.16
RW-6	NO	NO	NO									
RW-7	NO	NO	NO									
RW-8	NO	NO	NO									
RW-9	NO	NO	NO									
RW-9D	0.75	0.75	0.83	0.75	0.83	0.75	0.58	0.58	0.83	0.67	0.83	0.75
RW-10	NO	NO	NO									
RW-11	NO	NO	NO									
HMMW-09S2	0.17	Trace	Trace	0.04	Trace	0.08	Trace	Trace	0.08	0.04	Trace	0.16
HMMW-15S	0.8**	NM	NM	0.9**	NM	NM	1.5**	NM	NM	2.6**	NM	NM
HMMW-05S2R	NM	NM	NM									
MW-03	NM	NM	NM									

Table 2-1. NAPL Gauging Summary
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2012											
	1/26/2012	2/27/2012	3/26/2012	5/2/2012	5/31/2012	6/27/2012	7/31/2012	8/29/2012	9/25/2012	11/9/2012	11/30/2012	12/12/2012
DNAPL Thickness (in feet)												
RW-1	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-2	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-3	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-4	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-5	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-5D	0.16	0.08	0.3	0.4	0.4	0.3	0.08	Trace	0.2	0.2	0.2	0.2
RW-6	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-7	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-8	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-9	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-9D	0.75	0.75	0.8	1.4	0.7	0.7	0.75	0.8	1.1	1.3	0.7	0.8
RW-10	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
RW-11	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO	NO
HMMW-09S2	Trace	Trace	Trace	Trace	Trace	Trace	Trace	0.1	Trace	Trace	Trace	Trace
HMMW-15S	0.8	NM	NM	2.1	NM	NM	NM	NM	4.0	NM	NM	3.5
HMMW-05S2R	NM	NM	NM	NM	NM	NM	NM	NM	0.2	Trace	Trace	0.1
MW-03	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM

Table 2-1. NAPL Gauging Summary
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2013										
	1/17/2013	2/18/2013	3/29/2013	4/26/2013	5/31/2013	7/25/2013	8/28/2013	9/30/2013	10/30/2013	11/26/2013	12/27/2013
DNAPL Thickness (in feet)											
RW-1	NO	NO	NO								
RW-2	NO	NO	NO								
RW-3	NO	NO	NO								
RW-4	NO	NO	NO								
RW-5	NO	NO	NO								
RW-5D	0.3	0.2	0.3	0.1	0.3	0.08	0.06	Trace	0.04	0.25	0.375
RW-6	NO	NO	NO								
RW-7	NO	NO	NO								
RW-8	NO	NO	NO								
RW-9	NO	NO	NO								
RW-9D	0.9	0.7	0.9	0.9	0.7	1.0	0.83	0.6	0.58	0.58	0.58
RW-10	NO	NO	NO								
RW-11	NO	NO	NO								
HMMW-09S2	Trace	Trace	0.1	Trace	0.1	NO	Trace	0.02	Trace	Trace	NO
HMMW-15S	NM	NM	3.0	NM	NM	NM	NM	0.8	NM	NM	Trace
HMMW-05S2R	Trace	0.1	0.1	Trace	Trace	0.1	NO	0.02	Trace	Trace	Trace
MW-03	NM	NM	NM								

Table 2-1. NAPL Gauging Summary
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2014									
	1/31/2014	2/28/2014	3/31/2014	4/28/2014	6/3/2014	6/25/2014	8/1/2014	8/29/2014	9/30/2014	12/29/2014
DNAPL Thickness (in feet)										
RW-1	NO	NO	NO	NO	NO	NO	NO	NO	NM	NM
RW-2	NO	NO	NO	NO	NO	NO	NO	NO	NM	NM
RW-3	NO	NO	NO	NO	NO	NO	NO	NO	NM	NM
RW-4	NO	NO	NO	NO	NO	NO	NO	NO	NM	NM
RW-5	NO	NO	NO	NO	NO	NO	NO	NO	NM	NM
RW-5D	0.04	0.125	0.17	0.04	0.125	NO	Trace	0.08	0.21	0.16
RW-6	NO	NO	NO	NO	NO	NO	NO	NO	NM	NM
RW-7	NO	NO	NO	NO	NO	NO	NO	NO	NM	NM
RW-8	NO	NO	NO	NO	NO	NO	NO	NO	NM	NM
RW-9	NO	NO	NO	NO	NO	NO	NO	NO	NM	NM
RW-9D	0.58	0.58	0.83	0.5	0.75	0.3	0.9	1.67	0.54	1.25
RW-10	NO	NO	NO	NO	NO	NO	NO	NO	NM	NM
RW-11	NO	NO	NO	NO	NO	NO	NO	NO	NM	NM
HMMW-09S2	Trace	Trace	Trace	Trace	0.02	NO	NO	Trace	Trace	0.02
HMMW-15S	NM	NM	NO***	NM	NM	Trace	NM	NM	0.17	Trace
HMMW-05S2R	0.04	NM	0.04	0.04	0.02	Trace	Trace	0.06	0.04	0.16
MW-03	Trace	Trace	Trace	Trace	Trace	Trace	Trace	Trace	0.02	NO

Table 2-1. NAPL Gauging Summary
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2015				2016				2017			
	3/31/2015	6/30/2015	9/25/2015	12/29/2015	4/12/2016	7/14/2016	10/4/2016	12/28/2016	3/30/2017	6/28/2017	9/25/2017	12/20/2017
DNAPL Thickness (in feet)												
RW-1	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NO	NM
RW-2	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NO	NM
RW-3	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NO	NM
RW-4	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NO	NM
RW-5	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NO	NM
RW-5D	0.06	0.04	0.21	0.08	0.04	0.04	0.42	0.04	0.06	0.08	0.06	0.33
RW-6	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NO	NM
RW-7	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NO	NM
RW-8	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NO	NM
RW-9	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NO	NM
RW-9D	1.25	1.16	1.0	1.2	1.7	1.1	1.5	2.4	3.0	2.5	2.4	2.6
RW-10	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NO	NM
RW-11	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NO	NM
HMW-09S2	0.04	Trace	0.04	Trace	Trace	Trace	NO	NO	Trace	Trace	Trace	NO
HMW-15S	Trace	0.08	1.25	0.33	0.04	0.04	0.06	0.67	0.04	0.06	Trace	Trace
HMW-05S2R	0.04	0.02	0.08	0.125	0.125	Trace	0.02	0.06	0.06	0.06	0.13	Trace
MW-03	NO	NO	Trace	NO	NO	NO	Trace	Trace	Trace	Trace	Trace	NO

Table 2-1. NAPL Gauging Summary
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2018				2019				2020			
	4/6/2018	6/13/2018	9/24/2018	12/7/2018	3/28/2019	6/28/2019	9/27/2019	12/27/2019	2/26/2020	4/22/2020	9/18/2020	12/29/2020
DNAPL Thickness (in feet)												
RW-1	NM	NM	NO	NO	NO	NO	NO	NM	NO	NO	NO	NO
RW-2	NM	NM	NO	NO	NO	NO	NO	NM	NO	NO	NO	NO
RW-3	NM	NM	NO	NO	NO	NO	NO	NM	NO	NO	NO	NO
RW-4	NM	NM	NO	NO	NO	NO	NO	NM	NO	NO	NO	NO
RW-5	NM	NM	NO	NO	NO	NO	NO	NM	NO	NO	NO	NO
RW-5D	0.04	0.25	0.41	0.21	0.025	0.42	0.55	0.25	0.45	0.25	0.16	0.21
RW-6	NM	NM	NO	NO	NO	NO	NO	NM	NO	NO	NO	NO
RW-7	NM	NM	NO	NO	NO	NO	NO	NM	NO	NO	NO	NO
RW-8	NM	NM	NO	NO	NO	NO	NO	NM	NO	NO	NO	NO
RW-9	NM	NM	NO	NO	NO	NO	NO	NM	NO	NO	NO	NO
RW-9D	3.17	1.42	2.2	1.42	2.17	1.25	1.41	0.75	0.6	0.83	1.25	1.16
RW-10	NM	NM	NO	NO	NO	NO	NO	NM	NO	NO	NO	NO
RW-11	NM	NM	NO	NO	NO	NO	NO	NM	NO	NO	NO	NO
HMMW-09S2	NO	NO	Trace	NO	NO	NO	NO	NO	NO	NO	NO	NO
HMMW-15S	Trace	0.04	Trace	Trace	Trace	NO	NO	NO	NO	NO	NO	Trace
HMMW-05S2R	0.04	0.04	0.04	0.04	Trace	0.04	0.04	NO	0.02	0.04	0.04	Trace
MW-03	NO	NO	Trace	NO	NO	NO	NO	NO	NO	Trace	NO	NO

No measurable levels of LNAPL have been observed to date.

Notes:

- NAPL = Non-aqueous phase liquid
- DNAPL = Dense non-aqueous phase liquid
- MGP = Manufactured Gas Plant
- NO = None observed
- NM = Not measured
- NM⁽¹⁾ = Not measured - see Table 2-2
- * = Measurement suspect
- ** = Measurement taken during quarterly sampling round
- *** = Measurement taken in April 2014

Table 2-1. NAPL Gauging Summary
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2021				2022				2023		
	3/23/2021	6/16/2021	8/10/2021	12/30/2021	3/15/2022	6/30/2022	8/15/2022	1/5/2023	4/6/2023	6/16/2023	8/31/2023
DNAPL Thickness (in feet)											
RW-1	NM	NM	NO	NM	NM	NM	NO	NM	NM	NM	NO
RW-2	NM	NM	NO	NM	NM	NM	NO	NM	NM	NM	NO
RW-3	NM	NM	NO	NM	NM	NM	NO	NM	NM	NM	NO
RW-4	NM	NM	NO	NM	NM	NM	NO	NM	NM	NM	NO
RW-5	NM	NM	NO	NM	NM	NM	NO	NM	NM	NM	NO
RW-5D	NO	0.25	0.33	0.42	0.60	0.20	0.01	0.36	0.58	0.25	Trace
RW-6	NM	NM	NO	NM	NM	NM	NO	NM	NM	NM	NO
RW-7	NM	NM	NO	NM	NM	NM	NO	NM	NM	NM	NO
RW-8	NM	NM	NO	NM	NM	NM	NO	NM	NM	NM	NO
RW-9	NM	NM	NO	NM	NM	NM	NO	NM	NM	NM	NO
RW-9D	1.54	1.25	1.4	2.83	1.34	0.80	0.23	1.78	1.25	1.00	0.60
RW-10	NM	NM	NO	NM	NM	NM	NO	NM	NM	NM	NO
RW-11	NM	NM	NO	NM	NM	NM	NO	NM	NM	NM	NO
HHMW-09S2	NO	NO	Trace	Trace	Trace	Trace	NO	NO	NO	NO	NO
HHMW-15S	Trace	Trace	Trace	Trace	NM	NM	NM	NM	NM	0.33	Trace
HHMW-05S2R	Trace	NO	Trace	0.08	Trace	0.12	0.5	Trace	NO	NO	NO
MW-03	NO	NO	Trace	NO	NO	NO	NO	NO	NO	NO	NO

Table 2-2. Onsite NAPL Gauging and Recovery Log
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2009	2010												
	12/14/2009 ⁽¹⁾	1/5/2010 ⁽²⁾	1/12/2010 ⁽³⁾	1/19/2010 ⁽³⁾	1/26/2010 ⁽³⁾	2/5/2010 ⁽³⁾	2/12/2010 ⁽⁴⁾	3/8/2010 ⁽³⁾	4/1/2010 ⁽³⁾	4/30/2010 ⁽³⁾	6/4/2010 ⁽³⁾	7/20/2010 ⁽³⁾	8/31/2010 ⁽³⁾	10/4/2010 ⁽³⁾
Initial Thickness (in feet)														
RW-5D	1.25	1.25	0.5	0.33	0.25	0.17	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
RW-9D	1.08	1.08	0.42	0.33	0.25	0.17	0.17	0.17	0.17	0.33	0.33	0.33	0.42	0.58
HHMW-05S2R	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
HHMW-09S2	NM	0.66	0.25	0.17	0.17	0.17	0.08	0.17	0.25	0.08	0.08	0.08	0.00**	0.00**
HHMW-15S	0.67****	NM	NM	NM	0.33****	NM	NM	NM	NM	0.12****	NM	0.97****	NM	NM
Amount Removed (in gallons)														
RW-5D	1.5	NA	1.1*	0.40	0.30	0.20	0.10	NA	0.10	0.10	0.10	0.10	0.10	0.10
RW-9D	1.5	NA	1*	0.40	0.30	0.20	0.20	NA	0.20	0.40	0.40	0.40	0.50	0.70
HHMW-05S2R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HHMW-09S2	NA	NA	0.1*	0.05	0.05	0.05	0.02	NA	0.08	0.02	0.02	0.02	0.00	0.00
HHMW-15S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Table 2-2. Onsite NAPL Gauging and Recovery Log
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2010			2011										
	10/29/2010 ⁽³⁾	11/30/2010 ⁽³⁾	12/30/2010 ⁽³⁾	1/24/2011 ⁽³⁾	2/18/2011 ⁽³⁾	3/29/2011 ⁽³⁾	4/29/2011 ⁽³⁾	5/20/2011 ⁽³⁾	6/22/2011 ⁽³⁾	7/19/2011 ⁽³⁾	8/29/2011 ⁽³⁾	9/30/2011 ⁽³⁾	10/20/2011 ⁽³⁾	11/15/2011 ⁽³⁾
Initial Thickness (in feet)														
RW-5D	0.08	0.08	trace	0.17	0.04	0.08	0.08	0.08	0.08	0.04	0.08	0.08	0.08	0.04
RW-9D	0.67	0.75	0.83	0.75	0.75	0.83	0.75	0.83	0.75	0.59	0.58	0.83	0.67	0.83
HHMW-05S2R	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM	NM
HHMW-09S2	0.08**	0.08	trace	trace	trace	trace	0.04	trace	0.08	trace**	trace**	0.08**	0.04**	trace**
HHMW-15S	0.71****	NM	NM	0.8****	NM	NM	0.9****	NM	NM	1.5****	NM	NM	2.6	NM
Amount Removed (in gallons)														
RW-5D	0.10	0.10	0.00	0.20	0.05	0.10	0.10	0.10	0.10	0.05	0.10	0.07	0.10	0.04
RW-9D	0.80	0.90	1.00	0.90	0.90	1.00	0.90	1.00	0.90	0.71	0.70	1.00	0.80	1.00
HHMW-05S2R	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
HHMW-09S2	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00
HHMW-15S	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2.00	NA

Table 2-2. Onsite NAPL Gauging and Recovery Log
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2011	2012												2013
	12/23/2011 ⁽³⁾	1/26/2012 ⁽³⁾	2/27/2012 ⁽³⁾	3/26/2012 ⁽³⁾	5/2/2012 ⁽³⁾	5/31/2012 ⁽³⁾	6/27/2012 ⁽³⁾	7/31/2012 ⁽³⁾	8/29/2012 ⁽³⁾	9/25/2012 ⁽³⁾	11/12/2012 ⁽³⁾	11/30/2012 ⁽³⁾	12/12/2012 ⁽³⁾	1/17/2013 ⁽³⁾
Initial Thickness (in feet)														
RW-5D	0.16	0.16	0.08	0.3	0.4	0.4	0.3	0.08	trace	0.2	0.2	0.2	0.2	0.30
RW-9D	0.75	0.75	0.75	0.8	1.4	0.7	0.7	0.75	0.8	1.1	1.3	0.7	0.8	0.90
HHMW-05S2R	NM	NM	NM	NM	NM	NM	NM	NM	NM	0.2	NM	NM	0.1	trace
HHMW-09S2	.16**	.16**	trace**	trace	trace	trace	trace	trace	0.1	trace	trace	trace	trace	trace
HHMW-15S	NM	0.8	NM	NM	2.1	NM	NM	NM	NM	4.0	NM	NM	3.5	NM
Amount Removed (in gallons)														
RW-5D	0.14	0.14	0.07	0.27	0.36	0.36	0.27	0.07	0.00	0.18	0.18	0.18	0.18	0.27
RW-9D	0.90	0.90	0.90	0.96	1.68	0.84	0.84	0.68	0.72	0.99	1.17	0.63	0.72	0.81
HHMW-05S2R	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.25	NA	NA	0.10	0.00
HHMW-09S2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HHMW-15S	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.25	NA	NA	0.60	NA

Table 2-2. Onsite NAPL Gauging and Recovery Log
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2013										2014			
	2/18/2013 ⁽³⁾	3/29/2013 ⁽³⁾	4/26/2013 ⁽³⁾	5/31/2013 ⁽³⁾	7/25/2013	6/28/2013	9/30/2013	10/30/2013	11/26/2013	12/18/2013	1/31/2014	2/28/2014	3/31/2014	4/28/2014
Initial Thickness (in feet)														
RW-5D	0.20	0.30	0.10	0.30	0.08	0.06	trace	0.04	0.25	0.38	0.04	0.13	0.17	0.04
RW-9D	0.70	0.90	0.90	0.70	1.00	0.83	0.58	0.58	0.58	0.58	0.58	0.58	0.83	0.58
HHMW-05S2R	0.1	0.1	trace	trace	0.1	NO	0.02	trace	trace	trace	0.04	NM	0.04	0.04
HHMW-09S2	trace	0.1	trace	0.1	NO	trace	0.02	trace	0.02	NO	trace	trace	trace	trace
HHMW-15S	NM	3.0	NM	NM	NM	NM	0.8	NM	NM	trace	NM	NM	0.00	NM
Amount Removed (in gallons)														
RW-5D	0.18	0.27	0.09	0.27	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.20	0.00
RW-9D	0.63	0.81	0.81	0.63	3.00	1.00	0.75	0.50	0.50	0.40	0.50	0.40	0.75	0.50
HHMW-05S2R	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HHMW-09S2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HHMW-15S	NA	0.60	NA	NA	NA	NA	0.10	NA	NA	0.00	NA	NA	0.00	NA

Table 2-2. Onsite NAPL Gauging and Recovery Log
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2014						2015				2016			
	6/3/2014	6/25/2014	8/1/2014	8/29/2014	9/30/2014	12/29/2014	3/31/2015	6/30/2015	9/25/2015	12/29/2015	4/12/2016	7/14/2016	10/4/2016	12/28/2016
Initial Thickness (in feet)														
RW-5D	0.13	0.00	trace	0.08	0.21	0.16	0.06	0.04	0.21	0.08	0.04	0.04	0.42	0.04
RW-9D	0.75	0.30	0.90	1.67	0.54	1.25	1.25	1.16	1.00	1.20	1.70	1.10	1.50	2.40
HHMW-05S2R	0.02	trace	trace	0.06	0.04	0.16	0.04	0.02	0.08	0.125	0.125	trace	0.02	0.06
HHMW-09S2	0.02	0.00	0.00	trace	trace	0.02	0.04	trace	0.04	trace	trace	trace	NO	NO
HHMW-15S	NM	trace	NM	NM	0.17	trace	0.16	0.08	1.25	0.33	0.04	0.04	0.06	0.67
Amount Removed (in gallons)														
RW-5D	0.00	0.00	0.00	0.00	0.25	0.20	0.00	0.00	0.10	0.00	0.00	0.00	0.50	0.00
RW-9D	0.75	0.25	0.75	2.50	0.75	2.00	2.00	2.25	1.75	1.75	2.00	1.50	2.25	3.50
HHMW-05S2R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HHMW-09S2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HHMW-15S	NA	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00

Table 2-2. Onsite NAPL Gauging and Recovery Log
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2017				2018				2019				2020	
	3/30/2017	6/28/2017	9/25/2017	12/20/2017	4/6/2018	6/13/2018	9/24/2018	12/7/2018	3/28/2019	6/28/2019	9/27/2019	12/27/2019	2/26/2020	7/7/2020
Initial Thickness (in feet)														
RW-5D	0.06	0.08	0.06	0.33	0.04	0.25	0.41	0.21	0.25	0.42	0.55	0.25	0.45	0.25
RW-9D	3.00	2.50	2.40	2.60	3.17	1.42	2.20	1.42	2.17	1.25	1.41	0.75	0.60	1.00
HHMW-05S2R	0.06	0.06	0.13	Trace	0.04	0.04	0.04	0.04	Trace	0.04	0.04	0.02	0.02	0.04
HHMW-09S2	Trace	Trace	Trace	NO	NO	NO	Trace	NO	NO	NO	NO	NO	NO	NO
HHMW-15S	0.04	0.06	Trace	Trace	Trace	0.04	Trace	Trace	Trace	NO	NO	NO	NO	NO
Amount Removed (in gallons)														
RW-5D	0.00	0.00	0.00	0.25	0.00	0.00	0.30	0.00	0.00	0.00	0.66	0.00	0.00	0.00
RW-9D	4.50	3.50	3.50	3.75	4.50	2.25	3.50	2.00	3.00	2.00	2.00	1.25	0.00	1.25
HHMW-05S2R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HHMW-09S2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HHMW-15S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Notes:

- NAPL = Non-Aqueous Phase Liquid
- MGP = Manufactured Gas Plant
- ⁽¹⁾ = DNAPL purged with bailer
- ⁽²⁾ = Oil-sorbent socks installed
- ⁽³⁾ = Oil-sorbent socks removed and replaced (thickness measured)
- ⁽⁴⁾ = Oil-sorbent socks removed in order to measure DNAPL
- * = Volume estimated based on well diameter and thickness
- ** = Oil-sorbent sock not replaced
- *** = Includes 0.4 gallons recovered between December 2019 and February 2020
- **** = Measured during quarterly sampling round
- NA = Not applicable
- NM = Not measured
- NO = None observed

Table 2-2. Onsite NAPL Gauging and Recovery Log
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well ID	2020		2021				2022				2023			Total (gallons)
	9/18/2020	12/29/2020	3/23/2021	6/16/2021	8/10/2021	12/30/2021	3/15/2022	6/30/2022	8/15/2022	1/5/2023	4/6/2023	6/16/2023	9/1/2023	
Initial Thickness (in feet)														
RW-5D	0.16	0.21	NO	0.16	0.16	0.42	0.60	0.20	0.01	0.36	0.58	NO	Trace	
RW-9D	1.25	1.16	1.54	1.25	1.40	2.83	1.34	0.80	0.23	1.78	1.25	1.00	0.60	
HHMW-05S2R	0.04	Trace	Trace	Trace	Trace	0.08	Trace	0.12	0.05	Trace	NO	0.05	NO	
HHMW-09S2	NO	NO	NO	NO	NO	Trace	Trace	Trace	NO	NO	NO	NO	NO	
HHMW-15S	NO	Trace	Trace	Trace	Trace	Trace	NM	NM	NM	NM	NM	0.33	Trace	
Amount Removed (in gallons)														
RW-5D	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	11.50
RW-9D	1.25	1.50	2.00	1.75	2.00	4.00	2.00	0.00	0.00	2.50	1.50	1.50	1.00	124.70
HHMW-05S2R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45
HHMW-09S2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.88***
HHMW-15S	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.65
														142.2

asured after sock was removed)
recharge.
measurements.

18 and February 2009

Table 3-1. Groundwater Monitoring Well Sampling Schedule
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance Monitoring Report

Monitoring Well ID	Screen Interval (feet bgs)	Sample Frequency
Upgradient Groundwater Monitoring Wells		
HHMW-13	39-49	A
HHMW-14	64-74	S
HHMW-16S1	15-20	A
HHMW-16S2	25-35	NS
HHMW-17S1	12-17	NS
HHMW-17S2	22-32	NS
HHMW-18S1	7-12	A
HHMW-18S2	17-27	NS
Area of Oxygen Injection System Groundwater Monitoring Wells		
HHMW-04I	30-40	NS
HHMW-05S1-R	6-11	NS
HHMW-05S2-R*	18-28	S
HHMW-09S1	6-11	S
HHMW-09S2	17.5-27.5	NS
HHMW-09I	43-53	NS
HHMW-09D	85-95	NS
HHMW-15S*	5-10	S
MW-03*	2-12	S
MW-04	1-21	NS
Side-gradient Groundwater Monitoring Wells		
HHMW-22S1*	3-8	S
HHMW-22S2	13-23	NS
Downgradient Groundwater Monitoring Wells		
HHMW-07S1	3-8	NS
HHMW-07S2	16-26	NS
HHMW-07I	45-55	NS
HHMW-07D	115-125	NS
HHMW-08S	2-12	NS
HHMW-08I	35-45	NS
HHMW-11SR	3-13	NS
HHMW-11I**	31-41	NS
HHMW-19S1	2-7	S
HHMW-19S2	15-25	NS
HHMW-20S1	2-7	NS
HHMW-20S2	15-25	NS
HHMW-21S1	2-7	NS
HHMW-21S2	15-25	NS

Notes:

Bold font denotes that the well is currently routinely sampled.

MGP = Manufactured Gas Plant

* = Not Sampled due to presence of DNAPL

** = Well abandoned

NS = Not Sampled

A = Annual

S = Semi-annual

DNAPL = Dense Non-Aqueous Phase Liquid

Table 3-2. Summary of Groundwater Parameter Data
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

		2009									2010		
Monitoring Well		Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10
pH (standard units)													
Upgradient	HHMW-13	5.53	--	--	5.21	--	--	--	5.09	--	--	5.43	--
	HHMW-14	5.40	--	--	5.60	--	--	--	5.17	--	--	5.47	--
	HHMW-16S1	5.08	4.73	4.20	6.20	4.47	4.28	4.34	6.21	6.53	3.91	4.47	4.48
	HHMW-16S2	5.12	5.43	3.94	6.10	5.23	5.25	5.25	5.05	5.51	5.29	4.26	5.09
	HHMW-17S1	5.31	4.95	5.87	4.40	5.06	4.71	4.78	5.93	6.96	5.14	4.97	4.63
	HHMW-17S2	5.32	5.13	6.37	5.38	5.10	5.08	5.16	4.95	5.36	5.45	5.50	5.40
	HHMW-18S1	5.34	5.65	6.42	4.65	5.34	5.12	5.09	4.91	6.92	5.18	5.35	5.42
	HHMW-18S2	5.30	5.63	6.36	5.44	5.05	5.16	5.11	6.31	5.31	5.15	5.31	5.31
Oxygen Injection Area	HHMW-04I	5.35	--	--	--	--	--	5.13	--	--	--	5.01	--
	HHMW-05S1-R	6.65	6.67	6.13	5.62	6.05	6.18	5.89	6.96	7.11	6.15	6.33	5.43
	HHMW-05S2-R	5.31	5.68	5.60	4.78	4.98	5.22	5.12	4.93	5.31	5.19	5.43	5.40
	HHMW-09D	6.02	--	--	--	--	--	--	--	--	5.93	--	--
	HHMW-09I	5.55	--	--	--	--	--	--	--	--	5.44	--	--
	HHMW-09S1	5.30	--	--	6.38	--	--	--	6.85	--	5.80	--	--
	HHMW-09S2	5.61	--	--	5.39	--	--	--	5.17	--	5.59	--	--
	HHMW-15S	--	5.62	--	5.61	--	--	--	--	--	--	--	--
	MW-03	6.67	--	--	7.03	--	--	6.33	--	--	6.67	--	--
	MW-04	5.29	--	--	5.21	--	--	4.98	--	--	5.48	--	--
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	5.40	--	--	5.71	--	--	5.15	--	--	5.18	--	--
Downgradient	HHMW-06I	5.69	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	6.76	--	--	--	--	--	6.28	--	--	6.45	--	--
	HHMW-06S2	5.45	--	--	--	--	--	5.37	--	--	5.83	--	--
	HHMW-07I	5.57	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	6.16	--	--	7.05	--	--	6.16	--	--	6.09	--	--
	HHMW-07S2	5.34	--	--	4.68	--	--	5.26	--	--	5.28	--	--
	HHMW-08S	5.67	--	--	--	--	--	5.45	--	--	5.63	--	--
	HHMW-19S1	6.63	6.48	6.67	7.26	6.27	6.03	5.45	5.59	5.96	5.71	5.79	5.99
	HHMW-19S2	5.41	5.75	6.02	5.57	5.25	5.39	5.26	6.92	7.11	5.32	5.46	4.90
	HHMW-20S1	6.85	6.76	6.99	--	--	--	--	--	--	5.06	6.74	6.12
	HHMW-20S2/20S2R	5.41	5.34	5.00	--	--	--	--	--	--	6.54	4.90	5.13
	HHMW-21S1	6.82	6.25	6.26	--	--	--	--	--	--	6.20	6.29	5.85
	HHMW-21S2	5.58	5.56	5.23	--	--	--	--	--	--	5.34	5.57	--
	HHMW-11I	5.70	--	--	--	--	--	--	--	--	5.56	--	--
	HHMW-11S/11SR	--	--	--	--	--	--	--	--	--	6.42	--	--

Table 3-2. Summary of Groundwater Parameter Data
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

		2009								2010			
Monitoring Well		Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10
Conductivity (mS/cm)													
Upgradient	HHMW-13	0.240	--	--	0.280	--	--	--	0.245	--	--	0.233	--
	HHMW-14	0.243	--	--	0.280	--	--	--	0.256	--	--	0.240	--
	HHMW-16S1	0.148	0.160	0.233	0.241	0.478	0.634	0.713	0.900	1.040	1.250	0.910	0.571
	HHMW-16S2	0.202	0.277	0.260	0.267	0.297	0.320	0.270	2.780	0.271	0.234	0.239	0.228
	HHMW-17S1	0.258	0.473	0.762	0.860	0.357	1.540	1.030	1.450	1.340	1.280	1.410	1.380
	HHMW-17S2	0.289	0.310	0.308	0.323	0.652	0.387	0.281	0.292	0.286	0.363	0.295	0.462
	HHMW-18S1	0.232	0.234	0.231	0.247	0.175	0.245	0.198	0.290	0.243	0.249	0.244	0.469
	HHMW-18S2	0.251	0.251	0.249	0.263	0.265	0.279	0.233	0.273	0.243	0.206	0.214	0.205
Oxygen Injection Area	HHMW-04I	0.285	--	--	--	--	--	0.254	--	--	--	0.283	--
	HHMW-05S1-R	0.559	0.545	0.780	0.854	0.725	1.110	0.926	0.866	0.720	0.669	0.640	0.656
	HHMW-05S2-R	0.276	0.348	0.780	0.342	0.328	0.289	0.245	0.261	0.284	0.225	0.235	0.284
	HHMW-09D	0.145	--	--	--	--	--	--	--	--	0.120	--	--
	HHMW-09I	0.214	--	--	--	--	--	--	--	--	0.255	--	--
	HHMW-09S1	2.840	--	--	2.660	--	--	--	0.980	--	0.711	--	--
	HHMW-09S2	0.365	--	--	0.284	--	--	--	0.309	--	0.252	--	--
	HHMW-15S	--	1.080	--	0.565	--	--	--	--	--	--	--	--
	MW-03	0.441	--	--	1.490	--	--	1.270	--	--	0.805	--	--
	MW-04	0.178	--	--	0.347	--	--	0.348	--	--	0.999	--	--
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	0.259	--	--	0.291	--	--	0.241	--	--	0.214	--	--
Downgradient	HHMW-06I	0.163	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	1.490	--	--	--	--	--	0.739	--	--	0.845	--	--
	HHMW-06S2	0.311	--	--	--	--	--	0.290	--	--	0.253	--	--
	HHMW-07I	0.179	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	0.511	--	--	0.862	--	--	1.280	--	--	0.774	--	--
	HHMW-07S2	0.268	--	--	0.317	--	--	0.239	--	--	0.294	--	--
	HHMW-08S	0.539	--	--	--	--	--	0.417	--	--	0.461	--	--
	HHMW-11I	0.279	--	--	--	--	--	--	--	--	0.339	--	--
	HHMW-11S/11SR	--	--	--	--	--	--	--	--	--	1.280	--	--
	HHMW-19S1	0.273	0.290	0.255	0.246	0.234	0.254	0.364	0.278	0.299	0.367	0.531	0.344
	HHMW-19S2	0.414	0.473	0.671	0.510	0.367	0.348	0.255	0.309	0.328	0.340	0.329	0.360
	HHMW-20S1	2.670	2.360	2.340	--	--	--	--	--	--	0.242	2.420	1.680
	HHMW-20S2/20S2R	0.357	0.335	0.328	--	--	--	--	--	--	2.660	0.257	0.254
	HHMW-21S1	0.341	0.412	0.440	--	--	--	--	--	--	0.445	0.441	0.340
HHMW-21S2	0.236	0.254	0.263	--	--	--	--	--	--	0.200	0.209	--	

Table 3-2. Summary of Groundwater Parameter Data
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

		2009									2010		
Monitoring Well		Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10
Dissolved Oxygen (mg/L)													
Upgradient	HHMW-13	6.95	--	--	0.00	--	--	--	0.00	--	--	0.00	--
	HHMW-14	9.10	--	--	14.81	--	--	--	6.87	--	--	6.82	--
	HHMW-16S1	5.79	11.94	0.00	0.00	8.88	1.55	13.32	16.80	13.10	9.00	23.00	9.23
	HHMW-16S2	0.00	5.11	0.00	2.25	8.40	8.00	8.32	7.67	7.68	7.11	7.90	8.20
	HHMW-17S1	0.00	7.40	10.60	18.38	15.88	30.00	17.18	15.00	9.00	25.00	27.00	22.00
	HHMW-17S2	0.00	10.87	4.59	7.79	8.40	7.61	8.00	5.36	7.85	7.92	8.20	9.50
	HHMW-18S1	0.00	0.00	0.00	0.00	2.37	0.00	0.00	0.00	0.00	3.56	3.53	6.09
	HHMW-18S2	3.80	0.00	0.00	1.17	3.50	1.84	1.69	2.10	3.72	2.86	2.30	5.30
Oxygen Injection Area	HHMW-04I	8.43	--	--	--	--	--	20.00	--	--	--	27.00	--
	HHMW-05S1-R	0.00	0.00	0.00	0.22	10.10	7.23	14.91	14.70	19.90	22.00	25.00	14.81
	HHMW-05S2-R	1.28	0.00	26.00	26.00	44.00	26.00	14.32	19.02	16.85	19.01	27.00	28.00
	HHMW-09D	8.67	--	--	--	--	--	--	--	--	7.29	--	--
	HHMW-09I	8.78	--	--	--	--	--	--	--	--	8.86	--	--
	HHMW-09S1	10.49	--	--	0.00	--	--	--	12.40	--	10.01	--	--
	HHMW-09S2	0.00	--	--	28.00	--	--	--	20.00	--	32.00	--	--
	HHMW-15S	--	0.00	--	0.00	--	--	--	--	--	--	--	--
	MW-03	0.00	--	--	4.21	--	--	20.00	--	--	15.41	--	--
	MW-04	5.39	--	--	25.00	--	--	20.00	--	--	37.00	--	--
O ₂	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	8.40	--	--	10.52	--	--	9.67	--	--	8.11	--	--
Downgradient	HHMW-06I	7.37	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	0.00	--	--	--	--	--	0.00	--	--	6.03	--	--
	HHMW-06S2	6.72	--	--	--	--	--	4.78	--	--	5.12	--	--
	HHMW-07I	8.27	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	3.14	--	--	0.00	--	--	0.00	--	--	0.00	--	--
	HHMW-07S2	0.11	--	--	0.00	--	--	1.10	--	--	2.95	--	--
	HHMW-08S	0.00	--	--	--	--	--	20.00	--	--	31.00	--	--
	HHMW-11I	5.19	--	--	--	--	--	--	--	--	6.27	--	--
	HHMW-11S/11SR	--	--	--	--	--	--	--	--	--	0.00	--	--
	HHMW-19S1	11.27	5.99	1.59	10.10	6.90	5.77	3.79	0.77	6.15	0.69	3.05	2.75
	HHMW-19S2	0.97	0.00	0.00	0.00	1.50	0.70	1.09	0.50	0.30	3.95	2.76	0.80
	HHMW-20S1	7.21	0.00	0.00	--	--	--	--	--	--	2.43	1.58	0.25
	HHMW-20S2/20S2R	2.28	0.00	0.00	--	--	--	--	--	--	2.20	3.20	4.20
	HHMW-21S1	12.05	4.45	0.70	--	--	--	--	--	--	5.30	4.67	7.48
	HHMW-21S2	7.84	3.81	0.34	--	--	--	--	--	--	7.34	7.80	--

Table 3-2. Summary of Groundwater Parameter Data
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

		2009									2010		
Monitoring Well		Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10
Temperature (degrees Celsius)													
Upgradient	HHMW-13	16.41	--	--	16.82	--	--	--	12.67	--	--	11.01	--
	HHMW-14	14.90	--	--	16.88	--	--	--	12.22	--	--	10.83	--
	HHMW-16S1	11.74	13.50	13.04	14.71	13.63	12.56	12.74	13.40	12.00	12.00	11.71	10.75
	HHMW-16S2	11.51	12.62	12.95	13.19	13.50	12.81	12.04	12.31	11.89	11.67	10.00	11.70
	HHMW-17S1	11.69	12.54	13.91	16.31	14.98	16.30	13.52	15.60	13.60	10.55	11.45	11.10
	HHMW-17S2	11.05	16.03	13.97	16.16	16.20	15.74	13.04	14.50	12.73	9.41	11.70	11.80
	HHMW-18S1	11.28	12.66	13.12	14.07	14.54	15.58	13.80	12.52	12.60	11.94	9.26	6.68
	HHMW-18S2	12.27	13.77	13.68	15.08	14.50	14.84	12.01	13.10	11.07	12.18	9.80	10.90
Oxygen Injection Area	HHMW-04I	11.11	--	--	--	--	--	14.12	--	--	--	10.70	--
	HHMW-05S1-R	9.82	10.82	13.21	15.35	19.20	20.06	15.64	16.30	15.50	11.48	8.70	6.30
	HHMW-05S2-R	10.53	11.48	11.17	12.64	14.10	15.33	14.06	14.45	13.97	12.77	11.80	10.90
	HHMW-09D	11.22	--	--	--	--	--	--	--	--	11.10	--	--
	HHMW-09I	11.31	--	--	--	--	--	--	--	--	11.29	--	--
	HHMW-09S1	10.71	--	--	18.02	--	--	--	14.40	--	9.75	--	--
	HHMW-09S2	11.37	--	--	16.85	--	--	--	12.94	--	9.01	--	--
	HHMW-15S	--	10.02	--	17.40	--	--	--	--	--	--	--	--
	MW-03	7.97	--	--	16.09	--	--	15.38	--	--	8.12	--	--
	MW-04	9.56	--	--	18.81	--	--	16.31	--	--	10.22	--	--
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	11.62	--	--	13.24	--	--	12.93	--	--	10.45	--	--
Downgradient	HHMW-06I	11.24	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	11.11	--	--	--	--	--	16.45	--	--	8.73	--	--
	HHMW-06S2	11.10	--	--	--	--	--	13.70	--	--	10.95	--	--
	HHMW-07I	11.24	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	10.43	--	--	18.92	--	--	14.91	--	--	8.69	--	--
	HHMW-07S2	11.11	--	--	13.06	--	--	13.26	--	--	12.28	--	--
	HHMW-08S	11.09	--	--	--	--	--	15.34	--	--	10.40	--	--
	HHMW-11I	10.98	--	--	--	--	--	--	--	--	12.20	--	--
	HHMW-11S/11SR	--	--	--	--	--	--	--	--	--	9.36	--	--
	HHMW-19S1	15.54	13.69	15.80	19.20	26.60	21.99	15.40	15.26	12.99	10.19	8.20	9.00
	HHMW-19S2	12.11	12.06	13.07	13.15	20.10	14.80	12.99	13.90	13.70	12.41	11.85	11.18
	HHMW-20S1	11.20	13.63	16.27	--	--	--	--	--	--	10.82	7.31	7.72
	HHMW-20S2/20S2R	11.05	11.36	13.55	--	--	--	--	--	--	7.92	11.30	11.00
	HHMW-21S1	14.41	14.79	17.28	--	--	--	--	--	--	8.29	7.30	9.43
	HHMW-21S2	11.57	12.17	12.94	--	--	--	--	--	--	11.06	10.90	--

Table 3-2. Summary of Groundwater Parameter Data
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		2009									2010		
Monitoring Well		Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09	Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10
Oxidation Reduction Potential (mV)													
Upgradient	HHMW-13	179	--	--	250	--	--	--	253	--	--	384	--
	HHMW-14	234	--	--	295	--	--	--	251	--	--	371	--
	HHMW-16S1	195	267	301	227	184	245	263	186	254	295	233	298
	HHMW-16S2	281	340	330	300	258	258	259	264	185	410	286	277
	HHMW-17S1	259	368	343	322	155	316	290	88	129	385	287	295
	HHMW-17S2	28	339	323	301	259	263	243	256	239	383	281	284
	HHMW-18S1	213	223	256	278	116	232	234	202	47	201	200	157
	HHMW-18S2	246	309	279	299	260	248	243	53	318	371	304	294
Oxygen Injection Area	HHMW-04I	242	--	--	--	--	--	296	--	--	--	315	--
	HHMW-05S1-R	23	9	257	254	115	125	227	11	32	152	169	168
	HHMW-05S2-R	215	242	342	335	262	248	282	240	326	423	226	285
	HHMW-09D	209	--	--	--	--	--	--	--	--	331	--	--
	HHMW-09I	247	--	--	--	--	--	--	--	--	194	--	--
	HHMW-09S1	185	--	--	185	--	--	--	63	--	331	--	--
	HHMW-09S2	223	--	--	316	--	--	--	332	--	447	--	--
	HHMW-15S	--	137	--	176	--	--	--	--	--	--	--	--
	MW-03	-85	--	--	5	--	--	168	--	--	255	--	--
MW-04	272	--	--	337	--	--	315	--	--	272	--	--	
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	260	--	--	316	--	--	280	--	--	382	--	--
Downgradient	HHMW-06I	217	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	7	--	--	--	--	--	-90	--	--	41	--	--
	HHMW-06S2	169	--	--	--	--	--	136	--	--	255	--	--
	HHMW-07I	209	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	5	--	--	-23	--	--	-60	--	--	-22	--	--
	HHMW-07S2	230	--	--	261	--	--	208	--	--	157	--	--
	HHMW-08S	205	--	--	--	--	--	247	--	--	230	--	--
	HHMW-11I	196	--	--	--	--	--	--	--	--	179	--	--
	HHMW-11S/11SR	--	--	--	--	--	--	--	--	--	-59	--	--
	HHMW-19S1	-65	-3	-3	-49	-80	-34	-36	-32	-8	44	-4	-52
	HHMW-19S2	223	180	166	142	217	223	120	10	6	233	224	231
	HHMW-20S1	-88	-72	-85	--	--	--	--	--	--	345	-86	-87
	HHMW-20S2/20S2R	122	379	322	--	--	--	--	--	--	-105	313	280
	HHMW-21S1	87	251	224	--	--	--	--	--	--	127	106	231
HHMW-21S2	235	327	254	--	--	--	--	--	--	394	280	--	

Table 3-2. Summary of Groundwater Parameter Data
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Monitoring Well	2010				2011				2012				2013	
	Apr-10	May-10	Jul-10	Oct/Nov-10	Jan-11	Apr-11	Jul-11	Nov-11	Jan-12	Apr-12	Aug-12	Nov-12	Jan-13	
pH (standard units)														
Upgradient	HHMW-13	4.74	--	5.02	5.17	5.45	5.10	4.90	5.00	4.92	4.50	4.65	4.81	4.07
	HHMW-14	4.97	--	4.68	5.21	4.82	5.20	4.95	4.50	4.25	4.00	7.10	7.05	6.34
	HHMW-16S1	5.05	4.30	4.53	4.60	4.40	4.48	4.31	3.70	4.24	4.39	4.87	5.07	4.62
	HHMW-16S2	4.86	4.82	5.01	5.15	5.49	4.80	5.27	5.30	5.21	5.40	6.30	6.85	6.31
	HHMW-17S1	4.94	4.58	4.96	4.21	4.71	4.84	5.05	4.10	4.44	5.86	5.98	5.54	5.21
	HHMW-17S2	4.98	4.82	5.31	4.87	5.47	5.38	5.53	4.75	4.59	5.00	5.25	5.95	5.54
	HHMW-18S1	5.74	4.86	4.94	4.20	4.70	5.70	5.19	4.76	4.87	5.03	5.19	5.26	4.81
	HHMW-18S2	5.10	4.78	5.19	4.28	5.07	5.27	5.11	4.98	4.61	4.61	5.33	5.40	5.32
Oxygen Injection Area	HHMW-04I	5.12	--	5.15	3.41	5.14	5.25	5.30	4.62	4.73	4.91	5.31	5.43	5.32
	HHMW-05S1-R	5.98	5.58	6.06	4.77	5.52	6.10	6.20	6.00	4.89	5.24	6.26	6.26	6.00
	HHMW-05S2-R	5.12	4.98	5.07	4.12	5.39	5.20	5.68	4.65	4.62	4.56	5.15	5.31	5.02
	HHMW-09D	5.86	--	5.83	--	6.01	--	--	--	5.33	--	--	--	5.56
	HHMW-09I	5.39	--	5.12	6.18	5.59	5.51	5.70	5.68	4.89	--	--	--	5.52
	HHMW-09S1	4.35	--	4.68	5.21	5.72	6.29	4.88	5.02	5.31	5.06	5.26	5.23	5.78
	HHMW-09S2	4.85	--	4.92	5.01	4.74	--	--	4.79	4.79	5.24	5.36	5.43	4.91
	HHMW-15S	5.34	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	6.59	--	6.38	7.33	6.86	6.87	--	6.24	6.14	6.95	6.74	6.66	6.51
	MW-04	5.10	--	4.95	3.14	5.42	5.54	5.10	4.39	4.79	5.63	5.32	5.43	5.04
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	--	4.82	5.18	3.57	--	3.45	5.17	5.02	4.41	5.34	5.03	5.27	5.17
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	6.34	--	6.24	6.91	6.93	6.68	6.61	6.00	6.57	--	--	--	--
	HHMW-06S2	--	4.88	5.00	5.55	5.15	5.21	5.70	5.17	4.75	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	6.44	--	6.33	6.41	7.03	6.39	6.82	7.98	5.97	6.50	6.60	6.73	6.68
	HHMW-07S2	5.24	--	5.00	5.27	5.13	5.36	6.89	4.87	4.73	5.40	5.43	5.55	4.93
	HHMW-08S	5.31	--	5.25	5.82	6.09	5.74	6.57	4.18	3.89	5.87	5.39	5.92	5.63
	HHMW-19S1	5.72	5.55	5.68	9.60	6.49	4.16	6.73	7.50	4.75	6.78	6.50	6.37	6.14
	HHMW-19S2	5.25	4.63	4.94	3.93	4.77	5.34	5.49	4.87	4.73	5.45	5.50	5.43	5.26
	HHMW-20S1	6.70	8.04	6.31	8.94	6.48	6.46	7.20	6.23	6.32	7.09	6.85	6.85	6.50
	HHMW-20S2/20S2R	5.00	4.76	4.93	3.91	5.60	5.31	6.68	5.11	3.79	4.75	5.22	5.30	5.10
	HHMW-21S1	--	5.65	5.84	5.41	6.07	5.81	5.96	4.38	4.77	6.04	5.86	5.95	5.72
	HHMW-21S2	--	4.95	5.14	3.91	5.03	4.99	5.50	5.31	4.77	5.46	5.56	5.69	5.47
	HHMW-11I	5.45	--	5.16	4.43	6.17	5.65	6.03	5.15	3.97	5.69	5.63	5.77	5.37
	HHMW-11S/11SR	6.00	--	6.08	7.83	7.42	6.35	6.94	7.02	5.58	6.70	6.36	6.44	6.17

Table 3-2. Summary of Groundwater Parameter Data
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Monitoring Well	2010				2011				2012				2013
	Apr-10	May-10	Jul-10	Oct/Nov-10	Jan-11	Apr-11	Jul-11	Nov-11	Jan-12	Apr-12	Aug-12	Nov-12	Jan-13
Conductivity (mS/cm)													
Upgradient													
HHMW-13	0.276	--	0.213	0.167	0.219	0.160	0.120	0.187	0.194	0.830	0.770	0.765	0.873
HHMW-14	0.201	--	0.228	0.168	0.239	0.152	0.112	0.113	0.285	0.535	0.590	0.638	0.682
HHMW-16S1	1.400	1.320	1.160	0.664	0.925	0.653	0.779	0.689	0.798	0.700	0.850	0.881	0.885
HHMW-16S2	0.209	0.245	0.226	0.196	0.241	0.190	0.201	0.198	0.206	0.490	0.500	0.529	0.615
HHMW-17S1	0.795	0.630	0.373	0.317	0.378	0.548	0.749	0.427	0.507	0.245	0.268	0.393	0.334
HHMW-17S2	0.223	0.215	0.158	0.233	0.250	0.307	0.515	0.305	0.317	0.550	0.306	0.359	0.396
HHMW-18S1	0.343	0.272	0.271	0.190	0.377	0.284	0.305	0.289	0.328	0.265	0.251	0.258	0.234
HHMW-18S2	0.280	0.216	0.215	0.206	0.205	0.272	0.239	0.271	0.268	0.208	0.229	0.231	0.249
Oxygen Injection Area													
HHMW-04I	0.316	--	0.208	0.181	0.204	0.327	0.265	0.300	0.232	0.298	0.244	0.270	0.300
HHMW-05S1-R	0.419	0.537	0.804	0.360	0.359	0.380	0.444	0.388	0.297	0.307	0.582	0.387	0.331
HHMW-05S2-R	0.642	0.316	0.199	0.183	0.201	0.788	0.275	0.291	0.252	0.214	0.280	0.255	0.289
HHMW-09D	0.165	--	0.112	--	0.121	--	--	--	0.157	--	--	--	0.120
HHMW-09I	0.241	--	0.199	0.176	0.173	0.237	0.219	0.188	0.190	--	--	--	0.226
HHMW-09S1	3.200	--	2.660	0.704	0.241	0.373	1.190	0.838	0.632	0.903	0.474	0.521	0.249
HHMW-09S2	0.219	--	0.189	0.194	0.188	--	--	0.315	0.243	0.227	0.344	0.292	0.206
HHMW-15S	0.413	--	--	--	--	--	--	--	--	--	--	--	--
MW-03	0.611	--	0.751	0.973	0.633	0.775	--	0.699	0.894	0.632	0.600	0.614	1.090
MW-04	0.560	--	0.569	0.340	0.253	0.388	0.250	0.290	0.294	0.202	0.370	0.313	0.238
S*													
HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--	--
HHMW-22S2	--	0.224	0.222	0.178	--	0.180	0.255	0.217	0.200	0.209	0.260	0.242	0.285
Downgradient													
HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--	--
HHMW-06S1	2.080	--	1.840	0.316	0.412	1.600	1.740	1.540	2.010	--	--	--	--
HHMW-06S2	--	0.286	0.265	0.264	0.210	0.228	0.387	0.291	0.255	--	--	--	--
HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--	--
HHMW-07S1	0.537	--	0.529	0.478	0.442	1.150	0.544	0.591	0.638	0.495	0.529	0.591	0.611
HHMW-07S2	0.281	--	0.211	0.182	0.131	0.283	0.568	0.258	0.204	0.187	0.225	0.228	0.199
HHMW-08S	0.323	--	0.287	0.270	0.207	0.475	0.681	0.314	0.295	0.274	0.295	0.307	0.330
HHMW-11I	0.304	--	0.236	0.196	0.212	0.307	0.783	0.280	0.251	0.260	0.237	0.270	0.292
HHMW-11S/11SR	0.900	--	0.960	0.369	0.920	0.895	0.788	0.392	0.532	0.430	0.323	0.545	0.586
HHMW-19S1	0.319	0.272	0.369	0.352	0.431	0.644	0.400	0.392	0.453	0.420	0.369	0.481	0.490
HHMW-19S2	0.320	0.230	0.223	0.214	0.251	0.271	0.266	0.273	0.292	0.235	0.215	0.262	0.287
HHMW-20S1	0.910	0.797	1.160	0.369	0.410	0.616	0.769	0.790	1.140	0.770	0.562	0.304	0.382
HHMW-20S2/20S2R	0.426	0.371	0.236	0.201	0.238	0.325	0.979	0.300	0.243	0.287	0.265	0.274	0.305
HHMW-21S1	--	0.573	0.464	0.373	0.370	0.369	0.647	0.340	0.297	0.272	0.454	0.354	0.363
HHMW-21S2	--	0.323	0.200	0.179	0.210	0.206	0.254	0.226	0.251	0.197	0.214	0.228	0.251

Table 3-2. Summary of Groundwater Parameter Data
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		2010				2011				2012				2013
Monitoring Well		Apr-10	May-10	Jul-10	Oct/Nov-10	Jan-11	Apr-11	Jul-11	Nov-11	Jan-12	Apr-12	Aug-12	Nov-12	Jan-13
Dissolved Oxygen (mg/L)														
Upgradient	HHMW-13	5.39	--	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	HHMW-14	7.80	--	6.76	7.28	6.44	7.01	0.00	0.00	0.00	0.00	0.00	0.00	0.21
	HHMW-16S1	8.18	0.00	11.83	16.29	15.45	15.30	13.20	4.80	4.90	5.94	0.00	0.00	0.00
	HHMW-16S2	7.70	8.20	6.90	7.63	6.94	7.52	7.30	8.00	6.21	0.00	0.00	0.00	0.00
	HHMW-17S1	21.00	9.00	19.00	15.20	21.00	17.00	20.11	11.90	11.93	19.99	16.96	23.07	29.00
	HHMW-17S2	7.40	8.10	7.84	4.20	8.95	6.73	5.63	7.79	9.97	5.43	5.49	9.11	13.01
	HHMW-18S1	9.80	0.00	7.73	2.10	3.70	9.34	4.33	1.63	3.98	7.11	2.89	4.97	4.91
	HHMW-18S2	2.49	1.90	0.00	1.50	4.02	3.50	4.25	4.93	4.80	6.03	4.59	3.76	4.82
Oxygen Injection Area	HHMW-04I	13.90	--	8.88	7.40	9.16	9.35	21.10	10.03	8.50	10.68	19.43	12.73	18.77
	HHMW-05S1-R	23.00	9.52	23.00	18.80	26.00	19.99	34.00	9.94	28.00	32.00	19.99	7.81	26.00
	HHMW-05S2-R	33.00	26.00	24.00	13.00	15.20	28.33	26.26	12.78	21.60	23.00	19.99	9.92	16.61
	HHMW-09D	9.04	--	7.38	--	4.33	--	--	--	9.66	--	--	--	9.19
	HHMW-09I	8.78	--	8.02	6.90	4.89	9.41	7.83	0.00	5.99	--	--	--	7.17
	HHMW-09S1	3.42	--	3.79	8.40	12.89	11.30	3.40	5.20	15.50	11.07	8.98	9.91	5.31
	HHMW-09S2	26.00	--	32.00	33.00	29.00	--	--	33.91	29.00	28.00	30.00	29.03	38.00
	HHMW-15S	7.70	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	19.80	--	18.00	7.00	16.01	6.52	--	15.08	15.19	21.00	10.85	14.56	25.00
	MW-04	20.00	--	28.00	36.00	27.00	20.00	20.00	19.99	23.07	21.00	19.72	24.34	36.00
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	--	8.80	9.29	8.40	--	12.37	12.12	7.40	7.02	9.84	8.92	5.28	9.12
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	0.51	--	0.56	0.00	0.00	2.85	1.82	0.00	3.28	--	--	--	--
	HHMW-06S2	--	6.60	5.75	4.10	5.03	6.16	6.24	7.16	4.32	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	2.51	2.81	0.00	0.35	0.71
	HHMW-07S2	1.20	--	2.65	1.65	0.00	8.10	0.00	3.41	0.00	1.90	4.89	1.82	2.21
	HHMW-08S	27.00	--	24.00	27.00	25.00	22.65	22.00	16.30	23.00	22.00	21.00	18.58	31.98
	HHMW-11I	4.10	--	4.19	3.40	3.00	4.19	0.00	5.62	3.31	3.58	3.48	3.41	5.24
	HHMW-11S/11SR	0.00	--	0.00	0.00	0.00	0.00	0.00	0.00	2.38	0.00	0.00	0.09	0.44
	HHMW-19S1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.25	0.70
	HHMW-19S2	1.28	0.00	1.47	0.00	0.00	2.31	2.97	3.07	3.32	0.39	1.20	2.81	2.11
	HHMW-20S1	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00	2.53	0.37	0.00	0.00	1.08
	HHMW-20S2/20S2R	4.00	3.90	4.10	3.20	2.34	11.00	4.60	5.41	3.35	3.79	4.08	3.46	4.69
	HHMW-21S1	--	0.54	4.61	3.10	7.56	5.37	4.56	2.72	5.48	4.92	3.84	3.85	6.70
	HHMW-21S2	--	8.70	8.40	7.70	6.75	5.50	8.83	8.10	9.97	7.72	8.20	6.01	7.02

Table 3-2. Summary of Groundwater Parameter Data
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Monitoring Well	2010				2011				2012				2013	
	Apr-10	May-10	Jul-10	Oct/Nov-10	Jan-11	Apr-11	Jul-11	Nov-11	Jan-12	Apr-12	Aug-12	Nov-12	Jan-13	
Temperature (degrees Celsius)														
Upgradient	HHMW-13	12.40	--	13.00	12.24	11.66	12.00	19.20	15.10	7.07	10.40	21.22	15.66	10.15
	HHMW-14	12.30	--	12.84	12.14	11.75	11.68	17.50	12.23	7.81	10.30	20.60	15.14	9.41
	HHMW-16S1	10.94	10.85	13.29	12.44	12.02	11.82	19.54	13.14	8.60	15.20	19.25	13.93	9.84
	HHMW-16S2	11.80	12.40	12.82	12.17	10.97	12.10	16.47	13.87	5.90	10.24	21.30	13.59	10.07
	HHMW-17S1	11.25	11.54	12.92	13.50	12.05	11.66	22.14	13.75	7.90	18.41	26.06	10.01	9.82
	HHMW-17S2	11.90	12.50	13.37	12.80	10.96	11.95	23.76	14.77	6.41	8.80	22.14	11.53	9.25
	HHMW-18S1	11.10	11.16	18.20	14.20	8.17	10.42	17.42	13.10	9.53	19.58	17.66	13.49	9.27
	HHMW-18S2	11.94	12.20	17.57	13.10	8.97	11.69	15.72	12.26	10.70	18.81	15.33	12.14	9.90
Oxygen Injection Area	HHMW-04I	11.70	--	15.91	11.70	10.27	11.08	22.49	12.25	11.79	12.95	15.60	9.47	10.59
	HHMW-05S1-R	10.70	11.01	19.89	16.10	10.42	9.33	18.05	15.90	9.85	12.51	20.87	14.07	9.29
	HHMW-05S2-R	10.99	11.10	14.77	14.60	12.43	10.33	13.69	13.94	12.32	13.14	16.50	13.49	10.57
	HHMW-09D	11.58	--	14.05	--	7.27	--	--	--	10.67	--	--	--	10.31
	HHMW-09I	11.71	--	14.15	12.60	8.45	11.51	18.28	11.75	8.77	--	--	--	10.95
	HHMW-09S1	10.33	--	16.22	14.20	9.29	12.00	24.10	13.61	12.62	11.61	22.72	15.62	9.25
	HHMW-09S2	11.60	--	14.79	13.10	8.60	--	--	13.14	10.15	11.22	15.96	16.33	10.60
	HHMW-15S	13.00	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	10.80	--	19.41	16.10	7.22	8.90	--	15.55	8.79	10.83	20.15	16.58	7.02
	MW-04	10.43	--	16.38	13.10	11.57	9.83	16.81	14.01	11.87	17.18	15.33	12.11	10.44
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	--	12.40	14.55	12.60	--	12.68	16.82	10.10	6.41	12.14	17.97	11.14	9.60
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	13.60	--	23.36	16.70	6.45	11.68	23.44	16.75	8.21	--	--	--	--
	HHMW-06S2	--	13.80	16.67	13.90	10.82	12.54	14.16	12.57	11.20	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	13.70	--	23.10	15.85	4.62	10.90	21.84	15.95	7.90	15.14	22.15	15.47	8.93
	HHMW-07S2	11.87	--	15.26	13.34	10.41	11.50	17.40	12.63	11.85	13.61	14.10	13.41	10.85
	HHMW-08S	12.80	--	19.88	15.40	10.10	11.02	20.50	15.90	11.23	15.94	21.42	16.29	9.84
	HHMW-11I	12.40	--	14.74	14.50	10.40	11.20	15.90	12.80	11.09	13.66	17.13	14.80	9.85
	HHMW-11S/11SR	12.02	--	22.04	18.30	6.00	10.32	21.36	16.27	10.01	13.20	22.75	18.28	8.74
	HHMW-19S1	13.20	14.10	20.15	16.40	8.09	10.70	18.64	15.97	9.82	14.55	23.95	16.42	9.38
	HHMW-19S2	12.10	11.26	13.61	13.10	12.28	11.45	13.49	12.67	11.84	14.66	20.47	13.25	11.40
	HHMW-20S1	12.99	13.73	21.58	18.20	6.41	10.97	20.37	16.19	9.56	15.17	23.38	17.09	8.83
	HHMW-20S2/20S2R	12.20	12.40	15.19	15.00	9.99	11.00	16.40	12.67	11.74	16.11	17.91	13.16	10.87
	HHMW-21S1	--	14.79	22.90	17.60	5.54	11.42	23.83	16.39	8.90	15.64	22.84	16.84	9.29
	HHMW-21S2	--	13.50	14.52	14.00	8.61	11.32	17.49	12.26	10.62	16.10	16.45	14.22	11.34

Table 3-2. Summary of Groundwater Parameter Data
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		2010				2011				2012				2013
Monitoring Well		Apr-10	May-10	Jul-10	Oct/Nov-10	Jan-11	Apr-11	Jul-11	Nov-11	Jan-12	Apr-12	Aug-12	Nov-12	Jan-13
Oxidation Reduction Potential (mV)														
Upgradient	HHMW-13	250	--	224	247	250	210	312	261	389	320	800	744	661
	HHMW-14	253	--	317	286	299	209	330	425	589	550	790	674	584
	HHMW-16S1	260	321	229	241	270	214	400	700	850	900	NM	283	237
	HHMW-16S2	246	242	312	275	273	274	260	220	236	380	500	432	357
	HHMW-17S1	291	322	281	249	310	335	291	231	154	195	340	251	244
	HHMW-17S2	239	233	282	277	278	275	188	268	327	290	280	405	344
	HHMW-18S1	236	245	238	214	300	248	236	196	196	260	247	276	309
	HHMW-18S2	203	266	282	214	294	299	278	355	290	316	267	325	287
Oxygen Injection Area	HHMW-04I	288	--	201	242	291	294	301	308	215	270	249	308	269
	HHMW-05S1-R	123	193	181	172	240	232	114	150	139	480	202	169	231
	HHMW-05S2-R	259	178	293	185	269	294	248	290	352	344	272	288	293
	HHMW-09D	189	--	206	--	237	--	--	--	255	--	--	--	213
	HHMW-09I	233	--	173	244	270	321	189	210	189	--	--	--	220
	HHMW-09S1	317	--	106	167	133	215	283	192	--	235	168	281	101
	HHMW-09S2	258	--	291	258	312	--	--	310	234	243	294	285	292
	HHMW-15S	186	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	50	--	-49	-7	12	93	--	150	266	157	90	91	79
MW-04	223	--	237	271	292	253	182	216	298	261	285	299	306	
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	--	258	301	257	--	50	286	187	164	279	258	313	285
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	-36	--	-127	-106	78	47	-75	-106	-8	--	--	--	--
	HHMW-06S2	--	205	172	135	200	280	141	159	159	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	1	--	-96	-75	-35	5	-98	-100	-53	-77	-135	-132	-155
	HHMW-07S2	190	--	184	259	287	225	-67	198	203	144	208	251	258
	HHMW-08S	188	--	214	240	216	247	250	118	219	254	234	245	234
	HHMW-11I	249	--	233	204	198	265	293	219	242	261	178	282	215
	HHMW-11S/11SR	-38	--	-107	-31	-90	-50	-108	-22	5	-70	-45	-38	-41
	HHMW-19S1	-96	-100	-85	-169	-81	6	-122	-150	-110	155	-149	-109	-78
	HHMW-19S2	243	247	171	212	277	245	230	219	126	235	151	278	267
	HHMW-20S1	-122	-99	-143	-149	-28	-16	-120	-127	-66	-84	-136	-59	-5
	HHMW-20S2/20S2R	282	285	244	248	203	275	281	221	273	288	197	302	277
	HHMW-21S1	--	205	138	172	133	253	216	115	164	185	190	221	235
HHMW-21S2	--	218	237	253	260	283	187	215	296	255	205	297	256	

Table 3-2. Summary of Groundwater Parameter Data
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		2013			2014			2015		2016		2017	
Monitoring Well		Apr-13	Jul-13	Oct-13	Jan-14	Apr-14	Sep-14	Mar-15	Sep-15	Mar-16	Sep/Oct-16	Mar-17	Sep-17
pH (standard units)													
Upgradient	HHMW-13	4.41	5.69	5.24	5.20	5.15	4.93	5.37	4.78	2.04	5.33	--	4.88
	HHMW-14	6.08	6.48	5.19	5.23	5.41	5.30	5.43	5.15	2.43	5.37	--	4.90
	HHMW-16S1	5.24	5.07	4.44	5.30	4.40	5.57	4.79	4.34	1.16	1.16	--	4.11
	HHMW-16S2	6.68	6.36	5.67	5.07	4.98	5.05	--	4.71	--	4.04	5.34	4.74
	HHMW-17S1	5.30	5.25	5.40	5.81	6.21	5.99	--	4.86	--	5.76	--	--
	HHMW-17S2	5.28	5.24	5.12	5.90	6.15	6.12	--	4.50	--	3.53	--	--
	HHMW-18S1	5.14	5.11	4.86	4.60	5.33	4.70	4.87	4.67	4.48	5.16	5.50	4.88
	HHMW-18S2	5.21	5.09	5.02	4.89	4.73	5.35	--	4.88	--	5.33	--	--
Oxygen Injection Area	HHMW-04I	5.33	5.31	5.01	4.84	5.14	5.30	--	4.79	--	5.31	--	--
	HHMW-05S1-R	6.30	6.29	6.02	5.82	5.78	5.92	5.32	5.62	4.81	5.56	--	--
	HHMW-05S2-R	5.27	5.16	5.11	4.92	5.36	5.38	--	5.04	--	5.34	--	--
	HHMW-09D	--	--	--	5.56	--	--	--	--	--	--	--	--
	HHMW-09I	--	--	--	5.02	--	--	--	5.01	--	5.71	--	--
	HHMW-09S1	5.82	5.75	4.91	5.37	6.63	5.40	5.42	5.21	3.29	5.95	6.10	5.41
	HHMW-09S2	5.40	5.14	5.26	4.98	4.92	4.99	--	4.98	--	5.53	--	--
	HHMW-15S	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	6.74	6.61	6.36	6.00	6.42	6.16	6.12	5.49	5.92	6.17	6.56	--
	MW-04	5.37	5.77	5.21	5.16	5.64	4.96	--	4.95	--	5.53	--	--
O ₂	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	5.27	5.24	5.11	4.88	5.41	4.91	--	4.99	--	5.35	--	--
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	6.69	6.46	6.48	6.30	6.68	6.11	6.24	5.73	5.03	6.62	6.77	6.35
	HHMW-07S2	5.50	5.70	5.35	5.03	4.81	5.41	--	5.06	--	5.50	--	--
	HHMW-08S	5.77	6.05	5.52	5.37	5.85	5.73	--	5.18	--	5.93	--	--
	HHMW-19S1	6.36	6.21	6.00	5.90	6.27	5.94	5.99	6.09	5.47	6.28	6.45	6.07
	HHMW-19S2	4.51	5.28	5.16	4.99	4.74	5.35	5.10	4.84	--	5.45	--	--
	HHMW-20S1	6.83	6.73	6.60	6.42	6.96	6.32	6.55	6.49	6.62	6.64	--	--
	HHMW-20S2/20S2R	5.39	5.66	5.11	4.97	5.94	5.33	--	4.76	--	5.48	--	--
	HHMW-21S1	5.89	5.77	5.58	5.65	6.05	5.46	--	5.51	--	5.87	--	--
	HHMW-21S2	5.59	5.41	5.36	5.16	5.15	5.54	--	4.84	--	5.61	--	--
	HHMW-11I	5.63	5.92	5.46	5.27	5.87	5.65	--	5.11	--	--	--	--
	HHMW-11S/11SR	6.47	6.37	6.15	6.14	6.59	6.00	6.27	6.24	--	6.76	8.89	6.75

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		2013			2014			2015		2016		2017	
Monitoring Well		Apr-13	Jul-13	Oct-13	Jan-14	Apr-14	Sep-14	Mar-15	Sep-15	Mar-16	Sep/Oct-16	Mar-17	Sep-17
Conductivity (mS/cm)													
Upgradient	HHMW-13	0.895	0.271	0.411	0.390	0.395	0.230	0.312	0.26	0.219	0.273	--	0.390
	HHMW-14	0.619	0.301	0.417	0.390	0.415	0.595	0.310	0.19	0.222	0.273	--	0.39
	HHMW-16S1	0.840	0.595	0.997	0.381	0.700	0.930	1.130	0.62	0.424	0.424	--	0.85
	HHMW-16S2	0.667	0.319	0.343	0.610	0.701	0.900	--	0.25	--	0.261	0.335	0.40
	HHMW-17S1	0.415	0.268	0.480	0.810	0.369	0.341	--	0.34	--	0.304	--	--
	HHMW-17S2	0.268	0.281	0.361	0.480	0.310	0.409	--	0.26	--	0.294	--	--
	HHMW-18S1	0.398	0.311	0.510	0.370	0.365	0.300	0.437	0.34	0.269	0.447	0.344	0.406
	HHMW-18S2	0.240	0.244	0.369	0.243	0.217	0.246	--	0.24	--	0.268	--	--
Oxygen Injection Area	HHMW-04I	0.284	0.308	0.452	0.311	0.142	0.330	--	0.311	--	0.316	--	--
	HHMW-05S1-R	0.316	0.365	0.470	1.23	0.448	3.230	0.219	0.234	0.234	0.204	--	--
	HHMW-05S2-R	0.276	0.301	0.347	0.269	0.262	0.283	--	0.238	--	0.333	--	--
	HHMW-09D	--	--	--	0.164	--	--	--	--	--	--	--	--
	HHMW-09I	--	--	--	0.213	--	--	--	0.217	--	0.220	--	--
	HHMW-09S1	0.526	0.300	0.705	0.269	0.200	0.405	0.299	0.309	0.15	0.254	0.289	0.357
	HHMW-09S2	0.258	0.305	0.333	0.298	0.266	0.253	--	0.299	--	0.379	--	--
	HHMW-15S	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	0.631	0.732	1.100	0.967	1.420	1.270	1.660	1.360	2.690	1.650	1.630	--
	MW-04	0.277	0.306	0.418	0.278	0.256	0.316	--	0.265	--	0.301	--	--
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	0.278	0.277	0.394	0.270	0.269	0.293	--	0.25	--	0.303	--	--
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	1.02	0.538	0.927	1.40	1.98	0.87	1.62	0.45	0.707	1.15	0.92	2.12
	HHMW-07S2	0.255	0.268	0.350	0.257	0.241	0.257	--	0.22	--	0.276	--	--
	HHMW-08S	0.309	0.346	0.512	0.308	0.525	0.401	--	0.37	--	0.414	--	--
	HHMW-11I	0.276	0.287	0.331	0.287	0.276	0.288	--	0.25	--	--	--	--
	HHMW-11S/11SR	0.537	0.647	0.703	0.675	1.790	1.000	0.747	0.81	--	0.877	0.530	0.590
	HHMW-19S1	0.683	0.567	0.778	1.28	2.53	1.48	1.82	1.06	1.08	0.710	2.33	1.17
	HHMW-19S2	0.251	0.273	0.329	0.273	0.245	0.275	0.302	0.26	--	0.288	--	--
	HHMW-20S1	0.412	0.699	0.857	0.698	0.730	0.874	1.390	0.70	0.385	0.536	--	--
	HHMW-20S2/20S2R	0.295	0.328	0.361	0.303	0.306	0.297	--	0.27	--	0.347	--	--
	HHMW-21S1	0.356	0.368	0.500	0.442	0.644	0.413	--	0.37	--	0.480	--	--
HHMW-21S2	0.218	0.244	0.301	0.258	0.130	0.259	--	0.24	--	0.267	--	--	

Table 3-2. Summary of Groundwater Parameter Data
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		2013			2014			2015		2016		2017	
Monitoring Well		Apr-13	Jul-13	Oct-13	Jan-14	Apr-14	Sep-14	Mar-15	Sep-15	Mar-16	Sep/Oct-16	Mar-17	Sep-17
Dissolved Oxygen (mg/L)													
Upgradient	HHMW-13	0.03	7.02	5.46	0.30	5.10	5.89	2.68	7.49	0.00	2.04	--	2.17
	HHMW-14	0.00	3.07	8.78	8.92	8.35	10.90	7.90	8.05	5.39	6.68	--	6.95
	HHMW-16S1	0.00	3.92	19.99	9.38	3.99	4.32	11.53	9.67	16.02	7.67	11.12	14.06
	HHMW-16S2	0.00	7.70	11.22	6.17	4.10	9.38	--	7.22	--	8.14	--	8.48
	HHMW-17S1	12.44	29.48	24.31	7.67	6.98	6.47	--	15.33	--	13.11	--	--
	HHMW-17S2	5.74	7.31	14.02	14.00	17.24	18.24	--	5.62	--	5.90	--	--
	HHMW-18S1	10.11	5.03	2.81	8.10	11.59	7.80	14.79	5.00	10.84	4.56	22.67	3.07
	HHMW-18S2	3.23	4.26	3.57	3.95	5.80	6.98	--	3.55	--	5.25	--	--
Oxygen Injection Area	HHMW-04I	8.28	6.61	10.56	10.96	7.58	10.03	--	17.80	--	5.96	--	--
	HHMW-05S1-R	24.70	19.57	22.60	21.65	17.90	20.00	17.39	31.00	14.89	9.66	--	--
	HHMW-05S2-R	12.21	19.42	19.00	16.10	19.87	19.24	--	18.98	--	9.38	--	--
	HHMW-09D	--	--	--	8.42	--	--	--	--	--	--	--	--
	HHMW-09I	--	--	--	9.71	--	--	--	10.47	--	6.17	--	--
	HHMW-09S1	5.25	8.95	9.96	7.48	7.64	8.23	16.12	6.97	8.66	6.47	2.98	5.94
	HHMW-09S2	22.89	28.97	34.00	38.26	23.50	30.00	--	48.00	--	27.92	--	--
	HHMW-15S	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	19.08	8.87	16.10	25.59	16.37	18.35	16.47	20.28	31.62	24.84	50.00	--
	MW-04	37.60	25.07	33.86	33.34	25.10	30.00	--	35.55	--	20.52	--	--
O ₂	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	7.41	6.33	9.51	8.60	7.97	7.90	--	8.42	--	7.00	--	--
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	0.98	0.65	3.50	0.68	0.83	0.40	1.58	1.91	4.88	0.35	5.62	0.43
	HHMW-07S2	4.28	7.12	2.10	2.06	0.75	5.66	--	2.76	--	2.62	--	--
	HHMW-08S	27.00	16.39	24.03	31.41	15.60	16.47	--	24.30	--	14.65	--	--
	HHMW-11I	4.85	6.60	8.34	4.35	2.80	6.57	--	2.90	--	--	--	--
	HHMW-11S/11SR	0.90	0.43	0.68	0.90	0.88	0.55	0.34	1.34	--	1.5	2.95	1.54
	HHMW-19S1	1.10	0.99	1.81	0.60	1.90	0.69	3.53	1.05	6.37	3.04	7.70	1.50
	HHMW-19S2	1.45	5.25	7.02	1.81	2.49	3.88	2.25	2.40	--	5.02	--	--
	HHMW-20S1	1.40	0.66	0.39	1.16	1.37	0.84	1.62	1.36	0.00	0.63	--	--
	HHMW-20S2/20S2R	5.10	8.30	8.64	4.29	3.09	8.15	--	4.80	--	7.30	--	--
	HHMW-21S1	4.96	3.39	4.30	4.84	5.87	4.55	--	3.11	--	4.78	--	--
	HHMW-21S2	6.09	6.58	11.73	7.90	5.98	7.22	--	8.10	--	7.05	--	--

Table 3-2. Summary of Groundwater Parameter Data
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		2013			2014			2015		2016		2017	
Monitoring Well		Apr-13	Jul-13	Oct-13	Jan-14	Apr-14	Sep-14	Mar-15	Sep-15	Mar-16	Sep/Oct-16	Mar-17	Sep-17
Temperature (degrees Celsius)													
Upgradient	HHMW-13	12.01	26.13	13.75	12.20	11.65	11.00	10.76	23.34	14.34	14.79	--	12.80
	HHMW-14	12.15	21.94	11.62	11.50	11.47	11.63	10.95	20.82	14.32	14.32	--	13.66
	HHMW-16S1	12.83	21.84	12.61	8.70	10.02	14.00	9.51	20.33	14.27	11.16	--	12.98
	HHMW-16S2	11.49	28.45	12.13	8.21	10.17	14.12	--	16.34	--	14.32	10.82	13.74
	HHMW-17S1	15.88	22.08	16.31	11.35	11.47	10.73	--	16.46	--	13.66	--	--
	HHMW-17S2	20.85	21.85	12.81	12.54	8.73	9.24	--	17.78	--	15.25	--	--
	HHMW-18S1	13.88	17.29	13.29	10.33	12.00	14.50	7.91	20.99	15.21	14.52	6.15	13.77
	HHMW-18S2	13.05	17.50	12.30	10.92	17.09	14.25	--	19.10	--	14.07	--	--
Oxygen Injection Area	HHMW-04I	11.42	18.74	13.20	9.16	15.86	15.32	--	15.37	--	17.60	--	--
	HHMW-05S1-R	10.23	19.25	16.22	11.06	9.00	17.75	6.07	20.28	14.17	20.29	--	--
	HHMW-05S2-R	12.25	14.64	14.01	13.10	10.76	13.44	--	16.93	--	16.07	--	--
	HHMW-09D	--	--	--	11.03	--	--	--	--	--	--	--	--
	HHMW-09I	--	--	--	11.16	--	--	--	14.41	--	12.80	--	--
	HHMW-09S1	13.12	19.71	14.32	9.19	10.63	20.02	3.20	26.65	13.63	20.72	12.29	18.66
	HHMW-09S2	18.93	15.69	12.71	10.79	11.22	15.26	--	15.16	--	13.57	--	--
	HHMW-15S	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	9.86	21.83	16.98	9.99	8.99	17.42	6.48	18.60	11.75	17.19	7.05	--
	MW-04	10.74	18.39	14.57	10.95	12.69	15.92	--	16.05	--	17.89	--	--
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	11.79	15.07	12.23	10.86	11.42	12.99	--	13.58	--	12.82	--	--
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	12.87	21.90	17.23	7.86	10.44	19.44	3.77	21.04	9.52	22.02	5.80	19.14
	HHMW-07S2	11.78	14.64	14.57	12.03	14.76	14.27	--	14.86	--	14.49	--	--
	HHMW-08S	11.42	18.56	16.63	10.86	12.10	18.36	--	20.23	--	19.22	--	--
	HHMW-11I	11.54	17.13	14.16	11.10	13.70	14.48	--	18.11	--	--	--	--
	HHMW-11S/11SR	10.79	21.16	18.34	10.04	11.17	19.55	6.31	22.08	--	18.61	8.78	19.84
	HHMW-19S1	11.50	20.85	17.06	8.40	11.00	20.02	5.27	22.24	10.75	22.57	5.97	18.89
	HHMW-19S2	13.25	15.13	13.53	11.77	15.11	14.23	10.09	16.28	--	15.34	--	--
	HHMW-20S1	12.75	21.20	18.51	9.12	11.27	20.07	5.53	23.96	11.38	21.18	--	--
	HHMW-20S2/20S2R	12.24	15.40	14.73	11.94	11.87	16.18	--	15.55	--	14.56	--	--
	HHMW-21S1	12.04	22.60	18.29	8.97	11.37	21.20	--	26.26	--	24.13	--	--
HHMW-21S2	11.30	17.43	14.17	11.41	15.49	16.79	--	18.11	--	17.03	--	--	

Table 3-2. Summary of Groundwater Parameter Data
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		2013			2014			2015		2016		2017	
Monitoring Well		Apr-13	Jul-13	Oct-13	Jan-14	Apr-14	Sep-14	Mar-15	Sep-15	Mar-16	Sep/Oct-16	Mar-17	Sep-17
Oxidation Reduction Potential (mV)													
Upgradient	HHMW-13	732	261	182	193	175	402	217	260	350	211	--	205
	HHMW-14	601	289	220	399	91	96	211	263	349	224	--	219
	HHMW-16S1	288	281	271	214	89	97	270	307	419	419	--	297
	HHMW-16S2	299	210	220	--	101	112	--	288	--	329	277	236
	HHMW-17S1	301	188	191	125	108	110	--	301	--	244	--	--
	HHMW-17S2	233	306	221	231	383	301	--	309	--	353	--	--
	HHMW-18S1	304	286	260	208	287	287	216	274	362	295	295	223
	HHMW-18S2	330	242	252	209	207	251	--	288	--	260	--	--
Oxygen Injection Area	HHMW-04I	280	171	266	173	95	277	--	299	--	268	--	--
	HHMW-05S1-R	183	186	322	216	186	243	181	248	330	233	--	--
	HHMW-05S2-R	404	222	221	258	297	255	--	243	--	163	--	--
	HHMW-09D	--	--	--	171	--	--	--	--	--	--	--	--
	HHMW-09I	--	--	--	198	--	--	--	280	--	123	--	--
	HHMW-09S1	122	175	161	147	119	133	106	41	157	5	113	10
	HHMW-09S2	248	228	238	198	297	318	--	322	--	203	--	--
	HHMW-15S	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	70	58	57	-8	12	-17	99	9	36	22	33	--
	MW-04	379	310	256	281	239	303	--	294	--	260	--	--
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-22S2	333	234	220	247	294	306	--	205	--	269	--	--
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	-149	-147	-158	-40	-130	-63	-2	2	22	-125	104	-140
	HHMW-07S2	212	256	169	94	236	183	--	213	--	108	--	--
	HHMW-08S	196	279	216	144	273	240	--	278	--	214	--	--
	HHMW-11I	364	293	222	121	232	218	--	273	--	--	--	--
	HHMW-11S/11SR	-60	-106	-40	-41	-54	-27	-3	-28	--	-125	60	-98
	HHMW-19S1	-112	-130	-103	-85	-92	-53	54	-62	20	-127	1	-98
	HHMW-19S2	266	293	222	93	220	239	110	267	--	98	--	--
	HHMW-20S1	-8	-125	-95	-36	21	12	-25	47	98	-1	--	--
	HHMW-20S2/20S2R	280	320	232	145	310	265	--	290	--	188	--	--
	HHMW-21S1	356	245	145	157	169	175	--	203	--	198	--	--
	HHMW-21S2	236	202	216	195	206	255	--	294	--	229	--	--

Notes:

- MGP = Manufactured Gas Plant
- mS/cm = millisiemens per centimeter
- mg/L = milligrams per liter
- mv = millivolts
- * = Sidegradient
- = not measured

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Monitoring Well	2018		2019		2020		2021		2022		2023		
	Mar-18	Aug-18	Mar-19	Sep-19	Feb-20	Sep-20	Mar-21	Aug-21	Feb-22	Aug-22	Mar-23	Aug-23	
pH (standard units)													
Upgradient	HHMW-13	--	--	--	5.19	--	5.18	--	5.81	--	5.71	--	5.61
	HHMW-14	--	5.41	--	5.41	--	5.36	5.60	5.50	4.54	5.84	--	5.95
	HHMW-16S1	4.56	4.75	4.76	4.14	4.97	4.97	--	5.09	--	5.57	--	5.19
	HHMW-16S2	--	5.20	--	5.08	--	--	--	--	--	--	--	--
	HHMW-17S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-17S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-18S1	--	5.16	--	5.27	--	5.10	5.34	5.37	--	5.85	--	5.06
	HHMW-18S2	--	--	--	--	--	--	--	--	--	--	--	--
Oxygen Injection Area	HHMW-04I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-05S1-R	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-05S2-R	--	--	--	--	--	--	--	--	--	--	5.37	5.41
	HHMW-09D	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-09I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-09S1	6.39	5.06	6.35	6.04	6.33	5.62	5.87	6.38	5.02	--	6.66	--
	HHMW-09S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-15S	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	--	--	--	--	6.72	--	6.72	--	6.38	7.25	6.48	6.49
	MW-04	--	--	--	--	--	--	--	--	--	--	--	--
O ₂	HHMW-22S1	--	--	--	--	--	--	--	--	--	7.17	--	--
	HHMW-22S2	--	--	--	--	--	--	--	--	--	--	--	--
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	--	5.54	--	7.50	--	6.95	--	7.13	--	--	--	--
	HHMW-07S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-08S	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-19S1	5.96	5.87	6.64	6.94	7.00	6.46	6.57	6.59	6.22	6.26	5.97	6.05
	HHMW-19S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-20S1	6.55	6.00	--	7.53	--	--	--	--	--	--	--	--
	HHMW-20S2/20S2R	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-21S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-21S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-11I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-11S/11SR	--	5.95	--	7.09	--	--	--	--	--	--	--	--

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		2018		2019		2020		2021		2022		2023	
Monitoring Well		Mar-18	Aug-18	Mar-19	Sep-19	Feb-20	Sep-20	Mar-21	Aug-21	Feb-22	Aug-22	Mar-23	Aug-23
Conductivity (mS/cm)													
Upgradient	HHMW-13	--	--	--	0.270	--	0.184	--	0.250	--	0.272	--	0.321
	HHMW-14	--	0.205	--	0.267	--	0.190	0.215	0.249	0.309	0.282	--	0.409
	HHMW-16S1	0.754	0.337	0.489	0.612	0.599	0.308	--	0.486	--	0.273	--	0.526
	HHMW-16S2	--	0.193	--	0.283	--	--	--	--	--	--	--	--
	HHMW-17S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-17S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-18S1	--	0.220	--	0.408	--	0.226	0.278	0.255	--	0.220	--	0.290
	HHMW-18S2	--	--	--	--	--	--	--	--	--	--	--	--
Oxygen Injection Area	HHMW-04I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-05S1-R	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-05S2-R	--	--	--	--	--	--	--	--	--	--	0.143	0.341
	HHMW-09D	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-09I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-09S1	0.361	0.212	0.200	0.221	0.183	0.153	0.130	0.200	0.162	--	0.076	--
	HHMW-09S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-15S	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	--	--	--	--	1.740	--	0.868	--	1.010	0.812	0.382	0.790
	MW-04	--	--	--	--	--	--	--	--	--	--	--	--
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	0.073	--	--
	HHMW-22S2	--	--	--	--	--	--	--	--	--	--	--	--
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	--	1.82	--	0.261	--	0.634	--	1.070	--	--	--	--
	HHMW-07S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-08S	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-11I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-11S/11SR	--	0.220	--	0.310	--	--	--	--	--	--	--	--
	HHMW-19S1	2.33	0.753	0.718	0.467	0.258	0.420	0.667	0.689	1.670	0.274	0.254	0.593
	HHMW-19S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-20S1	0.940	0.193	--	0.172	--	--	--	--	--	--	--	--
	HHMW-20S2/20S2R	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-21S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-21S2	--	--	--	--	--	--	--	--	--	--	--	--

Table 3-2. Summary of Groundwater Parameter Data
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

		2018		2019		2020		2021		2022		2023	
Monitoring Well		Mar-18	Aug-18	Mar-19	Sep-19	Feb-20	Sep-20	Mar-21	Aug-21	Feb-22	Aug-22	Mar-23	Aug-23
Dissolved Oxygen (mg/L)													
Upgradient	HHMW-13	--	--	--	0.00	--	1.18	--	5.86	--	2.10	--	3.15
	HHMW-14	--	6.87	--	6.84	--	9.25	6.29	7.89	13.26	30.56	--	12.01
	HHMW-16S1	17.80	10.43	15.45	13.67	6.07	18.21	--	9.26	--	11.56	--	9.21
	HHMW-16S2	--	5.59	--	6.69	--	--	--	--	--	--	--	--
	HHMW-17S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-17S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-18S1	--	0.60	--	7.66	--	2.95	8.41	4.48	--	3.41	--	5.13
	HHMW-18S2	--	--	--	--	--	--	--	--	--	--	--	--
Oxygen Injection Area	HHMW-04I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-05S1-R	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-05S2-R	--	--	--	--	--	--	--	--	--	--	16.21	23.86
	HHMW-09D	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-09I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-09S1	9.66	1.96	2.13	5.04	2.30	3.87	7.06	5.37	8.87	--	10.03	--
	HHMW-09S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-15S	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	--	--	--	--	16.10	--	18.94	--	32.07	26.50	12.88	13.14
	MW-04	--	--	--	--	--	--	--	--	--	--	--	--
O ₂	HHMW-22S1	--	--	--	--	--	--	--	--	--	4.45	--	--
	HHMW-22S2	--	--	--	--	--	--	--	--	--	--	--	--
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	--	0.00	--	0.00	--	0.00	--	0.00	--	--	--	--
	HHMW-07S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-08S	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-11I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-11S/11SR	--	0.00	--	0.00	--	--	--	--	--	--	--	--
	HHMW-19S1	0.74	0.00	0.37	0.00	0.92	0.00	0.00	0.00	0.00	0.02	0.86	0.87
	HHMW-19S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-20S1	2.55	0.00	--	0.00	--	--	--	--	--	--	--	--
	HHMW-20S2/20S2R	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-21S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-21S2	--	--	--	--	--	--	--	--	--	--	--	--

Table 3-2. Summary of Groundwater Parameter Data
Halesite Former MGP Site
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		2018		2019		2020		2021		2022		2023	
Monitoring Well		Mar-18	Aug-18	Mar-19	Sep-19	Feb-20	Sep-20	Mar-21	Aug-21	Feb-22	Aug-22	Mar-23	Aug-23
Temperature (degrees Celsius)													
Upgradient	HHMW-13	--	--	--	12.50	--	11.77	--	21.05	--	13.08	--	17.55
	HHMW-14	--	14.48	--	13.27	--	11.48	12.11	17.83	11.25	12.60	--	16.65
	HHMW-16S1	11.37	18.08	11.22	12.38	10.89	12.39	--	19.52	--	20.55	--	17.10
	HHMW-16S2	--	17.98	--	12.31	--	--	--	--	--	--	--	--
	HHMW-17S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-17S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-18S1	--	19.66	--	18.17	--	16.47	12.27	16.07	--	16.83	--	17.72
	HHMW-18S2	--	--	--	--	--	--	--	--	--	--	--	--
Oxygen Injection Area	HHMW-04I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-05S1-R	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-05S2-R	--	--	--	--	--	--	--	--	--	--	11.87	15.75
	HHMW-09D	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-09I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-09S1	8.93	21.87	9.52	16.88	8.52	18.96	10.76	18.87	13.94	--	12.08	--
	HHMW-09S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-15S	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	--	--	--	--	8.86	--	10.55	--	7.84	22.55	9.31	19.61
	MW-04	--	--	--	--	--	--	--	--	--	--	--	--
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	20.68	--	--
	HHMW-22S2	--	--	--	--	--	--	--	--	--	--	--	--
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	--	21.76	--	21.27	--	16.80	--	22.81	--	--	--	--
	HHMW-07S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-08S	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-11I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-11S/11SR	--	21.95	--	20.29	--	--	--	--	--	--	--	--
	HHMW-19S1	12.69	22.08	8.95	21.53	6.19	20.52	9.43	21.96	7.35	21.78	11.05	21.42
	HHMW-19S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-20S1	9.07	22.59	--	21.39	--	--	--	--	--	--	--	--
	HHMW-20S2/20S2R	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-21S1	--	--	--	--	--	--	--	--	--	--	--	--
HHMW-21S2	--	--	--	--	--	--	--	--	--	--	--	--	

Table 3-2. Summary of Groundwater Parameter Data
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

		2018		2019		2020		2021		2022		2023	
Monitoring Well		Mar-18	Aug-18	Mar-19	Sep-19	Feb-20	Sep-20	Mar-21	Aug-21	Feb-22	Aug-22	Mar-23	Aug-23
Oxidation Reduction Potential (mV)													
Upgradient	HHMW-13	--	--	--	221	--	243	--	103	--	218	--	75
	HHMW-14	--	328	--	206	--	297	185	135	386	243	--	189
	HHMW-16S1	232	397	241	311	267	201	--	129	--	232	--	107
	HHMW-16S2	--	365	--	269	--	--	--	--	--	--	--	--
	HHMW-17S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-17S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-18S1	--	345	--	248	--	264	208	218	--	315	--	251
	HHMW-18S2	--	--	--	--	--	--	--	--	--	--	--	--
Oxygen Injection Area	HHMW-04I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-05S1-R	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-05S2-R	--	--	--	--	--	--	--	--	--	--	178	158
	HHMW-09D	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-09I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-09S1	35	114.00	58	39	63	-13	177	4	0	--	33	--
	HHMW-09S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-15S	--	--	--	--	--	--	--	--	--	--	--	--
	MW-03	--	--	--	--	-18	--	93	--	138	-1	-45	-40
	MW-04	--	--	--	--	--	--	--	--	--	--	--	--
S*	HHMW-22S1	--	--	--	--	--	--	--	--	--	39	--	--
	HHMW-22S2	--	--	--	--	--	--	--	--	--	--	--	--
Downgradient	HHMW-06I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S1	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-06S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-07S1	--	57	--	-150	--	-177	--	-133	--	--	--	--
	HHMW-07S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-08S	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-11I	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-11S/11SR	--	126	--	-122	--	--	--	--	--	--	--	--
	HHMW-19S1	-145	20	-82	-130	-43	-175	-85	-108	-11	-35	-57	-146
	HHMW-19S2	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-20S1	-59	72.00	--	-118.00	--	--	--	--	--	--	--	--
	HHMW-20S2/20S2R	--	--	--	--	--	--	--	--	--	--	--	--
	HHMW-21S1	--	--	--	--	--	--	--	--	--	--	--	--
HHMW-21S2	--	--	--	--	--	--	--	--	--	--	--	--	

Table 3-3. Water Level Measurements and Calculated Water Elevations
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance Monitoring Report

Well and Piezometer I.D.	Top of Casing Elevation (ft)	Tide	8/31/2023		Notes
			Depth to Water (ft)	Groundwater Elevation (ft)	
Upland Groundwater Monitoring Wells					
HHMW-13	55.75	High	42.76	12.99	
		Low	44.98	10.77	
HHMW-14	76.12	High	65.01	11.11	
		Low	69.94	6.18	
HHMW-16S1	38.01	High	27.80	10.21	
		Low	28.13	9.88	
HHMW-16S2	37.69	High	27.86	9.83	
		Low	28.26	9.43	
HHMW-17S1	30.63	High	20.48	10.15	
		Low	21.05	9.58	
HHMW-17S2	31.09	High	21.08	10.01	
		Low	21.42	9.67	
Lowland Groundwater Monitoring Wells					
HHMW-04I	19.58	High	8.89	10.69	
		Low	9.34	10.24	
HHMW-05S1R	17.40	High	7.70	9.70	
		Low	7.79	9.61	
HHMW-05S2R	17.44	High	7.15	10.29	
		Low	7.54	9.90	
HHMW-09S1	19.26	High	9.54	9.72	
		Low	9.42	9.84	
HHMW-09S2	19.33	High	9.39	9.94	
		Low	9.76	9.57	
HHMW-09I	19.23	High	9.35	9.88	
		Low	9.68	9.55	
HHMW-09D	18.83	High	9.21	9.62	
		Low	9.31	9.52	
HHMW-15S	19.56	High	NM	NC	
		Low	10.96	8.60	
HHMW-18S1	20.66	High	10.28	10.38	
		Low	10.55	10.11	
HHMW-18S2	21.01	High	10.52	10.49	
		Low	10.96	10.05	
MW-03	14.66	High	5.05	9.61	
		Low	5.12	9.54	
MW-04	18.46	High	8.82	9.64	
		Low	9.20	9.26	
Downgradient Groundwater Monitoring Wells					
HHMW-07S1	11.59	High	3.82	7.77	
		Low	3.92	7.67	
HHMW-07S2	11.40	High	2.02	9.38	
		Low	3.32	8.08	
HHMW-07I	10.86	High	0.90	9.96	
		Low	1.61	9.25	
HHMW-07D	11.13	High	1.05	10.08	
		Low	1.53	9.60	
HHMW-08S	8.67	High	2.66	6.01	
		Low	5.45	3.22	
HHMW-08I	8.59	High	0.09	8.50	
		Low	0.15	8.44	
HHMW-11SR	NM	High	1.24	NC	Abandoned - Re-installed on 9/27/16. Not re-surveyed.
		Low	4.03	NC	
HHMW-19S1	11.87	High	4.05	7.82	
		Low	4.11	7.76	
HHMW-19S2	11.52	High	2.31	9.21	
		Low	3.42	8.10	
HHMW-20S1	10.27	High	4.30	5.97	
		Low	4.73	5.54	
HHMW-20S2R	NM	High	NM	NC	Abandoned - Re-installed on 9/27/16. Not re-surveyed.
		Low	NM	NC	
HHMW-21S1	9.77	High	3.57	6.20	
		Low	3.83	5.94	
HHMW-21S2	10.09	High	0.63	9.46	
		Low	2.03	8.06	
Side-gradient Groundwater Monitoring Wells					
HHMW-22S1	16.00	High	7.56	8.44	
		Low	6.35	9.65	
HHMW-22S2	16.40	High	6.34	10.06	
		Low	7.30	9.10	

Notes:

MGP = Manufactured Gas Plant
ft = feet
NC = Not Calculated
NM = Not Measured

Table 3-4. Groundwater Analytical Results
Halesite Former MGP
Annual Groundwater Monitoring and Operations, Maintenance Monitoring Report

Site Area		Upland Area					Oxygen Injection System Area					Downgradient		Side-Gradient
Sample Name	HHMW-13	HHMW-14	HHMW-14	HHMW-16S1	HHMW-18S1	HHMW-05S2R	HHMW-05S2R	HHMW-09S1	HHMW-09S1	MW-03	MW-03	HHMW-19S1	HHMW-19S1	HHMW-22S1
Start Depth	39	64	64	15	7	18	18	6	6	2	2	2	2	3
End Depth	49	74	74	20	12	28	28	11	11	12	12	7	7	8
Depth Unit	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
Sample Date	8/31/2023	3/30/2023	8/31/2023	8/31/2023	8/31/2023	3/30/2023	8/31/2023	3/30/2023	8/31/2023	3/30/2023	8/31/2023	3/30/2023	8/31/2023	8/31/2023
Parent Sample														
Analyte	Units	CAS No.	NYS AWQS											
BTEX	µg/L													
Benzene		71-43-2	1	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U
Toluene		108-88-3	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	0.98 J	1.2	0.43 J	1 U
Ethylbenzene		100-41-4	5	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1 U	1	0.52 J
Total Xylene		1330-20-7	5	2 U	1 U	2 U	6.4	2 U	1 U	2 U	5.7	6.3	7.2	4.6
Total BTEX (ND=0)		TBTEX_ND0	NE	ND	ND	ND	6.4	ND	ND	ND	6.7	7.5	9	5.3
PAH17	µg/L													
Acenaphthene		83-32-9	20*	10 U	10 U	10 U	1.3 J	20 J	10 U	10 U	1.7 J	10 U	16	9.5 J
Acenaphthylene		208-96-8	NE	2.3 J	1.4 J	1.1 J	2.4 J	54	10 U	10 J	2.5 J	4.3 J	1.7 J	1.1 J
Anthracene		120-12-7	50*	1.5 J	10 U	10 U	10 U	14 J	10 U	10 U	1.4 J	2.2 J	10 U	10 U
Benzo[a]anthracene		56-55-3	0.002*	1.6	2.4	2.3	1.0 U	27	1 U	3.1	3.3	2.3	1 U	1 U
Benzo[a]pyrene		50-32-8	ND	1 U	3.9	3.7	0.52 J	85	1 U	4.1	7.2	8.8	1 U	1 U
Benzo[b]fluoranthene		205-99-2	0.002*	2 U	3.1	2.6	2.0 U	55	2 U	3.3	4.8	4.6	2 U	2 U
Benzo[g,h,i]perylene		191-24-2	NE	10 U	1.9 J	2.0 J	1.7 J	75	10 U	2.2 J	5.4 J	11	10 U	10 U
Benzo[k]fluoranthene		207-08-9	0.002*	1 U	1.1	0.94 J	1.0 U	16	1 U	1.1	2.0	1.6	1 U	1 U
Chrysene		218-01-9	0.002*	1.2 J	1.8 J	1.9 J	2.0 U	31	2 U	2.2	3.4	2.7	2 U	2 U
Dibenz(a,h)anthracene		53-70-3	NE	1.0 U	1.0 U	1.0 U	1.0 U	13	1 U	1.0 U	1.0 U	0.92 J	1 U	1 U
Fluoranthene		206-44-0	50*	5.1 J	1.4 J	1.4 J	10 U	32 J	10 U	2.2 J	4.4 J	3.0 J	10 U	10 U
Fluorene		86-73-7	50*	1.2 J	10 U	10 U	1.0 J	16 J	10 U	10 U	10 U	1.2 J	1.6 J	1.1 J
Indeno[1,2,3-cd]pyrene		193-39-5	0.002*	2.0 U	1.9 J	1.7 J	1.4 J	66	2 U	2.0	4.4	8.6	2 U	2 U
2-Methylnaphthalene		91-57-6	NE	1.4 J	10 U	10 U	1.8 J	23 J	10 U	10 U	10 U	10 U	10 U	1.4 J
Naphthalene		91-20-3	10*	2.0 U	2.0 U	2.0 U	1.4 J	82	2 U	2 U	2 U	2.0 U	6.8	4.0
Phenanthrene		85-01-8	50*	4.6 J	10 U	10 U	10 U	34 J	10 U	10 U	10 U	2.6 J	10 U	10 U
Pyrene		129-00-0	50*	10	3.2 J	3.0 J	10 U	64	10 U	4.2 J	5.4 J	4.9 J	10 U	10 U
Total PAH (17) (ND=0)		TPAH17_ND0	NE	28.9	22.1	20.6	11.5	707	ND	25.4	45.9	58.7	26	15.7

**Table 3-4. Groundwater Analytical Results
Halesite Former MGP
Annual Groundwater Monitoring and Operations, Maintenance Monitoring Report**

Notes:

Analytes in blue are not detected in any sample

µg/L= micrograms per liter or parts per billion (ppb)

BTEX = Benzene, Toluene, Ethylbenzene, and Xylenes

PAH = Polycyclic Aromatic Hydrocarbon

Total BTEX and Total PAHs are calculated using detects only.

Total PAH16 is calculated using the EPA16 list of analytes: Acenaphthene, Acenaphthylene, Anthracene, Benz[a]anthracene, Benzo[a]pyrene, Benzo[b]fluoranthene, Benzo[g,h,i]perylene, Benzo[k]fluoranthene, Chrysene, Dibenz[a,h]anthracene, Fluoranthene, Fluorene, Indeno[1,2,3-cd]pyrene, Naphthalene, Phenanthrene, and Pyrene

Total PAH17 is calculated using the EPA16 list of analytes plus 2-Methylnaphthalene

NYS AWQS = New York State Ambient Water Quality Standards and Guidance Values for GA groundwater

* indicates the value is a guidance value and not a standard

CAS No. = Chemical Abstracts Service Number

MGP = Manufactured Gas Plant

ND = Not Detected

NE = Not Established

Bolding indicates a detected result concentration

Gray shading and bolding indicates that the detected result value exceeds the NYS AWQS

Data Qualifiers:

J = The result is an estimated value.

U = The result was not detected above the reporting limit.

Table 3-5. Summary of Historical Total BTEX Results
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well No.	Screen Interval (feet)	BTEX Concentrations (µg/L)														BTEX Concentrations (µg/L)																			
		Sampling Date														Sampling Date																			
		1995		2001		2003		2005		2006		2007		2008		2009		2009						2010				2011							
		Nov	Jul	Jul	Apr	Oct	Apr	Oct	Apr	Oct	Apr	Jul	Oct	Jan	Apr/May	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	April	May	July	Oct/Nov	Jan/Feb	Apr	July	Oct/Nov	
MW-04	1.0 - 21.0	--	0	--	0	0	0	0	0	0	0	0	0	3	0	NS	NS	0	NS	NS	0	NS	NS	0	NS	0	0	0	0	0	0	0	0	0	0
P-01	12.1 - 15.4	0	20	--	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾													
P-02	12.3 - 16.4	0	1	4	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾													
Downgradient Groundwater Monitoring Wells																																			
HHMW-06S1	2.5 - 7.5	**	0	0	0	0	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0	NS	NS	0	NS	0	0	0	0	0	0	0	0	0	
HHMW-06S2	12.0 - 22.0	**	0	0	0	0	0	0	0	NS	0	0	0	0	0	NS	NS	NS	NS	NS	0	NS	NS	0	NS	NS	0	0	0	0	0	0	0	0	
HHMW-06I	35.0 - 45.0	**	0	0	NS	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS									
HHMW-07S1	3.0 - 8.0	**	220	138	52	0	43	119	NS	98	148	113	108	66	62	NS	NS	103	NS	NS	14	NS	NS	31	NS	NS	0	NS	2	3	0	3	4	0	
HHMW-07S2	16.0 - 26.0	**	0	1	0	0	0	0	0	0	0	0	0	0	2	NS	NS	0	NS	NS	0	NS	NS	0	NS	0	0	0	0	0	0	0	0	0	
HHMW-07I	45.0 - 55.0	**	0	0	NS	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS									
HHMW-07D	115.0 - 125.0	**	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS												
HHMW-08S	2.0 - 12.0	**	1	0	0	0	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0	NS	NS	0	NS	NS	0	NS	0	0	0	0	0	0	
HHMW-08I	35.0 - 45.0	**	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS												
HHMW-11S/11SR	3.0 - 13.0	*	*	65	23	21	32	31	21	13	22	0	17	10	20	NS	NS	NS	NS	NS	NS	NS	2	NS	NS	3	NS	0	1	2	2	0	NS		
HHMW-11I	31.0 - 41.0	*	*	0	0	0	0	0	0	0	0	26	0	0	0	NS	NS	NS	NS	NS	NS	NS	0	0	NS	0	NS	0	0	0	0	0	0		
HHMW-19S1	3.0 - 8.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	113	183	195	115	149	213	158	92	96	50	75	75	180	208	134	144	123	140	137	125	
HHMW-19S2	15.0 - 25.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	46	21	24	16	10	7	5	7	10	0	3	4	0	0	0	0	0	0	0		
HHMW-20S1	4.0 - 9.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	21	26	17	NS	NS	NS	NS	NS	NS	0	13	10	12	2	1	2	0	0	1		
HHMW-20S2/20S2R	15.0 - 25.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	11	2	0	NS	NS	NS	NS	NS	NS	14	1	2	0	0	0	0	0	0	0		
HHMW-21S1	3.0 - 8.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	0	0	0	NS	NS	NS	NS	NS	NS	0	NS	0	NS	0	0	0	0	0	0		
HHMW-21S2	15.0 - 25.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	0	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾		
Sidegradient Groundwater Monitoring Wells																																			
HHMW-22S1	4.0 - 9.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾		
HHMW-22S2	15.0 - 25.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	0	NS	NS	0	NS	NS	0	NS	NS	0	NS	NS	0	NS	NS	NS	NS	0	0	0	0

Table 3-5. Summary of Historical Total BTEX Results
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well No.	Screen Interval (feet)	BTEX Concentrations (µg/L)														BTEX Concentrations (µg/L)												Pre-operational Period			Operational Period					
		Sampling Date														BTEX Concentrations (µg/L)												Min	Max	Mean	Min	Max	Mean			
		2012				2013				2014				2015		2016		2017		2018		2019		2020		2021								2022		2023
		Jan	Apr	July	Oct/Nov	Jan	Apr	July	Oct/Nov	Jan	Apr	Sept	Mar	Aug/Sept	Mar	Aug/Sept/Oct	Mar	Sept	Mar	Aug	Mar	Sept	Feb	Sept	Mar	Sept	Feb	Aug	Mar	Aug						
MW-04	1.0 - 21.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	0	3	0	0	0	0											
P-01	12.1 - 15.4	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	
P-02	12.3 - 16.4	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	
Downgradient Groundwater Monitoring Wells																																				
HHMW-06S1	2.5 - 7.5	0	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾												
HHMW-06S2	12.0 - 22.0	0	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾										
HHMW-06I	35.0 - 45.0	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾										
HHMW-07S1	3.0 - 8.0	0	5	6	9	19	13	15	7	25	30	11	17	0	76	2	0	0.94	NS ⁽¹⁾	8.5	NS ⁽¹⁾	0	NS ⁽¹⁾	5.05	NS ⁽¹⁾	0	NS	NS	NS	NS	0	220	96	0	103	13
HHMW-07S2	16.0 - 26.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾												
HHMW-07I	45.0 - 55.0	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾										
HHMW-07D	115.0 - 125.0	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾										
HHMW-08S	2.0 - 12.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾												
HHMW-08I	35.0 - 45.0	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾										
HHMW-11S/11SR	3.0 - 13.0	0	0	0	0	0	0	0	0	0	0	0	0	0	NS ⁽¹⁾	0	0	0.21	NS ⁽¹⁾	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾						
HHMW-11I	31.0 - 41.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	
HHMW-19S1	3.0 - 8.0	103	139	108	190	232	252	225	245	264	238	218	220	237	283	139	111.3	84.31	51.02	46.78	30.67	6	2	6	8	6	18	18	34	37	113	113	113	2.4	283	128
HHMW-19S2	15.0 - 25.0	0	0	2	0	0	0	0	0	0	0	0	2	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾												
HHMW-20S1	4.0 - 9.0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	NS ⁽¹⁾	NS ⁽¹⁾	0	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾						
HHMW-20S2/20S2R	15.0 - 25.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾												
HHMW-21S1	3.0 - 8.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾												
HHMW-21S2	15.0 - 25.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾												
Sidegradient Groundwater Monitoring Wells																																				
HHMW-22S1	4.0 - 9.0	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS	546	NS	1122	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	546	1122	834											
HHMW-22S2	15.0 - 25.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾												

General Notes:
µg/L = Micrograms per liter
PAH = Polycyclic Aromatic Hydrocarbons
MGP = Manufactured Gas Plant
Monitoring wells HHMW-16S1, HHMW-16S2, HHMW-17S1, and HHMW-17S2 sampled on March 2, 2010 were included in the February monthly results.
⁽¹⁾: Monitoring well abandoned
⁽²⁾: Monitoring well not sampled due to the presence of DNAPL
* = Well constructed in 2003
** = Well constructed in 2001
*** = Well constructed in October 2005
**** = Well constructed in 2009
NS = Not sampled
DNAPL = Dense Non-Aqueous Phase Liquid

Table 3-6. Summary of Historical Total PAH Results
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well No.	Screen Interval (feet)	Total PAH Concentrations (µg/L)														Total PAH Concentrations (µg/L)																					
		Sampling Date														Sampling Date																					
		1995	2001	2003	2005		2006		2007		2008			2009		2009							2010							2011							
		Nov	Jul	Jul	Apr	Oct	Apr	Oct	Apr	Oct	Apr	Jul	Oct	Jan	Apr/May	May	June	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	July	Oct/Nov	Jan/Feb	Apr	July	Oct/Nov			
Pre-operational Period														Operational Period																							
Downgradient Groundwater Monitoring Wells																																					
HHMW-06S1	2.5 - 7.5	**	1	0	0	0	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	0	NS	NS	0	NS	NS	0	NS	0	0	0	0	0	1			
HHMW-06S2	12.0 - 22.0	**	374	0	77	11	0	0	NS	0	0	39	0	31	0	NS	NS	NS	NS	NS	16	NS	NS	0	NS	NS	NS	5	0	6	0	3	45	23			
HHMW-06I	35.0 - 45.0	**	0	0	NS	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS											
HHMW-07S1	3.0 - 8.0	**	1,688	505	360	0	140	981	0	3	1,046	479	32	364	9	NS	NS	0	NS	NS	14	NS	NS	285	NS	NS	67	NS	96	15	1	0	74	42			
HHMW-07S2	16.0 - 26.0	**	0	0	11	111	13	47	0	0	7	16	0	26	0	NS	NS	0	NS	NS	6	NS	NS	59	NS	NS	0	NS	2	31	18	0	9	54			
HHMW-07I	45.0 - 55.0	**	1	0	NS	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS											
HHMW-07D	115.0 - 125.0	**	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS												
HHMW-08S	2.0 - 12.0	**	181	14	0	28	116	58	72	58	0	0	34	78	0	NS	NS	NS	NS	NS	0	NS	NS	0	NS	NS	0	NS	0	0	0	0	2	2			
HHMW-08I	35.0 - 45.0	**	0	10	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS												
HHMW-11S/11SR	3.0 - 13.0	*	*	63	79	130	88	80	98	49	79	0	97	82	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS			
HHMW-11I	31.0 - 41.0	*	*	82	0	0	0	0	0	0	0	0	0	0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS			
HHMW-19S1	3.0 - 8.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	5	1355	1495	0	4	97	10	210	184	31	0	82	178	619	1004	949	758	616	1,172	828		
HHMW-19S2	15.0 - 25.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	0	310	27	0	3	20	1	24	145	0	0	25	0	0	0	49	37	0	94	90		
HHMW-20S1	4.0 - 9.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	49	112	136	NS	0	27	48	28	0	111	65	36	0	154	154							
HHMW-20S2/20S2R	15.0 - 25.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	2	2	1	NS	NS	NS	NS	NS	NS	107	0	4	0	0	0	0	0	0	0	0		
HHMW-21S1	3.0 - 8.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	0	0	0	NS	NS	NS	NS	NS	NS	0	NS	0	NS	0	0	0	0	0	0	0		
HHMW-21S2	15.0 - 25.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	0	0	0	NS	NS	NS	NS	NS	NS	0	0	NS	NS	0	0	0	0	0	0	NS		
Sidegradient Groundwater Monitoring Wells																																					
HHMW-22S1	4.0 - 9.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾			
HHMW-22S2	15.0 - 25.0	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	0	NS	NS	0	NS	NS	0	NS	NS	0	NS	NS	0	NS	NS	NS	0	0	0	NS	1	0	0

Table 3-6. Summary of Historical Total PAH Results
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

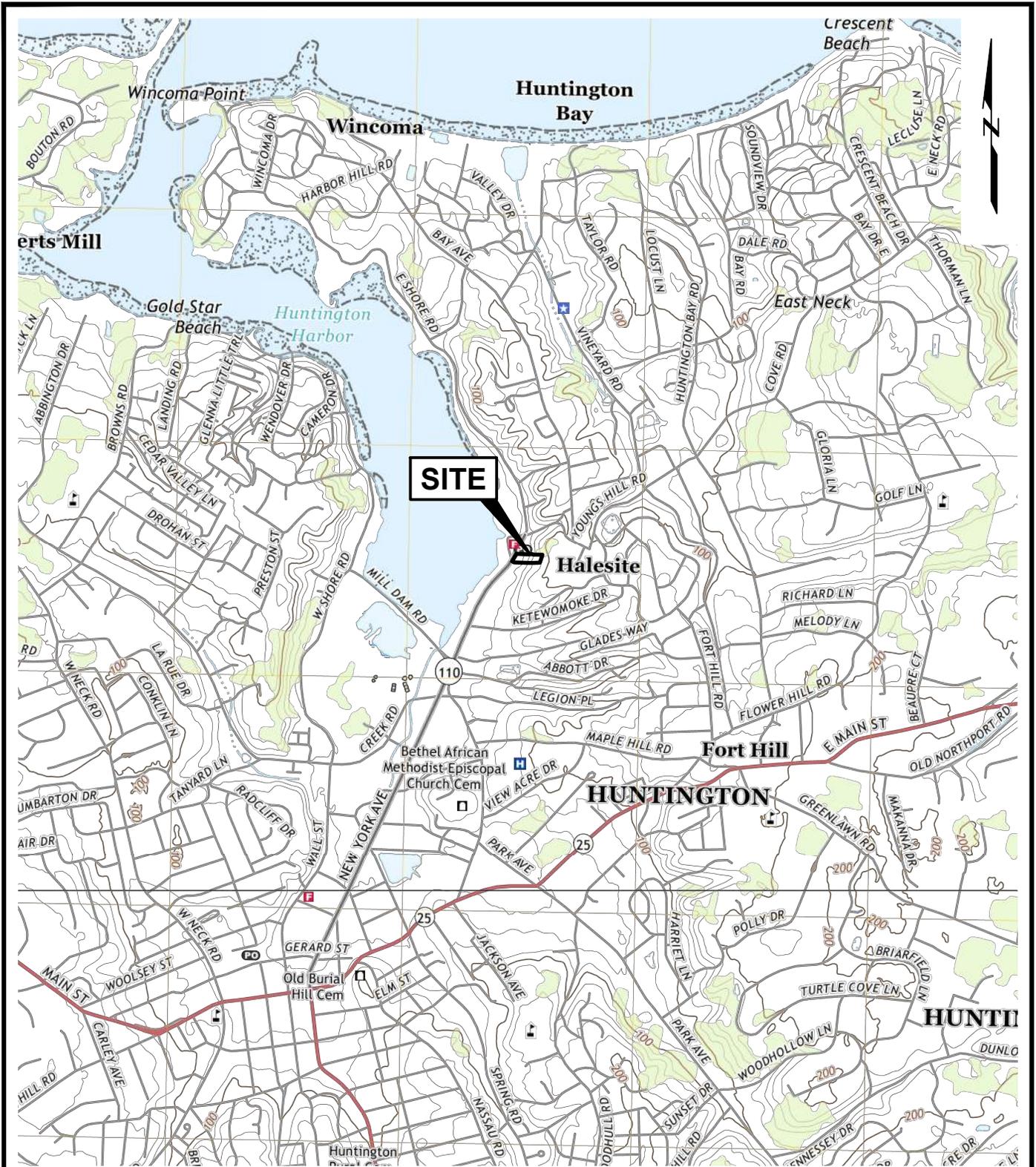
Well No.	Screen Interval (feet)	Total PAH Concentrations (µg/L)														Total PAH Concentrations (µg/L)														Pre-operational Period			Operational Period				
		Sampling Date														Sampling Date														Min	Max	Mean	Min	Max	Mean		
		2012				2013				2014			2015			2016		2017		2018		2019		2020		2021		2022								2023	
		Jan	Apr	July	Oct/Nov	Jan	Apr	July	Oct/Nov	Jan	Apr	Sept	Mar	Aug/Sept	Mar	Aug/Sept/Oct	Mar	Sept	Mar	Aug	Mar	Sept	Feb	Sept	Mar	Sept	Feb	Aug	Feb							Aug	
Operational Period														Operational Period																							
Upgradient Groundwater Monitoring Wells																																					
HHMW-12	45.0 - 55.0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	
HHMW-13	39.0 - 49.0	15	1	2	75	106	15	39	136	44	29	51	119	41	22	9	NS ⁽¹⁾	19	NS ⁽¹⁾	16	NS ⁽¹⁾	46	NS ⁽¹⁾	21	NS	43	NS	29	0	220	56	0	328	44			
HHMW-14	64.0 - 74.0	7	15	32	0	92	13	284	601	81	17	1	56	1	0	0	NS ⁽¹⁾	0	NS ⁽¹⁾	20	NS ⁽¹⁾	0	NS ⁽¹⁾	244	88	36	307	385	22	21	0	826	140	0	601	68	
HHMW-16S1	25.0 - 30.0	1	12	12	112	60	0	58	9	8	197	99	187	0	47	0	NS ⁽¹⁾	0	0	11	6	27	0	5	2	0	2	NS	12	98	98	98	0	600	60		
HHMW-16S2	35.0 - 45.0	0	0	0	0	0	0	NS	0	0	0	0	NS	0	NS ⁽¹⁾	112	5	0	NS ⁽¹⁾	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾									
HHMW-17S1	20.0 - 25.0	0	5	6	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾															
HHMW-17S2	30.0 - 40.0	0	0	2	0	0	0	0	0	0	0	0	NS	1	NS ⁽¹⁾	27	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾															
HHMW-18S1	9.0 - 14.0	552	427	672	554	0	32	235	670	613	37	121	123	486	93	75	0	24.5	NS ⁽¹⁾	33	NS ⁽¹⁾	5.2	NS ⁽¹⁾	53.2	26.31	16.2	NS	0	NS	707	48	48	48	0	924	269	
HHMW-18S2	19.0 - 29.0	0	0	0	0	0	0	5	0	0	0	9	NS	32	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾															
O2 Injection System Area GW Monitoring Wells																																					
HHMW-011	35.0 - 45.0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾		
HHMW-041	30.0 - 40.0	0	1	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾															
HHMW-05S1-R	6.0 - 11.0	0	0	0	2	1	5	8	0	0	0	0	S	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾															
HHMW-05S2-R	18.0 - 28.0	0	0	0	0	0	0	0	0	0	0	0	95	2	262	767	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾															
HHMW-05I	30.0 - 40.0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾		
HHMW-05D	80.0 - 90.0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾		
HHMW-09S1	6.0 - 11.0	159	45	75	20	0	2	138	106	208	276	257	121	NS	54	76	156	102	21	23	36	1	48	7	14	33	1	24	46	59	257	552	63	0	276	62	
HHMW-09S2	17.5 - 27.5	1	1	0	0	0	0	0	0	1	0	0	NS	0	NS ⁽¹⁾	4	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾															
HHMW-09I	43.0 - 53.0	2	NS	NS	NS	0	NS	NS	NS	1	NS	NS	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾															
HHMW-09D	85.0 - 95.0	0	NS	NS	NS	0	NS	NS	NS	0	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾		
HHMW-10	15.0 - 20.0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾		
HHRW-01	13.0 - 23.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾		
HHMW-15S	7.5 - 12.5	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾		
MW-01	5.0 - 25.0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾		
MW-02	6.0 - 26.0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾		
MW-03	2.0 - 12.0	4	5	10	2	1	39	1	33	311	312	377	669	824	763	4421	1005	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾														
MW-04	1.0 - 21.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	10	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾															
P-01	12.1 - 15.4	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾		
P-02	12.3 - 16.4	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾		

Table 3-6. Summary of Historical Total PAH Results
Halesite Former MGP Site
Annual Groundwater Monitoring and Operations, Maintenance & Monitoring Report

Well No.	Screen Interval (feet)	Total PAH Concentrations (µg/L)														Total PAH Concentrations (µg/L)												Pre-operational Period			Operational Period						
		Sampling Date														Sampling Date												Min	Max	Mean	Min	Max	Mean				
		2012				2013				2014			2015			2016		2017		2018		2019		2020		2021								2022		2023	
		Jan	Apr	July	Oct/Nov	Jan	Apr	July	Oct/Nov	Jan	Apr	Sept	Mar	Aug/Sept	Mar	Aug/Sept/Oct	Mar	Sept	Mar	Aug	Mar	Sept	Feb	Sept	Mar	Sept	Feb							Aug	Feb	Aug	
Operational Period														Operational Period																							
Downgradient Groundwater Monitoring Wells																																					
HHMW-06S1	2.5 - 7.5	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	0	1	0	0	1	0			
HHMW-06S2	12.0 - 22.0	0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	0	374	45	0	45	10			
HHMW-06I	35.0 - 45.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	0	0	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾			
HHMW-07S1	3.0 - 8.0	15	31	29	27	63	46	82	31	123	100	55	56	23	196	11	0	5	NS ⁽¹⁾	46	NS ⁽¹⁾	0	NS ⁽¹⁾	2	NS ⁽¹⁾	0	NS	NS	NS	NS	0	1,688	427	0	285	50	
HHMW-07S2	16.0 - 26.0	0	70	77	64	0	38	49	43	50	61	14	NS	7	NS ⁽¹⁾	16	NS ⁽¹⁾	0	111	18	0	77	29														
HHMW-07I	45.0 - 55.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	0	1	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾			
HHMW-07D	115.0 - 125.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	0	0	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾			
HHMW-08S	2.0 - 12.0	0	0	0	0	0	0	0	0	21	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	0	181	53	0	21	1														
HHMW-08I	35.0 - 45.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	0	10	5	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾			
HHMW-11S/11SR	3.0 - 13.0	43	30	31	35	34	33	28	30	36	35	58	51	76	NS ⁽¹⁾	32.3	8	17	NS ⁽¹⁾	8.5	NS ⁽¹⁾	9	NS ⁽¹⁾	NS ⁽¹⁾	0	130	77	4	76	37							
HHMW-11I	31.0 - 41.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	0	82	7	0	0	0			
HHMW-19S1	3.0 - 8.0	776	528	753	774	3732	921	663	1072	859	738	829	499	1198	909	347	321	358	218	241	138	9	22	26	46	29	33	15	138	57	5	5	5	0	3,732	538	
HHMW-19S2	15.0 - 25.0	0	57	72	92	62	3	58	98	82	119	53	50	14	NS ⁽¹⁾	49	NS ⁽¹⁾	0	0	0	0	0	310	50													
HHMW-20S1	4.0 - 9.0	0	79	124	87	37	28	69	68	19	13	36	5	31	4	7	NS ⁽¹⁾	NS ⁽¹⁾	4.04	8.2	NS ⁽¹⁾	9.9	NS ⁽¹⁾	NS ⁽¹⁾	49	49	49	0	154	48							
HHMW-20S2/20S2R	15.0 - 25.0	0	0	1	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	2	2	2	0	107	4														
HHMW-21S1	3.0 - 8.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	0	0	0	0	0	0														
HHMW-21S2	15.0 - 25.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	0	0	0														
Sidegradient Groundwater Monitoring Wells																																					
HHMW-22S1	4.0 - 9.0	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS ⁽¹⁾	NS	1,510	NS	2657	NS ⁽²⁾	NS ⁽²⁾	NS ⁽²⁾	1510	2,657	2084		
HHMW-22S2	15.0 - 25.0	0	0	0	0	0	0	0	0	0	0	0	NS	0	NS ⁽¹⁾	0	NS ⁽¹⁾	0	0	0	0	0	1	0													

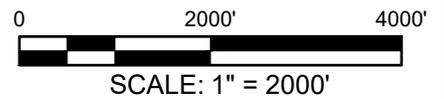
General Notes:
µg/L = Micrograms per liter
PAH = Polycyclic Aromatic Hydrocarbons
MGP = Manufactured Gas Plant
Monitoring wells HHMW-16S1, HHMW-16S2, HHMW-17S1, and HHMW-17S2 sampled on March 2, 2010 were included in the February monthly results.
⁽¹⁾: Monitoring well abandoned
⁽²⁾: Monitoring well not sampled due to the presence of DNAPL
* = Well constructed in 2003
** = Well constructed in 2001
*** = Well constructed in October 2005
**** = Well constructed in 2009
NS = Not sampled
DNAPL = Dense Non-Aqueous Phase Liquid

Figures



SOURCE:

MAP CREATED WITH THE FOLLOWING 7.5-MINUTE SERIES USGS TOPOGRAPHIC MAPS: LLOYD HARBOR, NY-CT QUADRANGLE, 2019 AND HUNTINGTON, NY, 2019 ([www.https://ngmdb.usgs.gov/topoview/viewer/](https://ngmdb.usgs.gov/topoview/viewer/)).



Halesite Former MGP Site
Halesite, New York

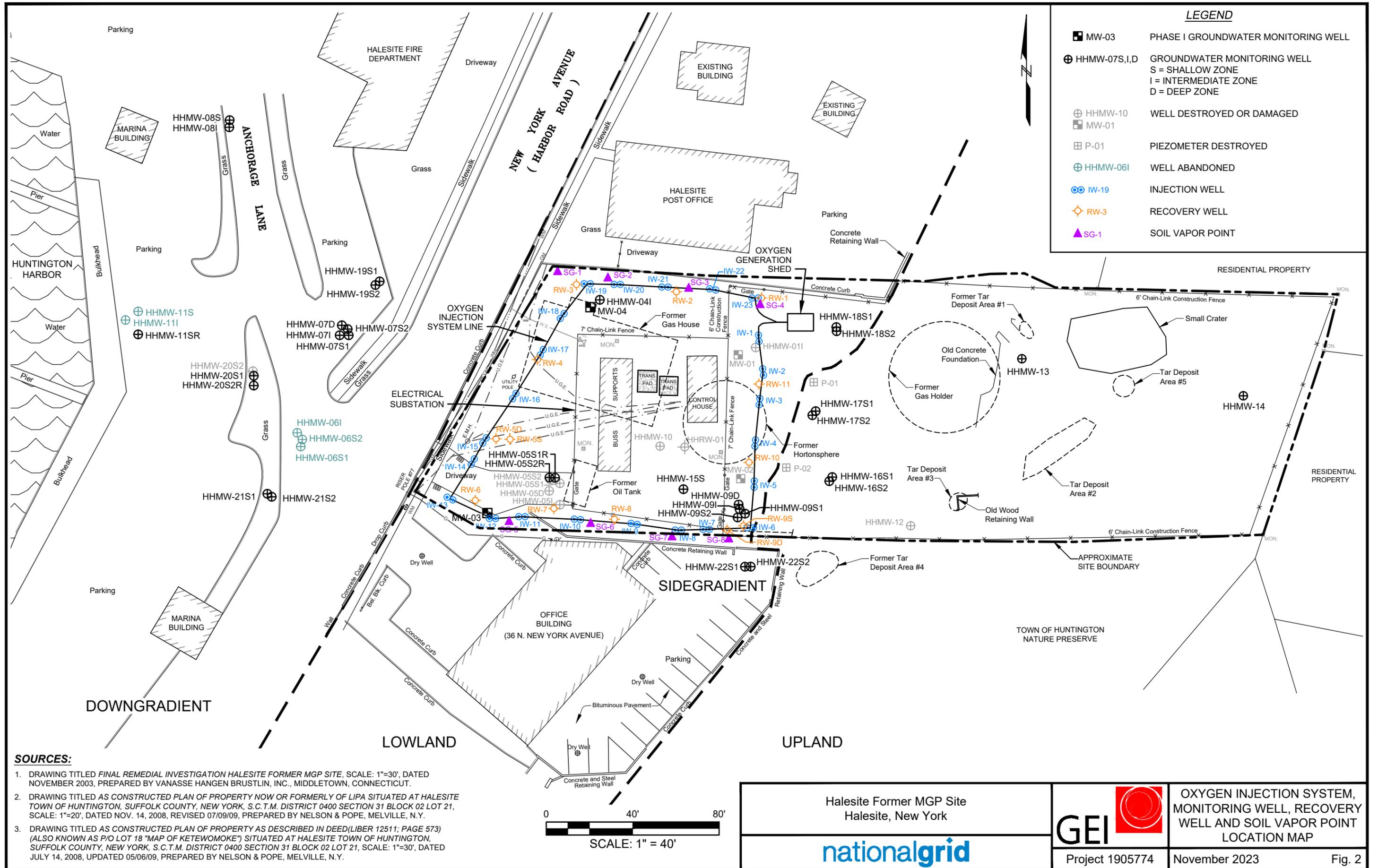


SITE LOCATION MAP

Project 1905774

November 2023

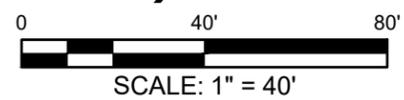
Fig. 1



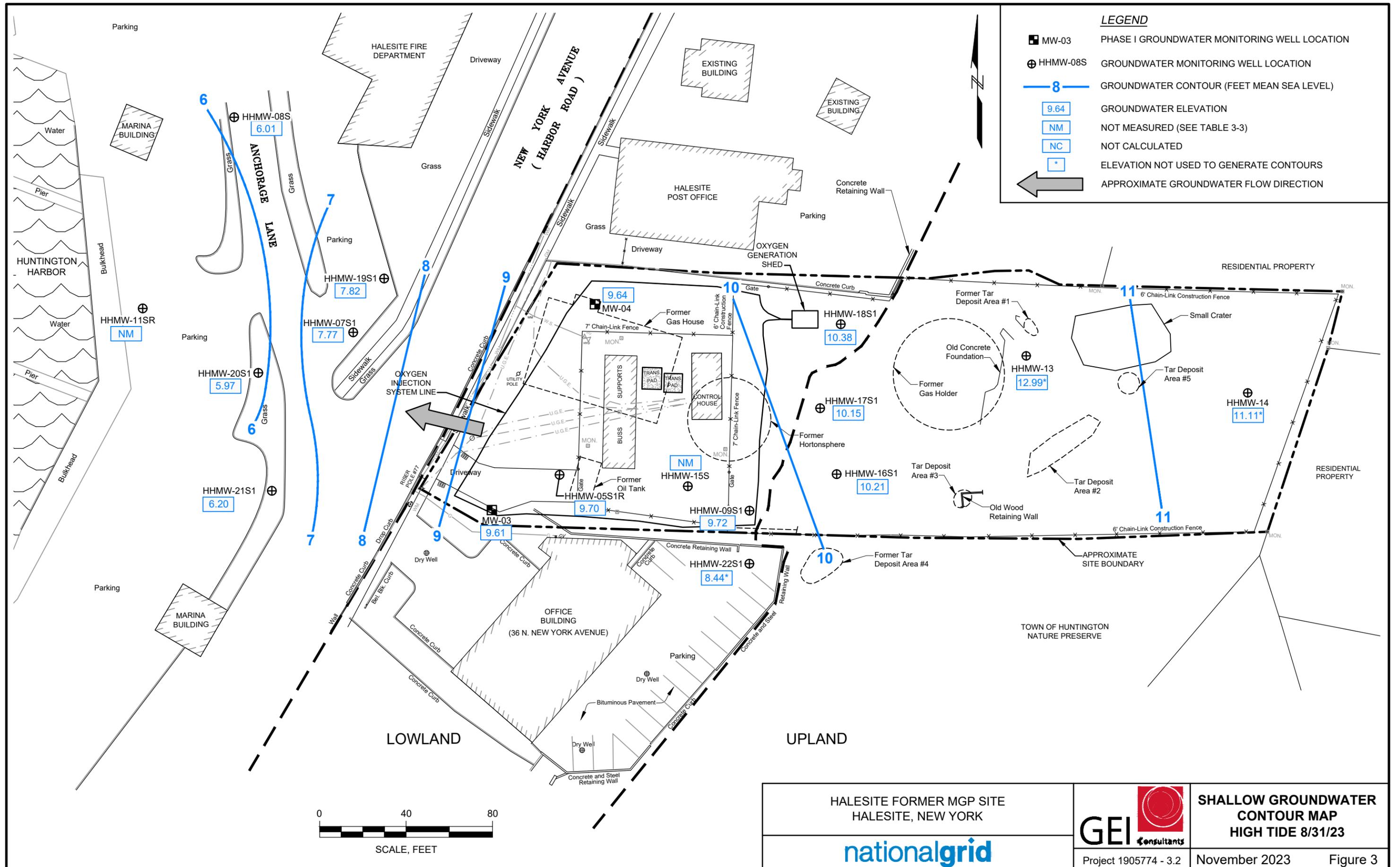
LEGEND

	MW-03	PHASE I GROUNDWATER MONITORING WELL
	HHMW-07S,I,D	GROUNDWATER MONITORING WELL S = SHALLOW ZONE I = INTERMEDIATE ZONE D = DEEP ZONE
	HHMW-10	WELL DESTROYED OR DAMAGED
	MW-01	PIEZOMETER DESTROYED
	HHMW-06I	WELL ABANDONED
	IW-19	INJECTION WELL
	RW-3	RECOVERY WELL
	SG-1	SOIL VAPOR POINT

- SOURCES:**
1. DRAWING TITLED *FINAL REMEDIAL INVESTIGATION HALESITE FORMER MGP SITE*, SCALE: 1"=30', DATED NOVEMBER 2003, PREPARED BY VANASSE HANGEN BRUSTLIN, INC., MIDDLETOWN, CONNECTICUT.
 2. DRAWING TITLED AS *CONSTRUCTED PLAN OF PROPERTY NOW OR FORMERLY OF LIPA SITUATED AT HALESITE TOWN OF HUNTINGTON, SUFFOLK COUNTY, NEW YORK, S.C.T.M. DISTRICT 0400 SECTION 31 BLOCK 02 LOT 21*, SCALE: 1"=20', DATED NOV. 14, 2008, REVISED 07/09/09, PREPARED BY NELSON & POPE, MELVILLE, N.Y.
 3. DRAWING TITLED AS *CONSTRUCTED PLAN OF PROPERTY AS DESCRIBED IN DEED/LIBER 12511; PAGE 573 (ALSO KNOWN AS P/O LOT 18 "MAP OF KETEWOMOKE") SITUATED AT HALESITE TOWN OF HUNTINGTON, SUFFOLK COUNTY, NEW YORK, S.C.T.M. DISTRICT 0400 SECTION 31 BLOCK 02 LOT 21*, SCALE: 1"=30', DATED JULY 14, 2008, UPDATED 05/06/09, PREPARED BY NELSON & POPE, MELVILLE, N.Y.

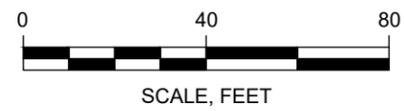


Halesite Former MGP Site Halesite, New York			OXYGEN INJECTION SYSTEM, MONITORING WELL, RECOVERY WELL AND SOIL VAPOR POINT LOCATION MAP	
				Project 1905774

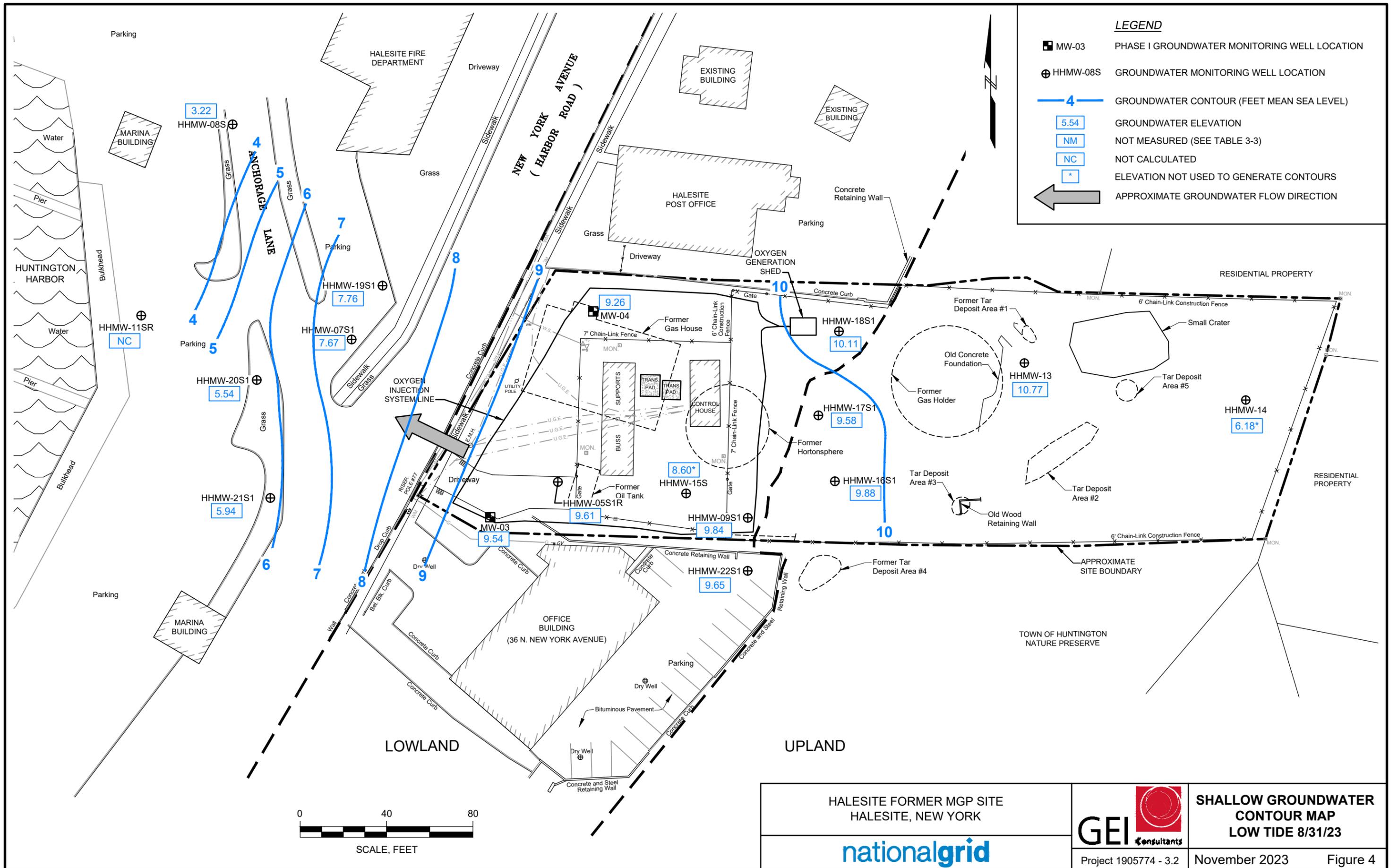


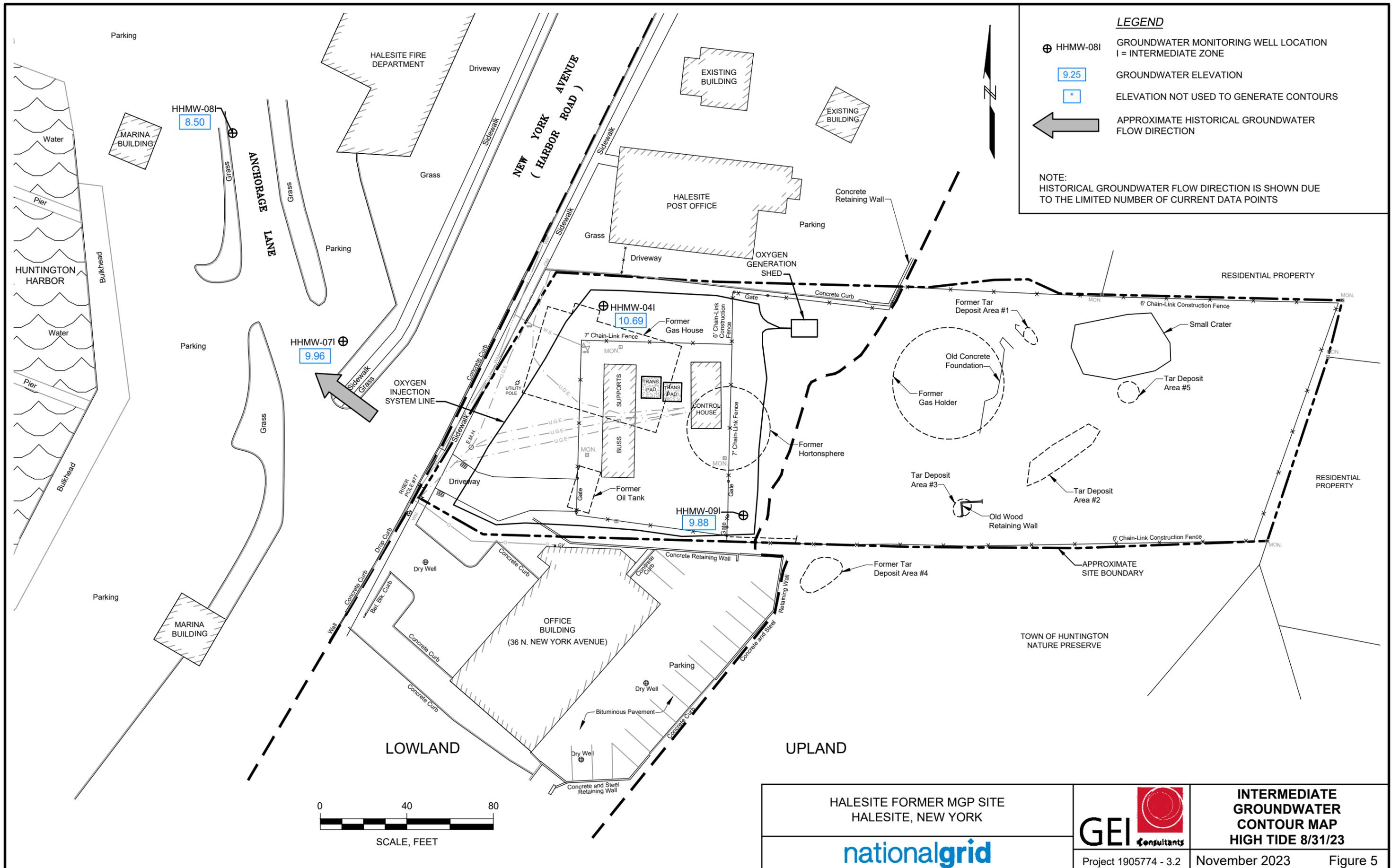
LEGEND

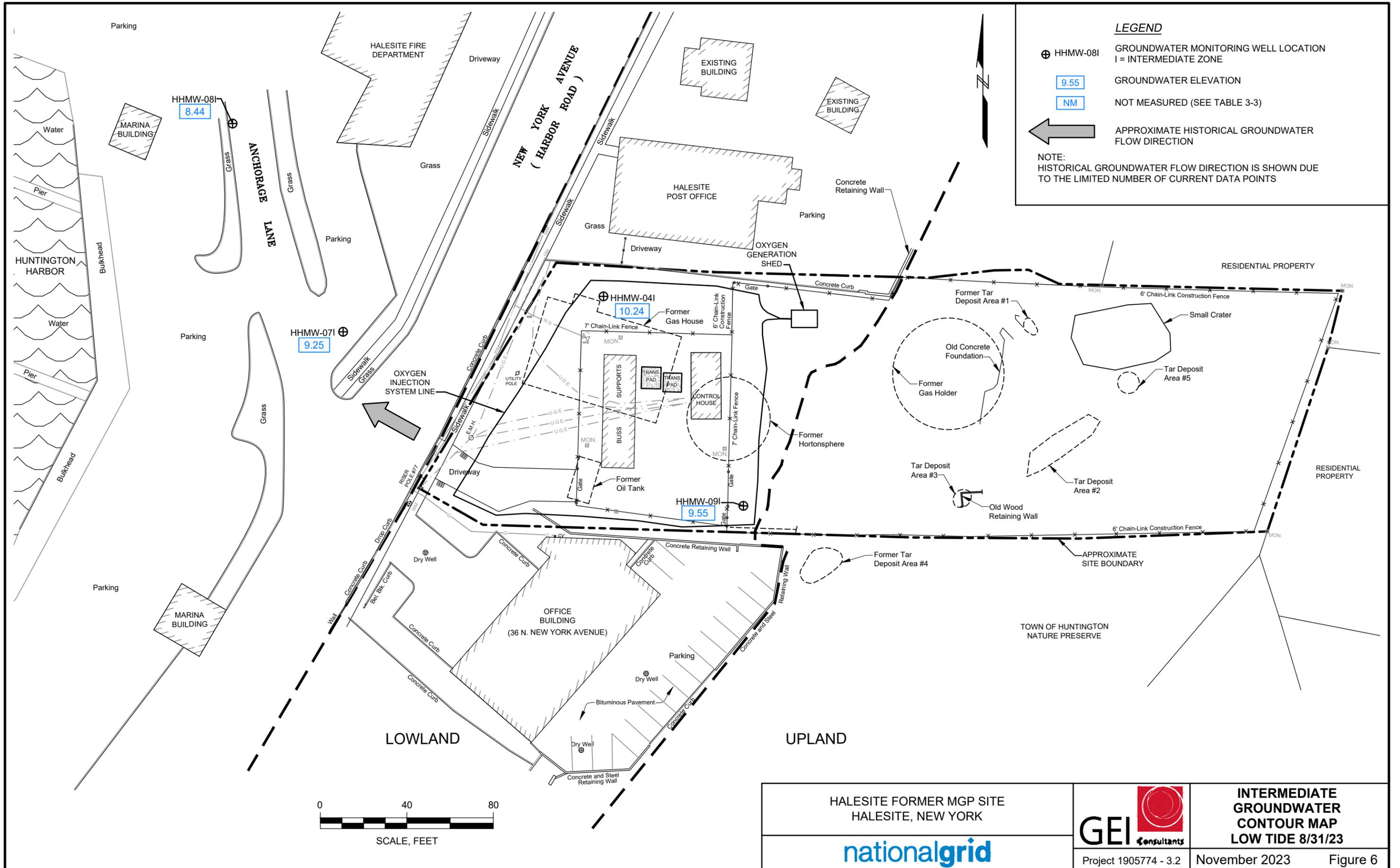
- MW-03 PHASE I GROUNDWATER MONITORING WELL LOCATION
- HHMW-08S GROUNDWATER MONITORING WELL LOCATION
- 8 GROUNDWATER CONTOUR (FEET MEAN SEA LEVEL)
- 9.64 GROUNDWATER ELEVATION
- NM NOT MEASURED (SEE TABLE 3-3)
- NC NOT CALCULATED
- * ELEVATION NOT USED TO GENERATE CONTOURS
- APPROXIMATE GROUNDWATER FLOW DIRECTION



HALESITE FORMER MGP SITE HALESITE, NEW YORK		SHALLOW GROUNDWATER CONTOUR MAP HIGH TIDE 8/31/23
	Project 1905774 - 3.2	November 2023 Figure 3







Appendix A

Oxygen Injection System OM&M Data

	11/2/2022	11/30/2022	12/19/2022
O2%	95.3	98.7	99.3
R	48.24	48.24	48.24
Temp R (T)	636	636	637
System Hours			

Operational Days	Oxygen Injected Per Month
Month 1 Oct-22	31 4975
Month 2 Nov-22	29 4364
Month 3 Dec-22	31 4574

Total Operational Days Oct. - Dec. 2022 91
 Total Oxygen injected during this period (lbs) 13,913
 Weight of Oxygen Injected through Q3 2022 (lbs) 550,870
 Running total of Injected Oxygen (lbs) 564,783

Notes:
 SCFH (M) = Measured flow rate
 SCFH (C*) = Flow rate converted for oxygen (Flow meters are calibrated for air)
 CF/D (V) = Volume of oxygen injected per day
 PSI (M) = Measured pressure
 PSla (P) = Pressure converted to atmospheric pressure.
 n = PV/RT = Mass of Oxygen (lbs)
 Temperature = Degrees Rankine
 R = Individual Gas Constant = 48.24 ft/T
 1 lb-mole of oxygen=32 lbm

System Operating Specs

Total of 6 injection banks
 Oxygen is injected for 13 minutes during each injection cycle
 Each Injection bank operates for 4 injection cycles per day
 Each injection point injects oxygen for 52 min per day (13 min per cycle * 4 Cycles)

Example

Bank 1 starts at 7AM
 Bank 1 finishes injection at 7:13AM
 System is recharging 7:13AM to 8:00AM
 System is recharging 8:13AM to 9:00AM
 Bank 3 starts injection at 9:00AM
 Bank 3 finishes injection at 9:13AM
 System is recharging from 9:13AM to 10:00AM
 Bank 4 starts injection at 10:00AM
 Bank 4 finishes injection at 10:13AM
 System is recharging from 10:13AM to 11:00PM
 Bank 5 starts injection at 11:00AM
 Bank 5 finishes injection at 11:13AM
 System is recharging from 11:13AM to 12:00PM
 Bank 6 starts injection at 12:00PM
 System is recharging from 12:13PM to 1:00PM
 (Keep repeating cycle for course of day)

	Depth	11/2/2022						11/30/2022						12/19/2022						
		SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	
Injection Bank 1	Point 1D	32	34	41.240	35.741	7.5	22.2	3.549	32	38.814	33.639	7.5	22.2	3.459	32	38.814	33.639	7.5	22.2	3.475
	Point 1	24	32	37.024	32.088	5.5	20.2	2.899	29	33.135	28.717	5.0	19.7	2.621	28	31.993	27.727	5.0	19.7	2.542
	Point 2D	27	32	39.678	34.388	8.5	23.2	3.568	30	36.795	31.889	8.0	22.7	3.353	28	34.342	29.763	8.0	22.7	3.144
	Point 2	20	32	36.563	31.688	5.0	19.7	2.792	31	34.968	30.306	4.5	19.2	2.696	32	36.563	31.688	5.0	19.7	2.905
	Point 3D	30	34	42.158	36.537	8.5	23.2	3.792	31	38.022	32.952	8.0	22.7	3.465	32	39.678	34.388	8.5	23.2	3.712
	Point 3	23	36	41.133	35.649	5.0	19.7	3.141	31	34.968	30.306	4.5	19.2	2.696	32	36.563	31.688	5.0	19.7	2.905
	Point 4D	30	36	43.665	37.843	7.5	22.2	3.758	30	35.976	31.179	7.0	21.7	3.134	32	38.814	33.639	7.5	22.2	3.475
Point 4	23	36	41.133	35.649	5.0	19.7	3.141	31	35.420	30.698	5.0	19.7	2.801	34	38.848	33.668	5.0	19.7	3.086	
Total Oxygen Injected per Day (lbs)		26.641						24.226						25.244						
Injection Bank 2	Point 5	23	28	31.584	27.373	4.5	19.2	2.351	30	33.396	28.944	4.0	18.7	2.507	29	32.283	27.979	4.0	18.7	2.435
	Point 5D	30	40	48.517	42.048	7.5	22.2	4.175	32	39.248	34.015	8.0	22.7	3.577	35	42.928	37.204	8.0	22.7	3.930
	Point 6D	29	40	47.968	41.572	7.0	21.7	4.035	32	38.374	33.258	7.0	21.7	3.343	30	35.976	31.179	7.0	21.7	3.148
	Point 6	22	42	46.755	40.521	4.0	18.7	3.389	32	35.623	30.873	4.0	18.7	2.674	35	38.963	33.768	4.0	18.7	2.938
	Point 7D	28	42	51.513	44.645	8.0	22.7	4.533	32	39.248	34.015	8.0	22.7	3.577	37	45.381	39.330	8.0	22.7	4.154
	Point 7	22	28	31.170	27.014	4.0	18.7	2.260	30	33.396	28.944	4.0	18.7	2.507	29	32.283	27.979	4.0	18.7	2.435
	Point 8D	30	30	37.198	32.239	8.5	23.2	3.345	30	36.795	31.889	8.0	22.7	3.353	30	36.795	31.889	8.0	22.7	3.368
Point 8	22	42	47.989	41.590	5.0	19.7	3.665	32	36.096	31.283	4.5	19.2	2.782	36	40.608	35.194	4.5	19.2	3.144	
Total Oxygen Injected per Day (lbs)		27.753						24.322						25.553						
Injection Bank 3	Point 9D	30	40	50.655	43.901	9.5	24.2	4.752	33	41.357	35.843	9.0	23.7	3.935	27	33.837	29.326	9.0	23.7	3.234
	Point 9	21	40	45.120	39.104	4.5	19.2	3.358	35	38.963	33.768	4.0	18.7	2.925	32	35.623	30.873	4.0	18.7	2.687
	Point 10	22	38	42.864	37.149	4.5	19.2	3.190	34	37.849	32.803	4.0	18.7	2.842	30	33.396	28.944	4.0	18.7	2.519
	Point 10D	30	40	49.598	42.985	8.5	23.2	4.461	33	40.475	35.078	8.0	22.7	3.689	32	39.248	34.015	8.0	22.7	3.593
	Point 11D	25	40	48.517	42.048	7.5	22.2	4.175	35	42.452	36.792	7.5	22.2	3.784	34	41.240	35.741	7.5	22.2	3.692
	Point 11	17	40	43.929	38.072	3.5	18.2	3.099	35	38.438	33.313	3.5	18.2	2.809	36	39.536	34.265	3.5	18.2	2.902
	Point 12D	24	40	49.060	42.519	8.0	22.7	4.317	32	39.248	34.015	8.0	22.7	3.577	34	41.701	36.141	8.0	22.7	3.818
Point 12	16	40	45.120	39.104	4.5	19.2	3.358	33	37.224	32.261	4.5	19.2	2.869	34	38.352	33.238	4.5	19.2	2.970	
Total Oxygen Injected per Day (lbs)		30.711						26.430						25.414						
Injection Bank 4	Point 13D	23	40	49.060	42.519	8.0	22.7	4.317	31	37.601	32.587	7.5	22.2	3.351	29	35.175	30.485	7.5	22.2	3.149
	Point 13	16	40	45.120	39.104	4.5	19.2	3.358	32	35.623	30.873	4.0	18.7	2.674	35	39.480	34.216	4.5	19.2	3.057
	Point 14	15	54	62.478	54.148	5.5	20.2	4.892	48	54.844	47.532	5.0	19.7	4.338	50	57.850	50.137	5.5	20.2	4.713
	Point 14D	20	40	48.517	42.048	7.5	22.2	4.175	35	41.972	36.375	7.0	21.7	3.657	32	38.374	33.258	7.0	21.7	3.358
	Point 15D	19	44	52.153	45.199	6.5	21.2	4.286	36	42.671	36.981	6.5	21.2	3.632	36	42.671	36.981	6.5	21.2	3.648
	Point 15	14	50	57.850	50.137	5.5	20.2	4.530	48	55.536	48.131	5.5	20.2	4.504	50	57.850	50.137	5.5	20.2	4.713
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Oxygen Injected per Day (lbs)		25.559						22.156						22.638						
Injection Bank 5	Point 16D	14	40	50.655	43.901	9.5	24.2	4.752	34	43.057	37.316	9.5	24.2	4.183	31	39.258	34.024	9.5	24.2	3.831
	Point 16	8	36	38.989	33.791	3.0	17.7	2.675	48	51.986	45.055	3.0	17.7	3.694	48	51.986	45.055	3.0	17.7	3.711
	Point 17	13	40	44.529	38.591	4.0	18.7	3.228	46	51.208	44.380	4.0	18.7	3.845	40	44.529	38.591	4.0	18.7	3.358
	Point 17D	18	34	40.772	35.336	7.0	21.7	3.430	32	46.381	40.197	17.0	31.7	5.903	33	39.573	34.297	7.0	21.7	3.463
	Point 18D	25	34	40.772	35.336	7.0	21.7	3.430	32	38.374	33.258	7.0	21.7	3.343	28	33.962	29.434	7.5	22.2	3.041
	Point 18	19	44	48.981	42.451	4.0	18.7	3.551	45	50.095	43.415	4.0	18.7	3.761	40	44.529	38.591	4.0	18.7	3.358
	Point 19	19	44	48.981	42.451	4.0	18.7	3.551	48	54.144	46.925	4.5	19.2	4.174	46	51.888	44.970	4.5	19.2	4.018
Point 19D	25	36	42.671	36.981	6.5	21.2	3.507	31	36.744	31.845	6.5	21.2	3.127	32	37.929	32.872	6.5	21.2	3.243	
Total Oxygen Injected per Day (lbs)		28.123						32.030						28.023						
Injection Bank 6	Point 20D	25	32	38.374	33.258	7.0	21.7	3.228	30	35.976	31.179	7.0	21.7	3.134	30	35.976	31.179	7.0	21.7	3.148
	Point 20	19	30	33.396	28.944	4.0	18.7	2.421	43	47.868	41.486	4.0	18.7	3.594	39	43.415	37.627	4.0	18.7	3.274
	Point 21	20	36	40.608	35.194	4.5	19.2	3.022	30	34.278	29.707	5.0	19.7	2.711	28	31.993	27.727	5.0	19.7	2.542
	Point 21D	29	32	38.814	33.639	7.5	22.2	3.340	31	37.601	32.587	7.5	22.2	3.351	31	37.601	32.587	7.5	22.2	3.366
	Point 22	22	38	42.864	37.149	4.5	19.2	3.190	30	33.840	29.328	4.5	19.2	2.609	30	33.840	29.328	4.5	19.2	2.620
	Point 22D	28	32	38.814	33.639	7.5	22.2	3.340	28	33.962	29.434	7.5	22.2	3.027	25	30.663	26.574	8.0	22.7	2.807
	Point 23	18	36	41.133	35.649	5.0	19.7	3.141	32	36.563	31.688	5.0	19.7	2.892	31	35.867	31.085	5.5	20.2	2.922
Point 23D	29	34	42.158	36.537	8.5	23.2	3.792	25	30.999	26.865	8.5	23.2	2.887	29	36.344	31.498	9.0	23.7	3.474	
Total Oxygen Injected per Day (lbs)		21.684						21.318						20.680						
System Total Per Day (lbs)		160.47						150.48						147.55						

	1/23/2023	2/17/2023	3/23/2023
O2%	94.2	56.4	58.0
R	48.24	48.24	48.24
Temp R (T)	637	634	637
System Hours			

Operational Days	Jan-23	31	Oxygen Injected Per Month	2135
Month 1	Feb-23	28		1361
Month 2	Mar-23	31		1701
Month 3				

Total Operational Days Jan. - Mar. 2023 90
 Total Oxygen injected during this period (lbs) 5,198
 Weight of Oxygen Injected through Q4 2022 (lbs) 564,783
 Running total of Injected Oxygen (lbs) 569,981

Notes:
 SCFH (M) = Measured flow rate
 SCFH (C*) = Flow rate converted for oxygen (Flow meters are calibrated for air)
 CF/D (V) = Volume of oxygen injected per day
 PSI (M) = Measured pressure
 PSla (P) = Pressure converted to atmospheric pressure.
 n = PV/RT = Mass of Oxygen (lbs)
 Temperature = Degrees Rankine
 R = Individual Gas Constant = 48.24 ft/T
 1 lb-mole of oxygen=32 lbm

System Operating Specs

Total of 6 injection banks
 Oxygen is injected for 13 minutes during each injection cycle
 Each Injection bank operates for 4 injection cycles per day
 Each injection point injects oxygen for 52 min per day (13 min per cycle * 4 Cycles)

Example

Bank 1 starts at 7AM
 Bank 1 finishes injection at 7:13AM
 System is recharging 7:13AM to 8:00AM
 System is recharging 8:13AM to 9:00AM
 Bank 3 starts injection at 9:00AM
 Bank 3 finishes injection at 9:13AM
 System is recharging from 9:13AM to 10:00AM
 Bank 4 starts injection at 10:00AM
 Bank 4 Finishes injection at 10:13AM
 System is recharging from 10:13AM to 11:00PM
 Bank 5 starts injection at 11:00AM
 Bank 5 finishes injection at 11:13AM
 System is recharging from 11:13AM to 12:00PM
 Bank 6 starts injection at 12:00PM
 System is recharging from 12:13PM to 1:00PM
 (Keep repeating cycle for course of day)

	Depth	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	1/23/2023						2/17/2023						3/23/2023					
								SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2
Injection Bank 1	Point 1D	32	28	19.407	16.819	7.5	22.2	1.648	38	26.633	23.082	8.0	22.7	1.391	33	22.872	19.823	7.5	22.2	1.196					
	Point 1	24	28	18.281	15.844	5.0	19.7	1.378	42	27.422	23.766	5.0	19.7	1.243	32	20.893	18.107	5.0	19.7	0.970					
	Point 2D	27	28	19.624	17.008	8.0	22.7	1.704	43	30.467	26.405	8.5	23.2	1.627	34	24.090	20.878	8.5	23.2	1.317					
	Point 2	20	27	17.629	15.278	5.0	19.7	1.329	33	21.546	18.673	5.0	19.7	0.977	36	23.505	20.371	5.0	19.7	1.091					
	Point 3D	30	26	18.222	15.793	8.0	22.7	1.583	32	22.673	19.650	8.5	23.2	1.211	36	25.507	22.106	8.5	23.2	1.394					
	Point 3	23	26	16.759	14.524	4.5	19.2	1.231	32	20.893	18.107	5.0	19.7	0.947	36	23.505	20.371	5.0	19.7	1.091					
	Point 4D	30	26	17.817	15.441	7.0	21.7	1.479	32	22.428	19.437	8.0	22.7	1.172	36	25.231	21.867	8.0	22.7	1.349					
Point 4	23	20	13.058	11.317	5.0	19.7	0.984	28	18.281	15.844	5.0	19.7	0.829	35	22.852	19.805	5.0	19.7	1.060						
Total Oxygen Injected per Day (lbs)		11.336							9.397							9.467									
Injection Bank 2	Point 5	23	28	17.811	15.437	4.0	18.7	1.274	27	17.175	14.885	4.0	18.7	0.739	40	25.783	22.345	4.5	19.2	1.166					
	Point 5D	30	26	18.222	15.793	8.0	22.7	1.583	26	18.222	15.793	8.0	22.7	0.952	38	26.633	23.082	8.0	22.7	1.424					
	Point 6D	29	28	19.187	16.629	7.0	21.7	1.593	28	19.187	16.629	7.0	21.7	0.958	40	27.410	23.755	7.0	21.7	1.401					
	Point 6	22	26	16.539	14.334	4.0	18.7	1.183	26	16.539	14.334	4.0	18.7	0.712	30	19.084	16.539	4.0	18.7	0.841					
	Point 7D	28	26	18.222	15.793	8.0	22.7	1.583	26	18.222	15.793	8.0	22.7	0.952	30	21.026	18.222	8.0	22.7	1.124					
	Point 7	22	28	17.811	15.437	4.0	18.7	1.274	27	17.175	14.885	4.0	18.7	0.739	38	24.173	20.950	4.0	18.7	1.065					
	Point 8D	30	28	19.624	17.008	8.0	22.7	1.704	27	18.923	16.400	8.0	22.7	0.989	36	25.507	22.106	8.5	23.2	1.394					
Point 8	22	28	18.281	15.844	5.0	19.7	1.378	27	17.629	15.278	5.0	19.7	0.799	30	19.587	16.976	5.0	19.7	0.909						
Total Oxygen Injected per Day (lbs)		11.572							6.840							9.324									
Injection Bank 3	Point 9D	30	32	22.916	19.861	9.0	23.7	2.078	44	31.841	27.595	9.5	24.2	1.773	40	28.946	25.087	9.5	24.2	1.650					
	Point 9	21	28	17.811	15.437	4.0	18.7	1.274	32	20.356	17.642	4.0	18.7	0.876	32	20.626	17.876	4.5	19.2	0.933					
	Point 10	22	28	17.811	15.437	4.0	18.7	1.274	36	22.900	19.847	4.0	18.7	0.986	33	21.271	18.435	4.5	19.2	0.962					
	Point 10D	30	29	20.548	17.808	8.5	23.2	1.824	31	21.965	19.036	8.5	23.2	1.173	32	22.673	19.650	8.5	23.2	1.239					
	Point 11D	25	29	20.100	17.420	7.5	22.2	1.707	30	20.793	18.021	7.5	22.2	1.062	32	22.428	19.437	8.0	22.7	1.199					
	Point 11	17	29	18.199	15.773	3.5	18.2	1.267	28	17.572	15.229	3.5	18.2	0.736	32	20.356	17.642	4.0	18.7	0.897					
	Point 12D	24	29	20.325	17.615	8.0	22.7	1.765	31	21.727	18.830	8.0	22.7	1.135	32	22.428	19.437	8.0	22.7	1.199					
Point 12	16	28	18.048	15.642	4.5	19.2	1.326	28	18.048	15.642	4.5	19.2	0.797	32	20.626	17.876	4.5	19.2	0.933						
Total Oxygen Injected per Day (lbs)		12.515							8.539							9.012									
Injection Bank 4	Point 13D	23	28	19.624	17.008	8.0	22.7	1.704	42	29.436	25.511	8.0	22.7	1.538	41	28.735	24.904	8.0	22.7	1.537					
	Point 13	16	26	16.759	14.524	4.5	19.2	1.231	30	19.337	16.759	4.5	19.2	0.854	31	19.982	17.317	4.5	19.2	0.904					
	Point 14	15	44	29.090	25.212	5.5	20.2	2.248	50	33.057	28.650	5.5	20.2	1.537	45	29.751	25.785	5.5	20.2	1.416					
	Point 14D	20	26	18.021	15.618	7.5	22.2	1.531	36	24.952	21.625	7.5	22.2	1.275	38	26.338	22.826	7.5	22.2	1.377					
	Point 15D	19	27	18.287	15.849	6.5	21.2	1.483	34	23.299	20.192	7.0	21.7	1.164	34	23.299	20.192	7.0	21.7	1.191					
	Point 15	14	42	27.768	24.066	5.5	20.2	2.146	50	33.057	28.650	5.5	20.2	1.537	48	31.735	27.504	5.5	20.2	1.510					
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-					
Total Oxygen Injected per Day (lbs)		10.343							7.904							7.934									
Injection Bank 5	Point 16D	14	28	20.262	17.561	9.5	24.2	1.876	30	21.709	18.815	9.5	24.2	1.209	38	27.499	23.832	9.5	24.2	1.568					
	Point 16	8	36	22.280	19.309	3.0	17.7	1.509	52	32.182	27.891	3.0	17.7	1.311	51	31.563	27.355	3.0	17.7	1.316					
	Point 17	13	37	23.537	20.398	4.0	18.7	1.684	56	36.096	31.283	4.5	19.2	1.595	52	33.518	29.049	4.5	19.2	1.516					
	Point 17D	18	28	19.407	16.819	7.5	22.2	1.648	32	22.179	19.222	7.5	22.2	1.133	34	23.299	20.192	7.0	21.7	1.191					
	Point 18D	25	25	17.328	15.017	7.5	22.2	1.472	36	24.669	21.380	7.0	21.7	1.232	33	22.872	19.823	7.5	22.2	1.196					
	Point 18	19	37	23.537	20.398	4.0	18.7	1.684	52	33.518	29.049	4.5	19.2	1.481	52	33.518	29.049	4.5	19.2	1.516					
	Point 19	19	36	23.205	20.111	4.5	19.2	1.704	48	31.340	27.161	5.0	19.7	1.421	55	35.910	31.122	5.0	19.7	1.666					
Point 19D	25	28	19.187	16.629	7.0	21.7	1.593	32	21.928	19.004	7.0	21.7	1.095	36	24.669	21.380	7.0	21.7	1.261						
Total Oxygen Injected per Day (lbs)		13.170							10.477							11.230									
Injection Bank 6	Point 20D	25	14	9.594	8.314	7.0	21.7	0.796	20	13.705	11.878	7.0	21.7	0.684	34	23.299	20.192	7.0	21.7	1.191					
	Point 20	19	30	19.084	16.539	4.0	18.7	1.365	35	22.264	19.296	4.0	18.7	0.958	46	29.262	25.360	4.0	18.7	1.289					
	Point 21	20	30	19.587	16.976	5.0	19.7	1.476	23	15.017	13.015	5.0	19.7	0.681	33	21.546	18.673	5.0	19.7	1.000					
	Point 21D	29	29	20.325	17.615	8.0	22.7	1.765	22	15.248	13.215	7.5	22.2	0.779	32	22.428	19.437	8.0	22.7	1.199					
	Point 22	22	28	18.281	15.844	5.0	19.7	1.378	25	16.323	14.146	5.0	19.7	0.740	31	20.240	17.542	5.0	19.7	0.939					
	Point 22D	28	30	21.026	18.222	8.0	22.7	1.826	20	14.017	12.148	8.0	22.7	0.732	32	22.428	19.437	8.0	22.7	1.199					
	Point 23	18	27	17.629	15.278	5.0	19.7	1.329	30	19.587	16.976	5.0	19.7	0.888	35	23.140	20.055	5.5	20.2	1.101					
Point 23D	29	26	18.619	16.137	9.0	23.7	1.688	25	17.903	15.516	9.0	23.7	0.977	31	22.200	19.240	9.0	23.7	1.239						
Total Oxygen Injected per Day (lbs)		9.936							5.463							7.918									
System Total Per Day (lbs)		68.87							48.62							54.89									

	5/1/2023	5/30/2023	6/16/2023
O2%	55.5	66.4	71.6
R	48.24	48.24	48.24
Temp R (T)	636	636	630
System Hours			

Operational Days	Oxygen Injected Per Month	
Month 1 Apr-23	30	1608
Month 2 May-23	31	2007
Month 3 Jun-23	30	2040

Total Operational Days Apr. - June 2023 91
 Total Oxygen injected during this period (lbs) 5,655
 Weight of Oxygen Injected through Q1 2023 (lbs) 569,981
 Running total of Injected Oxygen (lbs) 575,635

Notes:
 SCFH (M) = Measured flow rate
 SCFH (C*) = Flow rate converted for oxygen (Flow meters are calibrated for air)
 CF/D (V) = Volume of oxygen injected per day
 PSI (M) = Measured pressure
 PSla (P) = Pressure converted to atmospheric pressure.
 n = PV/RT = Mass of Oxygen (lbs)
 Temperature = Degrees Rankine
 R = Individual Gas Constant = 48.24 ft/T
 1 lb-mole of oxygen=32 lbm

System Operating Specs

Total of 6 injection banks
 Oxygen is injected for 13 minutes during each injection cycle
 Each Injection bank operates for 4 injection cycles per day
 Each injection point injects oxygen for 52 min per day (13 min per cycle * 4 Cycles)

Example

Bank 1 starts at 7AM
 Bank 1 finishes injection at 7:13AM
 System is recharging 7:13AM to 8:00AM
 System is recharging 8:13AM to 9:00AM
 Bank 3 starts injection at 9:00AM
 Bank 3 finishes injection at 9:13AM
 System is recharging from 9:13AM to 10:00AM
 Bank 4 starts injection at 10:00AM
 Bank 4 Finishes injection at 10:13AM
 System is recharging from 10:13AM to 11:00PM
 Bank 5 starts injection at 11:00AM
 Bank 5 finishes injection at 11:13AM
 System is recharging from 11:13AM to 12:00PM
 Bank 6 starts injection at 12:00PM
 System is recharging from 12:13PM to 1:00PM
 (Keep repeating cycle for course of day)

	Depth	5/1/2023						5/30/2023						6/16/2023						
		SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	
Injection Bank 1	Point 1D	28	23.104	20.023	8.0	22.7	1.183	30	24.480	21.216	7.5	22.2	1.468	30	24.480	21.216	7.5	22.2	1.598	
	Point 1	24	31	23.829	20.652	5.0	19.7	1.059	30	23.060	19.986	5.0	19.7	1.227	29	22.292	19.319	5.0	19.7	1.291
	Point 2D	27	31	25.859	22.411	8.5	23.2	1.354	31	25.859	22.411	8.5	23.2	1.620	29	24.191	20.965	8.5	23.2	1.650
	Point 2	20	28	21.523	18.653	5.0	19.7	0.957	28	21.523	18.653	5.0	19.7	1.145	30	23.060	19.986	5.0	19.7	1.336
	Point 3D	30	24	20.020	17.351	8.5	23.2	1.048	30	25.025	21.688	8.5	23.2	1.568	28	23.357	20.242	8.5	23.2	1.593
	Point 3	23	27	20.754	17.987	5.0	19.7	0.923	28	21.523	18.653	5.0	19.7	1.145	28	21.523	18.653	5.0	19.7	1.247
	Point 4D	30	28	23.104	20.023	8.0	22.7	1.183	28	23.104	20.023	8.0	22.7	1.417	30	24.754	21.453	8.0	22.7	1.652
Point 4	23	30	23.060	19.986	5.0	19.7	1.025	30	23.060	19.986	5.0	19.7	1.227	28	21.523	18.653	5.0	19.7	1.247	
Total Oxygen Injected per Day (lbs)		8.732						10.817						11.614						
Injection Bank 2	Point 5	23	35	26.560	23.019	4.5	19.2	1.151	30	22.766	19.730	4.5	19.2	1.181	35	26.560	23.019	4.5	19.2	1.499
	Point 5D	30	30	24.754	21.453	8.0	22.7	1.268	27	22.279	19.308	8.0	22.7	1.366	34	28.054	24.314	8.0	22.7	1.872
	Point 6D	29	31	25.009	21.675	7.0	21.7	1.225	25	20.169	17.480	7.0	21.7	1.182	32	25.816	22.374	7.0	21.7	1.647
	Point 6	22	29	21.718	18.823	4.0	18.7	0.916	25	18.723	16.226	4.0	18.7	0.946	35	26.212	22.717	4.0	18.7	1.441
	Point 7D	28	27	22.279	19.308	8.0	22.7	1.141	24	19.803	17.163	8.0	22.7	1.214	32	26.404	22.884	8.0	22.7	1.762
	Point 7	22	31	23.216	20.121	4.0	18.7	0.980	29	21.718	18.823	4.0	18.7	1.097	31	23.216	20.121	4.0	18.7	1.276
	Point 8D	30	32	26.693	23.134	8.5	23.2	1.397	29	23.929	20.738	8.0	22.7	1.467	32	26.404	22.884	8.0	22.7	1.762
Point 8	22	29	22.292	19.319	5.0	19.7	0.991	25	19.217	16.655	5.0	19.7	1.023	33	25.366	21.984	5.0	19.7	1.469	
Total Oxygen Injected per Day (lbs)		9.068						9.475						12.730						
Injection Bank 3	Point 9D	30	38	32.374	28.058	9.5	24.2	1.768	36	30.670	26.581	9.5	24.2	2.005	38	32.374	28.058	9.5	24.2	2.304
	Point 9	21	26	19.730	17.100	4.5	19.2	0.855	31	23.525	20.388	4.5	19.2	1.220	30	22.766	19.730	4.5	19.2	1.285
	Point 10	22	26	19.730	17.100	4.5	19.2	0.855	30	22.467	19.472	4.0	18.7	1.135	30	22.467	19.472	4.0	18.7	1.235
	Point 10D	30	26	21.688	18.797	8.5	23.2	1.135	31	25.859	22.411	8.5	23.2	1.620	30	25.025	21.688	8.5	23.2	1.707
	Point 11D	25	26	21.453	18.593	8.0	22.7	1.099	36	29.705	25.744	8.0	22.7	1.821	29	23.929	20.738	8.0	22.7	1.597
	Point 11	17	24	17.974	15.577	4.0	18.7	0.758	32	23.965	20.770	4.0	18.7	1.210	29	21.718	18.823	4.0	18.7	1.194
	Point 12D	24	28	23.104	20.023	8.0	22.7	1.183	30	24.754	21.453	8.0	22.7	1.518	29	23.929	20.738	8.0	22.7	1.597
Point 12	16	26	19.730	17.100	4.5	19.2	0.855	28	21.248	18.415	4.5	19.2	1.102	29	22.007	19.073	4.5	19.2	1.242	
Total Oxygen Injected per Day (lbs)		8.508						11.631						12.162						
Injection Bank 4	Point 13D	23	30	24.754	21.453	8.0	22.7	1.268	32	26.404	22.884	8.0	22.7	1.619	32	26.404	22.884	8.0	22.7	1.762
	Point 13	16	30	23.060	19.986	5.0	19.7	1.025	31	23.829	20.652	5.0	19.7	1.268	25	18.971	16.442	4.5	19.2	1.071
	Point 14	15	48	37.821	32.778	6.0	20.7	1.767	46	35.805	31.031	5.5	20.2	1.953	39	30.356	26.309	5.5	20.2	1.803
	Point 14D	20	32	26.404	22.884	8.0	22.7	1.352	32	26.112	22.630	7.5	22.2	1.566	25	20.400	17.680	7.5	22.2	1.332
	Point 15D	19	30	24.203	20.976	7.0	21.7	1.185	30	24.203	20.976	7.0	21.7	1.419	23	18.555	16.081	7.0	21.7	1.184
	Point 15	14	45	35.457	30.730	6.0	20.7	1.656	45	35.027	30.356	5.5	20.2	1.911	39	30.356	26.309	5.5	20.2	1.803
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Oxygen Injected per Day (lbs)		8.253						9.736						8.955						
Injection Bank 5	Point 16D	14	32	27.543	23.870	10.0	24.7	1.535	30	25.559	22.151	9.5	24.2	1.671	29	24.707	21.412	9.5	24.2	1.758
	Point 16	8	41	30.705	26.611	4.0	18.7	1.296	46	33.986	29.455	3.5	18.2	1.671	38	28.076	24.332	3.5	18.2	1.502
	Point 17	13	50	38.434	33.309	5.0	19.7	1.708	44	33.390	28.938	4.5	19.2	1.732	46	35.359	30.644	5.0	19.7	2.048
	Point 17D	18	28	23.104	20.023	8.0	22.7	1.183	31	25.296	21.923	7.5	22.2	1.517	28	22.848	19.801	7.5	22.2	1.491
	Point 18D	25	33	27.229	23.599	8.0	22.7	1.395	30	24.480	21.216	7.5	22.2	1.468	29	23.664	20.509	7.5	22.2	1.545
	Point 18	19	46	34.907	30.253	4.5	19.2	1.512	45	34.149	29.595	4.5	19.2	1.771	41	31.113	26.965	4.5	19.2	1.756
	Point 19	19	41	31.516	27.314	5.0	19.7	1.401	45	34.590	29.978	5.0	19.7	1.841	40	30.747	26.647	5.0	19.7	1.781
Point 19D	25	30	24.203	20.976	7.0	21.7	1.185	30	24.203	20.976	7.0	21.7	1.419	26	20.976	18.179	7.0	21.7	1.338	
Total Oxygen Injected per Day (lbs)		11.215						13.087						13.220						
Injection Bank 6	Point 20D	25	29	23.396	20.276	7.0	21.7	1.146	30	24.203	20.976	7.0	21.7	1.419	23	18.555	16.081	7.0	21.7	1.184
	Point 20	19	46	34.450	29.857	4.0	18.7	1.454	44	32.952	28.558	4.0	18.7	1.664	44	32.952	28.558	4.0	18.7	1.812
	Point 21	20	30	23.351	20.238	5.5	20.2	1.064	29	22.292	19.319	5.0	19.7	1.186	27	20.754	17.987	5.0	19.7	1.202
	Point 21D	29	28	23.104	20.023	8.0	22.7	1.183	30	24.754	21.453	8.0	22.7	1.518	23	18.978	16.448	8.0	22.7	1.267
	Point 22	22	28	21.523	18.653	5.0	19.7	0.957	30	23.060	19.986	5.0	19.7	1.227	23	17.680	15.322	5.0	19.7	1.024
	Point 22D	28	28	23.104	20.023	8.0	22.7	1.183	31	25.579	22.168	8.0	22.7	1.568	32	26.404	22.884	8.0	22.7	1.762
	Point 23	18	24	18.681	16.190	5.5	20.2	0.851	33	25.686	22.261	5.5	20.2	1.401	23	17.902	15.515	5.5	20.2	1.063
Point 23D	29	27	22.764	19.729	9.0	23.7	1.217	28	23.607	20.459	9.0	23.7	1.511	25	21.078	18.267	9.0	23.7	1.469	
Total Oxygen Injected per Day (lbs)		7.838						9.983						9.314						
System Total Per Day (lbs)		53.61						64.73						67.99						

	7/25/2023	8/15/2023	9/26/2023
O2%	75.7	78.6	66.0
R	48.24	48.24	48.24
Temp R (T)	627	636	646
System Hours			

	Operational Days	Oxygen Injected Per Month
Month 1	Jul-23	31
Month 2	Aug-23	19
Month 3	Sep-23	11

Total Operational Days July - Sept. 2023 61
 Total Oxygen injected during this period (lbs) 4,961
 Weight of Oxygen Injected through Q2 2023 (lbs) 575,635
 Running total of Injected Oxygen (lbs) 580,596

Notes:
 SCFH (M) = Measured flow rate
 SCFH (C*) = Flow rate converted for oxygen (Flow meters are calibrated for air)
 CF/D (V) = Volume of oxygen injected per day
 PSI (M) = Measured pressure
 PSla (P) = Pressure converted to atmospheric pressure.
 n = PV/RT = Mass of Oxygen (lbs)
 Temperature = Degrees Rankine
 R = Individual Gas Constant = 48.24 ft/T
 1 lb-mole of oxygen=32 lbm

System Operating Specs

Total of 6 injection banks
 Oxygen is injected for 13 minutes during each injection cycle
 Each Injection bank operates for 4 injection cycles per day
 Each injection point injects oxygen for 52 min per day (13 min per cycle * 4 Cycles)

Example

Bank 1 starts at 7AM

Bank 1 finishes injection at 7:13AM
 System is recharging 7:13AM to 8:00AM
 System is recharging 8:13AM to 9:00AM
 Bank 3 starts injection at 9:00AM
 Bank 3 finishes injection at 9:13AM
 System is recharging from 9:13AM to 10:00AM
 Bank 4 starts injection at 10:00AM
 Bank 4 finishes injection at 10:13AM
 System is recharging from 10:13AM to 11:00PM
 Bank 5 starts injection at 11:00AM

Bank 5 finishes injection at 11:13AM
 System is recharging from 11:13AM to 12:00PM
 Bank 6 starts injection at 12:00PM
 System is recharging from 12:13PM to 1:00PM
 (Keep repeating cycle for course of day)

	Depth	7/25/2023						8/15/2023						9/26/2023						
		SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	SCFH (M)	SCFH (C*)	CF/D (V)	PSI (M)	PSla (P)	n=PV/RT lbs O2	
Injection Bank 1	Point 1D	32	26	25.114	21.765	7.5	22.2	1.741	30	29.302	25.395	8.0	22.7	2.127	30	29.302	25.395	8.0	22.7	2.127
	Point 1	24	28	25.799	22.359	5.5	20.2	1.628	30	27.641	23.956	5.5	20.2	1.785	32	29.117	25.235	5.0	19.7	1.516
	Point 2D	27	30	29.623	25.673	8.5	23.2	2.147	30	29.623	25.673	8.5	23.2	2.197	30	29.623	25.673	8.5	23.2	1.817
	Point 2	20	26	23.355	20.241	4.5	19.2	1.401	30	27.297	23.658	5.0	19.7	1.719	29	26.387	22.869	5.0	19.7	1.374
	Point 3D	30	22	21.250	18.417	7.5	22.2	1.474	30	29.623	25.673	8.5	23.2	2.197	25	24.686	21.394	8.5	23.2	1.514
	Point 3	23	22	20.018	17.349	5.0	19.7	1.232	30	27.297	23.658	5.0	19.7	1.719	25	22.748	19.715	5.0	19.7	1.184
	Point 4D	30	28	27.046	23.440	7.5	22.2	1.875	26	25.114	21.765	7.5	22.2	1.783	25	24.148	20.928	7.5	22.2	1.417
Point 4	23	26	23.658	20.503	5.0	19.7	1.456	30	26.949	23.355	4.5	19.2	1.654	26	23.658	20.503	5.0	19.7	1.232	
Total Oxygen Injected per Day (lbs)		12.953						15.182						11.812						
Injection Bank 2	Point 5	23	30	26.949	23.355	4.5	19.2	1.616	30	26.949	23.355	4.5	19.2	1.654	29	26.050	22.577	4.5	19.2	1.322
	Point 5D	30	26	25.395	22.009	8.0	22.7	1.801	30	29.302	25.395	8.0	22.7	2.127	25	24.418	21.163	8.0	22.7	1.465
	Point 6D	29	26	24.829	21.519	7.0	21.7	1.683	30	28.649	24.829	7.0	21.7	1.988	25	23.874	20.691	7.0	21.7	1.369
	Point 6	22	22	19.503	16.903	4.0	18.7	1.139	26	23.049	19.976	4.0	18.7	1.378	28	24.822	21.513	4.0	18.7	1.227
	Point 7D	28	22	21.488	18.623	8.0	22.7	1.524	26	25.395	22.009	8.0	22.7	1.843	22	21.488	18.623	8.0	22.7	1.289
	Point 7	22	28	24.822	21.513	4.0	18.7	1.450	3	2.695	2.336	4.5	19.2	0.165	28	24.822	21.513	4.0	18.7	1.227
	Point 8D	30	28	27.648	23.962	8.5	23.2	2.004	30	29.623	25.673	8.5	23.2	2.197	28	27.349	23.702	8.0	22.7	1.641
Point 8	22	20	17.966	15.570	4.5	19.2	1.077	22	19.762	17.127	4.5	19.2	1.213	28	25.477	22.080	5.0	19.7	1.327	
Total Oxygen Injected per Day (lbs)		12.293						12.566						10.867						
Injection Bank 3	Point 9D	30	22	22.187	19.229	9.5	24.2	1.677	30	30.255	26.221	9.5	24.2	2.341	38	38.323	33.213	9.5	24.2	2.451
	Point 9	21	28	25.152	21.798	4.5	19.2	1.508	26	23.355	20.241	4.5	19.2	1.434	35	31.028	26.891	4.0	18.7	1.534
	Point 10	22	28	25.152	21.798	4.5	19.2	1.508	26	23.355	20.241	4.5	19.2	1.434	32	28.368	24.586	4.0	18.7	1.402
	Point 10D	30	26	25.673	22.250	8.5	23.2	1.860	30	29.623	25.673	8.5	23.2	2.197	36	35.548	30.808	8.5	23.2	2.180
	Point 11D	25	28	27.046	23.440	7.5	22.2	1.875	26	25.114	21.765	7.5	22.2	1.783	38	36.705	31.811	7.5	22.2	2.154
	Point 11	17	26	22.739	19.707	3.5	18.2	1.293	30	26.237	22.739	3.5	18.2	1.527	38	33.687	29.196	4.0	18.7	1.665
	Point 12D	24	28	27.349	23.702	8.0	22.7	1.939	28	27.349	23.702	8.0	22.7	1.985	35	34.186	29.628	8.0	22.7	2.051
Point 12	16	26	23.355	20.241	4.5	19.2	1.401	30	26.949	23.355	4.5	19.2	1.654	32	28.745	24.912	4.5	19.2	1.459	
Total Oxygen Injected per Day (lbs)		13.062						14.354						14.895						
Injection Bank 4	Point 13D	23	30	29.941	25.948	9.0	23.7	2.216	30	29.941	25.948	9.0	23.7	2.269	29	28.325	24.549	8.0	22.7	1.699
	Point 13	16	26	23.658	20.503	5.0	19.7	1.456	26	23.658	20.503	5.0	19.7	1.490	33	29.643	25.691	4.5	19.2	1.504
	Point 14	15	40	36.396	31.543	5.0	19.7	2.240	45	41.462	35.934	5.5	20.2	2.678	38	35.013	30.344	5.5	20.2	1.869
	Point 14D	20	25	24.418	21.163	8.0	22.7	1.731	28	27.648	23.962	8.5	23.2	2.051	38	36.705	31.811	7.5	22.2	2.154
	Point 15D	19	23	22.216	19.254	7.5	22.2	1.540	24	23.442	20.316	8.0	22.7	1.701	40	38.199	33.106	7.0	21.7	2.191
	Point 15	14	40	38.199	33.106	7.0	21.7	2.589	45	43.466	37.671	7.5	22.2	3.085	35	32.248	27.949	5.5	20.2	1.722
	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Total Oxygen Injected per Day (lbs)		11.773						13.274						11.140						
Injection Bank 5	Point 16D	14	30	30.255	26.221	9.5	24.2	2.287	30	30.255	26.221	9.5	24.2	2.341	26	26.221	22.725	9.5	24.2	1.677
	Point 16	8	50	43.124	37.374	3.0	17.7	2.384	45	38.812	33.637	3.0	17.7	2.196	38	32.774	28.404	3.0	17.7	1.533
	Point 17	13	45	40.423	35.033	4.5	19.2	2.424	45	39.893	34.574	4.0	18.7	2.385	42	37.728	32.698	4.5	19.2	1.915
	Point 17D	18	30	28.649	24.829	7.0	21.7	1.942	30	28.649	24.829	7.0	21.7	1.988	26	25.114	21.765	7.5	22.2	1.474
	Point 18D	25	30	28.649	24.829	7.0	21.7	1.942	30	28.649	24.829	7.0	21.7	1.988	25	24.148	20.928	7.5	22.2	1.417
	Point 18	19	45	39.893	34.574	4.0	18.7	2.330	42	37.234	32.269	4.0	18.7	2.226	38	33.687	29.196	4.0	18.7	1.665
	Point 19	19	45	40.423	35.033	4.5	19.2	2.424	45	40.423	35.033	4.5	19.2	2.481	40	35.931	31.141	4.5	19.2	1.823
Point 19D	25	30	28.317	24.542	6.5	21.2	1.875	32	30.205	26.178	6.5	21.2	2.047	28	26.739	23.174	7.0	21.7	1.534	
Total Oxygen Injected per Day (lbs)		17.608						17.653						13.038						
Injection Bank 6	Point 20D	25	32	30.205	26.178	6.5	21.2	2.000	28	26.739	23.174	7.0	21.7	1.855	29	27.694	24.002	7.0	21.7	1.588
	Point 20	19	45	39.356	34.109	3.5	18.2	2.237	50	43.729	37.898	3.5	18.2	2.545	29	25.709	22.281	4.0	18.7	1.271
	Point 21	20	30	26.949	23.355	4.5	19.2	1.616	30	27.297	23.658	5.0	19.7	1.719	30	27.297	23.658	5.0	19.7	1.421
	Point 21D	29	30	28.978	25.114	7.5	22.2	2.009	32	30.909	26.788	7.5	22.2	2.194	26	25.395	22.009	8.0	22.7	1.524
	Point 22	22	40	35.931	31.141	4.5	19.2	2.155	30	26.949	23.355	4.5	19.2	1.654	24	21.838	18.926	5.0	19.7	1.137
	Point 22D	28	22	21.250	18.417	7.5	22.2	1.474	30	29.302	25.395	8.0	22.7	2.127	32	31.256	27.088	8.0	22.7	1.875
	Point 23	18	38	34.576	29.966	5.0	19.7	2.128	30	27.297	23.658	5.0	19.7	1.719	26	23.956	20.762	5.5	20.2	1.279
Point 23D	29	32	31.598	27.385	8.5	23.2	2.290	30	29.941	25.948	9.0	23.7	2.269	29	28.943	25.084	9.0	23.7	1.813	
Total Oxygen Injected per Day (lbs)		13.619						13.813						10.096						
System Total Per Day (lbs)		81.31						86.84						71.85						