

ON-SITE WASTEWATER TREATMENT AND DISPOSAL SYSTEM OPERATION PERMIT APPLICATION

MT. CUBA CENTER

3120 Barley Mill Road

Hockessin, DE 19707

Mill Creek Hundred

New Castle County, Delaware

Prepared for Submission to:

Delaware Department of Natural Resources & Environmental Control

Division of Water

89 Kings Highway

Dover, DE 19901

June 2024

Prepared by:

Meliora Design

259 Morgan Street

Phoenixville, PA 19460

t: 610.933.0123

f: 610.933.0188

www.melioradesign.com

**MT. CUBA CENTER - ONSITE WASTEWATER TREATMENT SYSTEM
OPERATING PERMIT SUBMISSION**

ATTACHMENTS

Attachment 1: Groundwater Well Monitoring Report

Attachment 2: Construction Completion Inspection Documentation

Attachment 3: Operations and Maintenance Plan (includes As-Built Drawings and Material Safety Data Sheets)

Attachment 4: Wastewater Operator Agreement

**MT. CUBA CENTER - ONSITE WASTEWATER TREATMENT SYSTEM
OPERATING PERMIT SUBMISSION**

Attachment 1: Groundwater Well Monitoring Report



ARM Group LLC

Engineers and Scientists

**BACKGROUND GROUNDWATER MONITORING REPORT
MT. CUBA CENTER
WASTEWATER TREATMENT SYSTEM
DNREC STATE CONSTRUCTION PERMIT NO. 621706-01**

PREPARED FOR:

**MOUNT CUBA CENTER
3120 BARLEY MILL ROAD
HOCKESSIN, DELAWARE 19707**

FOR SUBMITTAL TO:

**MR. DERRICK P. CARUTHERS, P.E.
DELAWARE DEPARTMENT OF NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL
DIVISION OF WATER
89 KINGS HIGHWAY
DOVER, DE 19901**

PROJECT No. 000193834.01

JUNE 7, 2024

PREPARED BY:

**ARM GROUP, LLC.
515 SOUTH FRANKLIN STREET
WEST CHESTER, PENNSYLVANIA 19382
610.692.5770**



William Fernandez
WILLIAM FERNANDEZ
PROJECT SCIENTIST I

Douglas B. Schott
DOUGLAS B. SCHOTT, P.G.
SENIOR PROJECT MANGER

PRECISE. RESPONSIVE. SOLUTIONS.

515 South Franklin Street, West Chester, PA 19382

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WRF/DBS
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1.0 INTRODUCTION

This report has been prepared to document the background groundwater quality monitoring associated with the On-site Wastewater Treatment and Disposal System (OWTDS) at the Mount Cuba Center (MCC) facility located at 3120 Barley Mill Road, Hockessin, Delaware (Refer to Figure 1 Site Location Map). OWTDS Construction Permit No. 621706-01 was issued on August 11, 2021, for a maximum average daily influent flow of 3,770 gallons per day (gpd). Wastewater flows to the OWTDS will be generated from an education center, greenhouse, and main house at MCC. ARM Group was retained by MCC to conduct the background groundwater monitoring and reporting in accordance with Part II(B) of the permit.

This report documents the monthly background groundwater quality monitoring required under Part II(B)(2). The monthly monitoring events were conducted between February and April 2024, following the installation of supplemental monitoring wells in early February 2024. Groundwater elevation and quality monitoring was previously conducted to provide the information needed to prepare a combined Hydrogeologic Suitability Report and Surface Water Assessment Report (HSR/SWAR). The HSR/SWAR was submitted in support of the OWTDS design by Brickhouse Environmental on February 23, 2021. Please refer to the combined HSR/SWAR for additional background information related to the suitability assessment of the OWTDS disposal area.

2.0 SITE INFORMATION

2.1 Physiography and Geology

The MCC and surrounding area are located in the Appalachian Piedmont province, which is characterized by pronounced hills and valleys underlain by metamorphic crystalline rocks that can be exposed at the surface or overlain by significant thicknesses of saprolite (decomposed rock). According to the Delaware State Geologic Map (The Delaware Geological Survey, interactive online map, accessed January 2020), the underlying bedrock geology is consistent throughout the local area consisting of psammitic and pelitic gneiss of the Wissahickon Formation. The Wissahickon Formation underlies a large portion of northern New Castle County. The depth to which these rock types weather (decompose) can vary considerably based on local mineralogy. Site-specific investigation is required to evaluate the depth to competent bedrock in areas underlain by this rock type.

Based on site-specific drilling observations, the overburden geology above the competent rock within the study area generally consists of weathered gneiss (saprolite). The saprolite consists of alternating bands of brown and gray decomposed gneiss with mica evident at some locations. Distinguishable horizons were not discernable. The competence of the saprolite increased with depth, and competent bedrock was generally encountered at 5 to 10 feet below grade. Contacts between saprolite and competent bedrock were found to be both abrupt and gradational depending on the specific test boring location.



2.2 Regional Hydrogeology

The water table aquifers in the region are generally a subdued replica of the ground surface topography, with groundwater flowing from high topographical areas to low topographical areas. Groundwater flow paths are relatively short, with flow migrating from recharge areas to discharge areas (seeps, springs, streams). The United States Geological Survey (USGS) reports that groundwater recharge is greatest in the late fall, winter, and early spring. Groundwater infiltrating into the soil and weathered bedrock is transmitted by primary porosity (open spaces within the unconsolidated matrix). Groundwater in the deeper competent bedrock flows in secondary porosity features such as fractures, faults, joints, and relic bedding planes. Water table aquifers within unconsolidated materials are not always present in the hydrogeologic setting where the MCC is located. The absence or presence of a shallow/overburden aquifer system is site-specific and depends on the depth of bedrock weathering, topography and the relative location of groundwater discharge features. Deeper fractured bedrock aquifer systems are always present in the hydrogeologic setting where the MCC is located. The greatest density of water bearing zones within fractured bedrock aquifers are generally present at shallower depths within the fractured bedrock mass, below the interface between saprolite and competent bedrock.

Based on site-specific information gathered as part of this assessment, a shallow overburden aquifer is not present in the vicinity of the disposal system. During monitoring well installation, groundwater was first encountered within the competent bedrock aquifer beneath the disposal areas.

3.0 **SITE DATA**

3.1 Monitoring Well Network

Three (3) monitoring wells, MW-1 through MW-3, were drilled and constructed in January of 2020 to evaluate the proposed wastewater disposal area consistent with HSR requirements. MW-1 is located upgradient of the disposal area near the northwest corner of the northern set of disposal trenches. MW-2 is located several hundred feet downgradient and southwest of the disposal area. MW-3 is located immediately downgradient of the southwestern corner of the disposal area. After installation of the monitoring wells, three (3) background monitoring events took place in early 2020. Groundwater quality was determined to be good with low nutrient concentrations and oxidizing groundwater conditions.

In February of 2024 two (2) additional monitoring wells (MW-4 and MW-5) were installed in accordance with the 2021 construction permit issuance. The locations of MW-4 and MW-5 were approved by DNREC prior to installation. MW-4 is located between the two sets of disposal trenches. MW-5 provides additional downgradient monitoring coverage and is positioned near the southeast corner of the southernmost set of disposal trenches. Following installation, the monitoring wells were surveyed by a licensed professional surveyor to provide accurate monitoring well position and elevation information. A well construction summary can be found below. Additional detail is provided in the lithologic description and well construction logs in Appendix A. All monitoring well locations are depicted on Figure 2 in relation to the as-built disposal trenches and pertinent site features.



Three (3) background groundwater monitoring events took place between February and April of 2024. All five (5) monitoring wells (MW-1 through MW-5) were gauged for groundwater elevation and groundwater samples were collected from each consistent with Part II(B)(2) of the permit. Groundwater elevations, static water levels, and analytical results are presented in Tables 1 and 2, respectively. Laboratory analytical reports are included in Appendix B. A summary of the results from the three monitoring events can be found below in sections 3.1.1 and 3.1.2.

Well Construction Summary

Well ID	DNREC Permit No.	Total Depth (ft)	Screened Interval (ft)	Casing Elevation (ft MSL)	Well Installation Date
MW-1	268364	80.08	77.5-37.5	279.32	1/9/2020
MW-2	268365	67.80	65.11-35.11	252.22	1/9/2020
MW-3	268366	61.60	59.22-29.22	246.10	1/9/2020
MW-4	284331	59.00	58.0-32.0	264.19	2/6/2024
MW-5	284332	52.00	51.0-37.0	246.92	2/7/2024

3.1.1 Groundwater Elevations

Static water levels were recorded during each monitoring event prior to monitoring well purging and sampling activities. The highest groundwater elevations (GWE) were recorded upgradient of and within the disposal area as measured at MW-1 and MW-4. Groundwater elevations at MW-1 and MW-4 were similar during all monthly monitoring events. The predominant groundwater flow direction is generally consistent with topography to the south and west toward MW-2, MW-3 and MW-5. Groundwater gradient, flow direction and elevation remained generally consistent throughout the 3-month monitoring period. Static water level measurements and calculated elevations are included on the attached tables for each monitoring well. Groundwater gradient maps, based on calculated groundwater elevations for February, March, and April 2024 are provided as Figures 3-5.

As shown on Figures 3-5 the groundwater gradient is moderate toward the south/southeast in the direction of an unnamed tributary (UNT) to Red Clay Creek. The UNT flows from west to east approximately 325 feet downgradient from the southern edge of the disposal area. The groundwater gradient and inferred direction of groundwater flow are consistent with what was observed and documented during the completion of the HSR.

As discussed in the HSR, the MCC maintains their own public water supply system to provide potable water to the MCC. MCC's public water supply obtains water from 4 supply wells. The wells are adjacent to the UNT to Red Clay Creek and are locally known as Wells 1 through 4. Wells 1 and 4 are located immediately north of the unnamed tributary while Wells 2 and 3 are immediately south of the unnamed tributary. All supply wells are constructed to draw groundwater from the fractured bedrock aquifer beneath the valley and unnamed tributary. Total depths range from 79 feet to 264 feet below grade, with open intervals that vary considerably.



The groundwater gradients shown on Figures 3-5 are consistently steeper toward MW-2 than the gradients toward the other downgradient wells (MW-3 and MW-5). This inconsistency in groundwater gradient across the disposal area is consistent with the groundwater gradient patterns noted during the completion of the HSR. ARM suspects that the inconsistent groundwater gradients are related to groundwater withdrawals at the nearby MCC supply wells causing a lowering of groundwater elevations in the vicinity of the UNT and the disposal area.

3.1.2 Groundwater Quality

MW-1 monitors groundwater quality upgradient of the disposal area and MW-4 monitors groundwater quality within the disposal area. MW-2, MW-3, and MW-5 monitor groundwater quality downgradient of the disposal area. ARM Group collected groundwater samples on three occasions from the five (5) monitoring wells between February and April 2024. Prior to sampling a decontaminated submersible pump was used to purge each well of at least three (3) times its standing water volume from the top of the water column. Analyze-immediately parameters (pH, specific conductance, temperature, dissolved oxygen, turbidity and reduction-oxidation potential) were monitored consistently throughout the purging process. Upon stabilization of analyze-immediately parameters, each sample was collected using a disposable bailer from the top of the water column. The groundwater samples were placed in an iced cooler and transported under chain of custody to a certified environmental testing laboratory (ALS Environmental-Middletown, PA) for analysis. The groundwater analytical results are summarized in Tables 1 and 2 for each well and discussed below:

Overall, the groundwater quality is considered good with low nutrient concentrations and oxidizing conditions. Heavy metals are generally not present at detectable concentrations. Fecal coliform was not detected during any of the monitoring events. Total coliform was not detected with the exception of the March event at MW-1 and during the April event at all monitoring wells. The highest concentration of total coliform was 920 MPN (most probable number)/100mL in MW-2 in April 2024. A comparison of groundwater analytical results obtained during the 2020 HSR and the 2024 background monitoring period was conducted for MW-1 through MW-3. In general, groundwater quality is comparable at all three monitoring well locations with no significant statistical differences between the results.

4.0 **SITE HISTORY**

- January 8-10, 2020: Site soil and hydrogeologic testing, including installation of MW-1 through MW-3.
- February 23, 2021: Submittal of Hydrogeologic Suitability Report to DNREC
- August 8, 2021: DNREC issues approval for operation of the OWTDS with an effective date of August 12, 2021, and an expiration date of August 11, 2026.
- September 2023: Installation of the OWTDS was completed including pretreatment facilities.



- February 6-7, 2024: Installation and development of additional monitoring wells (MW-4 and MW-5) with subsequent monthly monitoring commencing in late February 2024 and ending in late April 2024.
- February – April 2024: Completed monthly background groundwater quality and elevation monitoring.

5.0 CONCLUSIONS

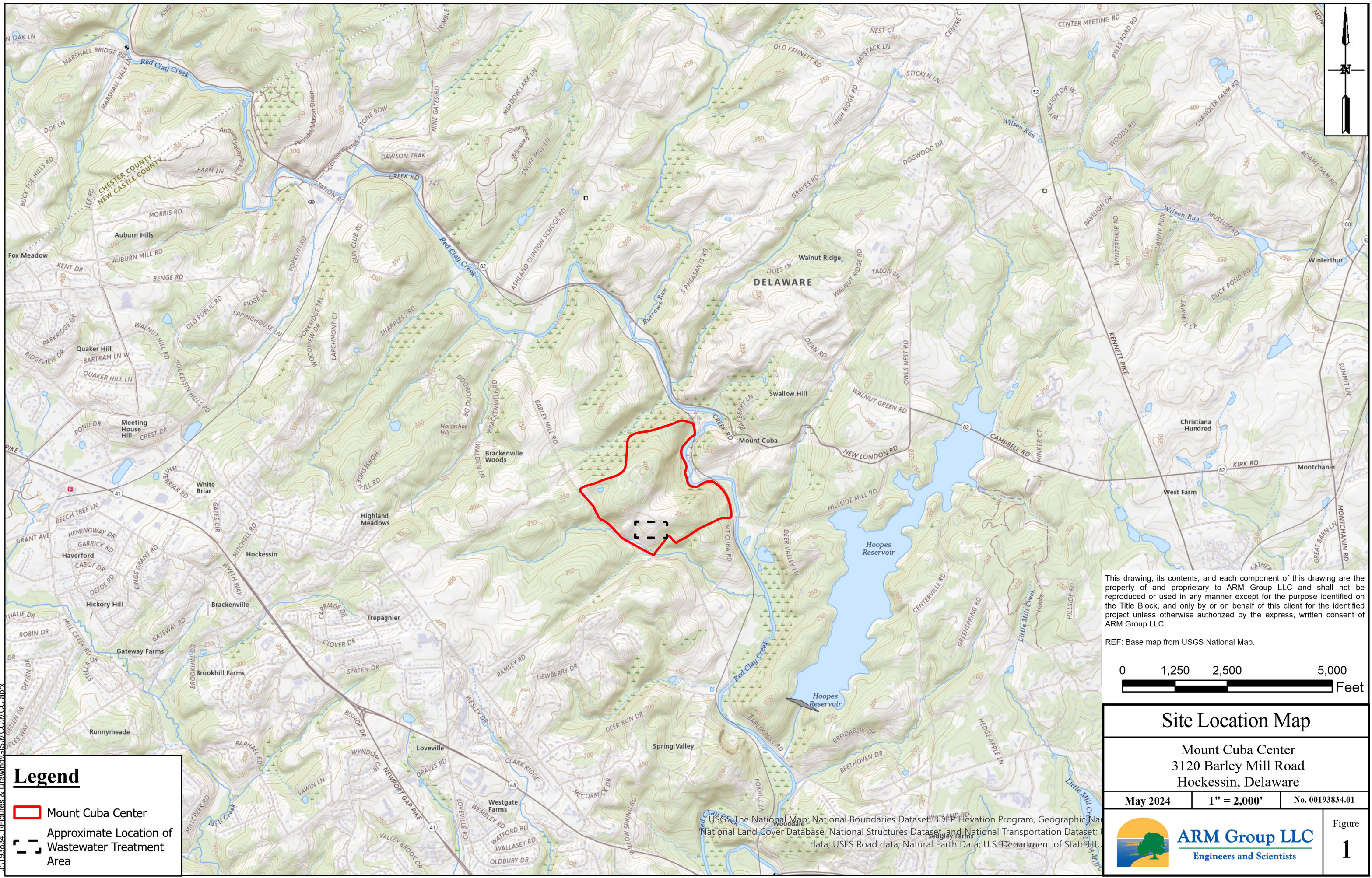
The following conclusions have been developed based on a review of the groundwater monitoring data collected during the 2020 HSR and subsequent background groundwater quality monitoring conducted in early 2024:

- The monitoring well network (MW-1 through MW-5) is well positioned to provide groundwater elevation and quality information in the vicinity of the OWTDS disposal area. Based on groundwater elevation mapping, groundwater flow is to the south/southwest toward an unnamed tributary to the Red Clay Creek. Groundwater elevations were generally consistent during all monitoring events conducted.
- Groundwater was monitored three (3) times between February and April 2024 at MW-1 through MW-5. All monitoring was conducted consistent with the requirements outlined in DNREC permit 621706-01. Groundwater quality was also previously monitored at MW-1 through MW-3 in 2020 in support of the HSR. Groundwater quality was found to be consistent during the monitoring period and consistent with groundwater quality monitoring results obtained in 2020. Groundwater quality is considered good with low nutrient concentrations, generally undetectable concentrations of heavy metals and oxidizing groundwater conditions.



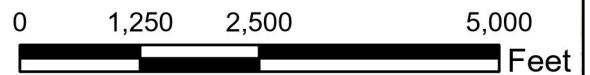
FIGURES AND TABLES





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REF: Base map from USGS National Map.



Legend

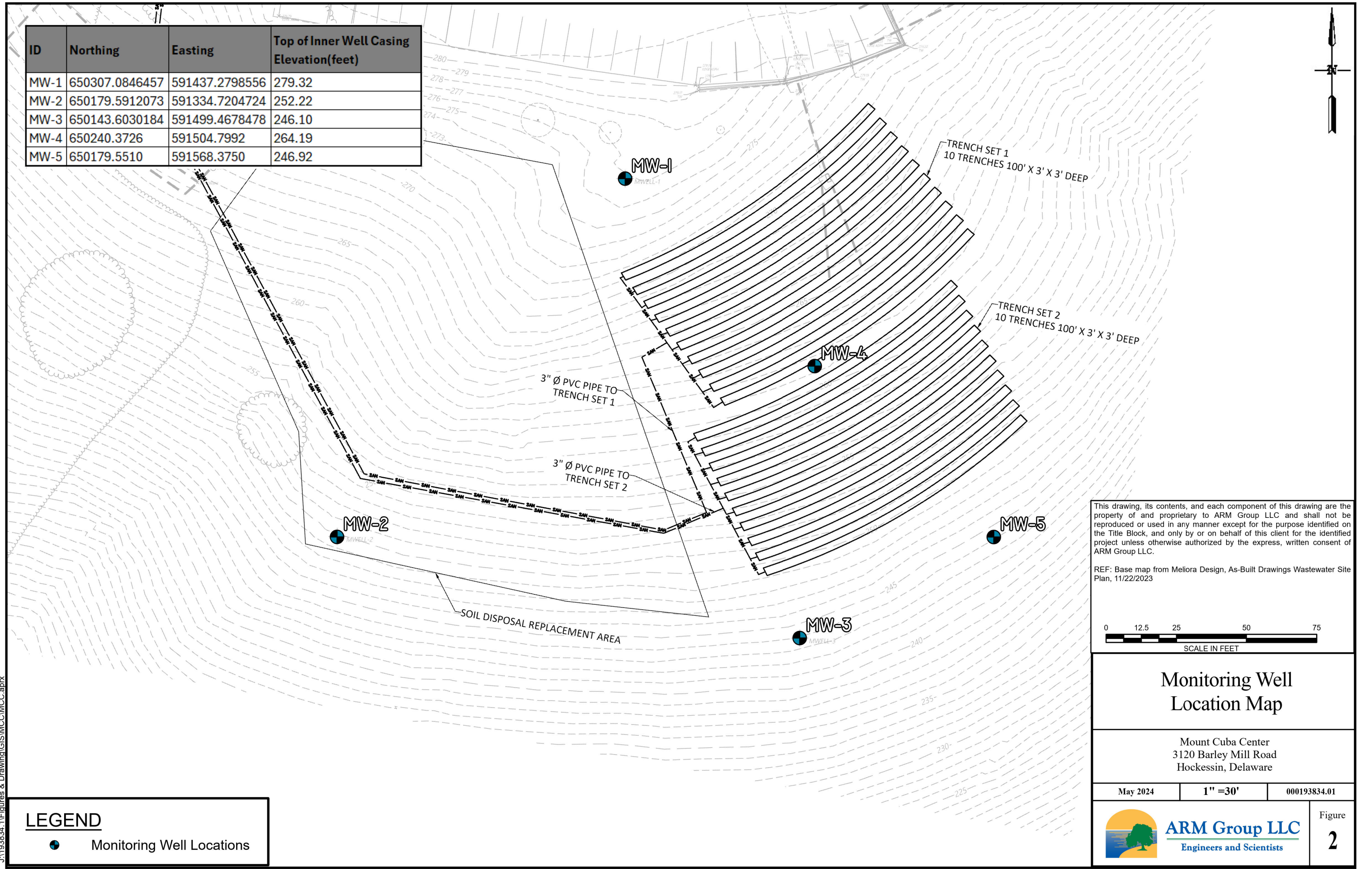
- Mount Cuba Center
- Approximate Location of Wastewater Treatment Area

<h2>Site Location Map</h2>		
<p>Mount Cuba Center 3120 Barley Mill Road Hockessin, Delaware</p>		
May 2024	1" = 2,000'	No. 00193834.01
		<p>Figure 1</p>

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USGS, The National Map; National Boundaries Dataset; 3DEP Elevation Program, Geographic Names Information System; National Land Cover Database; National Structures Dataset; and National Transportation Dataset; USFS Road data; Natural Earth Data; U.S. Department of State; HUD

ID	Northing	Easting	Top of Inner Well Casing Elevation(feet)
MW-1	650307.0846457	591437.2798556	279.32
MW-2	650179.5912073	591334.7204724	252.22
MW-3	650143.6030184	591499.4678478	246.10
MW-4	650240.3726	591504.7992	264.19
MW-5	650179.5510	591568.3750	246.92



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REF: Base map from Meliora Design, As-Built Drawings Wastewater Site Plan, 11/22/2023



Monitoring Well Location Map

Mount Cuba Center
3120 Barley Mill Road
Hockessin, Delaware

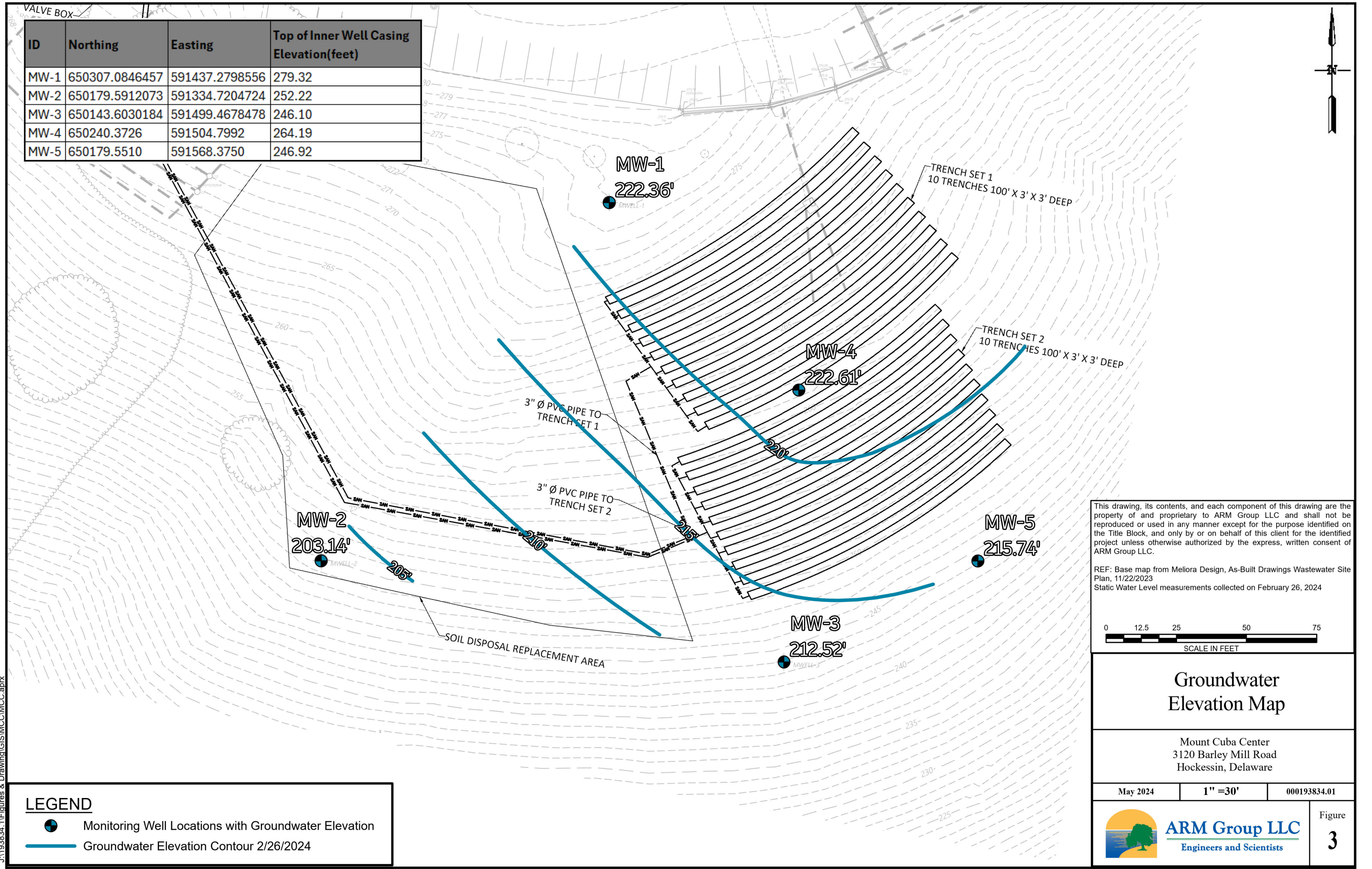
May 2024 1" = 30' 000193834.01



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LEGEND
● Monitoring Well Locations

ID	Northing	Easting	Top of Inner Well Casing Elevation(feet)
MW-1	650307.0846457	591437.2798556	279.32
MW-2	650179.5912073	591334.7204724	252.22
MW-3	650143.6030184	591499.4678478	246.10
MW-4	650240.3726	591504.7992	264.19
MW-5	650179.5510	591568.3750	246.92



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REF: Base map from Meliora Design, As-Built Drawings Wastewater Site Plan, 11/22/2023
 Static Water Level measurements collected on February 26, 2024



Groundwater Elevation Map

Mount Cuba Center
 3120 Barley Mill Road
 Hockessin, Delaware

May 2024 1" = 30' 000193834.01

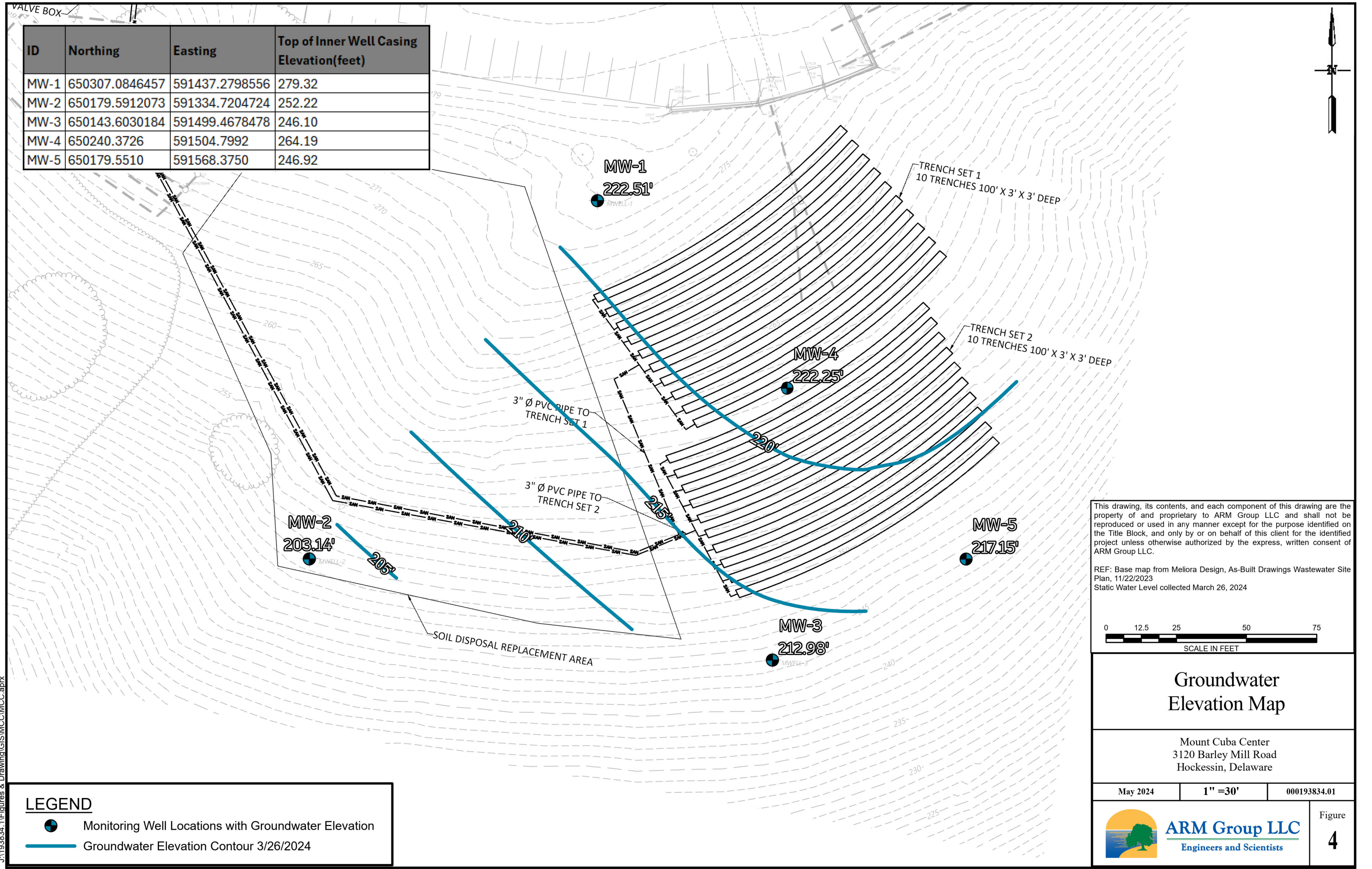


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LEGEND

- Monitoring Well Locations with Groundwater Elevation
- Groundwater Elevation Contour 2/26/2024

ID	Northing	Easting	Top of Inner Well Casing Elevation(feet)
MW-1	650307.0846457	591437.2798556	279.32
MW-2	650179.5912073	591334.7204724	252.22
MW-3	650143.6030184	591499.4678478	246.10
MW-4	650240.3726	591504.7992	264.19
MW-5	650179.5510	591568.3750	246.92



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REF: Base map from Meliora Design, As-Built Drawings Wastewater Site Plan, 11/22/2023
 Static Water Level collected March 26, 2024





Groundwater Elevation Map

Mount Cuba Center
 3120 Barley Mill Road
 Hockessin, Delaware

May 2024 1" = 30' 000193834.01

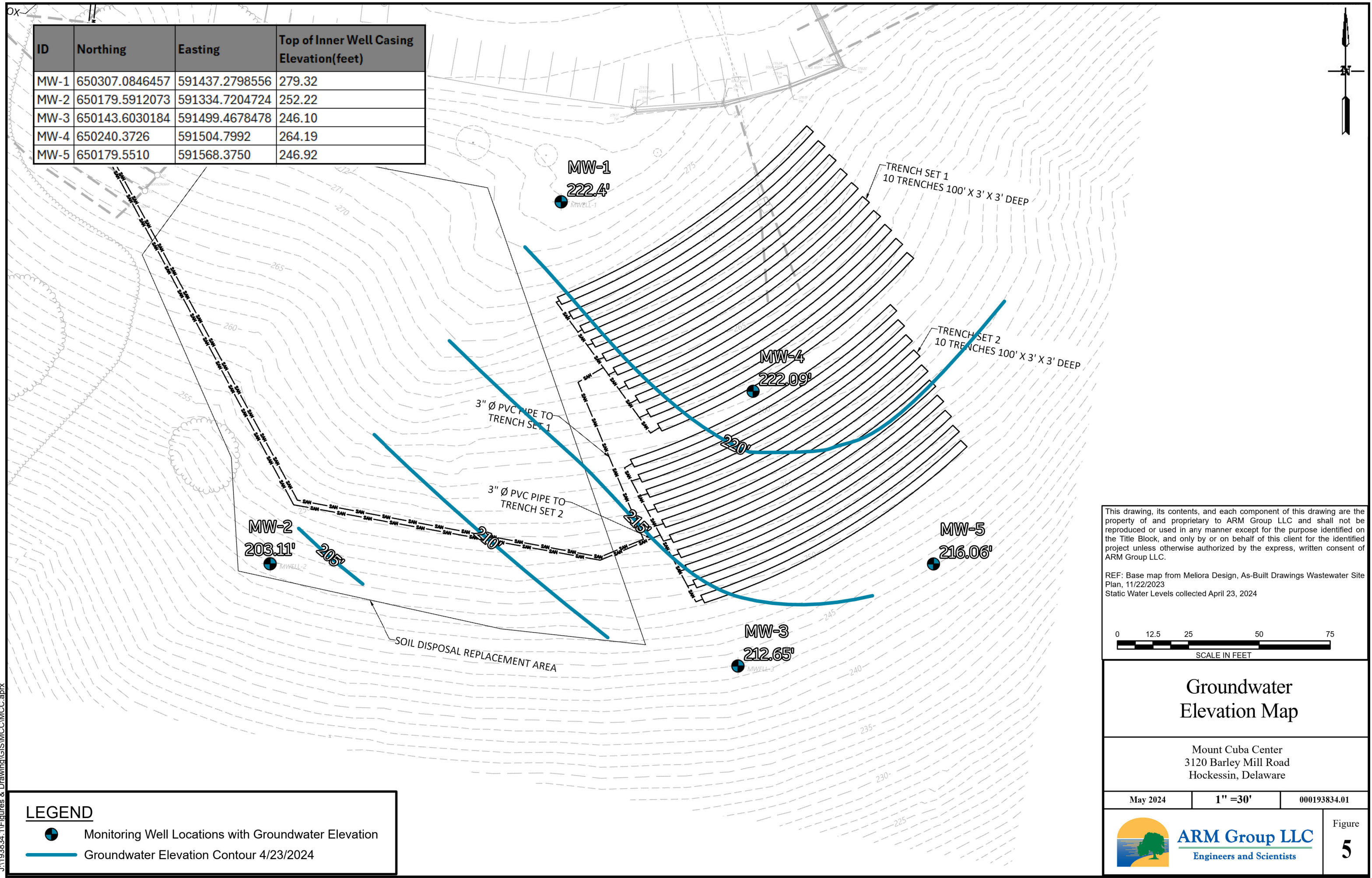


LEGEND

-  Monitoring Well Locations with Groundwater Elevation
-  Groundwater Elevation Contour 3/26/2024

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ID	Northing	Easting	Top of Inner Well Casing Elevation(feet)
MW-1	650307.0846457	591437.2798556	279.32
MW-2	650179.5912073	591334.7204724	252.22
MW-3	650143.6030184	591499.4678478	246.10
MW-4	650240.3726	591504.7992	264.19
MW-5	650179.5510	591568.3750	246.92



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REF: Base map from Meliora Design, As-Built Drawings Wastewater Site Plan, 11/22/2023
 Static Water Levels collected April 23, 2024



Groundwater Elevation Map

Mount Cuba Center
 3120 Barley Mill Road
 Hockessin, Delaware

May 2024 1" = 30' 000193834.01

ARM Group LLC
Engineers and Scientists

Figure
5

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LEGEND

- Monitoring Well Locations with Groundwater Elevation
- Groundwater Elevation Contour 4/23/2024

Table 1
Background Groundwater Monitoring
Mount Cuba Center
Background Groundwater Quality Monitoring
ARM Project: 00193834.01

Monitoring Well Location		MW-1			MW-2			MW-3			MW-4			MW-5		
DNREC Permit Number		268364			268365			268366			284331			284332		
Total Depth below TOIC		80.08			67.80			61.60			59.00			52.00		
Screened Interval (ft bgs)		77.5-37.5			65.11-35.11			59.22-29.22			55.00-30.00			49.00-35.00		
Top of Inner Casing Elevation (ft MSL)		279.32			252.22			246.10			264.19			246.92		
Ground Surface Elevation (ft MSL)		276.76			249.53			243.72			261.25			244.56		
Inner Casing Stickup (ft above grade)		2.56			2.69			2.38			2.94			2.4		
Sample Date		2/26/2024	3/26/2024	4/23/2024	2/26/2024	3/26/2024	4/23/2024	2/26/2024	3/26/2024	4/23/2024	2/26/2024	3/26/2024	4/23/2024	2/26/2024	3/26/2024	4/23/2024
Analyte	Units	Results														
Depth to Water	ft below TOIC	56.96	56.81	56.92	49.08	49.08	49.11	33.58	33.12	33.45	41.58	41.94	42.1	31.18	29.77	30.86
Groundwater Elevation	ft MSL	222.36	222.51	222.4	203.14	203.14	203.11	212.52	212.98	212.65	222.61	222.25	222.09	215.74	217.15	216.06
Temperature	°C	16.3	14.1	14.7	16.4	15	13.8	11.9	13.2	13.8	12.1	14.5	14.3	14.4	14.3	16.4
pH	Std. Units	6.01	5.77	5.89	6	5.9	5.82	6.2	6.11	6.1	6.04	6.17	6.06	6.26	6.1	6.18
Specific Conductance	uS/cm	151.7	120	144.4	145	137.2	144	106.4	97.74	100.3	94.85	92.31	89.92	93.27	91.24	93.18
ORP	mV	186	207	190	176	207	178	181	177	172	178	159	176	166	179	192
Dissolved Oxygen	mg/L	9.2	9.34	9.28	9.13	8.3	9.4	9.18	9.52	9.35	9.44	9.5	9.87	9.84	10.26	9.62

Notes:
ft - feet
MSL - Mean Sea Level
°C - degrees Celsius
bgs - below ground surface
mV - millivolts
mg/L - milligrams per liter
TOIC - Top of Inner Casing

Table 2
Laboratory Analytical Results
Mount Cuba Center
ARM Project: 00193834.01

Sample ID	MW-1						MW-2						MW-3						MW-4						MW-5						
	2/26/2024		3/26/2024		4/23/2024		2/26/2024		3/26/2024		4/23/2024		2/26/2024		3/26/2024		4/23/2024		2/26/2024		3/26/2024		4/23/2024		2/26/2024		3/26/2024		4/23/2024		
	Analyte	Units	Result	RDL	Result	RDL	Result	RDL	Result	RDL	Result	RDL	Result	RDL	Result	RDL	Result	RDL	Result	RDL	Result	RDL	Result	RDL	Result	RDL	Result	RDL	Result	RDL	
Ammonia-N	mg/L	0.02 J	0.10	<0.1	0.1	<0.1	0.1	0.02 J	0.10	<0.25	0.25	<0.1	0.1	0.03 J	0.10	<0.25	0.25	<0.1	0.1	0.02 J	0.10	<0.1	0.1	<0.1	0.1	0.2 J	0.10	<0.25	0.25	<0.1	0.1
Nitrogen, Total Organic	mg/L	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	<1	1	<1.0	1.00	1	1	<0.1	0.1
Total Nitrogen	mg/L	1.14	3.00	2.31J	3	3.07	3	3.15	3.00	2.74J	3	3.44	3	1.16 J	3.00	<3	3	0.96J	3	0.95 J	3.00	<3	3	<3	3	1.06 J	3.00	1.46J	3	2.93J	3
Chloride	mg/L	6.7	2.00	4	2	4.8	2	7.6	2.00	5.9	2	6	2	2.1	2.00	1.7J	2	2.1	2	1.7 J	2.00	1.6J	2	1.9J	2	<2.0	2.00	<2	2	1.7J	2
Nitrate-N	mg/L	4.1	1.00	2.3	1	3.1	1	3.2	1.00	2.7	1	2.9	1	1.2	1.00	0.95J	1	0.96J	1	0.95 J	1.00	0.88J	1	0.89J	1	0.48 J	1.00	0.45J	1	0.42J	1
Nitrite-N	mg/L	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	<1	1
Sulfate	mg/L	28.4	2.00	21.1	2	25.7	2	21.3	2.00	19.4	2	21.5	2	20.6	2.00	19.5	2	19.9	2	17.1	2.00	16.5	2	17.4	2	18.1	2.00	16.3	2	18.9	2
Phosphorus, Total	mg/L	0.11	0.10	0.094J	0.1	<0.1	0.1	0.52	0.10	0.51	0.1	<0.1	0.1	0.44	0.10	0.59	0.1	0.12	0.1	<0.10	0.10	<0.1	0.1	0.11	0.1	0.12	0.10	<0.1	0.1	0.32	0.1
Phosphorus, Total as PO4	mg/L	0.32		0.29		0.25		1.6		1.6		0.22	0	1.3		1.8		0.37		0.18		0.21		0.34		0.36		0.19		0.99	
Total Dissolved Solids	mg/L	121	25.00	90	25	110	25	124	25.00	94	25	104	25	91	25.00	90	25	54	25	96	25.00	69	25	40	25	90	25.00	68	25	36	25
Total Suspended Solids	mg/L	356	5.00	148	5	390	5	363	5.00	642	5	458	5	189	5.00	116	5	668	5	397	5.00	41	5	127	5	1590	5.00	366	5	413	5
Total Kjeldahl Nitrogen	mg/L	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	0.5J	1	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	<1	1	0.6 J	1.00	1	1	2.5	1
Total Coliform	MPN/100mL	<1.0	1.00	2	1	130	1	<1.0	1.00	<1	1	920	1	<1.0	1.00	<1	1	49	1	<1.0	1.00	<1	1	2	1	5	1.00	<1	1	350	1
Fecal Coliform	CFU/100mL	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	<1	1	<1.0	1.00	<1	1	<1	1	<5.0	5.00	<1	1	<1	1
Arsenic, Total	mg/L	<0.0033	0.00330	<0.0033	0.0033	<0.0033	0.0033	<0.00330	0.00330	<0.0033	0.0033	<0.0033	0.0033	<0.0033	0.00330	<0.0033	0.0033	<0.0033	0.0033	<0.0033	0.00330	<0.0033	0.0033	<0.0033	0.0033	0.0044 J	0.00590	<0.0033	0.0033	0.0019J	0.0033
Cadmium, Total	mg/L	<0.0011	0.00110	<0.0011	0.0011	<0.0011	0.0011	<0.0011	0.00110	<0.0011	0.0011	<0.0011	0.0011	<0.0011	0.00110	<0.0011	0.0011	<0.0011	0.0011	<0.0011	0.00110	<0.0011	0.0011	<0.0011	0.0011	<0.0011	0.00200	<0.0011	0.0011	<0.0011	0.0011
Chromium, Total	mg/L	0.0087	0.00220	0.0058	0.0022	0.0068	0.0022	0.0067	0.00220	0.0012J	0.0022	<0.0022	0.0022	0.0083	0.00220	0.013	0.0022	0.0042J	0.0022	0.009	0.00220	<0.0022	0.0022	<0.0022	0.0022	0.032	0.00400	0.0014J	0.0022	0.018	0.0022
Copper, Total	mg/L	0.021	0.00560	0.012	0.0056	0.0092	0.0056	0.017	0.00560	0.0041J	0.0056	0.0048J	0.0056	0.015	0.00560	0.018	0.0056	0.0047J	0.0056	0.041	0.00560	<0.0056	0.0056	0.0022J	0.0056	0.074	0.01000	<0.0056	0.0056	0.029	0.0056
Iron, Total	mg/L	6.9	0.05600	4.6	0.056	6.7	0.056	4.5	0.05600	0.65	0.056	0.3	0.056	6.6	0.05600	8.8	0.056	2.8	0.056	12.1	0.05600	0.066	0.056	0.22	0.056	39.5	0.10000	0.8	0.056	14.1	0.056
Lead, Total	mg/L	0.0024	0.00220	0.0015J	0.0022	0.0018J	0.0022	0.0012J	0.00220	<0.0022	0.0022	<0.0022	0.0022	0.003	0.00220	0.0038	0.0022	0.0011J	0.0022	0.0037	0.00220	<0.0022	0.0022	<0.0022	0.0022	0.021	0.00400	<0.0022	0.0022	0.008	0.0022
Manganese, Total	mg/L	0.079	0.00560	0.053	0.0056	0.071	0.0056	0.056	0.00560	0.0095	0.0056	0.007	0.0056	0.12	0.00560	0.16	0.0056	0.07	0.0056	0.23	0.00560	0.0034J	0.0056	0.0056J	0.0056	1.5	0.01000	0.05	0.0056	0.55	0.0056
Nickel, Total	mg/L	0.009	0.00560	0.0065	0.0056	0.0075	0.0056	0.0088	0.00560	0.0028J	0.0056	0.0042J	0.0056	0.0051 J	0.00560	0.0075	0.0056	0.0027J	0.0056	0.013	0.00560	<0.0056	0.0056	<0.0056	0.0056	0.027	0.01000	<0.0056	0.0056	0.013	0.0056
Selenium, Total	mg/L	<0.0056	0.00560	<0.0056	0.0056	<0.0056	0.0056	<0.0056	0.00560	<0.0056	0.0056	<0.0056	0.0056	<0.0056	0.00560	<0.0056	0.0056	<0.0056	0.0056	<0.0056	0.00560	<0.0056	0.0056	<0.0056	0.0056	<0.0056	0.01000	<0.0056	0.0056	<0.0056	0.0056
Sodium, Total	mg/L	7.7	0.11000	5.4	0.11	5.8	0.11	8.5	0.11000	6.9	0.11	6.4	0.11	5.5	0.11000	5.1	0.11	5	0.11	3.6	0.11000	4	0.11	4.2	0.11	2.5	0.20000	2.4	0.11	2.8	0.11
Zinc, Total	mg/L	0.02	0.00560	0.014	0.0056	0.017	0.0056	0.014	0.00560	0.0036J	0.0056	0.0067	0.0056	0.012	0.00560	0.018	0.0056	0.0063	0.0056	0.033	0.00560	<0.0056	0.0056	0.0046J	0.0056	0.055	0.01000	0.0026J	0.0056	0.021	0.0056
Mercury, Total	mg/L	<0.00050	0.00050	<0.0005	0.0005	<0.0005	0.0005	<0.00050	0.00050	<0.0005	0.0005	<0.0005	0.0005	<0.00050	0.00050	<0.0005	0.0005	<0.0005	0.0005	<0.00050	0.00050	<0.0005	0.0005	<0.0005	0.0005	<0.00050	0.00050	<0.0005	0.0005	<0.0005	0.0005

Notes:
RDL - Reporting Detection Limit
mg/L - milligrams per liter
MPN - Most Probable Number
CFU - Colony Forming Units
mL - Milliliter
Bold - Detection

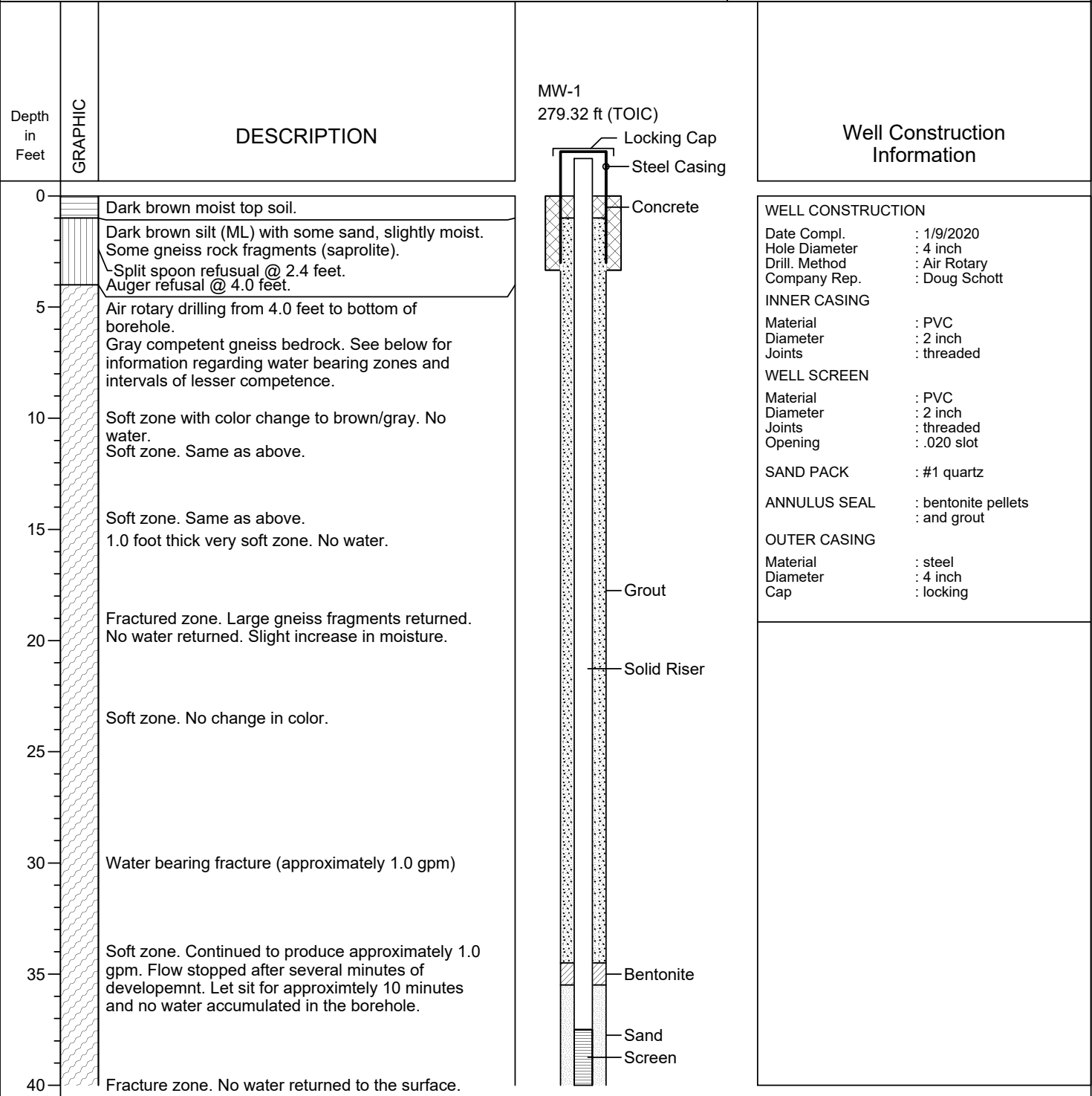
APPENDIX A
MONITORING WELL CONSTRUCTION AND
SURVEY INFORMATION





Monitoring Well MW-1

(Page 1 of 2)



Depth to water measured at 57.03 ft below TOIC on 1/24/2020

Monitoring Well MW-1

(Page 1 of 2)



Brickhouse Environmental


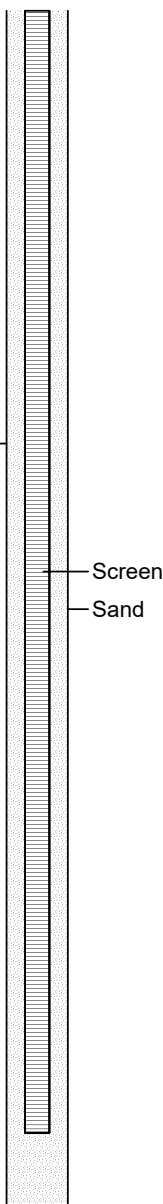
Mount Cuba Center
 3120 Barley Mill Road
 Hockessin, DE 19707
 Hydrogeologic Investigation

BE Project No. 19-3834-0

Date Started : 1/8/2020
 Date Completed : 1/9/2020
 Hole Diameter : 4 inch
 Drilling Method : HSA & Air Rotary
 Sampling Methods : Split Spoon and Cuttings
 Drilled By : Ameridrill, Inc.
 Licensed Driller No. : 4162
 Logged By : Douglas Schott, P.G.
 Checked By : Douglas Schott, P.G.

Monitoring Well MW-1

(Page 2 of 2)

Depth in Feet	GRAPHIC	DESCRIPTION	MW-1 279.32 ft (TOIC)	Well Construction Information
40		Fracture zone. Color change to gray/brown.	 <p style="text-align: center;">▼</p> <p style="text-align: right;">Screen</p> <p style="text-align: right;">Sand</p>	<p>WELL CONSTRUCTION</p> <p>Date Compl. : 1/9/2020 Hole Diameter : 4 inch Drill. Method : Air Rotary Company Rep. : Doug Schott</p> <p>INNER CASING</p> <p>Material : PVC Diameter : 2 inch Joints : threaded</p> <p>WELL SCREEN</p> <p>Material : PVC Diameter : 2 inch Joints : threaded Opening : .020 slot</p> <p>SAND PACK : #1 quartz</p> <p>ANNULUS SEAL : bentonite pellets : and grout</p> <p>OUTER CASING</p> <p>Material : steel Diameter : 4 inch Cap : locking</p>
45				
50		Very soft fractured zone between 54 and 56 feet. Cuttings are now balling up and trace free water returned to the surface after rod changes.		
55		Almost no cuttings being returned to the surface. Suspect that cuttings and trace water are accumulating above the hammer bit. Most circulation lost.		
60				
65				
70				
75				
80		Stopped drilling @ 80 feet and injected water to clean out the borehole. Yield is insufficient to cause water to be returned to the surface.		

Depth to water measured at 57.03 ft below TOIC on 1/24/2020

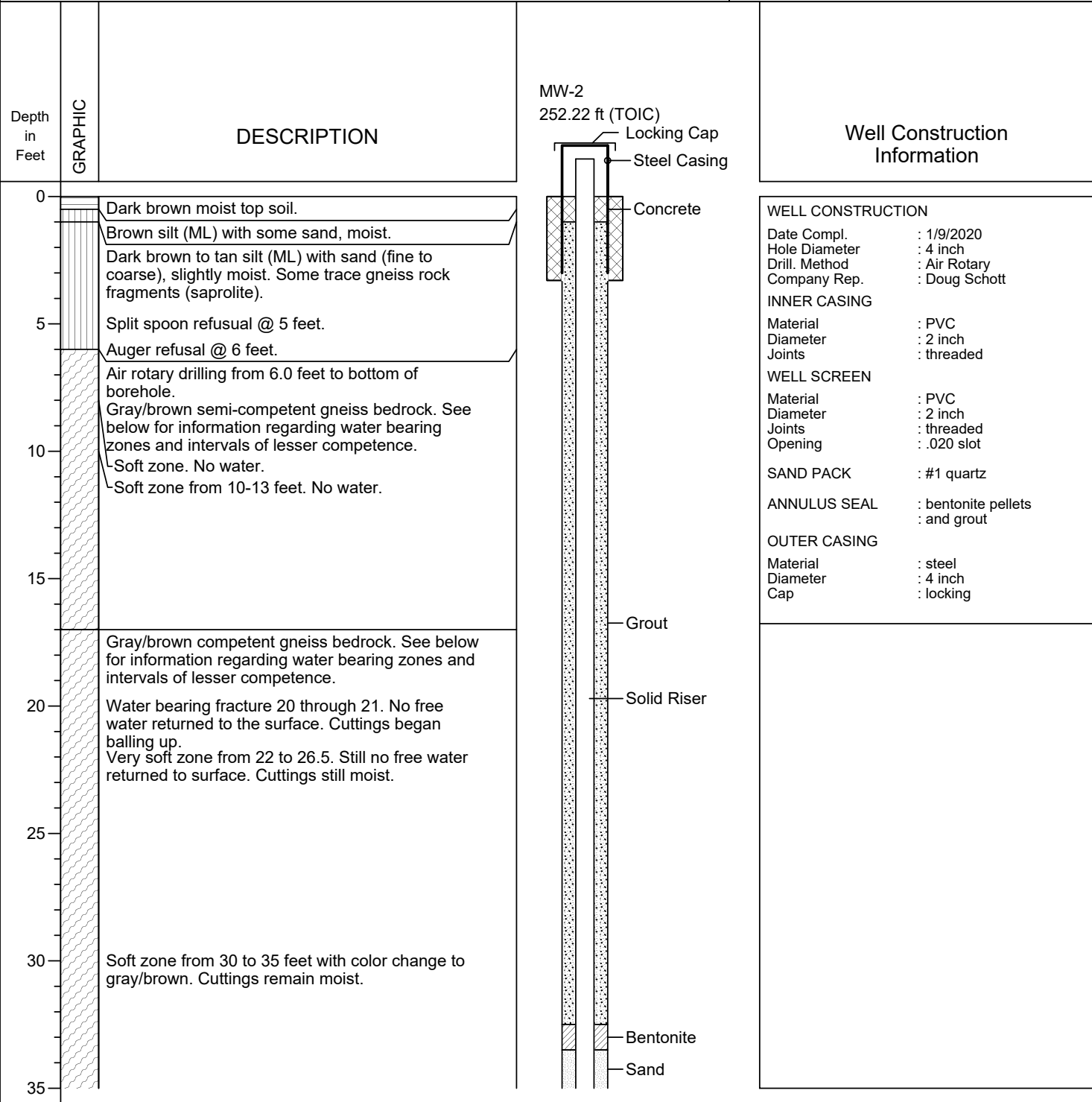
Monitoring Well MW-1

(Page 2 of 2)



Monitoring Well MW-2

(Page 1 of 2)



Depth to water measured at 48.71 ft below TOIC on 1/24/2020

Monitoring Well MW-2

(Page 1 of 2)



**Brickhouse
Environmental**

Mount Cuba Center
3120 Barley Mill Road
Hockessin, DE 19707
Hydrogeologic Investigation

BE Project No. 19-3834-0

Date Started : 1/8/2020
Date Completed : 1/9/2020
Hole Diameter : 4 inch
Drilling Method : HSA & Air Rotary
Sampling Methods : Split Spoon and Cuttings
Drilled By : Ameridrill, Inc.
Licensed Driller No. : 4162
Logged By : Douglas Schott, P.G.
Checked By : Douglas Schott, P.G.

Monitoring Well MW-2

(Page 2 of 2)

Depth in Feet	GRAPHIC	DESCRIPTION	MW-2 252.22 ft (TOIC)	Well Construction Information
35 40 45 50 55 60 65 70		<p>Soft zone from 38 to 40 feet.</p> <p>Soft zone. Cuttings remain moist. Sample recovery is minimal due to lack of significant water bearing zones and moist cuttings.</p> <p>Soft zone. Same as above.</p> <p>Soft zone. Same as above.</p>	<p>Solid Riser</p> <p>Sand</p> <p>Screen</p>	<p>WELL CONSTRUCTION</p> <p>Date Compl. : 1/9/2020 Hole Diameter : 4 inch Drill. Method : Air Rotary Company Rep. : Doug Schott</p> <p>INNER CASING</p> <p>Material : PVC Diameter : 2 inch Joints : threaded</p> <p>WELL SCREEN</p> <p>Material : PVC Diameter : 2 inch Joints : threaded Opening : .020 slot</p> <p>SAND PACK : #1 quartz</p> <p>ANNULUS SEAL : bentonite pellets and grout</p> <p>OUTER CASING</p> <p>Material : steel Diameter : 4 inch Cap : locking</p>

Depth to water measured at 48.71 ft below TOIC on 1/24/2020

Monitoring Well MW-2

(Page 2 of 2)



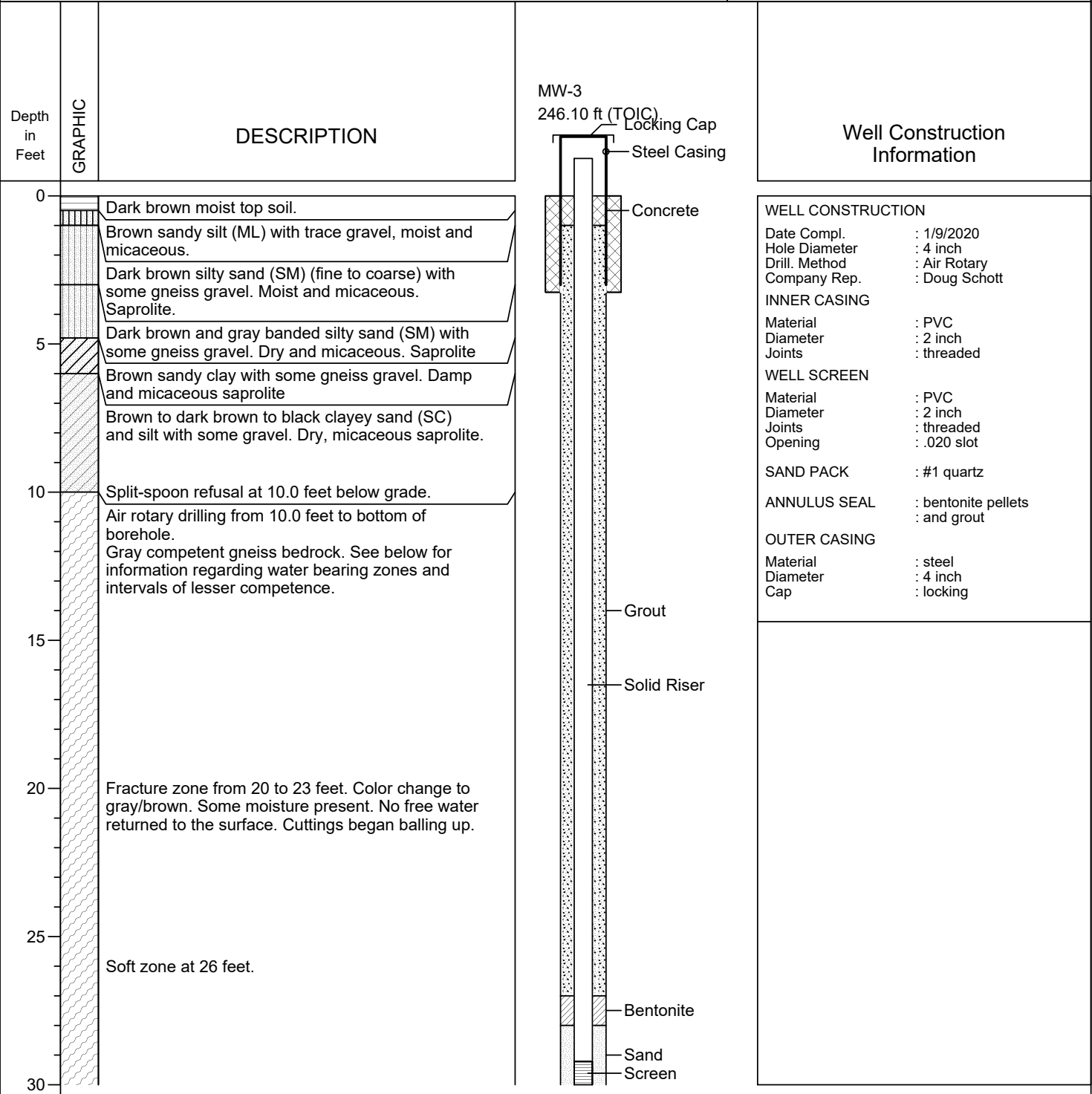
**Brickhouse
Environmental**

Mount Cuba Center
3120 Barley Mill Road
Hockessin, DE 19707
Hydrogeologic Investigation
BE Project No. 19-3834-0

Date Started : 1/9/2020
Date Completed : 1/9/2020
Hole Diameter : 4 inch
Drilling Method : HSA & Air Rotary
Sampling Methods : Split Spoon and Cuttings
Drilled By : Ameridrill, Inc.
Licensed Driller No. : 4162
Checked By : Douglas Schott, P.G.
Checked By : Douglas Schott, P.G.

Monitoring Well MW-3

(Page 1 of 2)



Depth to water measured at 33.84 ft below TOIC on 1/24/2020

Monitoring Well MW-3

(Page 1 of 2)



Date Started	: 1/9/2020
Date Completed	: 1/9/2020
Hole Diameter	: 4 inch
Drilling Method	: HSA & Air Rotary
Sampling Methods	: Split Spoon and Cuttings
Drilled By	: Ameridrill, Inc.
Licensed Driller No.	: 4162
Checked By	: Douglas Schott, P.G.
Checked By	: Douglas Schott, P.G.

Monitoring Well MW-3

(Page 2 of 2)

Depth in Feet	GRAPHIC	DESCRIPTION	MW-3 246.10 ft (TOIC)	Well Construction Information
30 35 40 45 50 55 60		<p>Fracture zone with large gneiss fragments from 31 to 33 feet. Additional moisture noted, but no free water returned to the surface.</p> <p>Loss of circulation related to fracture zone at 31 feet. Removed tooling to clean out hole. Reset the drill string and continued to drill to end of borehole with little to no cuttings or water being returned to the surface.</p>		<p>WELL CONSTRUCTION</p> <p>Date Compl. : 1/9/2020 Hole Diameter : 4 inch Drill. Method : Air Rotary Company Rep. : Doug Schott</p> <p>INNER CASING</p> <p>Material : PVC Diameter : 2 inch Joints : threaded</p> <p>WELL SCREEN</p> <p>Material : PVC Diameter : 2 inch Joints : threaded Opening : .020 slot</p> <p>SAND PACK : #1 quartz</p> <p>ANNULUS SEAL : bentonite pellets : and grout</p> <p>OUTER CASING</p> <p>Material : steel Diameter : 4 inch Cap : locking</p>

Depth to water measured at 33.84 ft below TOIC on 1/24/2020

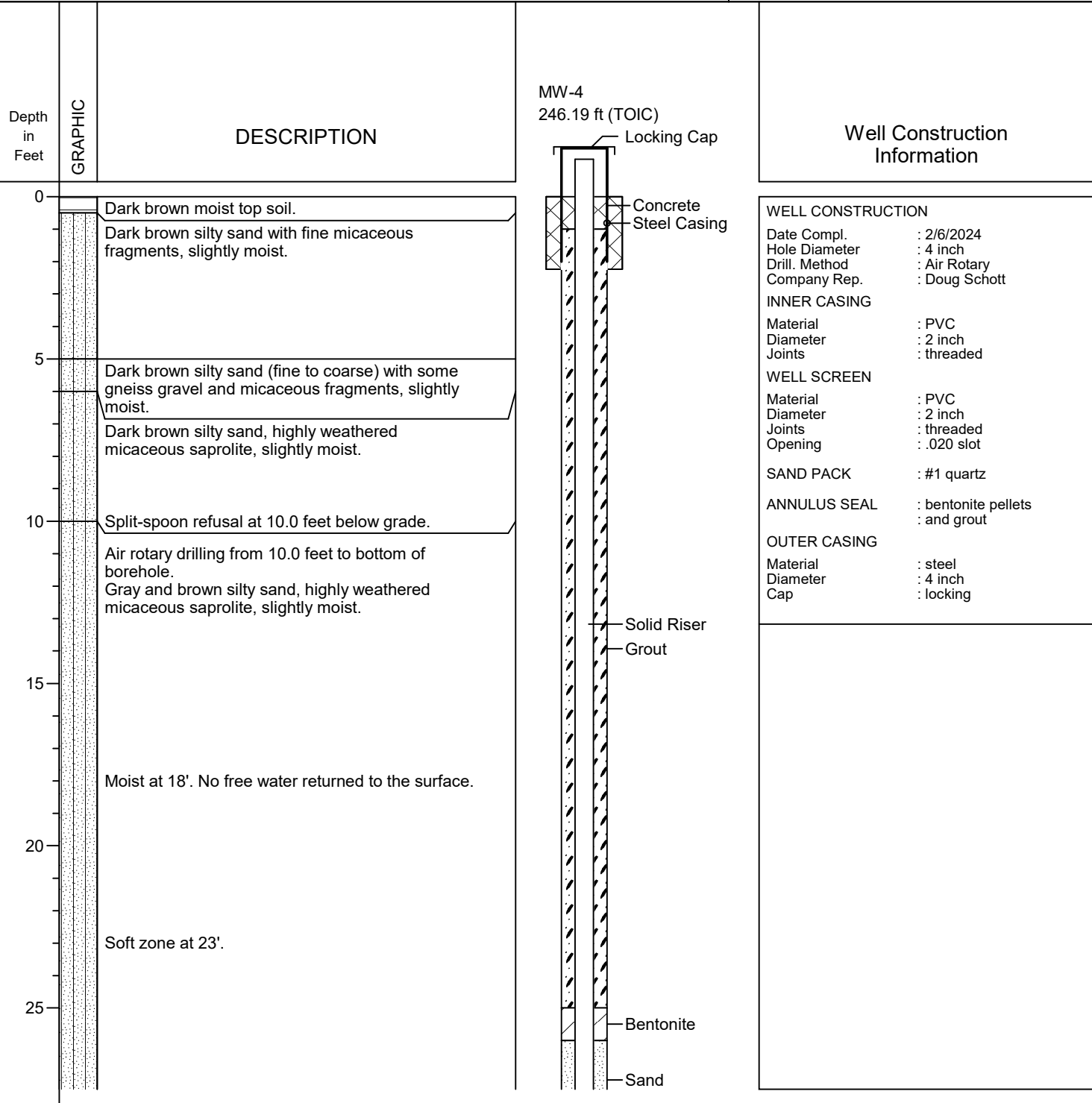
Monitoring Well MW-3

(Page 2 of 2)



Monitoring Well MW-4

(Page 1 of 2)



Depth to water measured at 38.41' on 2/6/2024.

Monitoring Well MW-4

(Page 1 of 2)



Monitoring Well MW-4

(Page 2 of 2)

Depth in Feet	GRAPHIC	DESCRIPTION	MW-4 246.19 ft (TOIC)	Well Construction Information
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WELL CONSTRUCTION

Date Compl. : 2/6/2024
Hole Diameter : 4 inch
Drill. Method : Air Rotary
Company Rep. : Doug Schott

INNER CASING

Material : PVC
Diameter : 2 inch
Joints : threaded

WELL SCREEN

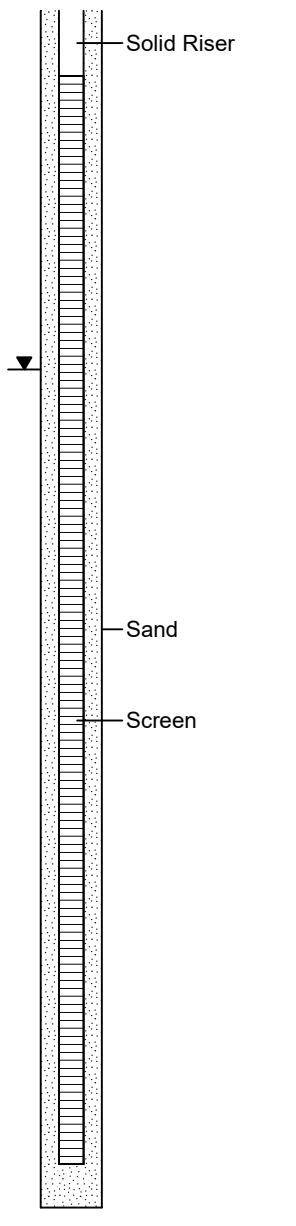
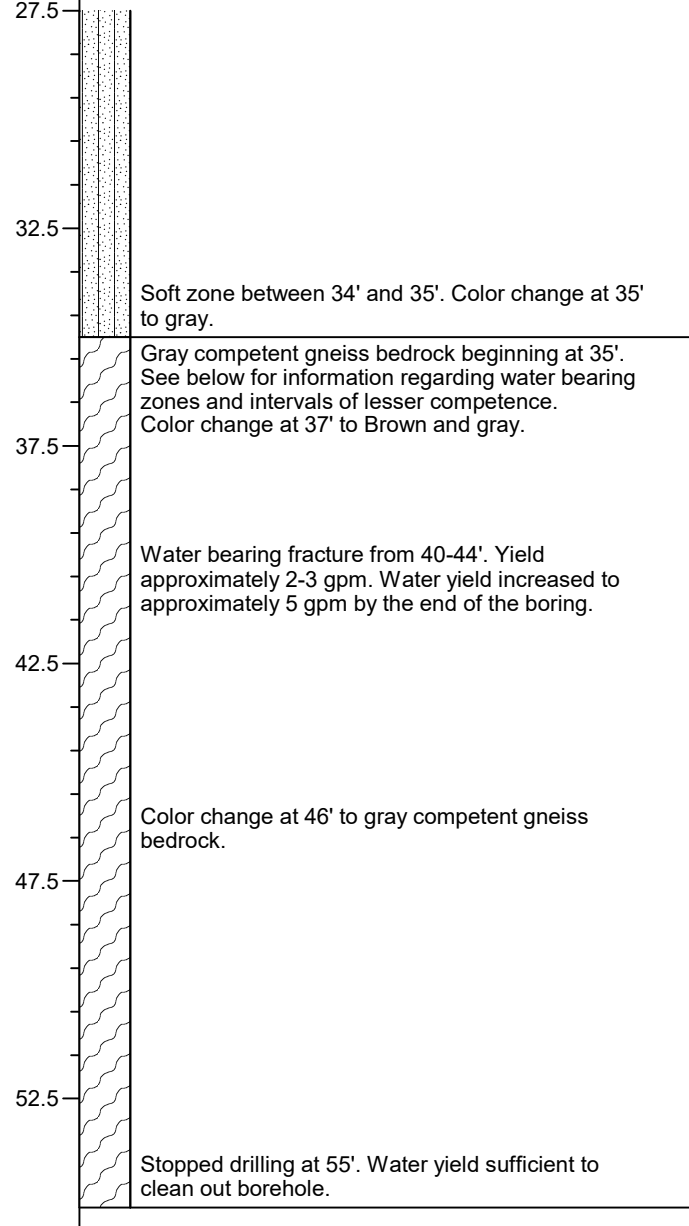
Material : PVC
Diameter : 2 inch
Joints : threaded
Opening : .020 slot

SAND PACK : #1 quartz

ANNULUS SEAL : bentonite pellets and grout

OUTER CASING

Material : steel
Diameter : 4 inch
Cap : locking



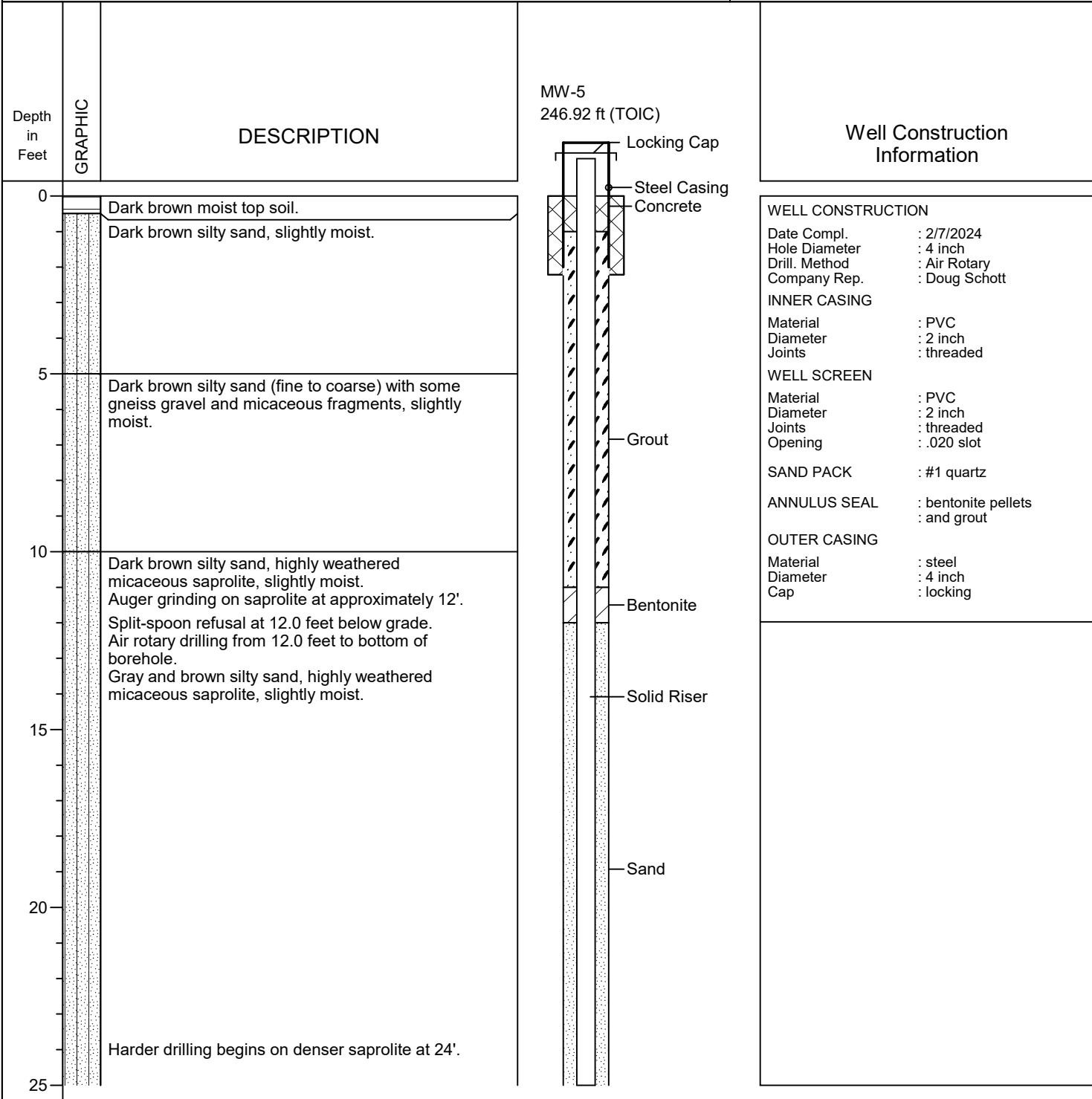
Depth to water measured at 38.41' on 2/6/2024.

06-07-2024 J:\193834.1\Report\Boring Logs\MW-4.bor



Monitoring Well MW-5

(Page 1 of 2)



Depth to water measured at 28.30' on 2/7/2024.

Monitoring Well MW-5

(Page 1 of 2)

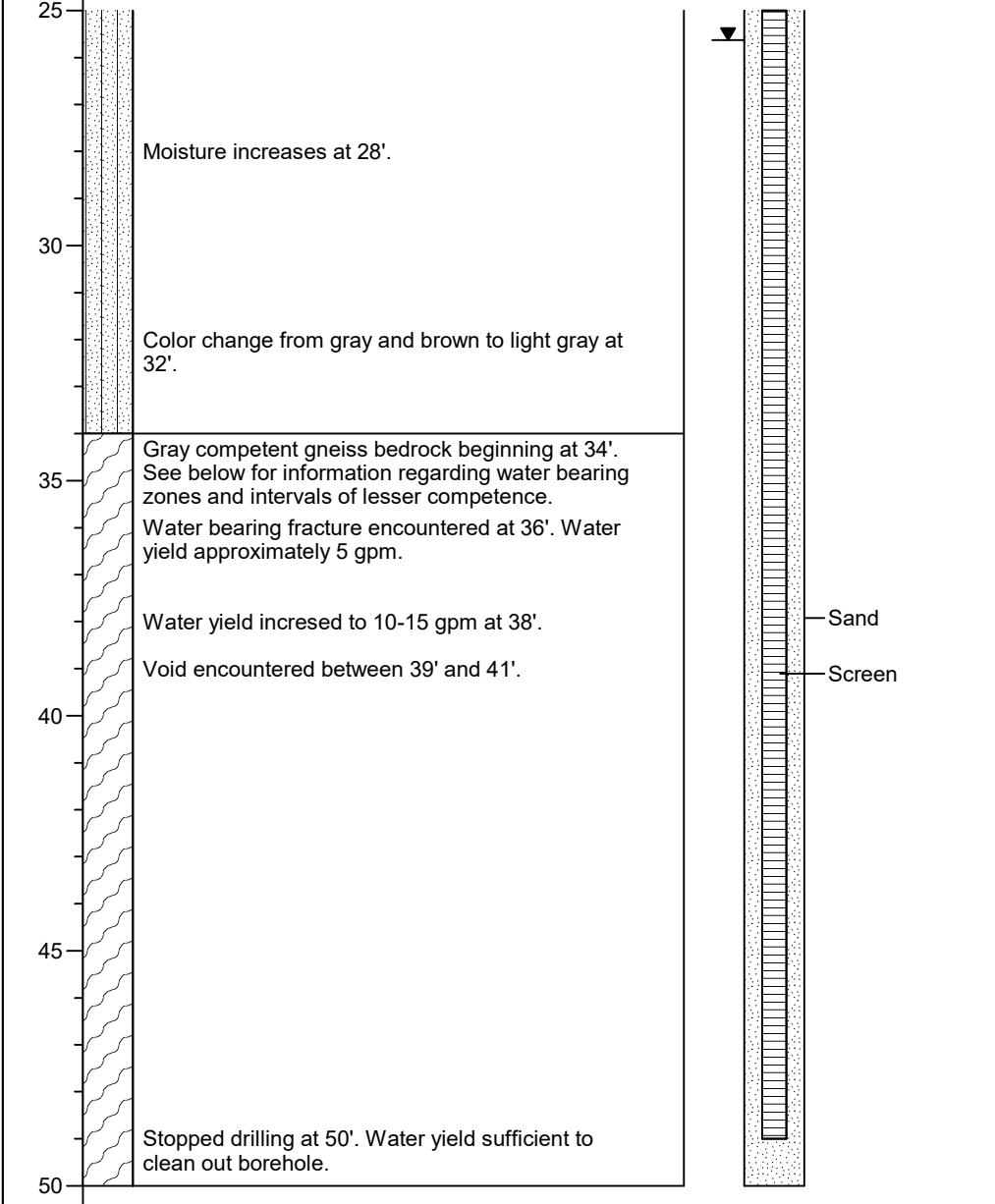


Date Started : 2/7/2024
 Date Completed : 2/7/2024
 Hole Diameter : 4 inch
 Drilling Method : HSA & Air Rotary
 Sampling Methods : Split Spoon and Cuttings
 Drilled By : Ameridrill, Inc.
 Licensed Driller No. : 4162
 Created By : Will Fernandez
 Checked By : Douglas Schott, P.G.

Monitoring Well MW-5

(Page 2 of 2)

Depth in Feet	GRAPHIC	DESCRIPTION	MW-5 246.92 ft (TOIC)	Well Construction Information
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WELL CONSTRUCTION

Date Compl. : 2/7/2024
 Hole Diameter : 4 inch
 Drill. Method : Air Rotary
 Company Rep. : Doug Schott

INNER CASING

Material : PVC
 Diameter : 2 inch
 Joints : threaded

WELL SCREEN

Material : PVC
 Diameter : 2 inch
 Joints : threaded
 Opening : .020 slot

SAND PACK : #1 quartz

ANNULUS SEAL : bentonite pellets
 and grout

OUTER CASING

Material : steel
 Diameter : 4 inch
 Cap : locking

Depth to water measured at 28.30' on 2/7/2024.

06-07-2024 J:\193834.1\Report\Boring Logs\MW-5.bor

APPENDIX B
LABORATORY ANALYTICAL REPORTS





Main Site: 301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | www.alsglobal.com
 Associated Site: 20 Riverside Drive | Spring City, PA 19475 | Phone: 610-948-4903 | Fax: 717-944-1430 |

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343, NJ PA101

Analytical Results Report For

ARM Brickhouse

Project Mt. Cuba GW
 Workorder 3347329
 Report ID 306729 on 3/11/2024

Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Feb 26, 2024.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Jessica Smith (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Global.
 ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):
 Alexander Chipman - ARM Brickhouse
 William Fernandez - ARM Brickhouse
 Becky Hingley - ARM Brickhouse
 Doug Schott - ARM Brickhouse
 Kristina Early - ARM Brickhouse

Jessica Smith

Jessica Smith
 Project Coordinator

(ALS Digital Signature)

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.



Sample Summary

<u>Lab ID</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Collector</u>	<u>Collection Company</u>
3347329001	MW-1	Ground Water	02/26/2024 12:00	02/26/2024 14:16	WF	ARM Brickhouse
3347329002	MW-2	Ground Water	02/26/2024 11:50	02/26/2024 14:16	WF	ARM Brickhouse
3347329003	MW-3	Ground Water	02/26/2024 11:23	02/26/2024 14:16	WF	ARM Brickhouse
3347329004	MW-4	Ground Water	02/26/2024 11:35	02/26/2024 14:16	WF	ARM Brickhouse
3347329005	MW-5	Ground Water	02/26/2024 12:15	02/26/2024 14:16	WF	ARM Brickhouse



Reference

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136, including but not limited to the following EPA Method reference revisions:
 EPA 300.1 Rev. 1.0-1997
 EPA 300.0 Rev. 2.1-1993
 EPA 353.2 Rev. 2.0-1993
 EPA 410.4 Rev. 1.0-1993
 EPA 420.4 Rev. 1.0-1993
 EPA 365.1 Rev. 2.0-1993
 EPA 200.7 Rev. 4.4-1994
 EPA 200.8 Rev. 5.4-1994
 EPA 245.1 Rev. 3.0-1994
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.



Project Notations

Sample Notations

Lab ID **Sample ID**

Result Notations

Notation Ref.

- | | |
|---|---|
| 1 | The Phosphorus as PO4 result is a calculated value based on the Total Phosphorus as P result. |
| 2 | The QC sample type DUP for method S2540D-15 was outside the control limits for the analyte Total Suspended Solids. The RPD was reported as 7.31 and the upper control limit is 5. |
| 3 | The Relative Percent Difference (RPD) between the matrix spike and the matrix spike duplicate was outside of the established control limits for this analyte. |
| 4 | ND is defined as <1 MPN/100mL |
| 5 | ALS-Middletown does not hold PADEP NELAP accreditation for this analyte by this method of analysis. |
| 6 | NPW TC analyzed following SM 9221B and EPA 600/8-78-017 pg 114. ND is defined as <2 MPN/100mL |
| 8 | ND is defined as <5 MPN/100mL |



Detected Results Summary

Client Sample ID	MW-1	Collected	02/26/2024 12:00
Lab Sample ID	3347329001	Lab Receipt	02/26/2024 14:16

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Chromium, Total	0.0087	mg/L	0.0022	0.00074	SW846 6020B	#
Copper, Total	0.021	mg/L	0.0056	0.0019	SW846 6020B	#
Iron, Total	6.9	mg/L	0.056	0.019	SW846 6020B	#
Lead, Total	0.0024	mg/L	0.0022	0.00074	SW846 6020B	#
Manganese, Total	0.079	mg/L	0.0056	0.0019	SW846 6020B	#
Nickel, Total	0.0090	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	7.7	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.020	mg/L	0.0056	0.0019	SW846 6020B	#
WET CHEMISTRY						
Ammonia-N, Low Level	0.02J	mg/L	0.10	0.01	SM 4500-NH3G	#
Chloride	6.7	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	4.1	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total	0.11	mg/L	0.10	0.085	EPA 365.1	#
Phosphorus, Total as PO4	0.32	mg/L			EPA 365.1	#
Sulfate	28.4	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	121	mg/L	25	25	SM2540C-15	#
Total Nitrogen	4.14	mg/L	3.00	1	Calculation	#
Total Suspended Solids	356	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-2	Collected	02/26/2024 11:50
Lab Sample ID	3347329002	Lab Receipt	02/26/2024 14:16

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Chromium, Total	0.0067	mg/L	0.0022	0.00074	SW846 6020B	#
Copper, Total	0.017	mg/L	0.0056	0.0019	SW846 6020B	#
Iron, Total	4.5	mg/L	0.056	0.019	SW846 6020B	#
Lead, Total	0.0012J	mg/L	0.0022	0.00074	SW846 6020B	#
Manganese, Total	0.056	mg/L	0.0056	0.0019	SW846 6020B	#
Nickel, Total	0.0088	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	8.5	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.014	mg/L	0.0056	0.0019	SW846 6020B	#
WET CHEMISTRY						
Ammonia-N, Low Level	0.02J	mg/L	0.10	0.01	SM 4500-NH3G	#
Chloride	7.6	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	3.2	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total	0.52	mg/L	0.10	0.085	EPA 365.1	#
Phosphorus, Total as PO4	1.6	mg/L			EPA 365.1	#
Sulfate	21.3	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	124	mg/L	25	25	SM2540C-15	#
Total Nitrogen	3.15	mg/L	3.00	1	Calculation	#
Total Suspended Solids	363	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-3	Collected	02/26/2024 11:23
Lab Sample ID	3347329003	Lab Receipt	02/26/2024 14:16

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Chromium, Total	0.0083	mg/L	0.0022	0.00074	SW846 6020B	#
Copper, Total	0.015	mg/L	0.0056	0.0019	SW846 6020B	#
Iron, Total	6.6	mg/L	0.056	0.019	SW846 6020B	#
Lead, Total	0.0030	mg/L	0.0022	0.00074	SW846 6020B	#
Manganese, Total	0.12	mg/L	0.0056	0.0019	SW846 6020B	#
Nickel, Total	0.0051J	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	5.5	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.012	mg/L	0.0056	0.0019	SW846 6020B	#
WET CHEMISTRY						
Ammonia-N, Low Level	0.03J	mg/L	0.10	0.01	SM 4500-NH3G	#
Chloride	2.1	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	1.2	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total	0.44	mg/L	0.10	0.085	EPA 365.1	#
Phosphorus, Total as PO4	1.3	mg/L			EPA 365.1	#
Sulfate	20.6	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	91	mg/L	25	25	SM2540C-15	#
Total Nitrogen	1.16J	mg/L	3.00	1	Calculation	#
Total Suspended Solids	189	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-4	Collected	02/26/2024 11:35
Lab Sample ID	3347329004	Lab Receipt	02/26/2024 14:16

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Chromium, Total	0.0090	mg/L	0.0022	0.00074	SW846 6020B	#
Copper, Total	0.041	mg/L	0.0056	0.0019	SW846 6020B	#
Iron, Total	12.1	mg/L	0.056	0.019	SW846 6020B	#
Lead, Total	0.0037	mg/L	0.0022	0.00074	SW846 6020B	#
Manganese, Total	0.23	mg/L	0.0056	0.0019	SW846 6020B	#
Nickel, Total	0.013	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	3.6	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.033	mg/L	0.0056	0.0019	SW846 6020B	#
WET CHEMISTRY						
Ammonia-N, Low Level	0.02J	mg/L	0.10	0.01	SM 4500-NH3G	#
Chloride	1.7J	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	0.95J	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total as PO4	0.18	mg/L			EPA 365.1	#
Sulfate	17.1	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	96	mg/L	25	25	SM2540C-15	#
Total Nitrogen	0.95J	mg/L	3.00	1	Calculation	#
Total Suspended Solids	397	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-5	Collected	02/26/2024 12:15
Lab Sample ID	3347329005	Lab Receipt	02/26/2024 14:16

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Arsenic, Total	0.0044J	mg/L	0.0059	0.0020	SW846 6020B	#
Chromium, Total	0.032	mg/L	0.0040	0.0013	SW846 6020B	#
Copper, Total	0.074	mg/L	0.010	0.0034	SW846 6020B	#
Iron, Total	39.5	mg/L	0.10	0.034	SW846 6020B	#
Lead, Total	0.021	mg/L	0.0040	0.0013	SW846 6020B	#
Manganese, Total	1.5	mg/L	0.010	0.0034	SW846 6020B	#
Nickel, Total	0.027	mg/L	0.010	0.0034	SW846 6020B	#
Sodium, Total	2.5	mg/L	0.20	0.067	SW846 6020B	#
Zinc, Total	0.055	mg/L	0.010	0.0034	SW846 6020B	#
MICROBIOLOGY						
Total Coliform	5	MPN/100mL	1	1	SM9223B-16	#
WET CHEMISTRY						
Ammonia-N, Low Level	0.02J	mg/L	0.10	0.01	SM 4500-NH3G	#
Nitrate-N	0.48J	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total	0.12	mg/L	0.10	0.085	EPA 365.1	#
Phosphorus, Total as PO4	0.36	mg/L			EPA 365.1	#
Sulfate	18.1	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	90	mg/L	25	25	SM2540C-15	#
Total Kjeldahl Nitrogen	0.6J	mg/L	1.0	0.4	S4500NH3G-11	#
Total Nitrogen	1.06J	mg/L	3.00	1	Calculation	#
Total Suspended Solids	1590	mg/L	5	5	SM2540D-15	#



Results

Client Sample ID	MW-1	Collected	02/26/2024 12:00
Lab Sample ID	3347329001	Lab Receipt	02/26/2024 14:16

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND	mg/L	0.0033	0.0011	SW846 6020B	1	03/06/2024 16:33	MO	A1
Cadmium, Total	ND	ND	mg/L	0.0011	0.00037	SW846 6020B	1	03/06/2024 16:33	MO	A1
Chromium, Total	0.0087		mg/L	0.0022	0.00074	SW846 6020B	1	03/06/2024 16:33	MO	A1
Copper, Total	0.021		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:33	MO	A1
Iron, Total	6.9		mg/L	0.056	0.019	SW846 6020B	1	03/06/2024 16:33	MO	A1
Lead, Total	0.0024		mg/L	0.0022	0.00074	SW846 6020B	1	03/06/2024 16:33	MO	A1
Manganese, Total	0.079		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:33	MO	A1
Mercury, Total	ND	ND,3	mg/L	0.00050	0.00017	SW846 7470A	1	03/01/2024 13:48	JSE	A
Nickel, Total	0.0090		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:33	MO	A1
Selenium, Total	ND	ND	mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:33	MO	A1
Sodium, Total	7.7		mg/L	0.11	0.037	SW846 6020B	1	03/06/2024 16:33	MO	A1
Zinc, Total	0.020		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:33	MO	A1

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,4	MPN/100mL	1	1	SM9223B Colilert-18/Qua ntitray	1	02/27/2024 13:47	CXA	F
Total Coliform	ND	ND,5,6	MPN/100mL	1	1	SM9223B-16	1	03/01/2024 13:38	ACA	G

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N, Low Level	0.02J	J	mg/L	0.10	0.01	SM 4500-NH3G	1	03/08/2024 01:59	NML	C
Chloride	6.7		mg/L	2.0	1.5	EPA 300.0	2	02/27/2024 15:36	J1W	E
Nitrate-N	4.1		mg/L	1.0	0.22	EPA 300.0	2	02/27/2024 15:36	J1W	E
Nitrite-N	ND	ND	mg/L	1.0	0.36	EPA 300.0	2	02/27/2024 15:36	J1W	E
Nitrogen, Total Organic	ND	ND	mg/L	1.0	1	Calculation	1	03/11/2024 10:23	AKH	C
Phosphorus, Total	0.11		mg/L	0.10	0.085	EPA 365.1	1	03/04/2024 17:55	JMS	C
Phosphorus, Total as PO4	0.32	1	mg/L			EPA 365.1	1	03/04/2024 17:55	JMS	C
Sulfate	28.4		mg/L	2.0	1.5	EPA 300.0	2	02/27/2024 15:36	J1W	E
Total Dissolved Solids	121		mg/L	25	25	SM2540C-15	1	02/29/2024 15:30	RAG	E
Total Kjeldahl Nitrogen	ND	ND	mg/L	1.0	0.4	S4500NH3G-11	1	03/07/2024 11:00	JXL	C
Total Nitrogen	4.14		mg/L	3.00	1	Calculation	1	03/08/2024 13:56	CW	C
Total Suspended Solids	356	2	mg/L	5	5	SM2540D-15	1	02/27/2024 13:50	ANH	E



Results

Client Sample ID	MW-2	Collected	02/26/2024 11:50
Lab Sample ID	3347329002	Lab Receipt	02/26/2024 14:16

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND	mg/L	0.0033	0.0011	SW846 6020B	1	03/06/2024 16:35	MO	A1
Cadmium, Total	ND	ND	mg/L	0.0011	0.00037	SW846 6020B	1	03/06/2024 16:35	MO	A1
Chromium, Total	0.0067		mg/L	0.0022	0.00074	SW846 6020B	1	03/06/2024 16:35	MO	A1
Copper, Total	0.017		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:35	MO	A1
Iron, Total	4.5		mg/L	0.056	0.019	SW846 6020B	1	03/06/2024 16:35	MO	A1
Lead, Total	0.0012J	J	mg/L	0.0022	0.00074	SW846 6020B	1	03/06/2024 16:35	MO	A1
Manganese, Total	0.056		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:35	MO	A1
Mercury, Total	ND	ND	mg/L	0.00050	0.00017	SW846 7470A	1	03/01/2024 13:53	JSE	A
Nickel, Total	0.0088		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:35	MO	A1
Selenium, Total	ND	ND	mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:35	MO	A1
Sodium, Total	8.5		mg/L	0.11	0.037	SW846 6020B	1	03/06/2024 16:35	MO	A1
Zinc, Total	0.014		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:35	MO	A1

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,4	MPN/100mL	1	1	SM9223B Colilert-18/Qua ntitray	1	02/27/2024 13:47	CXA	F
Total Coliform	ND	ND,5,6	MPN/100mL	1	1	SM9223B-16	1	03/01/2024 13:38	ACA	G

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N, Low Level	0.02J	J	mg/L	0.10	0.01	SM 4500-NH3G	1	03/08/2024 02:02	NML	C
Chloride	7.6		mg/L	2.0	1.5	EPA 300.0	2	02/27/2024 15:47	J1W	E
Nitrate-N	3.2		mg/L	1.0	0.22	EPA 300.0	2	02/27/2024 15:47	J1W	E
Nitrite-N	ND	ND	mg/L	1.0	0.36	EPA 300.0	2	02/27/2024 15:47	J1W	E
Nitrogen, Total Organic	ND	ND	mg/L	1.0	1	Calculation	1	03/11/2024 10:24	AKH	C
Phosphorus, Total	0.52		mg/L	0.10	0.085	EPA 365.1	1	02/28/2024 18:51	JMS	C
Phosphorus, Total as PO4	1.6	1	mg/L			EPA 365.1	1	02/28/2024 18:51	JMS	C
Sulfate	21.3		mg/L	2.0	1.5	EPA 300.0	2	02/27/2024 15:47	J1W	E
Total Dissolved Solids	124		mg/L	25	25	SM2540C-15	1	02/29/2024 15:30	RAG	E
Total Kjeldahl Nitrogen	ND	ND	mg/L	1.0	0.4	S4500NH3G-11	1	03/07/2024 11:02	JXL	C
Total Nitrogen	3.15		mg/L	3.00	1	Calculation	1	03/08/2024 13:57	CW	C
Total Suspended Solids	363		mg/L	5	5	SM2540D-15	1	02/27/2024 13:50	ANH	E



Results

Client Sample ID	MW-3	Collected	02/26/2024 11:23
Lab Sample ID	3347329003	Lab Receipt	02/26/2024 14:16

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND	mg/L	0.0033	0.0011	SW846 6020B	1	03/06/2024 16:37	MO	A1
Cadmium, Total	ND	ND	mg/L	0.0011	0.00037	SW846 6020B	1	03/06/2024 16:37	MO	A1
Chromium, Total	0.0083		mg/L	0.0022	0.00074	SW846 6020B	1	03/06/2024 16:37	MO	A1
Copper, Total	0.015		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:37	MO	A1
Iron, Total	6.6		mg/L	0.056	0.019	SW846 6020B	1	03/06/2024 16:37	MO	A1
Lead, Total	0.0030		mg/L	0.0022	0.00074	SW846 6020B	1	03/06/2024 16:37	MO	A1
Manganese, Total	0.12		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:37	MO	A1
Mercury, Total	ND	ND	mg/L	0.00050	0.00017	SW846 7470A	1	03/01/2024 13:54	JSE	A
Nickel, Total	0.0051J	J	mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:37	MO	A1
Selenium, Total	ND	ND	mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:37	MO	A1
Sodium, Total	5.5		mg/L	0.11	0.037	SW846 6020B	1	03/06/2024 16:37	MO	A1
Zinc, Total	0.012		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:37	MO	A1

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,4	MPN/100mL	1	1	SM9223B Colilert-18/Qua nitray	1	02/27/2024 13:47	CXA	F
Total Coliform	ND	ND,5,6	MPN/100mL	1	1	SM9223B-16	1	03/01/2024 13:38	ACA	G

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N, Low Level	0.03J	J	mg/L	0.10	0.01	SM 4500-NH3G	1	03/08/2024 02:32	NML	C
Chloride	2.1		mg/L	2.0	1.5	EPA 300.0	2	02/27/2024 15:57	J1W	E
Nitrate-N	1.2		mg/L	1.0	0.22	EPA 300.0	2	02/27/2024 15:57	J1W	E
Nitrite-N	ND	ND	mg/L	1.0	0.36	EPA 300.0	2	02/27/2024 15:57	J1W	E
Nitrogen, Total Organic	ND	ND	mg/L	1.0	1	Calculation	1	03/11/2024 10:25	AKH	C
Phosphorus, Total	0.44		mg/L	0.10	0.085	EPA 365.1	1	02/28/2024 18:53	JMS	C
Phosphorus, Total as PO4	1.3	1	mg/L			EPA 365.1	1	02/28/2024 18:53	JMS	C
Sulfate	20.6		mg/L	2.0	1.5	EPA 300.0	2	02/27/2024 15:57	J1W	E
Total Dissolved Solids	91		mg/L	25	25	SM2540C-15	1	02/29/2024 15:30	RAG	E
Total Kjeldahl Nitrogen	ND	ND	mg/L	1.0	0.4	S4500NH3G-11	1	03/07/2024 11:05	JXL	C
Total Nitrogen	1.16J	J	mg/L	3.00	1	Calculation	1	03/08/2024 13:58	CW	C
Total Suspended Solids	189		mg/L	5	5	SM2540D-15	1	02/27/2024 13:50	ANH	E



Results

Client Sample ID	MW-4	Collected	02/26/2024 11:35
Lab Sample ID	3347329004	Lab Receipt	02/26/2024 14:16

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND	mg/L	0.0033	0.0011	SW846 6020B	1	03/06/2024 16:39	MO	A1
Cadmium, Total	ND	ND	mg/L	0.0011	0.00037	SW846 6020B	1	03/06/2024 16:39	MO	A1
Chromium, Total	0.0090		mg/L	0.0022	0.00074	SW846 6020B	1	03/06/2024 16:39	MO	A1
Copper, Total	0.041		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:39	MO	A1
Iron, Total	12.1		mg/L	0.056	0.019	SW846 6020B	1	03/06/2024 16:39	MO	A1
Lead, Total	0.0037		mg/L	0.0022	0.00074	SW846 6020B	1	03/06/2024 16:39	MO	A1
Manganese, Total	0.23		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:39	MO	A1
Mercury, Total	ND	ND	mg/L	0.00050	0.00017	SW846 7470A	1	03/01/2024 13:55	JSE	A
Nickel, Total	0.013		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:39	MO	A1
Selenium, Total	ND	ND	mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:39	MO	A1
Sodium, Total	3.6		mg/L	0.11	0.037	SW846 6020B	1	03/06/2024 16:39	MO	A1
Zinc, Total	0.033		mg/L	0.0056	0.0019	SW846 6020B	1	03/06/2024 16:39	MO	A1

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,4	MPN/100mL	1	1	SM9223B Colilert-18/Qua ntray	1	02/27/2024 13:47	CXA	F
Total Coliform	ND	ND,5,6	MPN/100mL	1	1	SM9223B-16	1	03/01/2024 13:38	ACA	G

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N, Low Level	0.02J	J	mg/L	0.10	0.01	SM 4500-NH3G	1	03/08/2024 02:29	NML	C
Chloride	1.7J	J	mg/L	2.0	1.5	EPA 300.0	2	02/27/2024 16:07	J1W	E
Nitrate-N	0.95J	J	mg/L	1.0	0.22	EPA 300.0	2	02/27/2024 16:07	J1W	E
Nitrite-N	ND	ND	mg/L	1.0	0.36	EPA 300.0	2	02/27/2024 16:07	J1W	E
Nitrogen, Total Organic	ND	ND	mg/L	1.0	1	Calculation	1	03/11/2024 10:26	AKH	C
Phosphorus, Total	ND	ND	mg/L	0.10	0.085	EPA 365.1	1	03/04/2024 17:51	JMS	C
Phosphorus, Total as PO4	0.18	1	mg/L			EPA 365.1	1	03/04/2024 17:51	JMS	C
Sulfate	17.1		mg/L	2.0	1.5	EPA 300.0	2	02/27/2024 16:07	J1W	E
Total Dissolved Solids	96		mg/L	25	25	SM2540C-15	1	02/29/2024 15:30	RAG	E
Total Kjeldahl Nitrogen	ND	ND	mg/L	1.0	0.4	S4500NH3G-11	1	03/07/2024 11:07	JXL	C
Total Nitrogen	0.95J	J	mg/L	3.00	1	Calculation	1	03/08/2024 13:59	CW	C
Total Suspended Solids	397		mg/L	5	5	SM2540D-15	1	02/27/2024 13:50	ANH	E



Results

Client Sample ID	MW-5	Collected	02/26/2024 12:15
Lab Sample ID	3347329005	Lab Receipt	02/26/2024 14:16

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	0.0044J	J	mg/L	0.0059	0.0020	SW846 6020B	1	03/06/2024 16:41	MO	A1
Cadmium, Total	ND	ND	mg/L	0.0020	0.00067	SW846 6020B	1	03/06/2024 16:41	MO	A1
Chromium, Total	0.032		mg/L	0.0040	0.0013	SW846 6020B	1	03/06/2024 16:41	MO	A1
Copper, Total	0.074		mg/L	0.010	0.0034	SW846 6020B	1	03/06/2024 16:41	MO	A1
Iron, Total	39.5		mg/L	0.10	0.034	SW846 6020B	1	03/06/2024 16:41	MO	A1
Lead, Total	0.021		mg/L	0.0040	0.0013	SW846 6020B	1	03/06/2024 16:41	MO	A1
Manganese, Total	1.5		mg/L	0.010	0.0034	SW846 6020B	1	03/06/2024 16:41	MO	A1
Mercury, Total	ND	ND	mg/L	0.00050	0.00017	SW846 7470A	1	03/01/2024 13:56	JSE	A
Nickel, Total	0.027		mg/L	0.010	0.0034	SW846 6020B	1	03/06/2024 16:41	MO	A1
Selenium, Total	ND	ND	mg/L	0.010	0.0034	SW846 6020B	1	03/06/2024 16:41	MO	A1
Sodium, Total	2.5		mg/L	0.20	0.067	SW846 6020B	1	03/06/2024 16:41	MO	A1
Zinc, Total	0.055		mg/L	0.010	0.0034	SW846 6020B	1	03/06/2024 16:41	MO	A1

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,8	MPN/100mL	5	5	SM9223B Colilert-18/Qua nitray	5	02/27/2024 13:47	CXA	F
Total Coliform	5	5,6	MPN/100mL	1	1	SM9223B-16	1	03/01/2024 13:38	ACA	G

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N, Low Level	0.02J	J	mg/L	0.10	0.01	SM 4500-NH3G	1	03/08/2024 02:20	NML	C
Chloride	ND	ND	mg/L	2.0	1.5	EPA 300.0	2	02/27/2024 16:49	J1W	E
Nitrate-N	0.48J	J	mg/L	1.0	0.22	EPA 300.0	2	02/27/2024 16:49	J1W	E
Nitrite-N	ND	ND	mg/L	1.0	0.36	EPA 300.0	2	02/27/2024 16:49	J1W	E
Nitrogen, Total Organic	ND	ND	mg/L	1.0	1	Calculation	1	03/11/2024 10:26	AKH	C
Phosphorus, Total	0.12		mg/L	0.10	0.085	EPA 365.1	1	02/28/2024 19:09	JMS	C
Phosphorus, Total as PO4	0.36	1	mg/L			EPA 365.1	1	02/28/2024 19:09	JMS	C
Sulfate	18.1		mg/L	2.0	1.5	EPA 300.0	2	02/27/2024 16:49	J1W	E
Total Dissolved Solids	90		mg/L	25	25	SM2540C-15	1	02/29/2024 15:30	RAG	E
Total Kjeldahl Nitrogen	0.6J	J	mg/L	1.0	0.4	S4500NH3G-11	1	03/07/2024 11:15	JXL	C
Total Nitrogen	1.06J	J	mg/L	3.00	1	Calculation	1	03/08/2024 14:00	CW	C
Total Suspended Solids	1590		mg/L	5	5	SM2540D-15	1	02/27/2024 13:50	ANH	E



Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3347329001	MW-1	SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM 4500-NH3G	N/A	
		SM2540C-15	N/A	
		SM2540D-15	N/A	
3347329002	MW-2	SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM 4500-NH3G	N/A	
		SM2540C-15	N/A	
		SM2540D-15	N/A	
3347329003	MW-3	SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM 4500-NH3G	N/A	
		SM2540C-15	N/A	
		SM2540D-15	N/A	
3347329004	MW-4	SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM 4500-NH3G	N/A	
		SM2540C-15	N/A	
		SM2540D-15	N/A	



Project Mt. Cuba GW
Workorder 3347329

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3347329005	MW-5	SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM 4500-NH3G	N/A	
		SM2540C-15	N/A	
		SM2540D-15	N/A	



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3347329001	MW-1	SW846 3015A	1147085	02/27/2024 01:45	ANN	SW846 6020B	1152503
		SW846 7470A	1148161	02/29/2024 10:12	JSE	SW846 7470A	1150601
		N/A	1147408	02/26/2024 19:19	CXA	SM9223B Colilert-18/Quantitray	1147409
		SM9223B-16	1147071	02/26/2024 16:24	LAB	SM9223B-16	1147072
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1147099
		EPA 365.1	1148482	03/04/2024 08:29	JMS	EPA 365.1	1151528
		S4500-NorgB-11	1150102	03/06/2024 07:18	JXL	S4500NH3G-11	1153203
		N/A	N/A	N/A		SM 4500-NH3G	1152589
		N/A	N/A	N/A		SM2540C-15	1148412
		N/A	N/A	N/A		SM2540D-15	1147212
3347329002	MW-2	SW846 3015A	1147085	02/27/2024 01:45	ANN	SW846 6020B	1152503
		SW846 7470A	1148161	02/29/2024 10:12	JSE	SW846 7470A	1150601
		N/A	1147408	02/26/2024 19:19	CXA	SM9223B Colilert-18/Quantitray	1147409
		SM9223B-16	1147071	02/26/2024 16:24	LAB	SM9223B-16	1147072
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1147099
		EPA 365.1	1148040	02/28/2024 09:06	JMS	EPA 365.1	1148030
		S4500-NorgB-11	1150102	03/06/2024 07:18	JXL	S4500NH3G-11	1153203
		N/A	N/A	N/A		SM 4500-NH3G	1152589
		N/A	N/A	N/A		SM2540C-15	1148412
		N/A	N/A	N/A		SM2540D-15	1147212
3347329003	MW-3	SW846 3015A	1147085	02/27/2024 01:45	ANN	SW846 6020B	1152503
		SW846 7470A	1148161	02/29/2024 10:12	JSE	SW846 7470A	1150601
		N/A	1147408	02/26/2024 19:19	CXA	SM9223B Colilert-18/Quantitray	1147409
		SM9223B-16	1147071	02/26/2024 16:24	LAB	SM9223B-16	1147072
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1147099
		EPA 365.1	1148040	02/28/2024 09:06	JMS	EPA 365.1	1148030
		S4500-NorgB-11	1150102	03/06/2024 07:18	JXL	S4500NH3G-11	1153203
		N/A	N/A	N/A		SM 4500-NH3G	1152589
		N/A	N/A	N/A		SM2540C-15	1148412
		N/A	N/A	N/A		SM2540D-15	1147212
3347329004	MW-4	SW846 3015A	1147085	02/27/2024 01:45	ANN	SW846 6020B	1152503
		SW846 7470A	1148161	02/29/2024 10:12	JSE	SW846 7470A	1150601
		N/A	1147408	02/26/2024 19:19	CXA	SM9223B Colilert-18/Quantitray	1147409
		SM9223B-16	1147071	02/26/2024 16:24	LAB	SM9223B-16	1147072
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1147099
		EPA 365.1	1148482	03/04/2024 08:29	JMS	EPA 365.1	1151528
		S4500-NorgB-11	1150102	03/06/2024 07:18	JXL	S4500NH3G-11	1153203
		N/A	N/A	N/A		SM 4500-NH3G	1152589
		N/A	N/A	N/A		SM2540C-15	1148412
		N/A	N/A	N/A		SM2540D-15	1147212
3347329005	MW-5	SW846 3015A	1147085	02/27/2024 01:45	ANN	SW846 6020B	1152503
		SW846 7470A	1148161	02/29/2024 10:12	JSE	SW846 7470A	1150601
		N/A	1147408	02/26/2024 19:19	CXA	SM9223B Colilert-18/Quantitray	1147409
		SM9223B-16	1147071	02/26/2024 16:24	LAB	SM9223B-16	1147072
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1147099
		EPA 365.1	1148040	02/28/2024 09:06	JMS	EPA 365.1	1148030
		S4500-NorgB-11	1150102	03/06/2024 07:18	JXL	S4500NH3G-11	1153203
		N/A	N/A	N/A		SM 4500-NH3G	1152589
		N/A	N/A	N/A		SM2540C-15	1148412
		N/A	N/A	N/A		SM2540D-15	1147212

301 Fulling Mill Rd, Suite A
Middletown, PA 17057
P. 717-944-5541

CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS
ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT/
SAMPLER. INSTRUCTIONS ON THE BACK.

Client Name: **Adm Group LLC**
 Address: **515 Sifenlein St.
West Chester, PA, 19382**
 Contact: **Will Fernandez**
 Phone#: **267 854 5541**
 Project Name#: **Mt. Cuba GW / 193824.01**
 Bill To: **Adm Group**
 Purchase Order #: **000193824.01**
 Normal-Standard TAT is 10-12 business days.
 Rush-Subject to ALS approval and surcharges.
 Date Required: Approved?
 Email: **wfernandez@admgroup.net**
D.Schnott@admgroup.net

Date Collected: 2/26/24 1200
 Time Collected: 1150
 Date Collected: 1123
 Time Collected: 1135
 Date Collected: 1215

Container Type: P P P P P P
 Container Size: 1L 250 mL 125 mL 100 mL 100 mL
 Preservative: - #250 #100 5.0% #250 5.0%

Orthophosphate Filtered? Yes No
 ANALYSIS / METHOD REQUESTS
 Matrix (See bottom of COC) *G or C
 SDWA Sample Type (see key) *G or C
 Enter Number of Containers Per Sample
 CI, NO3, NO2, SO4
 Total Phosphate, Total NH3, Total
 Total Wastewater
 Total Coliform
 Fecal Coliform
 Total Metals: As, Cd, Cr, Cu, Fe, Mn, Hg, Ni, Pb, Se, Zn

Temp By: **MB** WO Temp (°C) **2**
 Temp (°C) **2**
 Receipt Info Completed By:
 Cooler Custody Seal Intact
 Sample Custody Seal Intact
 Received on Ice
 Cooler & Samples Intact
 Correct Container's Provided
 Sample Label/COC Agree
 Adequate Sample Volumes
 CR6 Samples Filtered
 OP Samples Filtered
 VOA Trip Blank
 NUS 4 Days?
 Rad Screen (uCi)
 Courier/Tracking #:

Temp by: **MB** WO Temp (°C) **2**
 Receipt Info Completed By:
 Cooler Custody Seal Intact
 Sample Custody Seal Intact
 Received on Ice
 Cooler & Samples Intact
 Correct Container's Provided
 Sample Label/COC Agree
 Adequate Sample Volumes
 CR6 Samples Filtered
 OP Samples Filtered
 VOA Trip Blank
 NUS 4 Days?
 Rad Screen (uCi)
 Courier/Tracking #:

Therm ID: **S10**
 Completed by: **Y N N A**
 Study Seals Intact: **Y N N A**
 Study Seal Intact: **Y N N A**
 in Ice: **Y N N A**
 Samples Intact: **Y N N A**
 Containers Provided: **Y N N A**
 Sell/COC Agree: **Y N N A**
 Sample Volumes: **Y N N A**
 OP Volumes: **Y N N A**
 Trip Blank: **Y N N A**
 NUS 4 Days?: **Y N N A**
 Rad Screen (uCi): **Y N N A**
 Courier/Tracking #: **2262024009**

Client contact: **fechal**
2262024014
2262024013
2262024018

SDWA Compliance: **Y N N A**
 PWSID: **Y N N A**
 WV Containers 0-6°C: **Y N N A**

SDWA Compliance: **Y N N A**
 PWSID: **Y N N A**
 WV Containers 0-6°C: **Y N N A**

SDWA Compliance: **Y N N A**
 PWSID: **Y N N A**
 WV Containers 0-6°C: **Y N N A**

Date	Time	Relinquished By / Company Name	Received By / Company Name
2/26/24	1225	<i>[Signature]</i>	<i>[Signature]</i>
2/26/24	1416	<i>[Signature]</i>	<i>[Signature]</i>

Circle Sample Collector: ALS Tech / **Will Fernandez** ID: **2**
 Comments:
 Relinquished By / Company Name: **Will Fernandez**
 Received By / Company Name: **Will Fernandez**

3/11/2024 10:40 AM

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Rev 07.06.2023



Main Site: 301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | www.alsglobal.com
 Associated Site: 20 Riverside Drive | Spring City, PA 19475 | Phone: 610-948-4903 | Fax: 717-944-1430 |

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343, NJ PA101

Analytical Results Report For

ARM Brickhouse

Project Mt. Cuba Center - DE GWs
 Workorder 3352023
 Report ID 320326 on 5/6/2024 (Revised report. See Project Notations Section.)

Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Mar 26, 2024.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Jessica Smith (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Global.
 ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):
 Alexander Chipman - ARM Brickhouse
 William Fernandez - ARM Brickhouse
 Becky Hingley - ARM Brickhouse
 Doug Schott - ARM Brickhouse
 Kristina Early - ARM Brickhouse

Jessica Smith

Jessica Smith
 Project Coordinator

(ALS Digital Signature)

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.



Sample Summary

<u>Lab ID</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Collector</u>	<u>Collection Company</u>
3352023001	MW-1	Ground Water	03/26/2024 12:15	03/26/2024 16:04	WF	Brickhouse Environmental
3352023002	MW-2	Ground Water	03/26/2024 12:25	03/26/2024 16:04	WF	Brickhouse Environmental
3352023003	MW-3	Ground Water	03/26/2024 12:35	03/26/2024 16:04	WF	Brickhouse Environmental
3352023004	MW-4	Ground Water	03/26/2024 12:57	03/26/2024 16:04	WF	Brickhouse Environmental
3352023005	MW-5	Ground Water	03/26/2024 12:47	03/26/2024 16:04	WF	Brickhouse Environmental



Reference

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136, including but not limited to the following EPA Method reference revisions:
EPA 300.1 Rev. 1.0-1997
EPA 300.0 Rev. 2.1-1993
EPA 353.2 Rev. 2.0-1993
EPA 410.4 Rev. 1.0-1993
EPA 420.4 Rev. 1.0-1993
EPA 365.1 Rev. 2.0-1993
EPA 200.7 Rev. 4.4-1994
EPA 200.8 Rev. 5.4-1994
EPA 245.1 Rev. 3.0-1994
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.



Project Notations

P1 Report modified to include Phos as PO4. JLS 05/03/24

Sample Notations

Lab ID **Sample ID**

Result Notations

Notation Ref.

- | | |
|---|---|
| 1 | Analyte was analyzed past the 48 hour holding time. |
| 2 | The Phosphorus as PO4 result is a calculated value based on the Total Phosphorus as P result. |
| 3 | This sample result was calculated and reported using Method SM2340B-2011. |
| 4 | ND is defined as <1 MPN/100mL |
| 5 | ALS-Middletown does not hold PADEP NELAP accreditation for this analyte by this method of analysis. |
| 6 | NPW TC analyzed following SM 9221B and EPA 600/8-78-017 pg 114. ND is defined as <2 MPN/100mL |



Detected Results Summary

Client Sample ID	MW-1	Collected	03/26/2024 12:15
Lab Sample ID	3352023001	Lab Receipt	03/26/2024 16:04

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Chromium, Total	0.0058	mg/L	0.0022	0.00074	SW846 6020B	#
Copper, Total	0.012	mg/L	0.0056	0.0019	SW846 6020B	#
Hardness	43.1	mg/L	1.0		SW846 6020A	#
Iron, Total	4.6	mg/L	0.056	0.019	SW846 6020B	#
Lead, Total	0.0015J	mg/L	0.0022	0.00074	SW846 6020B	#
Manganese, Total	0.053	mg/L	0.0056	0.0019	SW846 6020B	#
Nickel, Total	0.0065	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	5.4	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.014	mg/L	0.0056	0.0019	SW846 6020B	#
MICROBIOLOGY						
Total Coliform	2	MPN/100mL	1	1	SM9223B-16	#
WET CHEMISTRY						
Chloride	4.0	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	2.3	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total	0.094J	mg/L	0.10	0.085	EPA 365.1	#
Phosphorus, Total as PO4	0.29	mg/L			EPA 365.1	#
Sulfate	21.1	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	90	mg/L	25	25	SM2540C-15	#
Total Nitrogen	2.31J	mg/L	3.00	1	Calculation	#
Total Suspended Solids	148	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-2	Collected	03/26/2024 12:25
Lab Sample ID	3352023002	Lab Receipt	03/26/2024 16:04

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Chromium, Total	0.0012J	mg/L	0.0022	0.00074	SW846 6020B	#
Copper, Total	0.0041J	mg/L	0.0056	0.0019	SW846 6020B	#
Hardness	38.1	mg/L	1.0		SW846 6020A	#
Iron, Total	0.65	mg/L	0.056	0.019	SW846 6020B	#
Manganese, Total	0.0095	mg/L	0.0056	0.0019	SW846 6020B	#
Nickel, Total	0.0028J	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	6.9	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.0036J	mg/L	0.0056	0.0019	SW846 6020B	#
WET CHEMISTRY						
Chloride	5.9	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	2.7	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total	0.51	mg/L	0.10	0.085	EPA 365.1	#
Phosphorus, Total as PO4	1.6	mg/L			EPA 365.1	#
Sulfate	19.4	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	94	mg/L	25	25	SM2540C-15	#
Total Nitrogen	2.74J	mg/L	3.00	1	Calculation	#
Total Suspended Solids	642	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-3	Collected	03/26/2024 12:35
Lab Sample ID	3352023003	Lab Receipt	03/26/2024 16:04

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Chromium, Total	0.013	mg/L	0.0022	0.00074	SW846 6020B	#
Copper, Total	0.018	mg/L	0.0056	0.0019	SW846 6020B	#
Hardness	41.6	mg/L	1.0		SW846 6020A	#
Iron, Total	8.8	mg/L	0.056	0.019	SW846 6020B	#
Lead, Total	0.0038	mg/L	0.0022	0.00074	SW846 6020B	#
Manganese, Total	0.16	mg/L	0.0056	0.0019	SW846 6020B	#
Nickel, Total	0.0075	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	5.1	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.018	mg/L	0.0056	0.0019	SW846 6020B	#
WET CHEMISTRY						
Chloride	1.7J	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	0.95J	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total	0.59	mg/L	0.10	0.085	EPA 365.1	#
Phosphorus, Total as PO4	1.8	mg/L			EPA 365.1	#
Sulfate	19.5	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	90	mg/L	25	25	SM2540C-15	#
Total Suspended Solids	116	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-4	Collected	03/26/2024 12:57
Lab Sample ID	3352023004	Lab Receipt	03/26/2024 16:04

<u>Compound</u>	<u>Result</u>	<u>Units</u>	<u>RDL</u>	<u>MDL</u>	<u>Method</u>	<u>Flag</u>
METALS						
Hardness	31.0	mg/L	1.0		SW846 6020A	#
Iron, Total	0.066	mg/L	0.056	0.019	SW846 6020B	#
Manganese, Total	0.0034J	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	4.0	mg/L	0.11	0.037	SW846 6020B	#
WET CHEMISTRY						
Chloride	1.6J	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	0.88J	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total as PO4	0.21	mg/L			EPA 365.1	#
Sulfate	16.5	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	69	mg/L	25	25	SM2540C-15	#
Total Suspended Solids	41	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-5	Collected	03/26/2024 12:47
Lab Sample ID	3352023005	Lab Receipt	03/26/2024 16:04

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Chromium, Total	0.0014J	mg/L	0.0022	0.00074	SW846 6020B	#
Hardness	29.9	mg/L	1.0		SW846 6020A	#
Iron, Total	0.80	mg/L	0.056	0.019	SW846 6020B	#
Manganese, Total	0.050	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	2.4	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.0026J	mg/L	0.0056	0.0019	SW846 6020B	#
WET CHEMISTRY						
Nitrate-N	0.45J	mg/L	1.0	0.22	EPA 300.0	#
Nitrogen, Total Organic	1.0	mg/L	1.0	1	Calculation	#
Phosphorus, Total as PO4	0.19	mg/L			EPA 365.1	#
Sulfate	16.3	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	68	mg/L	25	25	SM2540C-15	#
Total Kjeldahl Nitrogen	1.0	mg/L	1.0	0.4	S4500NH3G-11	#
Total Nitrogen	1.46J	mg/L	3.00	1	Calculation	#
Total Suspended Solids	366	mg/L	5	5	SM2540D-15	#



Results

Client Sample ID	MW-1	Collected	03/26/2024 12:15
Lab Sample ID	3352023001	Lab Receipt	03/26/2024 16:04

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND,P1	mg/L	0.0033	0.0011	SW846 6020B	1	04/04/2024 11:00	MO	B2
Cadmium, Total	ND	ND,P1	mg/L	0.0011	0.00037	SW846 6020B	1	04/04/2024 11:00	MO	B2
Chromium, Total	0.0058	P1	mg/L	0.0022	0.00074	SW846 6020B	1	04/04/2024 11:00	MO	B2
Copper, Total	0.012	P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:00	MO	B2
Hardness	43.1	3,P1	mg/L	1.0		SW846 6020A	1	04/04/2024 11:00	MO	B1
Iron, Total	4.6	P1	mg/L	0.056	0.019	SW846 6020B	1	04/04/2024 11:00	MO	B2
Lead, Total	0.0015J	J,P1	mg/L	0.0022	0.00074	SW846 6020B	1	04/04/2024 11:00	MO	B2
Manganese, Total	0.053	P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:00	MO	B2
Mercury, Total	ND	ND,P1	mg/L	0.00050	0.00017	SW846 7470A	1	04/04/2024 15:14	JSE	B
Nickel, Total	0.0065	P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:00	MO	B2
Selenium, Total	ND	ND,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:00	MO	B2
Sodium, Total	5.4	P1	mg/L	0.11	0.037	SW846 6020B	1	04/04/2024 12:58	MO	B2
Zinc, Total	0.014	P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:00	MO	B2

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,4,P1	MPN/100mL	1	1	SM9223B Colilert-18/Qua nitray	1	03/27/2024 11:27	ACA	E
Total Coliform	2	5,6,P1	MPN/100mL	1	1	SM9223B-16	1	03/30/2024 13:30	ACA	F

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N	ND	ND,P1	mg/L	0.100	0.03	ASTM D6919-17	10	04/03/2024 10:22	NML	A
Chloride	4.0	P1	mg/L	2.0	1.5	EPA 300.0	2	03/27/2024 16:01	J1W	D
Nitrate-N	2.3	1,P1	mg/L	1.0	0.22	EPA 300.0	2	03/27/2024 16:01	J1W	D
Nitrite-N	ND	ND,1,P1	mg/L	1.0	0.36	EPA 300.0	2	03/27/2024 16:01	J1W	D
Nitrogen, Total Organic	ND	ND,P1	mg/L	1.0	1	Calculation	1	04/05/2024 11:01	AKH	A
Phosphorus, Total	0.094J	J,P1	mg/L	0.10	0.085	EPA 365.1	1	03/28/2024 20:21	AKH	A
Phosphorus, Total as PO4	0.29	2,P1	mg/L			EPA 365.1	1	03/28/2024 20:21	AKH	A
Sulfate	21.1	P1	mg/L	2.0	1.5	EPA 300.0	2	03/27/2024 16:01	J1W	D
Total Dissolved Solids	90	P1	mg/L	25	25	SM2540C-15	1	03/27/2024 15:40	RAG	D
Total Kjeldahl Nitrogen	ND	ND,P1	mg/L	1.0	0.4	S4500NH3G-11	1	04/02/2024 14:03	JXL	A
Total Nitrogen	2.31J	J,P1	mg/L	3.00	1	Calculation	1	04/03/2024 12:10	CW	A
Total Suspended Solids	148	P1	mg/L	5	5	SM2540D-15	1	03/27/2024 09:39	ANH	D



Results

Client Sample ID	MW-2	Collected	03/26/2024 12:25
Lab Sample ID	3352023002	Lab Receipt	03/26/2024 16:04

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND,P1	mg/L	0.0033	0.0011	SW846 6020B	1	04/04/2024 11:02	MO	B2
Cadmium, Total	ND	ND,P1	mg/L	0.0011	0.00037	SW846 6020B	1	04/04/2024 11:02	MO	B2
Chromium, Total	0.0012J	J,P1	mg/L	0.0022	0.00074	SW846 6020B	1	04/04/2024 11:02	MO	B2
Copper, Total	0.0041J	J,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:02	MO	B2
Hardness	38.1	3,P1	mg/L	1.0		SW846 6020A	1	04/04/2024 11:02	MO	B1
Iron, Total	0.65	P1	mg/L	0.056	0.019	SW846 6020B	1	04/04/2024 11:02	MO	B2
Lead, Total	ND	ND,P1	mg/L	0.0022	0.00074	SW846 6020B	1	04/04/2024 11:02	MO	B2
Manganese, Total	0.0095	P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:02	MO	B2
Mercury, Total	ND	ND,P1	mg/L	0.00050	0.00017	SW846 7470A	1	04/04/2024 15:19	JSE	B
Nickel, Total	0.0028J	J,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:02	MO	B2
Selenium, Total	ND	ND,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:02	MO	B2
Sodium, Total	6.9	P1	mg/L	0.11	0.037	SW846 6020B	1	04/04/2024 13:01	MO	B2
Zinc, Total	0.0036J	J,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:02	MO	B2

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,4,P1	MPN/100mL	1	1	SM9223B Colilert-18/Qua nitray	1	03/27/2024 11:27	ACA	E
Total Coliform	ND	ND,5,6, P1	MPN/100mL	1	1	SM9223B-16	1	03/30/2024 13:30	ACA	F

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N	ND	ND,P1	mg/L	0.250	0.07	ASTM D6919-17	25	04/05/2024 22:18	NML	A
Chloride	5.9	P1	mg/L	2.0	1.5	EPA 300.0	2	03/27/2024 16:12	J1W	D
Nitrate-N	2.7	1,P1	mg/L	1.0	0.22	EPA 300.0	2	03/27/2024 16:12	J1W	D
Nitrite-N	ND	ND,1,P1	mg/L	1.0	0.36	EPA 300.0	2	03/27/2024 16:12	J1W	D
Nitrogen, Total Organic	ND	ND,P1	mg/L	1.0	1	Calculation	1	04/08/2024 16:02	AKH	A
Phosphorus, Total	0.51	P1	mg/L	0.10	0.085	EPA 365.1	1	03/28/2024 22:13	AKH	A
Phosphorus, Total as PO4	1.6	2,P1	mg/L			EPA 365.1	1	03/28/2024 22:13	AKH	A
Sulfate	19.4	P1	mg/L	2.0	1.5	EPA 300.0	2	03/27/2024 16:12	J1W	D
Total Dissolved Solids	94	P1	mg/L	25	25	SM2540C-15	1	03/27/2024 15:40	RAG	D
Total Kjeldahl Nitrogen	ND	ND,P1	mg/L	1.0	0.4	S4500NH3G-11	1	04/02/2024 14:05	JXL	A
Total Nitrogen	2.74J	J,P1	mg/L	3.00	1	Calculation	1	04/03/2024 12:11	CW	A
Total Suspended Solids	642	P1	mg/L	5	5	SM2540D-15	1	03/27/2024 09:39	ANH	D



Results

Client Sample ID	MW-3	Collected	03/26/2024 12:35
Lab Sample ID	3352023003	Lab Receipt	03/26/2024 16:04

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND,P1	mg/L	0.0033	0.0011	SW846 6020B	1	04/04/2024 11:04	MO	B2
Cadmium, Total	ND	ND,P1	mg/L	0.0011	0.00037	SW846 6020B	1	04/04/2024 11:04	MO	B2
Chromium, Total	0.013	P1	mg/L	0.0022	0.00074	SW846 6020B	1	04/04/2024 11:04	MO	B2
Copper, Total	0.018	P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:04	MO	B2
Hardness	41.6	3,P1	mg/L	1.0		SW846 6020A	1	04/04/2024 11:04	MO	B1
Iron, Total	8.8	P1	mg/L	0.056	0.019	SW846 6020B	1	04/04/2024 11:04	MO	B2
Lead, Total	0.0038	P1	mg/L	0.0022	0.00074	SW846 6020B	1	04/04/2024 11:04	MO	B2
Manganese, Total	0.16	P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:04	MO	B2
Mercury, Total	ND	ND,P1	mg/L	0.00050	0.00017	SW846 7470A	1	04/04/2024 15:20	JSE	B
Nickel, Total	0.0075	P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:04	MO	B2
Selenium, Total	ND	ND,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:04	MO	B2
Sodium, Total	5.1	P1	mg/L	0.11	0.037	SW846 6020B	1	04/04/2024 13:03	MO	B2
Zinc, Total	0.018	P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:04	MO	B2

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,4,P1	MPN/100mL	1	1	SM9223B Colilert-18/Qua nitray	1	03/27/2024 11:27	ACA	E
Total Coliform	ND	ND,5,6, P1	MPN/100mL	1	1	SM9223B-16	1	03/30/2024 13:30	ACA	F

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N	ND	ND,P1	mg/L	0.250	0.07	ASTM D6919-17	25	04/05/2024 22:37	NML	A
Chloride	1.7J	J,P1	mg/L	2.0	1.5	EPA 300.0	2	03/27/2024 16:53	J1W	D
Nitrate-N	0.95J	J,1,P1	mg/L	1.0	0.22	EPA 300.0	2	03/27/2024 16:53	J1W	D
Nitrite-N	ND	ND,1,P1	mg/L	1.0	0.36	EPA 300.0	2	03/27/2024 16:53	J1W	D
Nitrogen, Total Organic	ND	ND,P1	mg/L	1.0	1	Calculation	1	04/08/2024 16:03	AKH	A
Phosphorus, Total	0.59	P1	mg/L	0.10	0.085	EPA 365.1	1	03/28/2024 21:55	AKH	A
Phosphorus, Total as PO4	1.8	2,P1	mg/L			EPA 365.1	1	03/28/2024 21:55	AKH	A
Sulfate	19.5	P1	mg/L	2.0	1.5	EPA 300.0	2	03/27/2024 16:53	J1W	D
Total Dissolved Solids	90	P1	mg/L	25	25	SM2540C-15	1	03/27/2024 15:40	RAG	D
Total Kjeldahl Nitrogen	ND	ND,P1	mg/L	1.0	0.4	S4500NH3G-11	1	04/02/2024 14:08	JXL	A
Total Nitrogen	ND	ND,P1	mg/L	3.00	1	Calculation	1	04/03/2024 12:12	CW	A
Total Suspended Solids	116	P1	mg/L	5	5	SM2540D-15	1	03/27/2024 09:39	ANH	D



Results

Client Sample ID	MW-4	Collected	03/26/2024 12:57
Lab Sample ID	3352023004	Lab Receipt	03/26/2024 16:04

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND,P1	mg/L	0.0033	0.0011	SW846 6020B	1	04/04/2024 11:06	MO	B2
Cadmium, Total	ND	ND,P1	mg/L	0.0011	0.00037	SW846 6020B	1	04/04/2024 11:06	MO	B2
Chromium, Total	ND	ND,P1	mg/L	0.0022	0.00074	SW846 6020B	1	04/04/2024 11:06	MO	B2
Copper, Total	ND	ND,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:06	MO	B2
Hardness	31.0	3,P1	mg/L	1.0		SW846 6020A	1	04/04/2024 11:06	MO	B1
Iron, Total	0.066	P1	mg/L	0.056	0.019	SW846 6020B	1	04/04/2024 11:06	MO	B2
Lead, Total	ND	ND,P1	mg/L	0.0022	0.00074	SW846 6020B	1	04/04/2024 11:06	MO	B2
Manganese, Total	0.0034J	J,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:06	MO	B2
Mercury, Total	ND	ND,P1	mg/L	0.00050	0.00017	SW846 7470A	1	04/04/2024 15:21	JSE	B
Nickel, Total	ND	ND,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:06	MO	B2
Selenium, Total	ND	ND,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:06	MO	B2
Sodium, Total	4.0	P1	mg/L	0.11	0.037	SW846 6020B	1	04/04/2024 13:05	MO	B2
Zinc, Total	ND	ND,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:06	MO	B2

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,4,P1	MPN/100mL	1	1	SM9223B Colilert-18/Qua nitray	1	03/27/2024 11:27	ACA	E
Total Coliform	ND	ND,5,6, P1	MPN/100mL	1	1	SM9223B-16	1	03/30/2024 13:30	ACA	F

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N	ND	ND,P1	mg/L	0.100	0.03	ASTM D6919-17	10	04/03/2024 11:56	NML	A
Chloride	1.6J	J,P1	mg/L	2.0	1.5	EPA 300.0	2	03/27/2024 17:04	J1W	D
Nitrate-N	0.88J	J,1,P1	mg/L	1.0	0.22	EPA 300.0	2	03/27/2024 17:04	J1W	D
Nitrite-N	ND	ND,1,P1	mg/L	1.0	0.36	EPA 300.0	2	03/27/2024 17:04	J1W	D
Nitrogen, Total Organic	ND	ND,P1	mg/L	1.0	1	Calculation	1	04/05/2024 11:02	AKH	A
Phosphorus, Total	ND	ND,P1	mg/L	0.10	0.085	EPA 365.1	1	03/28/2024 21:57	AKH	A
Phosphorus, Total as PO4	0.21	2,P1	mg/L			EPA 365.1	1	03/28/2024 21:57	AKH	A
Sulfate	16.5	P1	mg/L	2.0	1.5	EPA 300.0	2	03/27/2024 17:04	J1W	D
Total Dissolved Solids	69	P1	mg/L	25	25	SM2540C-15	1	03/27/2024 15:40	RAG	D
Total Kjeldahl Nitrogen	ND	ND,P1	mg/L	1.0	0.4	S4500NH3G-11	1	04/02/2024 14:10	JXL	A
Total Nitrogen	ND	ND,P1	mg/L	3.00	1	Calculation	1	04/03/2024 12:13	CW	A
Total Suspended Solids	41	P1	mg/L	5	5	SM2540D-15	1	03/27/2024 09:39	ANH	D



Results

Client Sample ID	MW-5	Collected	03/26/2024 12:47
Lab Sample ID	3352023005	Lab Receipt	03/26/2024 16:04

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND,P1	mg/L	0.0033	0.0011	SW846 6020B	1	04/04/2024 11:08	MO	B2
Cadmium, Total	ND	ND,P1	mg/L	0.0011	0.00037	SW846 6020B	1	04/04/2024 11:08	MO	B2
Chromium, Total	0.0014J	J,P1	mg/L	0.0022	0.00074	SW846 6020B	1	04/04/2024 11:08	MO	B2
Copper, Total	ND	ND,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:08	MO	B2
Hardness	29.9	3,P1	mg/L	1.0		SW846 6020A	1	04/04/2024 11:08	MO	B1
Iron, Total	0.80	P1	mg/L	0.056	0.019	SW846 6020B	1	04/04/2024 11:08	MO	B2
Lead, Total	ND	ND,P1	mg/L	0.0022	0.00074	SW846 6020B	1	04/04/2024 11:08	MO	B2
Manganese, Total	0.050	P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:08	MO	B2
Mercury, Total	ND	ND,P1	mg/L	0.00050	0.00017	SW846 7470A	1	04/04/2024 15:25	JSE	B
Nickel, Total	ND	ND,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:08	MO	B2
Selenium, Total	ND	ND,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:08	MO	B2
Sodium, Total	2.4	P1	mg/L	0.11	0.037	SW846 6020B	1	04/04/2024 13:07	MO	B2
Zinc, Total	0.0026J	J,P1	mg/L	0.0056	0.0019	SW846 6020B	1	04/04/2024 11:08	MO	B2

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,4,P1	MPN/100mL	1	1	SM9223B Colilert-18/Qua nitray	1	03/27/2024 11:27	ACA	E
Total Coliform	ND	ND,5,6, P1	MPN/100mL	1	1	SM9223B-16	1	03/30/2024 13:30	ACA	F

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N	ND	ND,P1	mg/L	0.250	0.07	ASTM D6919-17	25	04/05/2024 22:57	NML	A
Chloride	ND	ND,P1	mg/L	2.0	1.5	EPA 300.0	2	03/27/2024 17:14	J1W	D
Nitrate-N	0.45J	J,1,P1	mg/L	1.0	0.22	EPA 300.0	2	03/27/2024 17:14	J1W	D
Nitrite-N	ND	ND,1,P1	mg/L	1.0	0.36	EPA 300.0	2	03/27/2024 17:14	J1W	D
Nitrogen, Total Organic	1.0	P1	mg/L	1.0	1	Calculation	1	04/08/2024 16:03	AKH	A
Phosphorus, Total	ND	ND,P1	mg/L	0.10	0.085	EPA 365.1	1	03/28/2024 21:53	AKH	A
Phosphorus, Total as PO4	0.19	2,P1	mg/L			EPA 365.1	1	03/28/2024 21:53	AKH	A
Sulfate	16.3	P1	mg/L	2.0	1.5	EPA 300.0	2	03/27/2024 17:14	J1W	D
Total Dissolved Solids	68	P1	mg/L	25	25	SM2540C-15	1	03/27/2024 15:40	RAG	D
Total Kjeldahl Nitrogen	1.0	P1	mg/L	1.0	0.4	S4500NH3G-11	1	04/02/2024 14:13	JXL	A
Total Nitrogen	1.46J	J,P1	mg/L	3.00	1	Calculation	1	04/03/2024 12:14	CW	A
Total Suspended Solids	366	P1	mg/L	5	5	SM2540D-15	1	03/27/2024 09:39	ANH	D



Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3352023001	MW-1	SW846 6020A	SW846 3015A	
		SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		ASTM D6919-17	N/A	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM2540C-15	N/A	
		SM2540D-15	N/A	
3352023002	MW-2	SW846 6020A	SW846 3015A	
		SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		ASTM D6919-17	N/A	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM2540C-15	N/A	
		SM2540D-15	N/A	
3352023003	MW-3	SW846 6020A	SW846 3015A	
		SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		ASTM D6919-17	N/A	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM2540C-15	N/A	
		SM2540D-15	N/A	
3352023004	MW-4	SW846 6020A	SW846 3015A	
		SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		ASTM D6919-17	N/A	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM2540C-15	N/A	
		SM2540D-15	N/A	



Project Mt. Cuba Center - DE GWs
Workorder 3352023

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3352023005	MW-5	SW846 6020A	SW846 3015A	
		SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		ASTM D6919-17	N/A	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM2540C-15	N/A	
		SM2540D-15	N/A	



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3352023001	MW-1	SW846 3015A	1163009	03/27/2024 00:48	ANN	SW846 6020A	1171508
		SW846 3015A	1163013	03/27/2024 03:35	ANN	SW846 6020B	1171507
		SW846 3015A	1163013	03/27/2024 03:35	ANN	SW846 6020B	1171213
		SW846 7470A	1171210	04/04/2024 10:30	JSE	SW846 7470A	1171533
		N/A	1163920	03/26/2024 16:51	ACA	SM9223B Colilert-18/Quantitray	1163921
		SM9223B-16	1163213	03/26/2024 17:41	CXA	SM9223B-16	1163214
		N/A	N/A	N/A		ASTM D6919-17	1168646
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1163243
		EPA 365.1	1163444	03/28/2024 09:42	JMS	EPA 365.1	1163879
		S4500-NorgB-11	1163929	04/01/2024 07:20	JXL	S4500NH3G-11	1169847
		N/A	N/A	N/A		SM2540C-15	1163281
N/A	N/A	N/A		SM2540D-15	1163256		
3352023002	MW-2	SW846 3015A	1163009	03/27/2024 00:48	ANN	SW846 6020A	1171508
		SW846 3015A	1163013	03/27/2024 03:35	ANN	SW846 6020B	1171213
		SW846 3015A	1163013	03/27/2024 03:35	ANN	SW846 6020B	1171507
		SW846 7470A	1171210	04/04/2024 10:30	JSE	SW846 7470A	1171533
		N/A	1163920	03/26/2024 16:51	ACA	SM9223B Colilert-18/Quantitray	1163921
		SM9223B-16	1163213	03/26/2024 17:41	CXA	SM9223B-16	1163214
		N/A	N/A	N/A		ASTM D6919-17	1173729
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1163243
		EPA 365.1	1163445	03/28/2024 09:42	JMS	EPA 365.1	1163879
		S4500-NorgB-11	1163929	04/01/2024 07:20	JXL	S4500NH3G-11	1169847
		N/A	N/A	N/A		SM2540C-15	1163281
N/A	N/A	N/A		SM2540D-15	1163256		
3352023003	MW-3	SW846 3015A	1163009	03/27/2024 00:48	ANN	SW846 6020A	1171508
		SW846 3015A	1163013	03/27/2024 03:35	ANN	SW846 6020B	1171213
		SW846 3015A	1163013	03/27/2024 03:35	ANN	SW846 6020B	1171507
		SW846 7470A	1171210	04/04/2024 10:30	JSE	SW846 7470A	1171533
		N/A	1163920	03/26/2024 16:51	ACA	SM9223B Colilert-18/Quantitray	1163921
		SM9223B-16	1163213	03/26/2024 17:41	CXA	SM9223B-16	1163214
		N/A	N/A	N/A		ASTM D6919-17	1173729
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1163243
		EPA 365.1	1163445	03/28/2024 09:42	JMS	EPA 365.1	1163879
		S4500-NorgB-11	1163929	04/01/2024 07:20	JXL	S4500NH3G-11	1169847
		N/A	N/A	N/A		SM2540C-15	1163281
N/A	N/A	N/A		SM2540D-15	1163256		
3352023004	MW-4	SW846 3015A	1163009	03/27/2024 00:48	ANN	SW846 6020A	1171508
		SW846 3015A	1163013	03/27/2024 03:35	ANN	SW846 6020B	1171507
		SW846 3015A	1163013	03/27/2024 03:35	ANN	SW846 6020B	1171213
		SW846 7470A	1171210	04/04/2024 10:30	JSE	SW846 7470A	1171533
		N/A	1163920	03/26/2024 16:51	ACA	SM9223B Colilert-18/Quantitray	1163921
		SM9223B-16	1163213	03/26/2024 17:41	CXA	SM9223B-16	1163214
		N/A	N/A	N/A		ASTM D6919-17	1168646
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1163243
		EPA 365.1	1163445	03/28/2024 09:42	JMS	EPA 365.1	1163879
		S4500-NorgB-11	1163929	04/01/2024 07:20	JXL	S4500NH3G-11	1169847
		N/A	N/A	N/A		SM2540C-15	1163281
N/A	N/A	N/A		SM2540D-15	1163256		



Project Mt. Cuba Center - DE GWs
Workorder 3352023

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3352023005	MW-5	SW846 3015A	1163009	03/27/2024 00:48	ANN	SW846 6020A	1171508
		SW846 3015A	1163013	03/27/2024 03:35	ANN	SW846 6020B	1171213
		SW846 3015A	1163013	03/27/2024 03:35	ANN	SW846 6020B	1171507
		SW846 7470A	1171210	04/04/2024 10:30	JSE	SW846 7470A	1171533
		N/A	1163920	03/26/2024 16:51	ACA	SM9223B Colilert-18/Quantitray	1163921
		SM9223B-16	1163213	03/26/2024 17:41	CXA	SM9223B-16	1163214
		N/A	N/A	N/A		ASTM D6919-17	1173729
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1163243
		EPA 365.1	1163445	03/28/2024 09:42	JMS	EPA 365.1	1163879
		S4500-NorgB-11	1163929	04/01/2024 07:20	JXL	S4500NH3G-11	1169847
		N/A	N/A	N/A		SM2540C-15	1163281
		N/A	N/A	N/A		SM2540D-15	1163256



301 Fulling Mill Rd, Suite A
Middletown, PA 17057
P. 717-944-5541

**CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS**
ALL SHADED AREAS MUST BE COMPLETED BY THE CL
SAMPLER. INSTRUCTIONS ON THE BACK.



3352023
Logged By: SLS
PM: JLS



352023
101

Client Name: Alm Group LLC		Temp By: MP		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Address: 515 S. Franklin street West Chester, PA 19382		Receipt Info Completed By:		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Contact: Will Fernandez		Cooler Custody Seal Intact		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Phone#: 267 384 5541		Sample Custody Seal Intact		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Project Name#: MS. Cuba GW / 1038734.01		Received on Ice		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Bill To: Alm Group		Cooler & Samples Intact		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Purchase Order #: 000197834.01		Correct Containers Provided		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
TAT <input checked="" type="checkbox"/> Normal-Standard TAT is 10-12 business days.		Sample Label/COC Agree		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Date Required: <input checked="" type="checkbox"/> Rush-Subject to ALS approval and surcharges.		Adequate Sample Volumes		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Email? <input checked="" type="checkbox"/> wfernandez@almgroup.net		CR6 Samples Filtered		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Approved? <input checked="" type="checkbox"/> DSNOOTH@almgroup.net		OP Samples Filtered		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Sample Description/Location		VOA Trip Blank		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Date Collected		NJIS 4 Days?		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Time		Rad Screen (uCi)		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
min:dd:yy		SDWA Compliance		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
hh:mm		PWSID		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
1 MW-1		WV Containers 0-6°C		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
3/6/24		Courier/Tracking #:		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
12:15		SDWA Compliance		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
12:25		PWSID		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
12:35		Rad Screen (uCi)		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
12:57		New Source? Y N		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
12:47		New Source Contact:		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
6		PWS Contact:		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
7		PWS Phone #:		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
8		SDWA Sample Type Key: D=Distribution E=Entry Point		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
9		R=Raw P=Plant C=Check S=Special A=Annual Startup		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
10		Sample/COC Remarks		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Comments:		Contains Short Hold Testing YES NO		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Circle Sample Collector: ALS Tech / Client		Internal Use: If less than 48 hours - notify lab upon receipt		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Name: Will Fernandez		State Samples Collected In		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Date:		Standard Lvl 1		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Time		Standard Lvl 2		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
13:20		Standard Lvl 3		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
3-26-24		Standard Lvl 4		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
1604		Excel Summary		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
3		Equis		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
5		Custom		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
7		Sample Disposal		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
9		Lab		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
10		Special		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Relinquished By / Company Name		Format Type		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
Received By / Company Name		EDDS:		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
3/26/24 13:20		Equis		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
3-26-24 1604		Custom		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
ALS		Sample Disposal		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
ALS		Lab		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
ALS		Special		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	
ALS		Other		Therm ID: 570		WO Temp (°C): 40		WO Temp (°C): 42	



Main Site: 301 Fulling Mill Road | Middletown, PA 17057 | Phone: 717-944-5541 | Fax: 717-944-1430 | www.alsglobal.com
 Associated Site: 20 Riverside Drive | Spring City, PA 19475 | Phone: 610-948-4903 | Fax: 717-944-1430 |

NELAP Certifications: NJ PA010 , NY 11759 , PA 22-293 DoD ELAP: PJLA 74618
 State Certifications: FL E871113 , WA C999 , MD 128 , VA 460157 , WV DW 9961-C , WV 343, NJ PA101

Analytical Results Report For

ARM Brickhouse

Project [Mt. Cuba GW/193834.01](#)
 Workorder [3356314](#)
 Report ID [319502 on 5/1/2024](#)

Certificate of Analysis

Enclosed are the analytical results for samples received by the laboratory on Apr 23, 2024.

The ALS Environmental laboratory in Middletown, Pennsylvania is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory and as such, certifies that all applicable test results meet the requirements of NELAP.

If you have any questions regarding this certificate of analysis, please contact Jessica Smith (Project Coordinator) at (717) 944-5541.

Analyses were performed according to our laboratory's NELAP-approved quality assurance program and any applicable state requirements. The test results meet requirements of the current NELAP standards or state requirements, where applicable. For a specific list of accredited analytes, refer to the certifications section of the ALS website at www.alsglobal.com/en/Our-Services/Life-Sciences/Environmental/Downloads.

This laboratory report may not be reproduced, except in full, without the written approval of ALS Global.
 ALS Middletown: 301 Fulling Mill Road, Middletown, PA 17057 : 717-944-5541.

Recipient(s):
 Alexander Chipman - ARM Brickhouse
 William Fernandez - ARM Brickhouse
 Becky Hingley - ARM Brickhouse
 Doug Schott - ARM Brickhouse
 Kristina Early - ARM Brickhouse

Jessica Smith

Jessica Smith
 Project Coordinator

(ALS Digital Signature)

This page is included as part of the Analytical Report and must be retained as a permanent record thereof.



Sample Summary

<u>Lab ID</u>	<u>Sample ID</u>	<u>Matrix</u>	<u>Date Collected</u>	<u>Date Received</u>	<u>Collector</u>	<u>Collection Company</u>
3356314001	MW-1	Ground Water	04/23/2024 11:55	04/23/2024 14:30	CBC	Collected By Client
3356314002	MW-2	Ground Water	04/23/2024 11:45	04/23/2024 14:30	CBC	Collected By Client
3356314003	MW-3	Ground Water	04/23/2024 12:03	04/23/2024 14:30	CBC	Collected By Client
3356314004	MW-4	Ground Water	04/23/2024 12:23	04/23/2024 14:30	CBC	Collected By Client
3356314005	MW-5	Ground Water	04/23/2024 12:13	04/23/2024 14:30	CBC	Collected By Client



Reference

Notes

- Samples collected by ALS personnel are done so in accordance with the procedures set forth in the ALS Field Sampling Plan (20 - Field Services Sampling Plan).
- Except as qualified, Clean Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 136, including but not limited to the following EPA Method reference revisions:
 EPA 300.1 Rev. 1.0-1997
 EPA 300.0 Rev. 2.1-1993
 EPA 353.2 Rev. 2.0-1993
 EPA 410.4 Rev. 1.0-1993
 EPA 420.4 Rev. 1.0-1993
 EPA 365.1 Rev. 2.0-1993
 EPA 200.7 Rev. 4.4-1994
 EPA 200.8 Rev. 5.4-1994
 EPA 245.1 Rev. 3.0-1994
- Except as qualified, Safe Drinking Water Act sample analyses are consistent with methodology requirements in 40 CFR Part 141.
- The Chain of Custody document is included as part of this report.
- All Library Search analytes should be regarded as tentative identifications based on the presumptive evidence of the mass spectra. Concentrations reported are estimated values.
- Parameters identified as "analyze immediately" require analysis within 15 minutes of collection. Any "analyze immediately" parameters not listed under the header "Field Parameters" are performed in the laboratory and are therefore analyzed out of hold time.
- Method references listed on this report beginning with the prefix "S" followed by a method number (such as S2310B-97) refer to methods from "Standard Methods for the Examination of Water and Wastewater".
- For microbiological analyses, the "Prepared" value is the date/time into the incubator and the "Analyzed" value is the date/time out the incubator.
- An Analysis-Prep Method Cross Reference Table is included after Analytical Results & Qualifiers section in this report.
- Unless otherwise noted, all quantitative results for soils are reported on a dry weight basis.

Standard Acronyms/Flags

J	Indicates an estimated value between the Method Detection Limit (MDL) and the Practical Quantitation Limit (PQL) for the analyte
U	Indicates that the analyte was Not Detected (ND) above the MDL
N	Indicates presumptive evidence of the presence of a compound
MDL	Method Detection Limit
PQL	Practical Quantitation Limit
RDL	Practical Quantitation Limit for this Project
ND	Not Detected - indicates that the analyte was Not Detected
Cntr	Analysis was performed using this container
RegLmt	Regulatory Limit
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
DUP	Sample Duplicate
%Rec	Percent Recovery
RPD	Relative Percent Difference
LOD	DoD Limit of Detection
LOQ	DoD Limit of Quantitation
DL	DoD Detection Limit
I	Indicates reported value is greater than or equal to the Method Detection Limit (MDL) but less than the Report Detection Limit (RDL)
(S)	Surrogate Compound
NC	Not Calculated
*	Result outside of QC limits
#	Please reference the result in the Results Section for analyte-level flags.



Project Notations

Sample Notations

Lab ID **Sample ID**

Result Notations

Notation Ref.

- | | |
|---|---|
| 1 | The Phosphorus as PO4 result is a calculated value based on the Total Phosphorus as P result. |
| 2 | ND is defined as <1 MPN/100mL |
| 3 | ALS-Middletown does not hold PADEP NELAP accreditation for this analyte by this method of analysis. |
| 4 | NPW TC analyzed following SM 9221B and EPA 600/8-78-017 pg 114. ND is defined as <2 MPN/100mL |



Detected Results Summary

Client Sample ID	MW-1	Collected	04/23/2024 11:55
Lab Sample ID	3356314001	Lab Receipt	04/23/2024 14:30

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Chromium, Total	0.0068	mg/L	0.0022	0.00074	SW846 6020B	#
Copper, Total	0.0092	mg/L	0.0056	0.0019	SW846 6020B	#
Iron, Total	6.7	mg/L	0.056	0.019	SW846 6020B	#
Lead, Total	0.0018J	mg/L	0.0022	0.00074	SW846 6020B	#
Manganese, Total	0.071	mg/L	0.0056	0.0019	SW846 6020B	#
Nickel, Total	0.0075	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	5.8	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.017	mg/L	0.0056	0.0019	SW846 6020B	#
MICROBIOLOGY						
Total Coliform	130	MPN/100mL	1	1	SM9223B-16	#
WET CHEMISTRY						
Chloride	4.8	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	3.1	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total as PO4	0.25	mg/L			EPA 365.1	#
Sulfate	25.7	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	110	mg/L	25	25	SM2540C-15	#
Total Nitrogen	3.07	mg/L	3.00	1	Calculation	#
Total Suspended Solids	390	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-2	Collected	04/23/2024 11:45
Lab Sample ID	3356314002	Lab Receipt	04/23/2024 14:30

<u>Compound</u>	<u>Result</u>	<u>Units</u>	<u>RDL</u>	<u>MDL</u>	<u>Method</u>	<u>Flag</u>
METALS						
Copper, Total	0.0048J	mg/L	0.0056	0.0019	SW846 6020B	#
Iron, Total	0.30	mg/L	0.056	0.019	SW846 6020B	#
Manganese, Total	0.0070	mg/L	0.0056	0.0019	SW846 6020B	#
Nickel, Total	0.0042J	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	6.4	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.0067	mg/L	0.0056	0.0019	SW846 6020B	#
MICROBIOLOGY						
Total Coliform	920	MPN/100mL	1	1	SM9223B-16	#
WET CHEMISTRY						
Chloride	6.0	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	2.9	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total as PO4	0.22	mg/L			EPA 365.1	#
Sulfate	21.5	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	104	mg/L	25	25	SM2540C-15	#
Total Kjeldahl Nitrogen	0.5J	mg/L	1.0	0.4	S4500NH3G-11	#
Total Nitrogen	3.44	mg/L	3.00	1	Calculation	#
Total Suspended Solids	458	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-3	Collected	04/23/2024 12:03
Lab Sample ID	3356314003	Lab Receipt	04/23/2024 14:30

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Chromium, Total	0.0042	mg/L	0.0022	0.00074	SW846 6020B	#
Copper, Total	0.0047J	mg/L	0.0056	0.0019	SW846 6020B	#
Iron, Total	2.8	mg/L	0.056	0.019	SW846 6020B	#
Lead, Total	0.0011J	mg/L	0.0022	0.00074	SW846 6020B	#
Manganese, Total	0.070	mg/L	0.0056	0.0019	SW846 6020B	#
Nickel, Total	0.0027J	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	5.0	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.0063	mg/L	0.0056	0.0019	SW846 6020B	#
MICROBIOLOGY						
Total Coliform	49	MPN/100mL	1	1	SM9223B-16	#
WET CHEMISTRY						
Chloride	2.1	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	0.96J	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total	0.12	mg/L	0.10	0.085	EPA 365.1	#
Phosphorus, Total as PO4	0.37	mg/L			EPA 365.1	#
Sulfate	19.9	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	54	mg/L	25	25	SM2540C-15	#
Total Nitrogen	0.96J	mg/L	3.00	1	Calculation	#
Total Suspended Solids	668	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-4	Collected	04/23/2024 12:23
Lab Sample ID	3356314004	Lab Receipt	04/23/2024 14:30

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Copper, Total	0.0022J	mg/L	0.0056	0.0019	SW846 6020B	#
Iron, Total	0.22	mg/L	0.056	0.019	SW846 6020B	#
Manganese, Total	0.0056J	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	4.2	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.0046J	mg/L	0.0056	0.0019	SW846 6020B	#
MICROBIOLOGY						
Total Coliform	2	MPN/100mL	1	1	SM9223B-16	#
WET CHEMISTRY						
Chloride	1.9J	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	0.89J	mg/L	1.0	0.22	EPA 300.0	#
Phosphorus, Total	0.11	mg/L	0.10	0.085	EPA 365.1	#
Phosphorus, Total as PO4	0.34	mg/L			EPA 365.1	#
Sulfate	17.4	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	40	mg/L	25	25	SM2540C-15	#
Total Suspended Solids	127	mg/L	5	5	SM2540D-15	#



Detected Results Summary

Client Sample ID	MW-5	Collected	04/23/2024 12:13
Lab Sample ID	3356314005	Lab Receipt	04/23/2024 14:30

Compound	Result	Units	RDL	MDL	Method	Flag
METALS						
Arsenic, Total	0.0019J	mg/L	0.0033	0.0011	SW846 6020B	#
Chromium, Total	0.018	mg/L	0.0022	0.00074	SW846 6020B	#
Copper, Total	0.029	mg/L	0.0056	0.0019	SW846 6020B	#
Iron, Total	14.1	mg/L	0.056	0.019	SW846 6020B	#
Lead, Total	0.0080	mg/L	0.0022	0.00074	SW846 6020B	#
Manganese, Total	0.55	mg/L	0.0056	0.0019	SW846 6020B	#
Nickel, Total	0.013	mg/L	0.0056	0.0019	SW846 6020B	#
Sodium, Total	2.8	mg/L	0.11	0.037	SW846 6020B	#
Zinc, Total	0.021	mg/L	0.0056	0.0019	SW846 6020B	#
MICROBIOLOGY						
Total Coliform	350	MPN/100mL	1	1	SM9223B-16	#
WET CHEMISTRY						
Chloride	1.7J	mg/L	2.0	1.5	EPA 300.0	#
Nitrate-N	0.42J	mg/L	1.0	0.22	EPA 300.0	#
Nitrogen, Total Organic	2.5	mg/L	1.0	1	Calculation	#
Phosphorus, Total	0.32	mg/L	0.10	0.085	EPA 365.1	#
Phosphorus, Total as PO4	0.99	mg/L			EPA 365.1	#
Sulfate	18.9	mg/L	2.0	1.5	EPA 300.0	#
Total Dissolved Solids	36	mg/L	25	25	SM2540C-15	#
Total Kjeldahl Nitrogen	2.5	mg/L	1.0	0.4	S4500NH3G-11	#
Total Nitrogen	2.93J	mg/L	3.00	1	Calculation	#
Total Suspended Solids	413	mg/L	5	5	SM2540D-15	#



Results

Client Sample ID	MW-1	Collected	04/23/2024 11:55
Lab Sample ID	3356314001	Lab Receipt	04/23/2024 14:30

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND	mg/L	0.0033	0.0011	SW846 6020B	1	04/30/2024 12:03	MO	A1
Cadmium, Total	ND	ND	mg/L	0.0011	0.00037	SW846 6020B	1	04/30/2024 12:03	MO	A1
Chromium, Total	0.0068		mg/L	0.0022	0.00074	SW846 6020B	1	04/30/2024 12:03	MO	A1
Copper, Total	0.0092		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:03	MO	A1
Iron, Total	6.7		mg/L	0.056	0.019	SW846 6020B	1	04/30/2024 12:03	MO	A1
Lead, Total	0.0018J	J	mg/L	0.0022	0.00074	SW846 6020B	1	04/30/2024 12:03	MO	A1
Manganese, Total	0.071		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:03	MO	A1
Mercury, Total	ND	ND	mg/L	0.00050	0.00017	SW846 7470A	1	04/25/2024 13:46	JSE	A
Nickel, Total	0.0075		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:03	MO	A1
Selenium, Total	ND	ND	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:03	MO	A1
Sodium, Total	5.8		mg/L	0.11	0.037	SW846 6020B	1	04/30/2024 12:03	MO	A1
Zinc, Total	0.017		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:03	MO	A1

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,2	MPN/100mL	1	1	SM9223B Colilert-18/Qua nitray	1	04/24/2024 13:30	ACA	D
Total Coliform	130	3,4	MPN/100mL	1	1	SM9223B-16	1	04/27/2024 14:57	ACA	E

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N, Low Level	ND	ND	mg/L	0.10	0.01	SM 4500-NH3G	1	04/26/2024 20:04	NML	B
Chloride	4.8		mg/L	2.0	1.5	EPA 300.0	2	04/24/2024 14:15	J1W	C
Nitrate-N	3.1		mg/L	1.0	0.22	EPA 300.0	2	04/24/2024 14:15	J1W	C
Nitrite-N	ND	ND	mg/L	1.0	0.36	EPA 300.0	2	04/24/2024 14:15	J1W	C
Nitrogen, Total Organic	ND	ND	mg/L	1.0	1	Calculation	1	05/01/2024 08:27	AKH	B
Phosphorus, Total	ND	ND	mg/L	0.10	0.085	EPA 365.1	1	04/25/2024 17:13	JMS	B
Phosphorus, Total as PO4	0.25	1	mg/L			EPA 365.1	1	04/25/2024 17:13	JMS	B
Sulfate	25.7		mg/L	2.0	1.5	EPA 300.0	2	04/24/2024 14:15	J1W	C
Total Dissolved Solids	110		mg/L	25	25	SM2540C-15	1	04/26/2024 16:45	RAG	C
Total Kjeldahl Nitrogen	ND	ND	mg/L	1.0	0.4	S4500NH3G-11	1	04/26/2024 13:48	JXL	B
Total Nitrogen	3.07		mg/L	3.00	1	Calculation	1	04/26/2024 16:09	CW	B
Total Suspended Solids	390		mg/L	5	5	SM2540D-15	1	04/24/2024 15:41	ANH	C



Results

Client Sample ID	MW-2	Collected	04/23/2024 11:45
Lab Sample ID	3356314002	Lab Receipt	04/23/2024 14:30

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND	mg/L	0.0033	0.0011	SW846 6020B	1	04/30/2024 12:05	MO	A1
Cadmium, Total	ND	ND	mg/L	0.0011	0.00037	SW846 6020B	1	04/30/2024 12:05	MO	A1
Chromium, Total	ND	ND	mg/L	0.0022	0.00074	SW846 6020B	1	04/30/2024 12:05	MO	A1
Copper, Total	0.0048J	J	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:05	MO	A1
Iron, Total	0.30		mg/L	0.056	0.019	SW846 6020B	1	04/30/2024 12:05	MO	A1
Lead, Total	ND	ND	mg/L	0.0022	0.00074	SW846 6020B	1	04/30/2024 12:05	MO	A1
Manganese, Total	0.0070		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:05	MO	A1
Mercury, Total	ND	ND	mg/L	0.00050	0.00017	SW846 7470A	1	04/25/2024 13:47	JSE	A
Nickel, Total	0.0042J	J	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:05	MO	A1
Selenium, Total	ND	ND	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:05	MO	A1
Sodium, Total	6.4		mg/L	0.11	0.037	SW846 6020B	1	04/30/2024 12:05	MO	A1
Zinc, Total	0.0067		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:05	MO	A1

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,2	MPN/100mL	1	1	SM9223B Colilert-18/Qua nitray	1	04/24/2024 13:30	ACA	D
Total Coliform	920	3,4	MPN/100mL	1	1	SM9223B-16	1	04/27/2024 14:57	ACA	E

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N, Low Level	ND	ND	mg/L	0.10	0.01	SM 4500-NH3G	1	04/26/2024 20:10	NML	B
Chloride	6.0		mg/L	2.0	1.5	EPA 300.0	2	04/24/2024 14:26	J1W	C
Nitrate-N	2.9		mg/L	1.0	0.22	EPA 300.0	2	04/24/2024 14:26	J1W	C
Nitrite-N	ND	ND	mg/L	1.0	0.36	EPA 300.0	2	04/24/2024 14:26	J1W	C
Nitrogen, Total Organic	ND	ND	mg/L	1.0	1	Calculation	1	05/01/2024 08:39	AKH	B
Phosphorus, Total	ND	ND	mg/L	0.10	0.085	EPA 365.1	1	04/25/2024 17:15	JMS	B
Phosphorus, Total as PO4	0.22	1	mg/L			EPA 365.1	1	04/25/2024 17:15	JMS	B
Sulfate	21.5		mg/L	2.0	1.5	EPA 300.0	2	04/24/2024 14:26	J1W	C
Total Dissolved Solids	104		mg/L	25	25	SM2540C-15	1	04/26/2024 16:45	RAG	C
Total Kjeldahl Nitrogen	0.5J	J	mg/L	1.0	0.4	S4500NH3G-11	1	04/26/2024 13:51	JXL	B
Total Nitrogen	3.44		mg/L	3.00	1	Calculation	1	04/26/2024 16:10	CW	B
Total Suspended Solids	458		mg/L	5	5	SM2540D-15	1	04/24/2024 15:41	ANH	C



Results

Client Sample ID	MW-3	Collected	04/23/2024 12:03
Lab Sample ID	3356314003	Lab Receipt	04/23/2024 14:30

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND	mg/L	0.0033	0.0011	SW846 6020B	1	04/30/2024 12:07	MO	A1
Cadmium, Total	ND	ND	mg/L	0.0011	0.00037	SW846 6020B	1	04/30/2024 12:07	MO	A1
Chromium, Total	0.0042		mg/L	0.0022	0.00074	SW846 6020B	1	04/30/2024 12:07	MO	A1
Copper, Total	0.0047J	J	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:07	MO	A1
Iron, Total	2.8		mg/L	0.056	0.019	SW846 6020B	1	04/30/2024 12:07	MO	A1
Lead, Total	0.0011J	J	mg/L	0.0022	0.00074	SW846 6020B	1	04/30/2024 12:07	MO	A1
Manganese, Total	0.070		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:07	MO	A1
Mercury, Total	ND	ND	mg/L	0.00050	0.00017	SW846 7470A	1	04/25/2024 13:49	JSE	A
Nickel, Total	0.0027J	J	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:07	MO	A1
Selenium, Total	ND	ND	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:07	MO	A1
Sodium, Total	5.0		mg/L	0.11	0.037	SW846 6020B	1	04/30/2024 12:07	MO	A1
Zinc, Total	0.0063		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:07	MO	A1

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,2	MPN/100mL	1	1	SM9223B Colilert-18/Qua nitray	1	04/24/2024 13:30	ACA	D
Total Coliform	49	3,4	MPN/100mL	1	1	SM9223B-16	1	04/27/2024 14:57	ACA	E

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N, Low Level	ND	ND	mg/L	0.10	0.01	SM 4500-NH3G	1	04/26/2024 20:13	NML	B
Chloride	2.1		mg/L	2.0	1.5	EPA 300.0	2	04/24/2024 14:38	J1W	C
Nitrate-N	0.96J	J	mg/L	1.0	0.22	EPA 300.0	2	04/24/2024 14:38	J1W	C
Nitrite-N	ND	ND	mg/L	1.0	0.36	EPA 300.0	2	04/24/2024 14:38	J1W	C
Nitrogen, Total Organic	ND	ND	mg/L	1.0	1	Calculation	1	05/01/2024 08:40	AKH	B
Phosphorus, Total	0.12		mg/L	0.10	0.085	EPA 365.1	1	04/25/2024 16:47	JMS	B
Phosphorus, Total as PO4	0.37	1	mg/L			EPA 365.1	1	04/25/2024 16:47	JMS	B
Sulfate	19.9		mg/L	2.0	1.5	EPA 300.0	2	04/24/2024 14:38	J1W	C
Total Dissolved Solids	54		mg/L	25	25	SM2540C-15	1	04/26/2024 16:45	RAG	C
Total Kjeldahl Nitrogen	ND	ND	mg/L	1.0	0.4	S4500NH3G-11	1	04/26/2024 13:53	JXL	B
Total Nitrogen	0.96J	J	mg/L	3.00	1	Calculation	1	04/26/2024 16:11	CW	B
Total Suspended Solids	668		mg/L	5	5	SM2540D-15	1	04/24/2024 15:41	ANH	C



Results

Client Sample ID	MW-4	Collected	04/23/2024 12:23
Lab Sample ID	3356314004	Lab Receipt	04/23/2024 14:30

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	ND	ND	mg/L	0.0033	0.0011	SW846 6020B	1	04/30/2024 12:09	MO	A1
Cadmium, Total	ND	ND	mg/L	0.0011	0.00037	SW846 6020B	1	04/30/2024 12:09	MO	A1
Chromium, Total	ND	ND	mg/L	0.0022	0.00074	SW846 6020B	1	04/30/2024 12:09	MO	A1
Copper, Total	0.0022J	J	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:09	MO	A1
Iron, Total	0.22		mg/L	0.056	0.019	SW846 6020B	1	04/30/2024 12:09	MO	A1
Lead, Total	ND	ND	mg/L	0.0022	0.00074	SW846 6020B	1	04/30/2024 12:09	MO	A1
Manganese, Total	0.0056J	J	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:09	MO	A1
Mercury, Total	ND	ND	mg/L	0.00050	0.00017	SW846 7470A	1	04/25/2024 13:50	JSE	A
Nickel, Total	ND	ND	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:09	MO	A1
Selenium, Total	ND	ND	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:09	MO	A1
Sodium, Total	4.2		mg/L	0.11	0.037	SW846 6020B	1	04/30/2024 12:09	MO	A1
Zinc, Total	0.0046J	J	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:09	MO	A1

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,2	MPN/100mL	1	1	SM9223B Colilert-18/Qua nitray	1	04/24/2024 13:30	ACA	D
Total Coliform	2	3,4	MPN/100mL	1	1	SM9223B-16	1	04/27/2024 14:57	ACA	E

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N, Low Level	ND	ND	mg/L	0.10	0.01	SM 4500-NH3G	1	04/26/2024 20:15	NML	B
Chloride	1.9J	J	mg/L	2.0	1.5	EPA 300.0	2	04/24/2024 15:35	J1W	C
Nitrate-N	0.89J	J	mg/L	1.0	0.22	EPA 300.0	2	04/24/2024 15:35	J1W	C
Nitrite-N	ND	ND	mg/L	1.0	0.36	EPA 300.0	2	04/24/2024 15:35	J1W	C
Nitrogen, Total Organic	ND	ND	mg/L	1.0	1	Calculation	1	05/01/2024 08:41	AKH	B
Phosphorus, Total	0.11		mg/L	0.10	0.085	EPA 365.1	1	04/25/2024 16:45	JMS	B
Phosphorus, Total as PO4	0.34	1	mg/L			EPA 365.1	1	04/25/2024 16:45	JMS	B
Sulfate	17.4		mg/L	2.0	1.5	EPA 300.0	2	04/24/2024 15:35	J1W	C
Total Dissolved Solids	40		mg/L	25	25	SM2540C-15	1	04/26/2024 16:45	RAG	C
Total Kjeldahl Nitrogen	ND	ND	mg/L	1.0	0.4	S4500NH3G-11	1	04/26/2024 13:58	JXL	B
Total Nitrogen	ND	ND	mg/L	3.00	1	Calculation	1	04/26/2024 16:13	CW	B
Total Suspended Solids	127		mg/L	5	5	SM2540D-15	1	04/24/2024 15:41	ANH	C



Results

Client Sample ID	MW-5	Collected	04/23/2024 12:13
Lab Sample ID	3356314005	Lab Receipt	04/23/2024 14:30

METALS

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Arsenic, Total	0.0019J	J	mg/L	0.0033	0.0011	SW846 6020B	1	04/30/2024 12:11	MO	A1
Cadmium, Total	ND	ND	mg/L	0.0011	0.00037	SW846 6020B	1	04/30/2024 12:11	MO	A1
Chromium, Total	0.018		mg/L	0.0022	0.00074	SW846 6020B	1	04/30/2024 12:11	MO	A1
Copper, Total	0.029		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:11	MO	A1
Iron, Total	14.1		mg/L	0.056	0.019	SW846 6020B	1	04/30/2024 12:11	MO	A1
Lead, Total	0.0080		mg/L	0.0022	0.00074	SW846 6020B	1	04/30/2024 12:11	MO	A1
Manganese, Total	0.55		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:11	MO	A1
Mercury, Total	ND	ND	mg/L	0.00050	0.00017	SW846 7470A	1	04/25/2024 13:51	JSE	A
Nickel, Total	0.013		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:11	MO	A1
Selenium, Total	ND	ND	mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:11	MO	A1
Sodium, Total	2.8		mg/L	0.11	0.037	SW846 6020B	1	04/30/2024 12:11	MO	A1
Zinc, Total	0.021		mg/L	0.0056	0.0019	SW846 6020B	1	04/30/2024 12:11	MO	A1

MICROBIOLOGY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Fecal Coliform	ND	ND,2	MPN/100mL	1	1	SM9223B Colilert-18/Qua nitray	1	04/24/2024 13:30	ACA	D
Total Coliform	350	3,4	MPN/100mL	1	1	SM9223B-16	1	04/27/2024 14:57	ACA	E

WET CHEMISTRY

Compound	Result	Flag	Units	RDL	MDL	Method	Dilution	Analysis Date/Time	By	Cntr
Ammonia-N, Low Level	ND	ND	mg/L	0.10	0.01	SM 4500-NH3G	1	04/26/2024 20:19	NML	B
Chloride	1.7J	J	mg/L	2.0	1.5	EPA 300.0	2	04/24/2024 15:46	J1W	C
Nitrate-N	0.42J	J	mg/L	1.0	0.22	EPA 300.0	2	04/24/2024 15:46	J1W	C
Nitrite-N	ND	ND	mg/L	1.0	0.36	EPA 300.0	2	04/24/2024 15:46	J1W	C
Nitrogen, Total Organic	2.5		mg/L	1.0	1	Calculation	1	05/01/2024 08:42	AKH	B
Phosphorus, Total	0.32		mg/L	0.10	0.085	EPA 365.1	1	04/25/2024 17:11	JMS	B
Phosphorus, Total as PO4	0.99	1	mg/L			EPA 365.1	1	04/25/2024 17:11	JMS	B
Sulfate	18.9		mg/L	2.0	1.5	EPA 300.0	2	04/24/2024 15:46	J1W	C
Total Dissolved Solids	36		mg/L	25	25	SM2540C-15	1	04/26/2024 16:45	RAG	C
Total Kjeldahl Nitrogen	2.5		mg/L	1.0	0.4	S4500NH3G-11	1	04/26/2024 13:56	JXL	B
Total Nitrogen	2.93J	J	mg/L	3.00	1	Calculation	1	04/26/2024 16:12	CW	B
Total Suspended Solids	413		mg/L	5	5	SM2540D-15	1	04/24/2024 15:41	ANH	C



Sample - Method Cross Reference Table

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3356314001	MW-1	SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM 4500-NH3G	N/A	
		SM2540C-15	N/A	
		SM2540D-15	N/A	
3356314002	MW-2	SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM 4500-NH3G	N/A	
		SM2540C-15	N/A	
		SM2540D-15	N/A	
3356314003	MW-3	SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM 4500-NH3G	N/A	
		SM2540C-15	N/A	
		SM2540D-15	N/A	
3356314004	MW-4	SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM 4500-NH3G	N/A	
		SM2540C-15	N/A	
		SM2540D-15	N/A	



Project Mt. Cuba GW/193834.01
Workorder 3356314

Lab ID	Sample ID	Analysis Method	Preparation Method	Leachate Method
3356314005	MW-5	SW846 6020B	SW846 3015A	
		SW846 7470A	SW846 7470A	
		SM9223B Colilert-18/Quantitray	N/A	
		SM9223B-16	SM9223B-16	
		Calculation	N/A	
		Calculation	N/A	
		EPA 300.0	N/A	
		EPA 365.1	EPA 365.1	
		S4500NH3G-11	S4500-NorgB-11	
		SM 4500-NH3G	N/A	
		SM2540C-15	N/A	
		SM2540D-15	N/A	



QUALITY CONTROL DATA CROSS REFERENCE TABLE

Lab ID	Sample ID	Preparation Method	Prep Batch	Prep Date/Time	By	Analysis Method	Anly Batch
3356314001	MW-1	SW846 3015A	1187388	04/24/2024 04:24	ANN	SW846 6020B	1192597
		SW846 7470A	1188637	04/25/2024 10:15	JSE	SW846 7470A	1188718
		N/A	1187381	04/23/2024 19:24	ACA	SM9223B Colilert-18/Quantitray	1187382
		SM9223B-16	1187363	04/23/2024 15:33	CXA	SM9223B-16	1187364
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1187606
		EPA 365.1	1188619	04/25/2024 08:22	JMS	EPA 365.1	1188630
		S4500-NorgB-11	1187976	04/25/2024 07:04	JXL	S4500NH3G-11	1190814
		N/A	N/A	N/A		SM 4500-NH3G	1189806
		N/A	N/A	N/A		SM2540C-15	1188676
		N/A	N/A	N/A		SM2540D-15	1187807
3356314002	MW-2	SW846 3015A	1187388	04/24/2024 04:24	ANN	SW846 6020B	1192597
		SW846 7470A	1188637	04/25/2024 10:15	JSE	SW846 7470A	1188718
		N/A	1187381	04/23/2024 19:24	ACA	SM9223B Colilert-18/Quantitray	1187382
		SM9223B-16	1187363	04/23/2024 15:33	CXA	SM9223B-16	1187364
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1187606
		EPA 365.1	1188619	04/25/2024 08:22	JMS	EPA 365.1	1188630
		S4500-NorgB-11	1187976	04/25/2024 07:04	JXL	S4500NH3G-11	1190814
		N/A	N/A	N/A		SM 4500-NH3G	1189806
		N/A	N/A	N/A		SM2540C-15	1188676
		N/A	N/A	N/A		SM2540D-15	1187807
3356314003	MW-3	SW846 3015A	1187388	04/24/2024 04:24	ANN	SW846 6020B	1192597
		SW846 7470A	1188637	04/25/2024 10:15	JSE	SW846 7470A	1188718
		N/A	1187381	04/23/2024 19:24	ACA	SM9223B Colilert-18/Quantitray	1187382
		SM9223B-16	1187363	04/23/2024 15:33	CXA	SM9223B-16	1187364
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1187606
		EPA 365.1	1188619	04/25/2024 08:22	JMS	EPA 365.1	1188630
		S4500-NorgB-11	1187976	04/25/2024 07:04	JXL	S4500NH3G-11	1190814
		N/A	N/A	N/A		SM 4500-NH3G	1189806
		N/A	N/A	N/A		SM2540C-15	1188676
		N/A	N/A	N/A		SM2540D-15	1187807
3356314004	MW-4	SW846 3015A	1187388	04/24/2024 04:24	ANN	SW846 6020B	1192597
		SW846 7470A	1188637	04/25/2024 10:15	JSE	SW846 7470A	1188718
		N/A	1187381	04/23/2024 19:24	ACA	SM9223B Colilert-18/Quantitray	1187382
		SM9223B-16	1187363	04/23/2024 15:33	CXA	SM9223B-16	1187364
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1187606
		EPA 365.1	1188619	04/25/2024 08:22	JMS	EPA 365.1	1188630
		S4500-NorgB-11	1187976	04/25/2024 07:04	JXL	S4500NH3G-11	1190814
		N/A	N/A	N/A		SM 4500-NH3G	1189806
		N/A	N/A	N/A		SM2540C-15	1188676
		N/A	N/A	N/A		SM2540D-15	1187807
3356314005	MW-5	SW846 3015A	1187388	04/24/2024 04:24	ANN	SW846 6020B	1192597
		SW846 7470A	1188637	04/25/2024 10:15	JSE	SW846 7470A	1188718
		N/A	1187381	04/23/2024 19:24	ACA	SM9223B Colilert-18/Quantitray	1187382
		SM9223B-16	1187363	04/23/2024 15:33	CXA	SM9223B-16	1187364
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		Calculation	
		N/A	N/A	N/A		EPA 300.0	1187606
		EPA 365.1	1188619	04/25/2024 08:22	JMS	EPA 365.1	1188630
		S4500-NorgB-11	1187976	04/25/2024 07:04	JXL	S4500NH3G-11	1190814
		N/A	N/A	N/A		SM 4500-NH3G	1189806
		N/A	N/A	N/A		SM2540C-15	1188676
		N/A	N/A	N/A		SM2540D-15	1187807



301 Fulling Mill Rd, Suite A
Middletown, PA 17057
P: 717-944-5541

**CHAIN OF CUSTODY/
REQUEST FOR ANALYSIS**
ALL SHADED AREAS MUST BE COMPLETED BY THE CLIENT /
SAMPLER. INSTRUCTIONS ON THE BACK.

COC #: 3356314
Logged By: MJE
PH: JLS

ALS Quote #:



1 of 1

Temp Taken By: MJP Therm ID: 570 WO Temp (°C) 59
Receipt info completed by: DJC
Cooler Custody Seals Intact Y N NA Deviations NO YES
Sample Custody Seal Intact Y N NA If YES, list below
Received on Ice Y N NA
Coolers & Samples Intact Y N NA
Correct Containers Provided Y N NA
Sample Label/COC Agree Y N NA
Adequate Sample Volumes Y N NA
VOA only: Trip Blank Y N NA
NJ ≤ 4 days? Y N NA
Courier/Tracking # _____

Client contact:
Date/Tech: _____

Rad Screen (uCi) _____
New Source? Y N
New Source Contact _____
PWSID # _____
PWS Contact: _____
PWS Phone #: _____

SDWA Sample Type Key: D=Distribution E=Entry Point
R=Raw P=Plant C=Check S=Special A=Annual Startup

Sample/COC Remarks

Contains Short Hold Testing **YES** **NO**
Internal Use: If less than 48 hours - notify lab upon receipt

Standard LVI 1	<input type="checkbox"/>	CLP-like	<input type="checkbox"/>	HSCA	State Samples Collected In	NY <input type="checkbox"/>
Standard LVI 2	<input type="checkbox"/>	DOD	<input type="checkbox"/>	Landfill	PA <input checked="" type="checkbox"/>	FL <input type="checkbox"/>
Standard LVI 3	<input type="checkbox"/>	NJ RED	<input type="checkbox"/>	NJ GW	WV <input type="checkbox"/>	other _____
Standard LVI 4	<input type="checkbox"/>	NJ Full	<input type="checkbox"/>			
Excel Summary		Sample Disposal				
Equis		Lab		X		
Custom		Special				

Container Type	P	P	P	P	P	Yes	No
Container	1L	250 mL	100mL	100 mL	125mL		
Preservative	H2SO4	NA2S2O3	NA2S2O3	NA2S2O3	HNO3		
Orthophosphate Filtered?							
						Yes	No

ANALYSIS / METHOD REQUESTED		Yes	No
CI, NO3, NO2, SO4, TDS, TSS			
Total Phosphorus, Total Phosphorus as P, NH3, TON, TN			
Fecal Coliform			
Total Coliform			
Total Metals: As, Cd, Cr, Cu, Fe, Pb, Mn, Hg, Ni, Se, Na, Zn			
Enter Number of Containers Per Sample or Field Results Below.			
SDWA Sample Type (see key)	G	GW	1 2 1 1 2
**Matrix (See bottom of COC)	G	GW	1 2 1 1 2
	G	GW	1 2 1 1 2
	G	GW	1 2 1 1 2
	G	GW	1 2 1 1 2
	G	GW	1 2 1 1 2

4232024001
4232024010

Comments:

Circle Sample Collector: ALS Tech (Client ID: _____)
Name: Will Fernandez

Date	Time	Relinquished By / Company Name
4/23/24	12:30	<u>Will Fernandez</u> / ARM
4/23/24	14:30	<u>ALS Exon</u> / ARM

*G=Grab; C=Composite

**Matrix - A=Air; D=Drinking Water; GW=Groundwater; O=Oil; LVI=Liquid Waste; S=Solid/Soil/Sediment; SW=Surface Water; WP=Wipe; WW=Wastewater

ALS SHIPPING ADDRESS: 301 Fulling Mill Road, Suite A, Middletown, PA 17057

**MT. CUBA CENTER - ONSITE WASTEWATER TREATMENT SYSTEM
OPERATING PERMIT SUBMISSION**

Attachement 2: Construction Completion Inspection Documentation



**STATE OF DELAWARE
DEPARTMENT OF NATURAL RESOURCES AND ENVIRONMENTAL CONTROL
GROUND WATER DISCHARGES SECTION
ENGINEER'S INSPECTION REPORT**

Dover Office
serving Kent and New Castle Counties
Tel: (302) 739-9947 * Fax: (302) 739-7764

Georgetown Office
serving Sussex County
Tel: (302) 856-4561 * Fax: (302) 856-5088

PERMIT #: _____ TAX MAP #: 08-009.00-052
 AUTH #: _____ PERMITTEE: Mt. Cuba Center
 PROPERTY LOCATION: 3120 Barley Mill Road
 DESIGNER: Carmine Casper LIC #: C2050 PHONE #: 302-354-1189
 CONTRACTOR: Rick Webb LIC #: _____ PHONE #: 302-540-6718
 DATE / TIME OF SYSTEM REVIEW: See Attached Log

SEPTIC TANK

New Existing _____
 Level yes _____ no _____
 Size (New) 2500 gal.
 Size (Existing) _____ gal.
 Bldg 10+ ft. Well 150+ ft.
 Watercourse _____ ft.
 Baffles yes _____ no _____
 Filter yes _____ no _____
 Risers yes _____ no _____
 Comments _____

DRAINFIELD

Bed _____ # Trenches 20
 Length of B or T _____ ft.
 Width of B or T 3 ft.
 Depth of B or T 36 in.
 Depth to top of Stone Chamber EZFlow
24 in.
 Depth to top of Pipe 30 in.
 Piping Level yes _____ no _____
 Dams per Plan _____ yes _____ no _____
 Stone Thickness 12 in.
 Isolation Distances
 Bldgs 10+ ft. Wells 150+ ft.
 Trees 10+ ft. Prop Lines 10+ ft.
 Easements _____
 Watercourses _____
 Location per Plan yes _____ no _____
 GPS Points for Drainfield
39.785
25.657
 Comments _____

EZFlow

DOSING TANK

Size 7050 gal.
 Inside Dimensions
 L DIA 10' H 12'
 Vent Installed yes _____ no _____
 Diameter 4 in.
 Height 24 in. above grade
 Pump(s) # 2 Model LEP 200
 Screened _____ yes _____ no _____
 Check Valve yes _____ no _____
 Electrical
 Alarm Sep. Circuit yes _____ no _____
 Wiring Complete yes _____ no _____
 Alarm Loc. Next to station
 Pressure Tested yes _____ no _____
 Floats On yes _____ no _____
 Off yes _____ no _____
 Alarm yes _____ no _____
 Isolation Distances
 Bldg 10+ ft. Well 150+ ft.
 Watercourses _____ ft.
 Comments _____

Comments _____

GENERAL COMMENTS:

As-Built Required yes _____ no _____
 Reason for As-Built _____

CERTIFICATE OF CONSTRUCTION

The undersigned Class E System Contractor hereby attests that all construction specified in the permit and conditions has been completed using accepted construction techniques and installation practices as specified in The Regulations Governing the Design, Installation and Operation of On-Site Wastewater Treatment and Disposal Systems.

PIPING

Manifold Length 400 ft.
 Manifold Diameter 3 in.
 Trans. Length 60 ft.
 Trans. Diameter 3 in.
 PVC Sch 40 yes _____ no _____
 # of Laterals 10
 Spacing of Laterals 6 ft.
 # Holes per Lateral 20
 Spacing of Holes 5 in.
 Diameter of Holes 5/32 in.
 Joints Glued yes _____ no _____

Signature of Class E System Contractor _____

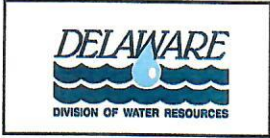
The Class C Designer (or Designee) has examined all visible on-site wastewater treatment and disposal system components on _____ (dates) _____ and issues this Engineer's Inspection Report in the belief that the system is installed in conformance with the DNREC permit. All observed deviations from this permit are noted on the as-built drawing.

This On-Site Wastewater Treatment and Disposal System substantially conforms to the approved permit conditions: _____ yes _____ no

Class C Designer (or Designee) Signature: _____ Date: 11/29/23

Dover Office: 89 Kings Highway, Dover, DE 19901
 Georgetown Office: 20669 DuPont Blvd, Unit 5, Georgetown, DE 19947





ON-SITE WASTEWATER SYSTEM CONSTRUCTION REPORT



(Please Type or Print Legibly)

R WEBB EXCAVATING, LLC
916 YORKLYN RD.
HOCKESSIN, DE 19707

PERMIT #: _____

TAX MAP #: _____

INSTALLER'S NAME: Charles R. Webb LICENSE #: 2387 PHONE #: 302-540-6718

CONSTRUCTION START DATE: _____ AUTHORIZATION #: _____ COMPLETION DATE: _____

THIS FORM MUST BE SUBMITTED WITHIN 10 DAYS OF COMPLETION

(Please check all boxes that apply)

CF = Cap & Fill / FD = Full Depth

Type of Construction:

- Replacement
- New Construction
- Component Replacement
- Repair to Existing System

- Low Pressure Pipe (FD)
- Low Pressure Pipe (CF)
- Pressure Dose (FD)
- Pressure Dose (CF)
- Gravity (FD)
- Gravity (CF)

System Type:

- Elevated Sand Mound
- Wisconsin At-Grade
- Subsurface Micro Irrigation
- Peat Bio- Filter
- Other ORANCO pre treatment unit

Bed or Trench Sand-lined Yes No

Gravelless Chamber Stone/Gravel Tire Chips EZ Flows

Existing System Malfunctioning Yes No N/A

Pre-Treatment Units

- Septic Tank
- Other ORANCO Pretreatment Unit

-AS -BUILT CONSTRUCTION CHANGES-

(Please describe any changes different from approved permit)

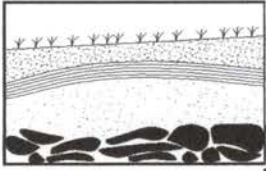
ANY LOCATION CHANGE MUST BE MARKED (USE RED INK) ON COPY OF ORIGINAL PERMIT (PLEASE ATTACH)

No Changes

I hereby affirm that the sewage disposal system for permit number _____ was constructed in accordance with all requirements and conditions of the permit. I further certify that if I made any changes that the copy of the original permit (with red markings) is an accurate representation of the installation.

_____ Date

Charles R. Webb
Contractor's Signature



Lanchester Soil Consultants, inc.

325 East Avondale Road

610.637.4118

West Grove, PA 19390

www.Soildude.com

soildude@comcast.net

Inspection Log of Onsite Wastewater Treatment & Disposal System for Mt. Cuba Center

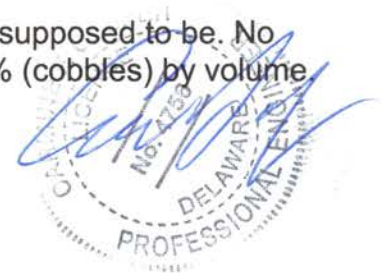
7/10/2023

- 1:40 PM Received call from R. Webb asking for guidance. Drainfield is being installed and rock was encountered.
- 2:20 PM Arrived at site. Upper-most trench is partially excavated, and competent rock is exposed. Instructed crew to cease trench excavation and open a test pit down slope of trench #1 near western end of proposed trench #2. Test pit encountered rock but less than in trench #1 and at a deeper depth. Instructed crew to excavate a test pit near the western end of trench #3. No competent rock encountered to 84 inches depth. Instructed crew to shift entire drainfield downslope by 12 feet, starting uppermost trench where trench #3 was supposed to be.



7/10/2023 Trench 1 showing excessive rock.

- 3:05 PM Begin excavation of first trench where trench #3 was originally supposed to be. No bedrock or competent rock encountered. Rock fragment content is ~20% (cobbles) by volume





7/10/2023 Excavation of trench where trench #3 was planned.

- 3:40 PM Approximately 70 feet of trench has been excavated with no bedrock or competent rock encountered.
- 3:45 PM Approximately 90 feet of trench has been excavated with no bedrock or competent rock encountered. EZ Flows and laterals being installed. Encountered 4-inch diameter PVC drain line from parking lot. Instructed crew to remove line and relocate it away from the drainfield. Instructed crew to proceed but to call me if any changes or concerns were encountered.





Trench installation showing EZ Flows being placed.

7/11/2023

- 11:20 AM Trenches 1-3 installed with no rock encountered. Instructed crew to continue.

7/14/2023

- 9:32 AM Trenches 1-9 installed and trench #10 under construction. No rock encountered. EZ Flows and laterals being installed.

7/17/2023

- 2:20 PM 16 trenches are installed. Crew is awaiting the delivery of EZ Flows for further trenches. Some loose rock encountered in eastern end of trench # 15 but not enough to be limiting. Excavation of manifold trench is underway.





7/17/2023 Manifold Trench under excavation (left). Trench #16 under excavation (right).

7/21/2023

- 3:30 PM Trench #20 being installed along with manifold. No rock encountered. Orenco unit is on site but not installed.

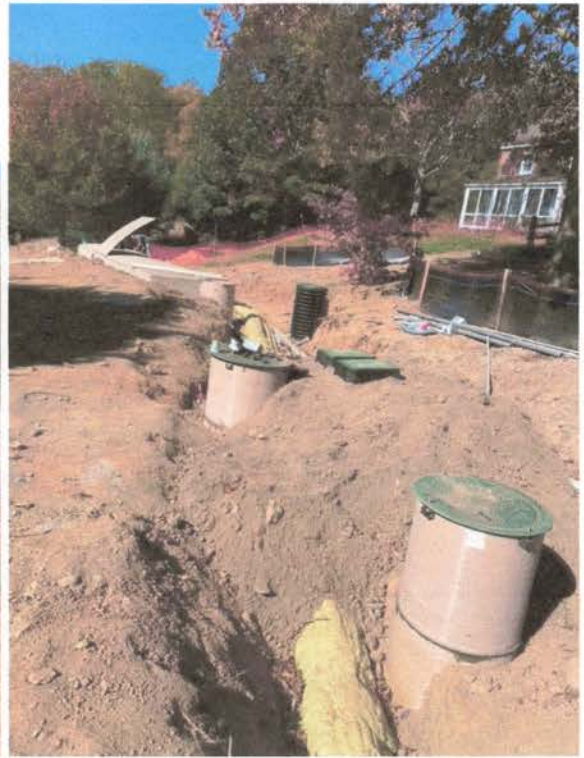


7/21/2023 Manifold installation (left). Trench #20 being installed (right).

10/24/2023

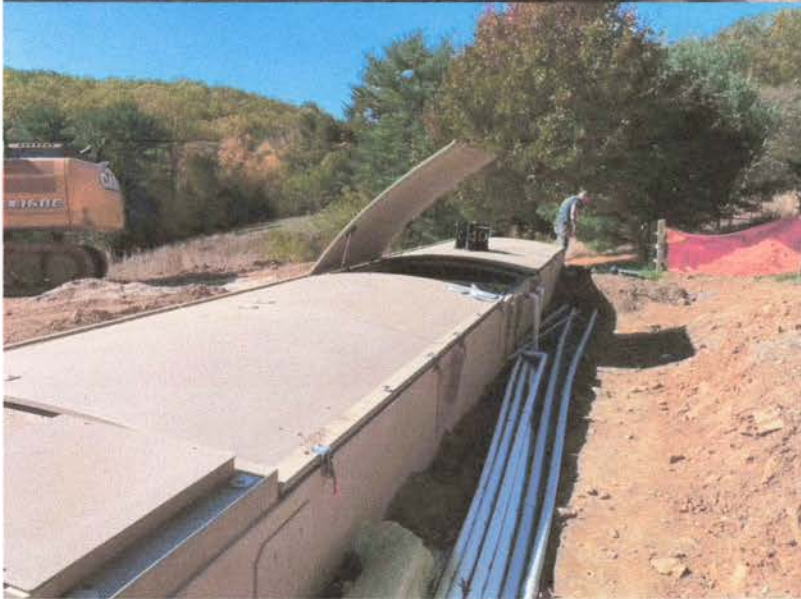


- Orenco unit is installed. Electricians are wiring unit. Dosing station and valve box are in place without top. One pump is partially installed. Walked surface of drainfield. Ground surface appears to be stable.



10/24/2023 Orenco unit.





10/24/2023 Orenco unit.





10/24/2023 Dosing Station under installation.



10/24/2023 Dosing Station under construction.





10/24/2023 Valve Chamber.

11/14/2023

- 11:45 PM Meeting with Marc Henderson & Tara Dougherty of Meliora and Derrick Carruthers of DNREC. Orenco representative Gary Lee also on site. Both sets of trenches pressure tested. Inspect pump installation and control panel. Alarm tested. All floats checked and functioning.

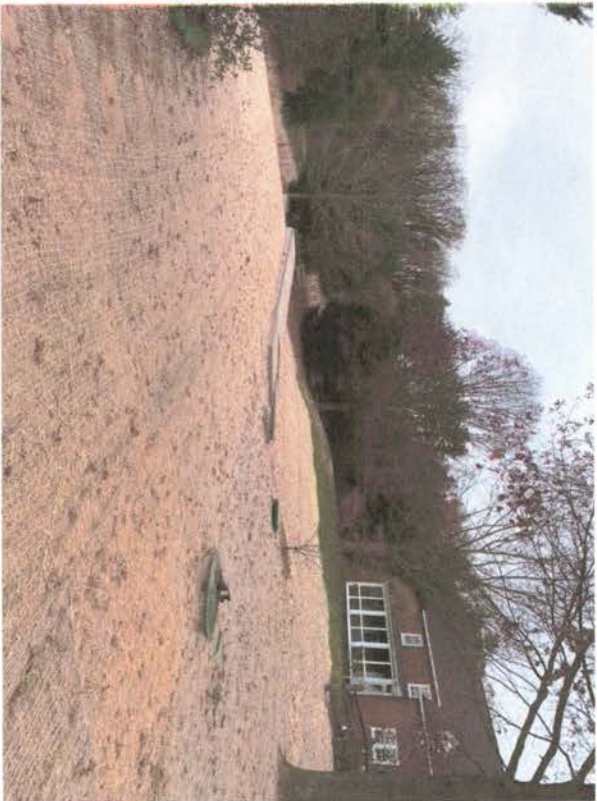
11/21/2023

- 11:30 AM Drainfield is covered, finish graded and strawed. Dosing station appears to be complete, including vent installed. Orenco unit, dosing station, force line and manifold are covered, finish graded and strawed.

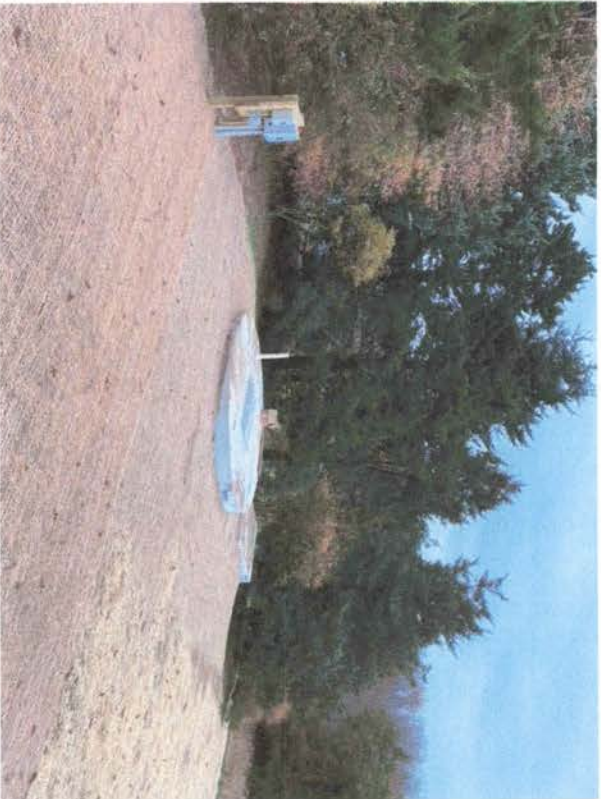


11/21/2023 Drainfield area.





11/21/2023 Orenco unit.



11/21/2023 Dosing station.

[Handwritten Signature]
EXAMINER
LICENSED PROFESSIONAL ENGINEER
No. 4706
DELAWARE
PROFESSIONAL ENGINEER

Orenco
SYSTEMS

814 Airway Ave.

Sutherlin, OR

97479

Telephone:

541-459-4449

800-348-9843

Fax:

541-459-2884

orenco.com

April 8, 2024

Rick Webb
R. Webb Excavating, LLC
916 Yorklyn Road
Hockessin, DE 19707

SUBJECT: Mt. Cuba Center Startup

Rick,

During my visit, I had the chance to walk through the installation and perform tasks to ensure the correct installation and operation of the system. This included the following:

- Installation of the tanks, including riser and pumping system
- Installation of the AX-Max treatment unit
- Proper operation of Stage One, MBBRd, and Stage Two pumps and floats
- Installation and operation of the AdvanTex[®] treatment system ventilation
- Installation and operation of the chemical feed systems
- Installation and operation of the telemetry control system

Based on my inspection and official startup of the system conducted November 13 - 15, 2023, Orenco Systems would consider The Mt. Cuba Center to be an appropriately installed and operating AdvanTex[®] treatment system. Orenco Systems will continue to provide technical assistance and follow-up for the life of the system if telemetry is available.

For your records, I have enclosed my official start up checklist. I look forward to working with you on future projects. If I can assist you in any way feel free to call me at 1-800 348-9843 ext. 322 or email me at the address below.

Sincerely,



Garry-Lee G. Espinosa
Sr. Systems Engineer
Systems Engineering - Northeast Region
Orenco Water
814 Airway Avenue
Sutherlin, OR 97479
Phone: (800) 348-9843 ext. 322
Fax: (541) 459-2884
gespinosa@orenco.com
www.orenco.com

Enclosure: Mt. Cuba Center Inspection Checklist

System Start-Up

Facility Information

Project Name: _____
Site Address: _____
City: _____ State: _____ Zip code: _____
Start-up date: _____ Start-up performed by: _____

Owner

Company Name: _____ Contact Name: _____
Site Address: _____
City: _____ State: _____ Zip code: _____
Phone: _____ E-mail: _____ Attended Start-up: Yes No

Designer/Engineer

Company Name: _____ Contact Name: _____
Site Address: _____
City: _____ State: _____ Zip code: _____
Phone: _____ E-mail: _____ Attended Start-up: Yes No

Installer

Company Name: _____ Contact Name: _____
Site Address: _____
City: _____ State: _____ Zip code: _____
Phone: _____ E-mail: _____ Attended Start-up: Yes No

Operator/Service Provider

Company Name: _____ Contact Name: _____
Site Address: _____
City: _____ State: _____ Zip code: _____
Phone: _____ E-mail: _____ Attended Start-up: Yes No
Operator Trained: Yes No

Dealer

Company Name: _____ Contact Name: _____
Site Address: _____
City: _____ State: _____ Zip code: _____
Phone: _____ E-mail: _____ Attended Start-up: Yes No

Regulator

Company Name: _____ Contact Name: _____
Site Address: _____
City: _____ State: _____ Zip code: _____
Phone: _____ E-mail: _____ Attended Start-up: Yes No

Description of kitchen facilities (if applicable): _____

Water softener system present: Yes No If yes, backwash plumbed to: _____

Water source available: Yes No

O&M manual received: Yes No

Operator has O&M Tools: Yes No

Operator has spare parts: Yes No

Comments: _____

System Start-Up: Pump Tank(s)

Tank

Tank manufacturer: Gillespie Precast Material: Concrete

Tank and Accessories

Watertight test performed: Yes No N/A

Tank anti-flotation measures: Yes No N/A

Notes: **Actual test not performed, but the tank was full to the riser upon inspection indicating that the tank has no leaking issues.**

Access Risers

Proper grading and drainage: Yes No N/A

Riser, riser adapters, grommets installed correctly: Yes No N/A

Riser lids secure: Yes No N/A

Notes: Final site grading not completed. Installer to fill after inspection. Stormwater will be diverted from riser.

Adhesive fillets on risers were not smoothed out, but no gapping observed (possible places of infiltration if gaps are visible). Stormwater to be diverted from the riser.

Biotube Pump System

Cartridge is removable and handle is accessible: Yes No N/A Notes: Handle short, need extention

Discharge assembly orientation/access to union/cam and valve: Yes No N/A Notes: _____

Float cords neatly wrapped, cords long enough for removal: Yes No N/A Notes: _____

Floats are properly orientated and handle is accessible : Yes No N/A Notes: Adjusted in the field

Float settings are appropriate: Yes No N/A Notes: _____

Sanitary Tee: Yes No N/A _____

Tank invert of inlet from outside top of tank: 15"

Float function	Float setting (from outside top of tank)
HWA/Lag	<u>18"</u>
OVR	<u>21"</u>
Timer On/OFF	<u>25"</u>
RO/LWA	<u>28"</u>
_____	_____
_____	_____

The tank is baffled with a flow through port !@ 30" from the bottom of the tank. Inlet into the tank was at a different heights. Adjusted floats in the field.

Verify pump voltage and phase match control panel: Yes No N/A Notes: _____

Voltage/Phase: _____

Check pump operation in manual: Yes No N/A Notes: _____

Splice box is accessible, waterproof splices, conduit seal: Yes No N/A Notes: _____

Record Pump Voltage and Amperage at Control Panel

Pump #	Pump Model	Voltage		Amperage	
		Static	Dynamic	Pump	Panel
1	PF300532	212.0	211.6	3.1	3.1
2	PF300532	210.8	211.5	3.2	3.2

Notes: _____

Control Panel

Model: TCOM Custom number: 535903 TCOM phone/IP: 166.144.48.161:2080

- Verify internal overloads and phase monitor (3 phase only): Yes No N/A Notes: _____
- Verify inputs from floats are communicating with control panel: Yes No N/A Notes: _____
- Verify automatic operation of pumps and alarms: Yes No N/A Notes: _____
- Verify range on current sensor: Yes No N/A Notes: _____
- Verify/calibrate pump gpm, enter it into control panel: Yes No N/A Notes: _____
- Verify timer mode: Yes No N/A Notes: _____

Timer Setting (if applicable)

Time on: 1 minutes Timer off: 60 minutes Override on: 1 minute Override off: 30 minute

- Verify pump & control breakers are "on" and system is in "auto": Yes No N/A Notes: _____
- Verify correct phone number: Yes No N/A Notes: _____
- Verify alarms are called out to operator: Yes No N/A Notes: _____
- Verify remote connectivity: Yes No N/A Notes: _____

System Start-Up: AX-Max™ Units

Use this form in conjunction with NFO-ATX-SSU-1, *System Start-Up*. When completed, attach this form to NFO-ATX-SSU-1 along with other applicable system start-up forms and provide a copy of these forms to the system owner and to the system operator.

Project Information

Project Name: Mt. Cuba Center
Date: November 13, 2023

Treatment Unit Information

Unit #	Serial #	Unit #	Serial #	Unit #	Serial #
1	<u>438381</u>	5	_____	9	_____
2	_____	6	_____	10	_____
3	_____	7	_____	11	_____
4	_____	8	_____	12	_____

Unit and Site Installation Inspection

Installation Method	<input checked="" type="checkbox"/> Burial	<input type="checkbox"/> Partial Burial	<input type="checkbox"/> Bermed	<input type="checkbox"/> Above-Grade
Depth and Spacing	Burial Depth To Native Soil: <u>6"</u>		Spacing Between Units: <u>N/A</u>	
Bedding Material(s) (Select All Applicable)	<input type="checkbox"/> Native Fill	<input checked="" type="checkbox"/> Aggregate	<input type="checkbox"/> Other: _____	
Anti-Flotation Installed	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____	
Unit(s) Installed Level	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____	
Site Grading Checked	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: <u>final grading with clean fill to be completed</u>	
Site Drainage Checked	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: <u>final grading with clean fill to be completed</u>	
Lids Accessible	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____	
Inlet Plumbing Correct and Watertight	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____	
Outlet Plumbing Correct and Watertight	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____	
Textile Correctly Installed	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____	
Key Components Photographed	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____	

Ventilation System Inspection

All System Electrical Connections Made	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____
Waterproof Wire Nuts Used in Splice Boxes	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____
All Vent Pipes Connected	<input type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: <u>N/A one insulated air line from building.</u>
Vent Inlets Installed	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____
Vent Outlets Installed	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____
Carbon Filters Installed (If Applicable)	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: <u>Located in fan enclosure</u>
Vent Fans Operate	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Notes: <u>Fan failed at start up. Replacement sent 11/14/24</u>
Intake Airflow Verified	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Notes: _____
Exhaust Airflow Verified	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	Notes: _____
Fan Alarm Operates	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____
Key Components Photographed	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Notes: _____

Recirculation Pumping (Recirc) System Inspection Applied to both Stage 1 and Stage 2

- All System Electrical Connections Made Yes No Notes: _____
- Waterproof Wire Nuts Used in Splice Boxes Yes No Notes: _____
- Float Switches Installed Yes No Notes: _____
- Float Switch Cords Neatly Wrapped Yes No Notes: _____
- Float Switch Tests Performed Yes No Notes: _____
- Manifolds Flushed Yes No Notes: _____
- Spray Nozzles Operate Yes No Notes: _____
- Spray Patterns Adequate Yes No Notes: _____

Manifold Pressure	Unit #	Manifold Pressure	Unit #	Manifold Pressure	Unit #	Manifold Pressure
	1	Spray pattern	5	_____	9	_____
	2	Spray pattern	6	_____	10	_____
	3	_____	7	_____	11	_____
	4	_____	8	_____	12	_____

- Recirc Pump(s) Operate in "Manual" Yes No Notes: _____
- Recirc Pump(s) Operate in "Auto" Yes No Notes: _____

Recirc Pump Volts and Amps	Pump #	Voltage		Amperage		Pump #	Voltage		Amperage	
		Static	Dynamic	Pump	Panel		Static	Dynamic	Pump	Panel
	1					13				
	2					14				
Rnox	3	211.3	211.2	3.2	3.1	15				
ST1R	4	212.2	211.6	5.2	5.1	16				
ST1R	5	212.2	211.9	3.6	4.9	17				
ST1D	6	210.7	210.3	2.7	2.9	18				
ST1D	7	212.0	211.8	2.8	2.9	19				
ST2R	8	211.7	211.6	3.0	3.2	20				
ST2R	9	211.9	211.7	3.1	3.2	21				
Pnematic Blower (MBBRd)	10	120.1	120.3	12.7	12.8	22				
	11					23				
	12					24				

- Key Components Photographed Yes No Notes: _____

AX-Max Discharge Pumping System Inspection

- Discharge Type Timed-Dose Pump Demand-Dose Pump Gravity Discharge
- All System Electrical Connections Made Yes No Notes: _____
- Waterproof Wire Nuts Used in Splice Boxes Yes No Notes: _____
- Float Switches Installed Yes No Notes: _____
- Float Switch Cords Neatly Wrapped Yes No Notes: _____
- Float Switch Tests Performed Yes No Notes: _____
- Discharge Pump(s) Connected Yes No Notes: _____
- Discharge Pump(s) Operate in "Manual" Yes No Notes: _____
- Discharge Pump(s) Operate in "Auto" Yes No Notes: _____

AX-Max Discharge Pumping System Inspection, cont.

Discharge Pump Volts and Amps

Pump #	Voltage		Amperage		Pump #	Voltage		Amperage	
	Static	Dynamic	Pump	Panel		Static	Dynamic	Pump	Panel
1					6				
2					7				
3					8				
4					9				
5					10				

- Flow Meter Installed Yes No Notes: _____
- Flow Meter Operates Yes No Notes: Both influent and effluent
- Key Components Photographed Yes No Notes: _____

Control Panel Inspection

Control Panel Type TCOM Other: _____

Control Panel Identification Panel Serial Number: 535903 Panel Phone/IP Number: 166.144.18.161:2020

Control Panel Power Service Panel Voltage: 211.6 Service Panel Amperage: _____

Neutral-To-Ground Voltage Measured Yes No Notes: _____

All Panel Electrical Connections Made Yes No Notes: _____

Electrical Conduits Sealed Correctly Yes No Notes: _____

Internal Pump Overload Relay Operates Yes No Notes: Failed, had to replace

Phase Monitor Operates (3-Phase Systems) Yes No Notes: _____

Float Switch Inputs Communicate with Panel Yes No Notes: _____

Automatic Pump & Alarm Operation Verified Yes No Notes: _____

Alarm Call-Out Verified Yes No Notes: _____

Current Sensor Range Verified Yes No Notes: _____

Operator Phone #s Entered Into Panel Yes No Notes: _____

Pumps gpm Recorded In Control Panel Yes No Notes: _____

Recirc Pump Timer Mode Verified Yes No Notes: _____

Initial Recirc Timer Settings Recorded Yes No Notes: _____

Recirc Timer Settings

Manual	Estimated Flow	Trend
Time On: <u>1.5</u>	Recirc-Return Ratio: <u>4:1</u>	Recirc-Return Ratio: <u>N/A</u>
Time Off: <u>19</u>	RT Maximum Off Time: <u>20</u>	RT Maximum Off Time: _____
Override On: <u>1.5</u>	RT Minimum Off Time: <u>0.5</u>	RT Minimum Off Time: _____
Override Off: <u>9.5</u>	Est. Average Daily Flow: <u>848</u>	Avg. # of Off Days: _____
	Est. Maximum Daily Flow: <u>1,696</u>	

Final Timer Mode Manual Estimated Flow Trend

Discharge Pump Timer Mode Verified Yes No Notes: _____

Initial Discharge Timer Settings Recorded Yes No Notes: _____

Discharge Timer Settings Time On: 0.5 Time Off: 30 Override On: 2 Override Off: 15

System Start-Up: MBBRd Units

For systems using AdvanTex secondary treatment units, use this form in conjunction with NFO-ATX-SSU-1, *System Start-Up*. For systems with more MBBRd units, use additional sheets as necessary. When completed, attach this form to NFO-ATX-SSU-1 along with other applicable system start-up forms and provide a copy of these forms to the system owner and to the system operator.

Project Information

Project Name: Mt. Cuba Center
Date: November 15, 2023

MBBRd Unit Information

Unit Number: 438381 Unit Serial Number: _____
Unit Number: _____ Unit Serial Number: _____

Site And Unit Installation Inspection

Installation Method Burial Partial Burial Bermed Above-Grade
Depth and Spacing Burial Depth To Native Soil: 6" Spacing Between Units: _____
Bedding Material(s) (Select All Applicable) Native Fill Aggregate Other: _____
Anti-Flotation Installed Yes No Notes: _____
Unit Installed Level Yes No Notes: _____
Site Grading Checked Yes No Notes: final grading with clean fill to be completed
Site Drainage Checked Yes No Notes: final grading with clean fill to be completed
Lids Accessible Yes No Notes: _____
Inlet Plumbing Correct and Watertight Yes No Notes: _____
Outlet Plumbing Correct and Watertight Yes No Notes: _____
Media Retention Screen Seated Yes No Notes: _____
Static Media Depth _____ Notes: _____
Key Components Photographed Yes No Notes: _____

Blower and Mixing System Inspection

Blower VFD Yes No Hertz: N/A
Blower Vent Comp Notes: N/A
Bubble Events per Cycle per Injector 1 per 3 hrs Notes: _____
Air Bubbles Visible Yes No Notes: N/A
Large Bubbles Yes No Notes: _____
Describe Bubble Patterns and Surface Interaction with Media Notes: When the blower activates, each pneumatic ejector (qty 2) expells a large bubble to mix media.

Key Components Photographed Yes No Notes: _____

Sludge Removal System Inspection

Sludge Pump(s) (Optional) Yes No Notes: N/A

All System Electrical Connections Made Yes No Notes: N/A

Waterproof Wire Nuts Used In Splice Boxes Yes No Notes: N/A

All Interior Electrical Cords Neatly Wrapped Yes No Notes: N/A

Sludge Pump Power Supply

Unit/Pump	Static/Dynamic Voltage	Pump/Panel Amperage	Unit/Pump	Static/Dynamic Voltage	Pump/Panel Amperage
	/	/		/	/
	/	/		/	/

Key Components Photographed Yes No Notes: _____

Control Panel Inspection

All Panel Electrical Connections Made Yes No Notes: _____

All Electrical Conduits Sealed Correctly Yes No Notes: _____

Internal Pump Overload Relay Operates Yes No Notes: _____

Variable Frequency Drive Operates (Optional) Yes No Notes: **REFER TO AX-MAX START UP SHEET**

Automatic Alarm Operation Verified Yes No Notes: _____

Alarm Call-Out Verified Yes No Notes: _____

Current Sensor Range Verified Yes No Notes: _____

Mixer Timer Mode Verified Yes No Notes: _____

Initial Mixer Timer Settings Recorded Yes No Notes: _____

Mixer Timer Settings "On" Time, Min. _____ "Off" Time, Hrs _____

Carbon Feed

Carbon Feed Runs in Manual Mode Yes No Notes: Tested

Carbon Feed Runs in Auto Mode Yes No Notes: Not tested due to basin empty

Peristaltic Pump Speed Percentage: _____

Chemical Used: _____

LLA Float Alarm Verified (if Applicable) Yes No Notes: _____

Storage Volume: 145 gallons

Data Collection Information

Data Collected By: Sasha Earl, Garry-Lee Espinosa - Orenco Systems, Inc. Date: 11/13 -15/2023

Additional Information

**MT. CUBA CENTER - ONSITE WASTEWATER TREATMENT SYSTEM
OPERATING PERMIT SUBMISSION**

**Attachment 3: Operations and Maintenance Plan
(includes As-Built Drawings and Material Safety Data Sheets)**

MT. CUBA CENTER
ON-SITE WASTEWATER TREATMENT AND DISPOSAL SYSTEM
OPERATION AND MAINTENANCE MANUAL

JUNE 2024

OPERATIONS AND MAINTENANCE MANUAL

MT. CUBA CENTER

HOCKESSIN, DELAWARE

Prepared for:

MT. CUBA CENTER

3120 Barley Mill Road
Hockessin, DE 19707
Mill Creek Hundred
New Castle County, Delaware

June 2024

Prepared by:

MELIORA DESIGN

259 Morgan Street
Phoenixville, PA 19460

t: 610.933.0123

f: 610.933.0188

www.melioradesign.com

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APPENDICES

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1.0 ADDRESSES AND PHONE NUMBERS

Operator/Maintainer

Rick Webb
916 Yorklyn Road
Hockessin, Delaware 19707

System Installer

R. Webb Excavating, LLC
916 Yorklyn Road
Hockessin, Delaware 19707

Treatment System Supplier

Orenco Water
814 Airway Avenue
Sutherlin, OR 97479
Phone: 800-348-9843

Civil Engineer

Meliora Design
259 Morgan Street
Phoenixville, PA 19460
Phone: 610-933-0123

DNREC Class C System Designer

Lanchester Soil Consultants. Inc.
325 East Avondale Road
West Grove, PA 19390
Phone: 610-637-4118

Biosolids Handling

A-1 Sanitation
1009 River Rd
New Castle, DE 19720

For Spills or Unauthorized Releases

DNREC Division of Waste and Hazardous Substances
800-662-8802

2.0 TREATMENT FACILITY OVERVIEW

2.1 SYSTEM LOCATION

The Mt. Cuba Center facility is located at 3120 Barley Mill Road, Hockessin, New Castle County, Delaware. The facility details are as follows:

Facility Name/Owner:	Mt. Cuba Center
Tax Map Parcel:	0800900052
Hydrologic Code:	020402050307
Watershed Name:	Red Clay Creek Watershed
Utility Operator:	Mt. Cuba Center

2.2 PURPOSE OF THIS MANUAL

This Operation and Maintenance (O&M) manual is provided to serve as a reference, guide, and resource to understand, operate, and maintain the *Large Onsite Wastewater Treatment System* at the Mt. Cuba Center. As discussed below the Mt. Cuba Center has a few onsite wastewater treatment and disposal systems; this O&M Manual is for the Large Onsite Wastewater Treatment and Disposal System Only.

2.3 CAMPUS WASTEWATER SYSTEM SUMMARY

The Mt. Cuba Center has three distinct campus areas: Greenhouse, Education Center, and Main House. The Greenhouse area is connected to the large onsite wastewater treatment and disposal system. The Education Center and Main House will be connected in the future. The Mt. Cuba Center campus areas, design wastewater flows, and current permit numbers are summarized in **Table 2.1**. A schematic diagram of the campus wastewater system is shown in **Figure 2.1**.

The treatment and disposal system have been designed to manage wastewater from the entire Mt. Cuba Center (3,770 gpd). The Delaware Department of Natural Resources and Environmental Control (DNREC) system operating permit is provided **Appendix A**.

Table 2.1: Wastewater Systems, Flows and Permit Numbers Summary

Campus Area	Building	Wastewater Flows (gpd)	Permit Details
Greenhouse	New Head house	100	Large Onsite Wastewater Treatment and Disposal System
	Existing Stone Barn	120	
	Existing Farm garage	360	
	Existing Tenant House 3	360	
	New Service Building	120	
	Greenhouse Area Total	1,060	
Education Center	Adapted Tenant House 5	710	System 1: Permit No. 182499 Pretreatment Unit + 1,000 gallon septic tank + 1,375 sf soil disposal
	Adapted Brick garage	180	
	New Learning Building	1,300	System 2: Permit No. 188525 3,500 gallon septic tank + 2,250 sf soil disposal
	Education Center Area Total	2,190	
Main House	Existing Main House	520	Permit No. 157250/172691 6,000 gallon septic tank + 2,592 sf soil disposal
	Main House Area Total	520	
Total Estimated Wastewater Flow		3,770	

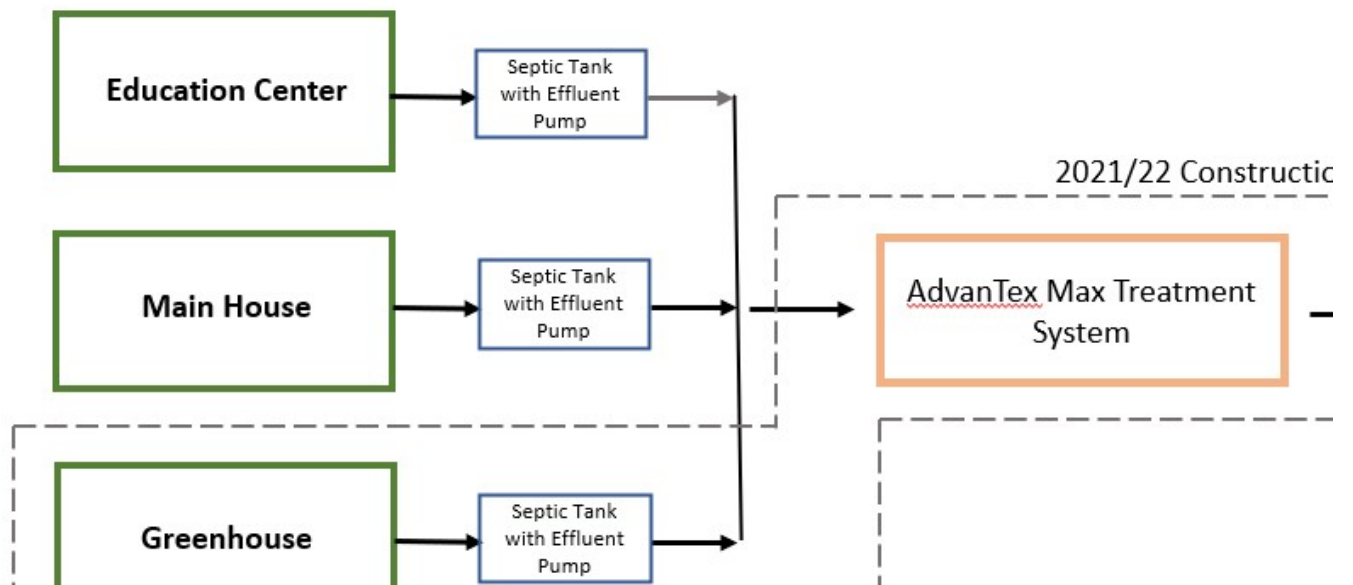


Figure 2.1: Campus Wastewater Management Schematic

2.4 WASTEWATER CHARACTERISTICS

Wastewater will be sent to septic tanks at each campus area before being discharged to the treatment system. The estimated raw wastewater and septic tank effluent concentrations for 5-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), nitrates and nitrites, total kjeldhal nitrogen (TKN), total nitrogen (TN) and total phosphorus (TP) are summarized in **Table 2.2**.

Table 2.2: Estimated Influent Wastewater Characteristics

Parameter	Raw Wastewater Concentration (mg/L) ¹	Septic Tank Effluent Concentration (mg/L) ²
BOD ₅	286	180
TSS	330	80
Nitrates + Nitrites	<1	<1
TKN	<1	75 ³
TN	75	75
TP	12	12

1: Values based on the high end of the concentration ranges provided in Table 3-7 of the USEPA Onsite Wastewater Treatment System Manual.

2: Values based on high end of the concentration ranges provided in Table 3-19 of the USEPA Onsite Wastewater Treatment System Manual and information from Orenco Systems.

3: Orenco Systems used a conservative TKN value of 90 mg/L in the design of the AdvanTex Max unit

2.5 WASTEWATER TREATMENT AND DISPOSAL FACILITY COMPONENTS

Table 2.3 summarizes the treatment and disposal system components. **Appendix B** includes as-built drawings of the system. **Figure 2.2** is a schematic of the treatment and disposal system while **Figure 2.3** is a flow schematic of the Orenco AdvanTex Treatment System.

Table 2.3: Treatment and Disposal System Components

Component	Details
Construction Date	2023
Design Flow	3,770 gpd
Greenhouse Septic Tank and Effluent Pump	2,500 gallons / Orenco Biotube Pump PF30053200-30
Education Center Septic Tank	1,000 gallons & 3,500 gallons
Main House Septic Tank	6,000 gallons
Influent Flow Meter	Endress + Hauser / Proline Promag W 400 (2" Diameter)
Advantex Unit	Orenco / AX-MAX300-42
Advantex Unit Blower	Airtech / 3BA7310
Advantex Chemical Feed Pumps	Blue-White / A-100N Peristaltic Injector Pump
Advantex Control Panel	Orenco Controls / TCOM-DAX/S/DS/DAX/DAX208 3Ø/MBBRd CS TSD UPS XF LCFA LCFC (2)FM CV Cell

Effluent Flow Meter	Endress + Hauser / Proline Promag W 400 (4" Diameter)
Duplex Soil Disposal Dosing Station Pumps	Goulds / WE20H Series 3885
Duplex Pump Station Control Panel	SJE Rhombus IFS 1W 8AC10E
Soil Disposal Trenches	EZflow Geosynthetic Aggregate Technology

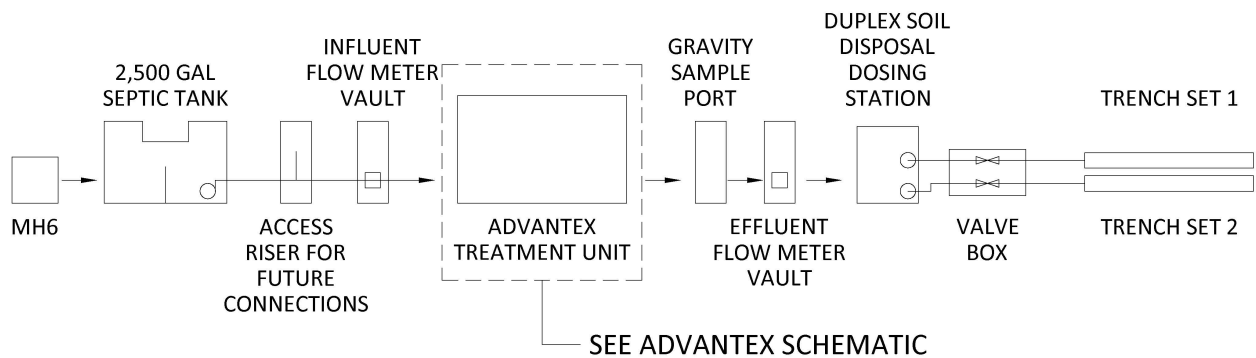


Figure 2.2: Wastewater Treatment and Disposal System Schematic

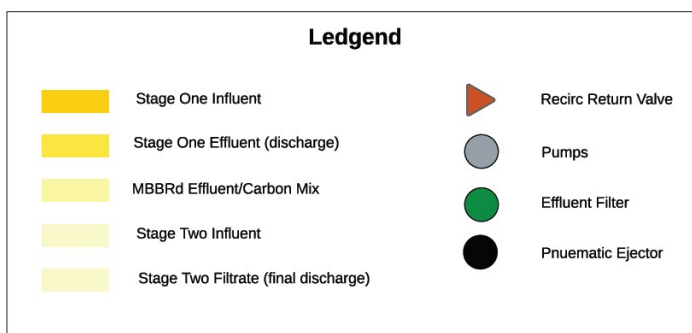
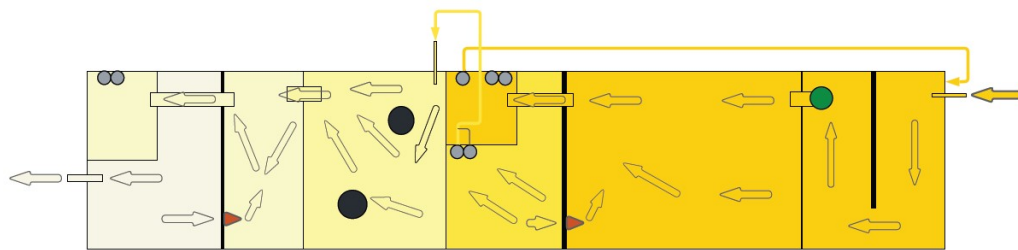


Figure 2.3: Orenco Advantex System Schematic

3.0 MANAGEMENT AND STAFFING

A Level I Operator Certification is required to operate the facility. The operator will be responsible for maintaining equipment, operating the system to meet the DNREC effluent water quality limits, and keeping records as required by the DNREC permit and for proper operation of the system.

4.0 FACILITY OPERATION AND MAINTENANCE

The treatment system must be maintained and operated to meet the DNREC effluent requirements listed in Table 4.1 below.

Table 4.1: DNREC Wastewater Effluent Limits

Parameter	Effluent Limit (mg/L)
BOD	30 ¹
TSS	30 ¹
Nitrogen	10 ²

1: Daily Average Concentration

2: Annual Average Concentration

4.1 TREATMENT SYSTEM

The onsite wastewater treatment system includes septic tanks and septic tank effluent pumps and an Orenco AdvanTex treatment system. The Operation and Maintenance of each of these components is described below.

4.1.1 SEPTIC TANKS

The septic tank system includes a tank and Orenco Biotube Effluent Filter Pump. The septic tank should be pumped every year. Both compartments should be pumped. The installed septic tank drawing is provided in **Appendix D**.

The Orenco Biotube Effluent Filter Pump should be operated and maintained per Orenco's recommendations, located in Appendix C.

DNREC requires the following licensed professionals to perform inspection, sludge hauling and installation:

- System inspection: Class H System Inspector
- Septic tank pumping: Class F Liquid Waste Hauler
- Installation/Troubleshooting: Class E System Contractor

4.1.2 ADVANTEX TREATMENT SYSTEM

The AdvanTex Treatment System is designed to meet the DNREC wastewater effluent limits. Orenco has prepared an O&M manual for the treatment system which is provided in **Appendix C**.

4.2 DISPOSAL SYSTEM

The disposal system includes a 10-foot diameter duplex pumping station, valve vault and two sets of disposal trenches. Each trench set includes 10 parallel, 100-foot long trenches; an isolation valve is provided at the beginning of each trench. Each of the two pumps in the pumping station is dedicated to a trench set. The control panel cycles between the operation of each pump. The dosing station has an approximate capacity of 5,300 gallons. The pumps turn on and off based on float switches within the

station and are set to provide an approximate dose volume of 1,257 gallons. The system design calculations and equipment submittals are provided in **Appendix D**.

4.2.1 SERVICE LIFE

The onsite wastewater disposal system is designed to work indefinitely if properly installed and maintained. Although typical single family home systems are expected to last only 20-30 years, this system has been provided with a much higher degree of treatment. Most disposal system failures are the result of biological overload of the soil due to overuse, inadequate treatment or poor maintenance.

4.2.2 START-UP AND SHUT-DOWN PROCEDURES

The disposal system pumps are set to operate on automatic mode. The pumps start up when the float switches switch the pumps to on or off; the control panel cycles between the operation of each pump. At start-up the trench laterals were tested for residual pressure at the end of each line and the isolation valves at the beginning of each trench were adjusted to meet the design residual pressure.

4.2.3 EQUIPMENT INSPECTION SCHEDULES

The pumps and electrical controls should be inspected quarterly for proper function. At this time the drainfield portion of the system should be observed by walking across the surface and looking for any anomalies such as overly green grass, damp areas, animal burrows or erosional features. Any such anomalies should be immediately addressed.

4.2.4 EQUIPMENT MAINTENANCE SCHEDULES

The pumps and electrical controls should be inspected quarterly for proper function. Should any pumps or electrical components be found to be problematic, they are to be replaced or repaired immediately. Trench laterals are to be flushed annually.

4.2.5 OPERATING PROCEDURES FOR ADVERSE CONDITIONS

The soil-based portion of the system is constructed to withstand adverse weather conditions. The trenches are three feet deep, which is below the typical frost depth encountered in the last decade. Even if frost were to reach the depths found in the past, which have included three feet, the effluent in the trenches is biologically active and produces heat, so freezing should not be a concern. The landscape position of the drainfield is a backslope on a high promontory, so wet weather should not be a concern as most rainfall will run from the site. As such, saturated soils, except as addressed above under "maintenance" should not be a factor. High winds should not affect the functioning of the system as it is located underground.

4.2.6 ELECTRICAL AND MECHANICAL MALFUNCTIONS

Any electrical or mechanical malfunctions noted during inspection should be attended to immediately. The parts in the system that would be subject to such concerns are limited to pumps, control panels and activating floats. As the dosing station is designed as a duplex station,

failure of one of the pumps is not immediately catastrophic, however, it should be replaced within 48 hours. High-level alarms are provided to warn of pump malfunction.

4.2.7 TROUBLESHOOTING FOR COMMON OR EXPECTED PROBLEMS

The pumps and electrical controls should be inspected quarterly for proper function. At this time the drainfield portion of the system should be observed by walking across the surface and looking for any anomalies such as overly green grass, damp areas, animal burrows or erosional features. Any areas of overly green grass or damp soil be encountered, the flow to that trench(es) should be shut off using the ball valve installed on the lateral, and the trenches inspected and, if needed they should be de-watered. De-watering would require excavation at the end of the trench to expose the water in the trench, placement of a 6-inch diameter perforated pipe to grade and then pumping the water out using a Class F licensed septage hauler. The pipe should then be capped and the hole backfilled. The pipe is to remain in place in case of future need. The trench should remain shut off for at least one week to allow the soil to dry, then the valve is to be re-opened.

4.2.8 O&M BACK-UP, STAND-BY AND SUPPORT EQUIPMENT

Any back-up equipment, such as generators, should also be inspected and exercised on the same quarterly schedule as the rest of the equipment.

4.2.9 SUBSURFACE DISPOSAL SYSTEM DOSING CONTROLS

The control panel and activation floats should be inspected quarterly. Any malfunctioning units should be replaced immediately.

4.2.10 SUBSURFACE DISPOSAL DOSING VOLUME AND SCHEDULE

During inspection of the control panel, pump run times should be checked and logged. Any variation from the dosing schedule as designed must be adjusted.

4.2.11 SUBSURFACE DISPOSAL INSPECTION

At the quarterly inspection, the drainfield portion of the system should be observed by walking across the surface and looking for any anomalies such as overly green grass, damp areas, animal burrows or erosional features. Any areas of overly green grass or damp soil be encountered, the flow to that trench(es) should be shut off using the ball valve installed on the lateral, and the trenches inspected and, if needed they should be de-watered. De-watering would require excavation at the end of the trench to expose the water in the trench, placement of a 6-inch diameter perforated pipe to grade and then pumping the water out using a Class F licensed septage hauler. The pipe should then be capped and the hole backfilled. The pipe is to remain in place in case of future need. The trench should remain shut off for at least one week to allow the soil to dry, then the valve is to be re-opened.

4.2.12 SUBSURFACE DISPOSAL VEGETATIVE COVER

The drainfield is to be maintained with herbaceous cover, which should be mowed regularly. No trees or shrubs are allowed within ten feet of the perimeter of the drainfield. Any bare spots are to be seeded with grass seed.

4.2.13 SUBSURFACE DISPOSAL COMMON SIGNS OF SYSTEM SPECIFIC EXPECTED PROBLEMS AND TROUBLESHOOTING PROCEDURES

See "Inspection of Disposal Area" and "Equipment Maintenance Schedules" above.

5.0 MONITORING PROGRAM

The system shall be monitored and reported to DNREC according to the permit requirements (see **Appendix A**).

6.0 RECORDS AND REPORTS

Records and reports from third-party vendors shall be kept for the following wastewater treatment and disposal system activities (maintenance reports are available in the Orenco Advantex O&M Manual (**Appendix C**)):

- 1) Septic System Maintenance (pumping, filter cleaning)
- 2) Orenco Advantex System Maintenance, Repairs and Chemical Use/Replacement
- 3) Disposal System Pump Testing
- 4) Influent/Effluent Monitoring
- 5) Monitoring Well Data Collection

7.0 EXAMPLE OPERATOR LOG

Field Maintenance Report templates are provided in the Orenco Advantex O&M Manual (**Appendix C**).

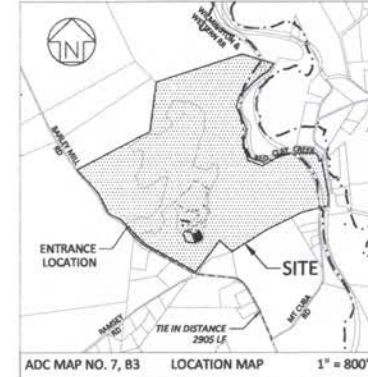
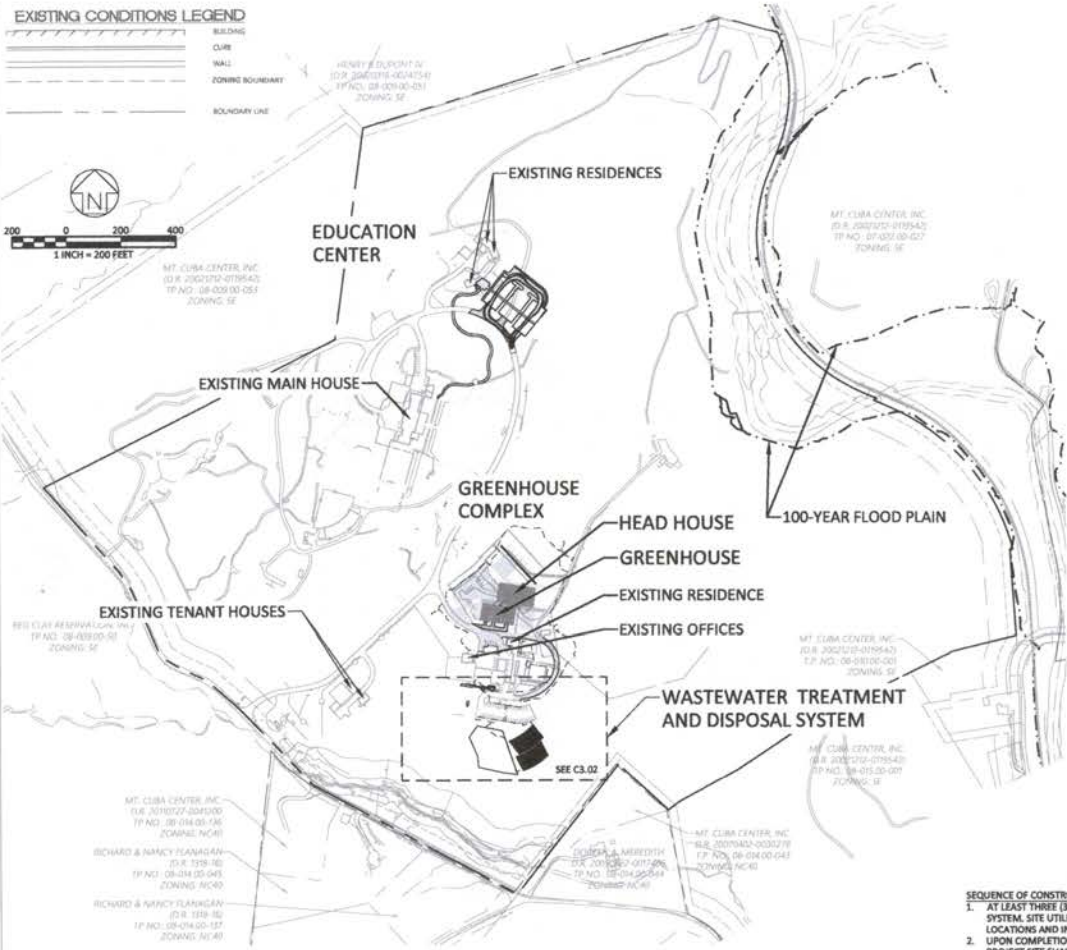
APPENDIX A

PERMIT

APPENDIX B
AS-BUILT DRAWINGS

EXISTING CONDITIONS LEGEND

	BUILDING
	CURB
	WALL
	ZONING BOUNDARY
	BOUNDARY LINE



Sheet List Table

Sheet Number	Sheet Title
C3.01	OVERALL SITE PLAN
C3.02	WASTEWATER SITE PLAN
C3.03	WASTEWATER DETAILS - SHEET 1
C3.04	WASTEWATER DETAILS - SHEET 2
C3.05	WASTEWATER DETAILS - SHEET 3
C3.06	WASTEWATER DETAILS - SHEET 4
C3.07	WASTEWATER DETAILS - SHEET 5
C3.08	WASTEWATER DETAILS - SHEET 6
C3.09	WASTEWATER PROFILE



- SEQUENCE OF CONSTRUCTION:**
- AT LEAST THREE (3) DAYS PRIOR TO THE START OF EARTH DISTURBANCE ACTIVITIES, ORDER A UTILITY MARK BUT AVOIDING THE DELAWARE ONE CALL SYSTEM. SITE UTILITIES MUST BE FIELD LOCATED AND MARKED BEFORE THE START OF ANY SITE WORK, INCLUDING ALL PRIVATE UTILITIES. CONFIRM LOCATIONS AND INVERTS.
 - UPON COMPLETION OR TEMPORARY CESSATION OF THE EARTH DISTURBANCE ACTIVITY THAT WILL EXCEED 24 HOURS OR ANY RANGE THEREOF, THE PROJECT SITE SHALL BE IMMEDIATELY STABILIZED WITH THE APPROPRIATE TEMPORARY OR PERMANENT STABILIZATION.
 - INSTALL TEMPORARY ROCK CONSTRUCTION ENTRANCE, AS NOTED ON THE EROSION & SEDIMENT CONTROL PLAN, PRIOR TO BEGINNING WORK.
 - INSTALL CONSTRUCTION FENCING ALONG LIMIT OF DISTURBANCE AND COMPOST SOCK AS SHOWN ON THE PLAN. NO DISTURBANCE CAN TAKE PLACE OUTSIDE OF THE PROJECT LIMIT.
 - INSTALL INLET PROTECTION PRIOR TO LAND-DISTURBING ACTIVITIES.
 - CLEAR AND GRUB AREAS FOR THE LOCATION OF THE PROPOSED TREATMENT AND DISPOSAL SYSTEM.
 - CONTRACTOR TO ABSOLUTELY PROTECT EXCAVATION PER OSHA STANDARDS THROUGHOUT PROJECT.
 - INSTALL TREATMENT AND SOIL DISPOSAL SYSTEM PER THE CONTRACT DOCUMENTS.
 - PERFORM SYSTEM TESTING TO CONFIRM PROPER FUNCTIONING OF SYSTEM COMPONENTS, INCLUDING BUT NOT LIMITED TO: SEPTIC TANK PUMPS, FLOWMETERS, ALL ORNICO ADVANTAX SYSTEM COMPONENTS, SOIL DISPOSAL SYSTEM PUMP AND PRESSURIZED LATERALS. PERFORM ADDITIONAL TESTING PER THE CONTRACT DOCUMENTS.
 - AFTER FINAL SITE STABILIZATION HAS BEEN ACHIEVED (VEGETATIVE AREAS SHALL BE CONSIDERED PERMANENTLY STABILIZED WHEN A UNIFORM 70% VEGETATIVE COVER OF EROSION RESISTANT PERENNIAL SPECIES HAS BEEN ACHIEVED), REMOVE TEMPORARY EROSION & SEDIMENT CONTROLS. AREAS DISTURBED DURING REMOVAL OF THE CONTROLS MUST ALSO BE STABILIZED IMMEDIATELY.

DESIGN TEAM

ARCHITECT
RE-VISION ARCHITECTURE
 133 GRAPE STREET
 PHILADELPHIA, PA 19127
 P: 215-482-1133

LANDSCAPE ARCHITECT
NELSON BYRD WOLTZ
 310 EAST MARKET STREET
 CHARLOTTESVILLE, VA 22902
 P: 434-984-1358

CIVIL ENGINEER
MELIORA
 259 MORGAN STREET
 PHOENIXVILLE, PA 19400
 P: 610-952-0129

CLASS C ENGINEER
H.L. ROBERTSON, INC.
 601 BRANDYWINE BLVD.
 WILMINGTON, DE 19809
 P: 302-784-2456

SOIL CONSULTANT
LANCHESTER SOIL CONSULTANTS, INC.
 326 EAST AVONDALE ROAD
 WEST GROVE, PA 18380
 P: 610-637-4118

OWNER
MT. CUBA CENTER
 3100 BAILEY MILL ROAD
 HOCKESSIN, DE 19707
 P: 302-230-4244

REVISIONS

AS-BUILT DRAWINGS

PLAN PREPARER
 CARMINE CAPRIO, PE
 CLASS C LICENSE #9260

GREENHOUSE AND EDUCATION CENTER IMPROVEMENTS

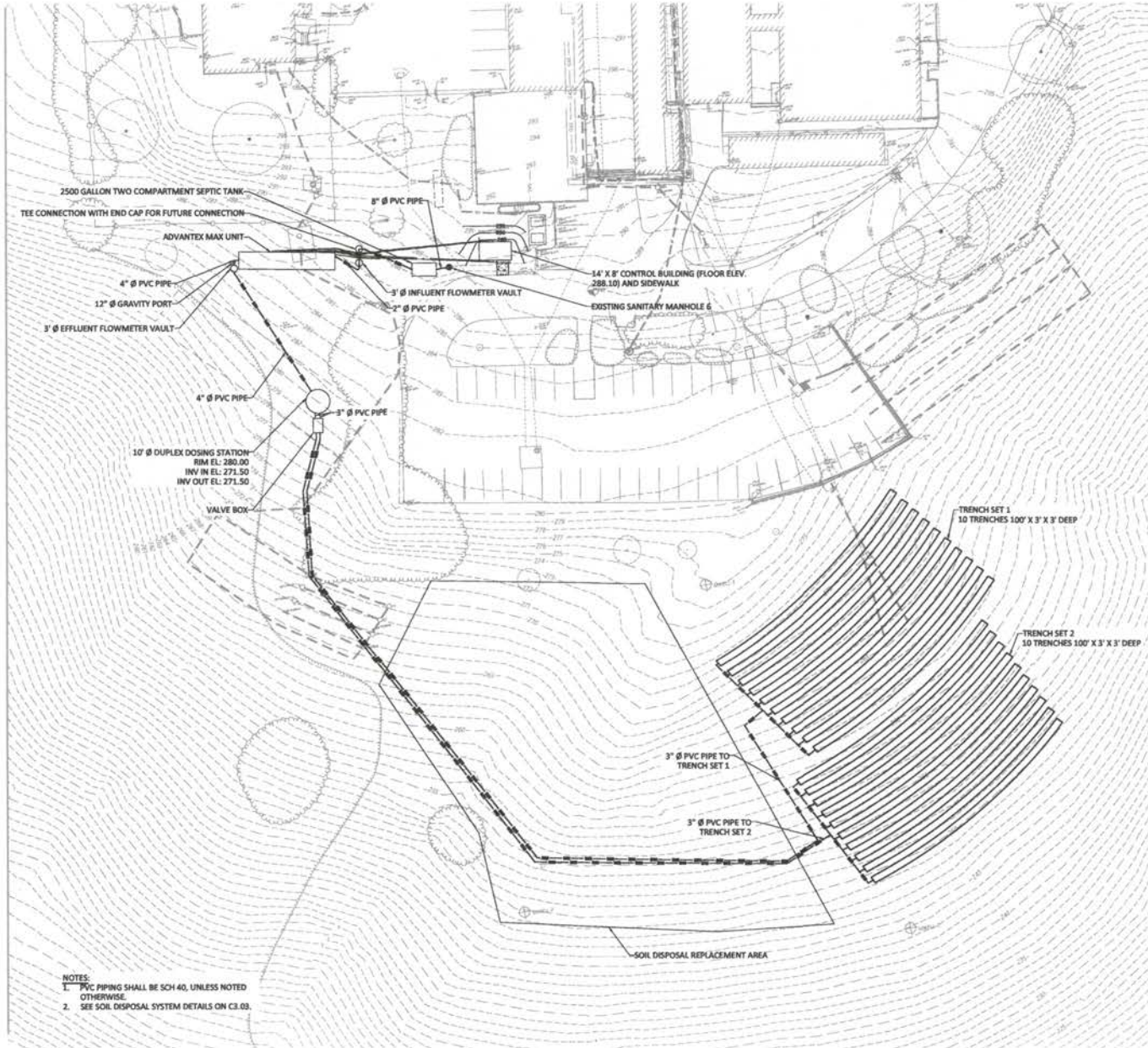
ON-SITE WASTEWATER SYSTEM

Mill Creek Hundred
 New Castle County, Delaware
 Prepared by Meliora Design

DATE: 11/22/2023
 SCALE: AS NOTED
 TITLE: OVERALL SITE PLAN

SHEET NO.: **C3.01**

CONTRACTOR TO VERIFY ALL DIMENSIONS IN FIELD AND INFORM ARCHITECT OF ANY DISCREPANCIES BEFORE STARTING WORK.
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- NOTES:
1. PVC PIPING SHALL BE SCH 40, UNLESS NOTED OTHERWISE.
2. SEE SOIL DISPOSAL SYSTEM DETAILS ON C3.03.

LEGEND
SANITARY MANHOLE
PROPOSED SANITARY LINE

- SOIL DISPOSAL GENERAL NOTES:
1. THIS PLAN DOES NOT CONSTITUTE A SURVEY.
2. ALL TREATMENT AND PUMP TANKS MUST BE WATERTIGHT.
3. NO WET WEATHER INSTALLATION IS PERMITTED WITHOUT APPROPRIATE PRECAUTIONS AND APPROVAL OF DNREC.
4. NO ACTIVITY IS ALLOWED ON THE DRAINFIELD OTHER THAN THE MINIMUM REQUIRED TO INSTALL THE SYSTEM. DRAINFIELD AREA IS TO BE PROTECTED FROM TRAFFIC AT ALL TIMES.
5. DRAINFIELD AREA IS TO BE PROTECTED FROM CUTTING OR FILLING BOTH BEFORE AND AFTER INSTALLATION.
6. UNLESS OTHERWISE NOTED, DRAINFIELD IS TO BE INSTALLED WITH LONG AXIS PARALLEL TO NATURAL CONTOUR LINES.
7. INSTALLER TO VERIFY ALL DIMENSIONS AND LOCATIONS PRIOR TO START OF CONSTRUCTION.
8. INSTALLER TO DETERMINE LOCATION OF ALL EXISTING UTILITIES BEFORE START OF CONSTRUCTION USING MISS UTILITIES SYSTEM (800) 441-8355.
9. ALL PIPE TO BE SCHEDULE 40 PVC OR APPROVED EQUAL.
10. PUMP AND ALARM MUST BE ON SEPARATE ELECTRICAL CIRCUITS.
11. BACK-UP GENERATOR TO BE CONNECTED IN CASE OF POWER FAILURE.

DESIGN TEAM
ARCHITECT
RE:VISION ARCHITECTURE
133 GRAPE STREET
PHILADELPHIA, PA 19127
P: 215.482.1133
LANDSCAPE ARCHITECT
NELSON BYRD WOLTZ
310 EAST MARKET STREET
CHARLOTTESVILLE, VA 22902
P: 434.284.1356

OWNER
MELIORA
259 MORGAN STREET
PHOENIXVILLE, PA 19460
P: 610.933.0123
CLASS C CONTRACTOR
H.L. ROBERTSON, INC.
601 BRANDYWINE BLVD.
WILMINGTON, DE 19089
P: 302.764.2456
SOIL CONSULTANT
LANCHESTER SOIL
CONSULTANTS, INC.
325 EAST ANCHORAGE ROAD
WEST GROVE, PA 18380
P: 610.637.4118

OWNER
MT. CUBA CENTER
3100 BARLEY MILL ROAD
HOCKESSIN, DE 19707
P: 302.239.4244

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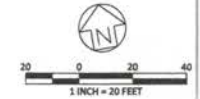
PLAN PREPARER
GARIBBE CASPER, PE
CLASS C LICENSE #2050



GREENHOUSE AND
EDUCATION CENTER
IMPROVEMENTS
ON-SITE WASTEWATER
SYSTEM
Mill Creek Hundred
New Castle County, Delaware
Prepared by Meliora Design

DATE: 11/22/2023
SCALE:
TITLE: WASTEWATER SITE PLAN
SHEET NO.:

C3.02



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DESIGN TEAM

ARCHITECT
 RE-VISION ARCHITECTURE
 133 GRAPE STREET
 PHILADELPHIA, PA 19127
 P: 215.482.1130

LANDSCAPE ARCHITECT
 NELSON BYRD WOLTZ
 310 EAST MARKET STREET
 CHARLOTTEVILLE, VA 22902
 P: 434.284.1356

CIVIL ENGINEER

MELIORA
 259 MORGAN STREET
 PHOENIXVILLE, PA 19460
 P: 610.853.0123

CLASS C DESIGNER
 H.L. ROBERTSON, INC.
 801 BRANDYWINE BLVD.
 WILMINGTON, DE 19089
 P: 302.754.2456

SOIL CONSULTANT
 LANCHESTER SOIL
 CONSULTANTS, INC.
 355 EAST AVONDALE ROAD
 WEST GROVE, PA 18380
 P: 610.637.4118

OWNER

MT. CUBA CENTER
 3100 BARLEY MILL ROAD
 HOCKESSIN, DE 19707
 P: 302.230.4244

REVISIONS

AS-BUILT DRAWINGS

PLAN PREPARER

GARMINE CAPRIN, PE
 CLASS LICENSE #2050

**GREENHOUSE AND
 EDUCATION CENTER
 IMPROVEMENTS**

**ON-SITE WASTEWATER
 SYSTEM**

Mill Creek Hundred
 New Castle County, Delaware
 Prepared by Meliora Design

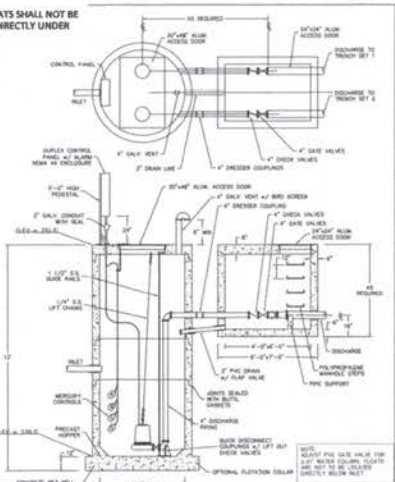
DATE: 11/22/2023
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SHEET NO.:

C3.03

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NOTE:
 PUMP FLOATS SHALL NOT BE
 LOCATED DIRECTLY UNDER
 THE INLET.

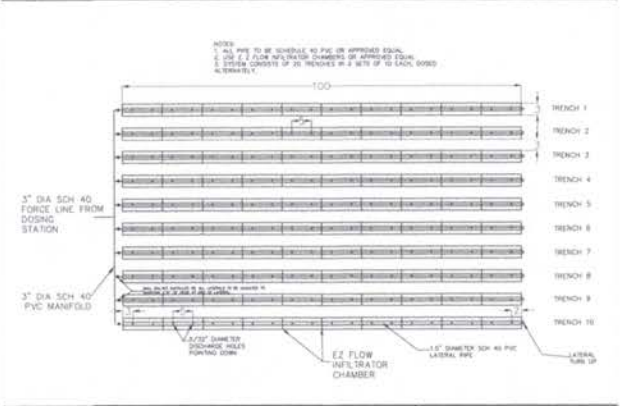


IPCR
 CERTIFIED PRECAST

MONARCH PRECAST CONCRETE CORP.
 425 NORTH CALPURN STREET ALLENTOWN, PA 18109 PHONE (610) 432-6746
 WWW.MONARCHPRECAST.COM FAX (610) 437-7132

PACKAGED DUPLEX SEWAGE PUMPING STATION

2
 DUPLEX PUMPING STATION
 NTS

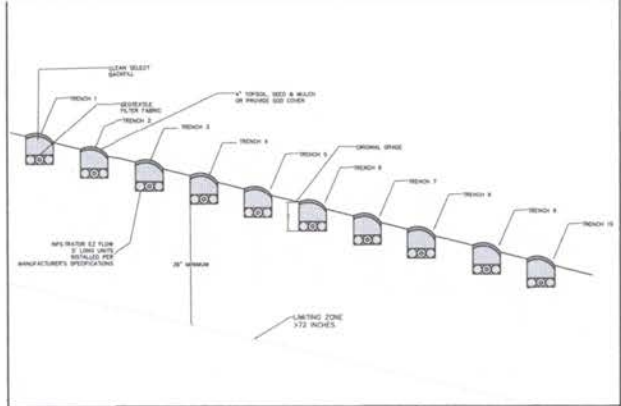


LANCHESTER SOIL CONSULTANTS, INC.
 225 East Avondale Road
 West Grove, PA 18380
 www.lanchemail.com

MT. CUBA CENTER
 3120 BARLEY MILL ROAD
 TP # 08-009.00-052

TRENCH SET
 NOT TO SCALE

1
 TRENCH SET
 TYPICAL NTS

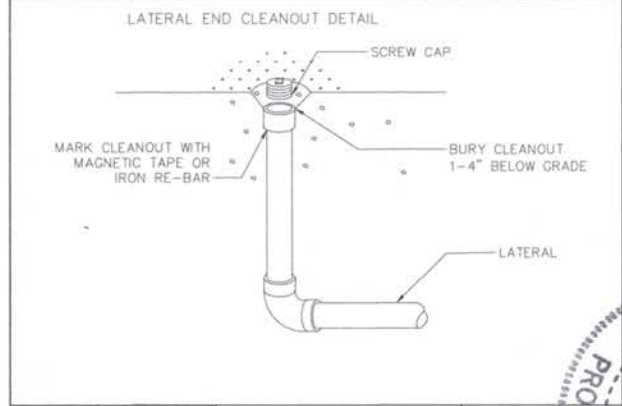


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 225 East Avondale Road
 West Grove, PA 18380
 www.lanchemail.com

MT. CUBA CENTER
 3120 BARLEY MILL ROAD
 TP # 08-009.00-052

HYDRAULIC PROFILE
 NOT TO SCALE

3
 HYDRAULIC PROFILE
 NTS



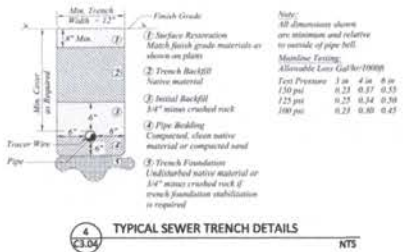
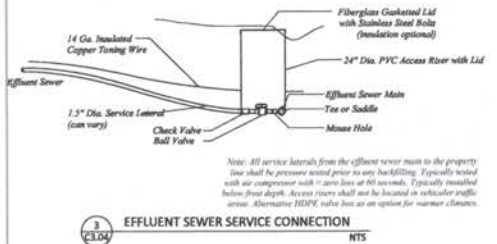
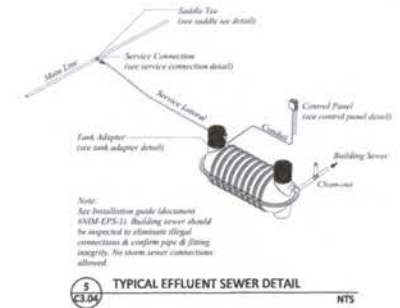
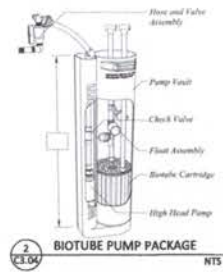
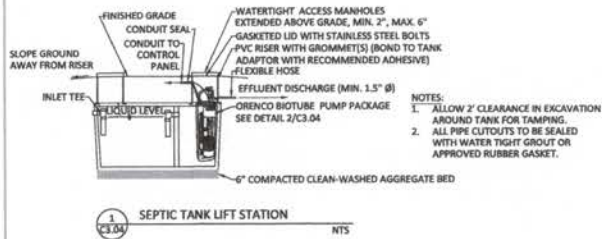
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 TP # 08-009.00-052

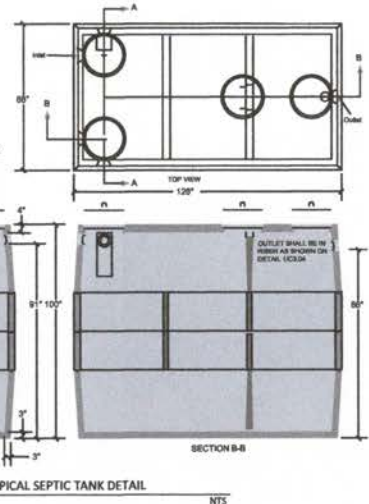
TURN UP DETAIL
 NOT TO SCALE

4
 TURN UP DETAIL
 TYPICAL NTS





- NOTES:
 * 2500 US Gallon Capacity
 * 4 Gall Sealing Inlets for 4 inch pipe
 * Polypropylene Inlet Baffle
 * Concrete: 5000psi min
 * Fiber reinforcement throughout
 * ASTM C 1227
 * TSG pipe sealed with butyl sealant
 * Covers 16" nominal diameter
 * No joint cover design with coated steel handles
 * Weight Top Section: 5900 lbs
 * Weight Bottom Section: 6400 lbs
 * Weight Center Section: 2800 lbs. x 2
 * ORONCO BIOTUBE PUMP PACKAGE TO BE PROVIDED IN SEPTIC TANK (SEE DETAILS B.1 AND 2 ON THIS SHEET)



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 CHARLOTTESVILLE, VA 22902
 P: 434-984-1358
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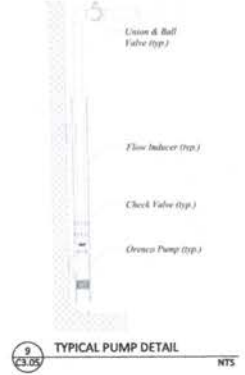
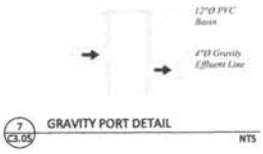
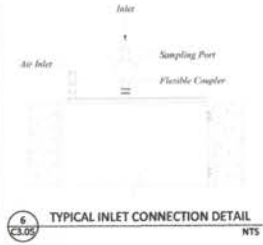
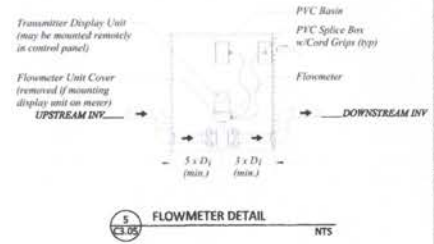
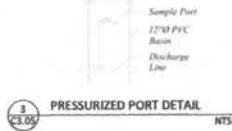
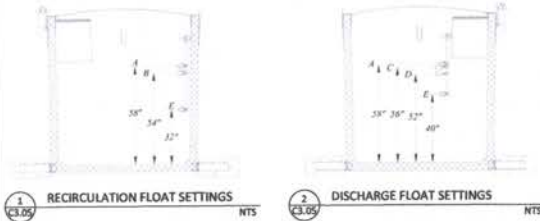
GREENHOUSE AND
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 IMPROVEMENTS
 ON-SITE WASTEWATER
 SYSTEM
 Mill Creek Hundred
 New Castle County, Delaware
 Prepared by Meliora Design

DATE: 11/22/2023
 SCALE:
 TITLE: WASTEWATER DETAILS - SHEET 2
 SHEET NO.:

C3.04

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- Float Functions
 A High Level Alarm / Log Enable
 B Override Timer
 C Pump ON
 D Pump OFF
 E Backwash Off / Low Level Alarm



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 PHILADELPHIA, PA 19127
 P: 215.482.1133
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 NELSON BYRD WOLTZ
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 CHARLOTTEVILLE, VA 22902
 P: 434.984.1308
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 PHOENIXVILLE, PA 19490
 P: 610.955.0122
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**GREENHOUSE AND
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**ON-SITE WASTEWATER
 SYSTEM**

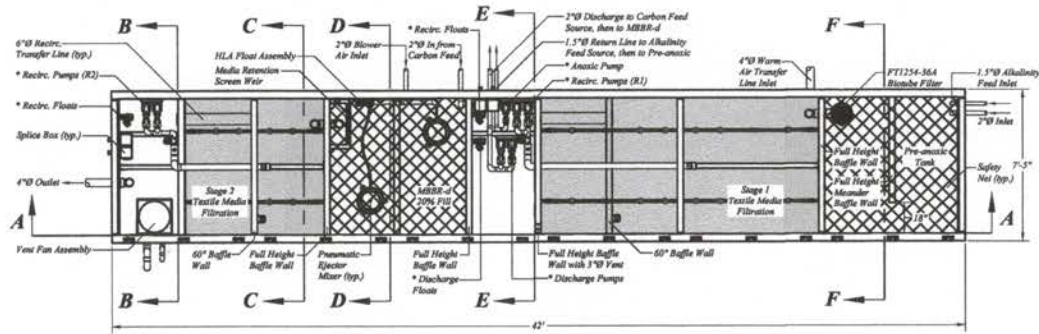
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 SCALE:
 TITLE: WASTEWATER DETAILS - SHEET 3

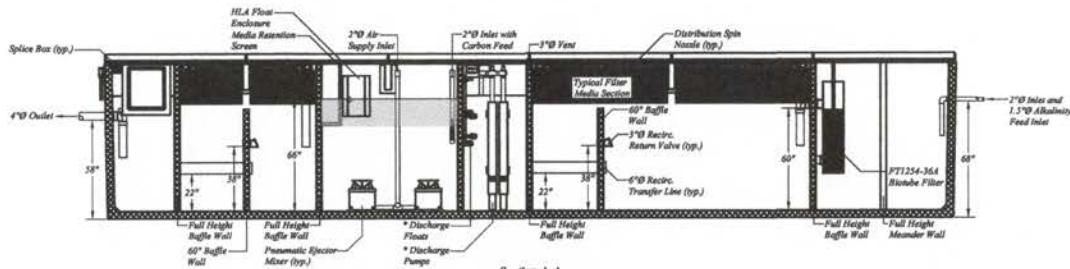
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Plan View
Scale: 1" = 4'-0"



Section A-A
Scale: 1" = 4'-0"

1
C3.07 ADVANTEX TREATMENT SYSTEM DETAILS
NTS

* Float Functions & Pump Index

A	High Level Alarm / Low Double
B	Override Timer
C	OVR ON/OFF
D	Timer ON/OFF
E	Return Valve / Low Level Alarm

Recirc. MP3P	Discharge MP4P
60"	32"
56"	58"
32"	34"
60"	44"
60"	40"

Recirculation Pumps (R1): FF7510
Recirculation Pumps (R2): FF3003
Discharge Pump: FF3003
Anoxic Return Pump: FF3003

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REVISION ARCHITECTURE
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PHILADELPHIA, PA 19127
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LANDSCAPE ARCHITECT
NELSON BYRD WOLTZ
310 EAST MARKET STREET
CHARLOTTESVILLE, VA 22902
P: 434.984.1358

CIVIL ENGINEER
MELIORA
259 MORGAN STREET
PHOENIXVILLE, PA 19400
P: 610.293.0123

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5120 BARELY MILL ROAD
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P: 302.239.4244

REVISIONS

AS-BUILT DRAWINGS

PLAN PREPARER

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IMPROVEMENTS

ON-SITE WASTEWATER
SYSTEM

Mill Creek Hundred
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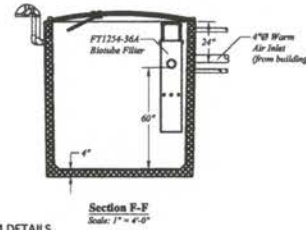
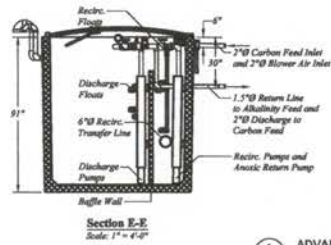
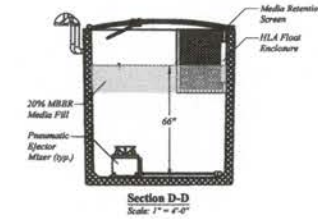
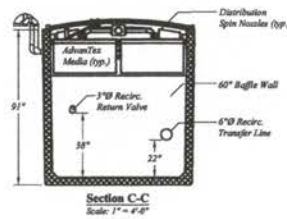
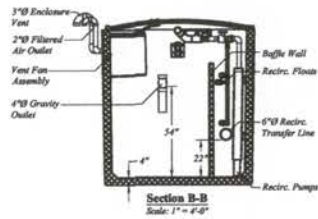
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1 ADVANTEX TREATMENT SYSTEM DETAILS
NTS

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P: 215.482.1130

LANDSCAPE ARCHITECT
NELSON BYRD WOLTZ
310 EAST MARKET STREET
CHARLOTTESVILLE, VA 22902
P: 434.984.1358

CIVIL ENGINEER
MELIORA
259 MORGAN STREET
PHOENIXVILLE, PA 19400
P: 610.932.0123

CLASS C DESIGNER
H.L. ROBERTSON, INC.
801 BRANDYWINE BLVD.
WILMINGTON, DE 19089
P: 302.764.2456

SOIL CONSULTANT
LANCHESTER SOIL
CONSULTANTS, INC.
302 EAST AVONDALE ROAD
WEST GROVE, PA 18390
P: 610.657.4118

OWNER
MT. CUBA CENTER
3170 BARLEY MALL ROAD
HOCKESSIN, DE 19707
P: 302.230.4244

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PLAN PREPARER

CARMINE CASPER, PE
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ON-SITE WASTEWATER
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Mill Creek Hundred
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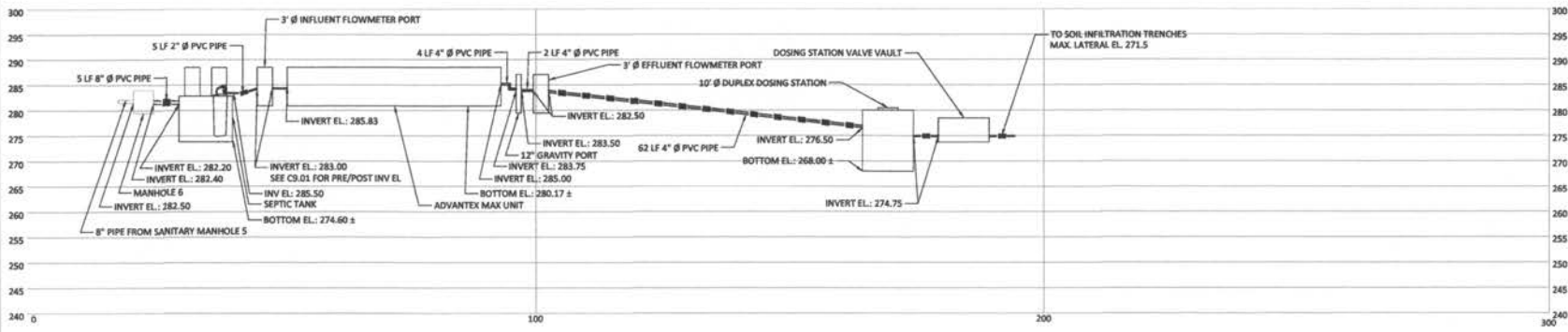
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 CHARLOTTESVILLE, VA 22902
 P: 434-384-1358

CIVIL ENGINEER
 MELIORA
 259 MORGAN STREET
 PHOENIXVILLE, PA 19460
 P: 610-893-0123

CLASS C DESIGNER
 H.L. ROBERTSON, INC.
 801 BRANDYWINE BLVD.
 WILMINGTON, DE 19089
 P: 302-764-2456

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 LANCHESTER SOIL
 CONSULTANTS, INC.
 325 EAST AVONDALE ROAD
 WEST GROVE, PA 18390
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**ON-SITE WASTEWATER
 SYSTEM**

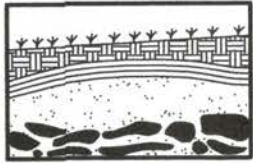
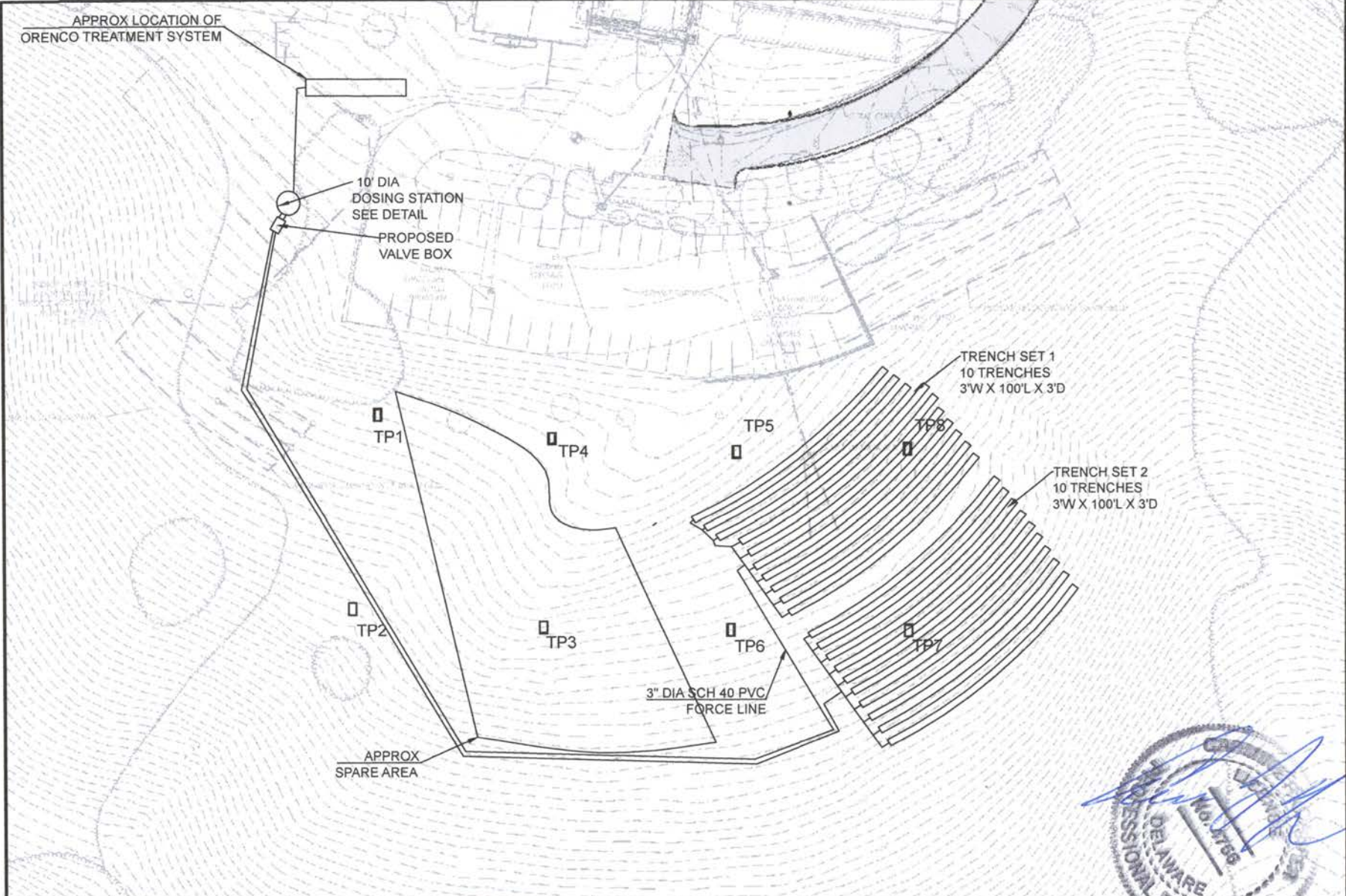
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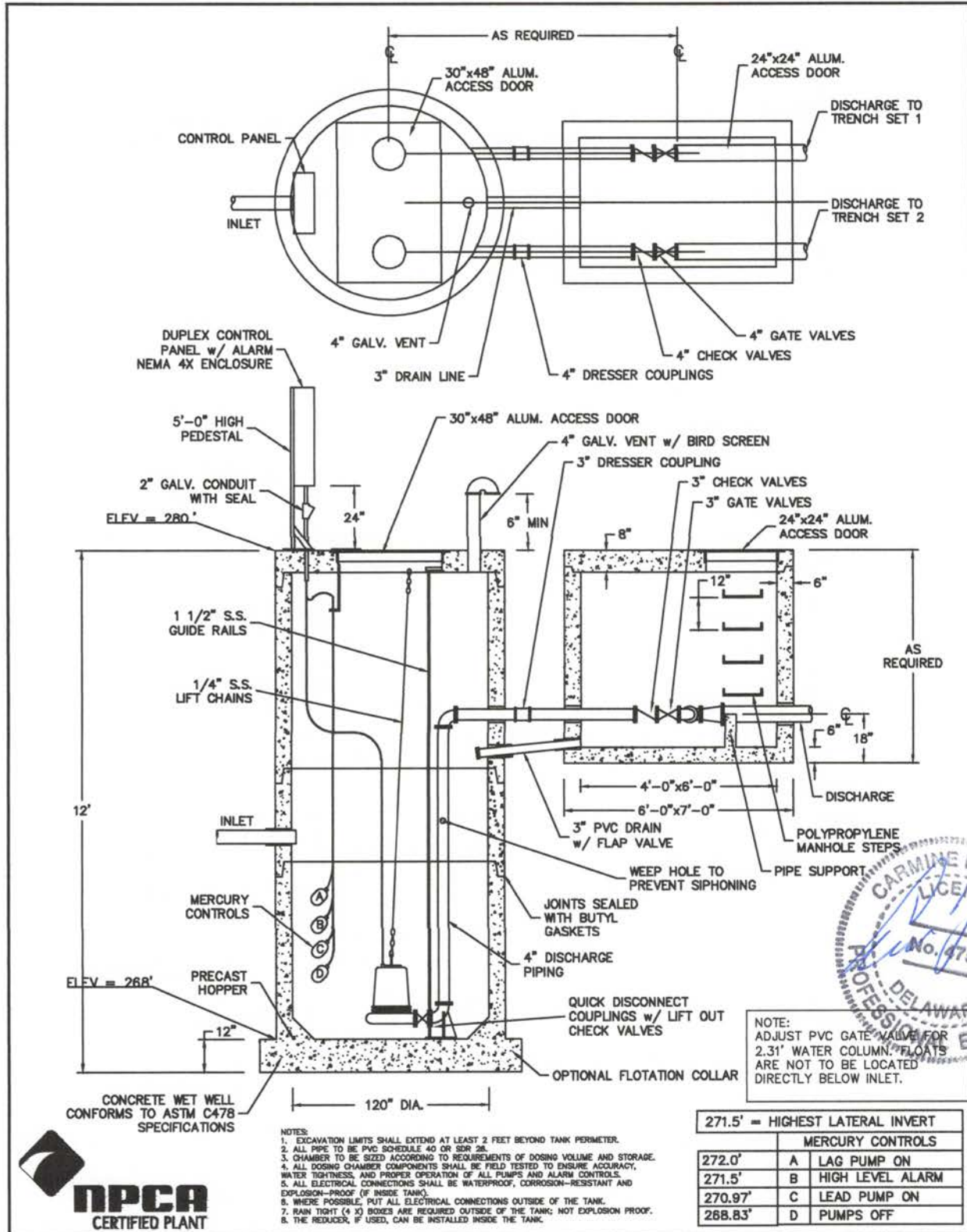




Lanchester Soil Consultants, inc.
 325 East Avondale Road 610.637.4118
 West Grove, PA 19390
 www.Soildude.com soildude@comcast.net

MT. CUBA CENTER
 AS- BUILT
 11/25/2023
 3120 BARLEY MILL ROAD
 TP # 08-009.00-052

**ILLUSTRATIVE PLAN
 VIEW**
 APPROX. SCALE 1" = 60'



- NOTES:
1. EXCAVATION LIMITS SHALL EXTEND AT LEAST 2 FEET BEYOND TANK PERIMETER.
 2. ALL PIPE TO BE PVC SCHEDULE 40 OR SDR 26.
 3. CHAMBER TO BE SIZED ACCORDING TO REQUIREMENTS OF DOSING VOLUME AND STORAGE.
 4. ALL DOSING CHAMBER COMPONENTS SHALL BE FIELD TESTED TO ENSURE ACCURACY, WATER TIGHTNESS, AND PROPER OPERATION OF ALL PUMPS AND ALARM CONTROLS.
 5. ALL ELECTRICAL CONNECTIONS SHALL BE WATERPROOF, CORROSION-RESISTANT AND EXPLOSION-PROOF (IF INSIDE TANK).
 6. WHERE POSSIBLE, PUT ALL ELECTRICAL CONNECTIONS OUTSIDE OF THE TANK.
 7. RAIN TIGHT (4 X) BOXES ARE REQUIRED OUTSIDE OF THE TANK; NOT EXPLOSION PROOF.
 8. THE REDUCER, IF USED, CAN BE INSTALLED INSIDE THE TANK.



MONARCH PRECAST CONCRETE CORP.

425 NORTH DAUPHIN STREET
WWW.MONARCHPRECAST.COM

ALLENTOWN, PA. 18109

PHONE (610) 435-6746
FAX (610) 437-7133

PACKAGED DUPLEX SEWAGE PUMPING STATION

DOSING PUMP DATA SHEET

Owner: Mt. Cuba Center	
Peak Flow (GPM)	88
Peak Flow = 200 holes x 0.44 gpm = 88 gpm.	

Friction Loss in Delivery Line			
Fittings	#	Equiv. Length	Total Equiv. Length
90° Elbows	1	10	10
45° Elbows	5	4	20
Couplings	40	1.5	60
Unions	1	1.5	1.5
Ball Valves	1	2.5	2.5
Check Valves	1	22	22
Force Line	1	395	395

Total Equiv. Length	511.0
Friction Head	9.6
Force Line	
Friction Head	5.6
Manifold & Laterals	
Static Head	3.5
Design Head	2.3
Total Dynamic Head	20.9

Discharge Volume Per Dose	1257 Gallons	Min. dose volume : (1000' of 1.5" dia lateral pipe x 0.09 gal/ft) + (73' of 3" dia manifold x 0.38 gal/ft) = 118.5 gal. x 5 = 595.5 gal. Provide 2.14" =1257 gallons.
----------------------------------	--------------	---

Pump	Liberty LEH200	Storage Volume required = 3770 gal(daily flow) . Provide 5300 gallons storage.
-------------	----------------	--

Grade at Pump Station	280	Pump Off	268.83	Timer to be set to run every 8 hours. Pump run time = 1257 gallons/88 gpm = 14.28 minutes or 14 minutes 15 seconds
------------------------------	-----	-----------------	--------	--

Pump Tank Floor	268	Pump On	270.97
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Pump Intake	268	Alarm On	271.5
--------------------	-----	-----------------	-------

Lateral Invert	271.5
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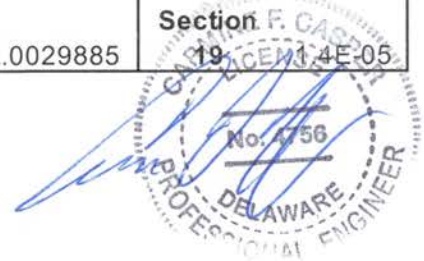
Pump Tank Capacity	7046 Gallons	Tank Volume:	48.9 gallons per inch	587.2 gallons per foot
---------------------------	--------------	---------------------	-----------------------	------------------------

Pump Tank Dimensions	10' Dia x 12' Deep
-----------------------------	--------------------



DOSING PUMP DATA SHEET

Friction Loss in Laterals		Lateral Diameter	1.5	Flow Entering Lateral	8.80	Length Between Holes	5
F-Loss/100' in Section 1	0.76729683	F-Loss/Section 1	0.0383648		Flow in Section 11	4.40	
Flow in Section 2	8.36				F-Loss/100' in Section 11	0.2125474	Section 11 0.01777
F-Loss/100' in Section 2	0.69776234	F-Loss/Section 2	0.0348881		Flow in Section 12	3.96	
Flow in Section 3	7.92				F-Loss/100' in Section 12	0.1748691	F-Loss/Section 12 0.01385
F-Loss/100' in Section 3	0.63127782	F-Loss/Section 3	0.0315639		Flow in Section 13	3.52	
Flow in Section 4	7.48				F-Loss/100' in Section 13	0.1405978	F-Loss/Section 13 0.01052
F-Loss/100' in Section 4	0.56786782	F-Loss/Section 4	0.0283934		Flow in Section 14	3.08	
Flow in Section 5	7.04				F-Loss/100' in Section 14	0.1097937	Section 14 0.00773
F-Loss/100' in Section 5	0.50755845	F-Loss/Section 5	0.03		Flow in Section 15	2.64	
Flow in Section 6	6.60				F-Loss/100' in Section 15	0.0825262	Section 15 0.00545
F-Loss/100' in Section 6	0.45037769	F-Loss/Section 6	0.0225189		Flow in Section 16	2.20	
Flow in Section 7	6.16				F-Loss/100' in Section 16	0.0588774	Section 16 0.00363
F-Loss/100' in Section 7	0.39635558	F-Loss/Section 7	0.0198178		Flow in Section 17	1.76	
Flow in Section 8	5.72				F-Loss/100' in Section 17	0.0389467	Section 17 0.00223
F-Loss/100' in Section 8	3.72877717	F-Loss/Section 8	0.1864389		Flow in Section 18	1.32	
Flow in Section 9	5.28				F-Loss/100' in Section 18	0.0228604	Section 18 0.00121
F-Loss/100' in Section 9	0.29791991	F-Loss/Section 9	0.014896		Flow in Section 19	0.88	
Flow in Section 10	4.84				F-Loss/100' in Section 19	0.0107886	F-Loss/Section 19 0.00052
F-Loss/100' in Section 10	0.25358006	F-Loss/Section 10	0.012679		Flow in Section 19	0.44	
Total F-Loss in Lateral	0.48	Total F-Loss in All	4.78		F-Loss/100' in Section 19	0.0029885	F-Loss/Section 19 1.4E-05



DOSING PUMP DATA SHEET

Friction Loss in Manifold Section 1	Friction Loss in Manifold Section 2	Friction Loss in Manifold Section 3	Friction Loss in Manifold Section 4
Length 3	Length 6	Length 6	Length 6
Flow 44	Flow 35.2	Flow 26.4	Flow 17.6
F-Loss/100' 3.72877717	F-Loss/100' 2.4665452	F-Loss/100' 1.447779912	F-Loss/100' 0.683253
F-Loss/Section 0.11186332	F-Loss/Section 0.1479927	F-Loss/Section 0.086866795	F-Loss/Section 0.040995
Friction Loss in Manifold Section 5	Total F-Loss in Manifold		0.798148
Length 6			
Flow 8.8			
F-Loss/100' 0.1892666			
F-Loss/Section 0.011356			



LEH200-Series

Motor

- Class B, oil-filled, and hermetically sealed
- Overload protection:
 - 1-phase embedded in windings automatically reset once cooled
 - 3-phase in control panel
- Rotor shaft: 303 Stainless Steel
- Upper and lower ball bearings
- Quick-connect power cord

Impeller

- Cast iron, 2 vane closed
- Capable of passing 2" solids

Dual Shaft Seal

- Upper: Unitized silicon carbide
- Lower: Viton® double lip

External Construction

- Heavy gray cast iron class 25 or better
- Powder coated
- Fasteners 300 series stainless steel

Dimensional Data

Weight: LEH202M: 95 lbs

Height: 21"

Major Width: 13"

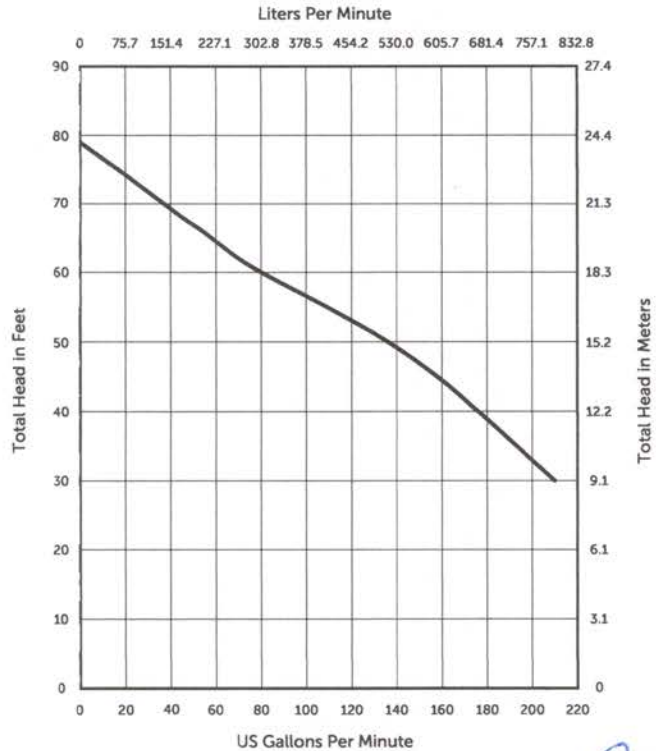
Maximum Fluid Temperature:

104°F, 40°C Continuous Duty

140°F, 60°C Intermittent

Performance Curve

2 hp, 3450 RPM, 30' Minimum Head Required



All Models

MODEL	VOLTS	PHASE	AMPS	DISCHARGE
1-Phase				
LEH202M2-2	230	1	18A	2" Flanged
LEH202M3-2	230	1	18A	3" Flanged
3-Phase				
LEH203M2-2	208/230	3	13.2A	2" Flanged
LEH203M3-2	208/230	3	13.2A	3" Flanged
LEH204M2-2	440-480	3	6.6A	2" Flanged
LEH204M3-2	440-480	3	6.6A	3" Flanged
LEH205M2-2	575	3	5.5A	2" Flanged
LEH205M3-2	575	3	5.5A	3" Flanged

NOTE: 25' cord standard on all models. 3-phase models require panel for automatic operation. See sewage accessories literature for complete information on all simplex and duplex controls. 35' and 50' cord options available.



APPENDIX C

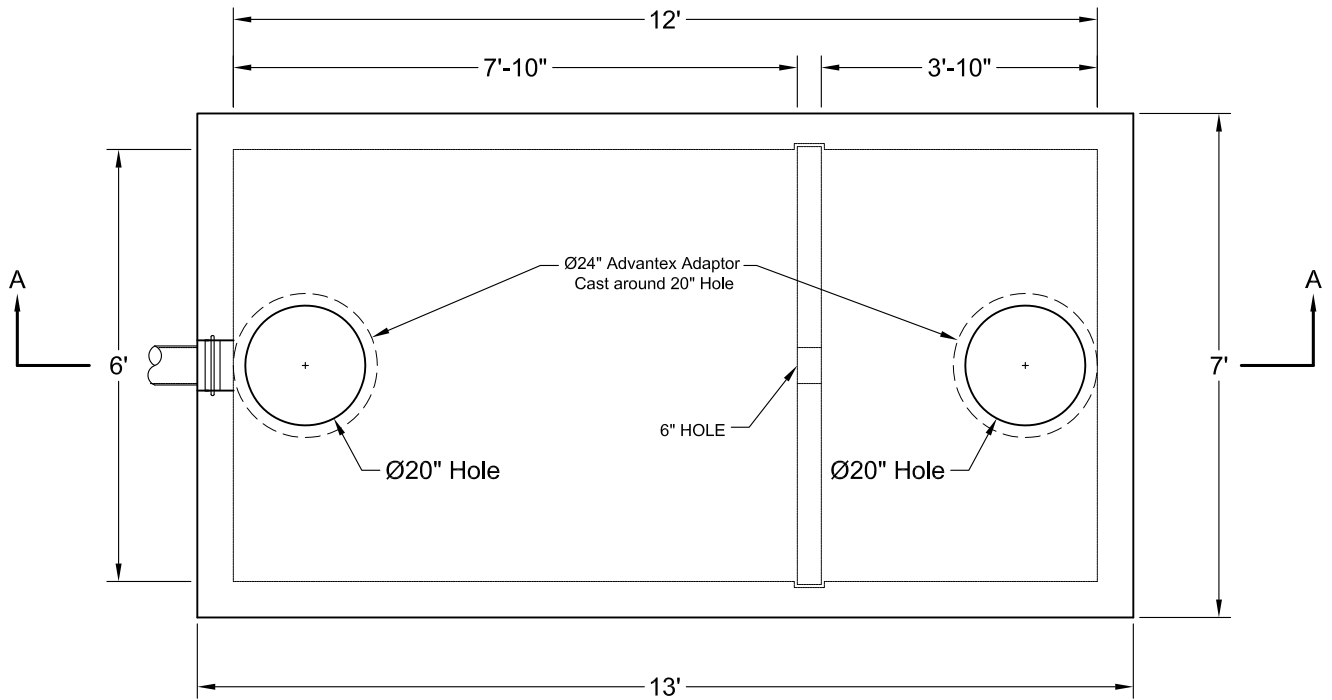
ORENCO ADVANTEX O&M MANUAL

(PROVIDED AS A SEPARATE DOCUMENT)

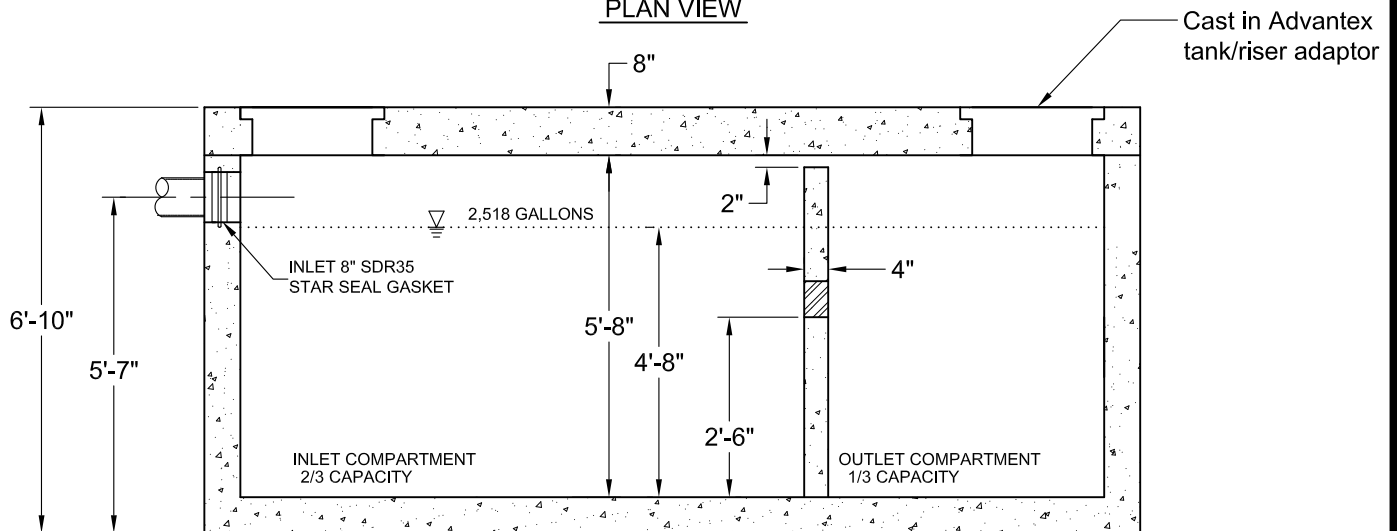
APPENDIX D
SEPTIC TANK & DISPOSAL SYSTEM EQUIPMENT
SUBMITTALS

GENERAL NOTES:

1. Overall Height = 6'-10"
2. Concrete: 5,000 psi
3. Heaviest Piece = 24,346 LBS.
4. Structural calculations upon request.



PLAN VIEW



SECTION A-A



GILLESPIE
PRECAST_{LLC}

1-800-638-6884
www.gillespieprecast.com

**2500 Gal Advantex Septic Tank
MT CUBA CENTER**

DRAWN BY: JHP	DWG.: 1 of 1
SCALE: 3/8" = 1'-0"	DATE: 6/9/23

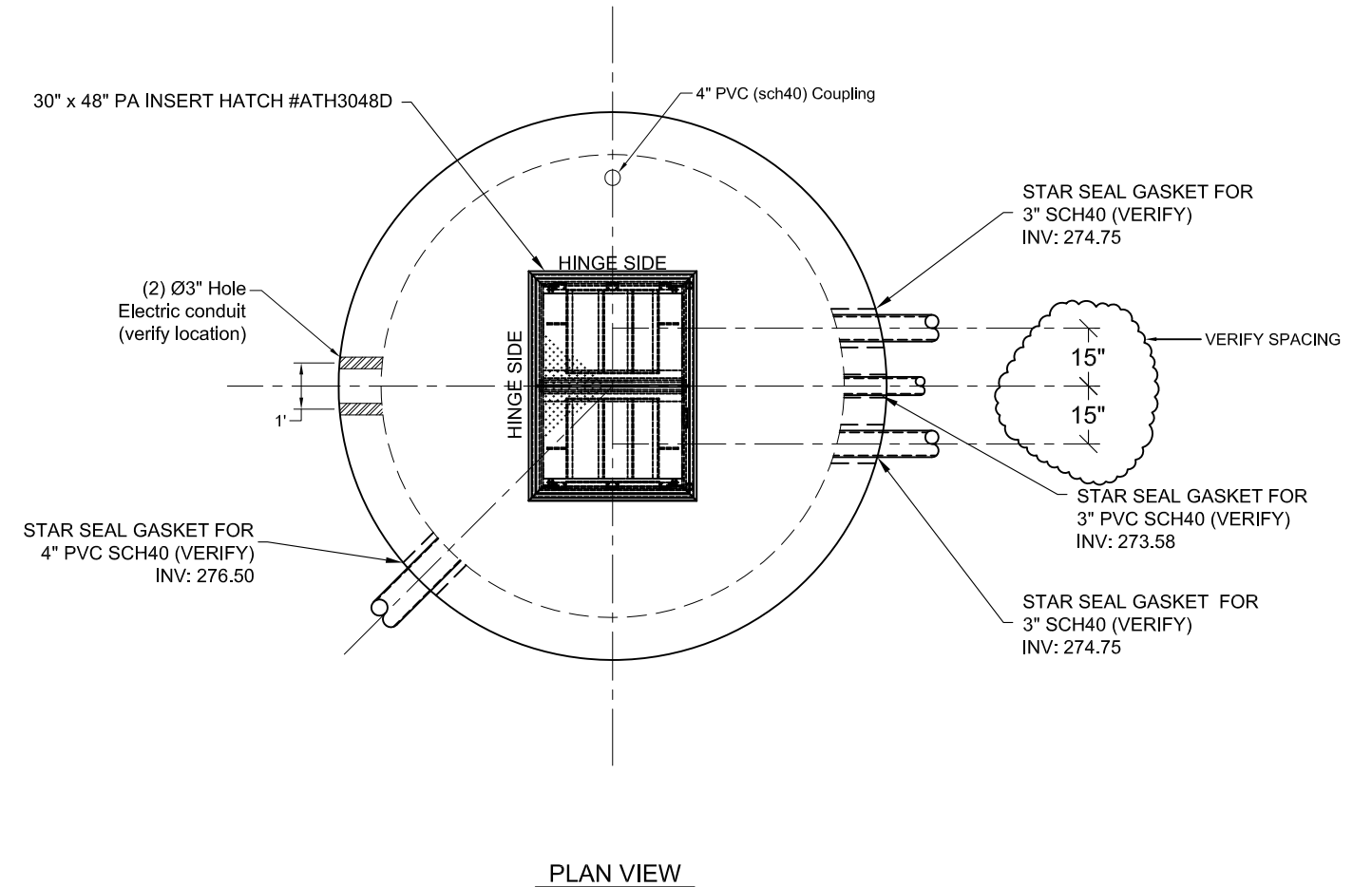
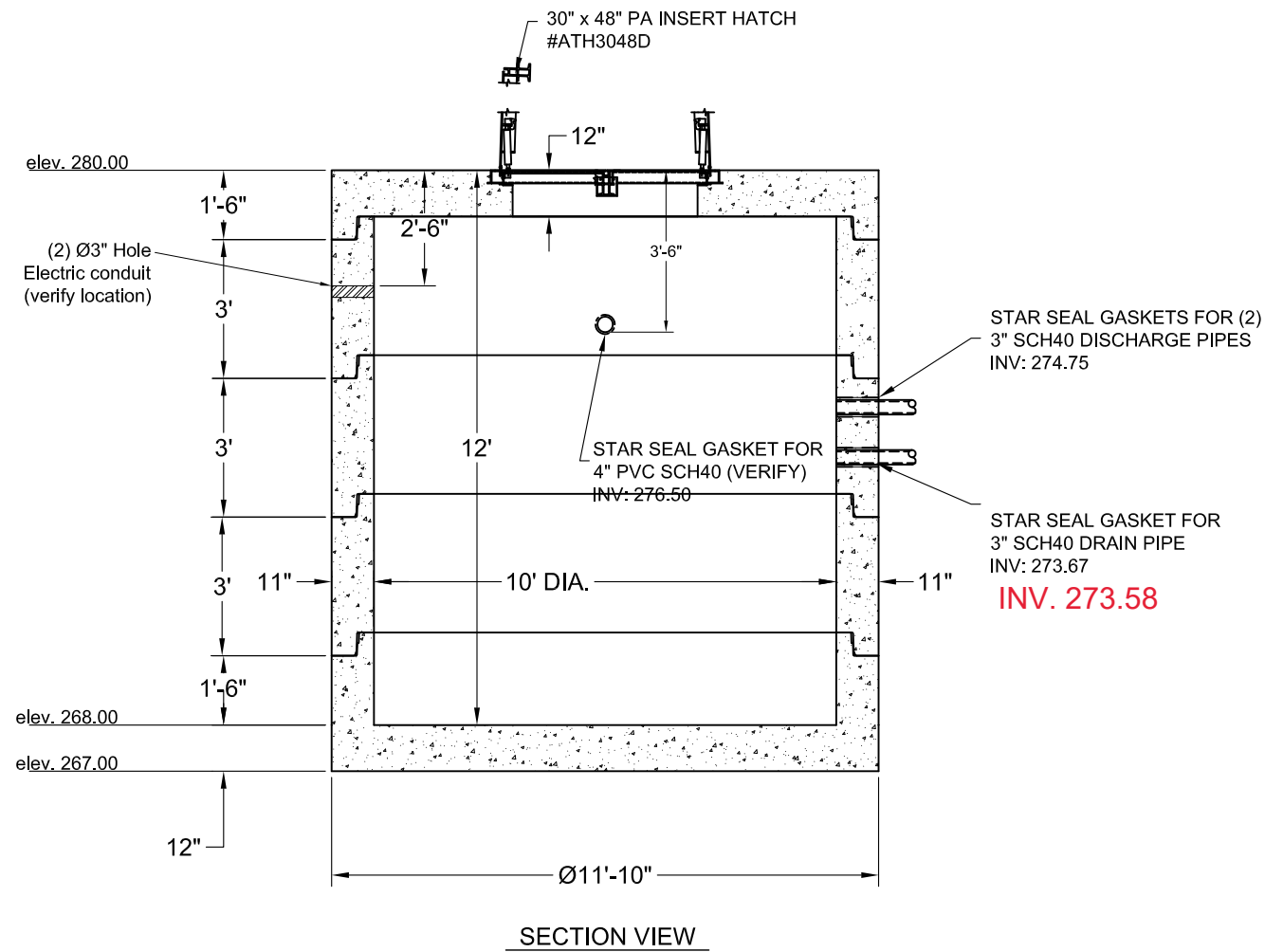
GENERAL NOTES:

1. Precast concrete manhole ASTM C478.
2. Joints to be sealed watertight with Con Seal CS-102 Sealant.
3. Concrete Strength: 5,000 psi at 28 days.
4. Hatch: PA Insert ATH3048D
5. Weights:

Riser Section: 14,000 LBS (QTY 3)

Base Section: 22,000 LBS

Slab Top: 17,280 lbs

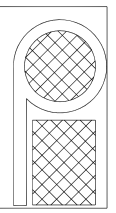


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PRECAST_{LLC}

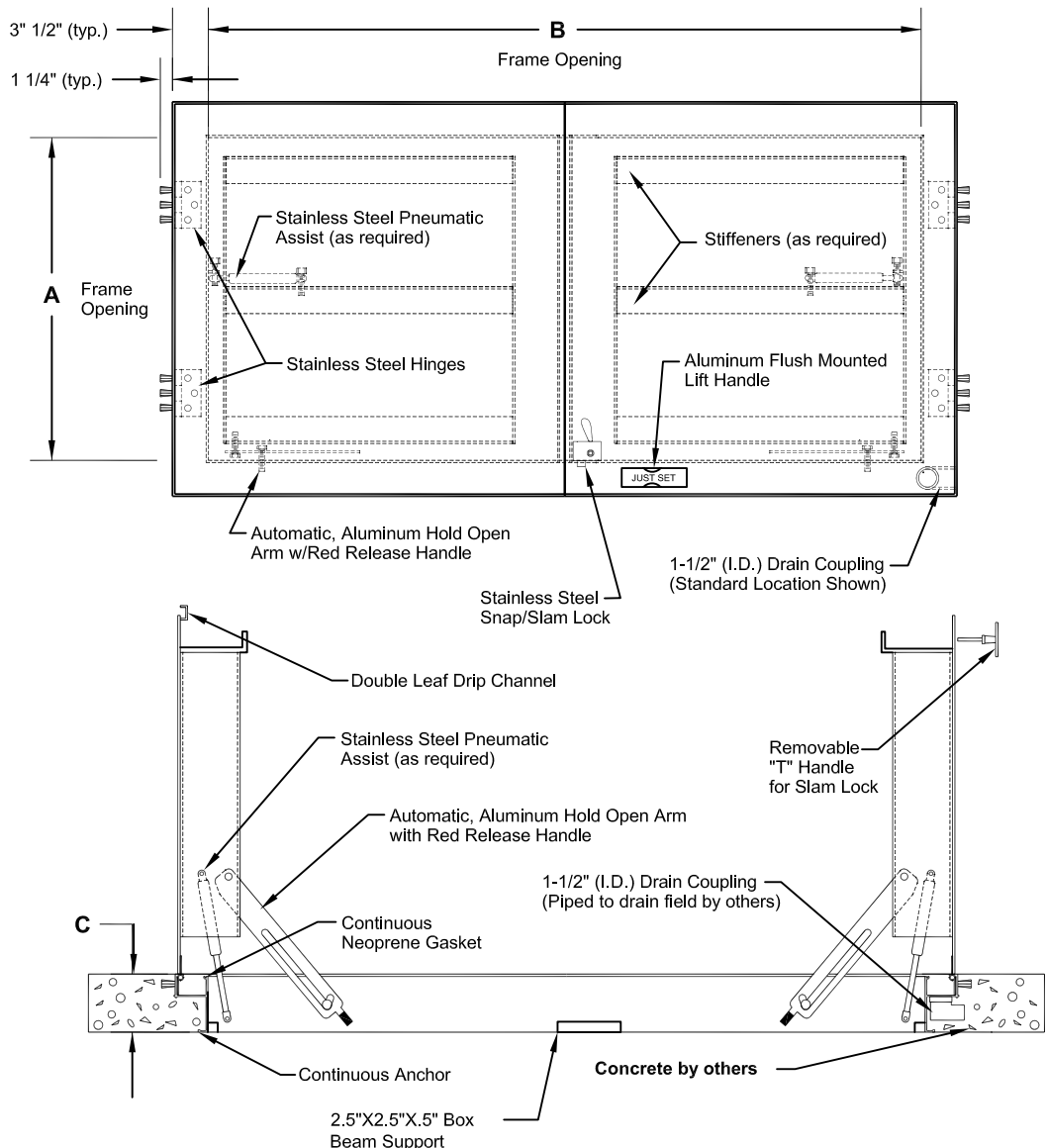
1-800-638-6884
www.gillespieprecast.com

120" Dia. Pump Station MT CUBA CENTER	
DRAWN BY: KLS	DWG.: 1 of 1
SCALE: NTS	DATE: 6/9/23

Fax to:	Customer	Approved/Notes		Pennsylvania Insert Corp PO Box 199 Spring City PA 19475 tel: 610-948-9688 fax: 610-948-9750 email: sales@pennsylvaniainsert.com web: www.pennsylvaniainsert.com
Fax#	Project			
From	Job#	Ship Date		
Date	PA Insert Quote/Order#	Page ____ of ____	Designed to withstand H-20 wheel loading, suitable for use in off-street locations where not subject to high density traffic.	



"Just Set" ALUMINUM DOOR, HEAVY DUTY, DOUBLE LEAF - TROUGH FRAME



- 1/4" Diamond Plate Lid Reinforced for HS-20 Wheel Load (w/out Impact for Incidental Traffic Only)
- 6" Drain Trough Frame with Gasket
- Protective Barrier where Concrete meets Aluminum
- Continuous Anchor to Lock Frame into Concrete
- Stainless Steel Spring or Pneumatic Assist (as required)
- Stainless Steel Hinges
- Stainless Steel Hardware
- Type 316 Stainless Steel Snap Lock
- 1-1/2" (I.D.) Drain Coupling
- Automatic Hold Open Arm with Red Release Handle
- Flush Mounted Lift Handle

WET WELL HATCH

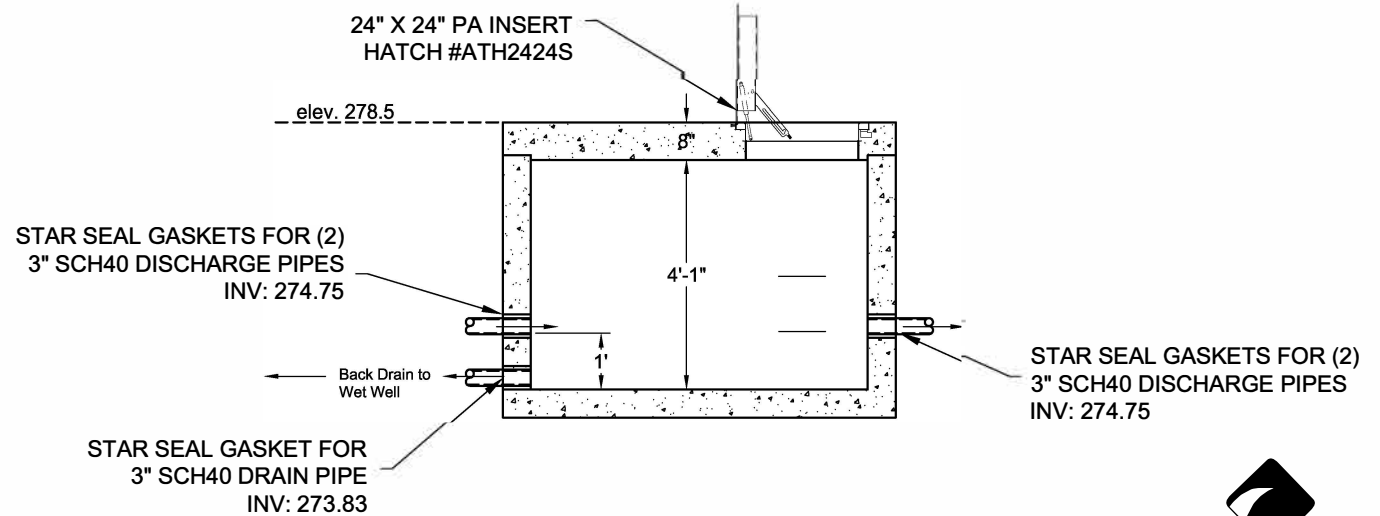
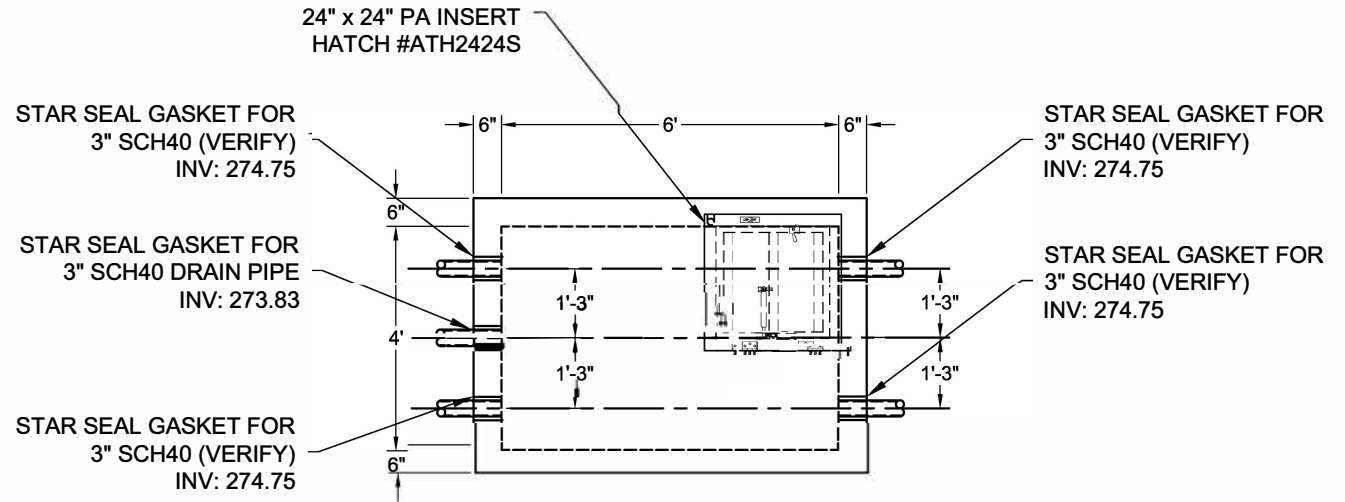
STANDARD DIMENSIONS				
QTY	A	B	C	STOCK#
●	30"	48"	6.00"	*ATH3048D
	36"	48"	6.00"	*ATH3648D
	48"	48"	6.75"	*ATH4848D
	48"	72"	6.75"	*ATH4872D
	60"	60"	8.75"	*ATH6060D

An asterisk (*) next to stock number = stainless steel compression spring or pneumatic assist is standard.

**Installation shall be in accordance with manufacturer's instructions

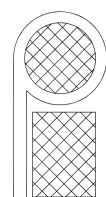
GENERAL NOTES:

1. Precast concrete manhole ASTM C478.
2. Joints to be sealed watertight with Conseal CS-102 Sealant.
3. Concrete Strength: 5,000 psi at 28 days
4. Hatch: PA Insert ATH2424S
5. Weights: Slab: 3,200 lbs.
 Base: 9,264 lbs.

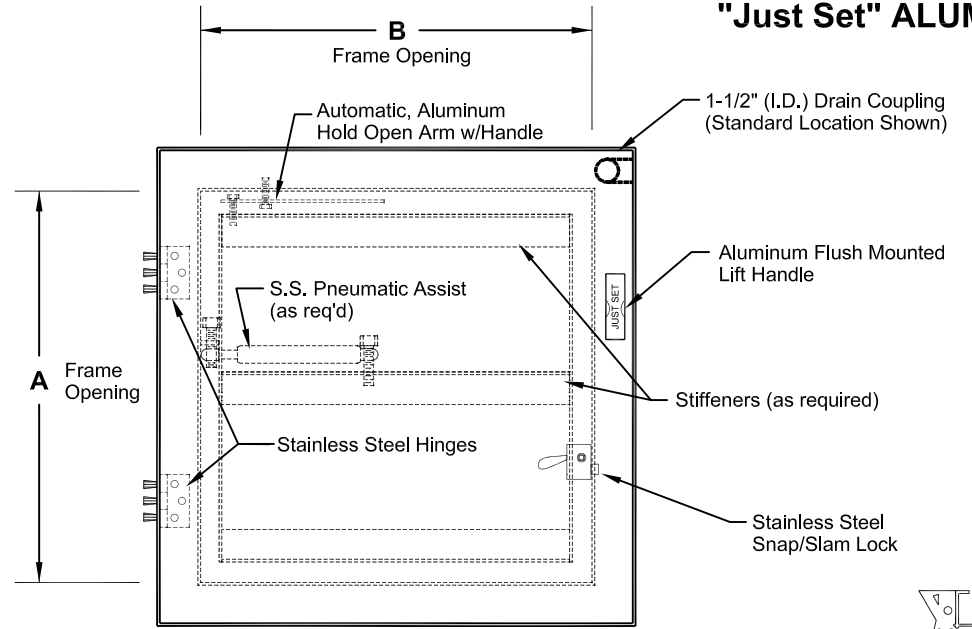


<p>1-800-638-6884 www.gillespieprecast.com</p>	<p>4x6 Valve Vault</p> <p>MT CUBA CENTER</p>	
	<p><i>DRAWN BY:</i> kls</p>	<p><i>DWG.:</i> 1 of 1</p>
	<p><i>SCALE:</i> nts</p>	<p><i>DATE:</i> 6/9/23</p>

Fax to:	Customer	Approved/Notes		Pennsylvania Insert Corp PO Box 199 Spring City PA 19475 tel: 610-948-9688 fax: 610-948-9750 email: sales@pennsylvaniainsert.com web: www.pennsylvaniainsert.com
Fax#	Project			
From	Job#	Ship Date		
Date	PA Insert Quote/Order#	Page ____ of ____	Designed to withstand H-20 wheel loading, suitable for use in off-street locations where not subject to high density traffic.	



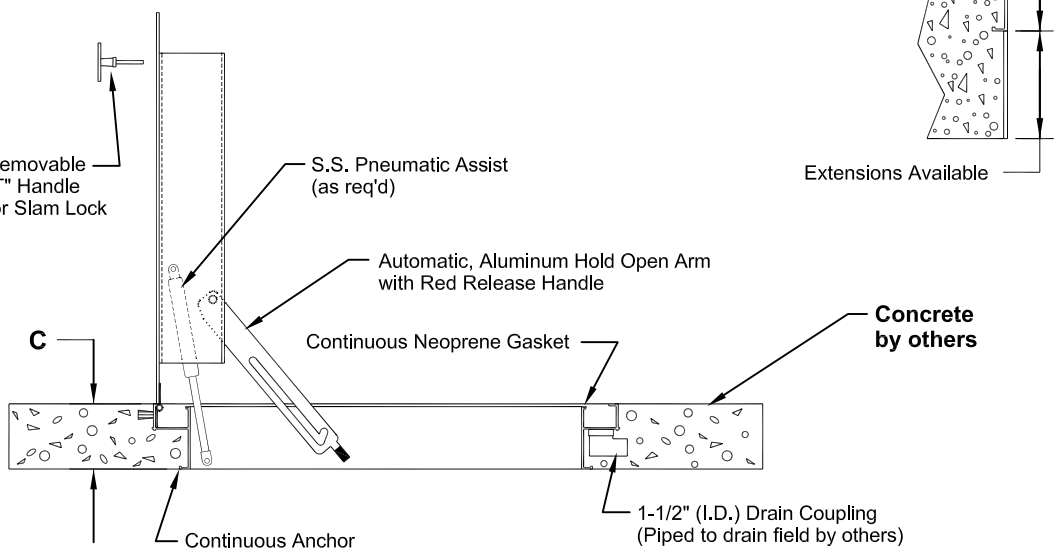
"Just Set" ALUMINUM DOOR, HEAVY DUTY, SINGLE LEAF - TROUGH FRAME



- 1/4" Diamond Plate Lid Reinforced for HS-20 Wheel Loading **(without Impact - for incidental traffic only)**
- 6" Drain Trough Frame with Gasket
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- Stainless Steel Pneumatic Assist (as required)
- Stainless Steel (Butt Style) Hinges & Hinge Pin Anchored with Steel Inserts.
- Stainless Steel Hardware
- Type 316 Stainless Steel Snap Lock
- 1-1/2" (I.D.) Drain Coupling
- Automatic Hold Open Arm with Red Release Handle
- Aluminum Flush Mounted Lift Handle

VALVE VAULT HATCH

STANDARD DIMENSIONS				
QTY	A	B	C	STOCK#
●	24"	24"	6.00"	ATH2424S
	30"	30"	6.00"	*ATH3030S
	36"	30"	6.00"	*ATH3630S
	36"	36"	6.00"	*ATH3636S
	42"	42"	6.00"	*ATH4242S
	48"	36"	6.00"	*ATH4836S
	48"	48"	6.50"	*ATH4848S



An asterisk (*) next to stock number = stainless steel pneumatic assist is standard.

Installation shall be in accordance with manufacturer's instructions

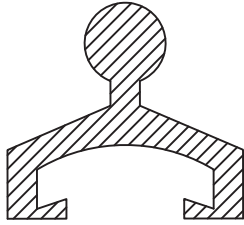
NO SCALE

06/08/04



Star Seal™ Compression Connector





The **Star Seal™ Compression Connector** produces a watertight seal between pipes entering a precast concrete structure. The **Star Seal™ Connector** is installed during the concrete pouring process and becomes an integral component of the concrete structure without requiring any coring or placement after the base component is cast. When the pipe is inserted, the gasket is compressed which provides both a primary and secondary sealing function.

Designed to meet or exceed all requirements outlined in ASTM C-923 and C-1478, the **Star Seal™ Connector** can be used in all stormwater and wastewater applications including manholes, catch basins, pump and lift stations, wet wells, treatment plants, septic tanks and more.

Occasionally during installation or after extended usage, even if ASTM standards have been met under the prescribed test conditions, the pipe could become out-of-round, shift within the opening, or bottom out due to backfilling, ground settlements, overhead traffic and similar transverse loads on the pipe. The **Star Seal™ Connector** provides accommodations by providing a primary seal at the narrowest clearance between the pipe and the connector wall while offering a secondary sealing function on the opposite side where the annular space widens, allowing the gasket to relax thereby strengthening the watertight seal.

Product References

ASTM C-923

Resilient Connector Between Reinforced Concrete Manhole Structures, Pipes and Laterals.

ASTM C-1244

Standard Test Method For Concrete Sewer Manholes by the Negative Air Pressure (Vacuum) Test

ASTM C-478C

Standard Specification for Precast Reinforced Concrete Manhole Sections

ASTM C-1478

Standard Specification for Drain Resilient Connectors Between Reinforced Concrete Storm Sewer Structures, Pipes and Laterals

Key Advantages

- Can be used with all wastewater and stormwater applications
- Provides a primary and secondary sealing function
- Fast and easy installation
- Up to 20 degrees of omnidirectional deflection
- 20 degree tapered holding ring assures easy strip-out
- Compensates for movement after backfilling is complete

Dimensional Data

Profile	Typical Pipe Size
4A6	4" - 6"
8T15	8" - 15"
15AA	18" +

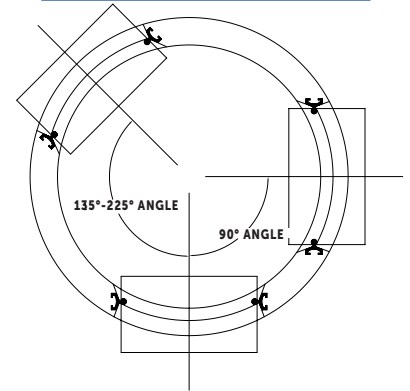
Performance Standard

The **Star Seal™ Connector** is molded or extruded from compounds formulated for wastewater applications, the standard rubber connector is engineered to conform with the requirements of section 4.1.1 of ASTM C-923 "Resilient Connector Between Reinforced Concrete Manhole Structures, Pipes and Laterals". Alternative compounds are available upon special request.

Test	Results	ASTM Method
Chemical Resistance 1 N Sulfuric Acid 1 N HCl Acid	No weight loss No weight loss	At 22° for 48h
Tensile Strength	1200 psi or 8.5 MPa, min	D 412
Elongation at Break	350% min.	
Hardness	+/- 5 from mfg's. specified hardness	D 2240
Accelerated Oven-aging	Decr. of 15% max. orig. tensile strength Decr. of 20% max. elongation	D 573
Compression set	Decr. of 25% original deflection	D 395, Method B
Water absorption	Incr. of 10% max. of original by weight	D 471
Ozone resistance	Rating 0	D 1171
Low-temp brittle point	No fracture at -40°C	D 746
Tear resistance	200 lbf/in. or 34 kn/m	D 624, Method B

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Manhole Diameter	MAX. PIPE SIZE OD's	
	135° - 225° Pipe Angle	90° Pipe Angle
42"	26.5"	22.0"
48"	31.5"	25.0"
60"	42.0"	32.0"
72"	52.5"	38.0"
84"	59.5"	44.0"
96"	73.5"	50.0"
108"	76.0"	56.0"
120"	85.0"	62.0"



Installation Instructions

Step 1:

Confirm the pipe surface is smooth, clean and free of foreign materials. Bevel any sharp edges caused by the cutting of the pipe.

Step 2:

Lubricate the connector and the entire section of the pipe that will be inserted into the connector.

Step 3:

Center the pipe and connector square to each other and insert the pipe into the connector using a bar or back hoe depending on the size. Once the pipe is coupled with the connector, deflect the structure or pipe to achieve the proper angle.

Warning:

To ensure the connector remains a flexible watertight connector, we recommend no mortar be placed between the pipe and wall of the concrete structure. The use of mortar in this area would decrease the effectiveness of the connector to compensate for shear caused by settlement of ground movement.

When installing pipe stubs for future pipeline installation, all stubs must be mechanically restrained to prevent any movement by means other than and in addition to the resilient connectors.

Note:

To find approximate subgrade, measure from the outside base of the structure to the junction of the connector and flat spot. Then add the wall thickness plus 1/4 inch.

Don't Just Seal It, ConSeal It!

Butyl Rubber Sealant for All Precast Concrete Structures - Meets ASTM C990

Applications

For concrete joints in: Manholes, Concrete Pipe, Vaults, Box Culverts, Septic Tanks, and Vertical Panel Structures. **Not intended for use in expansion joints or joints that move.**



Sealing Properties

- Provides permanently flexible watertight joints.
- Low to high temperature workability: 30°F to 120°F (-1°C to +49°C)
- Rugged service temperature: -30°F to +200°F (-34°C to +93°C)
- Excellent chemical and mechanical adhesion to clean dry surfaces.
- Greater cohesive and adhesive strengths.
- Sealed joints will not shrink, harden or oxidize upon aging.
- Controlled flow resistance for application ease.
- ConSeal CS-102 meets the hydrostatic performance requirement as set forth in ASTM C990 section 10.1. (Performance requirement: 10psi for 10 minutes in straight alignment – in plant, quality control test for joint materials.)
- ConSeal CS-102 meets or exceeds all of the requirements of Federal Specification SS-S-210 (210-A), and AASHTO M-198B.
- No priming normally necessary. When confronted with difficult installation conditions, such as wet concrete or temperatures below 40°F (4°C), priming the concrete will improve the bonding action. Consult Concrete Sealants for the proper primer to meet your application.

Physical Properties & Chemical Composition

Description	Spec	Required	CS-102
Color			Black
Specific Gravity, 77°F (25°C)	ASTM D71	1.15-1.50	1.25
Ductility, 77°F (25°C)	ASTM D113	5.0 min.	10
Penetration, cone 77°F (25°C), 150 gm, 5 sec.	ASTM D217	55-100 dmm	55-60 dmm
Flash Point, C.O.C., °F	ASTM D92	350°F min.	375°F
Fire Point, C.O.C., °F	ASTM D92	375°F min.	475°F
Hydrocarbon plastic content, % by weight	ASTM D297	50% min.	51%
Inert material filler, % by weight	AASHTO T111	30% min.	35%
Volatile Mater, % by weight	ASTM D6	3% max.	1.2%

Immersion Testing

30-Day Immersion Testing: No visible deterioration when tested in 5% Caustic Potash, 5% Hydrochloric Acid, 5% Sulfuric Acid, and 5% saturated Hydrogen Sulfide.

One Year Immersion Testing: No visible deterioration when tested in 5% Formaldehyde, 5% Formic Acid, 5% Sulfuric Acid, 5% Hydrochloric Acid, 5% Sodium Hydroxide, 5% Hydrogen Sulfide, and 5% Potassium Hydroxide.

Installation Guidelines

The following procedures should be followed for optimum sealant performance.

- Clean the upper and lower joint surface with a stiff bristle brush.
- Remove any dirt, debris, flashing, or concrete high points, which could keep the joint from coming together.
- If necessary, a joint primer can be applied to improve sealant adhesion. Allow the primer to dry before placing sealant.
- DO NOT PLACE ANY JOINTS WITHIN 12" OF A CORNER.
- Join the sealant into one continuous strand by kneading the ends together where they meet. **Do not stretch the sealant.**
- A **minimum** compression of 50% is required. Greater than 50% compression is optimal. It may take 15-20 minutes for the sealant to fully compress depending on the ambient temperature and the weight being applied.

Reference Installation Instructions for **"Butyl Sealing Tapes"** for more detailed instructions.

Limited Warranty

This information is presented in good faith, but we cannot anticipate all conditions under which this information and our products, or the products of other manufactures in combination with our products, may be used. We accept no responsibility for results obtained by the application of this information or the safety and suitability of our products, either alone or in combination with other products. Users are advised to make their own tests to determine the safety and suitability of each such product or product combinations for their own purposes. It is the **users' responsibility** to satisfy himself as to the suitability and completeness of such information for this own particular use. We sell this product without warranty, and buyers and users assume all responsibility and liability for loss or damage arising from the handling and use of this product, whether used alone or in combination with other products.

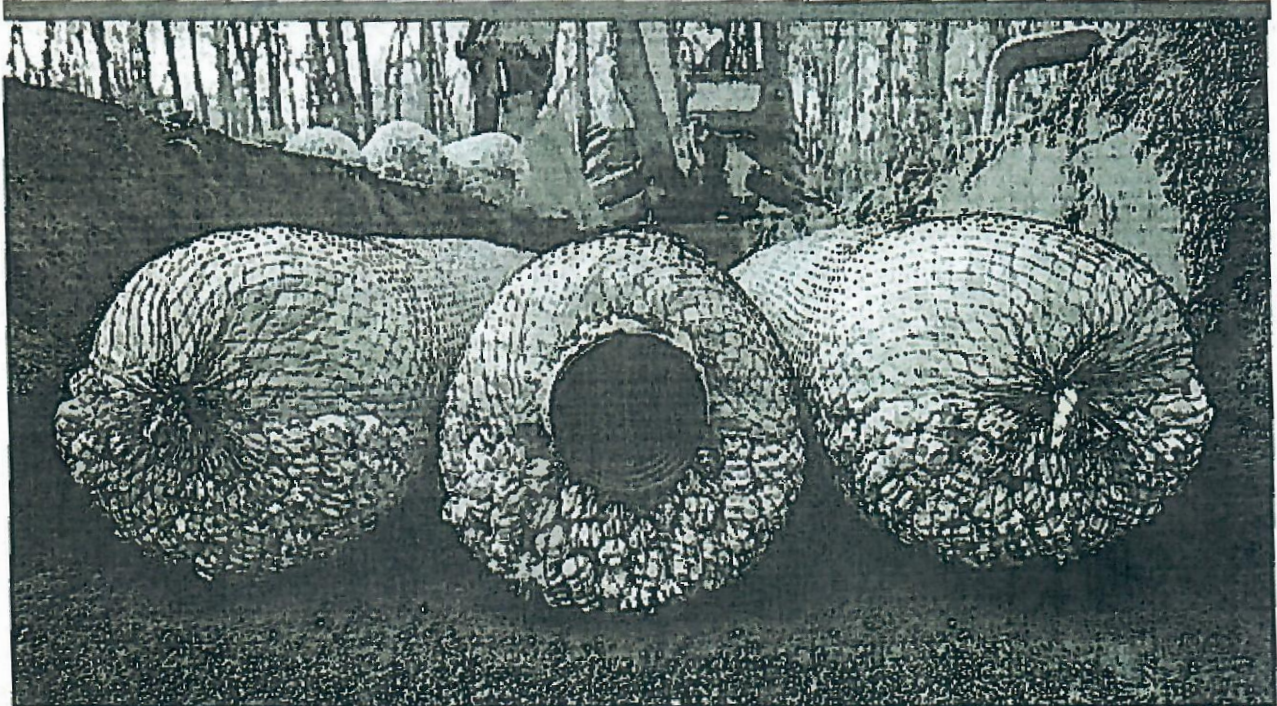
Version: 29-Jan-20

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GEOSYNTHETIC AGGREGATE TECHNOLOGY



EZflow by Infiltrator is an environmentally friendly replacement to traditional stone and pipe drainfields using an engineered geosynthetic aggregate modular design. The EZflow system is designed to improve infiltration performance by eliminating the fines associated with crushed stone, and reducing compaction and embedment associated with stone. Preassembled units include a 3" or 4" perforated pipe surrounded by aggregate and held in place with a durable high-strength netting. This product comes in easy-to-contour 5' and 10' lengths and in diameters of 7, 8, 9, 10, 12, 13, or 14 inches.

Lightweight expanded polystyrene construction offers structural integrity and resists compaction. Engineered flow-channels increase void space creating improved water flow and greater storage.

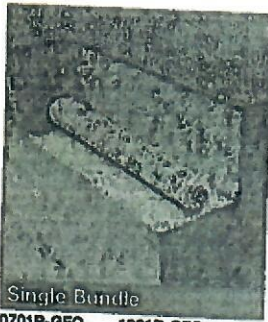


INFILTRATOR®
water technologies

Compared with stone and pipe, benefits include:

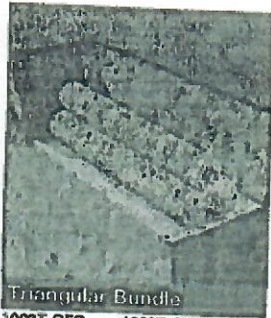
- Always clean and free of fines
- Bundles are quick to install, saving costs on heavy machinery and labor
- Modular construction allows configurations to match trench dimensions for most system shapes and sizes
- Engineered for optimal storage and absorption efficiencies
- Ability to contour along sloped sites and around trees or landscaping
- Lightweight system is perfect for repairs and tight job sites
- Easily hand-carried into position reducing time and labor
- 5' or 10' lengths with simple snap, internal couplers
- Easier cleanup at the job site with the elimination of stone
- Manufactured from recycled materials rather than a mined natural resource
- A wide variety of diameters and configurations to meet any installation professional's needs
- Approved in many jurisdictions with an increased efficiency rating, reducing drainfield size
- Backed by the leader in the onsite wastewater industry

Bundle System Configurations: Available in 7", 8", 9", 10", 12", 13" and 14" diameter bundles.



Single Bundle

0701P-GEO 1201P-GEO
0801P-GEO 1401P-GEO
1201P-GEO 1801P-GEO
1001P-GEO



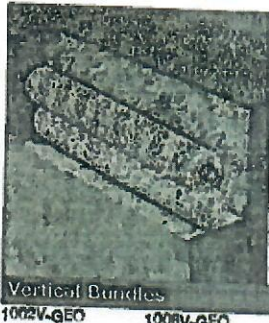
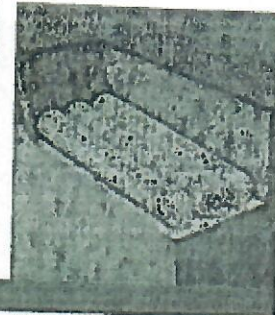
Triangular Bundle

1003T-GEO 1303T-GEO
1203T-GEO 1403T-GEO



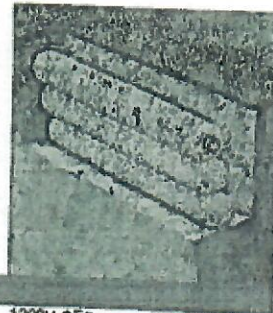
Horizontal Bundles

0705H-GEO 1303H-GEO 1208H-GEO 1402H-GEO
0904H-GEO 1202H-GEO 1303H-GEO 1802H-GEO
1002H-GEO 1203H-GEO



Vertical Bundles

1002V-GEO 1008V-GEO 1203V-GEO 1206V-GEO
1003V-GEO 1202V-GEO 1204V-GEO 1402V-GEO
1004V-GEO



Notes:

1. Other systems include 10" and 12" bed systems. Bed size will dictate the number of bundles.
2. System dimensions are dependent upon bundle diameter and configuration.
3. LLP is for "Low Pressure Pipe" in which a pressurized distribution pipe is field installed within the corrugated pipe.
4. Internal pipe and couplings meet the requirements of ASTM F405.
5. Bundles are also available without geotextile between the netting and synthetic aggregate.

INFILTRATOR WATER TECHNOLOGIES STANDARD LIMITED WARRANTY

(a) The structural integrity of each EZflow by Infiltrator expanded polystyrene drainfield system and other accessories manufactured by EZflow by Infiltrator ("Units"), when installed and operated in a leachfield of an onsite septic system in accordance with Infiltrator's instructions, is warranted to the original purchaser ("Holder") against defective materials and workmanship for one year from the date that the septic permit is issued for the septic system containing the Units; provided, however, that if a septic permit is not required by applicable law, the warranty period will begin upon the date that installation of the septic system commences. To exercise its warranty rights, Holder must notify Infiltrator in writing at its Corporate Headquarters in Old Saybrook, Connecticut within fifteen (15) days of the alleged defect. Infiltrator will supply replacement Units for Units determined by EZflow by Infiltrator to be covered by this Limited Warranty. EZflow by Infiltrator's liability specifically excludes the cost of removal and/or installation of the Units.

(b) THE LIMITED WARRANTY AND REMEDIES IN SUBPARAGRAPH (a) ARE EXCLUSIVE. THERE ARE NO OTHER WARRANTIES WITH RESPECT TO THE UNITS, INCLUDING NO IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE

(c) This Limited Warranty shall be void if any part of the EZflow system is manufactured by anyone other than EZflow by Infiltrator. The Limited Warranty does not extend to incidental, consequential, special or indirect damages. Infiltrator shall not be liable for penalties or liquidated damages, including loss of production and profits, labor and materials, overhead costs, or other losses or expenses incurred by the Holder or any third party. Specifically excluded from Limited Warranty coverage are damage to the Units due to ordinary wear and tear, alteration, accident, misuse, abuse or neglect of the Units; the Units being subjected to vehicle traffic or other conditions which are not permitted by the installation instructions; failure to maintain the minimum ground covers set forth in the installation instructions; the placement of improper materials into the system containing the Units; failure of the Units or the septic system due to improper siting or improper sizing, excessive water usage, improper grease disposal, or improper operation; or any other event not caused by Infiltrator. This Limited Warranty shall be void if the Holder fails to comply with all of the terms set forth in this Limited Warranty. Further, in no event shall Infiltrator be responsible for any loss or damage to the Holder, the Units, or any third party resulting from installation or shipment, or from any product liability claims of Holder or any third party. For this Limited Warranty to apply, the Units must be installed in accordance with all site conditions required by state and local codes; all other applicable laws; and Infiltrator's installation instructions.

(d) No representative of Infiltrator has the authority to change or extend this Limited Warranty. No warranty applies to any party other than the original Holder.

The above represents the Standard Limited Warranty offered by Infiltrator. A limited number of states and counties have different warranty requirements. Any purchaser of Units should contact Infiltrator's Corporate Headquarters in Old Saybrook, Connecticut, prior to such purchase, to obtain a copy of the applicable warranty, and should carefully read that warranty prior to the purchase of Units.



INFILTRATOR
water technologies

4 Business Park Road
P.O. Box 788
Old Saybrook, CT 06475
860-577-7000 • Fax 860-577-7001
1-800-221-4436
www.infiltratorwater.com

U.S. Patents: 4,759,661; 5,017,041; 5,156,468; 5,330,017; 5,401,116; 5,401,459; 5,511,903; 5,716,163; 5,588,778; 5,839,844 Canadian Patents: 1,329,959; 2,004,564 Other patents pending. Infiltrator, Equalizer, QuickCut, and SliceWelder are registered trademarks of Infiltrator Water Technologies. Infiltrator is a registered trademark in France. Infiltrator Water Technologies is a registered trademark in Mexico. Contour, MicroLeaching, PolyTuff, ChamberSpacer, MultiPort, PostLock, QuickPlay, SnapLock and StraightLock are trademarks of Infiltrator Water Technologies. PolyLok is a trademark of PolyLok, Inc. TUF-TITE is a registered trademark of TUF-TITE, INC. Ultra-Rib is a trademark of IPEX inc.

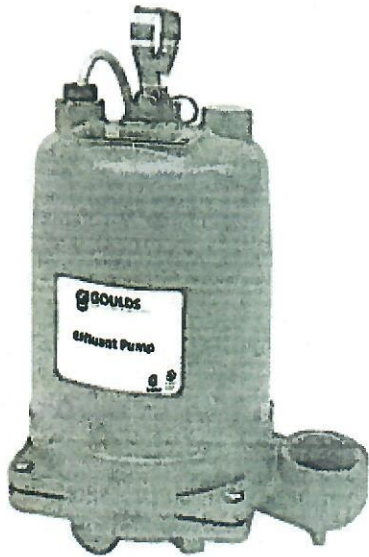
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Contact Infiltrator Water Technologies' Technical Services Department for assistance at 1-800-221-4436

EZ01 0315AG

xylem
Let's Solve Water

TECHNICAL BROCHURE
B3885 R3



WE Series Model 3885

SUBMERSIBLE EFFLUENT PUMPS



 **GOULDS**
WATER TECHNOLOGY
a xylem brand

FEATURES

Impeller: Cast iron, semi-open, non-clog with pump-out vanes for mechanical seal protection. Balanced for smooth operation. Silicon bronze impeller available as an option.

Casing: Cast iron volute type for maximum efficiency. 2" NPT discharge.

Mechanical Seal: Silicon Carbide vs. Silicon Carbide sealing faces. Stainless steel metal parts, BUNA-N elastomers.

Shaft: Corrosion-resistant, stainless steel. Threaded design. Locknut on all models to guard against component damage on accidental reverse rotation.

Fasteners: 300 series stainless steel.

Capable of running dry without damage to components.

Designed for continuous operation when fully submerged.

EXTENDED WARRANTY AVAILABLE FOR RESIDENTIAL APPLICATIONS.

APPLICATIONS

Specifically designed for the following uses:

- Homes, Farms, Trailer Courts, Motels, Schools, Hospitals, Industry, Effluent Systems

SPECIFICATIONS

Pump

- Solids handling capabilities: ¾" maximum
- Discharge size: 2" NPT
- Capacities: up to 140 GPM
- Total heads: up to 128 feet TDH
- Temperature: 104°F (40°C) continuous, 140°F (60°C) intermittent.
- See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

MOTORS

- Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
- Class B insulation on ½ - 1½ HP models.
- Class F insulation on 2 HP models.

Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.

- SJTOW or STOW severe duty oil and water resistant power cords.
- ½ - 1 HP models have NEMA three prong grounding plugs.
- 1½ HP and larger units have bare lead cord ends.

Three phase (60 Hz):

- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.
- Designed for Continuous Operation: Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.
- Bearings: Upper and lower heavy duty ball bearing construction.
- Power Cable: Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.
- O-ring: Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS



Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association File #LR38549



ITT

GOULDS PUMPS Wastewater

APPLICATIONS

Specifically designed for the following uses:

- Homes, Farms, Trailer Courts, Motels, Schools, Hospitals, Industry, Effluent Systems

SPECIFICATIONS

Pump

- Solids handling capabilities: 3/4" maximum.
- Discharge size: 2" NPT.
- Capacities: up to 140 GPM.
- Total heads: up to 128 feet TDH.
- Temperature: 104°F (40°C) continuous, 140°F (60°C) intermittent.
- See order numbers on reverse side for specific HP, voltage, phase and RPM's available.

MOTORS

- Fully submerged in high-grade turbine oil for lubrication and efficient heat transfer.
- Class B insulation on 1/3 - 1 1/2 HP models.
- Class F insulation on 2 HP models.

Single phase (60 Hz):

- Capacitor start motors for maximum starting torque.
- Built-in overload with automatic reset.
- SITOW or STOW severe duty oil and water resistant power cords.

- 1/3 - 1 HP models have NEMA three prong grounding plugs.
- 1 1/2 HP and larger units have bare lead cord ends.

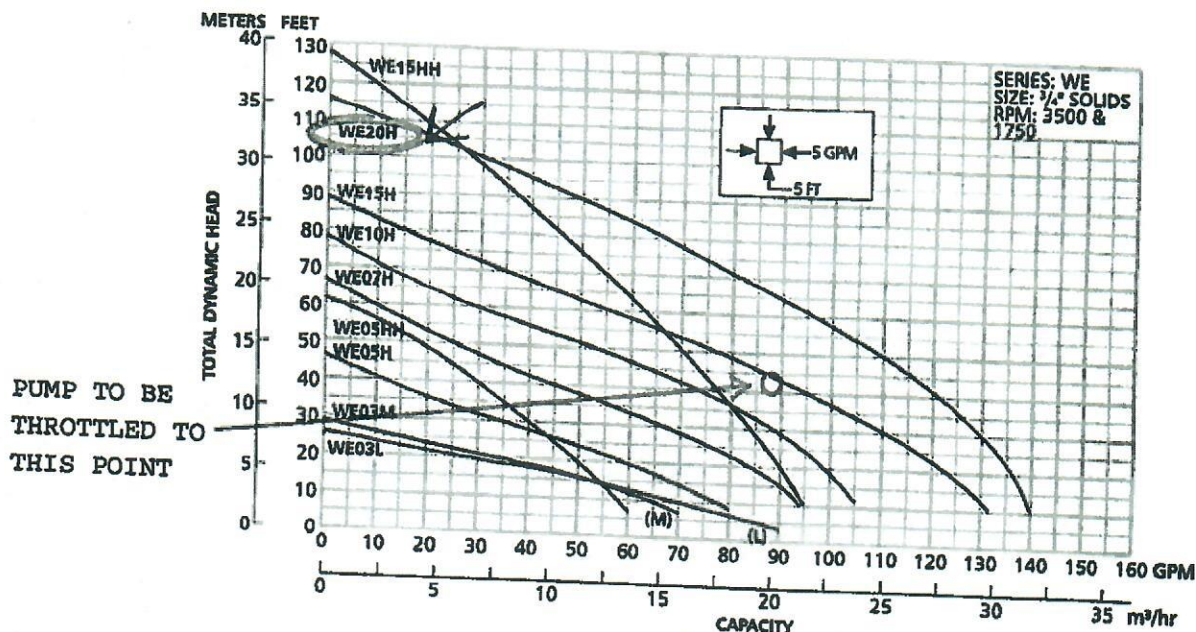
Three phase (60 Hz):

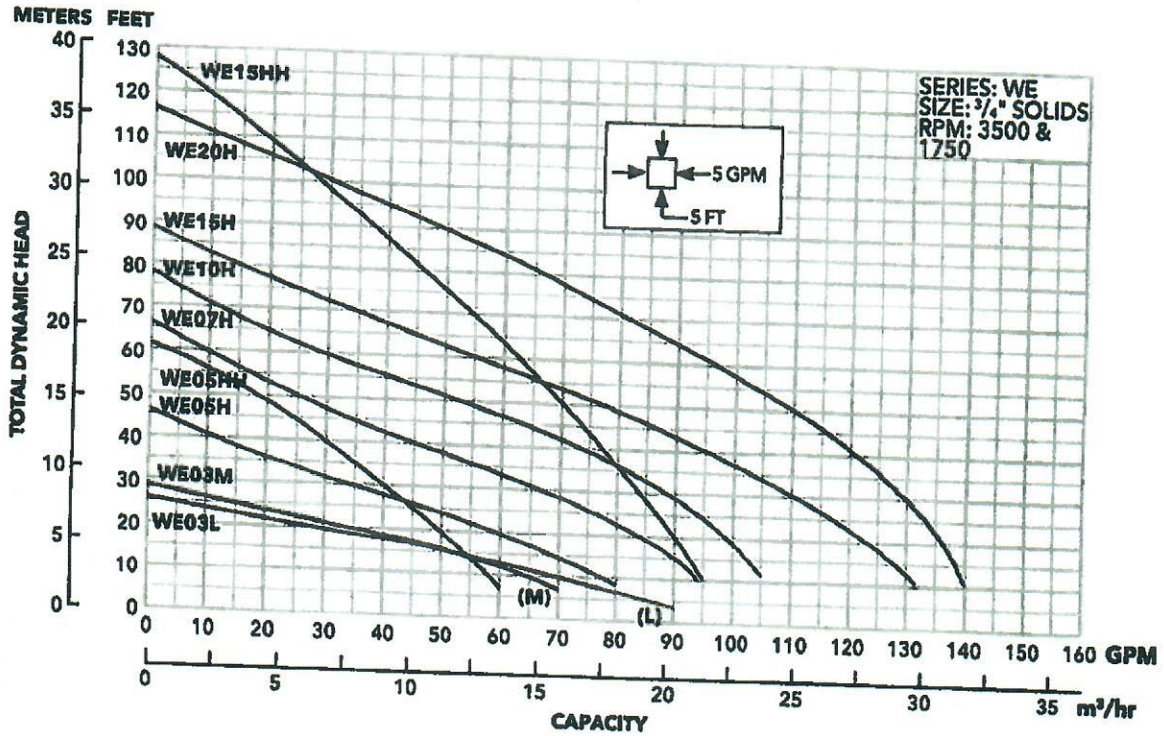
- Class 10 overload protection must be provided in separately ordered starter unit.
- STOW power cords all have bare lead cord ends.
- **Designed for Continuous Operation:** Pump ratings are within the motor manufacturer's recommended working limits, can be operated continuously without damage when fully submerged.
- **Bearings:** Upper and lower heavy duty ball bearing construction.
- **Power Cable:** Severe duty rated, oil and water resistant. Epoxy seal on motor end provides secondary moisture barrier in case of outer jacket damage and to prevent oil wicking. Standard cord is 20'. Optional lengths are available.
- **O-ring:** Assures positive sealing against contaminants and oil leakage.

AGENCY LISTINGS



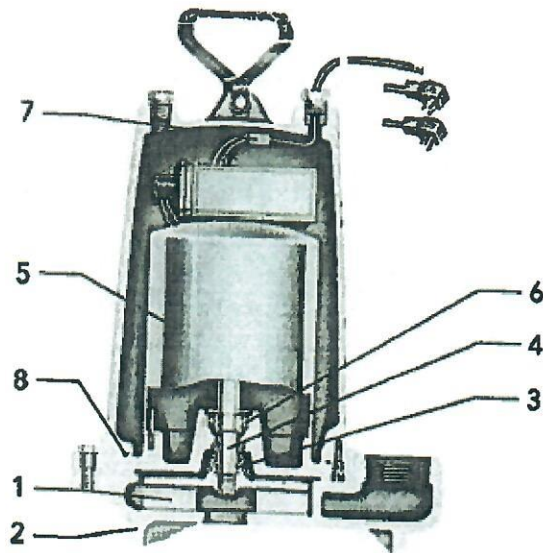
Tested to UL 778 and CSA 22.2 108 Standards
By Canadian Standards Association File #LR38949
Goulds Pumps is ISO 9001 Registered.





COMPONENTS

Item No.	Description
1	Impeller
2	Casing
3	Mechanical Seal
4	Motor Shaft
5	Motor
6	Ball Bearings
7	Power Cable
8	Casing O-Ring



MODELS

Order Number	HP	Phase	Volts	RPM	Impeller Diameter (in.)	Maximum Amps	Locked Rotor Amps	KVA Code	Full Load Efficiency %	Resistance		Power Cable Size	Weight (lbs.)		
										Start	Line-Line				
WE0311L	0.33	1	115	1750	5.38	10.7	30.0	M	54	11.9	1.7	16/3	56		
WE0318L			208			6.8	19.5	K	51	9.1	4.2				
WE0312L			230			4.9	14.1	L	53	14.5	8.0				
WE0311M			115			10.7	30.0	M	54	11.9	1.7				
WE0318M			208			6.8	19.5	K	51	9.1	4.2				
WE0312M			230			4.9	14.1	L	53	14.5	8.0				
WE0511H	0.5	1	115	3450	3.56	14.5	46.0	M	54	7.5	1.0	14/3	60		
WE0518H			208			8.1	31.0	K	68	9.7	2.4				
WE0512H			230			7.3	34.5	M	53	9.6	4.0				
WE0538H			200			4.9	22.6	R	68	NA	3.8				
WE0532H			230			3.3	18.8	R	70	NA	5.8				
WE0534H			460			1.7	9.4	R	70	NA	23.2				
WE0537H		575	1.4		7.5	R	62	NA	35.3						
WE0511HH		3	1		115	3.88	14.5	46.0	M	54	7.5	1.0		14/3	70
WE0518HH					208		8.1	31.0	K	68	9.7	2.4			
WE0512HH					230		7.3	34.5	M	53	9.6	4.0			
WE0538HH			200		4.9		22.6	R	68	NA	3.8				
WE0532HH			230		3.6		18.8	R	70	NA	5.8				
WE0534HH	460		1.8	9.4	R		70	NA	23.2						
WE0537HH	575	1.5	7.5	R	62	NA	35.3								
WE0718H	0.75	1	208	4.06	11.0	31.0	K	68	9.7	2.4	14/3	80			
WE0712H			230		10.0	27.5	J	65	12.2	2.7					
WE0738H			200		6.2	20.6	L	64	NA	5.7					
WE0732H		3	230		5.4	15.7	K	68	NA	8.6					
WE0734H			460		2.7	7.9	K	68	NA	34.2					
WE0737H			575		2.2	9.9	L	78	NA	26.5					
WE1018H	1	1	208	4.44	14.0	59.0	K	68	9.3	1.1	14/3	80			
WE1012H			230		12.5	36.2	J	69	10.3	2.1					
WE1038H			200		8.1	37.6	M	77	NA	2.7					
WE1032H		3	230		7.0	24.1	L	79	NA	4.1					
WE1034H			460		3.5	12.1	L	79	NA	16.2					
WE1037H			575		2.8	9.9	L	78	NA	26.5					
WE1518H	1.5	1	208	4.56	17.5	59.0	K	68	9.3	1.1	14/3	80			
WE1512H			230		15.7	50.0	H	68	11.3	1.6					
WE1538H			200		10.6	40.6	K	79	NA	1.9					
WE1532H			3		230	9.2	31.7	K	78	NA	2.9				
WE1534H					460	4.6	15.9	K	78	NA	11.4				
WE1537H					575	3.7	13.1	K	75	NA	16.9				
WE1518HH		3	1		208	5.50	17.5	59.0	K	68	9.3		1.1	14/3	83
WE1512HH					230		15.7	50.0	H	68	11.3		1.6		
WE1538HH					200		10.6	40.6	K	79	NA		1.9		
WE1532HH			3		230		9.2	31.7	K	78	NA		2.9		
WE1534HH					460		4.6	15.9	K	78	NA		11.4		
WE1537HH					575		3.7	13.1	K	75	NA		16.9		
WE2012H	2	1	230	5.38	18.0	49.6	F	78	3.2	1.2	14/3	83			
WE2038H			200		12.0	42.4	K	78	NA	1.7					
WE2032H			230		11.6	42.4	K	78	NA	1.7					
WE2034H		3	460		5.8	21.2	K	78	NA	6.6					
WE2037H			575		4.7	16.3	L	78	NA	10.5					

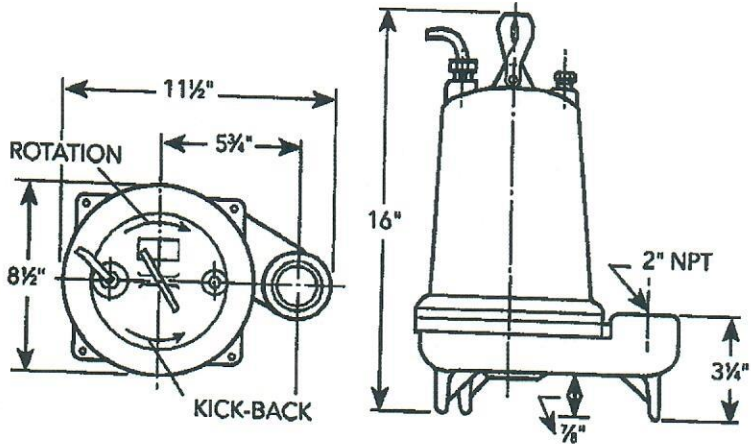
PERFORMANCE RATINGS (gallons per minute)

Order No.	WE-03L	WE-03M	WE-05H	WE-07H	WE-10H	WE-15H	WE05HH	WE15HH	WE-20H
HP	½	¾	½	¾	1	1½	½	1½	2
RPM	1750	1750	3500	3500	3500	3500	3500	3500	3500
5	86	-	-	-	-	-	-	-	-
10	70	63	78	94	-	-	-	-	-
15	52	52	70	90	103	128	58	95	-
20	27	35	60	83	98	123	49	90	138
25	5	15	48	76	94	117	45	87	136
30	-	-	35	67	88	110	40	83	133
35	-	-	22	57	82	103	35	80	130
40	-	-	-	45	74	95	30	77	126
45	-	-	-	35	64	86	25	74	121
50	-	-	-	25	53	77	-	70	116
55	-	-	-	-	40	67	-	66	110
60	-	-	-	-	30	56	-	63	103
65	-	-	-	-	20	45	-	58	96
70	-	-	-	-	-	35	-	55	89
75	-	-	-	-	-	25	-	51	81
80	-	-	-	-	-	-	-	47	74
90	-	-	-	-	-	-	-	37	66
100	-	-	-	-	-	-	-	28	49

Total Head Feet of Water

DIMENSIONS

(All dimensions are in inches. Do not use for construction purposes.)



STANDARD PANEL OPTIONS

Pump Order Number	K Series		Boulay Series	
	Simplex	Duplex	Simplex	Duplex
WE0311L	KS19020WF	KD19020WF	S10020	D10020
WE0318L	KS19020WF	KD19020WF	S10020	D10020
WE0312L	KS19020WF	KD19020WF	S10020	D10020
WE0311M	KS19020WF	KD19020WF	S10020	D10020
WE0318M	KS19020WF	KD19020WF	S10020	D10020
WE0312M	KS19020WF	KD19020WF	S10020	D10020
WE0511H	KS19020WF	KD19020WF	S10020	D10020
WE0518H	KS19020WF	KD19020WF	S10020	D10020
WE0512H	KS19020WF	KD19020WF	S10020	D10020
WE0538H	KS31255WF	KD31255WF	S34063	D34063
WE0532H	KS31255WF	KD31255WF	S32540	D32540
WE0534H	KS31255WF	KD31255WF	S31625	D31625
WE0537H	N/A	N/A	S31625	D31625
WE0511HH	KS19020WF	KD19020WF	S10020	D10020
WE0518HH	KS19020WF	KD19020WF	S10020	D10020
WE0512HH	KS19020WF	KD19020WF	S10020	D10020
WE0538HH	KS31255WF	KD31255WF	S34063	D34063
WE0532HH	KS31255WF	KD31255WF	S32540	D32540
WE0534HH	KS31255WF	KD31255WF	S31625	D31625
WE0537HH	N/A	N/A	S31625	D31625
WE0718H	KS19020WF	KD19020WF	S10020	D10020
WE0712H	KS19020WF	KD19020WF	S10020	D10020
WE0738H	KS34518WF	KD34518WF	S36310	D36310
WE0732H	KS34518WF	KD34518WF	S34063	D34063
WE0734H	KS31255WF	KD31255WF	S32540	D32540
WE0737H	N/A	N/A	S31625	D31625
WE1018H	KS19020WF	KD19020WF	S10020	D10020
WE1012H	KS19020WF	KD19020WF	S10020	D10020
WE1038H	KS34518WF	KD34518WF	S36310	D36310
WE1032H	KS34518WF	KD34518WF	S36310	D36310
WE1034H	KS34518WF	KD34518WF	S32540	D32540
WE1037H	N/A	N/A	S32540	D32540
WE1518H	KS19020WF	KD19020WF	S10020	D10020
WE1512H	KS19020WF	KD19020WF	S10020	D10020
WE1538H	KS34518WF	KD34518WF	S31016	D31016
WE1532H	KS34518WF	KD34518WF	S36310	D36310
WE1534H	KS34518WF	KD34518WF	S34063	D34063
WE1537H	N/A	N/A	S32540	D32540
WE1518HH	KS19020WF	KD19020WF	S10020	D10020
WE1512HH	KS19020WF	KD19020WF	S10020	D10020
WE1538HH	KS34518WF	KD34518WF	S31016	D31016
WE1532HH	KS34518WF	KD34518WF	S36310	D36310
WE1534HH	KS34518WF	KD34518WF	S34063	D34063
WE1537HH	N/A	N/A	S32540	D32540
WE2012H	KS19020WF	KD19020WF	S10020	D10020
WE2038H	KS34518WF	KD34518WF	S31016	D31016
WE2032H	KS34518WF	KD34518WF	S31016	D31016
WE2034H	KS34518WF	KD34518WF	S34063	D34063
WE2037H	N/A	N/A	S34063	D34063

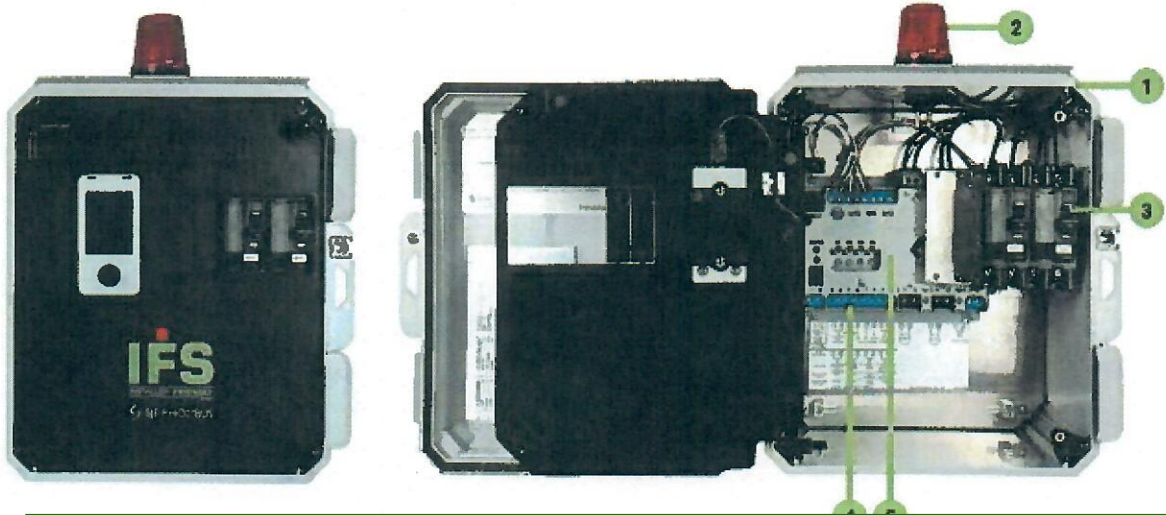
Note: Boulay Series part numbers have additional available features, see page 7 for more information.

Note: K Series panel part numbers include floats, to order without float switches, remove the 'WF' suffix. Boulay Series panels do not include float switches.

INSTALLER FRIENDLY SERIES™ (IFS)

SINGLE PHASE DUPLEX

Demand Dose or Timed Dose, Float or C-Level™ Sensor Controlled System for Pump Control and System Monitoring



Panel layout may vary with
Reg. Cdn Pat. & TM Off
C-Level™ Sensor US Patent

BCC Note: Design team to confirm product number

The Next Generation IFS duplex control panel utilizes an innovative circuit board design enclosed in a touch-safe housing to control two 120/208/240V single phase pumps in water and sewage applications. These newly redesigned IFS panels feature an easy-to use color LCD interface located on the inner door for programming and system monitoring. The panel configuration can be easily converted in the field to either a timed dose or demand dose through the LCD interface. Available with the EZconnex® float system.

The panel can easily be changed in the field to utilize either floats or the patented C-Level™ sensor for continuous level monitoring. The C-Level™ sensor senses the level in the tank and sends a signal to the panel. Pump activation levels can be adjusted by using the LCD interface. C-Level™ CL40 sensor operating range is 3-39.9 inches (7.6-101.3 cm). C-Level™ CL100 operating range is 3-99.5 inches (7.6-252.7 cm). The C-Level™ Sensor features a five year limited warranty.

LCD INTERFACE FEATURES

- Full color graphics and menu navigation encoder for easy setup
- Touch safe housing
- Pump Hand/Off/Auto Control selectable via menu navigation
- C-Level™ Sensor or Float operation selectable via menu navigation
- Demand or Timed Dose operation selectable via menu navigation
- Tank Level Indication and setpoint monitoring at-a-glance
- Lead pump is easily identified by a graphic ring around the current lead pump regardless of control mode (timed dose or demand)
- Displays remaining time in each active ON or OFF Timed Dose mode, as well as at-a-glance ON or OFF time elapsed graphic around lead pump
- RJ45 communication connector
- Flashing function for alarm beacon and horn (configurable)
- Manual alarm reset (configurable)

COMPONENTS

1. Enclosure measures 12 x 10 x 6 inches (30.48 x 24.4 x 15.24) NEMA 4X (ultraviolet stabilized thermoplastic, padlockable with integral mounting flanges, drip shield, heavy duty cover latches, and stainless steel ¼ turn set screw; for outdoor or indoor use)
2. Red Alarm Beacon provides 360° visual check of alarm condition
3. Circuit breakers provides pump power disconnect and branch circuit protection included as standard on all panels
4. C-Level™ Sensor and float connection terminal blocks
5. Controller Features:
 - a. Incoming Control/Alarm Power terminal blocks
 - b. Control/Alarm Power/System Status green LED indicators illuminate if control/alarm power is present and controller is operating*
 - c. Controller status green LED indicators for: Power/Active, Float Input Status, Pump Run, C-Level Active*
 - d. Normally open auxiliary alarm contacts included as standard
 - e. Control Power On/Off switch
 - f. Green LED Pump Run indicators illuminate when pump is called to run*
 - g. Control panel able to operate if LCD interface fails or is disconnected
 - h. Touch safe housing
6. Alarm Horn provides audible warning of alarm condition (not shown)
7. Exterior Alarm Test/Silence push button allows horn and light to be tested and horn to be silenced in an alarm condition; alarm automatically resets once alarm condition is cleared (not shown)
8. Modbus Port (RJ45) for future expansion - eg. seal fail modules, remote monitoring, valve control, In-Site®, logging, etc. (not shown)

*In fault condition, LED indicators will be red.

Note: Added options, voltage, and amp range selected may change enclosure size and enclosure features, and component layout.

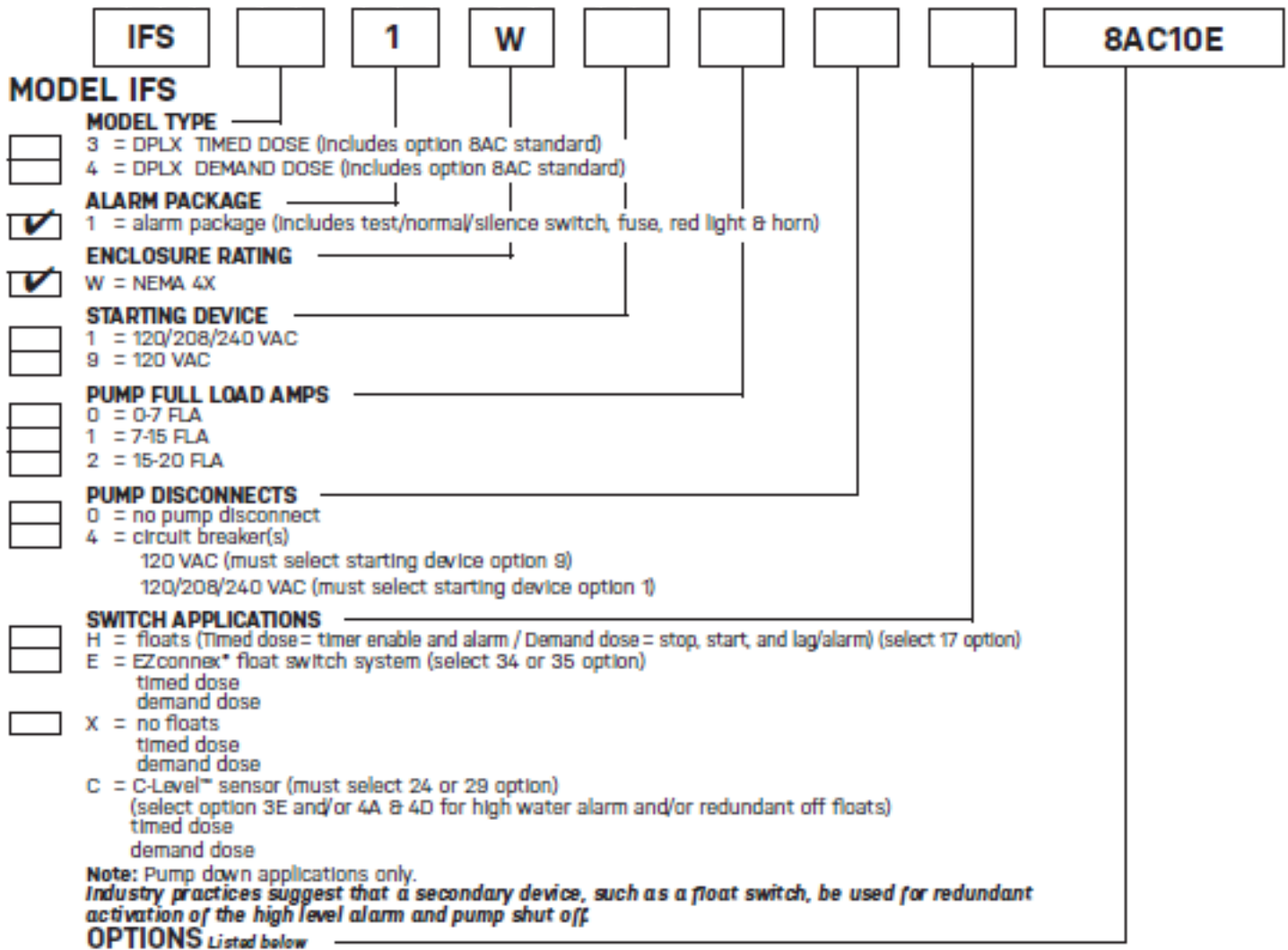
Note: Schematic/Wiring Diagram and Pump Specification Label are located inside the panel.



950005-1M, Rev. 10/22
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Meliora Comment on Control Panel: At a minimum, the control panel / options listed below (from the wastewater design documentation) shall be provided. The additional options provided in the submittal are acceptable.



- | CODE | DESCRIPTION |
|-------------------------------------|--|
| <input type="checkbox"/> | 1J Duo alarm inputs |
| <input type="checkbox"/> | 3A Alarm flasher |
| <input type="checkbox"/> | 3B Manual alarm reset |
| <input type="checkbox"/> | 3E High water alarm float (must select 17 option)
(Available only when Switch Applications = C) |
| <input type="checkbox"/> | 4A Redundant off (select option 4D if floats are required)
Demand Dose
Timed Dose |
| <input type="checkbox"/> | 4D Redundant off float
(must select 4A option) (must select 17 option) |
| <input type="checkbox"/> | 6A Auxiliary alarm contacts, Form C |
| <input checked="" type="checkbox"/> | 8AC Display board includes: ETM counter, events (cycles) counter, alarm counter, and override counter (timed dose only). (Included as standard.) |
| <input checked="" type="checkbox"/> | 10E Lockable latch - NEMA 4X (Included as standard.) |
| <input type="checkbox"/> | 10F Lightning arrestor (must select pump circuit breakers, control and alarm power combined) |
| <input type="checkbox"/> | 10K Anti-condensation heater |
| <input type="checkbox"/> | 11C NEMA 1 alarm panel (must select option 6A) |
| <input type="checkbox"/> | 11D NEMA 4X alarm panel (must select option 6A) |
| <input type="checkbox"/> | 15A Control / Alarm circuit breaker |

- | CODE | DESCRIPTION |
|--------------------------|--|
| <input type="checkbox"/> | 18A Timer override float
(timed dose float panel only) |
| <input type="checkbox"/> | 19F Fourth float to separate alarm function from lag
(demand dose float panel only) |
| <input type="checkbox"/> | 24E C-Level™ CL40 sensor with 4' vent tube & 20' cord |
| <input type="checkbox"/> | 24F C-Level™ CL40 sensor with 4' vent tube & 40' cord |
| <input type="checkbox"/> | 24G C-Level™ CL40 sensor with 8' vent tube & 20' cord |
| <input type="checkbox"/> | 24H C-Level™ CL40 sensor with 8' vent tube & 40' cord |
| <input type="checkbox"/> | 24X No C-Level™ CL40 sensor |
| <input type="checkbox"/> | 29A C-Level™ CL100 sensor w/10' vent tube & 20' cord |
| <input type="checkbox"/> | 29B C-Level™ CL100 sensor w/10' vent tube & 40' cord |
| <input type="checkbox"/> | 29X No C-Level™ CL100 sensor |
| <input type="checkbox"/> | 34D EZconnex® 4-Port, 25' w/10' floats (3) /pipe clamp, sealing plug * |
| <input type="checkbox"/> | 34E EZconnex® 4-Port, 50' w/10' floats (3) /pipe clamp, sealing plug * |
| <input type="checkbox"/> | 34G EZconnex® 4-Port, 25' w/20' floats (3) /pipe clamp, sealing plug * |
| <input type="checkbox"/> | 34H EZconnex® 4-Port, 50' w/20' floats (3) /pipe clamp, sealing plug * |
| <input type="checkbox"/> | 35D EZconnex® 4-Port, 25' w/10' floats (4) /pipe clamp * |

INSTALLER FRIENDLY SERIES® SINGLE PHASE DUPLEX - Demand or timed dose float controlled system for pump control and system monitoring.

IFN CONTROL PANEL	4 MODEL TYPE	1 ALARM PACKAGE	W ENCLOSURE RATING	1 STARTING DEVICE	1 PUMP FULL LOAD AMPS	4 PUMP DISCONNECTS	4 FLOAT SWITCH APPLICATION	6A8AC10E OPTIONS (LISTED BELOW)
-----------------------------	------------------------	---------------------------	------------------------------	-----------------------------	---------------------------------	------------------------------	--------------------------------------	---

CONTROL PANEL	✓	IFN	
MODEL TYPE	✓	4	Single Phase Duplex (includes Options 6A, 8AC and 10E as standard)
ALARM PACKAGE	✓	1	Alarm Package (includes test/normal/silence switch, fuse, red light, & horn)
ENCLOSURE RATING	✓	W	Weatherproof, NEMA 4X (engineered thermoplastic)
STARTING DEVICE	✓	1	120/208/240V
PUMP FULL LOAD AMPS		0	0 - 7 FLA
		1	7 - 15 FLA
		2	15 - 20 FLA
PUMP DISCONNECTS	✓	4	Circuit Breaker 120/208/240V
FLOAT SWITCH APPLICATION		H	Floats - Pump Down (select Option 17 below) Timed dose = redundant off, timer enable, alarm / Demand dose = stop, start, alarm (all systems will ship with 3 floats by default)
		E	EZconnex® Float Switch System (select Option 33 or 35 below)
		X	No Floats
		C	C-Level™ Sensor (select Option 24 or 29) Select Option 3E and/or 4D for high water alarm and/or redundant off floats

PRICING WORKSHEET

IFS Duplex Base Price _____

Alarm Package _____

Enclosure Rating _____

Starting Device _____

Pump Full Load Amps _____

Pump Disconnects _____

Float Switch Application _____

Total Options _____

TOTAL LIST PRICE _____

NOTE: Pump down applications only. Industry practices suggest that a secondary device, such as a float switch, be used for redundant activation of the high level alarm and pump shut off when using the C-Level™ sensor.

OPTIONS	DESCRIPTION
1J	Duo Alarm Inputs
3E	High Water Alarm Float (must also select Option 17) Only Available with Float Switch Application = C
4D	Redundant Off Float (must also select Option 17) Only Available with Float Switch Application = C
✓ 6A	Auxiliary Alarm Contact, Form C (included as standard)
✓ 8AC	Display Board - Includes: ETM Counter, Events (Cycles) Counter, Alarm Counter, and Override Counter (Timed Dose Only) (included as standard)
✓ 10E	Lockable Latch - NEMA 4X (included as standard)
10F	Lightning Arrestor (must also select Option 15A)
10K	Anti-condensation Heater (must also select Option 15A)
11C	Additional NEMA 1 Remote Alarm Panel
11D	Additional NEMA 4X Remote Alarm Panel
15A	Control/Alarm Circuit Breaker
16A	10' Cord in Lieu of 20' Cord (per Float)
16B	15' Cord in Lieu of 20' Cord (per Float)
16C	30' Cord in Lieu of 20' Cord (per Float)
16D	40' Cord in Lieu of 20' Cord (per Float)

OPTIONS	DESCRIPTION
17C	Sensor Float® / Internally Weighted (per Float) - Mercury
17D	Sensor Float® / Externally Weighted (per Float) - Mercury
17G	SJE MillAmpMaster™ / Pipe Clamp (per Float) - Mechanical
17H	SJE MillAmpMaster™ / Externally Weighted (per Float) - Mechanical
17J	Sensor Float® / Pipe Clamp (per Float) - Mercury
19F	Additional 4th Float (Timer Override or Lag) Only Available with Float Switch Application = H
24E	C-Level™ CL40 Sensor with 4' Vent Tube and 20' Cord
24F	C-Level™ CL40 Sensor with 4' Vent Tube and 40' Cord
24G	C-Level™ CL40 Sensor with 8' Vent Tube and 20' Cord
24H	C-Level™ CL40 Sensor with 8' Vent Tube and 40' Cord
24X	No C-Level™ CL40 Sensor
29A	C-Level™ CL100 Sensor with 10' Vent Tube and 20' Cord
29B	C-Level™ CL100 Sensor with 10' Vent Tube and 40' Cord
29X	No C-Level™ CL100 Sensor
33D	EZconnex® 3-Port, 25', with 10' Floats (3) / Pipe Clamp
33E	EZconnex® 3-Port, 50', with 10' Floats (3) / Pipe Clamp
33G	EZconnex® 3-Port, 25', with 20' Floats (3) / Pipe Clamp
33H	EZconnex® 3-Port, 50', with 20' Floats (3) / Pipe Clamp
35D	EZconnex® 4-Port, 25', with 10' Floats (4) / Pipe Clamp
35E	EZconnex® 4-Port, 50', with 10' Floats (4) / Pipe Clamp
35G	EZconnex® 4-Port, 25', with 20' Floats (4) / Pipe Clamp
35H	EZconnex® 4-Port, 50', with 20' Floats (4) / Pipe Clamp

■ EZconnex® mechanically-activated, narrow angle float switches with quick release connections

SJE PANEL LINK™

Web-Based Cellular Remote Monitoring for Duplex Lift Stations

The SJE Panel Link controller offers cloud based management of duplex wastewater pump stations. Alarms are monitored and service personnel notified in the event of failure via email and text SMS text messaging. Data logging and trending of critical information enables users to visually track system performance and recognize impending problems. Station data can be seen in a simple and intuitive format from a web browser on a computer, tablet or smartphone.

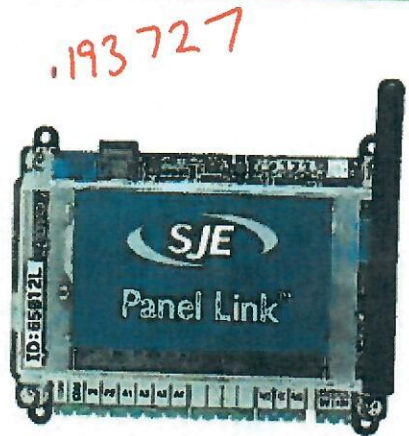
FEATURES

- 2 models available: **Light** or **Premium**
- Built-in I/O (no controller required)
- 2 pump run digital inputs
- 4 configurable digital alarm inputs
- 1 relay output
- Battery backup for digital inputs
- Access multiple SJE Panel Link products from one user friendly portal
- User is able to enter the tank diameter for in-flow and pump discharge flow monitoring
- 1 level input (4-20 mA) - Premium model only
- 1 motor amps input (4-20 mA) - Premium model only
- Level monitoring and data logging via 4-20 mA signal - Premium model only
- Monitor and log pump current - Premium model only

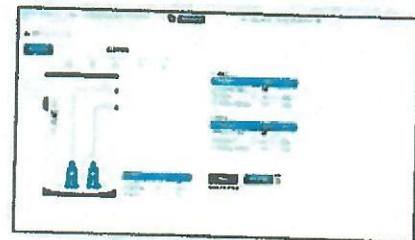
PART NO. DESCRIPTION

- **1052168** SJE Panel Link, Light, GSM, RTU
- **1052166** — SJE Panel Link, Light, GSM, NEMA 4X
- **1052170** SJE Panel Link, Premium, GSM, RTU
- **1052172** — SJE Panel Link, Premium, GSM, NEMA 4X

*Level transmitter sold separately.



SAMPLE SCREENS



05/09/16
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Toll Free 888-312-5753

Phone 213-217-1317





MODELS A10-12 (1¼"), A10-2015 (1½") AND A10-20 (2")

Provide an easy means of removing pump from a wet-well by utilizing a quick disconnect and guide rail system.

Connect directly to 1¼", 1½" or 2" vertical discharge Effluent, Wastewater and Grinder pumps.

Adaptable to 1¼", 1½" and 2" threaded, horizontal discharge pumps by using a street elbow.

Two piece 96" long fabricated SS rail assembly (2 easily coupled 48" long pieces for shipping convenience and ease of handling).

Corrosion resistant design

STANDARD GUIDE RAIL COMPONENTS

SS Guide rails, base, cross braces and pump brackets.

SS Lifting cable, 96" long x 3/16" cable.

Brass quick disconnect with o-ring seal.

Schedule 40 galvanized discharge pipe.

Optional stainless steel pipe nipples are available (contact factory).

Cast iron check valve with BUNA ball.

SS Tee handle for shut-off valve is supplied (it is for use with the optional discharge pipe assemblies).

GUIDE RAIL SYSTEMS AND DISCHARGE PIPE ASSEMBLIES

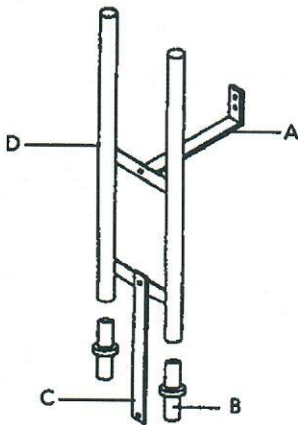
STAINLESS STEEL

ORDER NUMBERS / QUANTITY REQUIRED

Slide Rail Order Number	Pump Discharge	Discharge Size (Inches)	Standard Discharge From Bottom
A10-12	1¼"	1¼"	36"
A10-2015	1½"	2"	36"
A10-20	2"	2"	36"

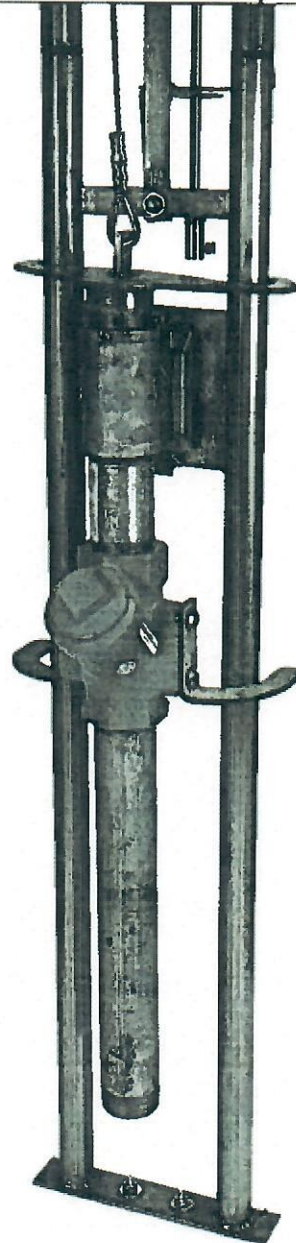
EXTENSION KITS INCLUDE:

- | | <u>Quantity</u> | <u>Item #</u> |
|---|-----------------|---------------|
| • Stainless steel wall bracket | 1 | A |
| • Guide rail connectors | 2 | B |
| • Stainless steel attachment brace | 1 | C |
| • Stainless steel rail extension | 1 | D |
| • Stainless steel nuts, bolts and washers | | |
| • Cable extension - not shown | | |



A10-2024EXT

Order Number	Length
A10-2012 EXT	12"
A10-2024 EXT	24"
A10-2048 EXT	48"



View of Lower Guide Rail showing Brass Disconnect, Ball Check Valve/Lower Pump Bracket Assembly, Lifting Cable and Upper Pump Bracket.

SYSTEM COMPONENTS AND DIMENSION CHART FOR A10-12, A10-2015 AND A10-20

Item No.	Dimension	Descriptions and Quantities
1	3/8" x 96" long	Stainless steel lifting cable
2	47" long	Stainless steel valve extension handle
3	11" min. - 14" max.	Adjustable stainless steel wall (support) brackets (qty. 2) includes (5) 3/8" SS bolts, nuts and washers
4	1 1/2" O.D.	Stainless steel guide rail tubing, 304 SS, 16 gauge
5	N/A	Stainless steel upper pump/guide bracket
6	1 1/4" (A10-12), 2" (A10-2015 & A10-20)	1 1/4" Brass quick disconnect assembly, 2" Brass quick disconnect assembly Discharge is 36" up from base to discharge centerline
7	1 1/4" (A10-12), 2" (A10-2015 & A10-20)	Cast iron ball check valve and lower pump bracket assembly with BUNA ball and clean-out port
8	1 1/4" (A10-12), 1 1/2" x 2" (A10-2015), 2" (A10-20)	Schedule 40 galvanized discharge pipe (SS discharge pipes are available as a special order option)
9	11" wide (2) 1/2" holes	Base or stud mounting plate
10	11 1/2" long, 1/2" hole and 1/2" x 1 1/2" slot	SS attachment brace - connects the (2) 48" guide rail halves, includes (2) 3/8" SS bolts, nuts and washers
11	N/A	Plastic guide rail connectors (2) fit inside SS rails
12	18 1/2" - 19" spacing	Stainless steel intermediate braces (3) on upper rail assembly
13	4 1/2" - 5 1/2" end to C/L	Upper and lower cross brace dimensions from end of rail



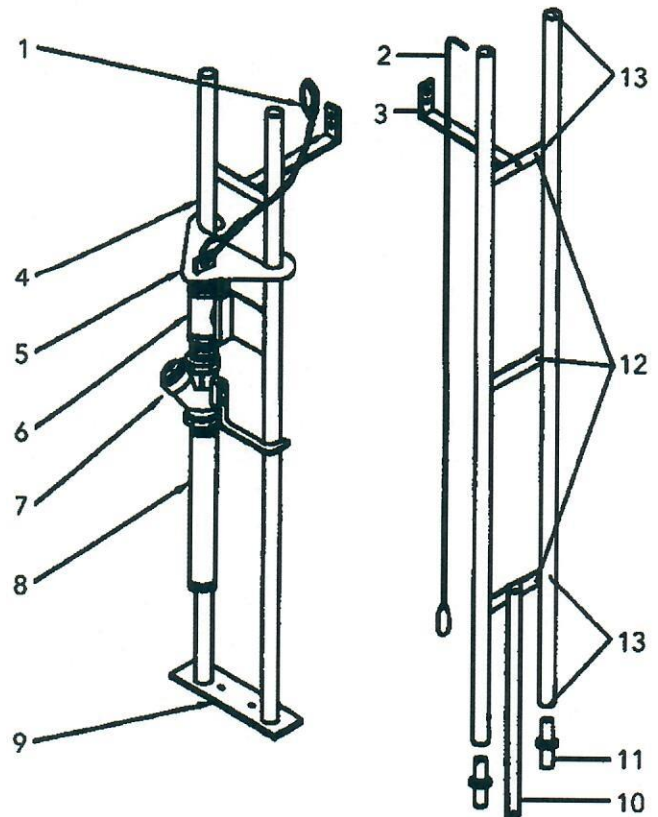
Stainless Steel Attachment Brace



Stainless Steel Wall Bracket Assembly



Valve End of Shut-Off Valve Handle



DISCHARGE PIPE ASSEMBLIES H12S, H20S, H12D, H20D

FEATURES

- Simplex discharge piping includes a union and a shut-off valve:
H12S (1 1/4") discharge - use with **A10-12**;
H20S (2") discharge - use with **A10-2015** or **A10-20**.
- Duplex discharge piping includes (2) unions, (2) shut-off valves and a tee assembly; **H12D** (1 1/4") discharge - use with **A10-12**; **H20D** (2") discharge - use with **A10-2015** or **A10-20**.

Items in bold type are product Order Numbers.

All pipe and fitting galvanized steel. Contact factory for stainless steel option.

Simplex Discharge Assemblies H12S and H20S

Assembled kits contain a brass gate valve, union and galvanized pipe nipples. Ready for connection to the appropriate guide rail assembly.

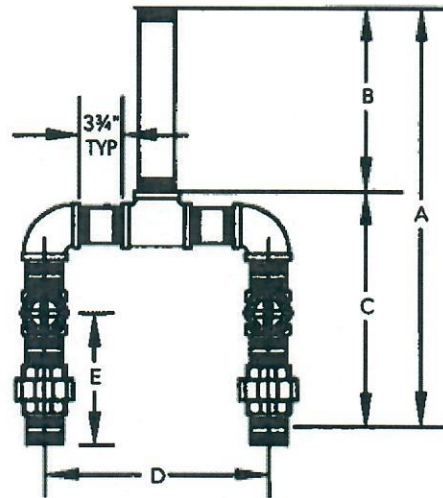
Duplex Discharge Piping Assemblies H12D and H20D

Assembled kits contain (2) brass gate valves, (2) unions, a tee and (2) elbows. Ready for connection to the appropriate guide rail (2) assemblies.

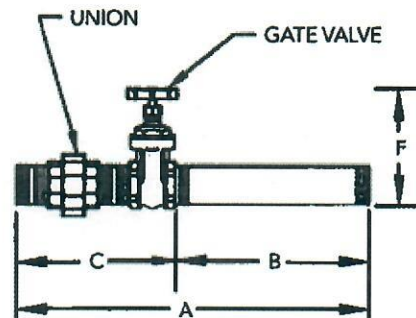
Dimension	Discharge Piping Order Number (dimensions in inches)			
	H12S	H20S	H12D	H20D
A	20	20	24	26
B	12	12	12	12
C	8	8	12	14
D	NA	NA	14	18
E	NA	NA	6	7
F	5.5	8	5.5	8

* Stainless steel option available. Consult factory.

Discharge Pipe	Rail System	Configuration
H12S	A10-12	Simplex
H12D	A10-12	Duplex
H20S	A10-15, 20	Simplex
H20D	A10-15, 20	Duplex



Duplex Discharge Kit



Simplex Discharge Kit

xylem
Let's Solve Water

Xylem, Inc.
2881 East Bayard Street Ext., Suite A
Seneca Falls, NY 13148
Phone: (866) 325-4210
Fax: (888) 322-5877
www.xylem.com/brands/centripro

CentriPro is a trademark of Xylem Inc. or one of its subsidiaries
Oil Smart is a registered trademark of See Water Inc.
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Submittal Information for Spears® Manufacturing Company PVC Schedule 40 Solid Wall Pipe & Fitting System

GSPVC40-0922

Date: _____

Job Name: _____ Location: _____

Engineer: _____ Contractor: _____

Scope:

This submittal covers Spears® PVC Schedule 40 solid wall pipe and PVC fittings intended for use in pressure applications where the application operating temperature does not exceed 140° F (63°C).

Product Specification:

All Spears® PVC Schedule 40 fittings shall be manufactured in the U.S.A. by Spears® Manufacturing Company from PVC Type I with a minimum cell classification 12454 in accordance with ASTM D1784. All injection molded PVC Schedule 40 fittings shall be manufactured in strict compliance to ASTM D2466 and certified for potable water service by NSF International and conform to CSA B137.3 for use in Canada. All fabricated schedule 40 fittings shall be produced in accordance with ASTM F1866 and Spears® General Specifications for Fabricated Fittings. Spears® PVC schedule 40 pipe and fittings shall be capable of withstanding a vacuum of twenty-six inches of mercury (Hg) at 73° F (23° C) when subjected to a one hour test with a leak factor of not more than one inch of Hg.

All Spears® PVC Schedule 40 pipe shall be manufactured in the U.S.A. by Spears® Manufacturing Company from a Type I, Grade I Polyvinyl Chloride (PVC) compound with a minimum cell classification of 12454 in accordance with ASTM D1784. The Schedule 40 pipe shall be manufactured in strict compliance to ASTM D1785 consistently meeting and/or exceeding the quality assurance test requirements of these standards. All Spears® EverTUFF® pipe shall be manufactured in the U.S.A. and immediately wrapped for protection. The pipe shall be provided with plain ends in 20 foot cut lengths. All Spears® Schedule 40 pipe shall be certified by NSF International for potable water applications and marked accordingly.

Product Marking:

All pipes shall be dual marked PVC schedule 40 and DWV and shall be marked with NSF® Listing, applicable ASTM Standard and applicable pressure @ 73° F. (23°C). PVC Schedule 40 Fittings shall be engraved with markings required by ASTM Standard and bear an NSF® Listing for potable water.

Installation:

Installation for Spears® PVC Schedule 40 systems shall comply with current installation instructions published by Spears® Manufacturing Company, established industry practices and all applicable code requirements. Buried pipe shall be in accordance with ASTM 2774 and ASTM F1668. The piping system shall be joined using a two-step solvent cement joining process with primer conforming to ASTM F656 and solvent cement conforming to ASTM D2564. The system shall be protected from ultra violet (UV) light exposure from the sun or other source and protected from any chemicals that are not compatible with the PVC materials including but not limited to fire stopping materials, plasticizers, incompatible thread sealants, etc.

NOTE: PVC piping systems are suitable for oil-free air handling to 25 psi, not for distribution of compressed air or gas.

Referenced Standards:

- ASTM D1784 – Rigid Vinyl Compounds
- ASTM D1785 – PVC Schedule 40, 80 & 120 Pipe
- ASTM D2466 – PVC Schedule 40 Fittings
- ASTM D2564 – Solvent Cements for PVC Pipe & Fittings
- ASTM D2774 – Procedure for Buried Pressure Pipe
- ASTM F656 – Primers for PVC Pipe & Fittings
- ASTM F1668 – Procedures for Buried Plastic Pipe
- ASTM F1866 – Fabricated PVC DWV Fittings
- CSA B137.3 – PVC pipe and fittings for pressure applications

Approvals:

NSF® – NSF International Standard 14/61 – Potable Water

PROJECT APPROVAL

Approved: _____

PRINT

Sign: _____

Date: _____



SUBMITTAL FOR CHARLOTTE PIPE® PVC SCHEDULE 40 PRESSURE PIPE AND FITTING SYSTEM

Date: _____

Job Name: _____

Location: _____

Engineer: _____

Contractor: _____

► **Scope:**

This specification covers PVC Schedule 40 pipe and fittings for pressure applications. This system is intended for pressure applications where the operating temperature will not exceed 140° F.

► **Specification:**

Pipe and fittings shall be manufactured from virgin rigid PVC (polyvinyl chloride) vinyl compounds with a cell class of 12454 as identified in ASTM D 1784.

PVC Schedule 40 pipe shall be Iron Pipe Size (IPS) conforming to ASTM D 1785. Injection molded PVC Schedule 40 fittings shall conform to ASTM D 2466. Pipe and fittings shall be manufactured as a system and be the product of one manufacturer. All pipe and fittings shall be manufactured in the United States. Pipe and fittings shall conform to NSF International Standard 61 or the health-effects portion of NSF Standard 14.

► **Installation:**












Installation shall comply with the latest installation instructions published by Charlotte Pipe and Foundry and shall conform to all applicable plumbing, fire, and building code requirements. Buried pipe shall be installed in accordance with ASTM F 1668. Solvent cement joints shall be made in a two-step process with primer manufactured for thermoplastic piping systems and solvent cement conforming to ASTM D 2564. The system shall be protected from chemical agents, fire-stopping materials, thread sealant, plasticized-vinyl products or other aggressive chemical agents not compatible with PVC compounds. The system shall be hydrostatically tested after installation. **WARNING!** Never test with or transport/store compressed air or gas in PVC pipe or fittings. Doing so can result in explosive failures and cause severe injury or death.

► **Referenced Standards:**

ASTM D 1784: Rigid Vinyl Compounds
ASTM D 1785: PVC Plastic Pipe, Schedule 40
ASTM D 2466: PVC Plastic Fittings, Schedule 40
ASTM D 2564: Solvent Cements for PVC
Pipe and Fittings

ASTM F 1668: Procedures for Buried Plastic Pipe
NSF Standard 14: Plastic Piping Components & Related Materials
NSF Standard 61: Drinking Water System Components –
Health Effects

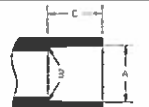


 Quarter Bend				 Eighth Bend				 Cross				 Street Quarter Bend			
 Male Adapter				 Bushing				 Female Adapter				 Cap			
 Plug				 Tee				 Coupling							

Not all fitting patterns shown

Schedule 40 Tapered Socket Dimensions

PVC SCHEDULE 40 - ASTM D 2466



Nominal Size	Schedule 80 and Schedule 40 Socket Diameter		Tolerance	Schedule 80	Schedule 40
	Entrance A	Bottom B		Socket Length C (Minimum)	Socket Length C (Minimum)
1/2	0.848	0.836	±0.004	0.875	0.688
3/4	1.058	1.046	±0.004	1.000	0.719
1	1.325	1.310	±0.005	1.125	0.875
1 1/4	1.670	1.655	±0.005	1.250	0.938
1 1/2	1.912	1.894	±0.006	1.375	1.094
2	2.387	2.369	±0.006	1.500	1.156
2 1/2	2.889	2.868	±0.007	1.750	1.750
3	3.516	3.492	±0.008	1.875	1.875
4	4.518	4.491	±0.009	2.250	2.000
6	6.647	6.614	±0.011	3.000	3.000
8	8.655	8.610	±0.015	4.000	4.000
10	10.780	10.735	±0.015	5.000	5.000
12	12.780	12.735	±0.015	6.000	6.000

PIPE REFERENCE GUIDE

Product	Sizes Available															
	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12	14	16
PVC Schedule 40	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

PRODUCT DATA

Plastics Technical Manual

>> PVC Schedule 40 Pipe, Type 1, Grade 1 - Bell End*

PVC SCHEDULE 40 (WHITE)			BELL END		PVC 1120	ASTM D 1785	
PART NO.	NOM. SIZE	UPC # 611942-	AVG. OD (IN.)	MIN. WALL (IN.)	MAX WORK PRESSURE AT 23° C OR 73° F	BELL DEPTH (IN.)	WT. PER 100 FT. (LBS.)
PVC 4005B**	½" x 10'	04986	.840	.109	600 PSI	2.00	15.9
PVC 4005B**	½" x 20'	03923	.840	.109	600 PSI	2.00	15.9
PVC 4007B**	¾" x 10'	04987	1.050	.113	480 PSI	2.25	21.1
PVC 4007B**	¾" x 20'	03926	1.050	.113	480 PSI	2.25	21.1
PVC 4010B**	1" x 10'	04988	1.315	.133	450 PSI	2.50	31.3
PVC 4010B**	1" x 20'	03929	1.315	.133	450 PSI	2.50	31.3
PVC 4012B§	1¼" x 10'	04989	1.660	.140	370 PSI	2.75	42.4
PVC 4012B§	1¼" x 20'	03930	1.660	.140	370 PSI	2.75	42.4
PVC 4015B§	1½" x 10'	04990	1.900	.145	330 PSI	3.00	50.7
PVC 4015B§	1½" x 20'	03931	1.900	.145	330 PSI	3.00	50.7
PVC 4020B†	2" x 10'	04991	2.375	.154	280 PSI	4.00	69.2
PVC 4020B†	2" x 20'	03932	2.375	.154	280 PSI	4.00	69.2
PVC 4025B‡	2½" x 20'	04206	2.875	.203	300 PSI	4.00	110.0
PVC 7300B§	3" x 10'	04853	3.500	.216	260 PSI	4.00	145.1
PVC 4030B†	3" x 20'	03933	3.500	.216	260 PSI	4.00	144.5
PVC 7400B§	4" x 10'	04835	4.500	.237	220 PSI	4.00	207.9
PVC 9400B†	4" x 20'	03964	4.500	.237	220 PSI	5.00	206.2
PVC 7600B§	6" x 10'	04850	6.625	.280	180 PSI	6.50	371.4
PVC 9600B†	6" x 20'	03965	6.625	.280	180 PSI	6.50	365.5
PVC 7800B†	8" x 10'	09903	8.625	.322	160 PSI	7.00	532.3
PVC 9800B†	8" x 20'	03967	8.625	.322	160 PSI	7.00	552.3
PVC 7910B†	10" x 20'	03960	10.750	.365	140 PSI	9.00	785.4
PVC 7912B†	12" x 20'	03962	12.750	.406	130 PSI	10.00	1046.7
PVC 7914B†	14" x 20'	04863	14.000	.437	130 PSI	10.00	1180.1
PVC 7916B†	16" x 20'	04929	16.000	.500	130 PSI	10.00	1543.1

* Bell dimensions meet either ASTM D 2672 or ASTM F 480, depending upon pipe diameter

** ASTM D 1785

§ Dual Marked ASTM D 1785 & ASTM D 2665

† Triple Marked ASTM D 1785 & ASTM D 2665 & ASTM F 480

‡ Dual Marked ASTM D 1785 & ASTM F 480

WARNING

Testing with or use of compressed air or gas in PVC / ABS / CPVC pipe or fittings can result in explosive failures and cause severe injury or death.

AIR/GAS

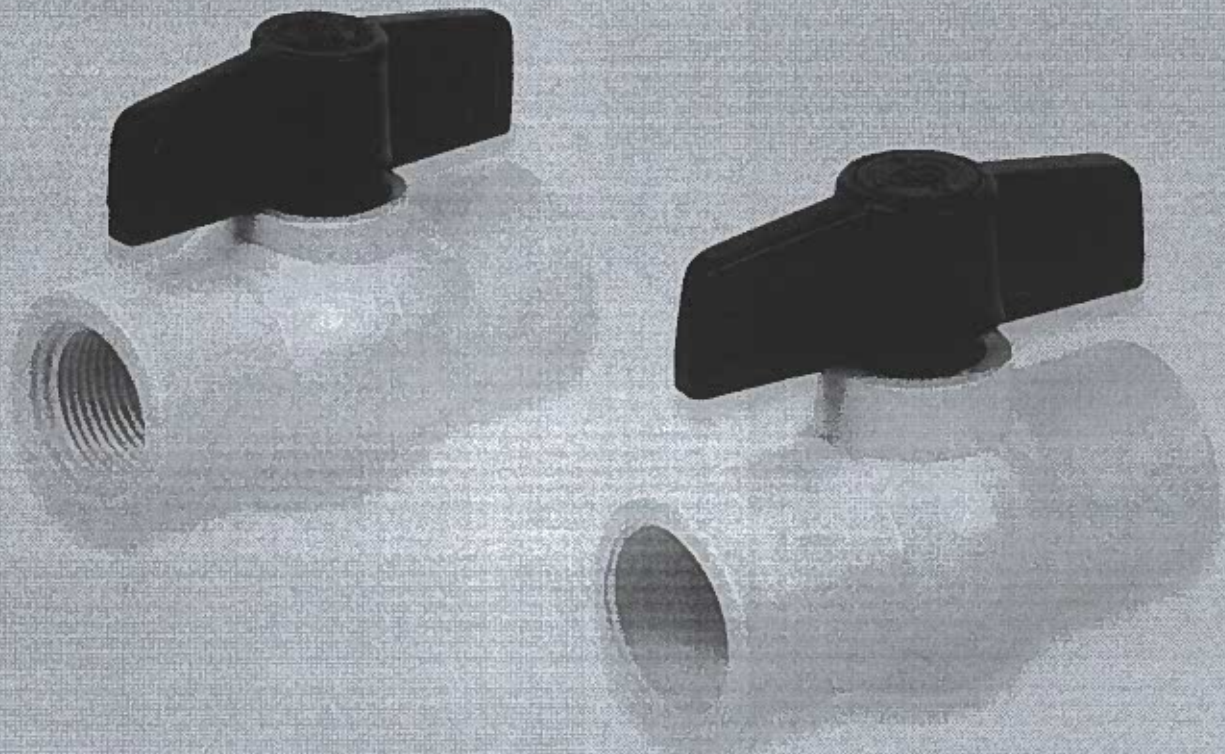
- NEVER test with or transport/store compressed air or gas in PVC / ABS / CPVC pipe or fittings.
- NEVER test PVC / ABS / CPVC pipe or fittings with compressed air or gas, or air over water boosters.
- ONLY use PVC / ABS / CPVC pipe or fittings for water or approved chemicals.
- Refer to warnings in PPFA User Bulletin 4-80 and ASTM D 1785.

Building connections that last™



Series 9121 & Series 9122

PVC Ball Valve, Threaded & Slip Datasheet

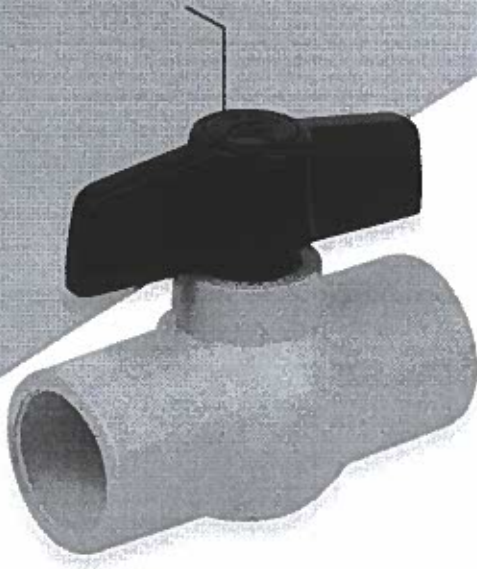


PVC Ball Valve, Slip Series 9122



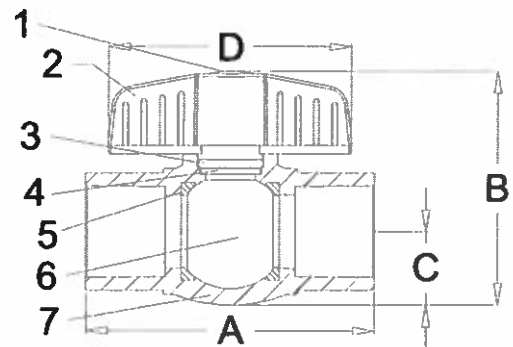
Design Features

- Schedule 40/80 PVC
- IPS
- 150 psi @ 73°F
- Molded in place construction
- White with blue handle
- EPDM O-ring
- Santoprene seat



Parts & Materials

No.	Part	Material
1	Cap	ABS
2	Handle	ABS
3	O-Ring	EPDM
4	O-Ring	EPDM
5	Seat	PTFE
6	Ball	PVC & ABS
7	Body	PVC



Dimensions

Size	Part Number	Weight	A	B	C	D
In		Lb	In	In	In	In
½	02939122G	0.2	3.16	2.46	0.71	2.74
¾	02939122I	0.2	3.61	2.98	0.87	3.01
1	02939122K	0.4	4.19	3.39	1.06	3.53
1-¼	02939122L	0.5	4.76	3.80	1.21	3.54
1-½	02939122M	0.8	5.13	4.32	1.46	4.42
2	02939122N	1.4	5.93	5.36	1.83	5.53
2-½	02939122P	3.7	7.48	7.68	2.26	7.09
3	02939122Q	5.6	8.66	8.86	2.66	9.05
4	02939122T	6.3	10.24	10.24	3.35	10.04



N035

Nonwoven Geotextile for Drainage and Separation

N035 is a polypropylene, needle punched nonwoven geotextile for use in drainage and separation applications. It has been stabilized to resist degradation due to ultraviolet exposure and is resistant to commonly encountered mildew, insects and soil chemicals, and is non-biodegradable. Polypropylene is stable with a pH range of 2 to 13.

Geotextile Property	Test Method	Minimum Average Roll Values
Grab Tensile Strength	ASTM D4632	90 Lbs
Grab Tensile Elongation	ASTM D4632	50 %
CBR Puncture Strength	ASTM D6241	250 Lbs
Trapezoid Tear Strength	ASTM D4533	40 Lbs
UV Resistance @ 500 Hours	ASTM D4355	70 %
AOS	ASTM D4751	50 Sieve
Permittivity (sec ⁻¹)	ASTM D4491	1.8 sec ⁻¹
Flow Rate	ASTM D4491	145 gpm/ft ²

Results quoted above are the mean of multiple tests conducted at an independent testing facility. N035 meets or exceeds values listed.

Packaging

Roll Width	12.5 ft.	15 ft.
Roll Length	360 ft.	360 ft.
Roll Area	500 sy	600 sy

04 2022

Disclaimer: Ferguson/ACF Environmental assumes no liability for the completeness or accuracy of this information or the ultimate use of this information. This document should not be construed as engineering advice. Always consult the project engineer for project specific requirements. The end user assumes sole responsibility for the use of this information

APPENDIX E
MATERIAL SAFETY DATA SHEETS

Material Safety Data Sheet



Date of issue 7 February 2012

Version 1

1. Product and company identification

Product name : PELS™ Caustic Soda Beads
 Code : 0040
 Synonym : Sodium Hydroxide; Anhydrous Sodium Hydroxide, Caustic Soda; NaOH
 Supplier : PPG Industries, Inc.
 One PPG Place
 Pittsburgh, PA 15272

Emergency telephone number : (412) 434-4515 (U.S.)
 (514) 645-1320 (Canada)
 01-800-00-21-400 (Mexico)

Technical Phone Number : 1-800-243-6774 (C/A) 8am-5pm Eastern time

2. Hazards identification

Emergency overview : DANGER!
 HARMFUL OR FATAL IF SWALLOWED. CAUSES SEVERE EYE AND SKIN BURNS. CAUSES RESPIRATORY TRACT IRRITATION. HARMFUL IF INHALED. MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. Add this product only to water. Never add water to this product. Do not add to warm or hot water, a violent eruption or explosive reaction can result. Avoid contact with organic materials. Take any precaution to avoid mixing with strong acids. May cause fire or explosion.

Do not swallow. Do not get in eyes or on skin or clothing. Do not breathe dust or mists from solutions. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.

Potential acute health effects

Inhalation : Harmful if inhaled. Causes burns. Corrosive to the respiratory system.
Ingestion : Harmful or fatal if swallowed. May cause burns to mouth, throat and stomach.
Skin : Severely corrosive to the skin. Causes severe burns.
Eyes : Severely corrosive to the eyes. Causes severe burns. Direct contact with the eyes can cause irreversible damage, including blindness.

Over-exposure signs/symptoms

Inhalation : Adverse symptoms may include the following:
 Respiratory tract irritation
 coughing
 Edema

Ingestion : Adverse symptoms may include the following:
 stomach pains
 nausea or vomiting
 gastric perforation
 blistering may occur

Skin : Adverse symptoms may include the following:
 pain or irritation
 redness
 blistering may occur
 ulcerations

Eyes :

Product code 0040	Date of issue 7 February 2012	Version 1
Product name PELS™ Caustic Soda Beads		

2. Hazards identification

Adverse symptoms may include the following:

pain
watering
redness
Cornea opacity
ulcerations
Direct contact with the eyes can cause irreversible damage, including blindness.

Medical conditions aggravated by over-exposure : Pre-existing disorders involving any target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

This Material Safety Data Sheet has been prepared in accordance with Canada's Workplace Hazardous Materials Information System (WHMIS) and the OSHA Hazard Communication Standard (29 CFR 1910.1200).

See toxicological information (Section 11)

3. Composition/information on ingredients

Name	CAS number	%
sodium hydroxide	1310-73-2	96 - 100
sodium chloride	7647-14-5	0 - 2
sodium carbonate	497-19-8	0 - 2

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

If ingestion, irritation, any type of overexposure or symptoms of overexposure occur during or persists after use of this product, contact a POISON CONTROL CENTER, EMERGENCY ROOM OR PHYSICIAN immediately; have Material Safety Data Sheet information available. Never give anything by mouth to an unconscious or convulsing person.

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Seek immediate medical attention.
- Skin contact** : Remove contaminated clothing and shoes. Wash skin thoroughly with soap and water or use recognized skin cleanser.
- Inhalation** : Remove to fresh air. Keep person warm and at rest. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel.
- Ingestion** : If swallowed, seek medical advice immediately and show this container or label. Keep person warm and at rest. Do not induce vomiting.
- Notes to physician** : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : Attacks many metals producing extremely flammable hydrogen gas which can form explosive mixtures with air.

Extinguishing media

- Suitable** : Use an extinguishing agent suitable for the surrounding fire.
- Not suitable** : None known.
- Special exposure hazards** : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous combustion products :

Product code 0040	Date of issue 7 February 2012	Version 1
Product name PELS™ Caustic Soda Beads		

5. Fire-fighting measures

Decomposition products may include the following materials:
carbon oxides
halogenated compounds
metal oxide/oxides

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

- Personal precautions** : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.
- Environmental precautions** : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
- Large spill** : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.
- Small spill** : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
- Special provisions** : If mixed with water, or likely to become mixed with water or any liquid, dike area to contain spill. Recycle, if possible. Or, dilute spill with large amounts of water then neutralize with dilute acid. Dispose of contents and container in accordance with all local, regional, national and international regulations. After all visible traces have been removed, flush area with large amounts of water.
- Reference to other sections** : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

7. Handling and storage

- Handling** : Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Do not swallow. Do not get in eyes or on skin or clothing. Do not breathe dust or mists from solutions. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Add this product only to water. Never add water to this product. Do not add to warm or hot water, a violent eruption or explosive reaction can result. May cause fire or explosion. Avoid contact with organic materials. Take any precaution to avoid mixing with strong acids. When making solutions or diluting, only add caustic soda slowly to surface of cold water while stirring. Attacks many metals producing extremely flammable hydrogen gas which can form explosive mixtures with air. Caustic soda may react with various sugars to generate carbon monoxide. Hazardous carbon monoxide gas can form upon contact with food and beverage products in enclosed vessels and can cause death. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. Do not enter a storage tank or container (truck or rail) that has contained this product, even if it appears empty.

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7. Handling and storage**8. Exposure controls/personal protection**

Name	Result	ACGIH	OSHA	Ontario	Mexico	PPG
sodium hydroxide	TWA	Not established	2 mg/m ³	Not established	Not established	Not established
	STEL	2 mg/m ³ C	Not established	2 mg/m ³ C	2 mg/m ³ C	Not established

Key to abbreviations

A	= Acceptable Maximum Peak	S	= Potential skin absorption
ACGIH	= American Conference of Governmental Industrial Hygienists.	SR	= Respiratory sensitization
C	= Ceiling Limit	SS	= Skin sensitization
F	= Fume	STEL	= Short term Exposure limit values
IPEL	= Internal Permissible Exposure Limit	TD	= Total dust
OSHA	= Occupational Safety and Health Administration.	TLV	= Threshold Limit Value
R	= Respirable	TWA	= Time Weighted Average
Z	= OSHA 29CFR 1910.1200 Subpart Z - Toxic and Hazardous Substances		

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Eyes : Chemical splash goggles and face shield.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Gloves : Impervious gloves. nitrile, neoprene

Respiratory : Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. If workers are exposed to concentrations above the exposure limit, they must use appropriate, certified respirators. Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary.

Skin : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

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9. Physical and chemical properties

Physical state : Solid. [Dustless granules.]
Flash point : Closed cup: Not applicable. [Product does not sustain combustion.]
Color : White.
Odor : Odorless.
pH : Strongly basic
Boiling/condensation point : 1390°C (2534°F)
Melting/freezing point : 310 to 320°C (590 to 608°F)
Specific gravity : 2.13
Density (lbs / gal) : 17.78
Bulk Density (g/cm³) : 1.12 (loosely packed)
Vapor pressure : Not applicable.
Vapor density : Not applicable
Volatility : 0% (w/w)
Evaporation rate : Not applicable.
Viscosity : Not applicable.
Solubility : Easily soluble in the following materials: cold water.
Water Solubility at room temperature : 3470 g/l @ 100°C
Partition coefficient: n-octanol/water : Not available.
% Solid. (w/w) : 100

10. Stability and reactivity

Stability : Stable under recommended storage and handling conditions (see section 7).
Conditions to avoid : Avoid increased storage temperature. Pressure hazard
Materials to avoid : Keep away from the following materials to prevent strong exothermic reactions: oxidizing agents, strong alkalis, strong acids.

Reactive or incompatible with the following materials: metals (Attacks many metals producing extremely flammable hydrogen gas which can form explosive mixtures with air.), acids, organic materials (May cause fire or explosion.), food sugars (Caustic soda may react with various sugars to generate carbon monoxide.), water (Aqueous reaction with caustic soda can generate heat (strongly exothermic).)

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

11. Toxicological information

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
sodium hydroxide	LD50 Oral	Rat	0.24 g/kg	-
sodium chloride	LD50 Oral	Rat	3000 mg/kg	-
sodium carbonate	LD50 Oral	Rat	4090 mg/kg	-

Conclusion/Summary : Harmful or fatal if swallowed. Harmful if inhaled.

Chronic toxicity

Conclusion/Summary : Not available.

Irritation/Corrosion

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11 . Toxicological information

- Skin** : Severely corrosive to the skin. Causes severe burns.
- Eyes** : Severely corrosive to the eyes. Causes severe burns. Direct contact with the eyes can cause irreversible damage, including blindness.
- Respiratory** : Corrosive to the respiratory system.
- Sensitization**
- Skin** : Not available.
- Respiratory** : Not available.
- Target organs** : May cause damage to the following organs: lungs, gastrointestinal tract, upper respiratory tract, skin, eyes.
Contains material which may cause damage to the following organs: eye, lens or cornea, stomach.
- Carcinogenicity**
- Carcinogenicity** : No known significant effects or critical hazards.
- Mutagenicity**
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity**
- Teratogenicity** : No known significant effects or critical hazards.
- Reproductive toxicity**
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

12 . Ecological information

Environmental effects : No known significant effects or critical hazards.

Aquatic ecotoxicity

Product/ingredient name	Result	Species	Exposure
sodium hydroxide	Acute LC50 196 mg/L Marine water	Fish - Guppy - Poecilia reticulata	96 hours
	Chronic NOEC 56 mg/L Marine water	Fish - Guppy - Poecilia reticulata	96 hours
sodium chloride	Acute LC50 1294600 ug/L Fresh water	Fish - Bluegill - Lepomis macrochirus	96 hours
	Acute EC50 402600 to 469200 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours
	Chronic NEL 0.86 g/L Fresh water	Fish - Fathead minnow - Pimephales promelas	96 hours
sodium carbonate	Acute LC50 300000 ug/L Fresh water	Fish - Bluegill - Lepomis macrochirus	96 hours
	Acute LC50 265000 ug/L Fresh water	Daphnia - Water flea - Daphnia magna	48 hours

Conclusion/Summary : Harmful to aquatic life.

13 . Disposal considerations

Waste disposal : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled

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13 . Disposal considerations

material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees. Section 6. Accidental release measures

14 . Transport information

Regulation	UN number	Proper shipping name	Classes	PG*	Additional information
UN	1823	SODIUM HYDROXIDE, SOLID	8	II	-
IMDG	1823	SODIUM HYDROXIDE, SOLID	8	II	-
DOT	1823	SODIUM HYDROXIDE, SOLID	8	II	-

PG* : Packing group

Reportable quantity RQ : CERCLA: Hazardous substances.: sodium hydroxide: 1000 lbs. (454 kg);

15 . Regulatory information

- United States inventory (TSCA 8b)** : All components are listed or exempted.
Australia inventory (AICS) : All components are listed or exempted.
Canada inventory (DSL) : All components are listed or exempted.
China inventory (IECSC) : All components are listed or exempted.
Europe inventory (REACH) : Please contact your supplier for information on the inventory status of this material.
Japan inventory (ENCS) : All components are listed or exempted.
Korea inventory (KECI) : All components are listed or exempted.
New Zealand (NZIoC) : All components are listed or exempted.
Philippines inventory (PICCS) : All components are listed or exempted.

United States

SARA 302/304/311/312 extremely hazardous substances: No products were found.

SARA 302/304 emergency planning and notification: No products were found.

SARA 302/304/311/312 hazardous chemicals: sodium hydroxide; sodium carbonate; sodium chloride

CERCLA: Hazardous substances.: sodium hydroxide: 1000 lbs. (454 kg);

SARA 311/312 MSDS Distribution - Chemical Inventory - Hazard Identification:

<u>Chemical name</u>	<u>CAS #</u>	<u>Acute</u>	<u>Chronic</u>	<u>Fire</u>	<u>Reactive</u>	<u>Pressure</u>
sodium hydroxide	1310-73-2	Y	N	N	Y	N
sodium chloride	7647-14-5	N	N	N	N	N
sodium carbonate	497-19-8	Y	N	N	Y	N
Product as-supplied :		Y	N	N	Y	N

California Prop. 65**WARNING:** This product contains a chemical known to the State of California to cause cancer and birth defects or other reproductive harm.**Canada**

WHMIS (Canada) : Class E: Corrosive solid. Class D-1B: Material causing immediate and serious toxic effects (Toxic). Class D-2B: Material causing other toxic effects (Toxic).

Mexico**Classification**

Flammability : 0 Health : 3 Reactivity : 1

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16 . Other information

Hazardous Material Information System (U.S.A.)

Health : 3 Flammability : 0 Physical hazards : 1
(*) - Chronic effects

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Health : 3 Flammability : 0 Instability : 1

Other special considerations : NSF/ANSI Drinking Water Treatment Chemicals - Health Effects Listing - PPG Pels™ Caustic Soda Beads are certified for maximum use at 100 mg/L under NSF/ANSI Standard 60.

Other information : PELS™ is a trademark of PPG Industries Ohio, Inc.

Date of previous issue : No previous validation.

Organization that prepared the MSDS : EHS

☑ Indicates information that has changed from previously issued version.

Disclaimer

The information contained in this data sheet is based on present scientific and technical knowledge. The purpose of this information is to draw attention to the health and safety aspects concerning the products supplied by PPG, and to recommend precautionary measures for the storage and handling of the products. No warranty or guarantee is given in respect of the properties of the products. No liability can be accepted for any failure to observe the precautionary measures described in this data sheet or for any misuse of the products.

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SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : Methanol (230, 232, 233)

MSDS Number : 000000011383

Product Use Description : Solvent

Manufacturer or supplier's details : Honeywell International Inc.
101 Columbia Road
Morristown, NJ 07962-1057

For more information call : 1-800-368-0050
+1-231-726-3171
(Monday-Friday, 9:00am-5:00pm)

In case of emergency call : Medical: 1-800-498-5701 or +1-303-389-1414
: **Transportation (CHEMTREC): 1-800-424-9300 or +1-703-527-3887**
:
: (24 hours/day, 7 days/week)

SECTION 2. HAZARDS IDENTIFICATION**Emergency Overview**

Form : liquid, clear

Color : colourless

Odor : slight alcohol-like

Classification of the substance or mixture

Classification of the substance or mixture : Flammable liquids, Category 2
Eye irritation, Category 2A
Reproductive toxicity, Category 2
Specific target organ toxicity - single exposure, Category 1,
Eyes, Nervous system, Systemic toxicity

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GHS Label elements, including precautionary statements

Symbol(s)

:



Signal word

: Danger

Hazard statements

: Highly flammable liquid and vapour.
Causes serious eye irritation.
Suspected of damaging fertility or the unborn child.
Causes damage to organs.

Precautionary statements

: **Prevention:**
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
Keep container tightly closed.
Ground/bond container and receiving equipment.
Use explosion-proof electrical/ ventilating/ lighting/ equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Do not breathe dust/ fume/ gas/ mist/ vapours/ spray.
Wash skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Wear protective gloves/ eye protection/ face protection.

Response:
IF ON SKIN (or hair): Remove/ Take off immediately all contaminated clothing. Rinse skin with water/ shower.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed: Call a POISON CENTER or doctor/ physician.
If eye irritation persists: Get medical advice/ attention.
In case of fire: Use dry sand, dry chemical or alcohol-resistant foam for extinction.

Storage:
Store in a well-ventilated place. Keep cool.

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Store locked up.

Disposal:

Dispose of contents/ container to an approved waste disposal plant.

Carcinogenicity

No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP, IARC, or OSHA.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTSFormula : CH₄O

Chemical nature : Substance

Chemical Name	CAS-No.	Concentration
Methanol	67-56-1	100.00 %

SECTION 4. FIRST AID MEASURES

- Inhalation : Call a physician immediately. Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Use oxygen as required, provided a qualified operator is present.
- Skin contact : Wash off immediately with plenty of water for at least 15 minutes. Take off contaminated clothing and shoes immediately. Wash contaminated clothing before re-use. Call a physician.
- Eye contact : Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Call a physician.
- Ingestion : Call a physician immediately. Do NOT induce vomiting. Immediate medical attention is required. Never give anything by mouth to an unconscious person.

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Notes to physician

Treatment : Treat symptomatically.

SECTION 5. FIREFIGHTING MEASURES

- Suitable extinguishing media : Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical
Cool closed containers exposed to fire with water spray.
- Unsuitable extinguishing media : Do not use a solid water stream as it may scatter and spread fire.
- Specific hazards during firefighting : Flammable.
Vapours may form explosive mixtures with air.
Vapours are heavier than air and may spread along floors.
Vapors may travel to areas away from work site before igniting/flashing back to vapor source.
In case of fire hazardous decomposition products may be produced such as:
Carbon monoxide
Carbon dioxide (CO₂)
Formaldehyde
- Special protective equipment for firefighters : Wear self-contained breathing apparatus and protective suit.

SECTION 6. ACCIDENTAL RELEASE MEASURES

- Personal precautions : Wear personal protective equipment.
Immediately evacuate personnel to safe areas.
Keep people away from and upwind of spill/leak.
Ensure adequate ventilation.
Remove all sources of ignition.
Do not swallow.
Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.
- Environmental precautions : Prevent further leakage or spillage if safe to do so.

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- Prevent product from entering drains.
Discharge into the environment must be avoided.
Do not flush into surface water or sanitary sewer system.
Do not allow run-off from fire fighting to enter drains or water courses.
- Methods for cleaning up : Ventilate the area.
No sparking tools should be used.
Use explosion-proof equipment.
Contain spillage, soak up with non-combustible absorbent material, (e.g. sand, earth, diatomaceous earth, vermiculite) and transfer to a container for disposal according to local / national regulations (see section 13).

SECTION 7. HANDLING AND STORAGE**Handling**

- Handling : Wear personal protective equipment.
Use only in well-ventilated areas.
Keep container tightly closed.
Do not smoke.
Do not swallow.
Do not breathe vapours or spray mist.
Avoid contact with skin, eyes and clothing.
- Advice on protection against fire and explosion : Keep away from fire, sparks and heated surfaces.
Take precautionary measures against static discharges.
Ensure all equipment is electrically grounded before beginning transfer operations.
Use explosion-proof equipment.
Keep product and empty container away from heat and sources of ignition.
No sparking tools should be used.
No smoking.

Storage

- Requirements for storage areas and containers : Store in area designed for storage of flammable liquids.
Protect from physical damage.
Keep containers tightly closed in a dry, cool and well-ventilated place.
Containers which are opened must be carefully resealed and

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kept upright to prevent leakage.
Keep away from heat and sources of ignition.
Keep away from direct sunlight.
Store away from incompatible substances.
Container hazardous when empty.
Do not pressurize, cut, weld, braze, solder, drill, grind or
expose containers to heat or sources of ignition.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

- Protective measures : Ensure that eyewash stations and safety showers are close to the workstation location.
- Engineering measures : Use with local exhaust ventilation.
Prevent vapour buildup by providing adequate ventilation during and after use.
- Eye protection : Do not wear contact lenses.
Wear as appropriate:
Safety glasses with side-shields
If splashes are likely to occur, wear:
Goggles or face shield, giving complete protection to eyes
- Hand protection : Solvent-resistant gloves
Gloves must be inspected prior to use.
Replace when worn.
- Skin and body protection : Wear as appropriate:
Solvent-resistant apron
Flame retardant antistatic protective clothing.
If splashes are likely to occur, wear:
Protective suit
- Respiratory protection : In case of insufficient ventilation, wear suitable respiratory equipment.
For rescue and maintenance work in storage tanks use self-contained breathing apparatus.
Use NIOSH approved respiratory protection.
- Hygiene measures : When using do not eat, drink or smoke.
Wash hands before breaks and immediately after handling the product.
Keep working clothes separately.

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Do not swallow.
 Do not breathe vapours or spray mist.
 Avoid contact with skin, eyes and clothing.
 This material has an established AIHA ERPG exposure limit.
 The current list of ERPG exposure limits can be found at
http://www.aiha.org/insideaiha/GuidelineDevelopment/ERPG/Documents/2011erpgweelhandbook_table-only.pdf.

Exposure Guidelines

Components	CAS-No.	Value	Control parameters	Update	Basis
Methanol	67-56-1	TWA : time weighted average	(200 ppm)	2008	ACGIH:US. ACGIH Threshold Limit Values
Methanol	67-56-1	STEL : Short term exposure limit	(250 ppm)	2008	ACGIH:US. ACGIH Threshold Limit Values
Methanol	67-56-1	SKIN_DE S : Skin designati on:	Can be absorbed through the skin.	2008	ACGIH:US. ACGIH Threshold Limit Values
Methanol	67-56-1	REL : Recomm ended exposure limit (REL):	260 mg/m3 (200 ppm)	2005	NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards
Methanol	67-56-1	SKIN_DE S : Skin designati on:	Can be absorbed through the skin.	2005	NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards

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Methanol	67-56-1	STEL : Short term exposure limit	325 mg/m3 (250 ppm)	2005	NIOSH/GUIDE:US. NIOSH: Pocket Guide to Chemical Hazards
Methanol	67-56-1	PEL : Permissi ble exposure limit	260 mg/m3 (200 ppm)	02 2006	OSHA_TRANS:US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)
Methanol	67-56-1	TWA : time weighted average	260 mg/m3 (200 ppm)	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000)
Methanol	67-56-1	STEL : Short term exposure limit	325 mg/m3 (250 ppm)	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000)
Methanol	67-56-1	SKIN_FI NAL : Skin designati on (Final Rule Limit applies):	Can be absorbed through the skin.	1989	Z1A:US. OSHA Table Z-1-A (29 CFR 1910.1000)

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state	: liquid, clear
Color	: colourless
Odor	: slight alcohol-like
pH	: Note: Not applicable

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Melting point/freezing point : Note: Not applicable

Boiling point/boiling range : 64.7 °C

Flash point : 52 °F (11 °C)
Method: closed cup

Evaporation rate : ca. 5
Method: Compared to Butyl acetate.

Lower explosion limit : 6 %(V)

Upper explosion limit : 36 %(V)

Vapor pressure : 129.32 hPa
at 20 °C(68 °F)

Vapor density : 1.11 Note: (Air = 1.0)

Density : 0.792 g/cm³ at 20 °C

Water solubility : Note: completely soluble

Ignition temperature : 464 °C

Molecular weight : 32.04 g/mol

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SECTION 10. STABILITY AND REACTIVITY

Chemical stability	: Stable under recommended storage conditions.
Possibility of hazardous reactions	: Hazardous polymerisation does not occur.
Conditions to avoid	: Heat, flames and sparks. Keep away from direct sunlight.
Incompatible materials to avoid	: Strong oxidizing agents Aluminium Magnesium May attack many plastics, rubbers and coatings.
Hazardous decomposition products	: In case of fire hazardous decomposition products may be produced such as: Carbon monoxide Carbon dioxide (CO ₂) Formaldehyde

SECTION 11. TOXICOLOGICAL INFORMATION

Acute oral toxicity	: LD50: 5,628 mg/kg Species: Rat
Acute inhalation toxicity	: LC50: 64000 ppm Exposure time: 4 h Species: Rat
Acute dermal toxicity	: LD50: 15,800 mg/kg Species: Rabbit
Skin irritation	: Species: Rabbit Classification: irritating Exposure time: 24 h

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Eye irritation	: Species: rabbit eye Classification: irritating
Repeated dose toxicity	: Species: Rat Application Route: Inhalation Test substance: Methanol Note: Developmental Toxicity NOAEL (maternal toxicity) 10,000 ppm NOAEL (developmental toxicity) 5,000 ppm Skeletal and visceral malformations.
Genotoxicity in vitro	: Note: In vitro tests did not show mutagenic effects
Genotoxicity in vivo	: Note: In vivo tests did not show mutagenic effects

SECTION 12. ECOLOGICAL INFORMATION**Ecotoxicity effects**

Toxicity to fish	: LC50: 29,400 mg/l Exposure time: 96 h Species: Fathead minnow
Toxicity to daphnia and other aquatic invertebrates	: LC50: 10,000 mg/l Exposure time: 24 h Species: Daphnia (water flea)
Toxicity to bacteria	: EC50: 43,000 mg/l Exposure time: 5 min Species: Photobacterium phosphoreum
	: EC50: 40,000 mg/l Exposure time: 15 min Species: Photobacterium phosphoreum
	: EC50: 39,000 mg/l Exposure time: 25 min Species: Photobacterium phosphoreum

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Further information on ecology

Additional ecological information : Accumulation in aquatic organisms is unlikely.
The product is readily degradable in the environment.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal methods : Observe all Federal, State, and Local Environmental regulations.

SECTION 14. TRANSPORT INFORMATION

DOT UN/ID No. : UN 1230
Proper shipping name : METHANOL
Class : 3
Packing group : II
Hazard Labels : 3

IATA UN/ID No. : UN 1230
Description of the goods : METHANOL
Class : 3
Packaging group : II
Hazard Labels : 3 (6.1)
Packing instruction (cargo aircraft) : 364
Packing instruction (passenger aircraft) : 352
Packing instruction (passenger aircraft) : Y341

IMDG UN/ID No. : UN 1230
Description of the goods : METHANOL
Class : 3
Packaging group : II
Hazard Labels : 3 (6.1)
EmS Number : F-E, S-D
Marine pollutant : no

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SECTION 15. REGULATORY INFORMATION**Inventories**

- US. Toxic Substances Control Act : On TSCA Inventory
- Australia. Industrial Chemical (Notification and Assessment) Act : On the inventory, or in compliance with the inventory
- Canada. Canadian Environmental Protection Act (CEPA). Domestic Substances List (DSL) : All components of this product are on the Canadian DSL.
- Japan. Kashin-Hou Law List : On the inventory, or in compliance with the inventory
- Korea. Toxic Chemical Control Law (TCCL) List : On the inventory, or in compliance with the inventory
- Philippines. The Toxic Substances and Hazardous and Nuclear Waste Control Act : On the inventory, or in compliance with the inventory
- China. Inventory of Existing Chemical Substances : On the inventory, or in compliance with the inventory
- New Zealand. Inventory of Chemicals (NZIoC), as published by ERMA New Zealand : On the inventory, or in compliance with the inventory

National regulatory information

- US. EPA CERCLA Hazardous Substances (40 CFR 302) : The following component(s) of this product is/are subject to release reporting under 40 CFR 302 when release exceeds the Reportable Quantity (RQ):

Reportable quantity: 5000 lbs

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	: Methanol	67-56-1	
SARA 302 Components	: No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.		
SARA 313 Components	: The following components are subject to reporting levels established by SARA Title III, Section 313:		
	: Methanol	67-56-1	
SARA 311/312 Hazards	: Fire Hazard Acute Health Hazard Chronic Health Hazard		
CERCLA Reportable Quantity	: 5000 lbs		
California Prop. 65	: WARNING: This product contains a chemical known to the State of California to cause birth defects or other reproductive harm. Methanol		67-56-1
Massachusetts RTK	: Methanol	67-56-1	
New Jersey RTK	: Methanol	67-56-1	
Pennsylvania RTK	: Methanol	67-56-1	
WHMIS Classification	: B2: Flammable liquid D1B: Toxic Material Causing Immediate and Serious Toxic Effects D2A: Very Toxic Material Causing Other Toxic Effects D2B: Toxic Material Causing Other Toxic Effects This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.		

SECTION 16. OTHER INFORMATION

Methanol (230, 232, 233)**000000011383**

Version 3.1

Revision Date 03/26/2015

Print Date 04/21/2015

	HMIS III	NFPA
Health hazard	: 2*	1
Flammability	: 3	3
Physical Hazard	: 0	
Instability	:	0

* - Chronic health hazard

Hazard rating and rating systems (e.g. HMIS® III, NFPA): This information is intended solely for the use of individuals trained in the particular system.

Further information

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text. Final determination of suitability of any material is the sole responsibility of the user. This information should not constitute a guarantee for any specific product properties.

Changes since the last version are highlighted in the margin. This version replaces all previous versions.

Previous Issue Date: 03/19/2014

Prepared by Honeywell Performance Materials and Technologies Product Stewardship Group

**MT. CUBA CENTER - ONSITE WASTEWATER TREATMENT SYSTEM
OPERATING PERMIT SUBMISSION**

Attachment 4: Wastewater Operator Agreement



(302) 540-6718

916 Yorklyn Road Hockessin DE 19707

Mount Cuba Center

3120 Barley Mill Road

Hockessin, DE 19709

ORENCO-ADVANTEX PRETREATMENT SYSTEM O & M ANNUAL AGREEMENT

ANNUAL MAINTENANCE:

- Confirm and record pump voltages and amperages
- Record scum and sludge accumulation
- Flush distribution laterals
- Inspect pumping components
- Clean filter racks as needed

MONTHLY MAINTENANCE:

- Visually inspect tank liquid levels
- Check Biotube effluent filters
- Record time meters and event counters for all pumps
- Inspect spin nozzles
- Test effluent quality—2 times per month
- Add chemicals as required

NOTE: Chemical requirements are unknown as this time. Once the system has operated for a period of time, the chemical usage will become more apparent.

The O & M Agreement covers inspections, testing and recording, but does not cover repairs, emergency maintenance, or parts.

O & M Agreement Annual Fee: \$12,840.00

Mount Cuba Center

R. Webb Excavating LLC