5.2

Tables

TABLE 5.2-1
SUMMARY OF GROUND WATER ELEVATIONS AND APPARENT LIGHT NON-AQUEOUS PHASE LIQUID THICKNESS
IAOC A9 - CONSERVATION AREA

EXXONMOBIL ENVIRONMENTAL AND PROPERTY SOLUTIONS COMPANY / BAYWAY REFINERY COMPLEX
LINDEN, NEW JERSEY

Well ID	Date	Top of Casing Elevation (FMSL)	Depth to Water (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Corrected GW Elevation (FMSL)
APZ-116	3/11/2022	11.85	6.24	ND	0.00	5.61
	4/22/2022	11.85	6.41	ND	0.00	5.44
APZ-117	3/11/2022	9.03	3.54	ND	0.00	5.49
	4/22/2022	9.03	3.92	ND	0.00	5.11
APZ-118	3/11/2022	8.96	3.41	ND	0.00	5.55
	4/22/2022	8.96	3.80	ND	0.00	5.16
APZ-119	3/11/2022	8.95	3.30	ND	0.00	5.65
	4/22/2022	8.95	3.79	ND	0.00	5.16
APZ-120	3/11/2022	12.11	8.14	8.12	0.02	3.99
	4/22/2022	12.11	NA*	8.26	NA*	3.85*
APZ-121	3/11/2022	10.73	4.48	ND	0.00	6.25
	4/22/2022	10.73	4.51	ND	0.00	6.22
APZ-122	3/11/2022	10.24	6.22	ND	0.00	4.02
	4/22/2022	10.24	6.18	ND	0.00	4.06
APZ-123	3/11/2022	11.84	7.03	ND	0.00	4.81
	4/22/2022	11.84	6.71	ND	0.00	5.13
BO2S	3/11/2022	12.78	4.81	ND	0.00	7.97
	4/22/2022	12.78	4.27	ND	0.00	8.51
DAM2-MW-1	3/11/2022	9.80	5.02	ND	0.00	4.78
	4/22/2022	9.80	4.56	ND	0.00	5.24
DAM2-MW-2	3/11/2022	10.78	7.78	ND	0.00	3.00
	4/22/2022	10.78	7.06	ND	0.00	3.72
DAM2-MW-4	3/11/2022	10.07	4.10	ND	0.00	5.97
	4/22/2022	10.07	4.24	ND	0.00	5.83
DAM2-P-1	3/11/2022	10.39	6.98	ND	0.00	3.41
	4/22/2022	10.39	6.82	ND	0.00	3.57
GMW-120	3/11/2022	11.87	7.79	ND	0.00	4.08
	4/22/2022	11.87	7.50	ND	0.00	4.37
GMW-124	3/11/2022	11.45	2.41	ND	0.00	9.04
	4/22/2022	11.45	3.58	ND	0.00	7.87
GMW-135	3/11/2022	11.27	4.70	ND	0.00	6.57
	4/22/2022	11.27	4.58	ND	0.00	6.69
GMW-206	3/11/2022	8.05	1.95	ND	0.00	6.10
	4/22/2022	8.05	1.79	ND	0.00	6.26
GMW-222	3/11/2022	11.84	5.98	5.09	0.89	6.66
	4/22/2022	11.84	6.34	4.95	1.39	6.75
GMW-223	3/11/2022	12.23	5.81	ND	0.00	6.42
	4/22/2022	12.23	5.58	ND	0.00	6.65
GMW-284[1]	3/11/2022	17.50	3.74	ND	0.00	13.76
	4/22/2022	17.50	7.96	ND	0.00	9.54
GMW-305	3/11/2022	11.39	4.97	ND	0.00	6.42
	4/22/2022	11.39	4.52	ND	0.00	6.87
GMW-657	3/11/2022	7.93	2.43	ND	0.00	5.50
	4/22/2022	7.93	2.76	ND	0.00	5.17
P-18	3/11/2022	16.72	9.07	ND	ND	7.65
	4/22/2022	16.72	8.92	ND	ND	7.80
P-19	3/11/2022	16.54	11.29	ND	0.00	5.25
	4/22/2022	16.54	11.05	ND	0.00	5.49
RW-28	3/11/2022	14.86	12.29	ND	0.00	2.57
	4/22/2022	14.86	12.09	ND	0.00	2.77
RW-29	3/11/2022	16.34	12.80	ND	0.00	3.54
	4/22/2022	16.34	>12.19	NA	NA	<4.15
RW-5	3/11/2022	10.01	8.46	ND	0.00	1.55
	4/22/2022	10.01	8.24	ND	0.00	1.77
RW-A9-1	3/11/2022	7.18	2.36	ND	0.00	4.82
	4/22/2022	7.18	3.01	ND	0.00	4.17
RW-A9-2	3/11/2022	6.86	6.69	6.69	FILM	0.17
	4/22/2022	6.86	6.68	ND	0.00	0.18
RW-A9-3	3/11/2022	6.61	6.28	6.28	FILM	0.33
	4/22/2022	6.61	NA*	6.54	NA*	0.07*

TABLE 5.2-1
SUMMARY OF GROUND WATER ELEVATIONS AND APPARENT LIGHT NON-AQUEOUS PHASE LIQUID THICKNESS
IAOC A9 - CONSERVATION AREA

EXXONMOBIL ENVIRONMENTAL AND PROPERTY SOLUTIONS COMPANY / BAYWAY REFINERY COMPLEX
LINDEN, NEW JERSEY

Well ID	Date	Top of Casing Elevation (FMSL)	Depth to Water (feet)	Depth to LNAPL (feet)	LNAPL Thickness (feet)	Corrected GW Elevation (FMSL)
RW-A9-4	3/11/2022	7.71	8.18	8.18	FILM	-0.47
	4/22/2022	7.71	8.20	ND	0.00	-0.49
RW-A9-5	3/11/2022	6.45	4.13	ND	0.00	2.32
	4/22/2022	6.45	5.28	ND	0.00	1.17
RW-A9-6	3/11/2022	5.58	7.22	ND	0.00	-1.64
	4/22/2022	5.58	7.56	ND	0.00	-1.98
S-28	3/11/2022	16.43	10.49	ND	0.00	5.94
	4/22/2022	16.43	10.18	ND	0.00	6.25
S-29	3/11/2022	16.70	10.90	ND	0.00	5.80
	4/22/2022	16.70	10.78	ND	0.00	5.92
S-5	3/11/2022	8.06	3.55	ND	0.00	4.51
	4/22/2022	8.06	2.85	ND	0.00	5.21
STW-D2	3/11/2022	12.91	6.76	ND	0.00	6.15
	4/22/2022	12.91	7.14	ND	0.00	5.77
STW-D4	3/11/2022	11.97	8.43	ND	0.00	3.54
	4/22/2022	11.97	8.46	ND	0.00	3.51

Notes:

FMSL	Feet above mean sea level
LNAPL	Light non-aqueous phase liquid
GW	Ground water
ND	Not detected
FILM	Apparent LNAPL Thickness less than 0.01 feet
NA	Not available
[1]	Obstruction detected in well GMW-284 during the 3/11/2022 event, affecting water level within well
*	Unable to determine depth to water and LNAPL thickness due to LNAPL viscosity. Corrected ground water elevation is approximate, with the actual elevation lower than or equal to the elevation shown.
>	Depth to ground water was greater than the depth depicted, which was measured as the top of pump
<	Ground water elevation is lower than the elevation depicted, which was calculated using the depth to top of pump measured during the event; actual depth to LNAPL and/or ground water was unable to be measured due to the limited clearance between well casing/screen and the recovery pump.

If LNAPL is detected, Ground Water Elevation is corrected using the following formula:
Corrected Ground Water Elevation = (Top of Casing Elevation - Depth to Water) + (Specific Gravity x Apparent LNAPL Thickness)
Specific Gravity = 0.88 for wells in Conservation Area (IAOC A9), and 0.899 for wells in Gasoline Blending Tankfield (IAOC A8) and Gasoline Component Tankfield (IAOC A10)

TABLE 5.2-2
VOLATILE ORGANIC COMPOUNDS IN GROUND WATER
IAOC A9 - CONSERVATION AREA

EXXONMOBIL ENVIRONMENTAL AND PROPERTY SOLUTIONS COMPANY / BAYWAY REFINERY COMPLEX
LINDEN, NEW JERSEY

Location ID		BW SW CRITERIA FRESH	BW SW CRITERIA SALINE	NJDEP CLASS II-A GWRS	A9 Extraction	APZ-122	APZ-123	DAM2-MW-1	DAM2-MW-2	GMW-120	GMW-124	GMW-135	GMW-283	GMW-305	GMW-657
Date					03/16/2022	03/22/2022	03/25/2022	03/22/2022	03/22/2022	03/18/2022	03/21/2022	03/21/2022	03/21/2022	04/05/2022	03/18/2022
Chemical	Units														
1,1,1-trichloroethane	µg/L	76	1560	30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1,2,2-tetrachloroethane	µg/L	380	10.8	1	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1,2-trichloro-1,2,2-trifluoroethane	µg/L	~	~	20000	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30 F1	<0.30	<0.30	<0.30
1,1,2-trichloroethane	µg/L	500	2097	3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1-dichloroethane	µg/L	410	2692	50	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,1-dichloroethylene	µg/L	65	3.2	1	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30 F1	<0.30	<0.30	<0.30
1,2,3-trichlorobenzene	µg/L	8	5	~	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
1,2,4-trichlorobenzene	µg/L	30	5.4	9	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,2-dibromo-3-chloropropane	µg/L	~	~	0.02	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,2-dibromoethane	µg/L	~	~	0.03	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
1,2-dichlorobenzene	µg/L	14	42	600	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	4.3 J	<0.20	<0.20	<0.20	<0.20
1,2-dichloroethane	µg/L	910	5650	2	<0.30	<0.30	0.65 J	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,2-dichloropropane	µg/L	360	1064	1	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,3-dichlorobenzene	µg/L	38	390	600	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
1,4-dichlorobenzene	µg/L	9.4	115	75	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
2-butanone	µg/L	22000	65695	300	<0.50	1.9 J	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
2-hexanone	µg/L	99	16871	40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40	<0.40
4-methyl-2-pentanone	µg/L	170	19142	~	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
acetone	µg/L	1700	117629	6000	0.70 J	2.3 J	<0.70	<0.70	<0.70	<0.70	5.0 J	<0.70	1.8 J	<0.70	3.3 J
Benzene	µg/L	114	110	1	0.51 J	3.4	4.3	<0.30	<0.30	<0.30	210	<0.30	0.85 J	<0.30	<0.30
bromochloromethane	µg/L	~	~	~	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
bromodichloromethane	µg/L	340	3510	1	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
bromoform	µg/L	230	360	4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
bromomethane	µg/L	16	265	10	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
carbon disulfide	µg/L	15	253	700	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30 F1	<0.30	<0.30	<0.30
carbon tetrachloride	µg/L	240	4.4	1	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
chlorobenzene	µg/L	47	25	50	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
chloroethane	µg/L	~	~	5	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.35 J
chloroform	µg/L	140	471	70	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
chloromethane	µg/L	~	~	30	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cis-1,2-dichloroethylene	µg/L	620	1629	70	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
cis-1,3-dichloropropene	µg/L	~	~	1	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
cyclohexane	µg/L	158	158	~	4.8 J	<1.0	<1.0	<1.0	<1.0	<1.0	820	1.3 J F1	13	<1.0	<1.0
dibromochloromethane	µg/L	320	34	1	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

TABLE 5.2-2
VOLATILE ORGANIC COMPOUNDS IN GROUND WATER
IAOC A9 - CONSERVATION AREA

EXXONMOBIL ENVIRONMENTAL AND PROPERTY SOLUTIONS COMPANY / BAYWAY REFINERY COMPLEX
LINDEN, NEW JERSEY

Location ID		BW SW CRITERIA FRESH	BW SW CRITERIA SALINE	NJDEP CLASS II-A GWRS	A9 Extraction	APZ-122	APZ-123	DAM2-MW-1	DAM2-MW-2	GMW-120	GMW-124	GMW-135	GMW-283	GMW-305	GMW-657
Date					03/16/2022	03/22/2022	03/25/2022	03/22/2022	03/22/2022	03/18/2022	03/21/2022	03/21/2022	03/21/2022	04/05/2022	03/18/2022
Chemical	Units														
dichlorodifluoromethane	µg/L	~	~	1000	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
isopropyl ether	µg/L	~	~	20000	9.2 T J N	NA	27 T J N	NA	NA	NA	NA	NA	96 T J N	NA	NA
ethylbenzene	µg/L	14	25	700	<0.40	2.4	<0.40	<0.40	<0.40	<0.40	260	<0.40	<0.40	<0.40	<0.40
isopropylbenzene	µg/L	4.8	98	700	1.4 J	0.65 J	<0.20	<0.20	<0.20	6.9	110	0.28 J	1.6 J	0.68 J	<0.20
m,p-Xylene	µg/L	~	~	~	<2.0	12	<2.0	<2.0	<2.0	<2.0	33	<2.0	<2.0	<2.0	<2.0
methyl acetate	µg/L	~	~	7000	<0.30	<0.30 *+	<0.30	<0.30 *+	<0.30 *+	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
methyl cyclohexane	µg/L	52	52	~	2.2 J	1.6 J	<0.50	<0.50	<0.50	<0.50	400	<0.50 F1	18	<0.50	<0.50
methyl tert-butyl ether	µg/L	51000	18000	70	0.42 J	0.41 J	2.9	1.1	6.4	4.1	<0.20	<0.20	3.4	1.4	<0.20
methylene chloride	µg/L	940	1580	3	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	0.75 J	<0.30	<0.30	<0.30	<0.30
naphthalene	µg/L	13	1.4	300	<0.10	<0.10	0.17 J	<0.10	<0.10	<0.11	95	<0.10	<0.10	<0.10	<0.10
o-xylene	µg/L	~	~	~	2.9	7.5	<0.40	<0.40	<0.40	<0.40	3.4	<0.40	<0.40	<0.40	<0.40
styrene	µg/L	32	412	100	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
tetrachloroethylene	µg/L	45	8.85	1	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
toluene	µg/L	253	215	600	0.46 J	2.8	1.1	<0.20	<0.20	<0.20	22	<0.20	0.59 J	<0.20	<0.20
trans-1,2-dichloroethylene	µg/L	970	1629	100	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trans-1,3-dichloropropene	µg/L	~	~	1	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
trichloroethylene	µg/L	47	81	1	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30	<0.30
trichlorofluoromethane	µg/L	~	~	2000	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
vinyl chloride	µg/L	930	2276	1	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
xylenes, total	µg/L	27	260	1000	2.9	20	<0.40	<0.40	<0.40	<0.40	36	<0.40	<0.40	<0.40	<0.40
Total TICs	µg/L	~	~	500	27.8	413	39	0	75.5	221.1	2723	0	466	0	0

Notes:

BW SW CRITERIA FRESH	Bayway Surface Water Criteria Standards - Fresh
BW SW CRITERIA SALINE	Bayway Surface Water Criteria Standards - Saline
NJDEP GWRS	New Jersey Department of Environmental Protection Class II-A Ground Water Remediation Standards
Blue Well ID	Analytical results are compared to the NJDEP GWRS and Saline SW Criteria
Green Well ID	Analytical results are compared to the NJDEP GWRS and Fresh SW Criteria
Gray Well ID	Analytical results are compared to the NJDEP GWRS only
µg/L	Micrograms per liter
~	A NJDEP Class II-A GWRS does not exist for this analyte
<5.0	Not detected at or above the method detection limit, method detection limit included
*-	Laboratory Control Sample (LCS) and/or Laboratory Control Sample Duplicate (LSCD) is outside of acceptance limits, low biased
*+	Laboratory Control Sample (LCS) and/or Laboratory Control Sample Duplicate (LSCD) is outside of acceptance limits, high biased
F1	Matrix Spike (MS) and/or Matrix Spike Duplicate (MSD) recovery exceeds control limits
T	Result is a tentaively identified compound (TIC) and an estimated value
J	Indicates an estimated value
N	Presumptive evidence of an analyte
TICs	Tentatively identified compounds
Gray Shading	Indicates a concentration above the NJDEP Class II-A GWRS

TABLE 5.2-3
SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUND WATER
IAOC A9 - CONSERVATION AREA

EXXONMOBIL ENVIRONMENTAL AND PROPERTY SOLUTIONS COMPANY / BAYWAY REFINERY COMPLEX
LINDEN, NEW JERSEY

	Location ID	BW SW CRITERIA FRESH	BW SW CRITERIA SALINE	NJDEP CLASS II-A GWRS	A9 Extraction	APZ-122	APZ-123	DAM2-MW-1	DAM2-MW-2	GMW-120	GMW-124	GMW-135	GMW-283	GMW-305	GMW-657
	Date				03/16/2022	03/22/2022	03/25/2022	03/22/2022	03/22/2022	03/18/2022	03/21/2022	03/21/2022	03/21/2022	04/05/2022	03/18/2022
Chemical	Units														
1,1'-Biphenyl	µg/L	6.5	49	400	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
1,2,4,5-Tetrachlorobenzene	µg/L	3	6	~	<0.50 *-	<0.52	<0.51 *-	<0.51	<0.50	<0.53	<0.50 *-	<0.50 *-	<0.50 *-	<0.52 *-	<0.50
1,4-Dioxane	µg/L	22000	200733	0.4	0.29 J B	0.16 J	0.48	0.27 J	1	<0.11	0.43	<0.10	0.58	0.42 B	<0.10
2,3,4,6-Tetrachlorophenol	µg/L	1	32	200	<1.0	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0	<1.0
2,4,5-trichlorophenol	µg/L	1.9	12	700	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
2,4,6-trichlorophenol	µg/L	4.9	6.5	~	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
2,4-dichlorophenol	µg/L	11	790	20	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
2,4-dimethylphenol	µg/L	100	193	100	<3.0	<3.1	<3.0	<3.0	<3.0	<3.2	<3.0	<3.0	<3.0	<3.1	<3.0
2,4-dinitrophenol	µg/L	19	14	40	<14	<15	<14	<14	<14	<15	<14	<14	<14	<15	<14
2,4-dinitrotoluene	µg/L	44	9.1	10	<1.0	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0	<1.0
2,6-dinitrotoluene	µg/L	81	36	10	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
2-chloronaphthalene	µg/L	0.396	~	600	<0.40	<0.42	<0.40	<0.41	<0.40	<0.42	<0.40	<0.40	<0.40	<0.42	<0.40
2-chlorophenol	µg/L	24	400	40	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
2-Methylnaphthalene	µg/L	330	52	30	<0.10	<0.10	<0.10	<0.10	<0.10	<0.11	30	<0.10	<0.10	<0.10	<0.10
2-Methylphenol	µg/L	67	995	50	<0.50	<0.52	<0.51	4.1	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
2-nitroaniline	µg/L	17	17	~	<1.0	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0	<1.0
2-nitrophenol	µg/L	73	900	~	<1.0	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0	<1.0
3,3-dichlorobenzidine	µg/L	4.5	13	30	<4.0	<4.2 *-	<4.0	<4.1 *- F1	<4.0 *-	<4.2	<4.0	<4.0	<4.0	<4.2	<4.0
3-nitroaniline	µg/L	~	~	~	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0
4,6-dinitro-2-methylphenol	µg/L	~	~	0.7	<8.0	<8.4	<8.1	<8.1	<8.1	<8.5	<8.0	<8.0	<8.0	<8.4	<8.0
4-bromophenyl phenyl ether	µg/L	1.5	2	~	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
4-chloro-3-methylphenol	µg/L	1	241	100	<1.0	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0	<1.0
4-chloroaniline	µg/L	0.8	0.8	30	<4.0	<4.2	<4.0	<4.1	<4.0	<4.2	<4.0	<4.0	<4.0	<4.2	<4.0
4-chlorophenyl phenyl ether	µg/L	~	~	~	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
4-Methylphenol	µg/L	53	405	~	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
4-nitroaniline	µg/L	~	~	~	<0.91	<0.94	<0.91	<0.91	<0.91	<0.96	<0.91	<0.90	<0.90	<0.94	<0.90
4-nitrophenol	µg/L	60	600	~	<10	<10	<10	<10	<10	<11	<10	<10	<10	<10	<10
Acenaphthene	µg/L	38	15	400	0.11 J	<0.10	<0.10	<0.10	<0.10	<0.11	2.2	<0.10	<0.10	<0.10	<0.10
Acenaphthylene	µg/L	4840	28	100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.11	<0.10	<0.10	<0.10	<0.10	<0.10
Acetophenone	µg/L	~	~	700	<1.0	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0	<1.0
Anthracene	µg/L	0.035	0.43	2000	<0.10	<0.10	<0.10	<0.10	<0.10	<0.11	<0.10	<0.10	<0.10	<0.10	<0.10
Atrazine	µg/L	0.03	~	3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0	<1.0
Benzaldehyde	µg/L	143	143	~	<1.0	<1.0	<1.0 *-	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0 *-	<1.0
benzo[a]anthracene	µg/L	0.025	0.35	0.1	<0.010	0.11	<0.010	<0.010	<0.010	<0.011	<0.010	<0.010	<0.010	<0.010	<0.010
benzo[a]pyrene	µg/L	0.014	0.02	0.1	0.013 J	0.11	<0.010	<0.010 F1	<0.010	<0.011	<0.010	<0.010	<0.010	<0.010	0.013 J
benzo[b]fluoranthene	µg/L	9.07	0.06	0.2	0.013 J	**0.087**	<0.010	<0.010 F1	<0.010	<0.011	<0.010	<0.010	<0.010	<0.010	0.032 J
benzo[g,h,i]perylene	µg/L	7.64	0.012	100	<0.10	<0.10	<0.10	<0.10	<0.10	<0.11	<0.10	<0.10	<0.10	<0.10	<0.10
benzo[k]fluoranthene	µg/L	0.06	0.06	0.5	<0.010	0.016 J	<0.010	<0.010	<0.010	<0.011	<0.010	<0.010	<0.010	<0.010	<0.010

TABLE 5.2-3
SEMI-VOLATILE ORGANIC COMPOUNDS IN GROUND WATER
IAOC A9 - CONSERVATION AREA

EXXONMOBIL ENVIRONMENTAL AND PROPERTY SOLUTIONS COMPANY / BAYWAY REFINERY COMPLEX
LINDEN, NEW JERSEY

	Location ID	BW SW CRITERIA FRESH	BW SW CRITERIA SALINE	NJDEP CLASS II-A GWRS	A9 Extraction	APZ-122	APZ-123	DAM2-MW-1	DAM2-MW-2	GMW-120	GMW-124	GMW-135	GMW-283	GMW-305	GMW-657
	Date				03/16/2022	03/22/2022	03/25/2022	03/22/2022	03/22/2022	03/18/2022	03/21/2022	03/21/2022	03/21/2022	04/05/2022	03/18/2022
Chemical	**Units**														
Bis(2-chloro-1-methylethyl) ether	µg/L	~	~	300	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52 *-	<0.50
bis(2-chloroethoxy) methane	µg/L	~	~	~	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
bis(2-chloroethyl) ether	µg/L	1900	~	7	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
bis(2-ethylhexyl) phthalate	µg/L	0.3	6	3	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0
butyl benzyl phthalate	µg/L	23	18	100	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0
Caprolactam	µg/L	~	~	4000	<3.0 *-	<3.1 *-	<3.0 *-	<3.0 *- F1 F2	<3.0 *-	<3.2 *-	<3.0 *-	<3.0 *-	<3.0 *-	<3.1 *-	<3.0 *-
Carbazole	µg/L	4	112	~	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	2.4	<0.50	<0.50	<0.52	<0.50
Chrysene	µg/L	4.7	0.35	5	<0.10	<0.10	<0.10	<0.10	<0.10	<0.11	<0.10	<0.10	<0.10	<0.10	<0.10
dibenz[a,h]anthracene	µg/L	0.012	0.01	0.3	<0.020 *-	**0.037 J *-**	<0.020	<0.020 F1 *-	<0.020 *-	<0.021	<0.020	<0.020	<0.020	<0.021	<0.020
Dibenzofuran	µg/L	4	61	~	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	1.0 J	<0.50	<0.50	<0.52	<0.50
diethyl phthalate	µg/L	110	59	6000	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0
dimethyl phthalate	µg/L	1100	3295	100	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0
di-n-butyl phthalate	µg/L	9.7	27	700	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0	<2.0	<2.0	<2.1	<2.0
di-n-octyl phthalate	µg/L	215	215	100	<5.0	<5.2	<5.1	<5.1	<5.0	<5.3	<5.0	<5.0	<5.0	<5.2	<5.0
Fluoranthene	µg/L	1.9	0.82	300	<0.10	<0.10	<0.10	<0.10	<0.10	<0.11	<0.10	<0.10	<0.10	<0.10	<0.10
Fluorene	µg/L	19	24	300	<0.12	0.57	<0.12	<0.12	<0.12	<0.13	2	<0.12	<0.12	<0.13	<0.12
hexachlorobenzene	µg/L	0.0003	0.15	0.02	<0.020 *-	<0.021	<0.020 *-	<0.020	<0.020	<0.021 *-	<0.020 *-	<0.020 *-	<0.020 *-	<0.021 *-	<0.020 *-
hexachlorobutadiene	µg/L	0.053	0.3	1	<0.50 *-	<0.52 *-	<0.51 *-	<0.51 *- F1	<0.50 *-	<0.53 *-	<0.50 *-	<0.50 *-	<0.50 *-	<0.52 *-	<0.50 *-
hexachlorocyclopentadiene	µg/L	77	0.07	40	<5.0	<5.2	<5.1	<5.1	<5.0	<5.3	<5.0	<5.0	<5.0	<5.2	<5.0
hexachloroethane	µg/L	8	33	7	<0.50 *-	<0.52 *-	<0.51 *-	<0.51 *- F1	<0.50 *-	<0.53 *-	<0.50 *-	<0.50 *-	<0.50 *-	<0.52 *-	<0.50 *-
indeno[1,2,3-c,d]pyrene	µg/L	4.31	0.012	0.2	<0.020	**0.030 J *-**	<0.020	<0.020 F1 *-	<0.020 *-	<0.021	<0.020	<0.020	<0.020	<0.021	<0.020
isophorone	µg/L	920	996	40	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
Naphthalene (extractable)	µg/L	13	1.4	300	<0.10	<0.10	0.17 J	<0.10	<0.10	<0.11	95	<0.10	<0.10	<0.10	<0.10
nitrobenzene	µg/L	220	1046	6	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
n-nitrosodi-n-propylamine	µg/L	~	~	10	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
n-nitrosodiphenylamine	µg/L	25	48	10	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
Pentachlorophenol	µg/L	15	7.9	0.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.1	<1.0	<1.0	<1.0	<1.0	<1.0
Phenanthrene	µg/L	3.6	4.6	100	<0.11	<0.12	<0.11	<0.11	<0.11	<0.12	1.5	<0.11	<0.11	<0.12	<0.11
phenol	µg/L	180	58	2000	<0.50	<0.52	<0.51	<0.51	<0.50	<0.53	<0.50	<0.50	<0.50	<0.52	<0.50
Pyrene	µg/L	0.3	0.11	200	0.15 J	<0.10	<0.10	<0.10	<0.10	<0.11	<0.10	<0.10	<0.10	<0.10	<0.10
Total TICs, Semi_volatile	µg/L	~	~	500	0	659	175.1	120.1	3149	140.9	1104	123.2	132.9	15.1	30.7

Notes:

BW SW CRITERIA FRESH	Bayway Surface Water Criteria Standards - Fresh
BW SW CRITERIA SALINE	Bayway Surface Water Criteria Standards - Saline
NJDEP GWRS	New Jersey Department of Environmental Protection Class II-A Ground Water Remediation Standards
Blue Well ID	Analytical results are compared to the NJDEP GWRS and Saline SW Criteria
Green Well ID	Analytical results are compared to the NJDEP GWRS and Fresh SW Criteria
Gray Well ID	Analytical results are compared to the NJDEP GWRS only
µg/L	Micrograms per liter
~	A NJDEP Class II-A GWRS does not exist for this analyte
<5.0	Not detected at or above the method detection limit, method detection limit included
*-	Laboratory Control Sample (LCS) and/or Laboratory Control Sample Duplicate (LSCD) is outside of acceptance limits, low biased
*3	International Standard (ISTD) response or retention time outside acceptable limits
J	Indicates an estimated value
TICs	Tentatively identified compounds
Gray Shading	Indicates a concentration above the NJDEP Class II-A GWRS
Bold	Indicates a concentration above the applicable SW Criteria

TABLE 5.2-4
METALS IN GROUND WATER
IAOC A9 - CONSERVATION AREA

EXXONMOBIL ENVIRONMENTAL AND PROPERTY SOLUTIONS COMPANY / BAYWAY REFINERY COMPLEX
LINDEN, NEW JERSEY

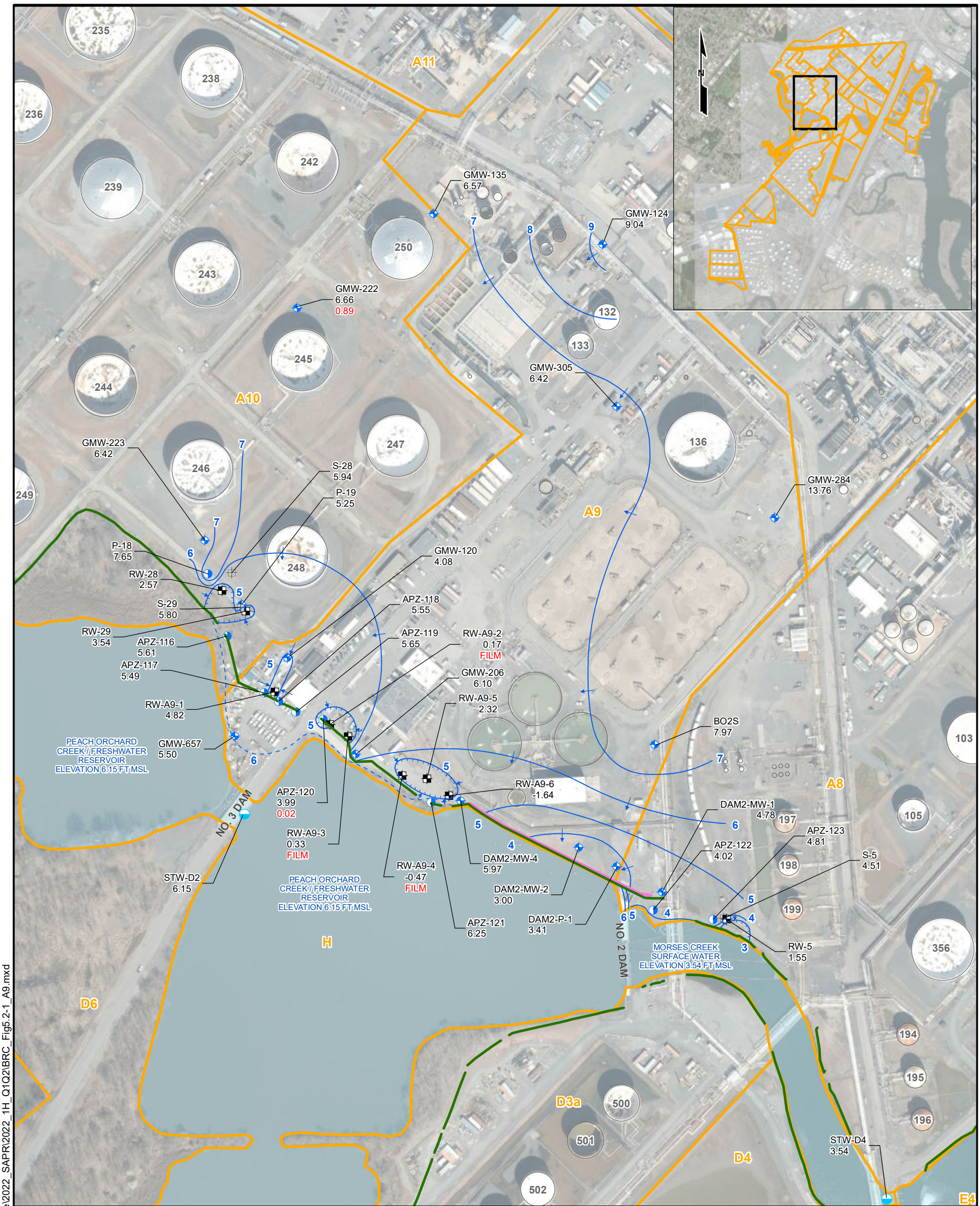
Location ID		BW SW CRITERIA FRESH	BW SW CRITERIA SALINE	NJDEP CLASS II-A GWRS	A9 Extraction	APZ-122		APZ-123		DAM2-MW-1		DAM2-MW-2	GMW-120	GMW-124	GMW-135	GMW-283	GMW-305	GMW-657	
Date					03/16/2022	03/22/2022	03/22/2022 (F)	03/25/2022	03/25/2022 (F)	03/22/2022	03/22/2022 (F)	03/22/2022	3/18/2022	03/21/2022	03/21/2022	03/21/2022	04/05/2022	03/18/2022	03/18/2022 (F)
Chemical	Units																		
aluminum	µg/L	87	1500	200	NA	**6900**	39	290	<12	100	16 J	NA	21 J	NA	NA	NA	NA	**3900**	49
antimony	µg/L	80	4300	6	NA	1.6	0.46 J	<0.20	<0.20	0.39 J	0.30 J	NA	<1.0	NA	NA	NA	NA	0.37 J	0.24 J
arsenic	µg/L	150	36	3	3.5	3.8	1.8 J	<0.68	<0.68	<0.68	<0.68	1.4 J	26	0.89 J	12	<0.68	1.1 J	4.8	3.3
barium	µg/L	220	4	6000	NA	**140**	**110**	**220**	**200**	**140**	**140**	NA	300	NA	NA	NA	NA	65	48
beryllium	µg/L	3.6	0.13	1	NA	**0.30 J**	<0.12	<0.12	<0.12	<0.12	<0.12	NA	<0.5	NA	NA	NA	NA	0.12 J	<0.12
cadmium	µg/L	0.45	8.8	4	NA	0.27 J	<0.15	<0.15	<0.15	<0.15	<0.15	NA	<0.5	NA	NA	NA	NA	<0.15	<0.16
calcium	µg/L	116000	~	~	NA	68000 ^3+	69000	150000	130000	97000 ^3+ F2	110000	NA	47000 B	NA	NA	NA	NA	71000 B	69000
chromium	µg/L	42	~	70	NA	13	0.50 J	1.1 J	0.34 J	0.80 J	<0.33	NA	0.43 J	NA	NA	NA	NA	9.6	0.42 J
cobalt	µg/L	24	~	100	NA	4.4	1.1	0.41 J	<0.16	0.30 J	0.23 J	NA	0.41 J	NA	NA	NA	NA	4.5	0.39 J
copper	µg/L	4.95	5.6	1300	NA	**26 ^5-**	0.61 J	**45**	<0.36	**14 ^5-**	<0.36	NA	<1.0	NA	NA	NA	NA	**27**	0.62 J
iron	µg/L	1000	300	300	NA	**16000**	**7600**	**550**	26 J	**5500 F1**	**1400**	NA	21000	NA	NA	NA	NA	**9100**	**2300**
lead	µg/L	5.4	24	5	1.4	**32**	0.35 J	10	<0.071	4.3	0.19 J	0.82	0.27 J	0.87	2.6	<0.071	1.3	**11**	0.19 J
magnesium	µg/L	82000	~	~	NA	87000	88000	81000	66000 ^5-	79000	83000	NA	27000 B	NA	NA	NA	NA	21000 B	18000
manganese	µg/L	93	100	50	NA	**2400**	**2300**	**2600**	**2400 B**	**420**	**430**	NA	580	NA	NA	NA	NA	50	**420 B**
mercury	µg/L	0.77	0.94	2	NA	0.27	0.14 J	0.12 J	0.11 J	0.22	0.13 J	NA	0.089 J	NA	NA	NA	NA	0.18 J	NA
nickel	µg/L	28.9	22	100	NA	15 ^5-	3.1 ^5-	4.6 ^5-	1.3 ^5-	3.2 ^5-	1.4	NA	<1.0	NA	NA	NA	NA	11	1.8
potassium	µg/L	53000	~	~	NA	34000	34000	17000	16000	29000	29000	NA	6600	NA	NA	NA	NA	5300	4800
selenium	µg/L	5	71	40	NA	0.49 J	0.28 J	<0.28	<0.28	<0.28 F1	<0.28	NA	<1.0	NA	NA	NA	NA	<0.28	<0.29
silver	µg/L	0.12	0.1	40	NA	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	NA	<0.5	NA	NA	NA	NA	<0.10	<0.10
sodium	µg/L	680000	~	50000	NA	880000	800000	400000	330000 ^5- ^6-	550000 F2	610000	NA	13000 B	NA	NA	NA	NA	59000 B	540000
thallium	µg/L	10	6.3	2	NA	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	NA	<0.5	NA	NA	NA	NA	<0.13	<0.13
vanadium	µg/L	12	~	~	NA	23	6.7	3.6 J	1.8 J	2.8 J	2.0 J	NA	1.3 J	NA	NA	NA	NA	11	<0.82
zinc	µg/L	66	81	2000	NA	58 ^5-	<4.0	21	<4.0	21 ^5-	<4.0	NA	<10	NA	NA	NA	NA	**93 B**	<4.1 ^3+

Notes:

BW SW CRITERIA FRESH	Bayway Surface Water Criteria Standards - Fresh
BW SW CRITERIA SALINE	Bayway Surface Water Criteria Standards - Saline
NJDEP GWRS	New Jersey Department of Environmental Protection Class II-A Ground Water Remediation Standards
Blue Well ID	Analytical results are compared to the NJDEP GWRS and Saline SW Criteria
Green Well ID	Analytical results are compared to the NJDEP GWRS and Fresh SW Criteria
Gray Well ID	Analytical results are compared to the NJDEP GWRS only
µg/L	Micrograms per liter
~	A NJDEP Class II-A GWRS does not exist for this analyte
<5.0	Not detected at or above the method detection limit, method detection limit included
(F)	Sample was filtered in the field
^3+	Reporting Limit Check Standard is outside acceptance limits, high biased
^5-	Linear Range Check (LRC) is outside acceptance limits, low biased
^6-	
J	Indicates an estimated value
Gray Shading	Indicates a concentration above the NJ Class II-A GWRS
Bold	Indicates a concentration above the applicable SW Criteria

Aluminum, iron, manganese, and sodium are naturally occurring and represent background ground water conditions at the site.
These metals are included in the table for informational purposes only.

Figures



REFERENCES

1. MAP AND WATER BODY LIMITS DERIVED FROM FIGURE ENTITLED "WETLAND DELINEATION SURVEY, BAYWAY REFINERY, CITY OF LINDEN, UNION COUNTY, NEW JERSEY", PREPARED BY KELLER & KIRKPATRICK INC., DATED 9-3-15, LAST UPDATED 9-21-16.
2. BASE MAP TOPOGRAPHIC FEATURES TAKEN FROM A MAP PREPARED BY ATLANTIS AERIAL SURVEY CO., INC. FROM PHOTOGRAPHY DATED OCTOBER 3, 2003.

   HORIZONTAL DATUM: NAVD 1983
   VERTICAL DATUM: NGVD 1929
   DISTANCE MEASUREMENTS ARE EXPRESSED IN U.S. FEET
3. PROPERTY BOUNDARY DERIVED FROM METES AND BOUNDS TAKEN FROM SURVEY, PREPARED BY KELLER & KIRKPATRICK INC., DATED 3-1-93, LAST UPDATED 4-5-93.
4. MEAN HIGH WATER LINE (ELEVATION = 3.44 FT MSL) DERIVED FROM TOPOGRAPHIC SURVEY, PREPARED BY KELLER & KIRKPATRICK INC., DATED 7-22-16, LAST UPDATED 11-02-17.

NOTES

1. SURFACE WATER LIMITS ARE SUBJECT TO SEASONAL AND TIDAL VARIATIONS.
2. IAOC DESIGNATION "H" INCLUDES SURFACE WATER BODIES WITHIN THE REFINERY UP TO THE CONFLUENCE OF THE ARTHUR KILL. THE ARTHUR KILL AND PILES CREEK ARE NOT INCLUDED AS AN IAOC.
3. IAOC BOUNDARY DESIGNATION LINES ABUTTING THE PROPERTY BOUNDARY SHALL BE CONSIDERED SYNONYMOUS WITH THE PROPERTY BOUNDARY.
4. LNAPL THICKNESS IS ONLY SHOWN FOR WELLS WHERE IT WAS DETECTED.
5. THE GCT, A9, NO.2 DAM, AND GBT GROUND WATER EXTRACTION SYSTEMS WERE OPERATING DURING THE GAUGING EVENT.
6. WELLS THAT ARE NOT INCLUDED IN THE GAUGING EVENT ARE NOT DEPICTED FOR CLARITY.
7. THE GROUND WATER ELEVATION DATA FOR MONITORING WELL GMW-284 APPEARS TO HAVE BEEN AFFECTED BY AN OBSTRUCTION IN THE WELL. THE DATA WAS NOT USED TO GENERATE CONTOURS.

APZ-120	WELL ID
3.99	CORRECTED GROUND WATER/SURFACE WATER ELEVATION (FT MSL)
0.02	MEASURED THICKNESS OF LNAPL IN WELL (FT)
FILM	LNAPL THICKNESS LESS THAN 0.01 FT
IAOC	INVESTIGATIVE AREA OF CONCERN
FT MSL	FEET MEAN SEA LEVEL

LEGEND

- SUBSURFACE BARRIER WALL
- RECOVERY TRENCH
- INFERRED GROUND WATER FLOW DIRECTION
- GROUND WATER ELEVATION CONTOUR (1 FOOT)
- DEPRESSION CONTOUR
- INFERRED GROUND WATER CONTOUR
- MONITORING WELL LOCATION
- PIEZOMETER LOCATION
- RECOVERY SUMP LOCATION
- RECOVERY WELL LOCATION
- STILLING WELL LOCATION
- TANK
- IAOC BOUNDARY
- OPEN WATER

225 112.5 0 225 Feet

1 inch = 225 feet

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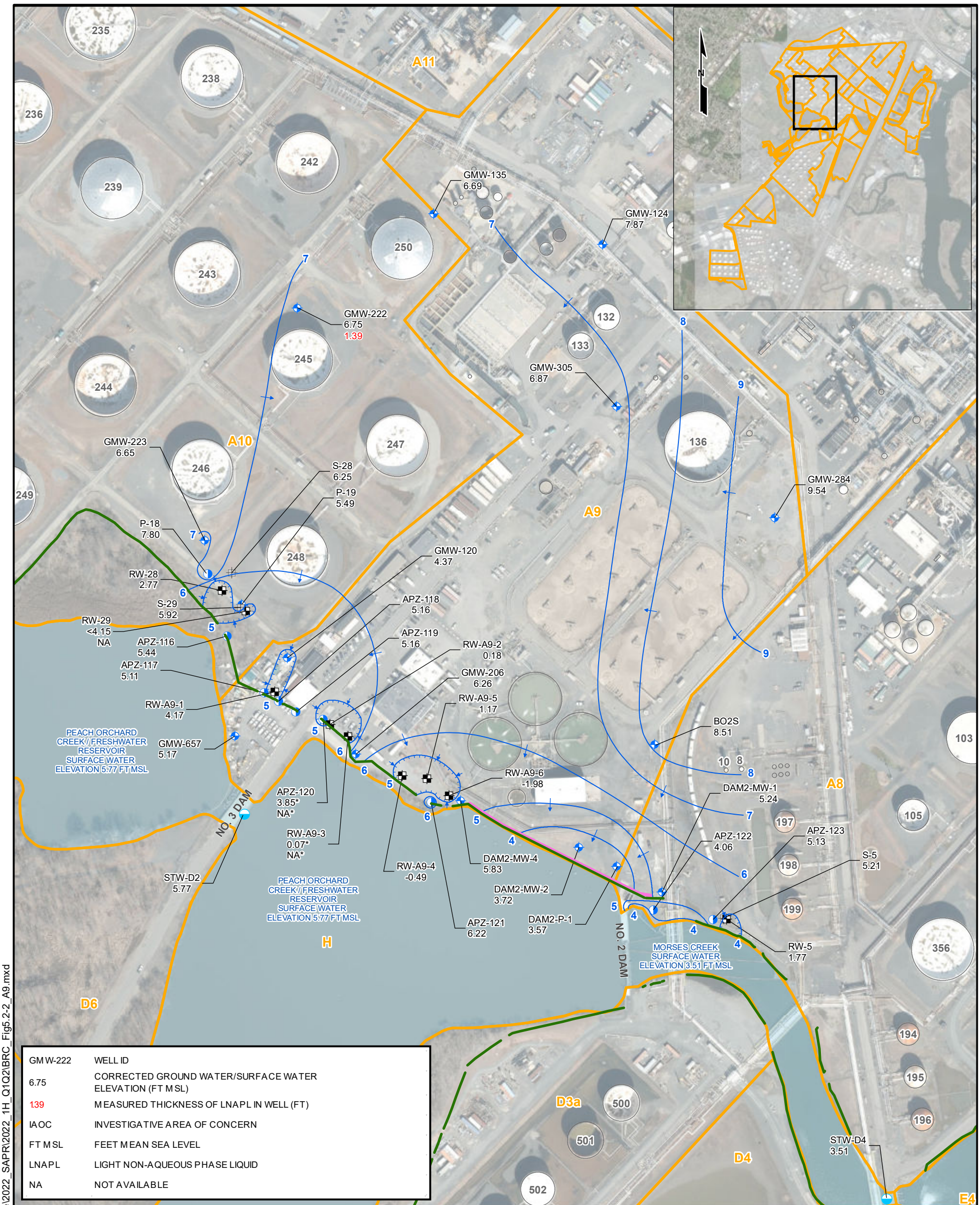
PROJECT NO.	20223959
DRAWN:	9/20/2022
DRAWN BY:	B. PACCIONE
CHECKED BY:	T. DMYTROW
FILE NAME:	BRC_Fig5.2-1_A9.mxd

CONSERVATION AREA GROUND WATER ELEVATION CONTOUR MAP
MARCH 11, 2022

BAYWAY REFINERY COMPLEX
LINDEN, NEW JERSEY
SEMIANNUAL PROGRESS REPORT
JANUARY THRU JUNE 2022

FIGURE
5.2-1

\\azrgisstorp01\GIS_Projects\Client\ExxonMobil\NJ_BRC\MXD_SiteWide\2022_SAPR\2022_1H_Q1Q2\BRC_Fig5.2-1_A9.mxd



GMW-222	WELL ID
6.75	CORRECTED GROUND WATER/SURFACE WATER ELEVATION (FT MSL)
1.39	MEASURED THICKNESS OF LNAPL IN WELL (FT)
IAOC	INVESTIGATIVE AREA OF CONCERN
FT MSL	FEET MEAN SEA LEVEL
LNAPL	LIGHT NON-AQUEOUS PHASE LIQUID
NA	NOT AVAILABLE

REFERENCES

1. MAP AND WATER BODY LIMITS DERIVED FROM FIGURE ENTITLED "WETLAND DELINEATION SURVEY, BAYWAY REFINERY, CITY OF LINDEN, UNION COUNTY, NEW JERSEY", PREPARED BY KELLER & KIRKPATRICK INC., DATED 9-3-15, LAST UPDATED 9-21-16.
2. BASE MAP TOPOGRAPHIC FEATURES TAKEN FROM A MAP PREPARED BY ATLANTIS AERIAL SURVEY CO., INC. FROM PHOTOGRAPHY DATED OCTOBER 3, 2003.
   HORIZONTAL DATUM: NAVD 1983
   VERTICAL DATUM: NGVD 1929
   DISTANCE MEASUREMENTS ARE EXPRESSED IN U.S. FEET
3. PROPERTY BOUNDARY DERIVED FROM METES AND BOUNDS TAKEN FROM SURVEY, PREPARED BY KELLER & KIRKPATRICK INC., DATED 3-1-93, LAST UPDATED 4-5-93.
4. MEAN HIGH WATER LINE (ELEVATION = 3.44 FT MSL) DERIVED FROM TOPOGRAPHIC SURVEY, PREPARED BY KELLER & KIRKPATRICK INC., DATED 7-22-16, LAST UPDATED 11-02-17.

NOTES

1. SURFACE WATER LIMITS ARE SUBJECT TO SEASONAL AND TIDAL VARIATIONS.
2. IAOC DESIGNATION "H" INCLUDES SURFACE WATER BODIES WITHIN THE REFINERY UP TO THE CONFLUENCE OF THE ARTHUR KILL. THE ARTHUR KILL AND PILES CREEK ARE NOT INCLUDED AS AN IAOC.
3. IAOC BOUNDARY DESIGNATION LINES ABUTTING THE PROPERTY BOUNDARY SHALL BE CONSIDERED SYNONYMOUS WITH THE PROPERTY BOUNDARY.
4. LNAPL THICKNESS IS ONLY SHOWN FOR WELLS WHERE IT WAS DETECTED.
5. THE GCT, A9, NO.2 DAM, AND GBT GROUND WATER EXTRACTION SYSTEMS WERE OPERATING DURING GAUGING.
6. WELLS THAT ARE NOT INCLUDED IN THE GAUGING EVENT ARE NOT DEPICTED FOR CLARITY.
7. * = UNABLE TO DETERMINE DEPTH TO WATER AND LNAPL THICKNESS DUE TO LNAPL VISCOSITY. CORRECTED GROUND WATER ELEVATION IS APPROXIMATE, WITH THE ACTUAL ELEVATION LOWER THAN OR EQUAL TO THE ELEVATION SHOWN
8. < = GROUND WATER ELEVATION IS LOWER THAN THE ELEVATION DEPICTED, WHICH WAS CALCULATED USING THE DEPTH TO TOP OF PUMP MEASURED DURING THE EVENT; ACTUAL DEPTH TO LNAPL AND/OR GROUNDWATER WAS UNABLE TO BE MEASURED DUE TO THE LIMITED CLEARANCE BETWEEN WELL CASING/SCREEN AND THE RECOVERY PUMP.
9. ADDITIONAL MONITORING WELLS IN GBT WERE GAUGED ON 4/22/22 AND USED TO DEFINE THE EXTENT OF CONTOURS.

LEGEND

- SUBSURFACE BARRIER WALL
- RECOVERY TRENCH
- INFERRED GROUND WATER FLOW DIRECTION
- GROUND WATER ELEVATION CONTOUR (1 FOOT)
- DEPRESSION CONTOUR
- MONITORING WELL LOCATION
- PIEZOMETER LOCATION
- RECOVERY SUMP LOCATION
- RECOVERY WELL LOCATION
- STILLING WELL LOCATION
- TANK
- IAOC BOUNDARY
- OPEN WATER

225 112.5 0 225 Feet

1 inch = 225 feet

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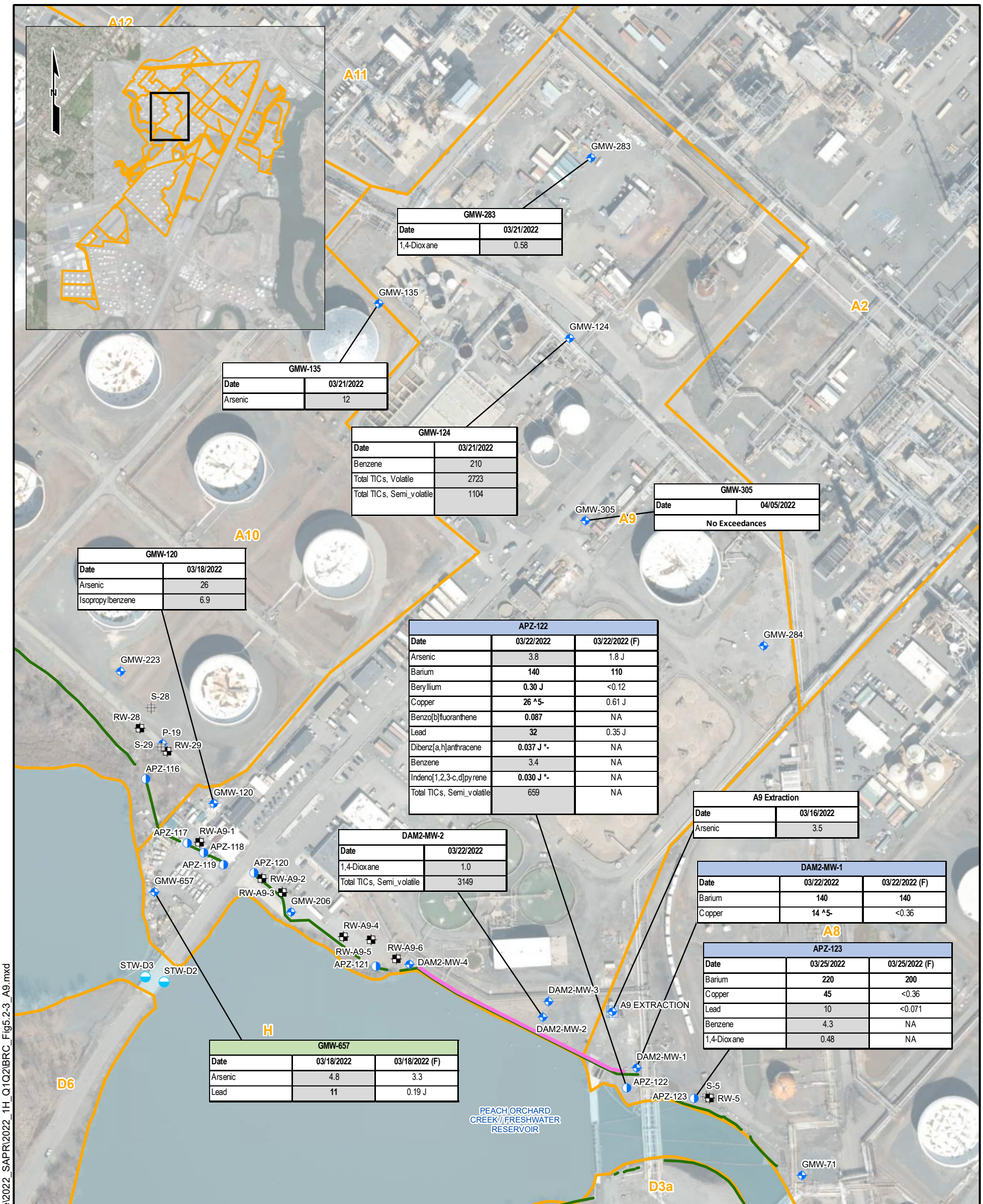
DRAWN BY:	B. PACCIONE
CHECKED BY:	T. DMYTROW
FILE NAME:	BRC_Fig5.2-2_A9.mxd

CONSERVATION AREA GROUND WATER ELEVATION CONTOUR MAP
APRIL 22, 2022

BAYWAY REFINERY COMPLEX
LINDEN, NEW JERSEY
SEMIANNUAL PROGRESS REPORT
JANUARY THRU JUNE 2022

FIGURE
5.2-2

\\azrgisstorp01\GIS_Projects\Client\ExxonMobil\NJ_BRC\MXD_SiteWide\2022_SAPR\2022_1H_Q1Q2\BRC_Fig5.2-2_A9.mxd



GMW-283	
Date	03/21/2022
1,4-Dioxane	0.58

GMW-135	
Date	03/21/2022
Arsenic	12

GMW-124	
Date	03/21/2022
Benzene	210
Total TICs, Volatile	2723
Total TICs, Semi_volatile	1104

GMW-305	
Date	04/05/2022
No Exceedances	

GMW-120	
Date	03/18/2022
Arsenic	26
Isopropylbenzene	6.9

APZ-122		
Date	03/22/2022	03/22/2022 (F)
Arsenic	3.8	1.8 J
Barium	**140**	**110**
Beryllium	**0.30 J**	<0.12
Copper	**26 ^5-**	0.61 J
Benzo[b]fluoranthene	**0.087**	NA
Lead	**32**	0.35 J
Dibenz[a,h]anthracene	**0.037 J *-**	NA
Benzene	3.4	NA
Indeno[1,2,3-c,d]pyrene	**0.030 J *-**	NA
Total TICs, Semi_volatile	659	NA

A9 Extraction	
Date	03/16/2022
Arsenic	3.5

DAM2-MW-2	
Date	03/22/2022
1,4-Dioxane	1.0
Total TICs, Semi_volatile	3149

DAM2-MW-1		
Date	03/22/2022	03/22/2022 (F)
Barium	**140**	**140**
Copper	**14 ^5-**	<0.36

APZ-123		
Date	03/25/2022	03/25/2022 (F)
Barium	**220**	**200**
Copper	**45**	<0.36
Lead	10	<0.071
Benzene	4.3	NA
1,4-Dioxane	0.48	NA

GMW-657		
Date	03/18/2022	03/18/2022 (F)
Arsenic	4.8	3.3
Lead	**11**	0.19 J

NOTES

1. IAOC BOUNDARY DESIGNATION LINES ABUTTING THE PROPERTY BOUNDARY SHALL BE CONSIDERED SYNONYMOUS WITH THE PROPERTY BOUNDARY.
2. IAOC DESIGNATION "H" INCLUDES SURFACE WATER BODIES WITHIN THE REFINERY UP TO THE CONFLUENCE OF THE ARTHUR KILL. THE ARTHUR KILL AND PILES CREEK ARE NOT INCLUDED AS AN IAOC.
3. ALL CONCENTRATIONS SHOWN IN MICROGRAMS PER LITER (µg/L).
4. SWQS = SURFACE WATER QUALITY STANDARDS (SHOWN FOR EVALUATION PURPOSES ONLY – NO SURFACE WATER SAMPLES WERE COLLECTED).
5. GWRS = NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION CLASS II-A GROUND WATER REMEDIATION STANDARDS.
6. THE GWRS FOR METALS APPLY TO TOTAL METALS DATA. THE SWQS FOR METALS (FRESH WATER AND SALINE) APPLY TO DISSOLVED METALS DATA.
7. ONLY ANALYTES THAT EXCEEDED THE APPLICABLE SWQS OR THE NJDEP CLASS II-A GWRS WITH THE EXCEPTION OF ALUMINUM, CHLORIDE, IRON, MANGANESE, AND SODIUM ARE INCLUDED ON THIS FIGURE.
8. GRAY SHADING = CONCENTRATION EXCEEDS NJDEP CLASS II-A GWRS
9. BOLD = CONCENTRATION EXCEEDS APPLICABLE SWQS (FRESH WATER OR SALINE)
10. ~ = A SWQS DOES NOT EXIST FOR THIS ANALYTE
11. # = SWQS (FRESHWATER) ARE TO BE CALCULATED AS A FUNCTION OF HARDNESS
12. *- = LABORATORY CONTROL SAMPLE (LCS) AND/OR LABORATORY CONTROL SAMPLE DUPLICATE (LSCD) IS OUTSIDE OF ACCEPTANCE LIMITS, LOW BIASED
13. ^5- = LINEAR RANGE CHECK (LRC) IS OUTSIDE ACCEPTANCE LIMITS, LOW BIASED
14. B = ANALYTE WAS FOUND IN THE BLANK AND SAMPLE
15. J = ESTIMATED VALUE = THE METHOD DETECTION LIMIT (MDL OR DL) AND < THE LIMIT OF QUANTITATION (LOQ OR RL)
16. (F) = DISSOLVED METALS, SAMPLE WAS FILTERED IN THE FIELD.

REFERENCES

1. MAP AND WATER BODY LIMITS DERIVED FROM FIGURE ENTITLED "WETLAND DELINEATION SURVEY, BAYWAY REFINERY, CITY OF LINDEN, UNION COUNTY, NEW JERSEY", PREPARED BY KELLER & KIRKPATRICK INC., DATED 9-3-15, LAST UPDATED 9-21-16.
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   DISTANCE MEASUREMENTS ARE EXPRESSED IN U.S. FEET
3. PROPERTY BOUNDARY DERIVED FROM METES AND BOUNDS TAKEN FROM SURVEY, PREPARED BY KELLER & KIRKPATRICK INC., DATED 3-1-93, LAST UPDATED 4-5-93.

Well ID	Applicable SWQS
GMW-657	SWQS (FRESH WATER)
APZ-122	SWQS (SALINE WATER)
APZ-123	
DAM2-MW-1	
DAM2-MW-2	NOT APPLICABLE (COMPARED TO NJDEP CLASS II-A GWRS ONLY)
GMW-120	
GMW-124	
GMW-135	
GMW-283	
GMW-305	

Chemical	SWQS (FRESH WATER)	SWQS (SALINE WATER)	NJDEP CLASS II-A GWRS
1,4-Dioxane	22000	200733	0.4
Arsenic	150	36	3
Barium	220	4	6000
Benzene	114	110	1
Benzo[b]fluoranthene	9.07	0.06	0.2
Beryllium	3.6	0.13	1
Copper	#	5.6	1300
Dibenz[a,h]anthracene	0.012	0.01	0.3
Indeno[1,2,3-c,d]pyrene	4.31	0.012	0.2
Isopropylbenzene	4.8	98	700
Lead	5.4	24	5
Total TICs, Volatile	~	~	500
Total TICs, Semi_volatile	~	~	500

Legend

- MONITORING WELL
- EXTRACTION WELL
- PIEZOMETER
- RECOVERY SUMP LOCATION
- RECOVERY WELL
- STILLING WELL
- SURFACE WATER MONITORING LOCATION
- DAM 2 RECOVERY TRENCH
- SUBSURFACE BARRIER WALL
- IAOC BOUNDARY
- OPEN WATER

200 100 0 200 Feet

1 inch = 200 feet

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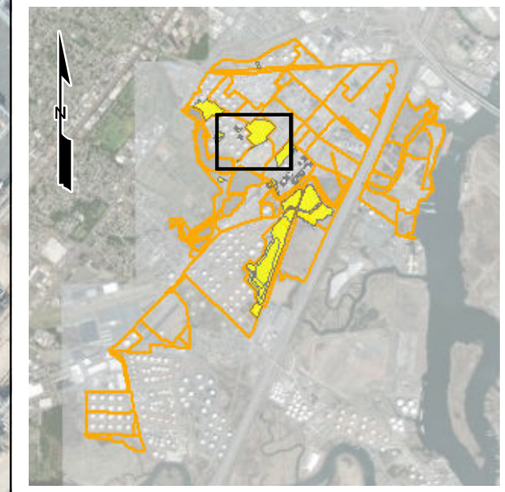
DRAWN BY:	B. PACCIONE
CHECKED BY:	T. DMYTROW
FILE NAME:	BRC_Fig5.2-3_A9.mxd

CONSERVATION AREA
GROUND WATER ANALYTICAL RESULTS MAP

BAYWAY REFINERY COMPLEX
LINDEN, NEW JERSEY
SEMIANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2022

FIGURE
5.2-3

\\azrgisstorp01\GIS_Projects\Client\ExxonMobil\NJ_BRC\MXD_SiteWide\2022_SAPR\2022_1H_Q1Q2\BRC_Fig5.2-3_A9.mxd



LEGEND

- SITE-SPECIFIC REMEDIAL ACTION SIGN LOCATION
- MONITORING WELL
- PIEZOMETER
- RECOVERY SUMP LOCATION
- RECOVERY WELL
- SUBSURFACE BARRIER WALL
- AREA OF CONCERN SPECIFIC CONTROL
- TANK
- CAPPED AREA (INSET VIEW)
- A9 IAOC BOUNDARY
- OPEN WATER

REFERENCES

1. MAP AND WATER BODY LIMITS DERIVED FROM FIGURE ENTITLED "WETLAND DELINEATION SURVEY, BAYWAY REFINERY, CITY OF LINDEN, UNION COUNTY, NEW JERSEY", PREPARED BY KELLER & KIRKPATRICK INC., DATED 9-3-15, LAST UPDATED 9-21-16.
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   HORIZONTAL DATUM: NAVD 1983
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200 100 0 200 Feet

1 inch = 200 feet

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DRAWN BY:	S. WILLIAMS
CHECKED BY:	J. FERRARA
FILE NAME:	BRC_Fig5.2-4_A9.mxd

CONSERVATION AREA
SOIL REMEDIAL ACTION LOCATION

BAYWAY REFINERY COMPLEX
LINDEN, NEW JERSEY
SEMIANNUAL PROGRESS REPORT
JANUARY THROUGH JUNE 2022

FIGURE
5.2-4

\\azrgisstorp01\GIS_Projects\Client\ExxonMobil\NJ_BRC\MXD_SiteWide\2022_SAPR\2022_1H_Q1Q2\BRC_Fig5.2-4_A9.mxd