

3.19 Parcel 79 – 400 Area Former Buildings

3.19.1 Site Description

Parcel 79 is located on the MP east of Oceanport Avenue and encompasses the 400 Bldg Area. Plan No. 506, “Gas and Fuel Storage Tanks Distribution System” dated January 22, 1956, was reviewed for the MP as part of the Phase I ECP. The plan depicts numerous fuel oil USTs that existed within Parcel 79 in 1956 in association with the former 400 Area buildings. Additional information pertaining to this parcel can be found in Section 3.4.1.1, Table 3-3, Section 4.3.2.1.7, Section 5.4, Section 5.4.2, Section 5.9, Section 5.13.1, Section 5.17, and Appendix G of the Phase I ECP (1).

3.19.2 Previous Investigations

Numerous USTs associated with former buildings, current buildings, and former bulk petroleum storage within Parcel 79 have been removed under the FTMM UST program and are summarized within the FTMM Phase I ECP Report (1).

A soil investigation and remedial action was recently conducted in portions of the 400, 700, and 800 Bldg Areas. The portion of Parcel 79 that was included within this investigation was south of Leonard Avenue (34). No data gaps were identified in association with the documented UST removals or the remedial action conducted south of Leonard Avenue.

3.19.3 Site Investigation Sampling

A review of documented UST removal locations versus the location of former buildings within Parcel 79 was conducted. Based on this review, it was determined that no UST removals have been documented at the locations of numerous former buildings within Parcel 79 in the vicinity of the baseball field bound by Fisher Avenue to the north, Cesar Avenue to the east, Leonard Avenue to the south, and Oceanport Avenue to the west. In order to determine the absence/presence of formerly utilized USTs and their potential releases to the environment, the following geophysical surveys, soil sampling, and groundwater sampling were conducted within the former buildings area located in Parcel 79.

Geophysical Survey Investigation

An EM survey was conducted throughout the current baseball field, located within Parcel 79, to determine the absence or presence of formerly utilized USTs. Follow-up GPR was performed where anomalies were identified as a result of the EM survey.

Geoprobe® Investigation

Soil and groundwater samples were collected in November and December 2007 in Parcel 79 in order to determine if contamination exists from potential historic heating oil UST releases. A total of 32 surface soil samples and 36 subsurface soil samples (including four duplicate samples) were collected from 32 distinct Geoprobe® borings

(Figure 3.19-1). Boring locations were conducted on 100-ft centers in an open field where the 400 Area buildings existed. Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. For borings located in paved areas, non-VO surface soil samples were collected from the 0- to 6-inch interval directly below the pavement sub-base. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. Subsurface soil samples were collected from the 6-inch interval directly above the water table. Field screening of soil boring cores was conducted using PID/FID instruments. No visual or olfactory evidence of impacted soil was noted.

A total of nine groundwater samples (including one duplicate sample) were collected from eight distinct temporary wells that were installed via the Geoprobe® rig (Figure 3.19-1). Temporary wells were installed along the north (Fisher Avenue), east (Cesar Avenue), and south (Leonard Avenue) boundaries of the soil boring grid. Temporary wells were constructed of PVC and 5 ft of factory-slotted screen.

Table 3.19-1 presents a summary of all field activities, and all sample locations are provided on Figure 3.19-1. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in Table 3.19-2.

**Table 3.19-1
Parcel 79 Sampling Location, Rationale and Analytical**

| Sample Location | Sample Media | Sample Location Rationale | Analytical Suite |
|---|-----------------|--|---|
| A 400-ft x 600-ft Former Buildings Area | | A geophysical survey was conducted throughout the current baseball field area to determine the presence/absence of USTs associated with former 400 Area buildings. The geophysical investigations consisted of an EM survey followed by targeted GPR of anomalies identified by the EM survey. | |
| 79SS-A2 through A7, 79SS-B2 through B7, 79SS-C2 through C7, 79SS-D1 through D7, 79SS-E1 through E7 (32 samples) | Surface soil | Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings in a grid configuration (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former 400 Area buildings in the area of the current baseball field. If the sample location was paved, the sample was collected from the 0- to 6-inch interval below the pavement sub-base. | TPHC, VO+10 (25% of TPHC > 1,000 mg/kg) |
| 79SB-A1 through 79SB-E7 (36 samples – includes 4 duplicate samples) | Subsurface soil | Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 2.5 to 7.5 ft bgs) from each Geoprobe® soil boring in the grid (conducted on 100-ft centers) to investigate the potential release from former heating oil USTs associated with the former 400 Area buildings. Field screening of the entire Geoprobe® soil core was conducted using PID/FID meters. | TPHC, VO+10 (25% of TPHC > 1,000 mg/kg) |

| Sample Location | Sample Media | Sample Location Rationale | Analytical Suite |
|--|--------------|---|------------------|
| 79GW-A2, A4, A6, B7, D7, E6, E4, E2 (9 samples – includes 1 duplicate sample) | Groundwater | Groundwater samples were collected from the specified Geoprobe® borings to investigate the groundwater downgradient of potential heating oil tanks associated with the former buildings. Groundwater samples were collected on 200-ft centers in the downgradient portion of the sampling grid. | VO+10, B/N+15 |

3.19.4 Site Investigation Results

Geophysical Survey Results

The geophysical survey identified a total of 33 target EM anomalies. The survey area is presented on **Figure 3.19-2**. This parcel of FTMM has been previously developed and the land surface reworked multiple times throughout its history. The findings of the geophysical survey (the density and small size of anomalies) are consistent with the site history. Four suspected USTs were identified within this Parcel; the locations of the suspected USTs are presented on **Figure 3.19-2**. The results of the GPR/TW-6 follow-up scanning are listed in **Table 3.19-3**. In summary, GPR scanning of the 34 targets revealed:

- Six targets that were associated with surface metal/debris (previously unaccounted for).
- Two targets that could not be relocated with the TW-6 because the targets were too small to be re-occupied, and therefore are most likely small pieces of scrap metallic debris.
- Six targets with the characteristics of a utility.
- Eight targets with moderate-amplitude near-surface scattered reflections indicative of scattered pieces of small metallic debris.
- Seven target with moderate-amplitude point target/anomalies indicative of small debris; not indicative of a UST.
- Three targets with the high-amplitude parabolic reflections indicative of a possible UST. The suspected USTs match up with former Bldgs 437, 440 or 444, and 441. Said buildings served as financial administrative buildings, non-housing structures, until the end of their life cycles. Supporting real property records are included in **Appendix I**.

- One target with the moderate-amplitude parabolic reflections indicating a possible UST. The suspected UST matches up with former Bldg 445. Said buildings served as financial administrative buildings, non-housing structures, until the end of its life cycle. Supporting real property records are included in **Appendix I**.

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TPHC. Corresponding surface and subsurface soil samples were collected for contingent VO+10 analysis. Groundwater samples were analyzed for VO+10 and B/N+15.

Soil

As presented in **Table 3.19-4**, TPHC was detected in 12 of the 32 surface soil samples and in two of the 36 subsurface soil samples. All 14 TPHC samples were detected at concentrations below 1,000 mg/kg; therefore, no contingency VOs were analyzed. There were no exceedances of NJDEP NRDCSCC or RDCSCC in any of the surface soil or subsurface soil samples collected in Parcel 79. No COCs were identified for soil in Parcel 79.

Groundwater

As presented in **Table 3.19-5**, three VOs and two B/Ns were detected at concentrations below NJDEP GWQC in Parcel 79 groundwater samples. No constituents were detected above the NJDEP GWQC and no COCs were identified in groundwater in Parcel 79.

3.19.5 Summary and Conclusions

Four targets indicative of suspected USTs were identified as part of the geophysical investigation. No constituents were identified above applicable NJDEP NRDCSCC or RDCSCC in surface or subsurface soil, and no constituents were identified above NJDEP GWQC in groundwater.

Soil and groundwater analytical results suggest that a release has not occurred. In light of the absence of evidence of a release to the environment, NFA for soil, groundwater, and the suspected USTs in Parcel 79 is recommended.

**Table 3.19-2
Parcel 79 Sample and Analytical Summary**

| Media | Type | Field Sample # | Sample Date | Sample Time | Begin Depth | End Depth | TPHC | VOC+15 | BVOC+15 | PCBs | TAL Metals | Cyanide | Mercury | Ammonia/ Nitrate/ Nitrite | COMMENTS/VARIANCES |
|-------|----------|----------------|-------------|-------------|-------------|-----------|------|--------|---------|------|------------|---------|---------|---------------------------|--|
| BLANK | TRIP | TRIP BLANK | 11/29/07 | - | -- | -- | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-D1-A | 11/29/07 | 9:50 | 0.5 | 1.0 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| SOIL | GEOPROBE | P79-D1-B | 11/29/07 | 9:50 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-D1-C | 11/29/07 | 10:00 | 7.5 | 8.0 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| SOIL | GEOPROBE | P79-E1-A | 11/29/07 | 10:20 | 0.5 | 1.0 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| SOIL | GEOPROBE | P79-E1-B | 11/29/07 | 10:20 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-E1-C | 11/29/07 | 10:30 | 6.5 | 7.0 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| SOIL | GEOPROBE | P79-B2-A | 11/29/07 | 10:50 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-B2-B | 11/29/07 | 10:50 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-B2-C | 11/29/07 | 10:50 | 3.0 | 3.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C2-A | 11/29/07 | 11:05 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C2-B | 11/29/07 | 11:05 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-C2-C | 11/29/07 | 11:20 | 6.5 | 7.0 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-D2-A | 11/29/07 | 11:30 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-D2-B | 11/29/07 | 11:30 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-D2-C | 11/29/07 | 11:40 | 6.0 | 6.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-A3-A | 11/29/07 | 13:25 | 0.5 | 1.0 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| SOIL | GEOPROBE | P79-A3-B | 11/29/07 | 13:25 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-A3-C | 11/29/07 | 13:35 | 6.0 | 6.5 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| BLANK | FIELD | FIELD BLANK | 11/29/07 | 13:30 | -- | -- | X | | | | | | | | |

**Table 3.19-2
Parcel 79 Sample and Analytical Summary**

| Media | Type | Field Sample # | Sample Date | Sample Time | Begin Depth | End Depth | TPHC | VOC+15 | BN+15 | PCBs | TAL Metals | Cyanide | Mercury | Ammonia/ Nitrate/ Nitrite | COMMENTS/VARIANCES |
|-------|----------|--------------------|-------------|-------------|-------------|-----------|------|--------|-------|------|------------|---------|---------|---------------------------|--|
| SOIL | GEOPROBE | P79-B3-A | 11/29/07 | 13:50 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-B3-B | 11/29/07 | 13:50 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-B3-C | 11/29/07 | 14:00 | 3.5 | 4.0 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-B3-C DUPLICATE | 11/29/07 | 14:00 | 3.5 | 4.0 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C3-A | 11/29/07 | 14:40 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C3-B | 11/29/07 | 14:40 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-C3-C | 11/29/07 | 14:50 | 5.0 | 5.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-D3-A | 11/29/07 | 15:05 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-D3-B | 11/29/07 | 15:05 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-D3-C | 11/29/07 | 15:30 | 6.5 | 7.0 | X | | | | | | | | |
| BLANK | TRIP | TRIP BLANK | 11/30/07 | - | -- | -- | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-A2-A | 11/30/07 | 7:55 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-A2-B | 11/30/07 | 7:55 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-A2-C | 11/30/07 | 8:15 | 6.0 | 6.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-A4-A | 11/30/07 | 8:55 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-A4-B | 11/30/07 | 8:55 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-A4-C | 11/30/07 | 9:15 | 5.5 | 6.0 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-A6-A | 11/30/07 | 9:35 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-A6-B | 11/30/07 | 9:35 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-A6-C | 11/30/07 | 9:45 | 6.0 | 6.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-B7-A | 11/30/07 | 10:20 | 0.5 | 1.0 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| SOIL | GEOPROBE | P79-B7-B | 11/30/07 | 10:20 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-B7-C | 11/30/07 | 10:30 | 5.0 | 5.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-D7-A | 11/30/07 | 10:50 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-D7-B | 11/30/07 | 10:50 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-D7-C | 11/30/07 | 11:00 | 6.0 | 6.5 | X | | | | | | | | |

**Table 3.19-2
Parcel 79 Sample and Analytical Summary**

| Media | Type | Field Sample # | Sample Date | Sample Time | Begin Depth | End Depth | TPHC | VOC+15 | BN+15 | PCBs | TAL Metals | Cyanide | Mercury | Ammonia/ Nitrate/ Nitrite | COMMENTS/VARIANCES |
|-------|----------|--------------------|-------------|-------------|-------------|-----------|------|--------|-------|------|------------|---------|---------|---------------------------|--|
| SOIL | GEOPROBE | P79-E6-A | 11/30/07 | 13:35 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-E6-B | 11/30/07 | 13:35 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-E6-C | 11/30/07 | 13:45 | 2.5 | 3.0 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-E6-C DUPLICATE | 11/30/07 | 13:45 | 2.5 | 3.0 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-E4-A | 11/30/07 | 14:10 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-E4-B | 11/30/07 | 14:10 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-E4-C | 11/30/07 | 14:20 | 5.0 | 5.5 | X | | | | | | | | |
| BLANK | FIELD | FIELD BLANK | 11/30/07 | 14:30 | -- | -- | X | | | | | | | | |
| SOIL | GEOPROBE | P79-E2-A | 11/30/07 | 14:45 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-E2-B | 11/30/07 | 14:45 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-E2-C | 11/30/07 | 15:05 | 6.0 | 6.5 | X | | | | | | | | |
| BLANK | TRIP | TRIP BLANK-SO | 12/01/07 | - | -- | -- | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-E3-A | 12/01/07 | 8:00 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-E3-B | 12/01/07 | 8:00 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-E3-C | 12/01/07 | 8:15 | 3.0 | 3.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-B4-A | 12/01/07 | 8:25 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-B4-B | 12/01/07 | 8:25 | 1.6 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-B4-C | 12/01/07 | 8:35 | 5.0 | 5.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C4-A | 12/01/07 | 8:55 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C4-B | 12/01/07 | 8:55 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-C4-C | 12/01/07 | 9:00 | 3.0 | 3.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-D4-A | 12/01/07 | 9:15 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-D4-B | 12/01/07 | 9:15 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-D4-C | 12/01/07 | 9:20 | 6.0 | 6.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-A5-A | 12/01/07 | 10:15 | 0.5 | 1.0 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| SOIL | GEOPROBE | P79-A5-B | 12/01/07 | 10:15 | 1.5 | 2.0 | NA | | | | | | | | |

**Table 3.19-2
Parcel 79 Sample and Analytical Summary**

| Media | Type | Field Sample # | Sample Date | Sample Time | Begin Depth | End Depth | TPHC | VOC+15 | BN+15 | PCBs | TAL Metals | Cyanide | Mercury | Ammonia/ Nitrate/ Nitrite | COMMENTS/VARIANCES |
|-------|----------|--------------------|-------------|-------------|-------------|-----------|------|--------|-------|------|------------|---------|---------|---------------------------|--|
| SOIL | GEOPROBE | P79-A5-C | 12/01/07 | 10:20 | 6.0 | 6.5 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| SOIL | GEOPROBE | P79-B5-A | 12/01/07 | 10:35 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-B5-B | 12/01/07 | 10:35 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-B5-C | 12/01/07 | 10:45 | 6.0 | 6.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C5-A | 12/01/07 | 11:10 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C5-B | 12/01/07 | 11:10 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-C5-C | 12/01/07 | 11:25 | 4.5 | 5.0 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C5-C DUPLICATE | 12/01/07 | 11:25 | 4.5 | 5.0 | X | | | | | | | | |
| BLANK | FIELD | FIELD BLANK-SO | 12/01/07 | 11:00 | -- | -- | X | | | | | | | | |
| BLANK | TRIP | TRIP BLANK-AQ | 12/01/07 | 7:30 | -- | -- | | X | | | | | | | |
| BLANK | FIELD | FIELD BLANK-AQ | 12/01/07 | 8:00 | -- | -- | | X | X | | | | | | |
| GW | GEOPROBE | P79-E2 | 12/01/07 | 8:30 | 5.0 | 10.0 | | X | X | | | | | | |
| GW | GEOPROBE | P79-E2 DUPLICATE | 12/01/07 | 8:30 | 5.0 | 10.0 | | X | X | | | | | | |
| GW | GEOPROBE | P79-E4 | 12/01/07 | 9:00 | 3.5 | 8.5 | | X | X | | | | | | |
| GW | GEOPROBE | P79-E6 | 12/01/07 | 9:30 | 3.5 | 8.5 | | X | X | | | | | | |
| GW | GEOPROBE | P79-D7 | 12/01/07 | 10:00 | 5.0 | 8.0 | | X | X | | | | | | |
| GW | GEOPROBE | P79-B7 | 12/01/07 | 10:30 | 5.0 | 10.0 | | X | X | | | | | | |
| GW | GEOPROBE | P79-A6 | 12/01/07 | 11:00 | 5.0 | 10.0 | | X | X | | | | | | |
| GW | GEOPROBE | P79-A4 | 12/01/07 | 11:30 | 5.0 | 10.0 | | X | X | | | | | | |
| GW | GEOPROBE | P79-A2 | 12/01/07 | 12:00 | 6.0 | 11.0 | | X | X | | | | | | |
| BLANK | TRIP | TRIP BLANK | 12/03/07 | - | -- | -- | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-D5-A | 12/03/07 | 8:55 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-D5-B | 12/03/07 | 8:55 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-D5-C | 12/03/07 | 9:05 | 3.5 | 4.0 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-E5-A | 12/03/07 | 9:45 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-E5-B | 12/03/07 | 9:45 | 1.5 | 2.0 | NA | | | | | | | | |

**Table 3.19-2
Parcel 79 Sample and Analytical Summary**

| Media | Type | Field Sample # | Sample Date | Sample Time | Begin Depth | End Depth | TPHC | VOC+15 | BVH+15 | PCBs | TAL Metals | Cyanide | Mercury | Ammonia/ Nitrate/ Nitrite | COMMENTS/VARIANCES |
|-------|----------|--------------------|-------------|-------------|-------------|-----------|------|--------|--------|------|------------|---------|---------|---------------------------|--|
| SOIL | GEOPROBE | P79-E5-C | 12/03/07 | 9:50 | 3.0 | 3.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-B6-A | 12/03/07 | 10:05 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-B6-B | 12/03/07 | 10:05 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-B6-C | 12/03/07 | 10:10 | 3.5 | 4.0 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C6-A | 12/03/07 | 10:30 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C6-B | 12/03/07 | 10:30 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-C6-C | 12/03/07 | 10:45 | 5.0 | 5.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-D6-A | 12/03/07 | 11:00 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-D6-B | 12/03/07 | 11:00 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-D6-C | 12/03/07 | 11:05 | 3.5 | 4.0 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-A7-A | 12/03/07 | 11:30 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-A7-B | 12/03/07 | 11:30 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-A7-C | 12/03/07 | 11:35 | 3.5 | 4.0 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-C7-A | 12/03/07 | 13:40 | 0.5 | 1.0 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| SOIL | GEOPROBE | P79-C7-B | 12/03/07 | 13:40 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-C7-C | 12/03/07 | 13:50 | 4.0 | 4.5 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| SOIL | GEOPROBE | P79-C7-C DUPLICATE | 12/03/07 | 13:50 | 4.0 | 4.5 | X | | | | | | | | Sample depth in field documentation was recorded from top of soil. Reported bgs depths adjusted to account for surface asphalt and sub-base. |
| SOIL | GEOPROBE | P79-E7-A | 12/03/07 | 14:10 | 0.0 | 0.5 | X | | | | | | | | |
| SOIL | GEOPROBE | P79-E7-B | 12/03/07 | 14:10 | 1.5 | 2.0 | NA | | | | | | | | |
| SOIL | GEOPROBE | P79-E7-C | 12/03/07 | 14:15 | 3.5 | 4.0 | X | | | | | | | | |
| BLANK | FIELD | FIELD BLANK | 12/03/07 | 14:00 | -- | -- | X | | | | | | | | |

NA = Not Analyzed. Sample was collected for VOC analysis in the event TPHC results in the 0.0-0.5 ft bgs interval exceeded 1,000 mg/kg. TPHC results were less than 1,000 mg/kg in the 0.0-0.5 ft bgs interval, therefore no VOC analysis was required.

X = Sample analyzed for the indicated analytical parameter suite

**Table 3.19-3
Parcel 79 - Ground Penetrating Radar and Metal Detection Follow-up Survey Results**

| Anomaly | Anomaly Type: Inphase, Conductivity, Both | Anomaly Re- Acquired by Small Area Metal Detection | Metal Detection (MD) Anomaly Size (feet) | GPR Anomaly Size (feet) | Description | Easting | Northing |
|----------------|--|---|---|------------------------------------|--|----------------|-----------------|
| P79_1 | Inphase | Yes | 10 x 10 | see notes | Moderate-amplitude scattered anomalies, possible scattered debris. | 622024 | 541442 |
| P79_2 | Both | Yes | | see notes | Suspected utility. | 622032 | 541602 |
| P79_3 | Both | N/A | N/A | N/A | Surface metal. | 622044 | 541397 |
| P79_4 | Both | Yes | see notes | see notes | Suspected utility. | 622047 | 541637 |
| P79_5 | Inphase | Yes | < 3 x 3 | < 3 x 3 | Moderate-amplitude point target/anomaly, possible debris. | 622054 | 541533 |
| P79_6 | Both | Yes | 6 x 10 | 4 x 7 | High-amplitude anomaly indicative of a UST. | 622067 | 541369 |
| P79_7 | Conductivity | Yes | 50 x 50 | see notes | Moderate-amplitude scattered anomalies, possible scattered debris. | 622093 | 541381 |
| P79_8 | Inphase | Yes | < 3 x 3 | < 3 x 3 | Moderate-amplitude point target/anomaly, possible debris. | 622111 | 541477 |
| P79_9 | Conductivity | Yes | see P79_7 | see P79_7 | see P79_7. | 622121 | 541397 |
| P79_10 | Inphase | Yes | < 3 x 3 | < 3 x 3 | Moderate-amplitude point target/anomaly, possible debris. | 622214 | 541526 |
| P79_11 | Inphase | Yes | < 3 x 3 | < 3 x 3 | Moderate-amplitude point target/anomaly, possible debris. | 622214 | 541587 |
| P79_12 | Both | Yes | 7 x 11 | 4 x 11 | High-amplitude anomaly indicative of a UST. | 622217 | 541689 |
| P79_13 | Inphase | Yes | < 3 x 3 | < 3 x 3 | Moderate-amplitude point target/anomaly, possible debris. | 622241 | 541579 |
| P79_14 | Both | Yes | 5 x 5 | see notes | Moderate-amplitude scattered anomalies, possible scattered debris. | 622247 | 541682 |
| P79_15 | Inphase | Yes | < 3 x 3 | < 3 x 3 | Moderate-amplitude point target/anomaly, possible debris. | 622251 | 541562 |
| P79_16 | Inphase | Yes | 5 x 8 | 4 x 7 | Low-amplitude anomaly indicative of a possible UST. | 622290 | 541548 |
| P79_17 | Inphase | Yes | 4 x 4 | see notes | Moderate-amplitude scattered anomalies, possible scattered debris. | 622290 | 541594 |
| P79_18 | Both | Yes | 8 x 12 | 4 x 11 | High-amplitude anomaly indicative of a UST. | 622293 | 541636 |
| P79_19 | Inphase | Yes | < 3 x 3 | < 3 x 3 | Moderate-amplitude point target/anomaly, possible debris. | 622310 | 541512 |
| P79_20 | Inphase | Yes | 8 x 7 | see notes | Moderate-amplitude scattered anomalies, possible scattered debris. | 622329 | 541484 |
| P79_21 | Both | Yes | 8 x 10 | see notes | Moderate-amplitude scattered anomalies, possible scattered debris. | 622338 | 541743 |
| P79_22 | Both | Yes | 7 x 7 | see notes | Moderate-amplitude scattered anomalies, possible scattered debris. | 622361 | 541725 |
| P79_23 | Conductivity | N/A | N/A | N/A | Surface metal. | 622377 | 541616 |
| P79_24 | Conductivity | Yes | see notes | see notes | Suspected utility. | 622384 | 541823 |
| P79_25 | Inphase | Yes | 4 x 4 | see notes | Moderate-amplitude scattered anomalies, possible scattered debris. | 622389 | 541664.9 |
| P79_26 | Conductivity | Yes | see notes | see notes | Suspected utility. | 622420.3 | 541718.3 |
| P79_27 | Inphase | N/A | N/A | N/A | Surface metal. | 622438.8 | 541631.7 |
| P79_28 | Conductivity | Yes | see notes | see notes | Suspected utility. | 622450.5 | 541656.8 |
| P79_29 | Both | N/A | N/A | N/A | Surface metal. | 622474.8 | 541466.6 |
| P79_30 | Both | N/A | N/A | N/A | Surface metal. | 622499.3 | 541649.8 |
| P79_31 | Inphase | Yes | see notes | see notes | Suspected utility. | 622501.5 | 541684.6 |
| P79_32 | Both | N/A | N/A | N/A | Surface metal. | 622511.1 | 541631.9 |
| P79_33 | Conductivity | No | N/A | N/A | No MD anomaly found associated with EM anomaly. | 622576.9 | 541597.6 |
| P79_34 | Both | No | N/A | N/A | No MD anomaly found associated with EM anomaly. | 622602.4 | 541616.2 |

**Table 3.19-4
Fort Monmouth Phase II Site Investigation, Parcel 79
Summary of TPHC Detected in Soil (mg/kg)**

| Sample ID | Lab ID | Sample Date | Depth (ft. bgs) | Result | MDL | NJDEP NRDCSCC ² (mg/kg) | NJDEP IGWSCC ³ (mg/kg) |
|-----------|---------|-------------|-----------------|--------|-----|------------------------------------|-----------------------------------|
| P79-A2-A | 7049803 | 11/30/07 | 0.0-0.5 | 226 | 68 | 10000 | 10000 |
| P79-A3-A | 7049518 | 11/29/07 | 0.5-1.0 | 92 | 72 | 10000 | 10000 |
| P79-A4-A | 7049806 | 11/30/07 | 0.0-0.5 | 121 | 77 | 10000 | 10000 |
| P79-A5-A | 7050115 | 12/01/07 | 0.5-1.0 | 120 | 67 | 10000 | 10000 |
| P79-B2-A | 7049509 | 11/29/07 | 0.0-0.5 | 201 | 76 | 10000 | 10000 |
| P79-B3-A | 7049522 | 11/29/07 | 0.0-0.5 | 111 | 75 | 10000 | 10000 |
| P79-B7-A | 7049812 | 11/30/07 | 0.5-1.0 | 78 | 69 | 10000 | 10000 |
| P79-C3-A | 7049525 | 11/29/07 | 0.0-0.5 | 84 | 75 | 10000 | 10000 |
| P79-C5-C | 7050123 | 12/01/07 | 4.5-5.0 | 130 | 78 | 10000 | 10000 |
| P79-E1-A | 7049506 | 11/29/07 | 0.5-1.0 | 346 | 74 | 10000 | 10000 |
| P79-E3-A | 7050103 | 12/01/07 | 0.0-0.5 | 86 | 77 | 10000 | 10000 |
| P79-E5-A | 7050306 | 12/03/07 | 0.0-0.5 | 242 | 79 | 10000 | 10000 |
| P79-E6-C | 7049820 | 11/30/07 | 2.5-3.0 | 133 | 77 | 10000 | 10000 |
| P79-E7-A | 7050324 | 12/03/07 | 0.0-0.5 | 110 | 74 | 10000 | 10000 |

¹ NJDEP Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

² NJDEP Non-Residential Direct Contact Soil Cleanup Criteria (NRDCSCC) per NJAC 7:26D, 1999.

³ NJDEP Impact to Groundwater Soil Cleanup Criteria (IGWSCC) per NJAC 7:26D, 1999.

DUP = Duplicate sample.

ft. bgs = Feet below ground surface.

MDL = Method detection limit

mg/kg = milligram per kilogram.

**Table 3.19-5
Fort Monmouth Phase II Site Investigation, Parcel 79
Summary of Analytical Parameters Detected in Groundwater (µg/L)**

| Chemical | Sample ID: Lab ID: Date Sampled: Screened Interval (ft. bgs): Quality Criteria ¹ | Analytical Results | | | | | | | | |
|----------------------------|---|--|--|--|--|---|--|--|---|---|
| | | P79-A2 7050011 12/1/2007 6-11 Result | P79-A4 7050010 12/1/2007 5-10 Result | P79-A6 7050009 12/1/2007 5-10 Result | P79-B7 7050008 12/1/2007 5-10 Result | P79-D7 7050007 12/1/2007 5-8 Result | P79-E2 7050004 12/1/2007 5-10 Result | P79-E2 DUP 7050003 12/1/2007 5-10 Result | P79-E4 7050005 12/1/2007 3.5-8.5 Result | P79-E6 7050006 12/1/2007 3.5-8.5 Result |
| Volatiles | | | | | | | | | | |
| Acetone | 6000 | 0.85 U | 0.85 U | 0.85 U | 3.58 B | 0.85 U | 0.85 U | 0.85 U | 0.85 U | 0.85 U |
| Benzene | 1 | 0.17 U | 0.17 U | 0.17 U | 0.17 U | 0.17 U | 0.15 J | 0.17 U | 0.17 U | 0.17 U |
| Toluene | 600 | 0.27 U | 0.27 U | 0.27 U | 0.15 J | 0.27 U | 0.27 U | 0.27 U | 0.27 U | 0.27 U |
| Semi-Volatiles | | | | | | | | | | |
| bis(2-Ethylhexyl)phthalate | 3 | 1.28 U | 1.28 U | 0.76 JB | 1.54 | 1.00 JB | 1.28 U | 1.28 U | 1.28 U | 1.28 U |
| Di-n-butylphthalate | 700 | 0.65 JB | 0.40 JB | 0.37 JB | 0.34 JB | 0.64 JB | 0.43 JB | 0.79 JB | 0.52 JB | 0.35 JB |

¹ Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

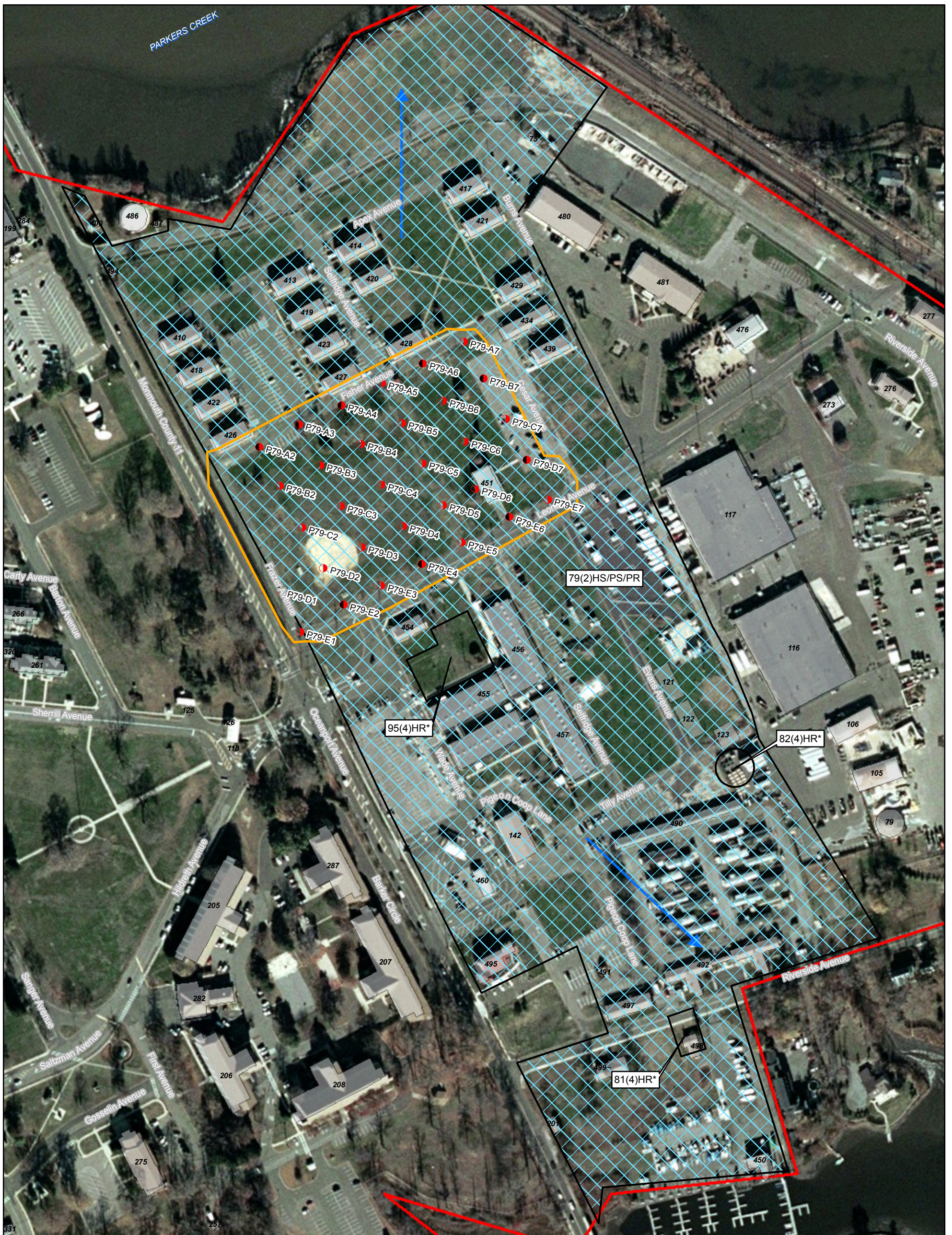
NT = Not tested.

NLE = No limit established.

Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.

µg/L = micrograms per liter.



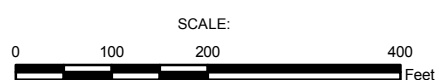
- LEGEND**
- Geoprobe Soil Sample Location
 - Geoprobe Soil & Groundwater Sample Location
 - ➔ Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
 - Geophysical Investigation Area (Electromagnetic Survey Followed by Targeted Ground Penetrating Radar of Anomalies)
 - Building
 - Installation Boundary
- ECP PARCEL CATEGORY DEFINITIONS**
- 2 Areas where only release or disposal of petroleum products has occurred.

* Parcel not included in Site Investigation. Information pertaining to parcels not included in this Site Investigation is presented in the Fort Monmouth Phase I ECP Report (January 2007).

BRAC PARCEL LABEL DEFINITIONS

| | |
|---------------------------|--|
| CONTAMINATION DESCRIPTION | HS - Hazardous Substance Storage HR - Hazardous Substance Release PS - Petroleum Storage PR - Petroleum Release (P) - Possible Release or Disposal |
| CATEGORY NUMBER | |
| PARCEL NUMBER | |

Aerial photography (0.5-meter resolution), dated January 15, 2006, was obtained from ESRI ArcOnline Map Services, July 2008.



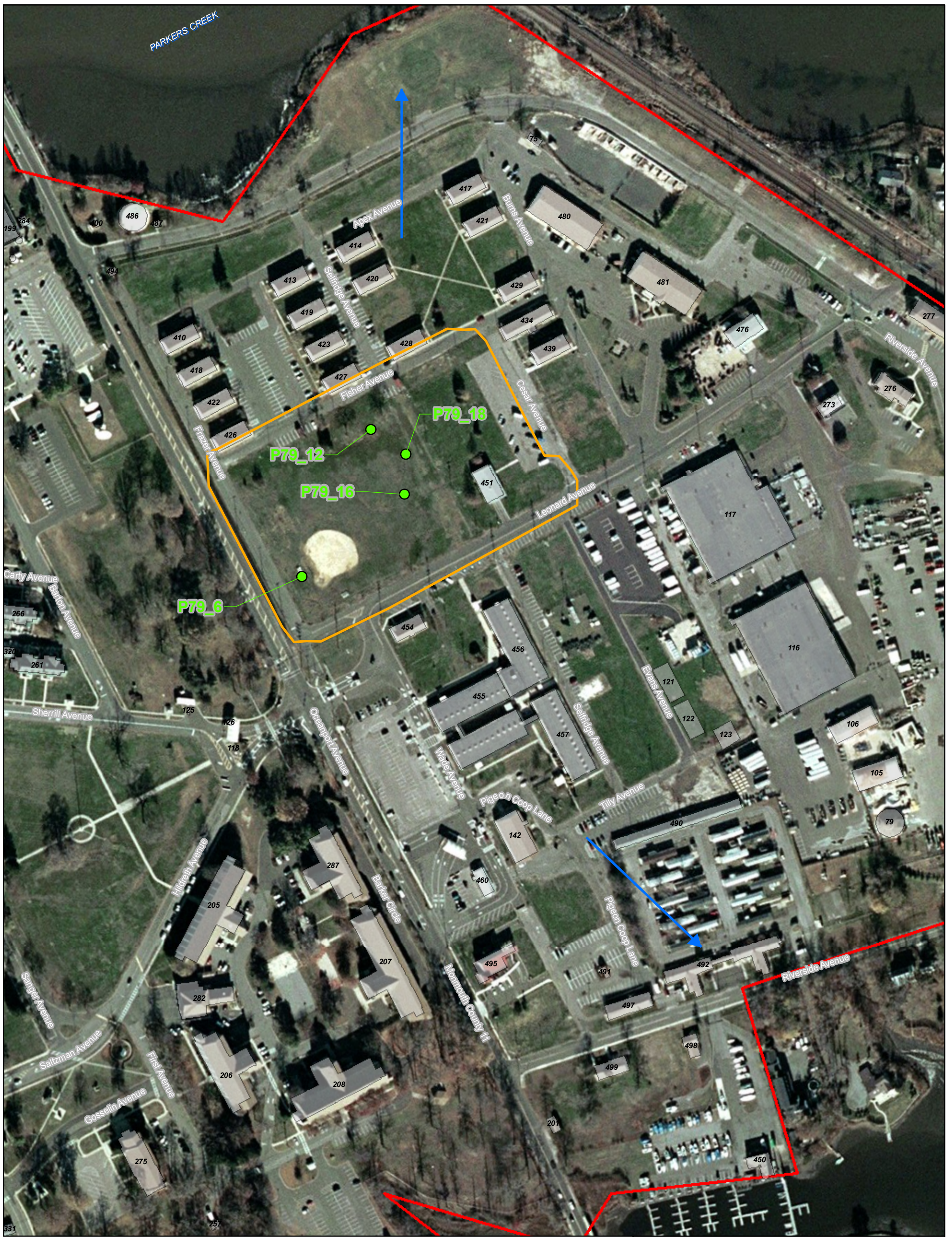
Base Realignment and Closure 2005








Shaw Shaw Environmental, Inc.



FIGURE 3.19-1
FORT MONMOUTH ECP
SITE INVESTIGATION
PARCEL 79 SAMPLE LOCATIONS
 MAIN POST
 FORT MONMOUTH
 NEW JERSEY



LEGEND

-  Subsurface Metallic Object (Suspected UST)
-  Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
-  Building
-  Geophysical Investigation Area (Electromagnetic Survey Followed by Targeted Ground Penetrating Radar of Anomalies)
-  Installation Boundary

Aerial photography (0.5-meter resolution), dated January 15, 2006, was obtained from ESRI ArcOnline Map Services, July 2008.



SCALE: 0 100 200 400 Feet



Base Realignment and Closure 2005



Shaw Shaw Environmental, Inc.



FIGURE 3.19-2
 FORT MONMOUTH ECP
 SITE INVESTIGATION
 PARCEL 79
 SUSPECTED UST LOCATIONS
 MAIN POST
 FORT MONMOUTH
 NEW JERSEY

3.20 Parcel 80 – Former Bldgs 105 and 106 – Former Photoprocessing

3.20.1 Site Description

Parcel 80 includes former Bldgs 105 and 106. Bldgs 105 and 106 were formerly located northeast of Oceanport Avenue, directly southeast of the current credit union (Bldg 495). Locations of the former buildings are depicted on Plan 506 – Gas and Fuel Storage Tanks Distribution System (**Appendix G**). These buildings served as photoprocessing facilities from the 1940s until they were demolished in the 1980s. An open-grassed area is present southeast of Bldg 495 where Bldgs 105 and 106 previously existed.

Bldg 105 was listed as part of the Printing Plant in 1975 and 1986 (36,37). Operations in Bldg 105 included the use of PCE during 1981 (38). Operations noted at Bldg 106 in 1950 and 1958 included arc lamp photography, letter press printing, photograph developing, and carbon arc sensitizing (39). Additional information pertaining to this parcel can be found in Appendix A of the Phase I ECP (1).

3.20.2 Previous Investigations

One former UST associated with former Bldg 106 was removed under the FTMM UST Management Program and is summarized within the FTMM Phase I ECP Report (1). No previous investigations have been conducted in relation to former operations in Bldgs 105 and 106.

3.20.3 Site Investigation Sampling

In order to determine the impact of historic building operations in the area of former Bldgs 105 and 106, the following soil sampling and groundwater sampling was conducted.

Geoprobe® Investigation

Soil and groundwater samples were collected in December 2007 in Parcel 80 in order to investigate the location of former Bldgs 105 and 106 and any associated historic releases. A total of four surface soil samples and five subsurface soil samples (including one duplicate sample) were collected from four distinct Geoprobe® borings (**Figure 3.20-1**). Surface soil samples for non-VO analysis were collected from the 0- to 6-inch interval bgs. Surface soil samples collected for VO analysis were collected from the 18- to 24-inch interval bgs. Subsurface soil samples were collected from the 6-inch interval directly above the water table. Field screening of soil boring cores were conducted using PID/FID instruments. No visual or olfactory evidence of impacted soil was noted.

A total of three groundwater samples (including one duplicate sample) were collected from two distinct temporary wells (**Figure 3.20-1**). Temporary wells were installed in the

vicinity of former Bldgs 105 and 106 and were constructed of PVC and 5 ft of factory-slotted screen.

Table 3.20-1 presents a summary of all field activities, and all sample locations are provided on **Figure 3.20-1**. A summary of sampling activities, including sample IDs, collection dates, and analytical parameters, is provided in **Table 3.20-2**.

**Table 3.20-1
Parcel 80 Sampling Location, Rationale and Analytical**

| Sample Location | Sample Media | Sample Location Rationale | Analytical Suite |
|---|-----------------|---|--|
| 80SS-1 through 80SS-4 (4 samples) | Surface soil | Soil samples were collected from the 0- to 6-inch bgs interval from Geoprobe® soil borings to investigate the location of former printing plant Bldgs 105 and 106. | TCL+30 (w/o pesticides), TAL Metals |
| 80SB-1 through 80SS-4 (5 samples – includes 1 duplicate sample) | Subsurface soil | Soil samples were collected from the 6-inch interval directly above the water table (depths ranging from 4.5 to 6.0 ft bgs) from each Geoprobe® soil boring to investigate the location of former printing plant Bldgs 105 and 106. Field screening of the entire Geoprobe® soil core was conducted using PID and FID meters. | TCL+30 (w/o pesticides), TAL Metals |
| 80GW-1 and 2 (3 samples – includes 1 duplicate sample) | Groundwater | Groundwater samples were collected from the specified Geoprobe® soil borings to investigate the former location of printing plant Bldgs 105 and 106. | TCL+30 (w/o pesticides/PCBs), TAL Metals |

3.20.4 Site Investigation Results

Geoprobe® Investigation Results

Surface and subsurface soil samples were analyzed for TCL+30 (minus pesticides) and TAL metals. Groundwater samples were analyzed for TCL+30 (minus pesticides/PCBs) and TAL metals.

Soil

As summarized in **Table 3.20-3**, seven VOs, 14 B/Ns and 19 metals were detected in Parcel 80 soil samples. No constituents were identified in soil at concentrations greater than the NJDEP NRDCSCC or IGWSCC, and no COCs were identified in soil at Parcel 80.

Groundwater

As shown in **Table 3.20-4**, one B/N, bis(2-ethylhexyl)phthalate, was detected at concentrations below respective GWQC in Parcel 80 groundwater samples. No VOs were detected in Parcel 80 groundwater. A total of 18 metals were detected in Parcel 80 groundwater samples. Of the 18 metals detected, four (aluminum, beryllium, iron, and manganese) were detected above the respective GWQC.

Several natural and anthropogenic factors contribute to the wide range in concentrations of metals in soils, which further impact the concentration of metals in groundwater. Soils derived from glauconitic sands contain abundant aluminum, calcium, potassium, iron, magnesium, manganese (among others), which are likely to be present at elevated concentrations in the groundwater, particularly when sediments are entrained in the collected groundwater samples. Due to the naturally elevated levels of these native metals in the groundwater, aluminum, iron, and manganese are not considered COCs. The non-native metals detected in the groundwater samples from the temporary wells have been compared to the respective GWQC and MBCs, presented in **Appendix H** to determine COCs requiring further evaluation.

Beryllium was detected at a concentration exceeding the NJDEP GWQC of 1 µg/L in three samples, P80GW-1 (5.67 µg/L), P80GW-1DUP (5.71 µg/L), and P80-GW2 (2.02 µg/L). The beryllium concentrations detected in P80GW-1 and P80GW-1DUP also exceeded the MPBC of 2.1 µg/L. Thus, beryllium was identified as a COC in groundwater at Parcel 80.

3.20.5 Summary and Conclusions

No COCs were identified above NJDEP criteria in surface or subsurface soil. NFA is recommended for soil within Parcel 80. Three naturally occurring metal constituents, aluminum, iron, and manganese, were detected at concentrations greater than the NJDEP GWQC, but these native metals are attributed to the aquifer material and are not site-related. Therefore, these metals are not considered to be COCs. One metal constituent not commonly identified at elevated levels in native soil, beryllium, was detected at concentrations above the NJDEP GWQC and MPBC. Further evaluation of beryllium in groundwater is recommended.

**Table 3.20-2
Parcel 80 Sample and Analytical Summary**

| Media | Type | Field Sample # | Sample Date | Sample Time | Begin Depth | End Depth | TP HC | VO+15 | BN+15 | PCBs | TAL Metals | Cyanide | Mercury | Ammonia/ Nitrate/ Nitrite | COMMENTS/VARIANCES |
|-------|----------|---------------------|-------------|-------------|-------------|-----------|-------|-------|-------|------|------------|---------|---------|---------------------------|--------------------|
| BLANK | TRIP | TRIP BLANK | 12/13/07 | - | -- | -- | | X | | | | | | | |
| SOIL | GEOPROBE | P80-SB1-A | 12/13/07 | 8:25 | 0.0 | 0.5 | | X | X | X | X | | | | |
| SOIL | GEOPROBE | P80-SB1-B | 12/13/07 | 8:25 | 1.5 | 2.0 | | X | | | | | | | |
| SOIL | GEOPROBE | P80-SB1-C | 12/13/07 | 8:50 | 5.5 | 6.0 | | X | X | X | X | | | | |
| SOIL | GEOPROBE | P80-SB2-A | 12/13/07 | 9:05 | 0.0 | 0.5 | | | X | X | X | | | | |
| SOIL | GEOPROBE | P80-SB2-B | 12/13/07 | 9:05 | 1.5 | 2.0 | | X | | | | | | | |
| SOIL | GEOPROBE | P80-SB2-C | 12/13/07 | 9:10 | 4.5 | 5.0 | | X | X | X | X | | | | |
| SOIL | GEOPROBE | P80-SB3-A | 12/13/07 | 9:25 | 0.0 | 0.5 | | | X | X | X | | | | |
| SOIL | GEOPROBE | P80-SB3-B | 12/13/07 | 9:25 | 1.5 | 2.0 | | X | | | | | | | |
| SOIL | GEOPROBE | P80-SB3-C | 12/13/07 | 9:30 | 5.0 | 5.5 | | X | X | X | X | | | | |
| SOIL | GEOPROBE | P80-SB3-C DUPLICATE | 12/13/07 | 9:30 | 5.0 | 5.5 | | X | X | X | X | | | | |
| BLANK | FIELD | FIELD BLANK | 12/13/07 | 9:40 | -- | -- | | X | X | X | X | | | | |
| SOIL | GEOPROBE | P80-SB4-A | 12/13/07 | 9:55 | 0.0 | 0.5 | | | X | X | X | | | | |
| SOIL | GEOPROBE | P80-SB4-B | 12/13/07 | 9:55 | 1.5 | 2.0 | | X | | | | | | | |
| SOIL | GEOPROBE | P80-SB4-C | 12/13/07 | 10:05 | 6.0 | 6.5 | | X | X | X | X | | | | |
| BLANK | TRIP | TRIP BLANK-AQ | 12/14/07 | 10:00 | -- | -- | | X | | | | | | | |
| BLANK | FIELD | FIELD BLANK-AQ | 12/14/07 | 11:00 | -- | -- | | X | X | | X | | | | |
| GW | GEOPROBE | P80-GW-1 | 12/14/07 | 11:30 | 5.0 | 10.0 | | X | X | | X | | | | |
| GW | GEOPROBE | P80-GW-1 DUPLICATE | 12/14/07 | 11:30 | 5.0 | 10.0 | | X | X | | X | | | | |
| GW | GEOPROBE | P80-GW-2 | 12/14/07 | 12:00 | 5.0 | 10.0 | | X | X | | X | | | | |

X = Sample analyzed for the indicated analytical parameter suite

**Table 3.20-3
Fort Monmouth Phase II Site Investigation, Parcel 80
Summary of Analytical Parameters Detected in Soil (mg/kg)**

| Chemical | Sample ID: | | Analytical Results | | | | | | | | | | | | |
|----------------------------|----------------------|---------------------|--------------------|--------------|-----------------|----------------|----------------|-----------------|-----------------|----------------|----------------|-----------------|----------------|------------|----------------|
| | Lab ID: | | P80-SB1-A | P80-SB1-B | P80-SB1-C | P80-SB2-A | P80-SB2-B | P80-SB2-C | P80-SB3-A | P80-SB3-B | P80-SB3-C | P80-SB3-C DUP | P80-SB4-A | P80-SB4-B | P80-SB4-C |
| | Date Sampled: | | 7053003 | 7053004 | 7053005 | 7053006 | 7053007 | 7053008 | 7053009 | 7053010 | 7053011 | 7053002 | 7053013 | 7053014 | 7053015 |
| | Depth (ft. bgs): | | 12/13/2007 | 12/13/2007 | 12/13/2007 | 12/13/2007 | 12/13/2007 | 12/13/2007 | 12/13/2007 | 12/13/2007 | 12/13/2007 | 12/13/2007 | 12/13/2007 | 12/13/2007 | 12/13/2007 |
| | NRDCSCC ² | IGWSCC ³ | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | Result | |
| Volatiles | | | | | | | | | | | | | | | |
| Acetone | 1000 | 100 | NT | 0.390 | 0.250 J | NT | 0.200 J | 0.200 J | NT | 0.300 U | 0.280 U | 0.440 | NT | 0.280 U | 0.100 J |
| Benzene | 13 | 1 | NT | 0.290 U | 0.310 U | NT | 0.019 J | 0.022 J | NT | 0.300 U | 0.280 U | 0.280 U | NT | 0.280 U | 0.300 U |
| Carbon disulfide | NLE | NLE | NT | 0.290 U | 0.310 U | NT | 0.260 U | 0.310 U | NT | 0.300 U | 0.280 U | 0.280 U | NT | 0.280 U | 0.049 J |
| Ethylbenzene | 1000 | 100 | NT | 0.290 U | 0.310 U | NT | 0.020 J | 0.310 U | NT | 0.300 U | 0.280 U | 0.280 U | NT | 0.280 U | 0.300 U |
| Tetrachloroethylene | 6 | 1 | NT | 0.290 U | 0.310 U | NT | 0.061 J | 0.095 J | NT | 0.076 J | 0.280 U | 0.280 U | NT | 0.280 U | 0.300 U |
| Toluene | 1000 | 500 | NT | 0.290 U | 0.310 U | NT | 0.091 J | 0.044 J | NT | 0.300 U | 0.280 U | 0.280 U | NT | 0.280 U | 0.300 U |
| Xylenes (Total) | 1000 | 67 | NT | 0.860 U | 0.930 U | NT | 0.305 J | 0.940 U | NT | 0.900 U | 0.830 U | 0.830 U | NT | 0.850 U | 0.890 U |
| Semi-Volatiles | | | | | | | | | | | | | | | |
| Anthracene | 10000 | 100 | 0.073 J | NT | 1.200 U | 1.200 U | NT | 1.200 U | 0.024 J | NT | 0.036 J | 1.200 U | 0.120 J | NT | 1.200 U |
| Benzo[a]anthracene | 4 | 500 | 0.170 J | NT | 1.200 U | 1.200 U | NT | 0.047 J | 0.083 J | NT | 0.120 J | 1.200 U | 0.280 J | NT | 1.200 U |
| Benzo[a]pyrene | 0.66 | 100 | 0.140 J | NT | 1.200 U | 1.200 U | NT | 1.200 U | 0.065 J | NT | 0.096 J | 1.200 U | 0.200 J | NT | 1.200 U |
| Benzo[b]fluoranthene | 4 | 50 | 0.230 J | NT | 1.200 U | 1.200 U | NT | 0.049 J | 0.092 J | NT | 0.150 J | 1.200 U | 0.350 J | NT | 1.200 U |
| Benzo[g,h,i]perylene | NLE | NLE | 1.200 U | NT | 1.200 U | 1.200 U | NT | 1.200 U | 1.300 U | NT | 0.056 J | 1.200 U | 1.200 U | NT | 1.200 U |
| Benzo[k]fluoranthene | 4 | 500 | 0.083 J | NT | 1.200 U | 1.200 U | NT | 1.200 U | 0.041 J | NT | 0.050 J | 1.200 U | 0.140 J | NT | 1.200 U |
| bis(2-Ethylhexyl)phthalate | 210 | 100 | 0.095 J | NT | 0.077 J | 0.081 J | NT | 1.200 U | 0.069 J | NT | 1.200 U | 0.055 J | 0.073 J | NT | 1.200 U |
| Chrysene | 40 | 500 | 0.180 J | NT | 1.200 U | 0.066 J | NT | 0.051 J | 0.084 J | NT | 0.130 J | 1.200 U | 0.290 J | NT | 1.200 U |
| Diethyl phthalate | 10000 | 50 | 1.200 U | NT | 0.056 JB | 1.200 U | NT | 0.039 JB | 0.039 JB | NT | 1.200 U | 0.050 JB | 1.200 U | NT | 1.200 U |
| Di-n-butylphthalate | 10000 | 100 | 0.800 J | NT | 0.750 J | 0.430 J | NT | 0.440 J | 0.740 J | NT | 0.440 J | 0.530 J | 0.450 J | NT | 0.290 J |
| Fluoranthene | 10000 | 100 | 0.410 J | NT | 1.200 U | 0.099 J | NT | 0.120 J | 0.190 J | NT | 0.300 J | 1.200 U | 0.610 J | NT | 1.200 U |
| Fluorene | 10000 | 100 | 1.200 U | NT | 1.200 U | 1.200 U | NT | 1.200 U | 1.300 U | NT | 1.200 U | 1.200 U | 0.051 J | NT | 1.200 U |
| Phenanthrene | NLE | NLE | 0.270 J | NT | 1.200 U | 0.054 J | NT | 0.046 J | 0.093 J | NT | 0.120 J | 1.200 U | 0.510 J | NT | 1.200 U |
| Pyrene | 10000 | 100 | 0.350 J | NT | 1.200 U | 0.140 J | NT | 0.090 J | 0.160 J | NT | 0.260 J | 1.200 U | 0.750 J | NT | 1.200 U |
| Metals | | | | | | | | | | | | | | | |
| Aluminum | NLE | NLE | 6730 B | NT | 17500 B | 13100 B | NT | 13500 B | 7950 B | NT | 16100 B | 16600 B | 12600 B | NT | 13800 B |
| Arsenic | 20 | NLE | 4.79 | NT | 10.5 | 10.1 | NT | 11.0 | 5.47 | NT | 11.1 | 11.9 | 9.38 | NT | 12.7 |
| Barium | 47000 | NLE | 25.7 B | NT | 33.4 B | 44.5 B | NT | 40.3 B | 20.4 B | NT | 47.7 B | 51.7 B | 55.1 B | NT | 44.2 B |
| Beryllium | 140 | NLE | 0.518 | NT | 1.93 | 0.895 | NT | 1.10 | 0.579 | NT | 1.50 | 1.45 | 0.582 | NT | 1.18 |
| Cadmium | 100 | NLE | 0.0799 B | NT | 0.0625 B | 0.114 B | NT | 0.0840 B | 0.0657 B | NT | 0.048 U | 0.163 B | 0.230 B | NT | 0.048 U |
| Calcium | NLE | NLE | 4540 B | NT | 890 B | 1660 B | NT | 1890 B | 1700 B | NT | 2360 B | 2500 B | 4520 B | NT | 1730 B |
| Chromium (Total) | NLE | NLE | 57.3 B | NT | 159 B | 69 B | NT | 77.5 B | 86.0 B | NT | 133 B | 106 B | 53.3 B | NT | 83.6 B |
| Cobalt | NLE | NLE | 0.658 | NT | 0.987 | 1.83 | NT | 1.06 | 0.365 U | NT | 0.983 | 0.987 | 1.95 | NT | 0.704 |
| Copper | 45000 | NLE | 11.8 B | NT | 7.86 B | 15.5 B | NT | 7.78 B | 8.78 B | NT | 10.9 B | 15.4 B | 33.2 B | NT | 7.31 B |
| Iron | NLE | NLE | 20000 | NT | 58000 | 28600 | NT | 30700 | 24600 | NT | 44900 | 42900 | 23200 | NT | 34900 |
| Lead | 800 | NLE | 43.6 | NT | 0.811 | 42.2 | NT | 10.3 | 21.3 | NT | 21.5 | 46.1 | 39.1 | NT | 9.03 |
| Magnesium | NLE | NLE | 1710 B | NT | 7130 B | 2480 B | NT | 3660 B | 1240 B | NT | 5210 B | 4850 B | 3400 B | NT | 3990 B |
| Manganese | NLE | NLE | 41.5 B | NT | 34.0 B | 99.9 B | NT | 60.5 B | 25.7 B | NT | 44.5 B | 56.4 B | 110 B | NT | 46.3 B |
| Mercury | 270 | NLE | 0.102 U | NT | 0.108 U | 0.114 U | NT | 0.137 | 0.110 U | NT | 0.109 U | 0.139 | 0.104 U | NT | 0.392 |
| Nickel (Soluble Salts) | 2400 | NLE | 4.60 | NT | 9.32 | 9.25 | NT | 7.52 | 5.05 | NT | 10.4 | 10.0 | 10.5 | NT | 7.49 |
| Potassium | NLE | NLE | 2820 | NT | 17300 | 4080 | NT | 6860 | 2780 | NT | 11500 | 10000 | 3340 | NT | 7710 |
| Sodium | NLE | NLE | 40.55 U | NT | 44.674 U | 42.119 U | NT | 38.771 U | 41.548 U | NT | 43.26 U | 44.387 U | 389 | NT | 43.522 U |
| Vanadium | 7100 | NLE | 48.1 | NT | 89.2 | 60.0 | NT | 49.1 | 71.4 | NT | 65.6 | 66.6 | 48.0 | NT | 52.9 |
| Zinc | 1500 | NLE | 47.1 | NT | 56.6 | 67.8 | NT | 70.0 | 40.7 | NT | 113 | 146 | 81.6 | NT | 43.3 |

¹ NJDEP Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

² NJDEP Non-Residential Direct Contact Soil Cleanup Criteria per NJAC 7:26D, 1999. Beryllium, Copper and Lead criteria per NJAC 7:26D, 2008.

³ NJDEP Impact to Groundwater Soil Cleanup Criteria per NJAC 7:26D, 1999.

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

mg/kg = milligram per kilogram.

Bold = Analyte was detected.

Shaded = Concentration exceeds level of concern. (Surface soil compared to NRDCSCC. Subsurface soil compared to IGWSCC when available, otherwise compared to NRDCSCC).

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.

Table 3.20-4
Fort Monmouth Phase II Site Investigation, Parcel 80
Summary of Analytical Parameters Detected in Groundwater (µg/L)

| Chemical | Sample ID: Lab ID: Date Sampled: Screened Interval (ft. bgs): Quality Criteria ¹ | Analytical Results | | |
|----------------------------|---|---|---|---|
| | | P80GW-1 7053304 12/14/2007 5-10' Result | P80GW-1 DUP 7053303 12/14/2007 5-10' Result | P80GW-2 7053305 12/14/2007 5-10' Result |
| Semi-Volatiles | | | | |
| bis(2-Ethylhexyl)phthalate | 3 | 1.33 | 1.28 U | 1.65 |
| Metals | | | | |
| Aluminum | 200 | 8510 B | 9230 B | 3490 B |
| Arsenic | 3 | 2.93 | 2.70 U | 2.70 U |
| Barium | 6000 | 65.6 | 68.0 | 55.9 |
| Beryllium | 1 | 5.67 | 5.71 | 2.02 |
| Cadmium | 4 | 1.22 | 1.18 | 0.433 |
| Calcium | NLE | 61600 B | 64300 B | 39600 B |
| Chromium (Total) | 70 | 1.68 B | 1.70 B | 1.03 B |
| Cobalt | 100* | 30.1 | 30.5 | 15.9 |
| Copper | 1300 | 11.0 | 12.9 | 6.58 |
| Iron | 300 | 1010 | 1100 | 39700 |
| Magnesium | NLE | 34000 | 34800 | 12800 |
| Manganese | 50 | 403 B | 420 B | 303 B |
| Nickel (Soluble Salts) | 100 | 67.3 B | 69.2 B | 25.9 B |
| Potassium | NLE | 14700 B | 15100 B | 6060 B |
| Selenium | 40 | 3.66 B | 5.82 B | 2.70 U |
| Sodium | 50000 | 46600 | 48200 | 25400 |
| Vanadium | NLE | 1.02 | 1.02 | 0.794 |
| Zinc | 2000 | 230 | 234 | 251 |

¹ Higher of Practical Quantitation Limits (PQLs) & Groundwater Quality Criterion (GWQC) per NJAC 7:9-6, 2005 (* Interim GWQC).

DUP = Duplicate Sample.

ft. bgs = Feet below ground surface.

B = The compound was found in the associated method blank as well as in the sample.

D = Sample was diluted.

E = The compound's concentration exceeds the calibration range of the instrument for that specific analysis.

J = Mass spec and retention time data indicate the presence of a compound however the result is less than the MDL but greater than zero.

U = The compound was analyzed for but not detected.

NT = Not tested.

NLE = No limit established.







Bold = Analyte was detected.

Shaded = Concentration exceeds Quality Criteria.


µg/L = micrograms per liter.



LEGEND

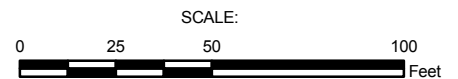
-  Geoprobe Soil Sample Location
-  Geoprobe Soil & Groundwater Sample Location
-  Road Centerline
-  Direction of Generalized Groundwater Flow derived from qualitative evaluation of surface topography, surface water features, and pre-existing IRP site groundwater potentiometric maps where available.
-  Building
-  Installation Boundary

ECP PARCEL CATEGORY DEFINITIONS

-  7 Areas that are not evaluated or require additional evaluation.

BRAC PARCEL LABEL DEFINITIONS

- 8(2)PS
- CONTAMINATION DESCRIPTION
 - HS - Hazardous Substance Storage
 - HR - Hazardous Substance Release
 - PS - Petroleum Storage
 - PR - Petroleum Release
 - (P) - Possible Release or Disposal
- CATEGORY NUMBER
- PARCEL NUMBER



Base Realignment and Closure 2005



| Sample ID | Media | Depth (ft bgs) | Compound | Concentration (ug/L) | Criteria | Criteria Value (ug/L) |
|----------------|-------|----------------|-----------|----------------------|----------|-----------------------|
| P80GW-1 | GW | 5-10' | Beryllium | 5.67 | NJ GWQC | 1 |
| P80GW-1 DUP | GW | 5-10' | Beryllium | 5.71 | NJ GWQC | 1 |

FIGURE 3.20-1
FORT MONMOUTH ECP
SITE INVESTIGATION
PARCEL 80 SAMPLE LOCATIONS
AND CONSTITUENTS OF CONCERN
 MAIN POST
 FORT MONMOUTH
 NEW JERSEY

