N60200.AR.002952
NAS CECIL FIELD, FL
5090.3a

# SUMMARY OF DIRECT PUSH TECHNOLOGY INVESTIGATION AT JET ENGINE TEST CELL AND OIL-WATER SEPARATOR 334-OW NAS CECIL FIELD FL

5/17/2001

TETRA TECH NUS INC

**SUMMARY OF DPT INVESTIGATION AT JETC AND 334 OW**
**NAS CECIL FIELD**

## FIELD OPERATIONS AND RESULTS

Groundwater levels were measured on May 8, 2001 and the resulting groundwater flow map shown by Figure 1 indicates flow to the south. In accordance with the workplan, TtNUS collected groundwater samples from 17 proposed DPT locations (CEF-JETC-DPT-GW-001 through CEF-JETC-DPT-GW-017). The first 16 sample locations were shallow sample points (approximately 8 to 12 feet below land surface (bls) and the 17$^{th}$ location was sampled at 26 to 30 feet below land surface (bls) to evaluate vertical contamination at 334 OW. The results of those first 17 sample locations led to four additional sample locations (CEF-JETC-DPT-GW-018 through CEF-JETC-DPT-GW-021). For brevity, the sample DPT identification numbers are shortened to the three-digit numbers. Figure 2 shows those sample locations and Table 1 provides the mobile laboratory analytical results.

The field screening data indicate that Groundwater Cleanup Target Levels (GCTLs) were exceeded at sample points 005, 014 and 015.

The horizontal extent of the groundwater contamination encountered at sample point 005 appears to be approximated by monitoring wells and DPT points around it. TtNUS contends that the foundation of Building 339 may be deep enough to prevent the northern plume from extending to the south of Building 339. We are in the process of locating structural diagrams to support our theory. The results of 005 along with the results of 007 and 008 appear to confirm the existence of two separate plumes.

Since sample points 014 and 015 revealed groundwater concentrations above GCTLs, additional sample points 018 through 021 (Figure 2) were also installed. Although some volatiles were detected in samples from points 020 and 021, none of the results for those four samples exceeded GCTLs.

Note that detection limits were slightly elevated at 004. The data appear to confirm that the extent of the plume around monitoring well CEF-811-30S shown on Attachment A is approximately correct and that the downgradient monitoring wells CEF-334-6S and CEF-339-1S do provide perimeter monitoring for that part of the site.

Though historical data for the northern half of the site indicate the groundwater plume has been delineated vertically, no such data existed for the southern half of the site around the Building 334 OW site. Sample point 017 indicates that petroleum concentrations from the sample for that location were below GCTLs, so the vertical extent of the plume is considered above the 26 foot interval bls.

The groundwater concentrations at the other DPTs were less than GCTLs or below detection limits. Thus, the extent of the plumes in the other parts of the site was confirmed.

Soil organic vapor analytical (OVA) data were collected since many of the proposed DPT sample points were outside the areas of soil remediation performed by the remedial action contractor. The OVA-FID data indicated no excessively contaminated soil at any of the DPT sample locations. The sample with the highest OVA-FID concentration was under 20 parts per million (corrected), and a sample was analyzed by the mobile laboratory. Table 1 shows the soil sample (CEF-JETC-DPT-SB-012-05) had no detectable concentrations.

**CONCLUSIONS and RECOMMENDATIONS**

The groundwater screening data are considered to have approximated the extent of the groundwater contamination, and it appears to have confirmed the existence of two groundwater contaminant plumes on site. Also, the DPT results at sample points 001 and 002 coupled with the south-southeast flow direction in that area indicate that an additional monitoring well is not necessary downgradient of CEF-811-08S. TtNUS considers the Golder well FL-SMW-10 will be adequate to monitor the plume downgradient of monitoring well CEF-811-08S. TtNUS recommends the installation of two shallow monitoring wells and one intermediate monitoring well to confirm these results. Figure 3 shows the proposed locations for the three monitoring wells.

As a reminder, monitoring well CEF-811-16S was recently abandoned to allow the remedial action contractor to complete soil remedial activities on site. Since that well is part of the current monitoring program, TtNUS will replace that well concurrent with the other proposed drilling. The replacement well will be named CEF-811-16SR.

In summary, the following wells are recommended:

- One shallow well at DPT sample point 005.
- One shallow well 10 feet due south of DPT sample point 020.
- One shallow well to replace CEF-811-16S to be called CEF-811-16SR.
- One intermediate well about 5 feet downgradient of CEF-334-2Sa.

Table 1
Mobile Laboratory Analytical Results
JETC and 334 O/W

| Compounds | Groundwater Cleanup Target Levels | Sample Identification | Blank | CEF-JETC-DPT-GW-001 | CEF-JETC-DPT-GW-002 | CEF-JETC-DPT-GW-003 | CEF-JETC-DPT-GW-004 | CEF-JETC-DPT-GW-005 | CEF-JETC-DPT-GW-006 | CEF-JETC-DPT-GW-007 | CEF-JETC-DPT-GW-008 | CEF-JETC-DPT-GW-009 | CEF-JETC-DPT-GW-010 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTBE | 50 | | <1 | <1 | <1 | <1 | <5 | <10 | <1 | <1 | <1 | <1 | <1 |
| Benzene | 1 | | 0.1 | <1 | <1 | <1 | <5 | <10 | <1 | <1 | <1 | <1 | <1 |
| Toluene | 40 | | 0.3 | <1 | <1 | <1 | <5 | <10 | <1 | <1 | <1 | <1 | <1 |
| Ethylbenzene | 30 | | 0.3 | <1 | <1 | <1 | <5 | <10 | <1 | <1 | <1 | <1 | <1 |
| m&p-Xylene | 20 | | 0.8 | <1 | <1 | <1 | <5 | <10 | <1 | <1 | <1 | <1 | <1 |
| o-Xylene | 20 | | 0.2 | <1 | <1 | <1 | <5 | <10 | <1 | <1 | <1 | <1 | <1 |
| Naphthalene | 20 | | 0.9 | <1 | 11.3 | <1 | <5 | 120 | <1 | <1 | <1 | <1 | <1 |
| DRO | | | | <0.5 | <0.5 | <0.5 | 1.3 | 0.7 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |

| Compounds | Groundwater Cleanup Target Levels | Sample Identification | Blank | CEF-JETC-DPT-GW-011 | CEF-JETC-DPT-GW-012 | CEF-JETC-DPT-SB-012-05 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTBE | 50 | | | <1 | <1 | <10 | | | | | | | |
| Benzene | 1 | | | <1 | <1 | <10 | | | | | | | |
| Toluene | 40 | | | <1 | <1 | <10 | | | | | | | |
| Ethylbenzene | 30 | | | <1 | <1 | <10 | | | | | | | |
| m&p-Xylene | 20 | | | <1 | <1 | <10 | | | | | | | |
| o-Xylene | 20 | | | <1 | <1 | <10 | | | | | | | |
| Naphthalene | 20 | | | <1 | <1 | <10 | | | | | | | |
| DRO | | | | <0.5 | <0.5 | <20 | | | | | | | |

Units for groundwater are in micrograms per liter, except DRO which is mg/L..
Units for soil are in micrograms per kilogram.

Table 1 (cont'd)
Mobile Laboratory Analytical Results
JETC and 334 O/W

| Compounds | Groundwater Cleanup Target Levels | Sample Identification | Blank | CEF-JETC-DPT-GW-013 | CEF-JETC-DPT-GW-014 | CEF-JETC-DPT-GW-015 | CEF-JETC-DPT-GW-016 | CEF-JETC-DPT-GW-017 | CEF-JETC-DPT-GW-018 | CEF-JETC-DPT-GW-019 | CEF-JETC-DPT-GW-020 | CEF-JETC-DPT-GW-021 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MTBE | 50 | | <1 | <1 | <2 | <10 | <1 | <1 | <1 | <1 | <1 | <1 |
| Benzene | 1 | | <1 | <1 | 3.44 | 19.5 | <1 | <1 | <1 | <1 | <1 | <1 |
| Toluene | 40 | | 0.1 | <1 | <2 | 119 | <1 | <1 | <1 | <1 | <1 | <1 |
| Ethylbenzene | 30 | | 0.1 | <1 | 47.4 | 138 | <1 | <1 | <1 | <1 | <1 | 1.73 |
| m&p-Xylene | 20 | | 0.5 | <1 | 36.8 | 324 | <1 | 1.91 | <1 | <1 | <1 | <1 |
| o-Xylene | 20 | | 0.2 | <1 | <2 | 138 | <1 | <1 | <1 | <1 | <1 | <1 |
| Naphthalene | 20 | | 1.5 | <1 | 22.1 | 255 | <1 | 3.74 | <1 | <1 | 5.81 | 5.19 |
| DRO | | | | <0.5 | <0.5 | 6.9 | <0.5 | NM | <0.5 | <0.5 | <0.5 | <0.5 |

Units for groundwater are in micrograms per liter, except DRO which is mg/L..

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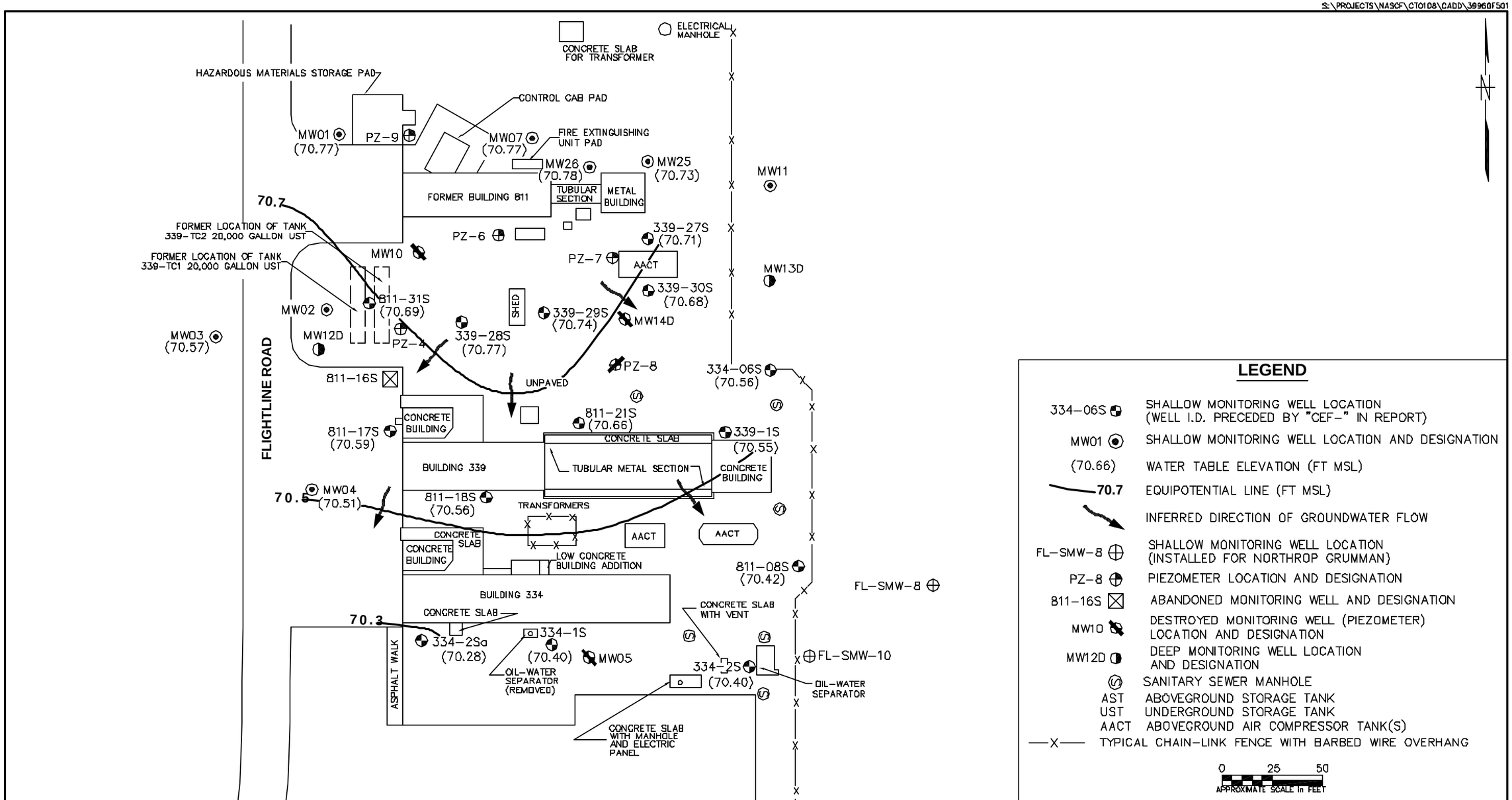


| NO. | DATE | REVISIONS | BY | CHKD | APPD | REFERENCES |
|---|---|---|---|---|---|---|
| | | | | | | |

DRAWN BY LLK DATE 5/14/01
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

GROUNDWATER ELEVATION CONTOUR MAP
MAY 8, 2001
DPT INVESTIGATION
JETC AND 334 OW
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NO. N3996
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 1 REV. 0

FORM CADD NO. SDIV_BH.DWG – REV 0 – 1/20/98

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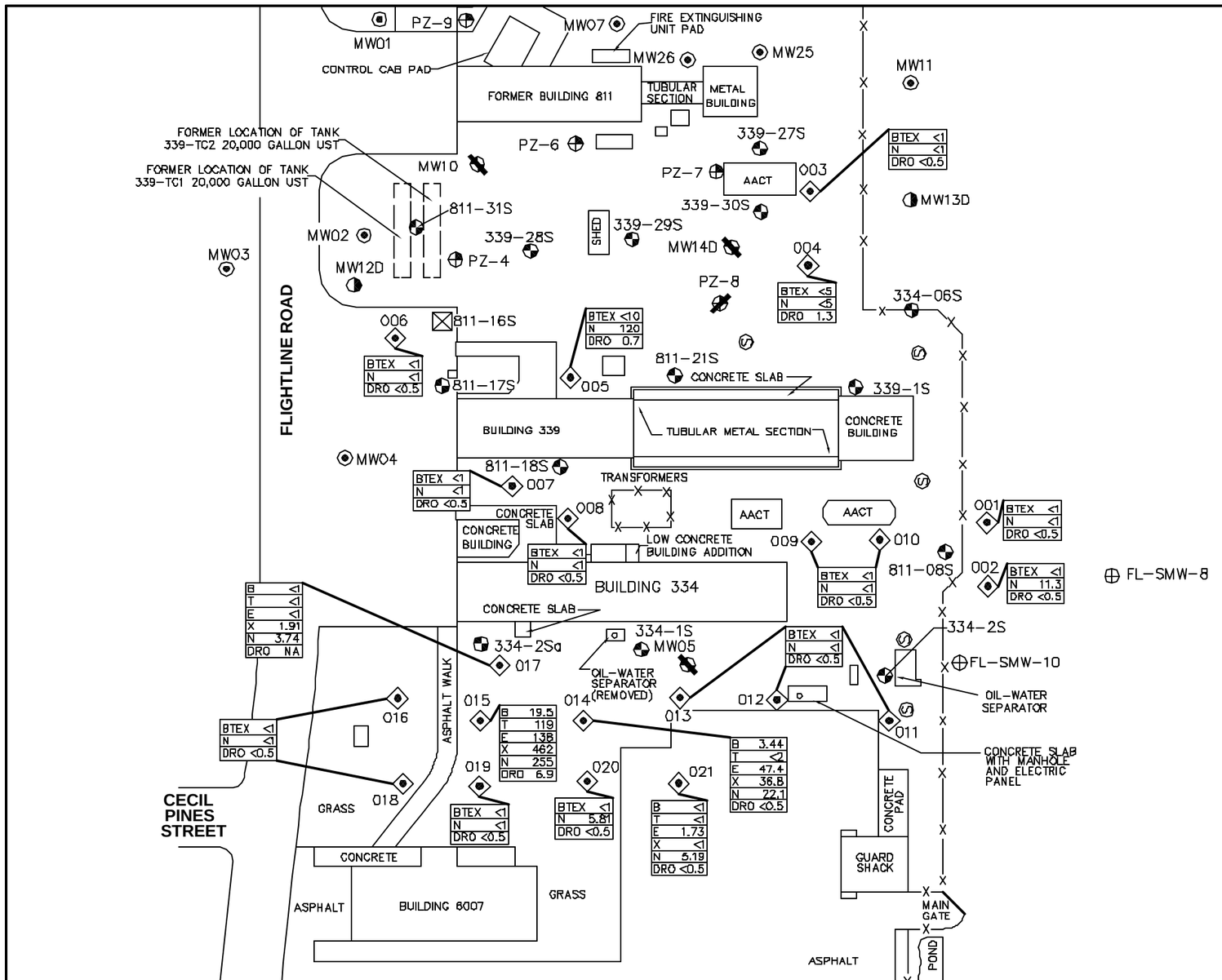


## LEGEND

004 ◇ DPT GROUNDWATER SAMPLE LOCATION/ID NO.

CONSTITUENT(S) ► BTEX <1 ◄ CONCENTRATION

| | |
|---|---|
| B | BENZENE (µg/L) |
| T | TOLUENE (µg/L) |
| E | ETHYLBENZENE (µg/L) |
| X | XYLENES (µg/L) |
| N | NAPHTHALENE (µg/L) |
| DRO | DIESEL RANGE ORGANICS (mg/L) |

NA = NOT ANALYZED
(µg/L) = MICROGRAMS PER LITER
(mg/L) = MILLIGRAMS PER LITER

| | |
|---|---|
| 334-06S | SHALLOW MONITORING WELL LOCATION (WELL I.D. PRECEDED BY "CEF-" IN REPORT) |
| MW01 | SHALLOW MONITORING WELL LOCATION AND DESIGNATION |
| FL-SMW-8 | SHALLOW MONITORING WELL LOCATION (WELL INSTALLED FOR NORTHROP GRUMMAN) |
| PZ-8 | PIEZOMETER LOCATION AND DESIGNATION |
| 811-16S | ABANDONED MONITORING WELL AND DESIGNATION |
| MW10 | DESTROYED MONITORING WELL LOCATION AND DESIGNATION |
| MW12D | DEEP MONITORING WELL LOCATION AND DESIGNATION |
| | SANITARY SEWER MANHOLE |
| AST | ABOVEGROUND STORAGE TANK |
| UST | UNDERGROUND STORAGE TANK |
| AACT | ABOVEGROUND AIR COMPRESSOR TANK(S) |
| —X— | TYPICAL CHAIN-LINK FENCE WITH BARBED WIRE OVERHANG |

0 25 50
APPROXIMATE SCALE in FEET

| NO. | DATE | REVISIONS | BY | CHKD | APPD | REFERENCES |
|---|---|---|---|---|---|---|
| | | | | | | |

DRAWN BY LLK DATE 5/15/01
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

DPT GROUNDWATER ANALYTICAL RESULTS
MAY 9 and 10, 2001
JETC AND 334 OW
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NO. N3996
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 2 REV. 0

FORM CADD NO. SDIV_BH.DWG – REV 0 – 1/20/98

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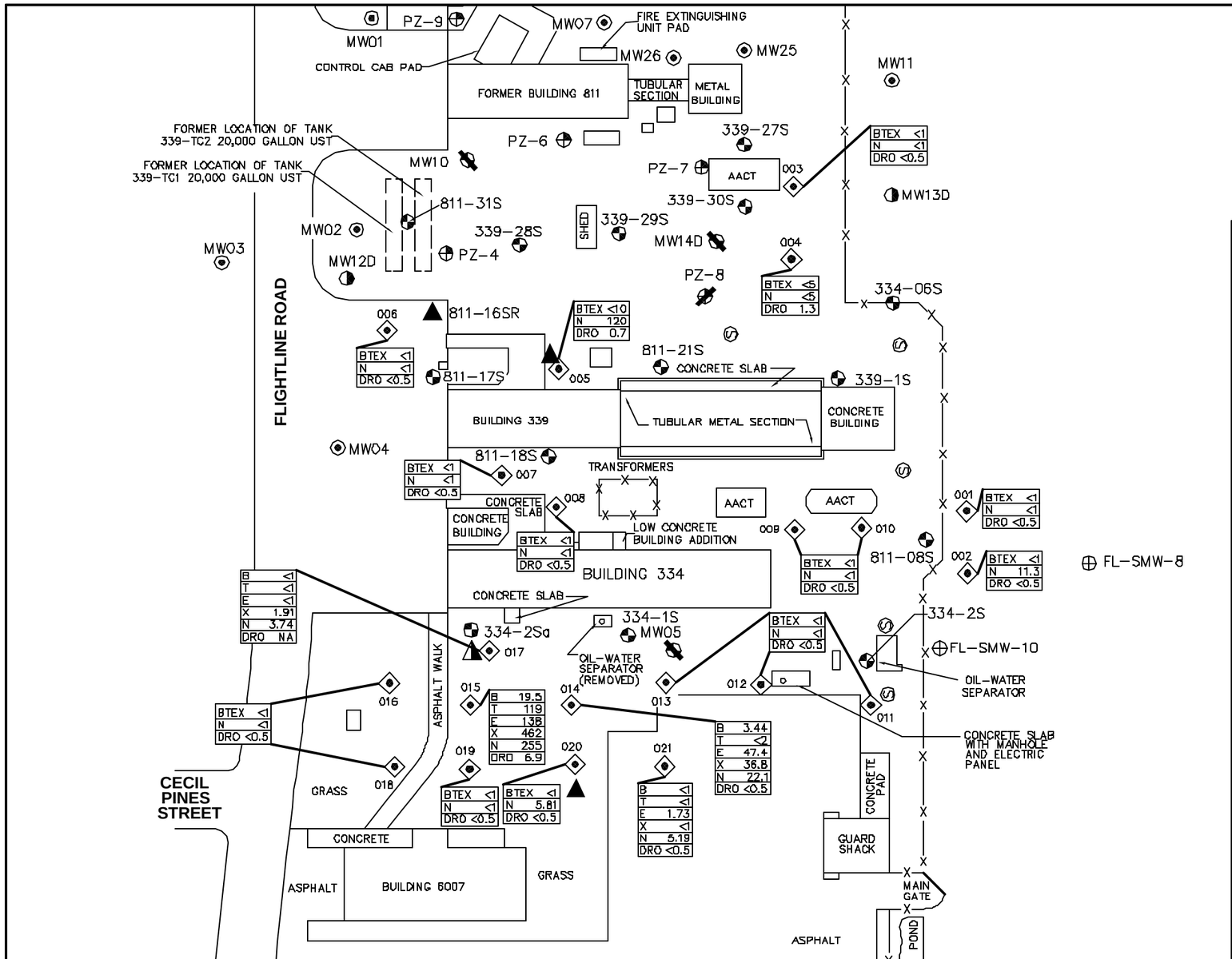


## LEGEND

▲ PROPOSED SHALLOW MONITORING WELL

◭ PROPOSED INTERMEDIATE MONITORING WELL

004 ◇ DPT GROUNDWATER SAMPLE LOCATION/ID NO.

CONSTITUENT(S) ► BTEX <1 ◄ CONCENTRATION

| | |
|---|---|
| B | BENZENE (µg/L) |
| T | TOLUENE (µg/L) |
| E | ETHYLBENZENE (µg/L) |
| X | XYLENES (µg/L) |
| N | NAPHTHALENE (µg/L) |
| DRO | DIESEL RANGE ORGANICS (mg/L) |

NA = NOT ANALYZED
(µg/L) = MICROGRAMS PER LITER
mg/L = MILLIGRAMS PER LITER

| | |
|---|---|
| 334-06S | SHALLOW MONITORING WELL LOCATION (WELL I.D. PRECEDED BY "CEF-" IN REPORT) |
| FL-SMW-8 | SHALLOW MONITORING WELL LOCATION (WELL INSTALLED FOR NORTHROP GRUMMAN) |
| PZ-8 | PIEZOMETER LOCATION AND DESIGNATION |
| MW01 | SHALLOW MONITORING WELL LOCATION AND DESIGNATION |
| MW10 | DESTROYED MONITORING WELL LOCATION AND DESIGNATION |
| MW12D | DEEP MONITORING WELL LOCATION AND DESIGNATION |
| | SANITARY SEWER MANHOLE |
| AST | ABOVEGROUND STORAGE TANK |
| UST | UNDERGROUND STORAGE TANK |
| AACT | ABOVEGROUND AIR COMPRESSOR TANK(S) |
| —X— | TYPICAL CHAIN-LINK FENCE WITH BARBED WIRE OVERHANG |

0 25 50
APPROXIMATE SCALE in FEET

| NO. | DATE | REVISIONS | BY | CHKD | APPD | REFERENCES |
|---|---|---|---|---|---|---|
| | | | | | | |

DRAWN BY LLK DATE 5/16/01
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

PROPOSED MONITORING WELL LOCATIONS
JETC AND 334 OW
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NO. N3996
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 3 REV. 0

FORM CADD NO. SDIV_BH.DWG – REV 0 – 1/20/98

**ATTACHMENT A**

**JETC GROUNDWATER CONCENTRATION MAP**

**FROM GROUNDWATER MONITORING REPORT**

**DATED JULY 2000**

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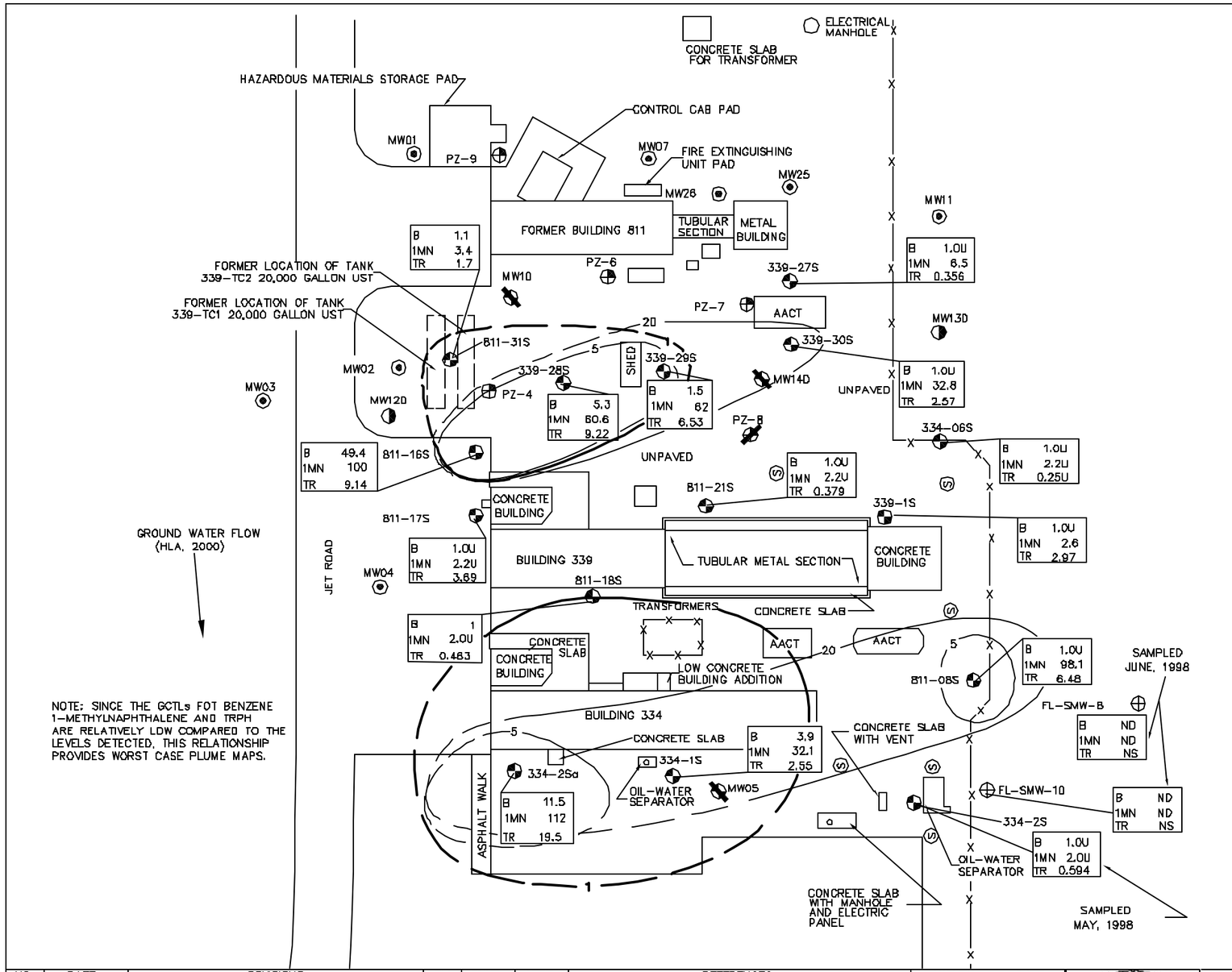


NOTE: SINCE THE GCTLs FOT BENZENE 1-METHYLNAPHTHALENE AND TRPH ARE RELATIVELY LOW COMPARED TO THE LEVELS DETECTED, THIS RELATIONSHIP PROVIDES WORST CASE PLUME MAPS.

## LEGEND

| | | GCTL |
|---|---|---|
| BENZENE | B 5.3 | 1 |
| 1-METHYLNAPHTHALENE | 1MN 3.4 | 20 |
| TRPH | TR 4.52 | 5 |
| UNDETECTED | U | |
| NOT DETECTED | ND | |
| NOT SAMPLED | NS | |

ANALYTICAL VALUES REPORTED IN MICROGRAMS PER LITER (µg/L) EXCEPT TRPH REPORTED IN MILLIGRAMS PER LITER (mg/L)

—5— TRPH GCTL ISOCONTOUR IN mg/L (DASHED WHERE INFERRED)

—1— BENZENE GCTL ISOCONTOUR IN µg/L (DASHED WHERE INFERRED)

—20— 1-METHYLNAPHTHALENE ISOCONTOUR (DASHED WHERE INFERRED)

334-06S SHALLOW MONITORING WELL LOCATION (WELL I.D. PRECEDED BY "CEF-" IN REPORT)

FL-SMW-8 SHALLOW MONITORING WELL LOCATION (WELL INSTALLED FOR NORTHROP GRUMMAN)

PZ-8 PIEZOMETER LOCATION AND DESIGNATION

SANITARY SEWER MANHOLE

MW01 SHALLOW MONITORING WELL LOCATION AND DESIGNATION

MW10 DESTROYED MONITORING WELL LOCATION AND DESIGNATION

MW12D DEEP MONITORING WELL LOCATION AND DESIGNATION

AST ABOVEGROUND STORAGE TANK

UST UNDERGROUND STORAGE TANK

AACT ABOVEGROUND AIR COMPRESSOR TANK(S)

—X— TYPICAL CHAIN-LINK FENCE WITH BARBED WIRE OVERHANG

0 25 50
APPROXIMATE SCALE in FEET

| NO. | DATE | REVISIONS | BY | CHKD | APPD | REFERENCES |
|---|---|---|---|---|---|---|
| | | | | | | |

DRAWN BY CW DATE 8/17/00
CHECKED BY DATE
COST/SCHED-AREA
SCALE AS NOTED

CONTAMINANT PLUME MAP
JULY 2000
QUARTERLY MONITORING REPORT
JET ENGINE TEST CELL
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NO. N0394
APPROVED BY DATE
APPROVED BY DATE
DRAWING NO. FIGURE 5 REV. 0

FORM CADD NO. SDIV_BH.DWG – REV 0 – 1/20/98