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TECHNICAL MEMORANDUM FOR INTERIM REMEDIAL ACTION ACTIVITIES AND
RECOMMENDATIONS FOR MONITORING WELLS AT STUDY AREA 36 NTC ORLANDO FL
1/16/2001
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Summary of IRA Activities and Recommendations for Monitoring Well Network, SA 36, NTC, Orlando

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DATE: January 16, 2001

This technical memorandum (TM) presents the activities related to the vegetable oil injection enhanced biodegradation Interim Remedial Action (IRA) at Study Area (SA) 36 at Orlando Naval Training Center (NTC). This work is being performed under the Remedial Action Contract No. N62467-98-D-0995, Contract Task Order (CTO) No. 0017 at Naval Training Center (NTC) Orlando. This TM also includes recommendations for the list of monitoring wells for inclusion in the quarterly groundwater sampling.

Background

SA 36 is located south of Langley Street and west of Grace Hopper Avenue on the Main Base. The areas of the site east and west of Building 2121 were used to store a variety of items, including pipes, fire hydrants, and bricks. Building 2122 was the Paint Shop. Paints and paint thinner were stored inside the building. A flammable materials storage cabinet was located at the north end of the building.

An initial site screening investigation was conducted by HLA in 1997. The results of the initial screening investigation detected concentrations of metals, total recoverable petroleum hydrocarbons (TRPH), and polynuclear aromatic hydrocarbons (PAHs) in soil samples exceeding screening criteria. The investigation also detected tetrachloroethene (PCE) and trichloroethene (TCE) in groundwater samples above screening criteria.

Subsequently, the Orlando Partnering Team (OPT) requested that HLA perform supplemental screening investigations to evaluate and characterize the volatile organic compound (VOC) contamination at the site.

The maximum TCE concentration detected in a monitoring well at the site was 300 ug/l. The results of the groundwater investigation at the site indicate that TCE and/or PCE concentrations in groundwater exceed the GCTL in an area of approximately 5,000 sq. ft. in the North Storage Area. Chlorinated solvent detections exceeded screening criteria in the 35 ft bls interval.

As a result of the PCE and TCE contamination detected at the site, the OPT requested that CCI implement an IRA at the site consisting of enhanced bioremediation using vegetable oil.

Implementation of IRA

In November 2000, fifteen vegetable oil injection points and seven downgradient monitoring wells were installed using hollow stem auger (HSA) drilling methods. The new wells and injection points were placed around the highest TCE concentration areas at the site, wells OLD-36-07A, OLD-36-08B, OLD-36-09C and OLD-36-10B.

Hydraulic conductivity were measured at specified monitoring wells using slug-in (falling head) or slug-out (rising head) tests. The hydraulic conductivity or slug testing were performed in accordance with the procedures outlined in the *POP* (ABB-ES 1997). Data from the hydraulic conductivity testing will be included in the Construction Completion Report to be submitted to the OPT in March 2001.

Upon completion of the hydraulic conductivity testing, groundwater samples were collected from fifteen monitoring wells as part of a baseline sampling event in December 2000. The baseline groundwater data was evaluated, and the vegetable oil injection began in January 2000. Approximately 50 to 75 gallons of vegetable oil (specifically food-grade soybean oil) was injected into each of the fifteen new injection points.

Groundwater Evaluation

The baseline groundwater data for SA-36 has been reviewed and evaluated. This technical memorandum serves to document the monitoring wells chosen for the treatment efficiency quarterly monitoring activities. The SA-36 Work Plan (CCI 2000) states that groundwater sampling will be conducted at 2, 6, 9 and 12 months after injection. The first groundwater sampling event (2 months after injection) will occur in mid-March.

Three figures attached to this technical memorandum show the locations of the new injection points and monitoring wells in each groundwater zone. The analytical laboratory data from the baseline sampling event (December 2000) is also attached as a Table for reference.

The groundwater sampling during the treatment efficiency monitoring will be sampled in accordance with the Work Plan for Enhanced Biodegradation IRA at SA-36 (CCI 2000). The thirteen monitoring wells chosen for the treatment efficiency quarterly monitoring, and rationale for selection, are included in the table below.

<u>SA-36 Well ID</u>	<u>Rationale</u>
OLD-36-06A	Source area
OLD-36-07A	Source area
OLD-36-26A	Downgradient
OLD-36-27A	Downgradient
OLD-36-08B	Source area
OLD-36-28B	Downgradient
OLD-36-29B	Downgradient
OLD-36-10B	Source area
OLD-36-11C	Downgradient/Next lower zone
OLD-36-30C	Downgradient
OLD-36-31C	Downgradient
OLD-39-32C	Upgradient
OLD-36-09C	Source area

Analytical Laboratory Data (unvalidated)

Site Location: SA-36, NTC, Orlando, FL

Project number: 152044.32.12.01.08

Date: January 16, 2001



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Station ID	Date	Parameter													
		Alkalinity (mg/L)	Bromide (mg/L)	Chloride (mg/L)	Nitrate/Nitrite Nitrogen (mg/L)	FL-PRO (mg/L)	TDS (mg/L)	TOC (mg/L)	VOC - cis-1,2-Dichloroethene (ug/L)	VOC - Tetrachloroethene PCE (ug/L)	VOC - Trichloroethene TCE (ug/L)	Methane (ug/ml)	Ethane (ug/ml)	Ethene (ug/ml)	Volatile Fatty Acids (mg/L)
OLD-36-06A	12/04/2000	1.5	ND	4.20	0.33	ND	110	10.70	ND	ND	14	ND	ND	ND	ND
OLD-36-07A	12/01/2000	16	ND	6.20	0.2	0.44 JB	110	12.50	ND	ND	59	ND	ND	ND	ND
OLD-36-26A	12/01/2000	26	ND	6.50	1.2	0.57 JB	260	46.60	ND	ND	15	ND	ND	ND	ND
OLD-36-27A	12/01/2000	160	ND	6.70	ND	0.49 JB	230	8.36	1.1 J	ND	79	ND	ND	ND	ND
OLD-36-08B	12/04/2000	24	ND	7.00	ND	ND	100	3.55	ND	ND	97	0.090	ND	ND	ND
OLD-36-10B	12/04/2000	25	ND	6.40	ND	ND	130	15.70	2.3 J	1.7 J	4.5 J	ND	ND	ND	ND
OLD-36-28B	12/01/2000	300	ND	8.70	ND	0.40 JB	920	90.50	0.54 J	ND	85	0.012	ND	ND	ND
OLD-36-29B	12/04/2000	27	ND	14.00	ND	ND	180	5.18	1.9 J	190	ND	ND	ND	ND	ND
OLD-36-09C	12/05/2000	280	ND	8.90	ND	0.35 JB	390	19.80	24	ND	300	ND	ND	ND	ND
OLD-36-11C	12/06/2000	14	ND	6.30	ND	0.34 J	85	8.77	3.5 J	1.3 J	6.4	ND	ND	ND	ND
OLD-36-12C	12/05/2000	17	ND	5.70	ND	0.44 JB	300	22.70	3.2 J	ND	9	ND	ND	ND	ND
OLD-36-23C	12/06/2000	25	ND	3.70	ND	0.28 J	600	15.00	0.81 J	14	3.2 J	0.037	ND	ND	ND
OLD-36-30C	11/29/2000	41	ND	9.40	ND	0.30 JB	140	6.21	ND	ND	37	ND	ND	ND	ND
OLD-36-31C	12/05/2000	18	ND	8.90	ND	0.40 JB	130	6.41	ND	ND	14	ND	ND	ND	ND
OLD-36-32C	12/06/2000	83	ND	7.90	ND	ND	620	18.50	ND	ND	17	ND	ND	ND	ND

Notes:

J = Estimated values where the compounds are present at concentrations that are less than the quantitation limit but above the method detection limits.

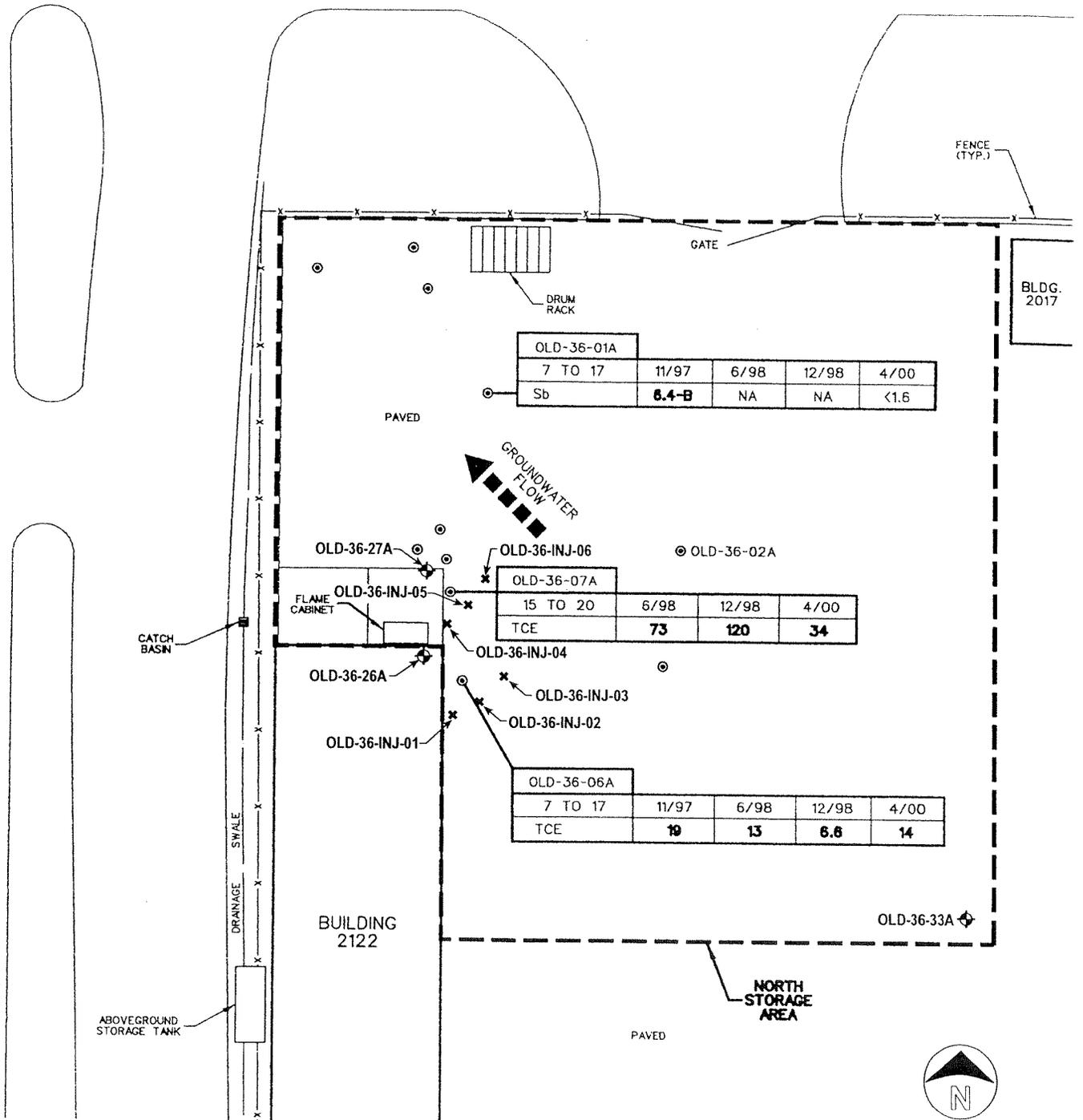
JB = Analyte was detected in the Method Blank at a concentration above the method detection limit, and the concentrations in the samples were less than 10 times the concentration in the Method Blank. The results should be considered estimated due to the Method Blank contamination.

ND = not detected/reported above laboratory detection limit

LEGEND

- ⊙ Monitoring Well
- ⊕ "A" Monitoring Well
- * Injection Point

LANGLEY STREET



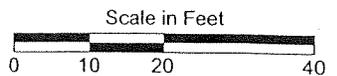
OLD-36-01A				
7 TO 17	11/97	6/98	12/98	4/00
Sb	6.4-B	NA	NA	<1.6

OLD-36-07A			
15 TO 20	6/98	12/98	4/00
TCE	73	120	34

OLD-36-06A				
7 TO 17	11/97	6/98	12/98	4/00
TCE	19	13	6.6	14

Source: Tetra Tech NUS

STUDY AREA 36 - MAIN BASE

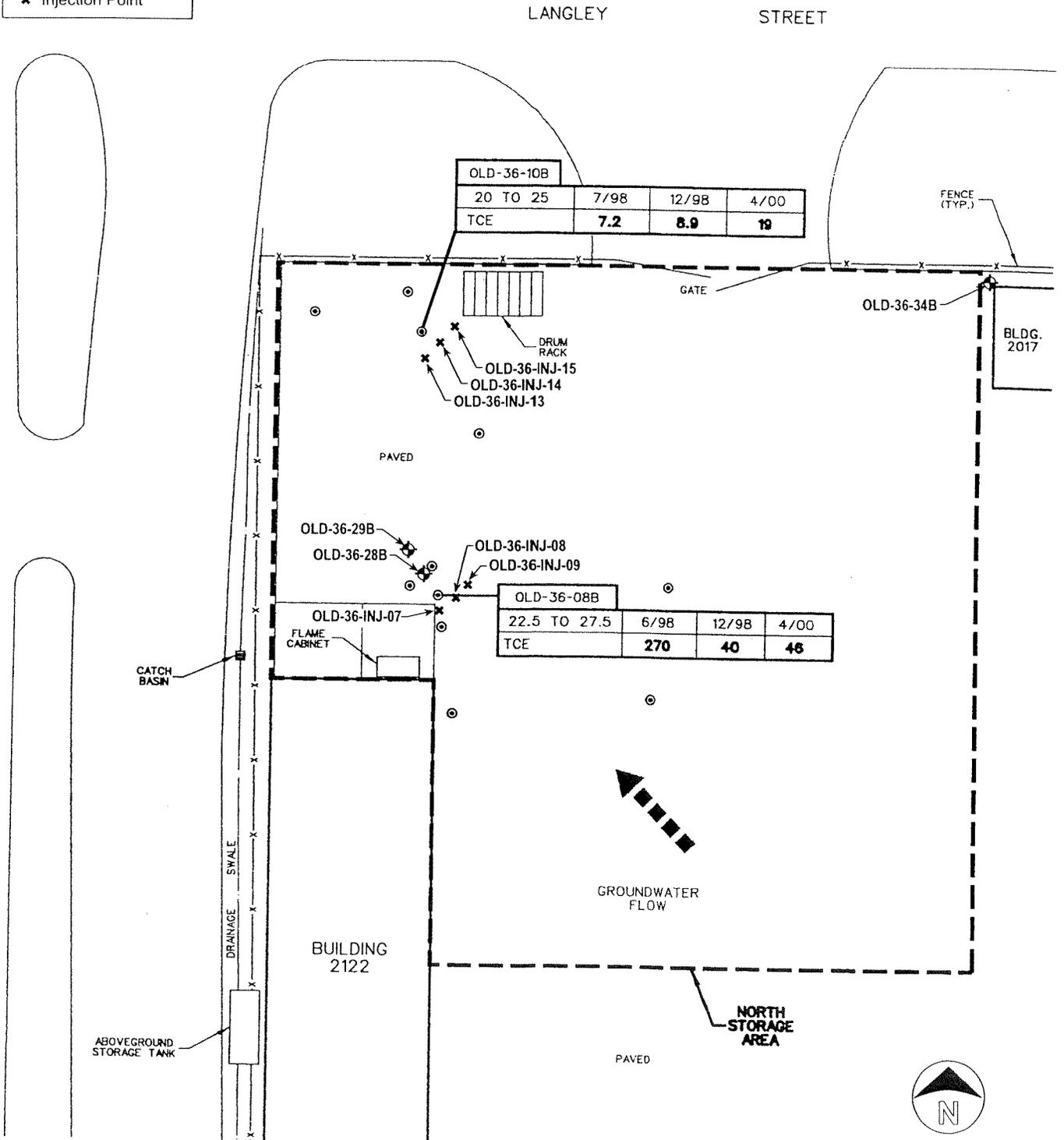


Injection Point and
Monitoring Well Locations for the "A" Zone
Naval Training Center,
Orlando, Florida

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LEGEND

- ⊙ Monitoring Well
- ⊕ "B" Monitoring Well
- * Injection Point

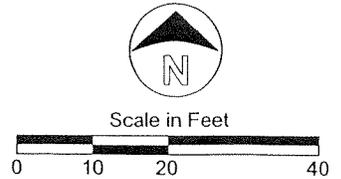


OLD-36-10B			
20 TO 25	7/98	12/98	4/00
TCE	7.2	8.9	19

OLD-36-08B			
22.5 TO 27.5	6/98	12/98	4/00
TCE	270	40	46

Source: Tetra Tech NUS

STUDY AREA 36 - MAIN BASE

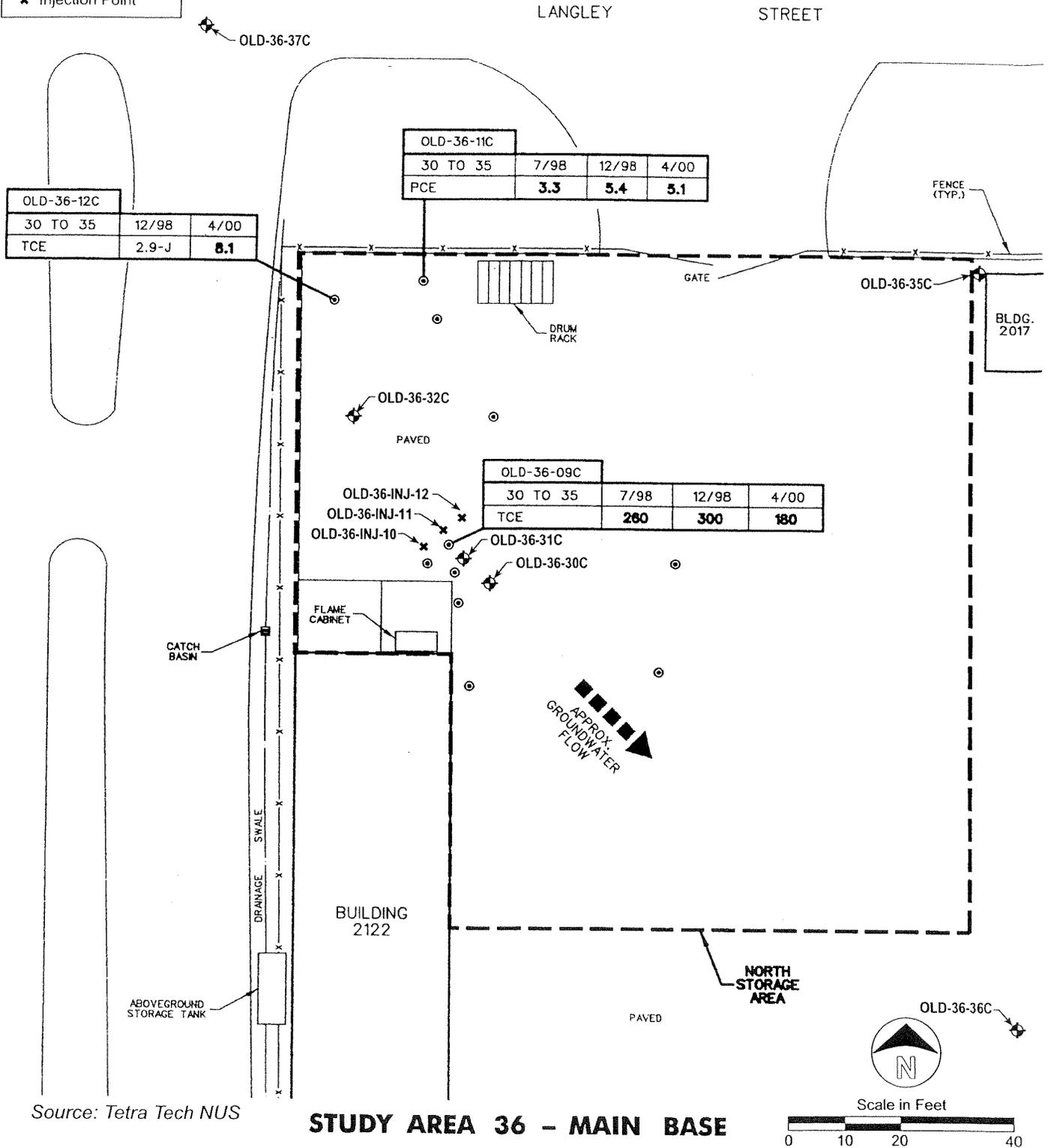


Injection Point and
Monitoring Well Locations for the "B" Zone
Naval Training Center,
Orlando, Florida

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LEGEND

- ⊙ Monitoring Well
- ⊕ "C" Monitoring Well
- * Injection Point



STUDY AREA 36 - MAIN BASE



Injection Point and
Monitoring Well Locations for the "C" Zone
Naval Training Center,
Orlando, Florida

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