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NAS CECIL FIELD, FL
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FINAL REMOVAL ACTION DESIGN PACKAGE FOR OPERABLE UNIT 5 (OU 5) SITE 49 FORMER SKEET RANGE NAS CECIL FIELD FL

5/1/2005

TETRA TECH NUS INC

REMOVAL ACTION DESIGN PACKAGE
FOR
OPERABLE UNIT 5, SITE 49 – FORMER SKEET RANGE

1.0 PURPOSE

The purpose of this removal action design package is to present the information necessary to support the decision to excavate additional soil and implement the removal action at Site 49 to achieve unrestricted reuse of the site.

2.0 SITE BACKGROUND

2.1 Site Description

OU 5, Site 49 consists of the former skeet range (Facility 804) located in the area known as the Main Base of NAS Cecil Field (Figure 2-1). The site is located at the western end of Lake Newman Street (formerly 6th Street), at the junction of Perimeter Road. The site is an unpaved and undeveloped area that has been cleared; it covers about 4.5 acres (Figure 2-2). The open area is surrounded by wooded areas, although the area to the northeast is cleared around Lake Newman. The wooded area south of the range (downrange) has sparse vegetation compared to the adjacent wooded areas. The area is undeveloped and the reuse plan identifies the area for Park/Buffer uses.

2.2 Site History

The area known as OU 5, Site 49 was used as a skeet shooting range from 1965 to 1998. Prior to 1965, historic aerial photographs show that the area was unused and undeveloped. Building 807 was constructed in 1971. The site was identified in the Environmental Baseline Survey (EBS) (ABB-ES, 1994) as Potential Source of Contamination (PSC) 49. TtNUS performed field investigations for the assessment of surface and subsurface soil and groundwater at PSC 49 from June 1999 to May 2001. Based on the extent and type of contamination, the investigation was moved into the CERCLA program, and the area was identified as Site 49 and grouped into Operable Unit 5.

2.3 Previous Sampling

Benzo(a)pyrene (BaP) and lead were detected at concentrations in excess of the Florida Department of Environmental Protection (FDEP) residential soil cleanup target levels (SCTLs). Also detected were a number of other carcinogenic polynuclear aromatic hydrocarbons (cPAHs). Since BaP accounted for

most of the cPAH exceedances, the Base Realignment and Closure (BRAC) Cleanup Team (BCT) decided that these cPAHs should be considered as a family of compounds and quantified in terms of BaP equivalents (BaPEqs). The BCT reviewed soil analytical results for Site 49, and a decision was made to delineate the extent of contaminated soil. The limits of contamination were determined and the results provided in the Engineering Evaluation / Cost Analysis (EE/CA) Report (TtNUS, 2002b).

2.4 Ninety-five Percent UCL Calculation

The site was divided into 1/2-acre exposure units in order to evaluate the site for residential use. A statistical evaluation was conducted to determine the areas requiring removal to achieve an exposure concentration less than their respective residential SCTLs. The exposure concentration is represented best by the 95% UCL of the mean for BaPEq and by the average concentration for lead.

The BCT decided that soil samples with contaminant concentrations greater than three times the FDEP residential SCTLs or greater than the leachability criteria would be excavated. Excavation of these soils ensures protection of human health and groundwater. Using the UCL method, some soil samples remaining on site after excavation have concentrations exceeding the residential SCTLs, but the exposure unit concentrations were determined to be less than the residential SCTL.

Using an iterative statistical process, the concentration above which soil must be removed to achieve a UCL for BaPEq or an average concentration for lead less than or equal to the FDEP residential SCTLs are determined and identified as the Pickup Level Concentrations. In theory, the sampling locations with the highest contaminant concentrations would be excavated and replaced with clean fill. The excavated sample points were assumed to be replaced with clean fill with a contaminant concentration equal to one-half the detection limit. If the UCL for BaPEq and the average for lead are less than the residential SCTLs, protection of human health is ensured.

For Site 49, the UCL for BaPEq and average for lead are less than the residential SCTLs when samples with concentrations greater than three times their respective SCTLs are removed. In addition, samples with concentrations greater than leachability criteria are to be excavated. Therefore, the pickup levels for contaminants of concern at Site 49 are the lesser of the leachability criteria and three times the residential criteria.

Contaminant	Leachability Criteria	Residential Criteria	Pickup Level
BaPEq	8,000 μg/kg	100 μg/kg	300 μg/kg
Lead	NC	400 mg/kg	1,200 mg/kg

NC = No criterion.

An excavation of areas exceeding the pickup level was conducted at Site 49 on August 8 to 29, 2002 and November 13 to December 31, 2003 by the Remedial Action Contractor (RAC). Information pertaining to the excavation was provided in the Source Removal Report (SRR) submitted by CH2MHill on May 10, 2004 (CH2MHill, 2004). FDEP provided comments on the SRR in a letter dated June 30, 2004 indicating that they concurred with the removal activities, however they could not concur that the removal activities remediated the site to an extent that would be protective for potential future residential use based on their evaluation of the 95% calculation.

3.0 ADDITIONAL INVESTIGATION

Based on FDEP's concerns regarding their subsequent review of the 95% calculation, it was proposed that an additional investigation would be collected in the area of the sample locations identified as a concern by FDEP. The additional sampling was appropriate because the removal action was conducted in approximately the same area as the samples of concern and site activities may have impacted these locations.

In July 2004, five sample locations were re-sampled to verify current conditions (CEF-P49-SS-108-01R, 203-01R, 204-01R, 206-01R, and 401-01R). As shown in Figure 3-1, sample CEF-P49-SS-108 is located within the UCL one-half acre cell identified as Cell 15; samples CEF-P49-SS-203 and CEF-P49-SS-204 are within Cell. 18; samples numbers CEF-P49-SS-206 and CEF-P49-SS-401 are located in Cell 19 and 20, respectively. The analytical results of this resampling effort are summarized in Table 3-1. The results indicated that the BaPEq concentration for Cell 15 (sample CEF-P49-SS-108 was reduced from 112 ug/kg to 9.5 ug/kg. Cell 18 identified a reduction at sample location CEF-P49-SS-203 from 195 ug/kg to 9 ug/kg BaPEq and an increase at sample location CEF-P49-SS-204 from 132 ppb to 392 ppb BaPEq. Cell 19 identified an increase in BaPEq from 187 ug/kg to 298 ug/kg at sample location CEF-P49-SS-206. Cell 20 identified a decrease in BaPEq concentrations at sample location CEF-P49-SS-401 from 170 ug/kg to 9.5 ug/kg. Based on these results, it was determined that no further investigation was required in Cells 15 and 20, however Cells 18 and 19 would need to be evaluated further.

It was agreed upon at the July 2004 BCT meeting (Minute No. 2109) that a composite sample in the location CEF-P49-SS-204 would be collected to further evaluate Cell 18 (Decision No. 660) and that FDEP would further review Cell 19 using the existing available data (Decision No. 659). Based on these decisions, a composite sample was collected in September 2004 from location CEF-P49-SS-204. This sample was comprised of five grab samples, one from the center (CEF-P49-SS-204) and one two feet in each direction north, east, south, and west. Each grab sample was collected 0-2 feet below ground surface. The result of the composite sample was presented at during the September 2004 BCT meeting (Minute Number 2125). The composite sample result was 515 ug/kg BaPEq. FDEP reported that further

evaluation of the data at Cell 19 and evaluation of various options did not reconcile the exceedance. It was agreed that additional sampling would be conducted in both Cells 18 and 19 (Decision No. 665).

In October 2004, fourteen additional samples were collected in Cells 18 and 19 to horizontally delineate the contaminated areas associated with original soil samples locations CEF-P49-SS-204 and CEF-P49-SS-206. CEF-P49-SS-801 thru CEF-P49-SS -804 were collected 5 feet in each direction from CEF-P49-SS-204 and CEF-P49-SS-805 thru CEF-P49-SS-808 were collected 5 feet in each direction from CEF-P49-SS-206. Samples CEF-P49-SS-809 thru CEF-P49-SS-811 were collected 15 feet in each direction (except to the south because of the previously excavated area) from CEF-P49-SS-204 and samples CEF-P49-SS-812 thru CEF-P49-SS-814 were collected 20 feet in each direction, except to the south, from CEF-P49-SS-206. As identified on the tag map (Figure 3-2), BaPEq concentrations above the pickup levels were observed in the samples collected 5 feet from the original sample locations. Several of the samples collected 20 feet from the original samples also had detections above the pickup level for BaPEq.

Based on the results obtained, it was anticipated that an additional soil removal action would need to be conducted. Therefore, during the November 2004 BCT meeting it was agreed that a vertical delineation sample would be collected from each area of anticipated excavation. The samples were to be collected at the sample location exhibiting the highest BaP concentrations (Minute Number 2149). In November 2004, two samples were collected from a depth of two feet below the ground surface. The first sample was collected from the sample location CEF-P49-SS-803 which had a BaP concentration of 930 ug/kg and the second sample was collected from the other proposed excavation area at sample location CEF-P49-SS-812 that had a BaP concentration of 18,500 ug/kg. Both vertical delineation samples were below the BaPEq pickup criteria. BaPEq sample concentrations for the vertical delineation samples CEF-P49-SS-803-02 and CEF-P49-SS-812-02 were 10.5 ug/kg and 9 ug/kg, respectively.

During the April 2005 BCT Meeting, FDEP reviewed the draft version of this report and indicated that the proposed excavation was acceptable; however, they had a concern regarding the evaluation of Cell 20. When Cell 20 was evaluated using the FLUCL program and a half-acre exposure unit, the 95% UCL was below the action level for BaP of 100 ug/kg and therefore no additional excavation was required. However, when Cell 20 was divided into quarter-acre units, the exposure concentrations within the exposure unit exceeded the action level. A review of the data indicated that Sample CEF-P49-SS-304 was below the pickup level when evaluated using a half-acre exposure unit; however, it was above the pickup level when evaluated using one-quarter acre exposure units. It was agreed at the BCT meeting (meeting minute number 2202, decision number 686) that this sample location would be re-sampled to verify the result. On May 3, 2005 sample CEF-P49-SS-304R-01 was collected at a depth of 0 to 1 foot bgs at the same location as CEF-P49-SS-304. The sample was analyzed for PAHs. The analytical

results obtained were all below the detection limits; therefore, no further action at this sample location is required.

4.0 DETERMINING THE LIMITS OF EXCAVATION

Using all the data collected to date, a proposed limits of excavation was established. Two of the samples used to delineate the limits of excavation, CEF-P49-SS-811 and CEF-P49-SS-809, exceeded the BaPEq FDEP residential criteria of 100 ug/kg. At this point a sufficient number of samples are located in the one-quarter acre cell comprising these two exceedences, therefore calculation of the 95% UCL using the University of Florida model (FL UCL) was deemed appropriate. The calculation was conducted assuming an excavation would be performed in the areas shown on Figure 3-2 and the sample results within the excavation would be replaced with clean backfill material having a conservative BaPEq concentration of 50 ug/kg. The FL UCL calculation identified a BaPEq of 78.58 ug/kg, as shown in Figure 3-3, which is below the FDEP residential criteria of 100 ug/kg. These results were presented at the February 2005 BCT meeting (minute no. 2184). It was agreed that the proposed excavation would achieve unrestricted reuse and No Further Action for soils would be required at Site 49. This was confirmed during the April 2005 BCT meeting.

5.0 GUIDANCE NOTES FOR EXCAVATION

This information is provided for general guidance purposes only. The approximate areas of excavation are shown on Figure 5-1. The actual extent of excavation will be defined by Tetra Tech NUS, Inc. (TtNUS) with white spray-down paint (or equivalent) prior to the execution of the removal action. The removal action and disposal of the soil will be conducted in a manner that complies with all state, local, and federal regulations, including established quality assurance/quality control (QA/QC) protocols provided in the U.S. EPA Region 4 Environmental Investigations Standard Operating Procedure and Quality Assurance Manual (EISOPQAM) (U.S. EPA, 1996).

This soil removal action is a continuation of the soil removal action conducted in accordance with the Action Memorandum submitted May 2002 (TtNUS, 2002a). TtNUS conducted a Gopher Tortoise Burrow Survey on April 29, 2002. The locations are identified on Figure 5-2. The survey identified that no burrows were located within the footprint of the excavation area; therefore, a permit to conduct the removal action was not required. An evaluation of the site will be conducted to confirm no Gopher Tortoise Burrows are within the limits of proposed additional excavation. If borrows are identified within a radius of 25 feet of the proposed excavation, then a formal survey will need to be conducted. No wetland areas were identified in the area of the proposed excavation.

The Remedial Action Contractor (RAC) will be responsible for the following:

- The schedule and methods of excavation.

- All aspects of work site health and safety.

- Identification and avoidance of all above-ground and underground utilities or other man-made structures.

- Waste characterization, transport (both on and off site), and disposal of all excavated soil.

- Notification of TtNUS and the Navy if observations indicate contaminants may extend beyond the planned lateral or vertical limits of the excavation.

- Except where necessary for avoidance of structures or utilities, or where otherwise specified by TtNUS, the depths of the excavation areas should extend to 1 foot below ground surface.

- Excavated soil shall be stockpiled on, and covered with, heavy-duty polyethylene sheeting at the site. This shall be done in a manner to avoid the potential for contaminating surrounding soil or surface water. Alternatively, soils may be stockpiled in properly covered roll-off containers.

- Stockpiling and combining of materials from different sites is permitted with prior approval of the BCT, if similar types and concentrations of contaminants are involved and were generated by similar processes.

- Materials used to backfill the excavations will be from an uncontaminated source and capable of supporting the same type of vegetation as the removed soil. The ground surface shall be restored to a similar or better condition than existed prior to excavation.

REFERENCES

ABB-ES (ABB Environmental Services, Inc.), 1994. Base Realignment and Closure Environmental Baseline Survey Report Naval Air Station (NAS) Cecil Field, November.

BRAC (Base Realignment and Closure) Cleanup Team (BCT), 2001. BCT Minutes No. 1494, Action No. 1196, Decision No. 540, Meeting of June 20.

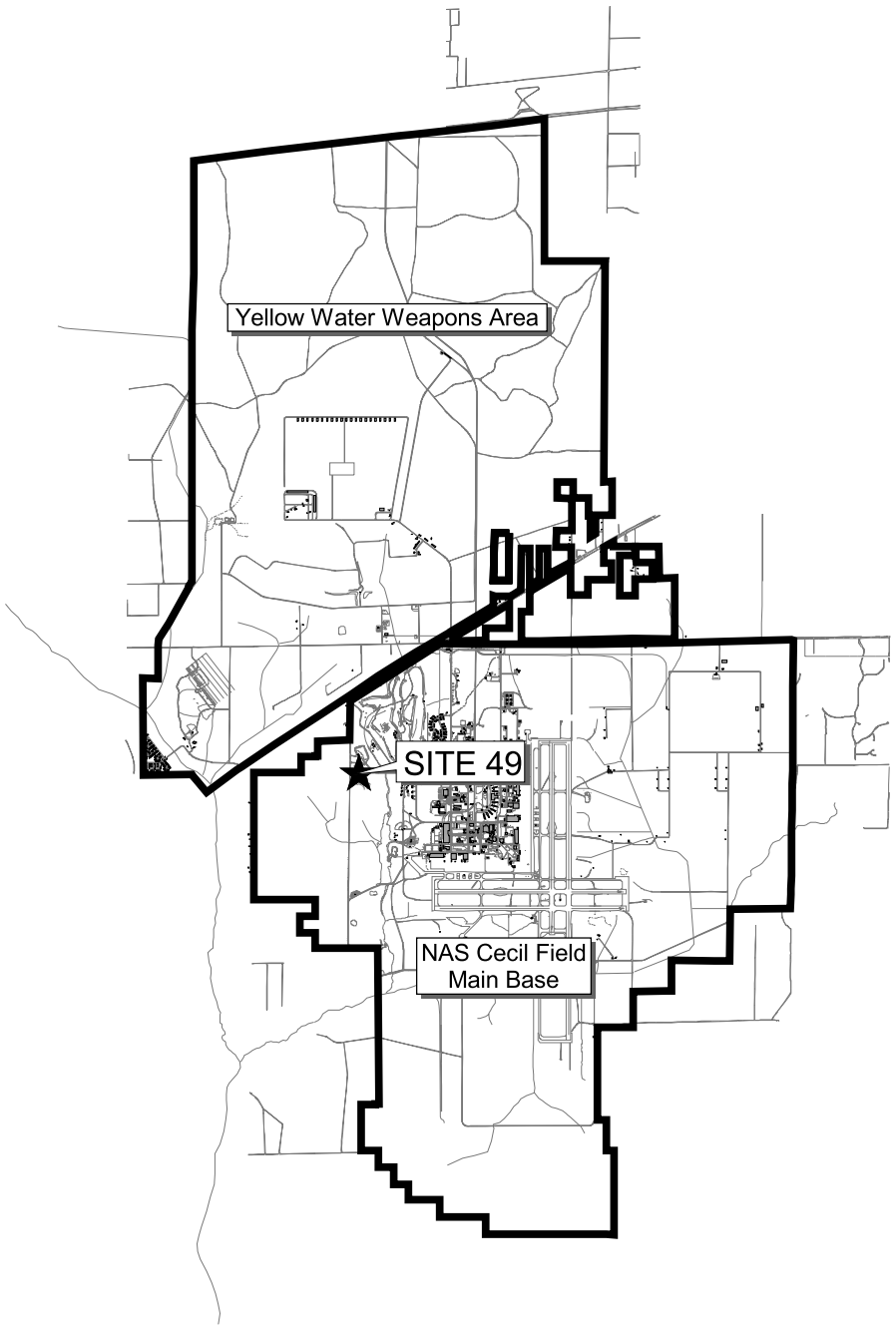
Florida Department of Environmental Protection (FDEP), 1999. Contaminant Target Levels Rule, Soil, Groundwater and Surface Water Target Cleanup Levels. Florida Administrative Code (F.A.C.) Chapter 62-777, August.

Harding Lawson Associates (HLA), 1998. Inorganic Background Data Set.

TtNUS (Tetra Tech NUS), 2002a. Action Memorandum for Operable Unit 5, Site 49, Former Skeet Range, Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for SOUTHNAVFACENCOM, North Charleston, South Carolina, May.

TtNUS (Tetra Tech NUS), 2002b. Engineering Evaluation/Cost Analysis for Operable Unit 5, Site 49, Former Skeet Range, Naval Air Station Cecil Field, Jacksonville, Florida. Prepared for SOUTHNAVFACENCOM, North Charleston, South Carolina, June.

U.S. EPA (U.S. Environmental Protection Agency), Region 4, 1996. Environmental Investigations Standard Operating Procedures and Quality Assurance Manual, Athens, Georgia.



DRAWN BY: MJJ	DATE: 26Jun01	GENERAL LOCATION MAP OU 5 - SITE 49, FORMER SKEET RANGE NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER: 0039
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE: AS NOTED	NAVFAC		DRAWING NO.: FIGURE 2-1 / REV: 0

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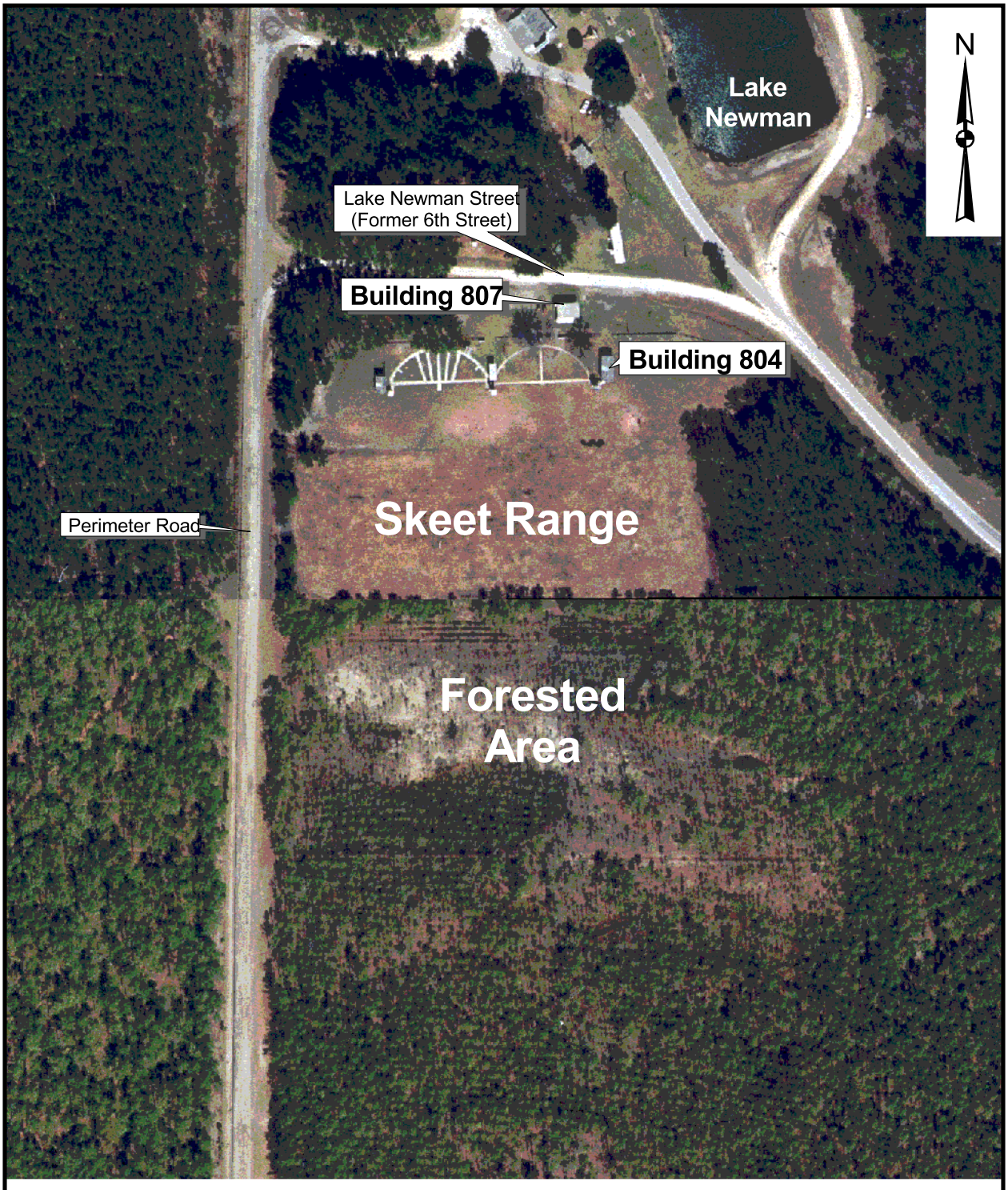

DRAWN BY: MJJ	DATE: 26Jun01	SITE LAYOUT MAP PRIOR TO REMOVAL ACTIONS OU 5 - SITE 49, FORMER SKEET RANGE NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER: 0039
CHECKED BY	DATE		APPROVED BY / DATE
COST/SCHEDULE-AREA			APPROVED BY / DATE
SCALE: AS NOTED			DRAWING NO.: FIGURE 2-2 / REV: 0

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SUMMARY OF ANALYTICAL DATA FOR BaPEq CONCENTRATIONS
OPERABLE UNIT 5, SITE 49 - FORMER SKEET RANGE
NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA

location	FDEP SCTLs				203	203	204	204	204	205	206	206	206	206	206
sample	Residential Criteria	Industrial Criteria	Leachability Criteria	Minimum Criteria	203-01	203-01R	204-01	204-01R	204-02	205-01	206-01	206-01-AVG	206-01-D	206-01R	206-01R-AVG
depth					0-1	0-1	0-1	0-1	1-2	0-1	0-1	0-1	0-1	0-1	0-1
date					08/24/99	07/13/04	08/24/99	07/13/04	09/13/04	08/24/99	08/24/99	08/24/99	08/24/99	07/13/04	07/13/04
code					NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	ORIG	AVG
PAHs (ug/kg)															
BaPEQ					**194.20**	**9**	**132**	**392**	**516**	**57**	**341**	**187**	**38**	**262**	**298**
BENZO(A)ANTHRACENE	1400	5000	3200	1400	**99.4**	89 U	**73.2**	**260 J**	**201 J**	11 U	**65.8**	**59.1**	**52.4**	**136 J**	**160 J**
BENZO(A)PYRENE	100	500	8000	100	**146**	18 U	**108**	**322**	**409**	**44.9**	**222 J**	**116.8 J**	**11.6 J**	**212**	**243**
BENZO(B)FLUORANTHENE	1400	4800	10000	1400	**164**	18 U	**112**	**186**	**297**	**43.9**	**107**	**98.7**	**90.4**	**115**	**128.5**
BENZO(K)FLUORANTHENE	15000	52000	25000	15000	**71.7**	18 U	**47.4**	**119**	**56.2 J**	**22.7**	**57.3**	**55.1**	**52.9**	**90.8**	**117.4**
CHRYSENE	140000	450000	77000	77000	**147**	89 U	**108**	**298 J**	**236 J**	11 U	11 U	**45.95 J**	**86.4 J**	**195 J**	**206.5 J**
DIBENZO(A,H)ANTHRACENE	100	500	30000	100	11 U	18 U	10 U	18 U	**24.9 J**	11 U	**98.8 J**	**51.9**	10 UJ	20 U	22 U
INDENO(1,2,3-CD)PYRENE	1500	5300	28000	1500	**155**	18 U	10 U	**154**	**307**	11 U	11 U	10.5 U	10 U	**133**	**141**

Notes:

FDEP Soil Cleanup Target Levels (SCTLs) (FDEP, 1999a).

Shaded indicates exceedance of minimum SCTL.

Bold indicates positive detection.

SUMMARY OF ANALYTICAL DATA FOR BaPEq CONCENTRATIONS
OPERABLE UNIT 5, SITE 49 - FORMER SKEET RANGE
NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA

location	FDEP SCTLs				206	207	304	304	304	304	712	801	802	803	803
sample	Residential Criteria	Industrial Criteria	Leachability Criteria	Minimum Criteria	206-01R-D	207-01	304-01	304-01	304-01	304-01R	712-01	801-01	802-01	803-01	803-02
depth					0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	1-2
date					07/13/04	08/24/99	10/11/99	10/11/99	10/11/99	03/05/05	05/24/01	09/30/04	09/30/04	09/30/04	11/30/04
code					DUP	NORMAL	NORMAL	AVG	DUP	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	NORMAL
PAHs (ug/kg)															
BaPEQ					**334**	**86**	**179**	**124**	**69**	**18**	**34**	**493**	**1225**	**1256**	**10.5**
BENZO(A)ANTHRACENE	1400	5000	3200	1400	**184 J**	**28.8**	**67.8 J**	**44.25 J**	**20.7 J**	92 U	340 U	**239 J**	**625**	**593**	110 U
BENZO(A)PYRENE	100	500	8000	100	**274**	**71**	**151 J**	**101.4 J**	**51.8 J**	18 U	68 U	**367**	**920**	**930**	21 U
BENZO(B)FLUORANTHENE	1400	4800	10000	1400	**142**	**48.6**	**149 J**	**103.75 J**	**58.5 J**	18 U	68 U	**212**	**594**	**558**	21 U
BENZO(K)FLUORANTHENE	15000	52000	25000	15000	**144**	**22.9**	**101 J**	**69.9 J**	**38.8 J**	18 U	68 U	**154**	**371**	**318**	21 U
CHRYSENE	140000	450000	77000	77000	**218 J**	**49.6**	**99.9 J**	**65.75 J**	**31.6 J**	92 U	340 U	**290 J**	**688**	**696**	110 U
DIBENZO(A,H)ANTHRACENE	100	500	30000	100	24 U	12 U	11 U	11 U	11 U	18 U	68 U	**50.7 J**	**114**	**136**	21 U
INDENO(1,2,3-CD)PYRENE	1500	5300	28000	1500	**149**	12 U	11 U	**24.95 J**	**44.4 J**	18 U	68 U	**284**	**639**	**714**	21 U

Notes:

FDEP Soil Cleanup Target Levels (SCTLs) (FDEP, 1999a).

Shaded indicates exceedance of minimum SCTL.

Bold indicates positive detection.

SUMMARY OF ANALYTICAL DATA FOR BaPEq CONCENTRATIONS
OPERABLE UNIT 5, SITE 49 - FORMER SKEET RANGE
NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA

location	FDEP SCTLs				804	805	806	807	808	809	809	809	810	811	812
sample	Residential Criteria	Industrial Criteria	Leachability Criteria	Minimum Criteria	804-01	805-01	806-01	807-01	808-01	809-01	809-01-AVG	809-01-D	810-01	811-01	812-01
depth					0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1	0-1
date					09/30/04	09/30/04	09/30/04	09/30/04	09/30/04	10/13/04	10/13/04	10/13/04	10/13/04	10/13/04	10/13/04
code					NORMAL	NORMAL	NORMAL	NORMAL	NORMAL	ORIG	AVG	DUP	NORMAL	NORMAL	NORMAL
PAHs (ug/kg)															
BaPEQ					**405**	**848**	**498**	**9421**	**745**	**123**	**101**	**78**	**11**	**120**	**25040**
BENZO(A)ANTHRACENE	1400	5000	3200	1400	**182 J**	**391 J**	110 U	**5270**	**251 J**	120 U	115 U	110 U	100 U	97 U	**10900**
BENZO(A)PYRENE	100	500	8000	100	**307**	**634**	**393**	**7060**	**579**	**90.3 J**	**71.65 J**	**53 J**	21 U	**89.6**	**18500**
BENZO(B)FLUORANTHENE	1400	4800	10000	1400	**192**	**381**	**228**	**3970**	**411**	**79.6 J**	**72.85 J**	**66.1 J**	21 U	**77.2**	**16200**
BENZO(K)FLUORANTHENE	15000	52000	25000	15000	**116**	**289**	**168**	**2920**	**271**	**27.1 J**	**19.05 J**	22 U	21 U	**25.5 J**	**7870**
CHRYSENE	140000	450000	77000	77000	**249 J**	**526**	**432**	**5360**	**595**	120 U	115 U	110 U	100 U	97 U	**11100**
DIBENZO(A,H)ANTHRACENE	100	500	30000	100	**35.6 J**	**91.2**	**45.8 J**	**935**	**57.4 J**	23 U	22.5 U	22 U	21 U	19 U	**2240**
INDENO(1,2,3-CD)PYRENE	1500	5300	28000	1500	**239**	**415**	**276**	**4680**	**388**	**69.7 J**	**40.35 J**	22 U	21 U	**74.8 J**	**15000**

Notes:

FDEP Soil Cleanup Target Levels (SCTLs) (FDEP, 1999a).

Shaded indicates exceedance of minimum SCTL.

Bold indicates positive detection.

SUMMARY OF ANALYTICAL DATA FOR BaPEq CONCENTRATIONS
OPERABLE UNIT 5, SITE 49 - FORMER SKEET RANGE
NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA

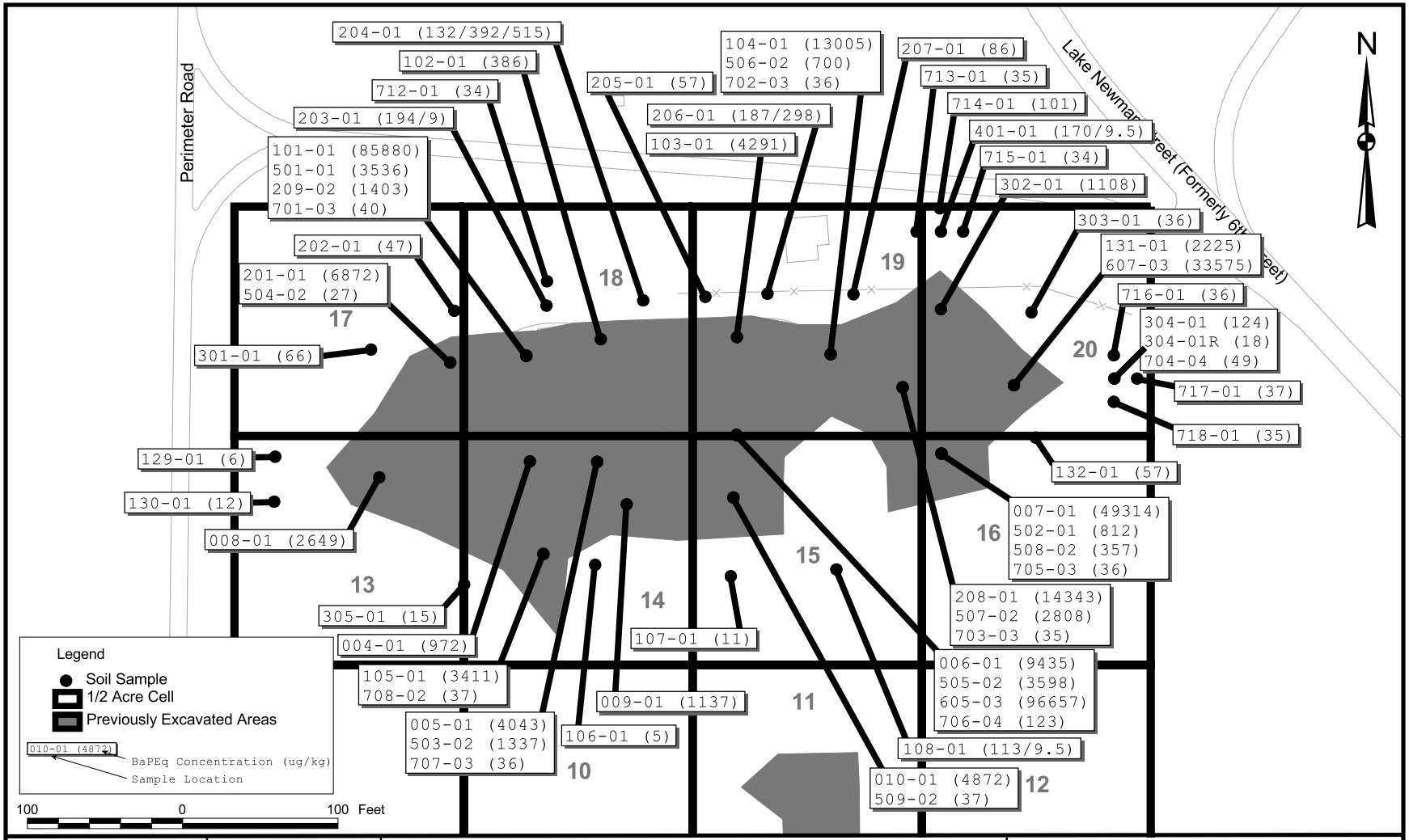
location	FDEP SCTLs				812	813	814
sample	Residential Criteria	Industrial Criteria	Leachability Criteria	Minimum Criteria	812-02	813-01	814-01
depth					1-2	0-1	0-1
date					11/30/04	10/13/04	10/13/04
code					NORMAL	NORMAL	NORMAL
PAHs (ug/kg)							
BaPEQ					**9**	**10**	**1121**
BENZO(A)ANTHRACENE	1400	5000	3200	1400	88 U	93 U	**487**
BENZO(A)PYRENE	100	500	8000	100	18 U	19 U	**882**
BENZO(B)FLUORANTHENE	1400	4800	10000	1400	18 U	19 U	**630**
BENZO(K)FLUORANTHENE	15000	52000	25000	15000	18 U	19 U	**248**
CHRYSENE	140000	450000	77000	77000	88 U	93 U	**529**
DIBENZO(A,H)ANTHRACENE	100	500	30000	100	18 U	19 U	**64 J**
INDENO(1,2,3-CD)PYRENE	1500	5300	28000	1500	18 U	19 U	**599**

Notes:

FDEP Soil Cleanup Target Levels (SCTLs) (FDEP, 1999a).

Shaded indicates exceedance of minimum SCTL.

Bold indicates positive detection.



DRAWN BY: MJJ	DATE: 28Jan05	SUPPLEMENTAL SOIL SAMPLING RESULTS OU 5 - SITE 49, FORMER SKEET RANGE NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER: 0039
CHECKED BY:	DATE:		APPROVED BY: DATE:
COST/SCHEDULE-AREA			APPROVED BY: DATE:
SCALE: AS NOTED	NAVFAC		DRAWING NO.: FIGURE 3-1 / REV: 0

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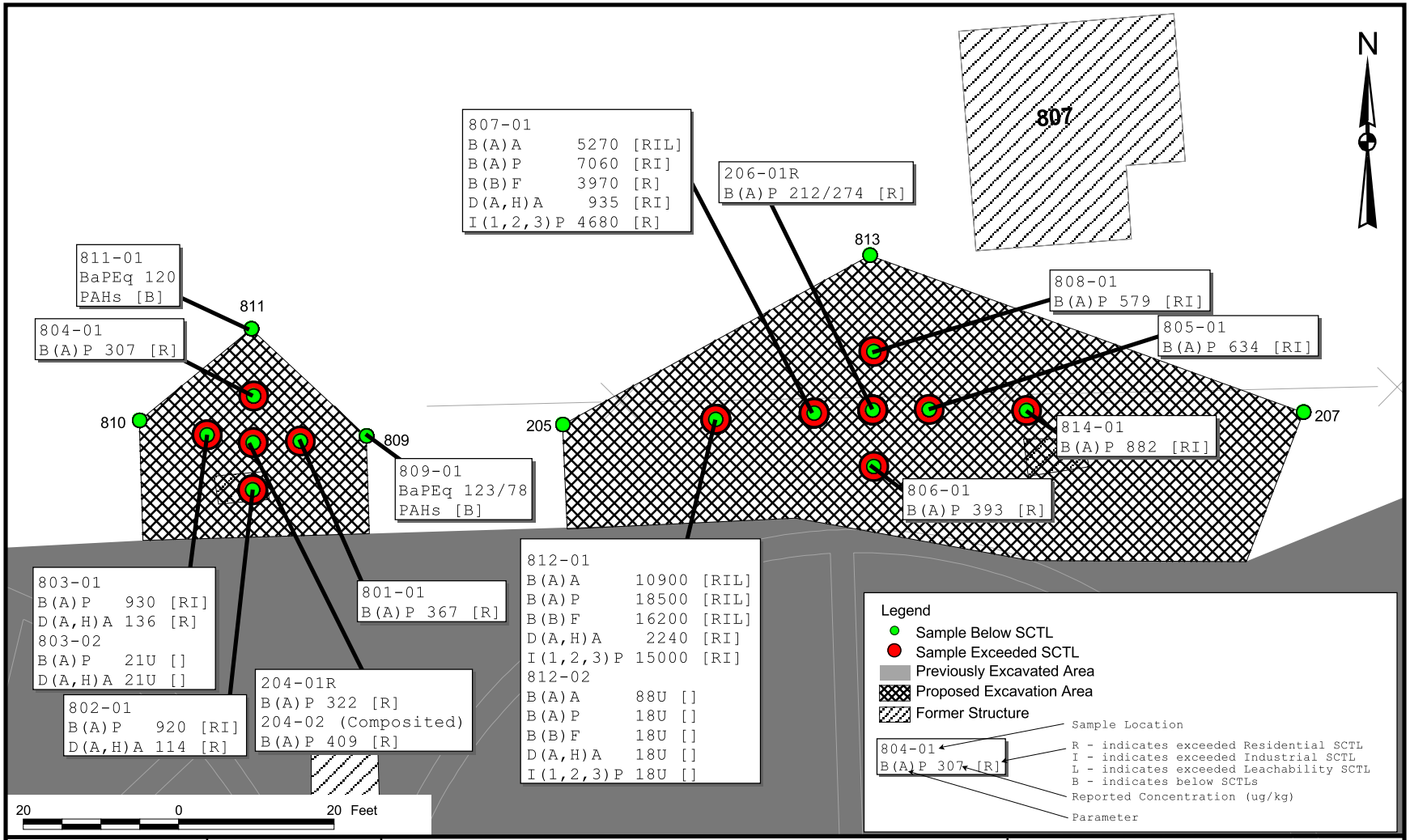

DRAWN BY: MJJ	DATE: 28Jan05	SUPPLEMENTAL SOIL SAMPLING RESULTS OU 5 - SITE 49, FORMER SKEET RANGE NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER: 0039
CHECKED BY:	DATE:		APPROVED BY: DATE:
COST/SCHEDULE-AREA			APPROVED BY: DATE:
SCALE: AS NOTED			DRAWING NO.: FIGURE 3-2 / REV: 0

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BaPEq Concentrations (ug/kg)

Sample	Pre	Post	Qual
203-01R	9	***50***	U
204-01R	392	***50***	U
205-01	57	57	
206-01R-AVG	298	***50***	U
207-01	86	86	
712-01	34	***50***	U
801-01	493	***50***	U
802-01	1225	***50***	U
803-01	1256	***50***	U
804-01	405	***50***	U
805-01	848	***50***	U
806-01	498	***50***	U
807-01	9421	***50***	U
808-01	745	***50***	U
809-01-AVG	101	101	
810-01	11	11	
811-01	120	120	
812-01	25040	***50***	U
813-01	10	10	
814-01	1121	***50***	U

FDEP UCL Calculator Version 0.97 — 2/12/05

Note: Bounding estimates are worst case 95% UCLs based on the Chebyshev (mean, std) method.

Reported in ug/kg

Summary Statistics for	
Number of Samples	20
Number of Censored Data	14
Minimum	50
Maximum	120
Mean	54.25
Median	50
Standard Deviation	24.71495
Variance	
Coefficient of Variation	0.455575
Skewness	0.967734
95% UCL (Assuming Normal Data)	
Student's-t	NA
95% UCL (Adjusted for Skewness)	
Adjusted-CLT	NA
Modified-t	NA
95% Non-parametric UCL	
CLT	NA
Jackknife	NA
Standard Bootstrap	NA
Bootstrap-t	NA
Chebyshev (Mean, Std)	NA
95% Bounding Method UCL	
Bounding (Max)	78.58818
Bounding (1/2 DL)	66.08067

Summary Statistics for	
Minimum	NA
Maximum	NA
Mean	NA
Standard Deviation	NA
Variance	NA
Goodness-of-Fit Results	
Distribution Recommended	NA
Distribution Used	Neither
Estimates Assuming Lognormal Distribution	
MLE Mean	NA
MLE Standard Deviation	NA
MLE Median	NA
MLE Coefficient of Variation	NA
MVUE Estimate of Mean	NA
MVUE Estimate of Std. Dev.	NA
MVUE Estimate of SE	NA
MVUE Coefficient of Variation	NA
UCL Assuming Lognormal Distribution	
95% H-UCL	NA
95% Chebyshev (MVUE) UCL	NA
99% Chebyshev (MVUE) UCL	NA
FDEP Recommended UCL to Use:	
78.58818	

PROUCL 2.1 NA

Note: These estimates are valid ONLY if samples are random and representative.

DRAWN BY	DATE
MJJ	12Feb05
CHECKED BY	DATE
COST/SCHEDULE-AREA	
SCALE	AS NOTED

FL UCL CALCULATION RESULTS
OU 5 - SITE 49, FORMER SKEET RANGE
NAVAL AIR STATION CECIL FIELD
JACKSONVILLE, FLORIDA

CONTRACT NUMBER	0039
APPROVED BY	DATE
APPROVED BY	DATE
DRAWING NO.	FIGURE 3-3
REV	0

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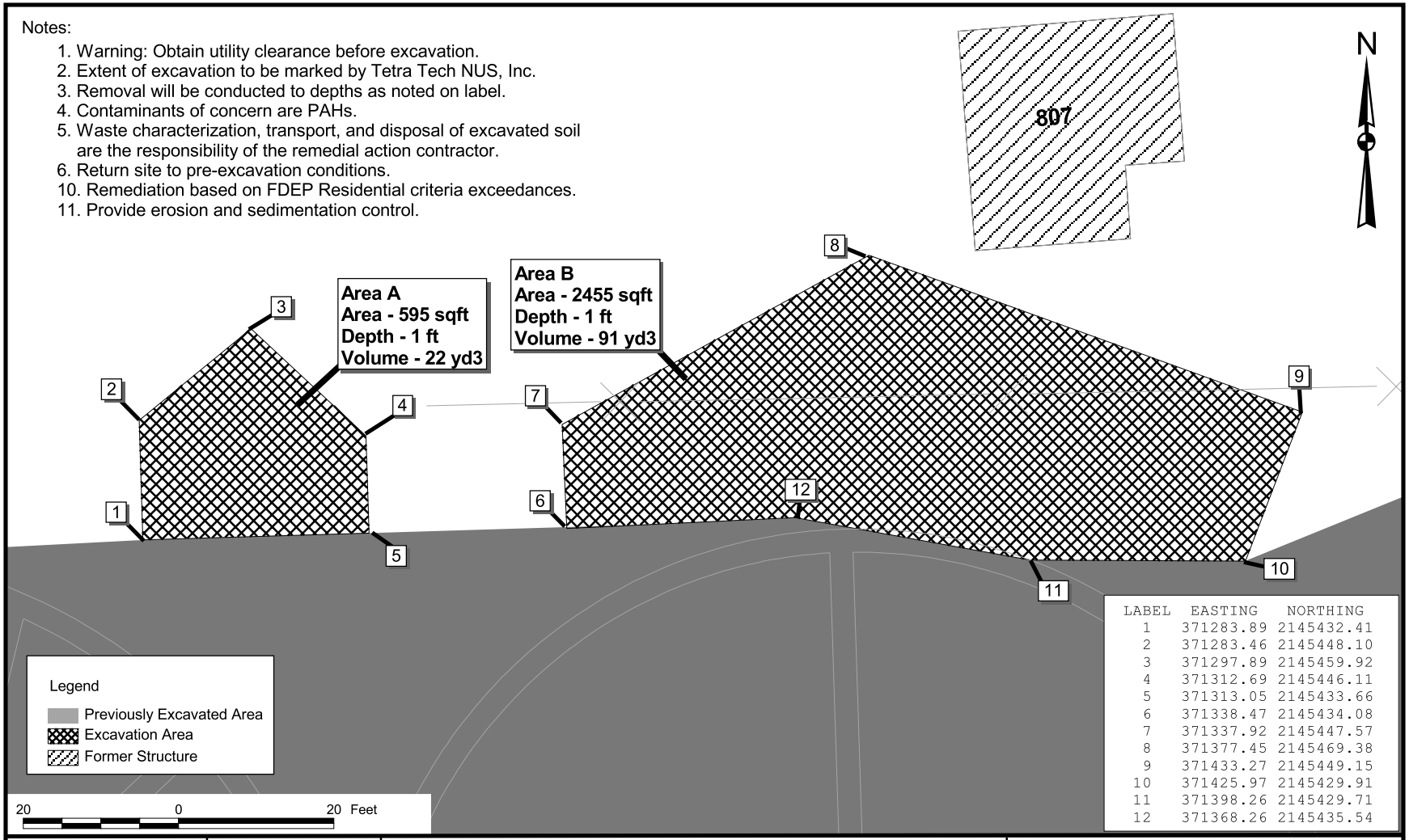
Notes:

1. Warning: Obtain utility clearance before excavation.
2. Extent of excavation to be marked by Tetra Tech NUS, Inc.
3. Removal will be conducted to depths as noted on label.
4. Contaminants of concern are PAHs.
5. Waste characterization, transport, and disposal of excavated soil are the responsibility of the remedial action contractor.
6. Return site to pre-excavation conditions.
10. Remediation based on FDEP Residential criteria exceedances.
11. Provide erosion and sedimentation control.



LABEL	EASTING	NORTHING
1	371283.89	2145432.41
2	371283.46	2145448.10
3	371297.89	2145459.92
4	371312.69	2145446.11
5	371313.05	2145433.66
6	371338.47	2145434.08
7	371337.92	2145447.57
8	371377.45	2145469.38
9	371433.27	2145449.15
10	371425.97	2145429.91
11	371398.26	2145429.71
12	371368.26	2145435.54

DRAWN BY: MJJ	DATE: 28Jan05	EXCAVATION PLAN OU 5 - SITE 49, FORMER SKEET RANGE NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER: 0039
CHECKED BY:	DATE:		APPROVED BY: DATE:
COST/SCHEDULE-AREA			APPROVED BY: DATE:
SCALE: AS NOTED			DRAWING NO.: FIGURE 5-1 / REV: 0

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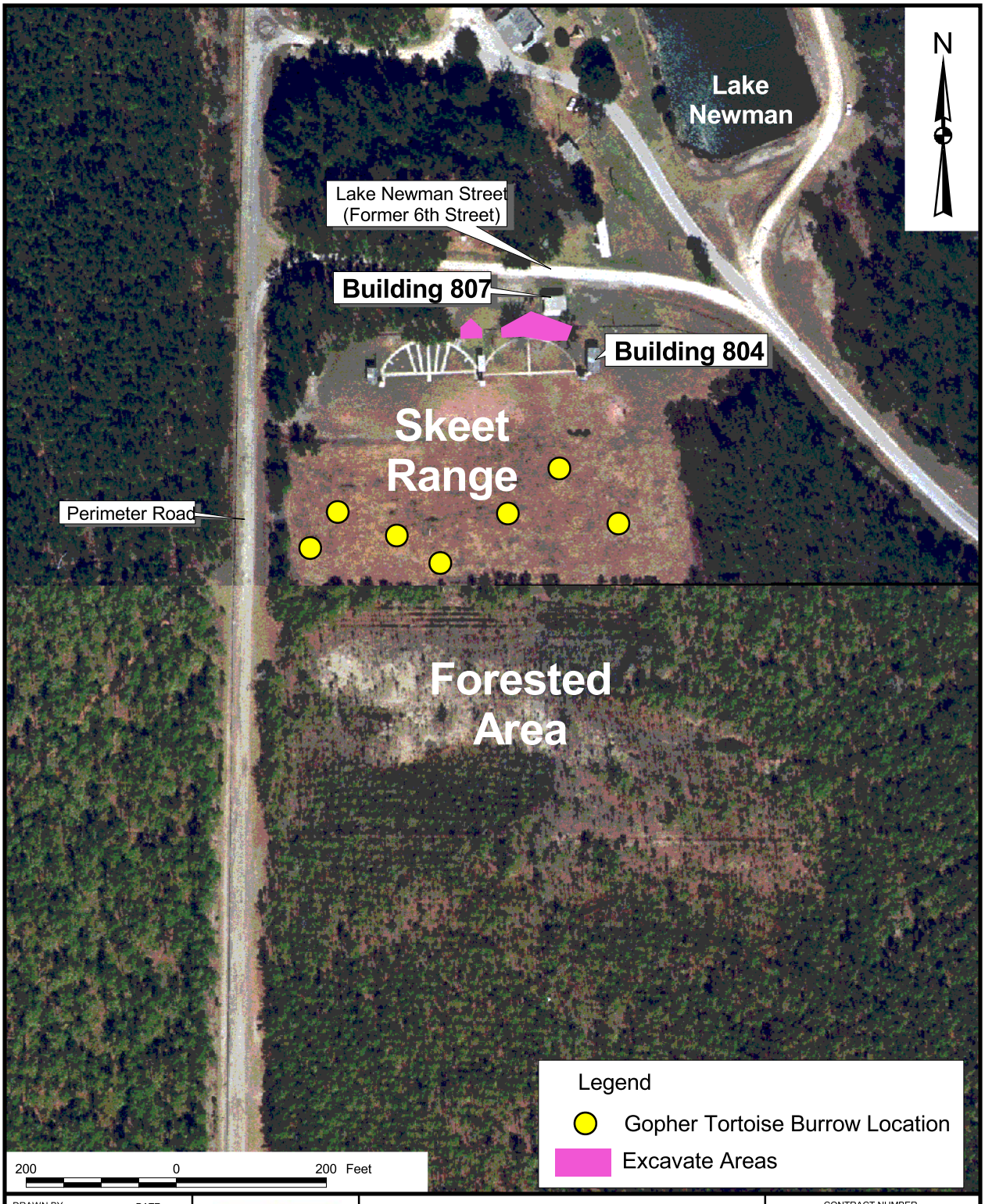

DRAWN BY MJJ	DATE 26Jun01	GOPHER TORTOISE BURROWS OU 5 - SITE 49, FORMER SKEET RANGE NAVAL AIR STATION CECIL FIELD JACKSONVILLE, FLORIDA	CONTRACT NUMBER 0039
CHECKED BY	DATE		APPROVED BY DATE
COST/SCHEDULE-AREA			APPROVED BY DATE
SCALE AS NOTED		NAVFAC	DRAWING NO. FIGURE 5-2 / REV 0

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