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FINAL BASE REALIGNMENT AND CLOSURE BUSINESS PLAN NTC ORLANDO FL
11/1/2013
NTC ORLANDO

Final Base Realignment and Closure Business Plan

Naval Training Center
Orlando, Florida



Prepared for
The Orlando Partnering Team

November 2013

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FOREWORD

The Department of the Navy has instituted several programs to address the requirements of the Defense Base Realignment and Closure (BRAC) Act of 1990. BRAC Cleanup Teams (BCT) have been assembled to address the multitude of issues surrounding base closure and to enhance environmental decision-making at BRAC installations where property will be available for redevelopment by the community. This team approach is intended to foster partnering, accelerate the environmental cleanup process, and expedite timely, cost-effective, and environmentally responsible disposal and reuse decisions. The BCT for the Naval Training Center (NTC) in Orlando, FL became a facilitated partnering team and expanded to include Navy BRAC contractors with support from Tier II personnel and the Base Transition Coordinator in 1995. This team renamed itself the Orlando Partnering Team (OPT) to emphasize the relationship between the team members, and this name is used throughout this document. The OPT became self-facilitating in January 2007 and continues to meet two times a year.

One of the OPT tasks is the preparation of a BRAC Cleanup Plan (BCP) for NTC Orlando. A BCP is a macro-level management tool encompassing all environmental issues related to base closure. The emphasis is on accelerating cleanup efforts to expedite conveyance of Federal property to surrounding communities for redevelopment. The BCP is updated annually with new information on environmental conditions and changed community priorities. Naval Facilities Headquarters has modified the requirement for the annual update by allowing teams to submit abbreviated "Business Plans" in lieu of the full BCP update.

A full update to the BCP for NTC Orlando was issued in March 1996. The update provided detailed information on site history, background data and maps, environmental conditions, compliance issues, ongoing Navy Installation Restoration Projects, and implementation strategies. Since 1997, revisions to the Business Plan provided the status of (1) transfer and reuse activities; (2) the restoration program; (3) major issues addressed by the OPT; (4) "success stories" describing actions taken to expedite the restoration work; and (5) the current restoration work schedule. This Business Plan follows a similar format.

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GLOSSARY

BCP	BRAC Cleanup Plan
BCT	BRAC Cleanup Team
bgs	below ground surface
BRAC	Base Realignment and Closure
cis-DCE	cis-1,2-dichloroethene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COC	chemical of concern
CVOC	chlorinated volatile organic compound
DoD	Department of Defense
DPT	direct push technology
EBS	Environmental Baseline Survey
EDC	Economic Development Conveyance
EIS	Environmental Impact Statement
EOS®	emulsified oil substrate
FDEP	Florida Department of Environmental Protection
FY	fiscal year
GCTL	Groundwater Cleanup Target Level
GOAA	Greater Orlando Aviation Authority
IAS	Initial Assessment Study
IRA	Interim Remedial Action
IRP	Installation Restoration Program
ISCO	in situ chemical oxidation
LUC	land use control
MCPA	2-methyl-4-chlorophenoxy acetic acid
MNA	monitored natural attenuation
NEPA	National Environmental Policy Act
NFA	no further action
NTC	Naval Training Center
OPT	Orlando Partnering Team
OU	Operable Unit
PAB	Permeable Adsorptive Barrier
PAH	polynuclear aromatic hydrocarbon

GLOSSARY (Continued)

PCB	polychlorinated biphenyl
PCE	tetrachloroethene, perchloroethene
RBCA	risk-based corrective action
RI	Remedial Investigation
ROD	Record of Decision
SA	Study Area
SCAP	Superfund Comprehensive Accomplishments Plan
SCTL	Soil Cleanup Target Level
TCE	trichloroethene
UST	underground storage tank
VOC	volatile organic compound
USEPA	United States Environmental Protection Agency
SVOC	semi-volatile organic compound
ug/L	micrograms per liter

EXECUTIVE SUMMARY

Base Closure: The Naval Training Center (NTC) Orlando was closed in phases starting with the closure of the Recruit Training Command and Naval Hospital in March 1995, the Service School Command in November 1996, and the Navy Nuclear Power Training Command in December 1998. All operations ceased at the training center on 30 April, 1999. In accordance with the requirements of the National Environmental Policy Act (NEPA), an Environmental Impact Statement (EIS) was prepared in connection with the disposal and reuse of the entire NTC Orlando. The NEPA Record of Decision for the EIS was signed on 15 November 1996.

Environmental Actions: Environmental investigations conducted as part of the Base Realignment and Closure process have identified 56 study areas to date. All study areas have been investigated and all known underground storage tanks and aboveground storage tanks have been removed. Of the sites where tanks were removed, 36 were contaminated and required assessments. Damaged friable asbestos was identified in 79 buildings, of which 21 were scheduled for reuse. Asbestos abatement was completed in fiscal year 1997 at each of the 21 buildings planned for reuse. Environmental actions are ongoing at Study Areas (SA) 2, 17, 36, 36NW/38, 39, 56 and Operable Units (OU) 2, 3, and 4. Land use controls are monitored at SA 2, 16, 17, 21, 25, 36, 39, 50, 52, and 54 as well as at OU 1, 2, 3, and 4.

Orlando Partnering Team: The Orlando Partnering Team has initiated and maintained many time-saving and cost-avoidance methods while taking the necessary steps to protect the public and the environment through teamwork, commitment, and shared goals. The partners have worked closely together, striving to conduct environmental restoration activities as efficiently and effectively as possible. Their success is demonstrated by the numerous accelerated cleanup milestones achieved since the 1999 base closure, including the fastest early transfer of property by the Navy and the first early transfer of Department of Defense property in Florida. The efforts of the Orlando Partnering Team have resulted in expedited document reviews and identification and implementation of remedial technologies that facilitate timely productive reuse and redevelopment of Naval Training Center Orlando and an estimated cost avoidance of over \$11 million. The community, through the Restoration Advisory Board, has been very supportive of the Navy's cleanup progress.

Property Transfer: The Economic Development Conveyance submitted by the City of Orlando Community Redevelopment Agency in September 1996 was finalized. Public Benefit Conveyances to the Department of Interior and Federal Aviation Authority were submitted and approved by their respective agencies in FY1997. Nearly all Main Base property (approximately 990 acres) was transferred to the City of Orlando in October 1999. The remaining property at Main Base was transferred to the City of Orlando in July 2005. As of April 2008,

ownership of all property that was part of the former Naval Training Center Orlando had been transferred. The majority of this land was transferred to the City of Orlando.

Successes: In recognition of the OPT's accomplishments in the environmental cleanup of the NTC, a Chief of Naval Operations Environmental Restoration Award was presented to the OPT in May 2004, to "recognize efforts to protect human health and the environment by cleaning up identified sites in a timely, cost-effective, and responsive manner."

The OPT won the Region 4 2006 Phoenix Award™ for the Baldwin Park Redevelopment Project at the former NTC Orlando. The Phoenix Award™ winners represent excellence in Brownfield redevelopment in each of the 10 U.S. Environmental Protection Agency (USEPA) regions. Created in 1997, this prestigious award honors individuals and groups who are working to solve the critical environmental challenge of transforming negatively impacted and contaminated areas into productive new uses.

1.0 INTRODUCTION

The former Naval Training Center (NTC) Orlando was comprised of four non-contiguous facilities in the heart of Orlando: the Main Base (1,095 acres), Area C (46 acres), Herndon Annex (54 acres), and the McCoy Annex (877 acres). In July 1993, the Base Realignment and Closure (BRAC) Commission recommended closure of NTC Orlando and in 1994 the Navy completed a basewide Environmental Baseline Survey (EBS) as required by Department of Defense (DoD) policy for property transfer. The EBS and other initial environmental studies identified 55 potential Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) sites and 200 petroleum storage tanks. The multi-phase closure began in March 1995 with the closure of the Recruit Training Command and Naval Hospital, followed by the Service School Command in November 1996, and the Navy Nuclear Power Training Command in December 1998. All operations ceased at the training center on 30 April, 1999. The Orlando Partnering Team (OPT) continues to assess, monitor, and/or remediate the following Operable Units (OUs) and Study Areas (SAs):

- Operable Unit 2
- Operable Unit 3 (includes Study Areas 8 and 9)
- Operable Unit 4 (includes Study Areas 12, 13, and 14)
- Study Area 2
- Study Area 17
- Study Area 36
- Study Area 36NW/Study Area 38
- Study Area 56/Bldg 148 (Area C SW)

Additional sites which are monitored only for compliance with land use controls (LUCs) include:

- Operable Unit 1
- Study Area 16
- Study Area 21
- Study Area 25
- Study Area 52
- Study Area 54

Study Area 39 was approved for No Further Action (NFA) in September 2013. All identified tank sites have been approved for NFA. The locations of OUs and SAs at the former Main Base are shown on Figure 1 and those at Area C, Herndon Annex, and McCoy Annex are shown on Figure 2.

2.0

BRAC PROPERTY TRANSFER STATUS AND REUSE PLAN

In accordance with the requirements of the National Environmental Policy Act of 1969 (NEPA), an Environmental Impact Statement (EIS) was prepared in connection with the disposal and reuse of the entire NTC Orlando. The NEPA Record of Decision (ROD) for the EIS was signed on 15 November, 1996. The Economic Development Conveyance (EDC) was submitted by the City of Orlando Community Redevelopment Agency in September 1996. Public Benefit Conveyances to the Department of Interior and Federal Aviation Authority were submitted and approved by their respective agencies in fiscal year (FY) 1997. Nearly all Main Base property (approximately 990 acres) was transferred to the City of Orlando in October 1999. The remaining Main Base property was transferred to the City of Orlando in July 2005.

Before mid-1996, cleanup actions had to be complete or remediation systems shown to be operating successfully before federal property could be transferred to the public for reuse via a standard or “clean” transfer. In June 1996, CERCLA was amended to allow deferral of this requirement and “early transfer” of the property before the required cleanup actions had been completed. The Early Transfer process was implemented in three phases to facilitate the disposal of SA 36 and SA 39 (Phase 1), SA 2, SA 17, SA 52, OU 2, OU 3, and OU 4 Area C NW (Phase 2), and OU 4 Area C Northeast (Phase 3) allowing use of the property while cleanup activities continued. With the transfer of SA 17 in April 2008 and Area C SW in March 2009 to the City of Orlando, all of the former NTC Orlando property had been transferred; although final recorded deeds remain pending for three parcels (Area C NW, Study Area 21, and Study Area 25).

The current owner, use and planned future use of former NTC Orlando property where cleanup activities are ongoing or where LUCs have been imposed are summarized in the following table.

Current and Future Property Use

Site	Current Owner	Current Use	Planned Use
SA 2	City of Orlando	Herndon Communications Center Police Training Facility	Same as current
SA 16	City of Orlando	Eastern half – Florida Emergency Medical Association conference facility Western Half – storage (Laurie Botts)	unknown
SA 17	City of Orlando	Unused	Industrial/commercial
SA 21	City of Orlando	Southport Community Park	Same as current
SA 25	City of Orlando	Undeveloped	Green space

Site	Current Owner	Current Use	Planned Use
SA 36	Individual Homeowners City of Orlando	Baldwin Park residential community and park	Same as current
SA 36NW/ SA 38	Post Properties, Individual Homeowners, City of Orlando	Baldwin Park residential community	Same as current
SA 39	Individual Homeowners City of Orlando	Baldwin Park residential community	Same as current
SA 50	City of Orlando	Unused	Industrial/commercial
SA 52	City of Orlando	Unused	Industrial/commercial
SA 54	US Army Reserve	Military equipment staging/vacant	Same as current
SA 56 Area C SW	Department of Interior → City of Orlando	Undeveloped	Recreational
OU 1	City of Orlando Orange County School Board Individual Homeowners	Blue Jacket Park; Glenridge Middle School; Baldwin Park residential community	Same as current
OU 2	Bogey Boggy Creek 08, LLC	Combat City airsoft field/recreational	Industrial/commercial
OU 3	City of Orlando Orlando NTC Partners Individual Homeowners	Green space with a walking trail along Lake Baldwin, parcel encroaches on residential area	Same as current
OU 4 Area C NE	Orlando Heights, LLC	Vacant	Residential
OU 4 Area C NW	Department of Interior → City of Orlando	Unused	Same as current

A summary of NTC Orlando property transfer activities is provided in Appendix A, TRANSFER SUMMARY.

3.0 RESTORATION PROGRAM STATUS

The environmental restoration program is divided into three areas:

- Installation Restoration Program (IRP): OU investigations and SA screening.
- Tank Management Program: underground storage tank, aboveground storage tank, and oil/water separator removals, assessments, and remediation.
- Compliance Surveys and Abatement Status: lead-based paint and asbestos compliance surveys and abatement.

3.1 INSTALLATION RESTORATION STATUS OF OPERABLE UNITS

The OPT has identified four OUs at NTC Orlando. An overview of each OU is presented below. Specific information on each active OU is presented in their respective tabbed sections of this Business Plan and summarized in Appendix B, IR SUMMARY.

Operable Unit 1

OU 1 is located in the northwest corner of the former Main Base and includes the North Grinder Landfill which operated from sometime between 1939 and 1947 until 1967. Landfill wastes included film, photographic chemicals; paint thinner, mess hall garbage, medical waste, yard and construction debris, and PCE stillbottoms from the drycleaning facility. Originally identified as a potentially contaminated site during the 1985 Initial Assessment Study (IAS), OU 1 was investigated, identifying soil (arsenic, polynuclear aromatic hydrocarbons [PAH], polychlorinated biphenyls [PCB], and pesticides) and groundwater (gross alpha, gross beta, beryllium, vanadium, manganese, and thallium) contamination. The contaminant concentrations in soil did not require further delineation or cleanup under a non-residential reuse scenario based on the human health risk assessment presented in the Remedial Investigation (RI) Report (ABB-ES, 1996). The RI was performed in 1995, a Proposed Plan was issued in May 1997, and the ROD was signed in November 1997. The selected remedy included a proposed 3-year monitoring program, indefinite inspections, and institutional controls (no digging or residential use of the former landfill area, and no use of groundwater).

The first 5-year review of OU 1 was issued in December 2003. The selected remedy was found to be protective of human health and the environment and meeting the requirements of the ROD. The Second Five-Year Review Report for OU 1, dated March 2011, was approved by FDEP in July 2011. The report recommended discontinuing the long-term groundwater monitoring specified in the ROD. The recommendation was based on statistical analysis, from which it was concluded that upgradient and downgradient data were not statistically different, and there was no advantage of further groundwater monitoring. In addition, the only contaminants in downgradient wells with concentrations above the GCTLs are iron and manganese, which have secondary drinking water standards. It was stated in the report that discontinuing groundwater monitoring would not affect protectiveness of the remedy. The report also recommended abandonment of the existing monitor wells and continuance of the institutional controls for groundwater use restriction and the annual cover inspections. Monitoring wells were abandoned in December 2011.

The Baldwin Park Development Company requested in March 2006 that the groundwater restriction area be decreased in order to allow groundwater use along Lower Park Road, which is hydraulically upgradient of the landfill, and along Upper Park Road, which is side-gradient of the landfill. There was consensus among the OPT that the groundwater restriction area along the Lower Park Road could be revised; however, since the area could not be completely unencumbered, the request was dropped.

Current Status: OU 1 is no longer considered an active site. LUC inspections are performed annually.

Operable Unit 2

OU 2 is located in the southern portion of the former McCoy Annex and includes the McCoy Annex landfill which operated from 1960 to 1978. Landfill wastes reportedly included paint and paint thinners, asbestos, transformers, hospital wastes, low level radiological waste, batteries, aircraft parts, yard waste, and possibly waste oil.

Originally identified as being of environmental concern during the 1985 IAS, OU 2 was investigated in three phases from May 1997 through December 2001. The investigation identified the limits of landfill materials and the thickness of the soil cover; described the types, quantities, and location of contaminants in surface soil, sediment, surface water and groundwater; and evaluated risks to human health and the environment. The RI report identified arsenic and PAHs in surface soil as the primary contaminants that exceeded the FDEP residential Soil Cleanup Target Levels (SCTLs). It was also shown that some areas of the former landfill did not have 2 feet of soil cover. Iron, manganese, trichloroethene (TCE), vinyl chloride and benzene were found to exceed FDEP GCTLs in groundwater of the surficial aquifer (i.e., 0-30 feet below ground surface [bgs]). Remedial actions at OU 2 have included localized soil removal for PAH contamination, providing adequate soil cover for areas where cover depth was insufficient, and injection of emulsified oil substrate (EOS[®]) as a barrier to address groundwater contamination and inhibit plume migration.

The OU 2 property was transferred to a private owner in 2008 for future industrial use. The Boggy Creek Golf Course in the northern part of OU 2 was closed in February 2007.

The results of the biobarrier pilot test implemented in 2008 and published in 2010 indicate decreases in tetrachloroethene and trichloroethene concentrations in all monitor wells within or downgradient of the biobarrier. Semi-annual groundwater and surface water monitoring is ongoing.

Current Status. The Revised Feasibility Study Report for OU2 was completed in August 2012 to document changes in site conditions since the 2003 Feasibility Study and to characterize current risks associated with potential exposures to site-related constituents. The changes in site conditions consisted of the implementation of land use controls, sale and transfer of property, completion of a soil interim remedial action, and implementation of a groundwater interim remedial action. The Final Proposed Plan was submitted on May 15, 2013. The preferred alternative being implemented at the site is LUCs, landfill containment, source area groundwater control via a biobarrier and monitoring of groundwater and surface water. Current LUCs include a prohibition on the following: installation of groundwater wells; the extraction or use of groundwater for any

purpose; agricultural or residential use of the OU2 property; and excavation, disturbance, or removal of soils from OU2 without prior written approval from the Navy and FDEP.

Operable Unit 3

OU 3 is located on the former Main Base and consists of SA 8 (former Greenskeeper's Storage Area, 1.88 acres) and SA 9 (former Pesticide Handling and Storage Area, 1.39 acres). The primary contaminants at OU 3 are arsenic and pesticides in groundwater.

Study Area 8. Structures previously located at SA 8 were used for storage of pesticides, paint, equipment, and supplies. Site activities included routine maintenance and repair of golf course equipment. Building 2134 was the primary maintenance facility for the former Main Base Golf Course. All buildings have been removed from SA 8, and the property is now sparsely vegetated, with a strip of densely wooded wetlands along the shoreline of Lake Baldwin and a paved walking trail along Lake Baldwin Lane. The topography is relatively flat, with a slight slope to the northwest, toward Lake Baldwin.

Study Area 9. Structures previously located at SA 9 were used for storing and mixing pesticides and herbicides for use at NTC Orlando. Equipment cleaning water and container rinse water were discharged to a gravel sump. All buildings have been removed from SA 9, and the property is now primarily a flat grass-covered field with a strip of densely wooded wetlands along the shoreline of Lake Baldwin and a paved walking trail along Lake Baldwin Lane. A shallow drainage swale (several feet wide and approximately a foot deep) borders the northern boundary of the site.

Remedial action has been performed at both SA 8 and SA 9. Contaminated soil has been removed from both sites, and no further action is anticipated for soil. A treatability study was performed at OU 3 to investigate the use of activated alumina to remove arsenic from groundwater in situ through Permeable Adsorptive Barriers (PAB). Installation of the PABs took place in April 2002. A final PAB Treatability Study Report for OU 3 was submitted in October 2003 to the OPT, indicating the potential for the PABs to effectively remove arsenic from contaminated groundwater.

Several monitoring wells were damaged during site redevelopment and dewatering in 2004 and 2005. These efforts also temporarily altered groundwater flow direction and velocity, disrupting the effectiveness of the PABs. A comprehensive site survey has confirmed that flow has returned to pre-construction conditions, and arsenic-contaminated groundwater is once again flowing through the PABs.

Current Status. Long term groundwater monitoring is ongoing at OU 3. Arsenic in groundwater continues to exceed the GCTL but has not impacted surface water, as indicated by analytical data from monitoring wells along the lakeshore and three wells installed in Lake Baldwin adjacent to SA 8. LUCs

have been implemented to prohibit the use of groundwater and portions of OU 3 are limited to non-residential use. The Draft Proposed Plan was submitted in November 2011, and FDEP comments were provided in April 2012. The Final proposed Plan is in preparation. Following approval of the Final Proposed Plan, a ROD will be submitted.

Operable Unit 4

OU 4 is located across the northern portion of the former Area C. Construction of Area C, which includes all of OU 4, began in 1942 to provide support services for the Army Air Corps Orlando Air Base. Prior to that time, the site was undeveloped. A railroad system was used for material transport within Area C until 1957. From 1957, salvageable materials were shipped by truck to the supply warehouses and salvage yard located on the site. From the time the Navy acquired the property on July 1, 1968, the area was used to provide support services and warehousing for NTC Orlando. It was last used as an office and storage space for base closure operations and for storage and vehicle maintenance by the Veteran's Administration.

OU 4 includes the former Defense Reutilization and Marketing Office and a salvage yard, and the location of the former base laundry (Building 1100). Chemicals of concern (COC) in soil include PAHs and tetrachloroethene (PCE). Focused soil excavation activities were performed by the Navy to reduce COCs to acceptable levels for Industrial reuse. Additional removal action by the property owner is anticipated for soil in order to allow residential development (apartments).

Groundwater COCs are PCE, TCE, cis-1,2-dichloroethene (cis-DCE), vinyl chloride, and antimony. A focused field investigation was conducted in May 1996 and concluded that VOCs in groundwater were migrating into Lake Druid from the former laundry facility (Building 1100). An interim remedial action (IRA) consisting of two recirculation wells began operation in January 1998 to intercept the VOC plume migrating into Lake Druid. In January 2001, the recirculation wells were converted to a conventional pump and treat system with air stripping and discharge of treated groundwater to the sanitary sewer system. A phytoremediation treatment area was planted in March 2002 to remediate the downgradient VOC plumes and an in situ chemical oxidation (ISCO) treatment system for VOC source reduction was completed in March 2003. The ISCO system was not successful in significantly reducing the source of contamination at the site, and was shut down in October 2003 due to operation difficulties. This system was dismantled in May 2013.

In May 1999, based on the findings of the RI field investigation, approximately 32 tons of surface soil contaminated with PAHs and arsenic were removed from three locations across OU 4. The excavated soil was disposed off-site and replaced with clean soil. Sampling of the sidewalls of the excavation confirmed the removal of the COCs.

Building 1100 was demolished between January and March 2004 as a result of safety concerns and interference with groundwater remediation at the site. Further investigation activities, completed in 2004 after demolition of Building 1100, indicated that the source area at the site is significantly smaller than originally thought; an optimization study completed in March 2006 recommended the injection of EOS[®] for the reduction of source area contamination. EOS[®] injection began in June 2007.

Site investigation activities performed in support of source area treatment remedy selection identified deeper groundwater contamination than previously observed. Seven deeper wells installed into the Hawthorn zone of the aquifer confirmed deeper groundwater contamination, primarily PCE and TCE around 120 feet bgs, and a groundwater flow direction of north-northeast rather than west toward Lake Druid as observed in the shallower portion of the aquifer. Off-site migration was suspected in the Hawthorn zone and two off-site wells were installed in March 2009 to delineate the Hawthorn groundwater plume. No chlorinated volatile organic compounds (CVOCs) have been observed in samples from the off-site wells as of the October 2012 sampling event.

Current Status. At OU 4, PCE and its degradation products TCE, cis-DCE, and VC are the groundwater COCs. All of these CVOCs are present in groundwater at concentrations greater than their respective Florida GCTLs. CVOCs have been detected to a depth of approximately 140 feet bgs in the surficial aquifer and Hawthorn Group beneath the site. A third, relatively stationary, antimony groundwater plume is located in the southeastern corner of OU 4.

Groundwater recovery and semi-annual monitoring are ongoing at OU 4. LUCs including no residential use, no groundwater use, no tampering with remedial systems and access restrictions have been implemented.

Several repairs were made to the groundwater recovery system in 2011. The shallow air stripper discharge was rerouted to a newly installed exfiltration gallery in April 2012. Recovery well UVB-1 was replaced with a 4-inch diameter well in February 2013. UVB-2 became inoperable in March 2013 due to sand and silt buildup in the well and remains offline. However, UVB-1R is currently pumping at a rate of 10-12 gallons per minute (gpm), and this configuration is expected to be as effective as or better than the previous configuration of approximately 5 gpm from both wells.

The property owner is considering residential development of the property (condominiums) and is performing independent environmental investigations in order to obtain a release of the residential use restriction.

A Feasibility Study (FS) Addendum was submitted in August 2012. The FS Addendum addressed the EOS injections for reductive dechlorination and the deeper contamination discovered in the Hawthorne zone. The Draft Proposed Plan was submitted in May 2013. Following approval of the Final Proposed Plan, the ROD is expected to be final in 2014.

3.2 INSTALLATION RESTORATION STATUS OF STUDY AREAS

In order to conduct the environmental investigations in an orderly manner, study areas were identified and grouped based on location and closure schedule. Specific information on each active SA is presented in their respective tabbed sections of this Business Plan and summarized in Appendix B, IR SUMMARY. An overview of the current status of each active SA is below.

Study Area 2

Two groundwater plumes are present at SA 2, one consisting primarily of benzene and one of PCE/TCE. These plumes are migrating to the east and northeast in the surficial aquifer. Currently, there is no known source at SA 2 or the Herndon Annex that is contributing to the plumes; the site usage history and the plume locations suggest that the groundwater plumes resulted from former air base operations. Benzene has been detected at concentrations greater than the GCTL of 1 microgram per liter ($\mu\text{g/L}$) in offsite wells located downgradient in the Azalea Park neighborhood; however, decreasing contaminant trends have been observed in the offsite wells and PCE/TCE has not been detected above GCTLs in the offsite wells. .

A water use survey conducted by the Navy and the City of Orlando in the Azalea Park neighborhood found that there were no permitted groundwater wells being used for domestic purposes; and public water supply is available to all residents. The Navy has delivered several Fact Sheets to the Azalea Park neighborhood residents warning that the groundwater in the surficial aquifer is contaminated and should not be used. The off-site direct push technology (DPT) and monitoring well data show that benzene or other VOCs are not present in the shallow portion of the surficial aquifer (i.e., the water table lies approximately 6 feet bgs and contaminated groundwater is encountered at depths of 35 to 60 feet bgs). This buffer of clean groundwater above the plume eliminates the concern of vapor intrusion into the residences.

Quarterly groundwater monitoring began in 1999. Installation of a minimum 2-foot landfill cover was completed in May 2004. A pilot-scale PHOSter™ system was installed in 2004 and operated until 2008. The PHOSter™ system, 84 injection wells, and 35 monitoring wells were properly abandoned in May 2008 by Stillwater Technologies on behalf of the City of Orlando to allow for construction of a police training facility. Following construction, the City installed three monitoring wells (OLD-02-68D, -69C, and -70D) along the eastern boundary as replacements for the wells abandoned. Groundwater monitoring was revised to a semiannual

frequency in April 2010 and continues to date. LUCs for SA 2 have been implemented, including non-residential use only, groundwater use restriction, and prohibiting disturbance of soil at former landfill areas.

Study Area 17

Previous site activities related to a motor pool area contributed to subsurface soil and groundwater contamination. Remaining contaminants of concern include chlorinated hydrocarbons, primarily TCE, cis-DCE, and vinyl chloride in groundwater. EOS[®] injection is being used for source area reduction, and initial treatment began in 2006. An additional EOS[®] injection effort was performed in Zone B in October 2008. Due to rebound observed in April 2011, EOS[®] injection, with AquaBupHTM to adjust the pH, was performed in B and C Zones in February 2012. Post-injection monitoring indicates the injection events have induced ERD, as evidenced by decreasing TCE concentrations accompanied by increasing concentrations of daughter products cis-DCE and vinyl chloride, and also increasing methane concentrations (methanogenesis). Due to detections of chlorinated VOCs above GCTLs in one well in the deeper semi-confined zone, two additional wells (OLD-17-59D and 60D) were installed in April 2013 to determine extent of groundwater contamination in this zone. Groundwater monitoring is continuing to be performed semi-annually and LUCs have been implemented. These controls include a groundwater use restriction and non-residential use of the site. The site is currently vacant. All buildings were demolished in 2009. Planned reuse is commercial/industrial.

Study Area 36

Contamination of groundwater was identified in the northwestern portion of SA 36. The primary contaminant TCE is currently being addressed through natural attenuation enhanced with vegetable oil injection. Vegetable oil injections took place in January and November 2001. The monitoring frequency was reduced from quarterly to semi-annually in September 2005, and to annually in July 2012. No additional active remediation is planned at this time. Groundwater use and tampering with remedial/monitoring equipment are prohibited by LUCs. The property is currently residential within the Baldwin Park community.

Study Area 36NW/ SA 38

Petroleum contamination associated with the former Main Base service station was discovered after the properties were transferred as uncontaminated. In 2002, remediation efforts were successful in cleaning up the shallow aquifer and contaminated soil; however, deeper contamination was subsequently found in groundwater flowing eastward. The Final Site Assessment Report submitted in May 2010 recommended monitored natural attenuation (MNA) as the selected remedy. The NAM Plan was finalized in December 2011 and was approved in March 2012. Quarterly sampling has been ongoing since March 2004. All groundwater contaminants fell below GCTLs in December 2012. Following confirmation of attainment of GCTLs, a Site Rehabilitation Completion Request will be prepared. The property is currently residential within the Baldwin Park community.

Study Area 39

Groundwater contamination at SA 39 was characterized primarily by the chlorinated solvent contaminants PCE and TCE. These contaminants were addressed through enhanced natural attenuation with vegetable oil injections taking place in December 2000 and November 2001. The monitoring frequency was reduced from quarterly to semi-annually in September 2005 and to annual in August 2007. In the 2010 and 2011 annual groundwater sampling conducted at the site, concentrations of contaminants were less than GCTLs. A Site Rehabilitation Completion Report was submitted to FDEP on May 15, 2013. Following FDEP approval of the No Further Action request, land use restrictions will be recommended for release. The property is currently residential within the Baldwin Park community.

Study Area 52

Groundwater sampling historically indicated the presence of a centrally located groundwater plume of relatively small areal extent in which dieldrin was the primary contaminant. A Site Rehabilitation Completion Order was received in 2008 granting NFA; however the Navy self-imposed a groundwater use restriction to protect human health and the environment. Although the property is suitable for residential use, the planned future use is industrial.

Study Area 54

Soil sampling conducted as part of the site screening investigation indicated that concentrations of PAHs in the soil exceeded both residential and industrial screening criteria. In March and April 2002, soil removal actions excavated two areas of contaminated surface soil in the northeastern portion of SA 54 where PAH concentrations exceeded the Florida commercial/industrial SCTLs. The remedy for contamination at SA 54 consists of institutional controls prohibiting future residential use of the property. The property was transferred to the U.S. Army Reserve in January 1998. The Memorandum of Agreement (MOA) between the Navy, the Army, and the FDEP was signed in April 2011. Warning signs were placed at the site in March 2013. Management of the LUCs will transition to the U.S. Army Reserve in 2014.

Study Area 56/Building 148 (Area C SW)

SA 56/Building 148 is located within Area C SW, which was transferred to the City of Orlando in March 2009 for public park and recreation area purposes. Carcinogenic PAHs have been detected in soil at concentrations exceeding both residential and industrial screening criteria in the vicinity of former Building 148 and in areas proposed to be developed as a playground, community garden, and dog run area in SA 56. Dieldrin has also been detected at concentrations above residential and industrial screening criteria in the vicinity of former Building 148. Sampling is currently being conducted to delineate the extent of soil contamination, and excavation of contaminated soils is planned. No groundwater impacts have been identified; groundwater sampling will be conducted to confirm the absence of groundwater contamination.

3.3 TANK MANAGEMENT PROGRAM STATUS

To date, all known tanks have been removed from the NTC Orlando properties. A table summarizing the environmental status of all identified tanks at NTC Orlando is included in Appendix C, TANK SUMMARY.

3.4 COMPLIANCE SURVEYS AND ABATEMENT STATUS

Surveys for lead-based paint and asbestos were completed in FY1995 and FY1996. Lead-based paint abatement was completed by the contractor who refurbished the Capehart housing units. Asbestos abatement was completed in FY1997 only in those structures scheduled for reuse where damaged, friable asbestos had been identified (21 buildings). Damaged friable asbestos was identified in an additional 58 buildings that were scheduled for demolition. The Navy placarded the rooms or spaces to indicate that they contained damaged friable asbestos and the current owner accepted responsibility to remediate the asbestos prior to demolition.

4.0 MAJOR ISSUES

LUCs are used to protect human health and the environment from unacceptable risk due to site contaminants. A major issue across the country as property is transferred is how to implement LUCs and ensure that they will be maintained and followed as planned. Using LUCs as a remediation tool has raised some concerns regarding their enforceability and possible failure. LUCs may be ignored, forgotten, or may yield to outside pressure unless appropriate oversight and enforcement mechanisms are implemented.

At NTC Orlando, LUCs are being used to restrict land use, limit intrusive activities, and restrict groundwater use at various sites. LUCs have been useful tools for making property available for reuse in a timely manner; however, LUCs must be enforced to ensure safe use of transferred properties. A summary of Institutional Controls for NTC Orlando is included in Appendix D titled INSTITUTIONAL CONTROLS.

5.0 SUCCESS STORIES

Several successes in the cleanup program at NTC Orlando have taken place. Risk reduction has been accomplished by source and soil removal when tanks were removed. Innovative technologies and presumptive remedies are being used where appropriate to speed up the investigations and remediation. Due to the OPTs outstanding management of the former NTC Orlando's environmental cleanup and property transfer efforts, the following significant accomplishments have been achieved:

- The fastest Early Transfer of property ever achieved by the Navy (less than 2 months).
- A 45-day medical waste cleanup to assure that a middle school opened on time.
- Use of innovative technologies achieving cost-avoidance of \$11 million in the cleanup process.
- Community trust and acceptance of Navy activities through an active Restoration Advisory Board.
- Strong regulatory coordination to achieve property turnover of the original 2,072 acres, the majority of which can be used for unrestricted land use.
- Partnering with developer to minimize or eliminate construction delays.
- A ZERO incident safety record.

Appendix E, CONTACT LIST, contains a list of OPT members and other key individuals in the former NTC Orlando cleanup process.

In recognition of the OPT's accomplishments in the environmental cleanup of the NTC, a Chief of Naval Operations Environmental Restoration Award was presented to the OPT in May 2004. The OPT is also the USEPA Region 4 recipient of the 2006 Phoenix Award™. The Phoenix Award™, created in 1997, honors individuals and groups who are working to solve the critical environmental challenge of transforming blighted and contaminated areas into productive new uses. The Phoenix Awards™ are widely recognized as the outstanding award for achievement of excellence in Brownfield redevelopment, and often are called "the Brownfield's equivalent of Hollywood's Oscar". Criteria for The Phoenix Awards™ focus on the magnitude of the project, innovative techniques, solutions to regulatory issues, and impact upon the community. A panel of environmental professionals and business, academic and government leaders select the winners.

6.0 IRP and BRAC SCHEDULE

Long-term monitoring will continue for several years at some sites. The schedule is periodically updated during review of the NTC Orlando Exit Strategy. The most recent Exit Strategy is included in Appendix F.

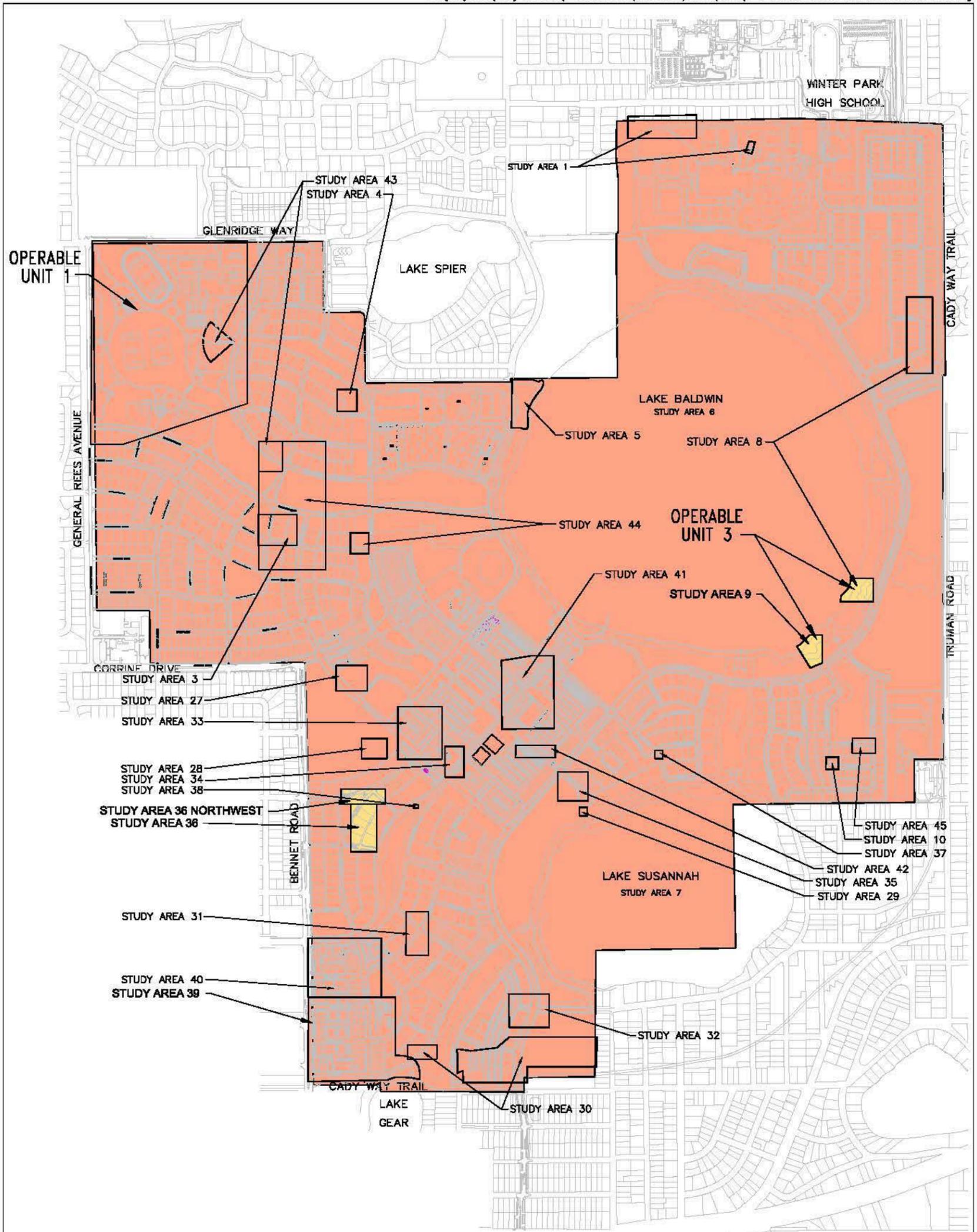
7.0 COMMUNITY RELATIONS

Fact sheets about various sites at the former NTC Orlando are developed periodically to keep the community and interested citizens informed. Copies of the most recent fact sheets for each site are included in Appendix G, SITE SPECIFIC INFORMATION.

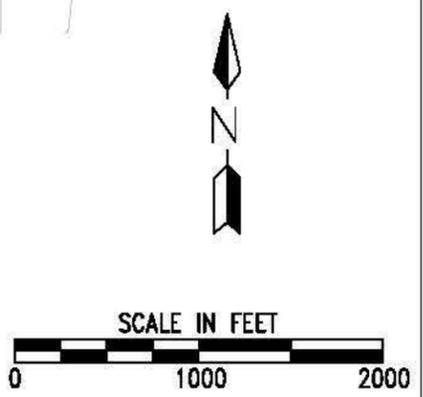
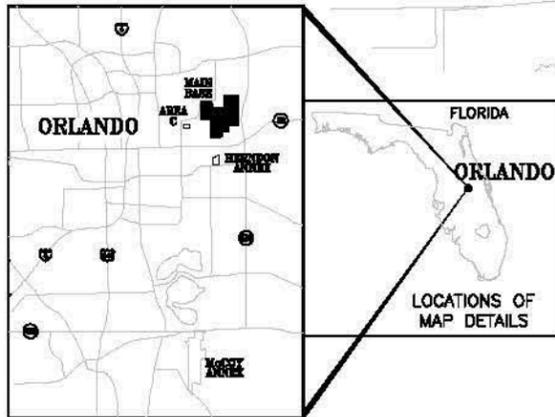
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FIGURES

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LEGEND	
	ACTIVE INSTALLATION RESTORATION SITES
	NO ACTIVE SITES
	BOUNDARY

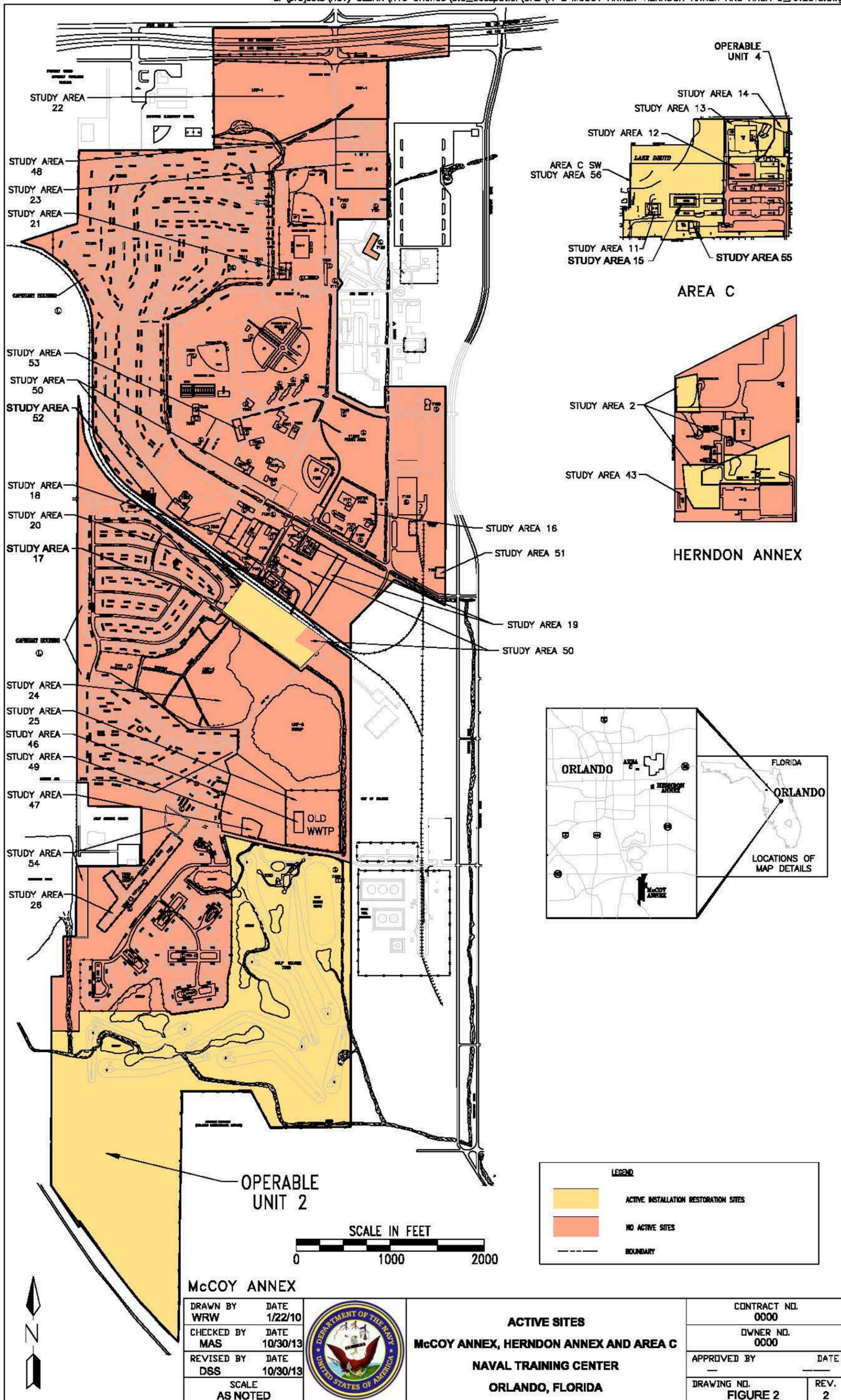


DRAWN BY	DATE
WRW	12/17/09
CHECKED BY	DATE
MAS	10/30/13
REVISED BY	DATE
DSS	10/30/13
SCALE AS NOTED	



**ACTIVE SITES
MAIN BASE
NAVAL TRAINING CENTER ORLANDO, FLORIDA**

CONTRACT NO. 0000	
OWNER NO. 0000	
APPROVED BY	DATE
DRAWING NO. FIGURE 1	REV. 1



APPENDIX A

BRAC PROPERTY TRANSFER SUMMARY

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**APPENDIX A
BRAC PROPERTY TRANSFER SUMMARY**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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PARCELS LISTED BELOW HAVE BEEN TRANSFERRED						
PARCEL	ACRES	RECIPIENT	TRANSFER METHOD	TRANSFER DATE	STUDY AREAS INCLUDED	ADDITIONAL INFORMATION
Naval Hospital	44.32	Veteran's Administration	Fed to Fed	March 1, 1997	SA 1	N/A
Orange County School Board	5	Orange County School Board	PBC	July 1, 1997	none	
Credit Union	1.56	Credit Union	Negotiated Sale	September 17, 1997	none	FOST signed 02/11/97
Capehart Housing, McCoy Annex	214.15	City of Orlando	EDC	September 18, 1997	none	FOST signed 11/15/96
Army Reserves at McCoy Annex and Main Base	22.29	US Army Reserve	DoD	December 31, 1997	SA 26, SA 54	No FOST (Fed to fed transfer). Property transferred by letter.
Customs	3.3	US Customs	Fed to Fed	February 23, 1998	none	No FOST (Fed to fed transfer). Property transferred by letter.
Florida Army National Guard at McCoy Annex	15.48	Florida National Guard	DoD	March 31, 1998	SA 23	FOST signed 02/27/98
Dept. of Corrections	2.04	Dept. of Corrections	PBC	July 31, 1998	none	FOST signed 06/20/97
Phase I	44.5	City of Orlando (via DOI)	PBC	December 31, 1998	SA 21	FOST North and South Central McCoy Annex signed 01/16/98
Phase III	18.3	City of Orlando (via DOI)	PBC	December 31, 1998	SAs 25, 46, 47, and 49	FOST North and South Central McCoy Annex signed 01/16/98
EDC-II (Phase II) Carve Out Parcel	192.3	City of Orlando	EDC	October 27, 1999	SA 22, SA 24	
Navy Exchange (leaseback)	12.2	NEXCOM	EDC	October 27, 1999	none	
EDC II (Phase I) Main Base & part of McCoy Annex	989.03	City of Orlando	EDC	October 27, 1999	SAs 3, 4, 5, 6, 7, 10, 27, 28, 29, 30, 31, 32, 33, 34, 38, 41, 43, 44, 45, 48, and OU 1	Main Base Golf Course FOST Addendum No. 1 North Main Base and Parts of McCoy Annex signed 10/05/99
EDC II (Phase II) Carve Out Parcel	2.34	City of Orlando	EDC	June 28, 2000	SA 37, SA 42	Original FOST signed 11/30/98, Addendum No. 2 FOST signed 05/26/00
Herndon Communications Center	6.809	City of Orlando	EDC	August 28, 2000	none	
GOAA at McCoy Annex (Phase IV)	2.86	GOAA	PBC	September 28, 2000	none	

**APPENDIX A
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ORLANDO, FLORIDA**

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PARCELS LISTED BELOW HAVE BEEN TRANSFERRED						
PARCEL	ACRES	RECIPIENT	TRANSFER METHOD	TRANSFER DATE	STUDY AREAS INCLUDED	ADDITIONAL INFORMATION
GOAA at Herndon Annex (Phase I)	38.01	GOAA via City	PBC	September 28, 2000	HA SA 43	
GOAA at McCoy Annex (Phase I)	42.38	GOAA via City	PBC	September 28, 2000	SA 19, SA 50 (part), and SA 51	FAA Parcels 1, 2, and 3, FOST signed 3/23/00
GOAA at McCoy Annex (Phase III) carve out, Bldg. 7174	0.494	GOAA	PBC	November 2, 2000	SA 50 (part)	
EDC II (Phase VI) McCoy Annex	93.4	City of Orlando	EDC	November 2, 2000	SA 16 (part), SA 20, SA 50 (part), and SA 53	FOST signed 3/23/00
GOAA at McCoy Annex (Phase II) carve out parcel, Study Area 16	0.597	GOAA via City	PBC	November 2, 2000	SA 50 (part)	FOST signed 3/23/00
Building 310	3.627	City of Orlando	PS	November 9, 2000	none	
EDC II (Phase V) carve out site 35 soil	2.12	City of Orlando	EDC	September 28, 2001	SA 35	FOST signed 06/15/01
EDC II (Phase III) carve out parcel SA 40 soil	30	City of Orlando	EDC	June 6, 2002	SA 40	Draft FOST signed 6/6/02
EDC II (Phase VII) carve out SAs 36 and 39 groundwater	1.58	City of Orlando	EDC	June 6, 2002	SA 36 (clean part) and SA 39 (clean part)	Draft FOST signed 6/6/02
Main Base EDC (SAs 36 & 39 part II groundwater)	3.42	City of Orlando	EDC	December 23, 2002	Remaining SAs 36 & 39	FOSET Phase I, FOST signed 12/20/02
Fairwinds Credit Union (Buildings 2531, 2533)	0.265	Fairwinds Federal Credit Union	EDC	February 3, 2003	none	FOST signed 2/11/97
McCoy EDC (Wetlands 1 & 2, Drainage)	10.11	City of Orlando	EDC	March 31, 2003	none	FOST signed 2/6/03
McCoy Annex EDC SA 18	6.847	City of Orlando	EDC	March 31, 2003	SA 18	FOST signed 2/27/03
Area C Northeast	9.22	Orlando Heights, LLC (Abe Saada)	PS	March 22, 2005	OU 4 (part) (SAs 12, 13, and 14)	FOSET Phase 3, FOST signed 02/08/05
Area C Southeast	10.2	Orlando Heights, LLC (Abe Saada)	PS	March 22, 2005	none	FOST signed 05/14/04
OU 3	3.27	City of Orlando	EDC	July 15, 2005	OU 3 (SA 8 and 9)	FOSET Phase 2, FOST signed 10/25/04

**APPENDIX A
BRAC PROPERTY TRANSFER SUMMARY**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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PARCELS LISTED BELOW HAVE BEEN TRANSFERRED						
PARCEL	ACRES	RECIPIENT	TRANSFER METHOD	TRANSFER DATE	STUDY AREAS INCLUDED	ADDITIONAL INFORMATION
Herndon FAA (SA 2)	11.34	City of Orlando	PBC	September 28, 2006	SA 2 (part)	FOSET Phase 2
Herndon (SA 2)	1.034	City of Orlando	EDC	September 28, 2006	SA 2 (part)	FOST signed 02/28/06
McCoy EDC (SA 52)	0.206	City of Orlando	EDC	September 28, 2006	SA 52	FOST signed 05/16/06
Area C Northwest*	6.63	City of Orlando	PBC	Draft Deed Oct 2008 on file	OU 4 (part)	FOSET Phase 2 7/17/06
Area C Southwest	19.73	City of Orlando	PBC	3/27/2009	SA 11, SA 15, SA 55	FOST Signed 7/17/06
McCoy PBC DOI (SA 17)	9.082	City of Orlando	EDC	April 17, 2008	SA 17	FOSET Phase 2 FOST Signed 7/8/07
McCoy PBC DOI (OU2)	176.81	Brian Mulvaney	PS	January 31, 2008	OU 2	FOSET Phase 2 FOST 1/14/08
SA 21*	1	City of Orlando	PBC	March 24, 2000	SA 21	FOST signed 2003
SA 25*	6	City of Orlando	PBC	March 24, 2000	SA 25	FOST signed 12/02/03

Notes:

* Finalized property transfer documentation has not yet been completed.

DOD: Department of Defense
 DOI: Department of Interior
 EDC: Economic Development Conveyance
 FAA: Federal Aviation Authority
 FOSET: Finding of Suitability for Early Transfer
 FOST: Finding of Suitability for Transfer
 GOAA: Greater Orlando Aviation Authority
 IR: Installation Restoration
 LLC: limited liability company
 NA: Not applicable
 OU: Operable Unit
 PBC: Public Benefit Conveyance
 PS: Public Sale
 SA: Study Area
 US: United States

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APPENDIX B

**ENVIRONMENTAL STATUS OF OPERABLE UNITS
AND STUDY AREAS**

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**APPENDIX B
INSTALLATION RESTORATION PROGRAM STATUS**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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SA	Location	Building Number	Name	Acreage	Remedial Action Taken	Active	LUCs	NFA	Decision Document	Change in designation
1	Main Base	3126 UNF-12	Hospital Civilian BEQ Alleged Hospital Landfill		No Remedial Action Required	-	-	07/24/96	NA	
2	Herndon Annex	6001	Septic Tank/Leachfield Herndon Landfills	12.37 Acres - includes SA 2A, SA 2B, SA 2C	ORC injection; Additional Soil Cover Over Landfill Areas; PHOSter	YES	Groundwater Use Non-Residential Restriction No Remedial System Interference No Digging/ Landfill Cover Disturbance	-	04/25/00	
3	Main Base	73/2816 2817	RTC 1st Lt. Storage/ Office/Shops	0.36	Monitoring Only	-	Groundwater Use Restriction	04/21/00		Restriction removed
4	Main Base	250/8	Rusk Memorial Chapel and covered walkways		No Remedial Action Required	-	-	07/24/96	NA	
		251	Rusk Memorial Chapel Annex							
5	Main Base	UNF-13	Septic Tank/Leachfield		No Remedial Action Required	-	-	07/24/96		
6	Main Base		Lake Baldwin		No Remedial Action Required	-	-	07/24/96	NA	
7	Main Base		Lake Susannah		No Remedial Action Required	-	-	07/24/96		
8	Main Base	2134	Greenskeeper Storage	1.88 Acres	Soil Removal; PAB TS	YES	Groundwater Restriction Non-Residential Use (part)	-		Designated OU 3
		UNF-15	Wastewater Treatment Plant		No Remedial Action Required	-	-	05/22/97	NA	
9	Main Base	UNF-14	Pesticide/Herbicide Storage	1.39 Acres	Soil Removal; PAB TS	YES	Groundwater Use Restriction Non-Residential Use No Remedial System Interference	-		Designated OU 3
10	Main Base	IAS-4	Yard Waste Disposal Area		No Remedial Action Required	-	-	07/24/96	NA	
11	Area C	148	Cold Storage Warehouse		Clean Tank Closure	-	-	07/24/96	NA	Moved to Tank Program
12	Area C	1061, 1063	DRMO Warehouses and Salvage Yard		Soil Removal, Groundwater IRA In Situ Chemical Oxidation, Pump and Treat, Recirculation, Phytoremediation, Emulsified Oil Substrate	YES	Groundwater Use Restriction Non-Residential Use No Remedial System Interference No Construction	-		Designated OU 4
13	Area C	1100, 1101	Dry cleaning and Laundry Facility	15.83 Acres						
14	Area C	1102	Disposal, salvage and scrap building							
15	Area C	1053	CBU-419 Maintenance Shop		OWS Assessment; Soil Removal	-		11/25/96		Moved to Tank Program

**APPENDIX B
INSTALLATION RESTORATION PROGRAM STATUS**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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SA	Location	Building Number	Name	Acreage	Remedial Action Taken	Active	LUCs	NFA	Decision Document	Change in designation
16	McCoy Annex	7168	Maintenance Yard	7.628 Acres	Clean Tank Closure	-	Groundwater Use Restriction Non-Residential No Remedial System Interference Must Manage ACM and LBP	05/07/96	NA	Moved to Tank Program
		7171	Army Motor Transportation		Clean Tank Closure OWS Assessment/Removal	-		07/08/99 09/21/99		1 UST to Tank Program 2 OWS to Tank Program
		7172	Army Battery Shop			-		10/16/96	NA	
			Drainage ditches (FAA Parcel)		Soil Removal	-		07/09/03		Tank Program
17	McCoy Annex	7178	Training Material Storage	9.082 Acres	Soil Removal, Groundwater IRA In Situ Chemical Oxidation, Emulsified Oil Substrate	YES	Groundwater Use Restriction Non-Residential No Remedial System Interference No excavation or drilling without approval No construction without prior approval	-	03/26/12	
		7191	DPDO Warehouse							
		7193	Army Maintenance Office							
		7190	Army Motor pool compound and drum storage area adjacent to 7190							
18	McCoy Annex	7182, 7179	Housing Office	6.85 acres	Soil Removal	-	-	06/10/03	05/30/03	
19	McCoy Annex	7184	Auto Hobby Shop		No Remedial Action Required	-	-	07/17/97	NA	
20	McCoy Annex	7187	Storage		No Remedial Action Required	-	-	06/19/97	NA	
21	McCoy Annex	7203	Maintenance Shop	1 acre	No Remedial Action Required	-	Non-Residential LBP	06/07/00	04/25/00	
22	McCoy Annex	UNF-1	Former Golf Course		No Remedial Action Required	-	-	06/19/97	NA	
23	McCoy Annex	UNF-2	Former officer's swimming pool and bathhouse (Building 7119)		Soil Removal	-	-	03/02/00	Mini ROD 5/13/99	
24	McCoy Annex	UNF-4	Northwest Swamp		No Remedial Action Required	-	-	06/19/97	NA	
		UNF-5	Southeast Swamp							
25	McCoy Annex		Former DWTP McCoy Annex	6 acres	No Remedial Action Required	-	Non-Residential	06/06/00	04/25/00	
26	McCoy Annex	7351	Camp Bath House		No Remedial Action Required	-	-	06/19/97	NA	
		7352	Camp Laundry							
		7357	Family Camp Office							
		7358	Family Camp							
27	Main Base	2010	Security Building	0.12 acres	Soil Removal	-	-	07/01/98		
		2073	Armory/Hurricane Storage Locker							

**APPENDIX B
INSTALLATION RESTORATION PROGRAM STATUS**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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SA	Location	Building Number	Name	Acreage	Remedial Action Taken	Active	LUCs	NFA	Decision Document	Change in designation
28	Main Base	114	Bowling/Arts & Crafts Center		No Remedial Action Required	-	-	01/22/98	NA	
29	Main Base	127	Grounds Maintenance	0.14 acres	No Remedial Action Required	-	Non-Residential	01/22/98		Restriction removed
30	Main Base	129	Automotive Hobby Shop		No Remedial Action Required	-	-	07/01/98	NA	
		131	Paint Shop Materials Storage			-	-		NA	
		2262	Custodial Contractor			-	-		NA	
31	Main Base	354	Nuclear Power Field "A" School		UST Removed			07/13/98		Tank Program
32	Main Base	358	BEQ/Heating Plant		No Remedial Action Required	-	-	03/19/98	NA	
33	Main Base	2001	Administration Building	0.03	Soil Removal	-	-	07/13/98		
		2002	NTC Headquarters			-	-			
		2003	DFAS Office			-	-			
		2004	Administration Building			-	-			
34	Main Base	2024	NTC Supply		No Remedial Action Required	-	-	03/19/98	NA	
35	Main Base	2078	Auto Maintenance Facility	2.12 acres	Soil Removal	-	-	08/27/02	08/27/02	
		2079	Auto Maintenance Facility Storage			-	-			
36	Main Base	2121	PW Lumber Storage	1.94 acres	Vegetable Oil Injection	YES	Groundwater Use Restriction (portion of SA 36) - 0.72 acres FDEP ICR ID 387	-	10/19/05	
		2122	PW Shops							
36NW	Main Base	109	Main Base Auto Service Station		Soil removal, groundwater treatment	YES	-	-		Tank Program
37	Main Base	2414	Flammable hazardous waste storage	0.41 acres	Soil Removal	-	-	01/19/00	Mini ROD 5/13/99	
38	Main Base	4001	Storage and use of pesticides and herbicides		No Remedial Action Required	-	-	12/16/97		Groundwater contamination discovered after NFA associated with and assigned to SA 36NW
39	Main Base	4060	Loading Platform (Bldg. 137)	12.88 acres	Soil Removal Vegetable Oil Injection	-	Groundwater Use Restriction (portion of SA 39) 2.70 acres FDEP ICR ID 378	09/20/13	04/13/06	SRCO signed September 20, 2013. Well abandonment in progress. Deed restriction to be released.
		4067	Loading Platform (Bldg. 137)							
		15109	Irrigation Well							
		UNF-10	Former coal storage area							
40	Main Base	21022	Softball Field	7.63 acres	Soil Removal	-	-	06/07/02	07/19/02	
		21023	Softball Field							
		UNF-6	Bottle Landfill							
41	Main Base	UNF-8	Open Area		No Remedial Action Required	-	-	12/16/97		
42	Main Base	2055	Maintenance Shop	0.05 acres	Soil Removal	-	-	03/03/00	Mini ROD 5/13/99	

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INSTALLATION RESTORATION PROGRAM STATUS**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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SA	Location	Building Number	Name	Acreage	Remedial Action Taken	Active	LUCs	NFA	Decision Document	Change in designation
43	Main Base		North Grinder Landfill skeet range		No Remedial Action Required	-	-	12/10/96	NA	
		229	Indoor rifle and pistol range		No Remedial Action Required					
	Herndon Annex	601	Indoor rifle and pistol range		No Remedial Action Required	-	-		NA	
44	Main Base		Motor pool and Missile Training Range		No Remedial Action Required	-	-	07/17/97	NA	
		Former 2721	Silk screening facility		No Remedial Action Required	-	-		NA	
45	Main Base	125	Alleged disposal area near Bldg. 125		No Remedial Action Required	-	-	06/19/97	NA	
46	McCoy Annex		Sewage disposal pit as part of DWTP		No Remedial Action Required	-	-	01/23/97	NA	
47	McCoy Annex		Former skeet range		No Remedial Action Required	-	-	01/23/97	NA	
48	McCoy Annex		Former auto, boat, and carpentry hobby shop		No Remedial Action Required	-	-	06/19/97	NA	
49	McCoy Annex		Former disposal area		No Remedial Action Required	-	-	07/17/97	NA	
50	McCoy Annex	7189	Former Civil Engineering Yard	0.857 acres associated with Bldg 7189	No Remedial Action Required	-	Non-residential Restriction for Building 7189, LBP	02/04/97	NA	
		7249	Former Power Facility		No Tank Found	-				Tank Program
		7174	Former Electrical Equipment Shop		Biosparge, Monitoring	-	Groundwater Use Restriction	03/18/04		Tank Program
		RV Storage			No Remedial Action Required	-	-	08/01/97	NA	
51	McCoy Annex	7159	Electrical Substation		No Remedial Action Required	-	-	01/23/97	NA	
52	McCoy Annex	former 7261	Entomology Lab	0.2 acres	Soil Removal Groundwater Monitoring	-	Groundwater Use Restriction	08/01/08	04/25/00	NFA received in 2008; however the Navy has self-imposed a groundwater use restriction
53	McCoy Annex	7262	Laundry Facility; Convenience shop		No Remedial Action Required	-	-	01/23/97	NA	
54	McCoy Annex		Taft Reserve Center		Soil Removal	-	Non-Residential No soil disturbance without approval from FDEP, Navy	07/25/03	05/25/12	

**APPENDIX B
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**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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SA	Location	Building Number	Name	Acreage	Remedial Action Taken	Active	LUCs	NFA	Decision Document	Change in designation
55	Area C	1104	PCB Storage Building		Soil Removal	-	-	08/11/04	06/29/04	
56	Area C SW		Building 148/SA 56	19.73	Soil Removal pending	YES	-			Re-opened after dieldrin and PAHs found in soil
Nextel	McCoy Annex		SE corner of former SA 16		Soil Removal	-	-	06/16/04		
OU 1	Main Base	21	RTC Fitness Trail	Parcel 4 = 18.07 acres; Parcel 5 = 36.68 acres	Soil cover over landfill Groundwater monitoring March 1998 to December 2008	-	Groundwater Use Restriction Non-Residential (part) Digging Restriction Maintain 2 feet of cover OSHA Notification Requirement FDEP ICR ID 287		11/12/97	FDEP approved discontinuation of groundwater monitoring following 2nd Five Year Review (July 2011)
		4004	North Grinder (paved)							
		4005	North Grinder (grass)							
		4021	South Grinder (paved)							
4022	South Grinder (grass)									
OU 2	McCoy Annex	7355	McCoy Annex Golf Course	176.81 acres	Soil removal Soil cover over landfill Groundwater monitoring	YES	Groundwater Use Restriction Non-Residential (part) Digging Restriction Maintain 2 feet of cover OSHA Notification Requirement Manage ACM			
		7354	Greenskeepers Storage							
		7353	Golf Course Club House							
		7356	Lawn Equipment Storage							
OU 3	Main Base	2134	Greenskeeper Storage	SA 8 = 1.88 acres; SA 9 = 1.39 acres	Soil removal Activated alumina Groundwater monitoring EOS Biobarrier	YES	Groundwater Use Restriction Non-Residential (part) FDEP ICR ID 362			
		UNF-14	Former Pesticide and herbicide Storage							
OU 4	Area C	1063, 1061	DRMO Warehouses and salvage yard	NW = 6.63, NE= 9.22, SW = 19.73, SE = 10.20, Total = 45.78 acres	Soil removal, groundwater IRA in situ chemical oxidation, pump and treat, recirculation, phytoremediation, Emulsified Oil Substrate	YES	Groundwater Use Restriction Non-Residential Vapor barrier for new construction Temporary no access restriction Manage LBP and ACM			
		1100, 1101	Laundry Drycleaners							
		1102	Disposal Salvage Scrap Building							

Notes:

Grey shading indicates tank program
ACM Asbestos Containing Materials
LBP Lead Based Paint

NA Not applicable
OU Operable Unit
ROD Record of Decision
SA Study Area

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APPENDIX C

ENVIRONMENTAL STATUS OF TANK SITES

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Bldg. No.	Tank No.	Building Name	Year Tank Installed	Year Tank Removed	Remedial Action Taken	NFA Date	LUCs	Comments
	106	TPD (Transient Personnel Dept.)	70	97		07/13/98		CLEAN CLOSURE
	109	Main Base Service Station		2002	Groundwater Monitoring	03/01/00		LTR - USTs closed in-place March 2000 - Clean Closure, removed and disposed off-site by Nodarse in July 2002
	109R1	Service Station	94	98				To be remediated as SA 36NW CA COMPLETED 9/3/96, CAR COMPLETED 10/4/96 NFA APPROVED BY FDEP 11/25/96.
	109R2	Service Station	94	98				
	109R3	Service Station	94	98				
109	109-1	Service Station	73	94	Soil Removal,	11/25/96		
	109-2	Service Station	73	94	Groundwater Extraction	11/25/96		
	109-3	Service Station	73	94		11/25/96		
	109-4	Service Station	74	96		04/11/97	CLEAN CLOSURE	
	109R4	Service Station	96	99		09/09/99	CLEAN CLOSURE	
113	113	NEX Mall	73	99		07/08/99		CLEAN CLOSURE
	128	Dental Clinic	77	99	Soil Removal	03/02/01		FDEP issued a Site Rehabilitation Completion Order on 3/2/01.
	128A	Dental Clinic	77	97		07/06/98		CLEAN CLOSURE
	128B	Dental/Clinic	96	99		09/09/99		CLEAN CLOSURE - AST also known as 4053
	129	Auto Hobby Shop	74	97	Groundwater Monitoring	10/28/99		FDEP issued a NFA Site Rehabilitation Completion Order for Building 129 on 10/28/99.
	129A	Auto Hobby Shop	96	99		07/07/99		CLEAN CLOSURE
131	131	Auto Hobby Paint Shop	?	96		07/13/98		CLEAN CLOSURE
138	138	Mariner's Club	75	97		07/06/98		CLEAN CLOSURE
148	148	Warehouse	55	REM		03/12/96		CLEAN CLOSURE
150	150	Water Sports Facility	82	95		03/12/96		CLEAN CLOSURE
200	200	Former Firefighting Training School	70	95	Soil Removal, Groundwater Monitoring	12/08/03		CAR COMPLETED 6/13/97
206	206	RTC Gym Fieldhouse	69	95		02/08/96		CLEAN CLOSURE
208	208	Blue Jacket	69	96		04/11/97		CLEAN CLOSURE
210	210	RTC Barracks	69	95		02/08/96		CLEAN CLOSURE
212	212	RTC Barracks	69	95		02/08/96		CLEAN CLOSURE
214	214	RTC Barracks	68	95		02/08/96		CLEAN CLOSURE
216	216	Galley #1	68	95		02/01/96		CLEAN CLOSURE
	218	Galley #2	72	95	Groundwater Monitoring	08/26/98		Site monitoring wells abandoned on 02/11/99 to complete site closure.
218	218A	Galley #2	72	95		08/26/98		CLEAN CLOSURE
	218B	Galley #2	81	96		07/13/98		
220	220	RTC Barracks	70	95		04/11/97		CA COMPLETED 1/2/97, CAR COMPLETED 2/25/97, NFA APPROVED BY FDEP 4/11/97
222	222	RTC Barracks	71	95		04/11/97		CA COMPLETED 1/10/97, CAR COMPLETED 2/25/97, NFA APPROVED BY FDEP 4/11/97

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Bldg. No.	Tank No.	Building Name	Year Tank Installed	Year Tank Removed	Remedial Action Taken	NFA Date	LUCs	Comments
224	224	RTC Barracks	72	95		07/05/96		CA COMPLETED 5/8/96, CAR COMPLETED 6/28/96, NFA APPROVED BY FDEP 7/5/96
226	226	RTC Barracks	71	95		05/07/96		CLEAN CLOSURE
228	228	RTC Barracks	72	95		02/08/96		CLEAN CLOSURE
230	230	RTCPSD (Personnel Support Dept.)	68	95		04/06/96		CLEAN CLOSURE
230	230A	RTCPSD (Personnel Support Dept.)	68	95		11/25/96		CA COMPLETED 5/28/96, CAR COMPLETED 9/10/96, NFA APPROVED BY FDEP 11/25/96
232	232	RTC Barracks	68	95		04/08/96		CLEAN CLOSURE
234	234	RTC Barracks	68	95		05/09/96		TCAR SUBMITTED TO FDEP, NFA APPROVED BY FDEP 5/9/96
235	235	RIF (Recruit In-Processing Facility)	70	95		11/13/95		CLEAN CLOSURE
238	238	Recruit Receiving Barracks	70	95		10/27/95		CLEAN CLOSURE
240	240	Recruit Community Center	69	95		10/27/95		CLEAN CLOSURE
246	246	Medical Dental Clinic	71	95		06/10/96		CLEAN CLOSURE
246	246A	Medical Dental Clinic	79	REM		03/12/96		TANK NOT LOCATED
	246B	Medical Dental Clinic	79	95				CLEAN CLOSURE
250	250	RTC Chapel	69	95		12/21/95		CLEAN CLOSURE
252	252	RTC Headquarters	69	95		04/08/96		CLEAN CLOSURE
303	303	Adv. Underwater Weapons Training	89	95		01/02/96		CLEAN CLOSURE
304	304	Service School Headquarters	68	96		04/11/97		CLEAN CLOSURE
310	310	SCC BEQ	86	96		04/11/97		CLEAN CLOSURE
311	311	SCC BEQ	87	96		04/11/97		CLEAN CLOSURE
313	313	SSC Barracks	88	96		04/11/97		CLEAN CLOSURE
316	316	SSC Barracks	91	97		11/13/97		CLEAN CLOSURE
317	317	Army Military Intelligence	91	97		11/13/97		CLEAN CLOSURE
325	325	Customs Communication Facility	93	STAY				
351	351	Heating Plant For Bldg. 350	75	97		07/13/98		CLEAN CLOSURE
352	352	Galley #3	72	98		07/06/98		CLEAN CLOSURE
354	354	Nuclear Field "A" School	81	97		07/13/98		REMOVED BY PWC, SA COMPLETED 3/19/98, SAR SUBMITTED TO FDEP ON 6/18/98, FDEP APPROVED NFA AS PER LETTER DATED 7/13/98.
356	356	Nuclear Power School	76	97		03/12/98		CLEAN CLOSURE
358	358	NNPTC Barracks	74	97		03/12/98		CLEAN CLOSURE
361	361	NNPTC Barracks	74	97		03/12/98		CLEAN CLOSURE
363	363	NNPTC Barracks	74	97		03/12/98		CLEAN CLOSURE

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Bldg. No.	Tank No.	Building Name	Year Tank Installed	Year Tank Removed	Remedial Action Taken	NFA Date	LUCs	Comments
364	364	NNPTC Barracks	74	97		03/12/98		CLEAN CLOSURE
366	366	NNPTC Barracks	74	97		03/12/98		CLEAN CLOSURE
369	369	NNPTC Barracks	75	97	Soil Removal	11/06/00		FDEP issued Site Rehabilitation Completion Order on 11/6/00.
371	371	NNPTC Barracks	75	97		03/12/98		CLEAN CLOSURE
375	375	Combined Bachelors Quarters Dept.	76	97		03/12/98		CLEAN CLOSURE
384	384	Barracks	82	97		03/12/98		CLEAN CLOSURE
386	386	NTC PSDNNPTC BEQ	94	99		09/09/99		CLEAN CLOSURE
502	502-A	Hospital Plant	81	STAY				
502	502-B	Hospital Plant	81	STAY				
602	602	General Warehouse	70	95		11/13/95		CLEAN CLOSURE
607	607	Heating Plant For Building 606	73	95	Groundwater Monitoring	11/25/96		Site monitoring wells abandoned on 02/11/99 to complete site closure.
610	610	Combined Research Lab	?	94		05/12/97		CLEAN CLOSURE
1050	1050	Old CBU 419 Headquarters	43	98		07/06/98		CLEAN CLOSURE - AST
1059	1059-1	Packing And Crating General Warehouse, DRMO	43	98		07/06/98		CLEAN CLOSURE - AST
	1059-2	Packing And Crating General Warehouse, DRMO	62	95		03/12/96		CLEAN CLOSURE
1063	1063	Salvage Office, DRMO Warehouse	?	REM		04/09/98		CLEAN CLOSURE
1065	1065	Security Storage		REM				
1100	1100	Laundry Plant	43	95		06/13/96		CLEAN CLOSURE
2001	2001-1	Admin/NTC BTO	59	98		07/06/98		CLEAN CLOSURE - AST
	2001-2	Admin/NTC BTO	59	98		07/06/98		CLEAN CLOSURE - AST
2002	2002	NTC Headquarters	59	98		07/06/98		CLEAN CLOSURE - AST
2003	2003	Vacant	59	95		01/02/96		CLEAN CLOSURE
2003	2003A	Vacant	52	95		04/08/96		CLEAN CLOSURE
2004	2004	Vacant	59	95		01/02/96		CLEAN CLOSURE
2005	2005	NEX Personnel	59	96		04/11/97		CLEAN CLOSURE
2006	2006	United Way	59	99		09/09/99		CLEAN CLOSURE
2008	2008	Security	43	REM		10/14/97		TANK NOT LOCATED
2009	2009	Thrift Shop	44	REM		10/14/97		TANK NOT LOCATED
2010	2010B	USO	43	97		07/13/98		CLEAN CLOSURE
	2010A	Security	43	97		06/16/98		CLEAN CLOSURE
2011	2011	Legal Tap/Rap	43	99		09/09/99		CLEAN CLOSURE
	2011A	Legal Tap/Rap	43	99		09/09/99		CLEAN CLOSURE
	2011B	Legal Tap/Rap	43	99		09/09/99		CLEAN CLOSURE

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Bldg. No.	Tank No.	Building Name	Year Tank Installed	Year Tank Removed	Remedial Action Taken	NFA Date	LUCs	Comments
2012	2012	Fire Alarm Techs/Admin	59	95		03/12/96		CLEAN CLOSURE
2013	2013	Fire Station	57	REM				TANK REMOVED, BLDG DEMOLISHED
2015	2015	Service Club	57	94		06/16/97		CLEAN CLOSURE
2018	2018	NEX Dry Cleaners	59	99		07/08/99		CLEAN CLOSURE
2020	2020	NTC Chapel	59	98		07/06/98		CLEAN CLOSURE - AST
2022	2022	Chaplain's Offices	59	98		07/06/98		CLEAN CLOSURE - AST
2025	2025	Public Works Department	75	99		09/09/99		CLEAN CLOSURE
2026	2026	Maxi- Mart	43	95		05/07/96		CLEAN CLOSURE
2033	2033-1	Service Station	?	83		08/07/96		CLEAN CLOSURE
	2033-2	Service Station	?	83		08/07/96		CLEAN CLOSURE
	2033-3	Service Station	?	83		08/07/96		CLEAN CLOSURE
2034	2034	MWR Administration	61	98		07/06/98		CLEAN CLOSURE - AST
2035	2035	NWR Media & Marketing	61	97		07/13/98		CLEAN CLOSURE
2036	2036A	Old Navy Campus	43	95	Soil Removal, Groundwater Monitoring	02/20/02		LTR- Site Rehabilitation Completion Order issued by FDEP on 2/20/02.
	2036B	Old Navy Campus	51	95		03/12/96		CLEAN CLOSURE
2039	2039	NTC Photo Lab	43	98		07/06/98		CLEAN CLOSURE
2040	2040-1	Navy Recruiting	61	95	Soil Sampling, Groundwater Monitoring	06/14/99		The No Further Action proposal was approved by the FDEP on 6/14/99.
	2040-2	Navy Recruiting	61	95		06/14/99		
	2040-3	Navy Recruiting	43	95		06/14/99		
2041	2041	Bldg Demolished	43	REM				TANK REMOVED, BLDG DEMOLISHED
2049	2049	Publishing & Printing	43	96		04/11/97		CLEAN CLOSURE
2051	2051	NTSC Demolished	43	REM		10/01/97		TANK REMOVED, BLDG DEMOLISHED
2053	2053	NEX Vending	43	95		05/07/96		CLEAN CLOSURE
	2053A	NEX Vending	61	98		07/06/98		CLEAN CLOSURE - AST
2058	2058		?	REM				TANK REMOVED, BLDG DEMOLISHED
2059	2059	NTSC	43	REM				TANK REMOVED, BLDG DEMOLISHED
2065	2065-1	NTSC	43	REM				TANK REMOVED, BLDG DEMOLISHED
	2065-2	NTSC	78	REM				TANK REMOVED, BLDG DEMOLISHED
	2065-3	NTSC	78	REM				TANK REMOVED, BLDG DEMOLISHED
2070	2070	NTSC	?	REM				TANK REMOVED, BLDG DEMOLISHED
2071	2071	NTSC	?	REM				TANK REMOVED, BLDG DEMOLISHED
2074	2074	NTSC	?	REM				TANK REMOVED, BLDG DEMOLISHED
2075	2075	NTSC	?	REM				TANK REMOVED, BLDG DEMOLISHED
2076	2076	Child Care Center	57	99		09/09/99		CLEAN CLOSURE
2078	2078-1	Vehicle Maintenance	63	98		07/06/98		CLEAN CLOSURE - AST
	2078-3	Vehicle Maintenance	63	98		07/06/98		CLEAN CLOSURE - AST
	2078-2	Vehicle Maintenance	63	98				1998 REMOVAL, BLDG CLOSED 9/30/97

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Bldg. No.	Tank No.	Building Name	Year Tank Installed	Year Tank Removed	Remedial Action Taken	NFA Date	LUCs	Comments
2080	2080A	NTC Supply Gas Station	72	88		06/02/92		REPLACED IN 1988, CLEAN CLOSURE
	2080B	NTC Supply Gas Station	72	88		06/02/92		REPLACED IN 1988, CLEAN CLOSURE
	2080C	NTC Supply Gas Station	72	88		06/02/92		REPLACED IN 1988, CLEAN CLOSURE
	2080D	NTC Supply Gas Station	72	88		06/02/92		REPLACED IN 1988, CLEAN CLOSURE
	2080	NTC Supply Gas Station	?	98		02/17/05		1998 REMOVAL, PROPANE
	2080-5	NTC Supply Gas Station	88	99	Soil Removal, Groundwater Monitoring	02/17/05		Tanks removed by DET 02/19/99. TCAR submitted to FDEP 6/15/99. Source removal February 2000. FDEP issued a Natural Attenuation Monitoring Plan Approval Order on 11/18/02.
	2080-6	NTC Supply Gas Station	88	99	Soil Removal, Groundwater Monitoring	02/17/05		
2080-7	NTC Supply Gas Station	88	99	Soil Removal, Groundwater Monitoring	02/17/05			
2089	2089	Synthetic Operation Bldg	43	REM		01/02/96		CLEAN CLOSURE
2090	2090	Air Service Mg	?	REM				TANK REMOVED, BLDG DEMOLISHED
2091	2091-1	Sailor's Chapel	61	99		09/09/99		CLEAN CLOSURE
	2091-2	Sailor's Chapel	61	99		09/09/99		CLEAN CLOSURE
	2091-3	Sailor's Chapel	61	99				
2092	2092	Self-Help/PEB	63	95		06/10/96		CLEAN CLOSURE
2093	2093-1	BEQ	58	95		05/07/96		CLEAN CLOSURE
	2093-2	BEQ	75	REM		05/07/96		CLEAN CLOSURE
	2093-3	BEQ	75	REM		03/12/96		CLEAN CLOSURE
2095	2095-1	Old CAACNADSAP	55	95		01/02/96		CLEAN CLOSURE
	2095-2	Old CAACNADSAP	55	95		01/02/96		CLEAN CLOSURE
2097	2097	Administration HDQ	?	REM		10/23/95		CLEAN CLOSURE
2101	2101	Administration HDQ	43	REM		03/12/96		CLEAN CLOSURE
2102	2102	NA	43	REM		10/23/95		CLEAN CLOSURE
2103	2103	NA	43	REM		10/23/95		CLEAN CLOSURE
2104	2104	Auditorium	43	REM		10/23/95		CLEAN CLOSURE
2105	2105	Library	43	REM		10/23/95		CLEAN CLOSURE
2109	2109	ORD Display Bldg	43	REM				TANK REMOVED, BLDG DEMOLISHED
2110	2110-1	Former Gas Station	61	86				TANK REMOVED, BLDG DEMOLISHED
	2110-2	Former Gas Station	61	86				TANK REMOVED, BLDG DEMOLISHED
	2110-3	Former Gas Station	61	86				TANK REMOVED, BLDG DEMOLISHED
	2110-4	Former Gas Station	74	86				TANK REMOVED, BLDG DEMOLISHED
	2110-5	Former Gas Station	61	86				TANK REMOVED, BLDG DEMOLISHED

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Bldg. No.	Tank No.	Building Name	Year Tank Installed	Year Tank Removed	Remedial Action Taken	NFA Date	LUCs	Comments
2111	2111	Synthetic Div Bldg	43	REM				TANK REMOVED, BLDG DEMOLISHED
2113	2113	NEX/MWR Visual Works Shop	43	98		07/06/98		CLEAN CLOSURE
2114	2114	ROICC, Administration	43	REM		11/13/97		TANK REMOVED IN PAST, TCAR SUBMITTED TO FDEP 10/31/97
2115	2115	New Medical Dental C11 NIC	58	99	Soil Removal, Groundwater Monitoring	03/08/02		LTR- Site Rehabilitation Completion Order issued by FDEP on 3/8/02.
2122	2122	Public Works Roads & Grounds	52	97		07/13/98		CLEAN CLOSURE
	2134-1	Golf Course Maintenance	85	98				1998 REMOVAL
2134	2134-2	Golf Course Maintenance	95	98				1998 REMOVAL
	2134-3	Golf Course Maintenance	95	98				1998 REMOVAL
2262	2262	Custodial Contractor	43	REM		04/08/96		CLEAN CLOSURE
2266	2266	Vet Clinic	59	99		09/09/99		CLEAN CLOSURE
	2273-1	NTC Supply Bulk Fuel Storage	44	93				
	2273-2	NTC Supply Bulk Fuel Storage	44	93				
2273	2273-3	NTC Supply Bulk Fuel Storage	44	96	Groundwater Monitoring	10/14/05		FDEP issued a Natural Attenuation Monitoring Plan Approval Order on 04/26/02. FDEP approved NFA on 10/14/05.
	2273-4	NTC Supply Bulk Fuel Storage	44	96				
2401	2401	BOQ (Bachelor Officer Quarters)	43	98		07/06/98		CLEAN CLOSURE - AST
2402	2402	BOQ (Bachelor Officer Quarters)	56	96		11/13/97		CLEAN CLOSURE
2403	2403	BOQ (Bachelor Officer Quarters)	43	98		07/06/98		CLEAN CLOSURE - AST
2404	2404	BOQ (Bachelor Officer Quarters)	43	98		07/06/98		CLEAN CLOSURE - AST
2405	2405	BOQ (Bachelor Officer Quarters)	43	99		09/09/99		CLEAN CLOSURE
2406	2406	BOQ (Bachelor Officer Quarters)	43	REM		01/09/98		CLEAN CLOSURE
2409	2409	BOQ (Bachelor Officer Quarters)	56	96		04/11/97		CLEAN CLOSURE
2410	2410	BOQ (Bachelor Officer Quarters)	43	98		07/06/98		CLEAN CLOSURE - AST
2411	2411	BOQ (Bachelor Officer Quarters)	56	96		04/11/97		CLEAN CLOSURE

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Bldg. No.	Tank No.	Building Name	Year Tank Installed	Year Tank Removed	Remedial Action Taken	NFA Date	LUCs	Comments
2412	2412	BOQ (Bachelor Officer Quarters)	43	98		07/06/98		CLEAN CLOSURE - AST
2415	2415	BOQ (Bachelor Officer Quarters)	56	96		01/09/98		CLEAN CLOSURE
2416	2416	BOQ (Bachelor Officer Quarters)	43	98		07/06/98		CLEAN CLOSURE - AST
2417	2417	BOQ (Bachelor Officer Quarters)	43	98		07/06/98		CLEAN CLOSURE - AST
2418	2418	BOQ (Bachelor Officer Quarters)	43	REM		11/13/97		CLEAN CLOSURE
2419	2419	BOQ (Bachelor Officer Quarters)	43	REM		11/13/97		CLEAN CLOSURE
2420	2420	BOQ (Bachelor Officer Quarters)	43	99		09/09/99		CLEAN CLOSURE
2421	2421	BOQ (Bachelor Officer Quarters)	56	96		04/11/97		CLEAN CLOSURE
2423	2423	BOQ (Bachelor Officer Quarters)	43	REM		03/09/98		CLEAN CLOSURE
2424	2424	BOQ (Bachelor Officer Quarters)	43	REM		03/09/98		CLEAN CLOSURE
2426	2426	BOQ (Bachelor Officer Quarters)	56	96	Soil Removal	05/19/00		
2427	2427	BOQ (Bachelor Officer Quarters)	43	REM		04/09/98		CLEAN CLOSURE
2434	2434-2	Brass Anchor	43	98		07/06/98		CLEAN CLOSURE - AST
	2434-3	Brass Anchor	43	98		07/06/98		CLEAN CLOSURE - AST
	2434-1	Brass Anchor	43	REM				TANK REMOVED
2450	2450	CPO Barracks (B. D.)	58	95		05/07/96		CLEAN CLOSURE
2451	2451	Public Works Carpenter Shop	43	98		07/06/98		CLEAN CLOSURE - AST
2452	2452	MOSP Admin.	?	REM				TANK REMOVED, BLDG DEMOLISHED
2510	2510	Swimming Pool Heat Plant	69	99	Soil Removal	03/02/01		A Site Rehabilitation Completion Order was issued on 3/2/01.
2516	2516-1	Old Anchor (Vacant)	55	95		03/12/96		CLEAN CLOSURE
	2516-2	Old Anchor (Vacant)	55	95		03/12/96		CLEAN CLOSURE
2525	2525	Old Barracks	?	REM		10/23/95		CLEAN CLOSURE
2526	2526	Old Barracks	?	REM		10/23/95		CLEAN CLOSURE
2527	2527	Old Barracks	?	REM		10/23/95		CLEAN CLOSURE
2529	2529	Special Services	?	REM				CLEAN CLOSURE
2535	2535	Acad. Inst.	60	REM				CLEAN CLOSURE

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Bldg. No.	Tank No.	Building Name	Year Tank Installed	Year Tank Removed	Remedial Action Taken	NFA Date	LUCs	Comments
2537	2537	Barracks	60	REM				CLEAN CLOSURE
2538	2538	Barracks	60	REM		01/02/96		CLEAN CLOSURE
2541	2541	Rope Yarn Club	60	REM		06/11/97		TANK NOT LOCATED
2542	2542	Guest House	61	REM		10/23/95		CLEAN CLOSURE
2543	2543	Guest House	61	REM		10/23/95		CLEAN CLOSURE
2555	2555	Guest House	?	REM		10/23/95		CLEAN CLOSURE
2557	2557	Guest House	?	REM		10/23/95		CLEAN CLOSURE
2651	2651	Base Recycling Center	?	REM		06/17/97		CLEAN CLOSURE
2701	2701	Old Barracks	?	REM				TANK REMOVED, BLDG DEMOLISHED
2702	2702	Old Barracks	?	REM				TANK REMOVED, BLDG DEMOLISHED
2704	2704	Old Barracks	?	REM				TANK REMOVED, BLDG DEMOLISHED
2709	2709	Vacant (Old NJROTC)	60	95		11/13/95		CLEAN CLOSURE
2712	2712	Old Sea Cadets (Vacant)	60	95		01/02/96		CLEAN CLOSURE
2713	2713	Administration Building	60	REM		06/17/97		CLEAN CLOSURE
2717	2717	BEQ	60	94		06/17/97		CLEAN CLOSURE
2718	2718	BEQ	60	94		06/17/97		CLEAN CLOSURE
2719	2719	BEQ	60	94		06/17/97		CLEAN CLOSURE
2720	2720	CCPO Training	60	REM		06/17/97		CLEAN CLOSURE
2723	2723	Vacant (Old Barrack)	61	95		10/27/95		CLEAN CLOSURE
2724	2724	Vacant (Old Wives Club, Fleet Res.)	61	95		03/12/96		CLEAN CLOSURE
2816	2816	HAZMAT	66	95		03/12/96		CLEAN CLOSURE
2817	2817	RTC 1st LT	66	95		01/02/96		CLEAN CLOSURE
3025	3025	Old Hospital Heating Plant	43	REM		05/07/96		CLEAN CLOSURE
3126	3126	Civilian BEQ	43	REM		01/02/96		CLEAN CLOSURE
3127	3127	Bio-Waste Correction Facility	43	REM		10/18/95		CLEAN CLOSURE
3128	3128	Civilian BEQ	43	REM		10/18/95		CLEAN CLOSURE
3129	3129	Civilian BEQ	43	REM		10/18/95		CLEAN CLOSURE
3132	3132	Alcohol Rehabilitation Dept. Bldg.	43	REM		02/08/96		CLEAN CLOSURE
3133	3133	Alcohol Rehabilitation Dept. Bldg.	43	REM		03/12/96		CLEAN CLOSURE
3134	3134	Alcohol Rehabilitation Dept. Bldg.	43	REM		10/18/95		CLEAN CLOSURE
4053	4053B	Stand By Gen. For Dental Clinic 128	76	99		09/09/99		CLEAN CLOSURE - replaced UST with AST, also known as 128B
	4053A	Stand By Gen. For Dental Clinic 128	77	98		07/06/98		CLEAN CLOSURE - replaced UST with AST, also known as 128A

**APPENDIX C
TANK MANAGEMENT PROGRAM STATUS**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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Bldg. No.	Tank No.	Building Name	Year Tank Installed	Year Tank Removed	Remedial Action Taken	NFA Date	LUCs	Comments
7107	7107	Water Pumping Station	52	96	Soil Removal, Groundwater Monitoring	01/06/00		FDEP issued a Site Rehabilitation Completion Order on 1/6/00 approving NFA for the site.
7119	7119	Swimming Pool Bathhouse (Demolished)	43	96		06/12/96		CLEAN CLOSURE
7121	7121-A	Florida Army National Guard	53	96		12/23/97		SAR COMPLETED 12/23/97
	7121-B	Florida Army National Guard	53	96		12/23/97		
	7121-C	Florida Army National Guard	53	96		12/23/97		
7125	7125-A	Barracks	61	96	Soil Removal, Groundwater Monitoring	09/09/05	groundwater use restriction	Source removal March 2000. FDEP issued a Natural Attenuation Monitoring Plan Approval Order on 02/24/03. FDEP approved NFA 9/9/05.
	7125	Barracks	52	96				
7151	7151	Commissary	52	99	Source removal March 2000.	10/19/05		Tanks removed by DET 02/17/99. TCAR submitted to FDEP 6/15/99. FDEP issued a Natural Attenuation Monitoring Plan Approval Order on 03/15/01. FDEP approved NFA 10/19/05.
7153	7153	Nex Warehouse	52	96	Groundwater Monitoring	05/05/98		Site monitoring wells abandoned on 07/16/98 to complete site closure.
7168	7168	Army Reserve Motorpool	66	96		05/07/96	non-residential, groundwater use restriction	transferred to Tank Program from SA 16
7171	7171OWSR	Nex Annex Motor Pool Oil/Water Separator	?	99		09/21/99		FDEP issued a Site Rehabilitation Completion Order on 09/21/99 approving NFA for the site.
	7171	Army Reserve Motor Pool	52	99	7171OWSR Soil Removal, Groundwater Monitoring	07/08/99		TCAR and clean closure approved by FDEP on 7/8/99.
	7171-A	Nex Annex Service Station	90	REM				
7172	7172	ECS 50(G) Battery Storage	66	90				
7174	7174-1	Service Station	42	97				Biosparge Treatment System Groundwater Monitoring
	7174-10	Service Station	86	94				
	7174-11	Service Station	57	97				
	7174-12	Service Station	57	97				
	7174-2	Service Station	42	97				
	7174-3	Service Station	42	97				
	7174-4	Service Station	42	97				
	7174-5	Service Station	42	97				
	7174-6	Service Station	42	97				
	7174-7	Service Station	86	94				
7174-8	Service Station	86	94					
7174-9	Service Station	57	94					

**APPENDIX C
TANK MANAGEMENT PROGRAM STATUS**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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Bldg. No.	Tank No.	Building Name	Year Tank Installed	Year Tank Removed	Remedial Action Taken	NFA Date	LUCs	Comments
7175	7175- B	McCoy Motor Pool	52	90	Soil Removal, Groundwater Monitoring	12/02/02		Site Rehabilitation Completion Order issued by FDEP on 12/2/02.
	7175- C	McCoy Motor Pool	52	90				
	7175-A	Service Station	92	94				
	7175-A	Motor Pool- McCoy Annex	52	93				
7178	7178	NAWC Storage	65	REM		04/09/98		TANK NOT LOCATED
	7178-A	Training Material Storage	65	REM		03/01/98		TANK NOT LOCATED
7180	7180	Library/Credit Union	52	96		04/11/97		CLEAN CLOSURE
7182	7182	Pwd	52	97				Chorinated solvents investigation under SA 18
7184	7184-A	Annex Auto Hobby Shop	65	96				CLEAN CLOSURE - also known as RV-1
	7184-B	Annex Auto Hobby Shop	78	96		07/16/98		CLEAN CLOSURE
	7184-C	Annex Auto Hobby Shop	85	96		07/16/98		CLEAN CLOSURE
	7184-D	Annex Auto Hobby Shop	78	96		07/16/98		CLEAN CLOSURE
7185	7185	Annex Fire Station	87	96		06/13/96		CLEAN CLOSURE
	7185A	Annex Fire Station	87	98		07/06/98		CLEAN CLOSURE - AST
7186	7186	Civil Air Patrol	52	96		05/07/96		CLEAN CLOSURE
7187	7187	Marine Corps Storage	52	96		07/14/97		
7190	7190	165th ADA Administration	52	96		06/13/96		CLEAN CLOSURE
7191	7191- A	Grounds Maintenance Compound	55	98				
	7191	Nawctsd Storage	55	REM		03/12/96		TANK NOT LOCATED
7201	7201	Medical Clinic	51	96		06/12/96		CLEAN CLOSURE
	7201A	Medical Clinic	43	96		06/12/96		CLEAN CLOSURE
7202	7202	Youth Center Boy & Girl Scouts	43	96	Groundwater Monitoring	07/14/97		Site Monitoring wells abandoned on 7/16/98 to complete site closure.
7203	7203	Golf Maintenance & Storage	55	96		04/11/97		CLEAN CLOSURE
	7203A	Golf Maintenance & Storage	75	96		04/11/97		CLEAN CLOSURE
7210	7210	Vacant (Old Navy Lodge)	52	95		02/08/96		CLEAN CLOSURE
7211	7211	Vacant (Old Navy Lodge)	52	95		04/01/97		
	7211A	Vacant (Old Navy Lodge)	52	95		12/21/95		CLEAN CLOSURE

**APPENDIX C
TANK MANAGEMENT PROGRAM STATUS**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

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Bldg. No.	Tank No.	Building Name	Year Tank Installed	Year Tank Removed	Remedial Action Taken	NFA Date	LUCs	Comments
7212	7212	Vacant (Old Navy Lodge)	52	95		12/21/95		CLEAN CLOSURE
	7212A	Vacant (Old Navy Lodge)	52	95		04/08/96		CLEAN CLOSURE
7224	7224	Navy Orlando Youth Sports Assoc	54	REM		06/12/97		CLEAN CLOSURE
7230	7230	Army Admin	52	73				TANK NOT LOCATED
7231	7231	Army BEQ	52	REM				TANK NOT LOCATED
7232	7232	Army BEQ	52	REM				TANK NOT LOCATED
7234	7234	USMC (Vacant)	54	96		04/11/97		CLEAN CLOSURE
7239	7239	Vacant (Oceans 24 Club)	57	96	Groundwater Monitoring	11/12/97		Site Monitoring wells abandoned on 7/16/98 to complete site closure.
	7239A	Vacant (Oceans 24 Club)	57	96		11/12/97		CLEAN CLOSURE
7240	7240	Vacant (Old Bank)	43	96		04/24/97		CLEAN CLOSURE
	7240A	Vacant (Old Bank)	90	REM		06/10/96		
7241	7241- 1	Chapel Fellowship Hall & Youth Cntr.	53	96	Soil Removal	06/16/97	Groundwater use restriction	CLEAN CLOSURE
	7241- 2	Chapel Fellowship Hall & Youth Cntr	53	96				
	7241- 3	Chapel Fellowship Hall & Youth Cntr.	53	96				
7242	7242	Religious Education Building	56	95		05/07/96		CLEAN CLOSURE
7243	7243-1	Former Chapel	43	89				TANK REMOVED, BLDG DEMOLISHED
7244	7244	Vacant (Old Country Store)	55	96		06/13/96		CLEAN CLOSURE
7246	7246	Annex Swimming Pool Bath House	53	96		04/11/97		CLEAN CLOSURE
7247	7247	Annex Gym	56	96		06/13/96		CLEAN CLOSURE
7249	7249	Exchange Service	54	96				TANK NOT LOCATED
7253	7253	Vacant (Old NEX Retail)	53	96	Groundwater Monitoring	08/25/97		Site Monitoring wells abandoned on 7/16/98 to complete site closure.
7257	7257	Police Station	?	REM				
7264	7264	Child Care Center	67	96		04/11/97		CLEAN CLOSURE
7350	7350	Sewage Treatment Plant	?	REM				TANK REMOVED, BLDG DEMOLISHED
7356	7356	Golf Course Maintenance	95	98				
	7356A	Golf Course Maintenance	83	98				
RV 1	RV-1	Annex Rec. Vehicle Storage Lot	?	96				CLEAN CLOSURE
RV2	RV-2	Annex Rec. Vehicle Storage Lot	65	97				CLEAN CLOSURE
	80001					06/17/97		CLEAN CLOSURE

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APPENDIX D

INSTITUTIONAL CONTROLS SUMMARY

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**TABLE D-1
INSTITUTIONAL CONTROLS SUMMARY**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 1 OF 2

Site	Site Name	IC Mechanism	Institutional Control	FDEP ICR#	Date IC Recorded	Date Order Issued	Date Removal Approved	Date IC Removed	Contaminated Media
Institutional Controls in Place as of November 2013									
FDEP CERCLA Program:									
SA 2	Herndon Annex Landfills Septic Tank/Leachfield	Deed Restriction	Groundwater Use Restriction Non-Residential (portion) Landfill Cover Maintenance Digging Restriction (portion)	681 (SA 2A) 682 (SA 2B)					Landfill Material Groundwater (benzene, TCE, PCE)
SA 17	DPDO, Army Motor Pool	Deed Restriction	Groundwater Use Restriction Non-Residential Digging Restriction Bldg Construction Restriction No Remedial System Interference	683					Groundwater (CVOCs)
SA 36	Lumber Storage	Restrictive Covenant	Groundwater Use Restriction No Remedial System Interference	387	12/23/02	12/19/02			Groundwater (VOCs, primarily TCE)
SA 39	Loading Platform	Restrictive Covenant	Groundwater Use Restriction No Remedial System Interference	378	12/23/02	12/19/02	pending		SRCO approved September 20, 2013
SA 50	Bldg 7189 Former Civil Eng Yard	Deed Restriction	Non-Residential Lead Based Paint	686	11/02/00	03/23/00			Soil (PAHs)
SA 54	Family Camp / US Army Reserve Center	Memorandum of Agreement	Non-residential, Digging Restriction, Notice Requirement	688 (SA 54A) 689 (SA 54B)					Soil (PAHs)
OU 1	North Grinder Landfill	Deed Restriction	Groundwater Use Restriction Non-residential (portion) Digging Restriction OSHA Notification Requirement No Remedial System Interference Soil Cover Maintenance	287	10/27/99	10/27/97			Landfill material Landfill material Soil (inorganics, PAHs) Soil Groundwater (inorganics)
OU 2	McCoy Annex Landfill	Deed Restriction	Groundwater Use Restriction Non-Residential Digging Restriction OSHA Notification Requirement No Remedial System Interference Landfill Cover Maintenance	676					Landfill Material Groundwater (benzene, TCE, PCE)
OU 3	Greenskeeper's Storage Area / Former Pesticide Handling and Storage Area	Deed Restriction	Groundwater Use Restriction Non-Residential (portion) No Remedial System Interference Bldg Use/Construction Restriction	677 (SA 8) 678 (SA 9)					Groundwater (arsenic, pesticides) Soil - arsenic
OU 4NE	DRMO Warehouses, Laundry/Drycleaners	Deed Restriction	Groundwater Use Restriction Non-Residential No Remedial System Interference Lead Based Paint Asbestos Bldg Use/Construction Restriction	679					Groundwater (VOCs, primarily TCE) Soil (PAHs)

**TABLE D-1
INSTITUTIONAL CONTROLS SUMMARY**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 2 OF 2

Site	Site Name	IC Mechanism	Institutional Control	FDEP ICR#	Date IC Recorded	Date Order Issued	Date Removal Approved	Date IC Removed	Contaminated Media
FDEP Tanks Program:									
SA 16	Bldg 7168 Maintenance Yard	Deed Restriction	Groundwater Use Restriction (portion) Non-Residential No Remedial System Interference (portion) Lead Based Paint Asbestos	365	11/02/00	11/14/00			Soil (PAHs)
			Groundwater Use Restriction				07/09/03	Groundwater (petroleum)	
Institutional Controls without finalized deeds or memorandum of agreement as of November 2013 (Property previously transferred)									
SA 21	Maintenance Shop	Restrictive Covenant	Non-residential Lead Based Paint	684					Soil (PAHs, dieldrin, beryllium, arsenic)
SA 25	Domestic Wastewater Treatment Plant	Restrictive Covenant	Non-residential (western area)	685					Soil (PAHs, dieldrin, beryllium, heptachlor epoxide)
OU 4NW	DRMO Warehouses, Laundry/Drycleaners	Deed Restriction	Groundwater Use Restriction Non-Residential No Remedial System Interference	680					Groundwater (VOCs, primarily TCE) Soil (PAHs)
Active Sites Previously Transferred (without Navy and FDEP imposed LUCs)									
SA 36NW (SA 38)			No LUCs						Groundwater (VOCs)
Institutional Controls released as of November 2013									
SA 3	RTC 1st Lt. Storage	Deed Restriction	Groundwater Use Restriction		10/27/99	04/20/98	06/06/00		Groundwater (VOAs)
SA 29	Bldg 127 Grounds Maintenance	Deed Restriction	Non-Residential		10/27/99	04/20/98	12/06/04	8/11/2005	Soil (inorganics metallic)
SA 52	Entomology Lab	Deed Restriction	Groundwater Use Restriction Digging Restriction No Remedial System Interference	687			NFA 8/1/08		Groundwater (dieldrin)
MBGC	Mainbase Golf Course	Memorandum of Agreement	Land Use Restriction		10/27/99	10/27/99	10/12/00		Soil (inorganic metallic)
Bldg 7125	Barracks, County Bug Site	Deed Restriction	Groundwater Use Restriction		11/02/00	09/18/00	NFA 9/9/05		Groundwater (petroleum)
Bldg 7174	Service Station	Deed Restriction	Groundwater Use Restriction	391	11/02/00	03/23/00	03/18/04		Groundwater (petroleum)
Bldg 7241-2	Chapel Fellowship Hall & Youth Center	Deed Restriction	Groundwater Use Restriction		11/02/00	09/02/97	08/16/01		Groundwater (petroleum)
Bldg 2080	NTC Supply Gas Station						02/17/05		
Bldg 2273	NTC Supply Bulk						NFA 10/14/05		No LUCs
Bldg 7151	Commissary						NFA 10/19/05		No LUCs

TABLE D-2

ACTIVE STUDY AREA LAND USE CONTROL BOUNDARIES

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

STUDY AREA	BOUNDARY	NORTH LATITUDE	WEST LONGITUDE
Study Area 2	SA 2A Site Boundary Land Use Restriction Boundary and Groundwater Use Restriction Boundary	28° 32' 48.7296"	-81° 19' 20.5010"
		28° 32' 48.7295"	-81° 19' 20.5010"
		28° 32' 46.6832"	-81° 19' 20.3134"
		28° 32' 44.6369"	-81° 19' 20.1259"
		28° 32' 44.6494"	-81° 19' 21.5408"
		28° 32' 44.6618"	-81° 19' 22.9557"
		28° 32' 46.4587"	-81° 19' 22.9786"
		28° 32' 48.2556"	-81° 19' 23.0015"
Study Area 2	SA 2B Site Boundary Land Use Restriction Boundary and Groundwater Use Restriction Boundary	28° 32' 48.4926"	-81° 19' 21.7513"
		28° 32' 42.2765"	-81° 19' 09.1770"
		28° 32' 39.7664"	-81° 19' 09.2243"
		28° 32' 37.2562"	-81° 19' 09.2716"
		28° 32' 37.2495"	-81° 19' 11.3208"
		28° 32' 37.2428"	-81° 19' 13.3701"
		28° 32' 37.2691"	-81° 19' 15.4826"
		28° 32' 37.2954"	-81° 19' 17.5951"
		28° 32' 37.3022"	-81° 19' 18.5678"
		28° 32' 37.3090"	-81° 19' 19.5405"
		28° 32' 37.9634"	-81° 19' 19.5422"
Study Area 2	SA 2C Site Boundary Land Use Restriction Boundary and Groundwater Use Restriction Boundary	28° 32' 38.6178"	-81° 19' 19.5440"
		28° 32' 40.4472"	-81° 19' 14.3605"
		28° 32' 40.3100"	-81° 19' 17.0691"
		28° 32' 40.2878"	-81° 19' 15.1273"
		28° 32' 40.2656"	-81° 19' 13.1856"
		28° 32' 38.7542"	-81° 19' 13.2682"
		28° 32' 37.2429"	-81° 19' 13.3507"
		28° 32' 37.2692"	-81° 19' 15.4633"
		28° 32' 37.2954"	-81° 19' 17.5758"
		28° 32' 35.9724"	-81° 19' 17.5780"
		28° 32' 34.6494"	-81° 19' 17.5802"
		28° 32' 34.6495"	-81° 19' 17.5802"
		28° 32' 34.6307"	-81° 19' 19.1347"
		28° 32' 34.6120"	-81° 19' 20.6891"
		28° 32' 35.4051"	-81° 19' 21.2037"
		28° 32' 36.1983"	-81° 19' 21.7183"
		28° 32' 37.7119"	-81° 19' 21.8799"
28° 32' 39.2256"	-81° 19' 22.0415"		
28° 32' 39.2445"	-81° 19' 19.5492"		
28° 32' 39.2633"	-81° 19' 17.0570"		
28° 32' 39.7867"	-81° 19' 17.0630"		

TABLE D-2

ACTIVE STUDY AREA LAND USE CONTROL BOUNDARIES

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

STUDY AREA	BOUNDARY	NORTH LATITUDE	WEST LONGITUDE
Study Area 17	SA 17 Site Boundary and Groundwater Use Restriction Boundary	28° 26' 05.3803"	-81° 20' 29.1052"
		28° 26' 03.1368"	-81° 20' 25.5010"
		28° 26' 00.8933"	-81° 20' 21.8968"
		28° 26' 00.2642"	-81° 20' 22.3690"
		28° 25' 59.6352"	-81° 20' 22.8412"
		28° 25' 58.9838"	-81° 20' 21.7382"
		28° 25' 58.3324"	-81° 20' 20.6351"
		28° 25' 57.2808"	-81° 20' 21.8763"
		28° 25' 56.2292"	-81° 20' 23.1175"
		28° 25' 59.1636"	-81° 20' 27.4221"
		28° 26' 02.0979"	-81° 20' 31.7267"
		28° 26' 03.7391"	-81° 20' 30.4159"
Study Area 36	Study Area 36 Site Boundary	28° 33' 50.8567"	-81° 19' 54.2315"
		28° 33' 48.7319"	-81° 19' 54.2083"
		28° 33' 46.6070"	-81° 19' 54.1850"
		28° 33' 46.5876"	-81° 19' 55.2844"
		28° 33' 46.5682"	-81° 19' 56.3837"
		28° 33' 48.6964"	-81° 19' 56.4139"
		28° 33' 50.8247"	-81° 19' 56.4440"
		28° 33' 50.8407"	-81° 19' 55.3378"
Study Area 36	Groundwater Use Restriction Boundary	28° 33' 50.8567"	-81° 19' 54.2315"
		28° 33' 50.4937"	-81° 19' 54.2269"
		28° 33' 50.1307"	-81° 19' 54.2223"
		28° 33' 49.9105"	-81° 19' 54.3577"
		28° 33' 49.6869"	-81° 19' 54.4858"
		28° 33' 49.5658"	-81° 19' 54.5510"
		28° 33' 49.4441"	-81° 19' 54.6147"
		28° 33' 49.4070"	-81° 19' 54.6333"
		28° 33' 49.3700"	-81° 19' 54.6520"
		28° 33' 49.1931"	-81° 19' 54.7372"
		28° 33' 49.0146"	-81° 19' 54.8179"
		28° 33' 49.0239"	-81° 19' 55.1271"
		28° 33' 49.0331"	81° 19' 55.4363"
		28° 33' 49.2099"	-81° 19' 55.9300"
		28° 33' 49.3866"	-81° 19' 56.4236"
		28° 33' 50.1057"	-81° 19' 56.4338"
28° 33' 50.8247"	-81° 19' 56.4440"		
28° 33' 50.8407"	-81° 19' 55.3378"		

TABLE D-2

ACTIVE STUDY AREA LAND USE CONTROL BOUNDARIES

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

STUDY AREA	BOUNDARY	NORTH LATITUDE	WEST LONGITUDE
Study Area 39	Study Area 39 Site Boundary	28° 33' 33.5992"	-81° 19' 51.8828"
		28° 33' 30.2868"	-81° 19' 51.8437"
		28° 33' 26.9743"	-81° 19' 51.8046"
		28° 33' 26.8288"	-81° 19' 51.4071"
		28° 33' 26.4794"	-81° 19' 51.2379"
		28° 33' 26.4727"	-81° 19' 51.7560"
		28° 33' 26.4660"	-81° 19' 52.2741"
		28° 33' 26.1929"	-81° 19' 52.9528"
		28° 33' 25.9198"	-81° 19' 53.6315"
		28° 33' 25.9209"	-81° 19' 56.8205"
		28° 33' 25.9219"	-81° 20' 00.0094"
		28° 33' 29.6988"	-81° 20' 00.0681"
		28° 33' 33.4757"	-81° 20' 00.1267"
Study Area 39	Groundwater Use Restriction Boundary	28° 33' 29.2315"	-81° 19' 51.8312"
		28° 33' 28.1029"	-81° 19' 51.8179"
		28° 33' 26.9743"	-81° 19' 51.8046"
		28° 33' 26.8288"	-81° 19' 51.4071"
		28° 33' 26.4794"	-81° 19' 51.2379"
		28° 33' 26.4727"	-81° 19' 51.7560"
		28° 33' 26.4660"	-81° 19' 52.2741"
		28° 33' 26.1929"	-81° 19' 52.9528"
		28° 33' 25.9198"	-81° 19' 53.6315"
		28° 33' 25.9202"	-81° 19' 54.7362"
		28° 33' 25.9205"	-81° 19' 55.8409"
		28° 33' 27.3490"	-81° 19' 55.8740"
		28° 33' 28.7775"	-81° 19' 55.9070"
		28° 33' 28.7775"	-81° 19' 56.0416"
		28° 33' 28.7775"	-81° 19' 56.1762"
		28° 33' 28.9874"	-81° 19' 56.1811"
		28° 33' 29.1973"	-81° 19' 56.1859"
28° 33' 29.2144"	-81° 19' 54.0086"		

Land Use Controls INFORMATION SHEET

Facility: USN ORLANDO TRAINING CTR
(Facility Name as in CERCLIS)

Facility ID: FL6170023711
(CERCLIS ID Number)

Date of ROD: 11/10/97
(Date in CERCLIS, mm/dd/yy)

(One per entry)

Operable Unit: OU 1, North Grinder Landfill
(Operable Unit, Name and OU Number, as in CERCLIS)

Who Is Responsible for Performing the LUC Inspection/certification.

Contact Person: (Name) Mr. Art Sanford
: (Phone) (843) 743-2135
: (Office Address) BRAC PMO Southeast
4130 Faber Place Drive, Suite 202
North Charleston, South Carolina 29405
(Office Address, City, State, Zip)

OU Coordinates. (Coordinates of the OU should be provided in the form of polygons, starting with the northern-most coordinate and moving clockwise (in degrees, minutes, seconds and thousands of seconds. Add as many lines as necessary to close the polygon.)

OU 1 Landfill Boundary (ROD)

1.	28° 34' 37.2916"	North Latitude	-81° 20' 10.4179"	West Longitude
2.	28° 34' 34.3779"	North Latitude	-81° 20' 10.3813"	West Longitude
3.	28° 34' 31.4643"	North Latitude	-81° 20' 10.3446"	West Longitude
4.	28° 34' 30.7412"	North Latitude	-81° 20' 12.3510"	West Longitude
5.	28° 34' 30.0182"	North Latitude	-81° 20' 14.3573"	West Longitude
6.	28° 34' 29.9926"	North Latitude	-81° 20' 18.4323"	West Longitude
7.	28° 34' 29.9670"	North Latitude	-81° 20' 22.5074"	West Longitude
8.	28° 34' 33.5661"	North Latitude	-81° 20' 22.5607"	West Longitude
9.	28° 34' 37.1652"	North Latitude	-81° 20' 22.6141"	West Longitude
10.	28° 34' 37.1736"	North Latitude	-81° 20' 22.0787"	West Longitude
11.	28° 34' 37.1819"	North Latitude	-81° 20' 21.5433"	West Longitude
12.	28° 34' 37.1763"	North Latitude	-81° 20' 21.5432"	West Longitude
13.	28° 34' 37.2106"	North Latitude	-81° 20' 18.2347"	West Longitude
14.	28° 34' 37.2449"	North Latitude	-81° 20' 14.9261"	West Longitude
15.	28° 34' 37.2682"	North Latitude	-81° 20' 12.6720"	West Longitude

OU 1 Groundwater Use Restriction Boundary

1.	28° 34' 43.5029"	North Latitude	-81° 20' 07.4258"	West Longitude
2.	28° 34' 36.1946"	North Latitude	-81° 20' 07.3107"	West Longitude
3.	28° 34' 28.8862"	North Latitude	-81° 20' 07.1955"	West Longitude
4.	28° 34' 26.8027"	North Latitude	-81° 20' 12.9636"	West Longitude
5.	28° 34' 24.7191"	North Latitude	-81° 20' 18.7316"	West Longitude
6.	28° 34' 24.6963"	North Latitude	-81° 20' 20.8165"	West Longitude
7.	28° 34' 24.6736"	North Latitude	-81° 20' 22.9013"	West Longitude
8.	28° 34' 26.6504"	North Latitude	-81° 20' 22.9318"	West Longitude
9.	28° 34' 28.6271"	North Latitude	-81° 20' 22.9623"	West Longitude
10.	28° 34' 35.9986"	North Latitude	-81° 20' 23.0617"	West Longitude
11.	28° 34' 43.3701"	North Latitude	-81° 20' 23.1611"	West Longitude
12.	28° 34' 43.4234"	North Latitude	-81° 20' 16.3144"	West Longitude
13.	28° 34' 43.4766"	North Latitude	-81° 20' 09.4678"	West Longitude
14.	28° 34' 43.4898"	North Latitude	-81° 20' 08.4468"	West Longitude

Media:

List All: Soil, Groundwater,
 Surface Water, Sediments

Date IC Removed:

List Contaminants of Concern: gross alpha in groundwater

Does the OU contain Primary Threat Source Material? Yes, No

List: _____

Select type of Institutional Control: Check All That Apply

- Restrictive Use of Groundwater
- Prohibited use of Groundwater for Drinking
- Non Residential use
- Industrial Use Only
- Monitoring wells not disturbed
- Remediation System not disturbed
- Surface Soils not disturbed
- Subsurface soils not disturbed
- Adjacent Wetlands not disturbed
- Creek sediments not disturbed

Select type of Engineering Controls: Check All That Apply

- Fencing
- Capping
- Landfill cover not disturbed
- Concrete Survey Markers not disturbed
- Storm Sewer Line not breached
- Creek sediments not disturbed

54.75 Area (acreage)

Certification Due Date: _____
(When is the next LUC/IC Certification Report due (mm/dd/yy))

Certification Received Date: _____
(When was the last Certification Received (mm/dd/yy))

Certification/Reporting Requirements: _____ (Document Name)
(To be filled out for active DOD/DOE, BRAC, and transferred DOE for example Quarterly inspections [April/July/October/January] until transfer; then will start Annual inspections. Risk evaluation indicates that inspections could be conducted every 5 years.)

Recommendation/Comments:

(If not in CERCLIS)

BRAC Current Owner: _____

Address: _____
(Street Address Not P.O. Box)

City: _____

State: _____

Zip Code: _____

Land Use Controls INFORMATION SHEET

Facility: USN ORLANDO TRAINING CTR
(Facility Name as in CERCLIS)

Facility ID: FL6170023711
(CERCLIS ID Number)

Date of ROD: --/--
(Date in CERCLIS, mm/dd/yy)

(One per entry)

Operable Unit: OU 2, McCoy Annex Landfill
(Operable Unit, Name and OU Number, as in CERCLIS)

Who Is Responsible for Performing the LUC Inspection/certification.

Contact Person: (Name) Mr. Art Sanford
: (Phone) (843) 743-2135
: (Office Address) BRAC PMO Southeast
4130 Faber Place Drive, Suite 202
North Charleston, South Carolina 29405
(Office Address, City, State, Zip)

OU Coordinates. (Coordinates of the OU should be provided in the form of polygons, starting with the northern-most coordinate and moving clockwise (in degrees, minutes, seconds and thousands of seconds. Add as many lines as necessary to close the polygon.)

OU 2 Site Boundary/Land Use Restriction Boundary/Groundwater Use Restriction Boundary

1.	28° 25' 38.1881"	North Latitude	-81° 20' 31.6468"	West Longitude
2.	28° 25' 37.9011"	North Latitude	-81° 20' 29.8274"	West Longitude
3.	28° 25' 36.8500"	North Latitude	-81° 20' 20.0027"	West Longitude
4.	28° 25' 36.2774"	North Latitude	-81° 20' 17.5194"	West Longitude
5.	28° 25' 35.8284"	North Latitude	-81° 20' 16.2836"	West Longitude
6.	28° 25' 08.6227"	North Latitude	-81° 20' 15.7256"	West Longitude
7.	28° 25' 08.5496"	North Latitude	-81° 20' 25.0994"	West Longitude
8.	28° 25' 12.4651"	North Latitude	-81° 20' 27.7048"	West Longitude
9.	28° 25' 12.3954"	North Latitude	-81° 20' 37.0300"	West Longitude
10.	28° 24' 45.1040"	North Latitude	-81° 20' 36.7660"	West Longitude
11.	28° 24' 50.6716"	North Latitude	-81° 20' 42.8452"	West Longitude
12.	28° 24' 54.7076"	North Latitude	-81° 20' 46.4654"	West Longitude
13.	28° 24' 57.9661"	North Latitude	-81° 20' 48.8441"	West Longitude
14.	28° 24' 56.9016"	North Latitude	-81° 20' 48.8368"	West Longitude
15.	28° 25' 00.6185"	North Latitude	-81° 20' 51.5503"	West Longitude
16.	28° 25' 17.4090"	North Latitude	-81° 20' 51.6659"	West Longitude
17.	28° 25' 17.4017"	North Latitude	-81° 20' 48.9141"	West Longitude
18.	28° 25' 20.9323"	North Latitude	-81° 20' 48.9369"	West Longitude
19.	28° 25' 20.9348"	North Latitude	-81° 20' 48.4635"	West Longitude
20.	28° 25' 20.1188"	North Latitude	-81° 20' 47.5914"	West Longitude
21.	28° 25' 20.1297"	North Latitude	-81° 20' 44.9294"	West Longitude
22.	28° 25' 20.2135"	North Latitude	-81° 20' 38.4054"	West Longitude
23.	28° 25' 19.7089"	North Latitude	-81° 20' 37.5129"	West Longitude
24.	28° 25' 20.4797"	North Latitude	-81° 20' 31.5405"	West Longitude
25.	28° 25' 20.9738"	North Latitude	-81° 20' 30.9824"	West Longitude

26.	28° 25' 22.9630"	North Latitude	-81° 20' 31.0235"	West Longitude
27.	28° 25' 24.7638"	North Latitude	-81° 20' 30.9031"	West Longitude
28.	28° 25' 31.6246"	North Latitude	-81° 20' 30.7440"	West Longitude
29.	28° 25' 34.9953"	North Latitude	-81° 20' 30.9659"	West Longitude
30.	28° 25' 36.0106"	North Latitude	-81° 20' 30.9703"	West Longitude
31.	28° 25' 36.4631"	North Latitude	-81° 20' 31.0707"	West Longitude

Media:

List All: Soil, Groundwater,
 Surface Water, Sediments

Date IC Removed:

List Contaminants of Concern: soil: arsenic and PAHs;
groundwater: benzene, iron, manganese, chlorinated organics

Does the OU contain Primary Threat Source Material? Yes, No

List: _____

Select type of Institutional Control: Check All That Apply

- Restrictive Use of Groundwater
- Prohibited use of Groundwater for Drinking
- Non Residential use
- Industrial Use Only
- Monitoring wells not disturbed
- Remediation System not disturbed
- Surface Soils not disturbed
- Subsurface soils not disturbed
- Adjacent Wetlands not disturbed
- Creek sediments not disturbed

Select type of Engineering Controls: Check All That Apply

- Fencing
- Capping
- Landfill cover not disturbed
- Concrete Survey Markers not disturbed
- Storm Sewer Line not breached
- Creek sediments not disturbed

177 Area (acreage)

Certification Due Date: _____

(When is the next LUC/IC Certification Report due (mm/dd/yy))

Certification Received Date: _____

(When was the last Certification Received (mm/dd/yy))

Certification/Reporting Requirements: _____ (Document Name)

(To be filled out for active DOD/DOE, BRAC, and transferred DOE for example Quarterly inspections [April/July/October/January] until transfer; then will start Annual inspections. Risk evaluation indicates that inspections could be conducted every 5 years.)

Recommendation/Comments:

(If not in CERCLIS)

BRAC Current Owner: _____

Address: _____
(Street Address Not P.O. Box)

City: _____

State: _____

Zip Code: _____

Land Use Controls INFORMATION SHEET

Facility: USN ORLANDO TRAINING CTR
(Facility Name as in CERCLIS)

Facility ID: FL6170023711
(CERCLIS ID Number)

Date of ROD: --/--
(Date in CERCLIS, mm/dd/yy)

(One per entry)

Operable Unit: OU 3, Greenskeeper Storage Area
(Operable Unit, Name and OU Number, as in CERCLIS)

Who Is Responsible for Performing the LUC Inspection/certification.

Contact Person: (Name) Mr. Art Sanford
: (Phone) (843) 743-2135
: (Office Address) BRAC PMO Southeast
4130 Faber Place Drive, Suite 202
North Charleston, South Carolina 29405
(Office Address, City, State, Zip)

OU Coordinates. (Coordinates of the OU should be provided in the form of polygons, starting with the northern-most coordinate and moving clockwise (in degrees, minutes, seconds and thousands of seconds. Add as many lines as necessary to close the polygon.)

Site Boundary & Groundwater Use Restriction Zone (OU 3 – SA 8)

1.	28° 34' 13.2214"	North Latitude	-81° 19' 00.7404"	West Longitude
2.	28° 34' 11.6879"	North Latitude	-81° 19' 00.5041"	West Longitude
3.	28° 34' 10.1544"	North Latitude	-81° 19' 00.2678"	West Longitude
4.	28° 34' 09.9751"	North Latitude	-81° 19' 02.1639"	West Longitude
5.	28° 34' 09.7959"	North Latitude	-81° 19' 04.0599"	West Longitude
6.	28° 34' 11.4231"	North Latitude	-81° 19' 03.4131"	West Longitude
7.	28° 34' 13.0503"	North Latitude	-81° 19' 02.7662"	West Longitude
8.	28° 34' 13.1358"	North Latitude	-81° 19' 01.7533"	West Longitude

Non-Residential Land Use Restriction Zone (OU 3 – SA 8)

1.	28° 34' 13.1860"	North Latitude	-81° 19' 01.1592"	West Longitude
2.	28° 34' 11.5445"	North Latitude	-81° 19' 02.0431"	West Longitude
3.	28° 34' 09.9030"	North Latitude	-81° 19' 02.9270"	West Longitude
4.	28° 34' 09.8494"	North Latitude	-81° 19' 03.4935"	West Longitude
5.	28° 34' 09.7959"	North Latitude	-81° 19' 04.0599"	West Longitude
6.	28° 34' 11.4231"	North Latitude	-81° 19' 03.4131"	West Longitude
7.	28° 34' 13.0503"	North Latitude	-81° 19' 02.7662"	West Longitude
8.	28° 34' 13.1182"	North Latitude	-81° 19' 01.9627"	West Longitude

Site Boundary (OU 3 – SA 9)

1.	28° 34' 06.6160"	North Latitude	-81° 19' 08.5779"	West Longitude
2.	28° 34' 06.6047"	North Latitude	-81° 19' 07.8685"	West Longitude
3.	28° 34' 06.5934"	North Latitude	-81° 19' 07.1590"	West Longitude
4.	28° 34' 05.2940"	North Latitude	-81° 19' 07.0338"	West Longitude
5.	28° 34' 03.9945"	North Latitude	-81° 19' 06.9086"	West Longitude
6.	28° 34' 03.6040"	North Latitude	-81° 19' 07.6256"	West Longitude
7.	28° 34' 03.2134"	North Latitude	-81° 19' 08.3427"	West Longitude
8.	28° 34' 04.4329"	North Latitude	-81° 19' 09.1129"	West Longitude
9.	28° 34' 05.6523"	North Latitude	-81° 19' 09.8831"	West Longitude
10.	28° 34' 06.1341"	North Latitude	-81° 19' 09.2305"	West Longitude

Groundwater Use Restriction Zone (OU 3 – SA 9)

1.	28° 34' 06.6160"	North Latitude	-81° 19' 08.5779"	West Longitude
2.	28° 34' 06.6047"	North Latitude	-81° 19' 07.8685"	West Longitude
3.	28° 34' 06.5934"	North Latitude	-81° 19' 07.1590"	West Longitude
4.	28° 34' 05.2940"	North Latitude	-81° 19' 07.0338"	West Longitude
5.	28° 34' 04.1269"	North Latitude	-81° 19' 06.9214"	West Longitude
6.	28° 34' 03.7236"	North Latitude	-81° 19' 07.6658"	West Longitude
7.	28° 34' 03.3204"	North Latitude	-81° 19' 08.4102"	West Longitude
8.	28° 34' 04.4329"	North Latitude	-81° 19' 09.1129"	West Longitude
9.	28° 34' 05.6523"	North Latitude	-81° 19' 09.8831"	West Longitude
10.	28° 34' 06.1341"	North Latitude	-81° 19' 09.2305"	West Longitude

Non-Residential Land Use Restriction Zone (OU 3 – SA 9)

1.	28° 34' 06.6160"	North Latitude	-81° 19' 08.5779"	West Longitude
2.	28° 34' 06.6047"	North Latitude	-81° 19' 07.8685"	West Longitude
3.	28° 34' 06.5934"	North Latitude	-81° 19' 07.1590"	West Longitude
4.	28° 34' 05.8742"	North Latitude	-81° 19' 07.0897"	West Longitude
5.	28° 34' 05.1551"	North Latitude	-81° 19' 07.0204"	West Longitude
6.	28° 34' 04.8584"	North Latitude	-81° 19' 08.1074"	West Longitude
7.	28° 34' 04.5618"	North Latitude	-81° 19' 09.1943"	West Longitude
8.	28° 34' 05.1070"	North Latitude	-81° 19' 09.5387"	West Longitude
9.	28° 34' 05.6523"	North Latitude	-81° 19' 09.8831"	West Longitude
10.	28° 34' 06.1341"	North Latitude	-81° 19' 09.2305"	West Longitude

Media:

List All: Soil, Groundwater,
 Surface Water, Sediments

Date IC Removed:

List Contaminants of Concern: arsenic and pesticides

Does the OU contain Primary Threat Source Material? Yes, No

List: _____

Select type of Institutional Control: Check All That Apply

- Restrictive Use of Groundwater
- Prohibited use of Groundwater for Drinking
- Non Residential use
- Industrial Use Only
- Monitoring wells not disturbed
- Remediation System not disturbed
- Surface Soils not disturbed
- Subsurface soils not disturbed
- Adjacent Wetlands not disturbed
- Creek sediments not disturbed

Select type of Engineering Controls: Check All That Apply

- Fencing
- Capping
- Landfill cover not disturbed
- Concrete Survey Markers not disturbed
- Storm Sewer Line not breached
- Creek sediments not disturbed

3.27 Area (acreage)

Certification Due Date: _____
(When is the next LUC/IC Certification Report due (mm/dd/yy))

Certification Received Date: _____
(When was the last Certification Received (mm/dd/yy))

Certification/Reporting Requirements: _____ (Document Name)
(To be filled out for active DOD/DOE, BRAC, and transferred DOE for example Quarterly inspections [April/July/October/January] until transfer; then will start Annual inspections. Risk evaluation indicates that inspections could be conducted every 5 years.)

Recommendation/Comments:

(If not in CERCLIS)

BRAC Current Owner: _____

Address: _____
(Street Address Not P.O. Box)

City: _____

State: _____

Zip Code: _____

Land Use Controls INFORMATION SHEET

Facility: USN ORLANDO TRAINING CTR
(Facility Name as in CERCLIS)

Facility ID: FL6170023711
(CERCLIS ID Number)

Date of ROD: --/--
(Date in CERCLIS, mm/dd/yy)

(One per entry)

Operable Unit: OU 4, Base Laundry Drycleaners
(Operable Unit, Name and OU Number, as in CERCLIS)

Who Is Responsible for Performing the LUC Inspection/certification.

Contact Person: (Name) Mr. Art Sanford
: (Phone) (843) 743-2135
: (Office Address) BRAC PMO Southeast
4130 Faber Place Drive, Suite 202
North Charleston, South Carolina 29405
(Office Address, City, State, Zip)

OU Coordinates. (Coordinates of the OU should be provided in the form of polygons, starting with the northern-most coordinate and moving clockwise (in degrees, minutes, seconds and thousands of seconds. Add as many lines as necessary to close the polygon.)

OU 4 Site Boundary/Groundwater Use Restriction Boundary

1.	28° 33' 40.8400"	North Latitude	-81° 20' 41.2604"	West Longitude
2.	28° 33' 36.5581"	North Latitude	-81° 20' 41.2070"	West Longitude
3.	28° 33' 34.2001"	North Latitude	-81° 20' 41.1777"	West Longitude
4.	28° 33' 34.1949"	North Latitude	-81° 20' 43.2075"	West Longitude
5.	28° 33' 34.1897"	North Latitude	-81° 20' 45.2373"	West Longitude
6.	28° 33' 35.1254"	North Latitude	-81° 20' 45.2404"	West Longitude
7.	28° 33' 36.0611"	North Latitude	-81° 20' 45.2434"	West Longitude
8.	28° 33' 36.0565"	North Latitude	-81° 20' 47.0407"	West Longitude
9.	28° 33' 36.0519"	North Latitude	-81° 20' 48.8380"	West Longitude
10.	28° 33' 36.0373"	North Latitude	-81° 20' 54.5370"	West Longitude
11.	28° 33' 36.0226"	North Latitude	-81° 21' 00.2360"	West Longitude
12.	28° 33' 37.8937"	North Latitude	-81° 21' 00.2443"	West Longitude
13.	28° 33' 37.9127"	North Latitude	-81° 20' 59.0211"	West Longitude
14.	28° 33' 37.9316"	North Latitude	-81° 20' 57.7980"	West Longitude
15.	28° 33' 37.9702'	North Latitude	-81° 20' 55.3098"	West Longitude
16.	28° 33' 38.0088"	North Latitude	-81° 20' 52.8216"	West Longitude
17.	28° 33' 39.3711"	North Latitude	-81° 20' 52.8486"	West Longitude
18.	28° 33' 40.7333"	North Latitude	-81° 20' 52.8757"	West Longitude
19.	28° 33' 40.7383"	North Latitude	-81° 20' 52.3368"	West Longitude
20.	28° 33' 40.7432"	North Latitude	-81° 20' 51.7980"	West Longitude
21.	28° 33' 40.7916"	North Latitude	-81° 20' 46.5292"	West Longitude

Media:

List All: Soil, Groundwater,
 Surface Water, Sediments

Date IC Removed:

List Contaminants of Concern: chlorinated organics and antimony (GW); PAHs (soil)

Does the OU contain Primary Threat Source Material? Yes, No

List: _____

Select type of Institutional Control: Check All That Apply

- Restrictive Use of Groundwater
- Prohibited use of Groundwater for Drinking
- Non Residential use
- Industrial Use Only
- Monitoring wells not disturbed
- Remediation System not disturbed
- Surface Soils not disturbed
- Subsurface soils not disturbed
- Adjacent Wetlands not disturbed
- Creek sediments not disturbed

Select type of Engineering Controls: Check All That Apply

- Fencing
- Capping
- Landfill cover not disturbed
- Concrete Survey Markers not disturbed
- Storm Sewer Line not breached
- Creek sediments not disturbed

15.85 Area (acreage)

Certification Due Date: _____

(When is the next LUC/IC Certification Report due (mm/dd/yy))

Certification Received Date: _____

(When was the last Certification Received (mm/dd/yy))

Certification/Reporting Requirements: _____ (Document Name)

(To be filled out for active DOD/DOE, BRAC, and transferred DOE for example Quarterly inspections [April/July/October/January] until transfer; then will start Annual inspections. Risk evaluation indicates that inspections could be conducted every 5 years.)

Recommendation/Comments:

(If not in CERCLIS)

BRAC Current Owner: _____

Address: _____

(Street Address Not P.O. Box)

City: _____

State: _____

Zip Code: _____

APPENDIX E

POINTS OF CONTACT

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**APPENDIX E
POINTS OF CONTACT**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 1 OF 9

The following personnel are associated with the former NTC Orlando and its redevelopment. Grey shading indicates a former position.

CONTACT	ROLE	SITE AFFILIATION	ADDRESS	PHONE NO.	CELL NO.	E-MAIL ADDRESS
Adams, Bill	SJRWMD Water Use Regulation Hydrologist	SA 2	SJRWMD Maitland Service Center 601 S. Lake Destiny Rd., Suite 200 Maitland, FL 32751	407.659.4851 office 407.659.4805 fax		wadams@sjrwmd.com
Agaj, Indrid	Coordinates property access	SA 36 NW/ SA 38 Baldwin Park	Post Properties, Inc. 2203 N. Lois Ave., Ste. 911 Tampa, FL 33607	813.882.8470 office 813.600.4085 fax	813.781.6795	indrid.agaj@postproperties.com
Alexander, Michael	Self-monitoring reports (Discharge permit #CO83TA)	OU 4	City of Orlando, Environmental Control Section 5100 L.B. McLeod Road Orlando, Florida 32811	407.246.2153 office 407.246.2886 fax		michael.alexander@cityoforlando.net
Bachowski, Donna	Orlando Public Library Information Repository	Basewide	Orlando Public Library 101 East Central Blvd 4th Floor - Reference Central Orlando, FL 32801-2429	407.835.7323 general 407.835.7370 direct		
Bagley, Bill	Sales & Leasing Associate Represents property owner (Abe Saada)	AREA C (OU 4)	Dunhill Properties, Inc. 520 N. Semoran Boulevard, Suite 222 Orlando, FL 32807	407.992.4000 x107 office 407.992.4010 fax	407.620.3629	bill@dunhill.net
Balsamo, Ed	Navy Legal Counsel Attorney Advisor	Basewide	Navy BRAC Program Management Office 1455 Frazee Rd., Suite 900 San Diego, CA 92108-4310	619.532.0910 office 619.532.0780 fax		ed.balsamo@navy.mil
Barts, Peter T., P.G.	President, Principal Hydrogeologist Consultant to property owner	OU 2	HSA Golden Environmental and Engineering Consultants 100 East Pine Street, Suite 605 Orlando, FL 32801	407.649.6458 direct 407.649.5475 office 407.649.6582 fax	407.353.3674	pbarts@hsagolden.com

**APPENDIX E
POINTS OF CONTACT**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 2 OF 9

CONTACT	ROLE	SITE AFFILIATION	ADDRESS	PHONE NO.	CELL NO.	E-MAIL ADDRESS
Bolena, Colleen	Baldwin Park Developer (worked with John Classe, assists HOA w/ environ. questions)	Baldwin Park	Orlando NTC Partners, A Joint Venture, d/b/a Baldwin Park Development Company 1410 N. Mills Ave. Orlando,, FL 32803	407.947.5269		cbolena@DeBartoloDevelopment.com
Bonilla, Lidia	Area Facilities Environmental Specialist 81 st Regional Support Command, DPW	SA 54	Alpha Facilities Solutions 11503 NW Military Hwy, Suite 300 San Antonio, TX 78231	210.492.5742x403 407.816.2659 (office) 407.446.3724 (cell)		lidia.bonilla@alpha-fs.com
Borden, Ann	Solutions-IES President	Basewide	Solutions-IES, Inc. 1101 Nowell Rd. Raleigh, NC 27607	919.873.1060 919.873.1074 fax		bordena@solutions-ies.com
Botts, Laurie	City of Orlando Office of Business and Financial Services Real Estate Management	SA 56 Area C SW	Orlando City Hall 400 South Orange Avenue PO Box 4990 Orlando, FL 32802-4990	407.246.2653 office 407.246.3712 fax		laurie.botts@cityoforlando.net
Brennan, Michele	Public Relations	Area C SW	City of Orlando			michele.brennan@cityoforlando.net
Cheung, Francis	Senior Project Engineer/VP Consultant to property owner	OU 2	Ardaman & Associates, Inc. 8008 South Orange Ave. Orlando, FL 23809	407.855.3860 office 407.859.7121 fax		fcheung@ardaman.com
Collins, Jeff	Environmental Specialist Reclaimed Water – City of Orlando	Basewide	City of Orlando Public Works Department Reclaimed Water Division 5100 L.B. McLeod Road Orlando, FL 32811	407.246.2664 x 242 office 407.246.2886 fax	407.832.5515	jeffrey.collins@cityoforlando.net
Criswell, David	Deputy Base Closure Manager OPT Member Tier II Link	Basewide	BRAC Program Management Office Southeast 4130 Faber Place Drive, Suite 202 North Charleston, SC 29405	843.743.2130		david.criswell@navy.mil

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CONTACT	ROLE	SITE AFFILIATION	ADDRESS	PHONE NO.	CELL NO.	E-MAIL ADDRESS
Currie, Kathy	Administrative Coordinator Baldwin Park information	SA 36 NW/ SA 38 Baldwin Park	New Broad Street Companies 420 South Orange Ave, Suite 400 Orlando, FL 32801	407.515.6976 office 407.529.3876 fax	407.873.6329	kcurrie@newbroadstreet.com
Daly, Mark	Army Reserve Point of Contact	SA 54	US Army Reserve 9500 Armed Forces Reserve Drive Orlando, FL 32827	407.816.2659 office	407.222.6876	mark.daly@usar.army.mil
Dashtaki, Dan	City of Orlando Environmental Control	Basewide	Environmental Control Section Wastewater Division 5100 L.B. McLeod Road Orlando, FL 32811	407.246.2664 x234	407.709.4562	dan.dashtaki@cityoforlando.net
Early, Lisa	Parks Director	SA 56 Area C SW	City of Orlando Families, Parks and Recreation 595 North Primrose Drive Orlando, FL 32803	407.246.4319 office 407.246.4038 fax		Lisa.early@cityoforlando.net
Evertsen, John	Surface Water Maintenance Program Manager	SA 17, OU 2, SA 2	City of Orlando Public Works Department 1030 Woods Avenue Orlando, FL 32805	407.246.2083 407.246.4050 fax		John.evertsen@cityoforlando.net
Fales, Charles D. (Charlie)	DERP-FUDS Project Manager	SA 2	Programs and Proj. Mgt. Division Interagency and International Branch U.S. Army Corps of Engineers, Jacksonville District 701 San Marco Blvd Jacksonville, FL. 32207	904.232.1017 office 904.232.3920 fax	904.910.8596	
Fryrear, Stacey	Community Association Manager	Baldwin Park	Baldwin Park Residential Owners Association, Inc. 1913 Meeting Place Orlando, FL. 32814	(407) 740-5838 (407) 740-0712		sfryrear@baldwinparkpoa.com
Garzia, Angela	Current contact for city consultant	OU 3	PSI 1748 33rd Street Orlando FL 32839	(407) 304-5560		

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Golden, James E.	V.P, Principal Hydrogeologist Consultant to property owner	OU 2	HSA Golden Environmental and Engineering Consultants 100 East Pine Street, Suite 605 Orlando, FL 32801	407.649.6458 direct 407.649.5475 office 407.649.6582 fax	407.353.3674	jgolden@hsagolden.com
Golden, Mark	Concerned resident	SA 36 NW/ SA 38 Baldwin Park	4596 New Broad St Orlando, FL 32814	407.702.4332		mig@cfl.rr.com
Gonzalez, Carlos	Orange County Environmental Protection Division	SA 2	Orange County Environmental Protection Division 800 Mercy Drive, Suite 4 Orlando, FL 32808	407-836-1425		Carlos.gonzalez2@ocfl.net
Grabka, David	FDEP RPM OPT Member	Basewide	Florida Department of Environmental Protection Twin Towers Office Building, Mail Station 4535 2600 Blair Stone Road Tallahassee, FL 32399-2400	850.245.8997 office 850.245.8976 fax	321.412.2802	david.grabka@dep.state.fl.us
Grayson, Teresa	Project Manager Former CLEAN Contractor	Basewide	Tetra Tech 1093 Commerce Park Drive, Suite 100 Oak Ridge, TN 37830	865.220.4701 865.483.2014 fax	865.640.4588	teresa.grayson@tetratech.com
Hossfield, Bruce	Senior Planner Economic Development Department	Basewide	City of Orlando 400 S. Orange Avenue, 6 th Floor P O Box 4990 Orlando, FL 32802-4990	407.246.3355 office		bruce.hossfield@cityoforlando.net
Howe, Steven P.	Former contact for Industrial Waste Pretreatment Program (see Michael Alexander)	OU 4	City of Orlando, Wastewater Division 5100 L.B. McLeod Road Orlando, Florida 32811	407.246.2152 office 407.246.2886 fax	321.229.7529	steven.howe@cityoforlando.net
Ince, Wes	Audubon Place City Condominiums Board Member	OU 4	Audubon Place City Condominiums 2800 Plaza Terrace Drive Orlando, FL 32803	407.862.5055		wes@audubonplaceonline.com cwesince@gmail.com

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Jenkins, Allan	Former Technical Lead	Basewide	Tetra Tech, Inc. 800 Oak Ridge Turnpike, Ste. A-600 Oak Ridge, TN 37830	865.220.4724 office 865.483.2014 fax	865.556.8662	allan.jenkins@tetrattech.com
Jimenez, Jr., Rafael E.	Project Engineer Consultant to City	SA 2	Engineering & Environmental Design, Inc. 940 N. Ferncreek Ave. Orlando FL, 32803	407.650.0006 office 407.648.8338 fax		rjimenez@eed-inc.com
Kaplan, Dave	Combat City	OU 2		407.509.3825		
Keener, Jessica	BOA Contractor	Basewide	Solutions-IES 1101 Nowell Road Raleigh, NC 27607	919-873-1060 office 919-873-1074 fax		jkeener@solution-ies.com
Lemmon, Anita	Assistant to Stan Thornton GOAA	SA 2, OU 2	GOAA 5850 Cargo Road Orlando, FL 32827	407.825.2461		
Lubozynski, Tom	FDEP Central District		FDEP Central District 3319 Maguire Boulevard, Suite 232 Orlando, Florida 32803	407.897.4300		
Maher, Mary (last name pronounced Marr)	Greater Orlando Aviation Authority Superintendent of OEA Facilities	Herndon Annex McCoy Annex	Greater Orlando Aviation Authority Orlando Executive Airport 365 Rickenbacker Drive Orlando, FL 32803	407.894.9831 Ext 4 (directory), then ext. 1		mmaher@goaa.org
Marshall, Dawn	BOA Contractor	OU 4	Solutions-IES 1101 Nowell Road Raleigh, NC 27607	919-873-1060 office 919-873-1074 fax	919.454.7747	dmarshall@solutions-ies.com
McCurry, John	Winter Park Library office assistant	Basewide	460 East New England Avenue Winter Park, FL 32789-4493	407.623.3278 407.623.3489		jmccurry@wppl.org
McDonald, Stephanie	Post Properties, Inc.	SA 36 NW/ SA 38 Baldwin Park	Post Properties, Inc. 1392 Lake Baldwin Lane, Suite B Orlando, FL 32814	404.846.7891 fax		stephanie.mcdonald@postproperties.com

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CONTACT	ROLE	SITE AFFILIATION	ADDRESS	PHONE NO.	CELL NO.	E-MAIL ADDRESS
Mulvane, Brian	Property Owner	OU 2		407.234.8524		
Naik, Sam	RAC Contractor Former OPT Member	Basewide	CH2M Hill, Inc Northpark 400 1000 Abernathy Road, Suite 1600 Atlanta, GA 30328	770.604.9182 x 54248 office 770.604.9183 fax	678.860.9626	sam.naik@ch2m.com
Nodarse	Consultant to Baldwin Park Development Co.	Baldwin Park	Terracon (formerly Nodarse and Associates, Inc.) 1675 Lee Road Winter Park, FL 32789	407.740.6110 407.740.6112		
Olson, Blanche	Former RAB co-chair	Basewide	1820 Glencoe Road Winter Park, FL 32789-6031		407.644.9779	uncheel50@aol.com
O'Quinn, Michael A.	Attorney and Counselor at Law	OU 2	Fowler, O'Quinn, Feeny & Sneed, P.A. 28 West Central Blvd. 4 th Floor Orlando, FL 32801	407.425.2690		mao@foslslaw.com
Owens, Connie	Consultant to City	SA 2	Engineering & Environmental Design, Inc. 940 N. Ferncreek Ave. Orlando FL, 32803	407.650.0006 office 407.648.8338 fax		cowens@eed-inc.com
Oyler, Alan R.	Professional Engineer Director	Basewide / SA 2	Orlando City Hall 400 South Orange Avenue PO Box 4990 Orlando, FL 32802-4990	407.246.3623	407.325.1772	alan.oyler@cityoforlando.net
Patterson, Mike	Director of Engineering & Construction	OU 2	Greater Orlando Aviation Authority Orlando International Airport One airport Boulevard Orlando, FL 32827-4399	407.825.2461	407.855.3531	
Pearson, Lisa	City of Orlando legal	Basewide	City of Orlando City Hall Office of Legal Affairs, 3 rd Floor 400 South Orange Avenue Orlando, FL 32801	407.246.3569 407.246.2854 fax	407.246.2295	lisa.pearson@ci.orlando.fl.us

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CONTACT	ROLE	SITE AFFILIATION	ADDRESS	PHONE NO.	CELL NO.	E-MAIL ADDRESS
Perrone, John	Division Manager	Area C SW	City of Orlando Families, Parks and Recreation Parks Division 1206 W. Columbia Street Orlando, FL 32805	407.246.2287 office 407.246.2702 fax		John.perrone@cityoforlando.net
Prather, Lisa	Submerged Lands and Environmental Resource Permitting	Area C SW	FDEP 3319 Maguire Blvd. Suite 232 Orlando, FL 32803	407.897.2947 850.412.0468 fax		Lisa.prather@dep.state.fl.us
Robertson, Barry D., P.G.	President and Principal Geologist Stillwater Technologies, Inc.	SA 2	Stillwater Technologies, Inc. 311 N. Rosalind Ave. Orlando, FL 32801 3001 Armory Dr. Nashville, TN 37204	407.206.7222 x101 407.206.-7223 fax	407.948.1041	brobertson@stillwatertech.com
Roe, Raymond	Orange County Health Department Environmental Manager	SA 2	Florida Department of Health in Orange County 800 Mercy Drive, Suite 1 Orlando, FL 32808	407.858.1400 x2292		Raymond_Roe@doh.state.fl.us
Rosenke, Yolanda	Environmental Specialist III	OU 4	City of Orlando Public Works Wastewater Division			
Sanford, Art	BRAC PMO SE Remedial Project Manager OPT Member	Basewide	BRAC Program Management Office Southeast 4130 Faber Place Drive, Suite 202 North Charleston, SC 29405	843.743.2135		art.sanford.ctr@navy.mil
Sheehan, Patty	Commissioner City of Orlando District 4	SA 56 Area C SW	Orlando City Hall 400 South Orange Avenue PO Box 4990 Orlando, FL 32802-4990	407.246.2004 office 407.246.3010 fax		Patty.sheehan@cityoforlando.net

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CONTACT	ROLE	SITE AFFILIATION	ADDRESS	PHONE NO.	CELL NO.	E-MAIL ADDRESS
Singleary, Mike	OPT Support	Basewide	NAVFAC Southeast PO Box 30, Bldg 903 EV3 Environmental Restoration Naval Air Station Jacksonville, FL 32212-0030	904.542.4261 office 904.542.6833 fax		michael.a.singleary@navy.mil
Sommerfeldt, Krista	OPT Scribe Project Support	Basewide	Resolution Consultants 320 East South Street, 2 nd Floor Orlando, FL 32801	407.304.4444	407.900.4683	krista.sommerfeldt@aecom.com
South Florida Water Management District		SA 17 OU 2	1707 Orlando Central Parkway Orlando, FL 32809-5795	407.858.6100		
Steinberg, Barry	Private attorney for City	Basewide	Kutak Rock LLP Suite 1000 1101 Connecticut Avenue NW Washington D.C. 20036-4374	202.626.2400 202.828.2488		
Sullivan, Patricia	Citisspace Orlando Commercial Real Estate www.citisspaceorlando.com	OU 4 Audubon Park	Citisspace Orlando 811 North Orange Ave, Orlando, FL 32801	407.219.3450 office 407.219.3460 fax	407.719.6550	pariciasullivan@citisspaceorl.com
Sweeney, Marianne	OPT Member CLEAN Contractor	Basewide	Resolution Consultants 320 East South Street, 2 nd Floor Orlando, FL 32801	407.304.4446	407.341.8763	marianne.sweeney@aecom.com
Thornton, Stan	Formerly GOAA Director of Engineering and Construction		GOAA 5850 Cargo Road, Orlando International Airport Orlando, FL 32827			
Twedell, Dave	Ep3 inc.	Baldwin Park OU 4	2699 Lee Road Winter Park, FL 32789-1739	407 339-3734		dtwedell@ep3inc.com

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Twitty, Amy	Senior Project Manager	Area C SW	CH2M Hill 1766 Sea Lark Lane Navarre, Florida 32566	850.939.0035 fax	850.232.0320	Amy.Twitty@ch2m.com
Watson, John	Former BOA Contractor	Basewide except OU 4	Barnes, Ferland and Associates, Inc. (BFA) 1230 Hillcrest Street Orlando, FL 32803	321.332.1170 direct 407.896.8608 x 2570 office 407.896.1822 fax		jwatson@bfaenvironmental.com
Wiedenbeck, Steve, P.E.	Environmental Control Section Public Works Dept.	SA 2	Orlando City Hall 400 South Orange Ave. 8 th Floor P.O. Box 4990 Orlando, FL 32808-4990	407.246.3271 office 407.246.2892 fax	321.229.0286	stephen.wiedenbeck@cityoforlando.net http://www.cityoforlando.net/public_works/index.htm

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APPENDIX F
EXIT STRATEGY

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															SITE-SPECIFIC EXIT STRATEGIES NTC ORLANDO, FLORIDA (Updated August 15, 2013)				Next 5 Yr Review Date - 7/13/2016	
				SITE STATUS										Projected Site Progress			Exit Strategy Effects			
G O U P	SITE SWMU UST AOC PSC	P M O G R A	Site Name	Projected Start Date (If not Started)	In Progress Status	ROD Baseline Date	ROD Projected Date	(A)CTUAL	RIP Baseline Date	RIP Projected Date	(A)CTUAL	NFA Baseline Date	NFA Projected Date	(A)CTUAL	SMP	Exit Strategy (include remedy/media)	Exit Strategy Advantages	Exit Strategy Concerns or Barriers	Exit Strategy Comments (Indicate planned optimizations or alternate remedy as applicable)	Additional Comments (LUC Duration/Rational; Permit Mod, Steady-state, SC, OPS/RIP & FCOR Date(s) as applicable)
3*		C	Greenskeeper Storage Area		PP/ROD	09/01/05	06/28/14		08/01/05	06/28/14		09/01/14	10/01/16		NA	Proposed remedy includes in situ treatment of arsenic-contaminated groundwater using permeable adsorptive barriers, a groundwater monitoring program, visual inspections, LUCs, and 5-year reviews.	Prevents residential exposure to soil and groundwater; mitigates offsite arsenic migration into Lake Baldwin	Continued leaching of arsenic from subsurface soil; horizontal extent of plume greater than length of PAB. Potential unacceptable impact to surface water.	Groundwater monitoring optimization performed; incorporated into LTM UFP-SAP. LTM Optimization <i>is</i> ongoing.	Land use restricted to non-residential (portion of the property) Groundwater use prohibited (most of the property)
2*		C	McCoy Annex Landfill		IRA/PP/ROD	03/01/05	06/28/14		09/01/05	06/28/14		09/01/33	03/01/37		NA	Media of concern are landfill and groundwater. Proposed remedy includes presumptive remedy for landfill (soil cover), biobarrier of emulsified oil substrate (EOS), groundwater and surface water monitoring program, LUCs, and 5-year reviews. LUCs on landfill: maintain 2 feet of soil cover, digging restriction, non-residential, groundwater use restriction.	Prevents residential exposure to soil and groundwater; intercepts offsite CVOC migration.	GCTLs may not be met. FS revised in 2012 included re-evaluation of risk to current CTLs.	Minimum soil cover requirement responsibility of new owner; perform annual LUC inspections Groundwater monitoring optimization <i>is</i> ongoing.	Land use restricted to non-residential Groundwater use prohibited As the site is a former landfill, the LUC duration is indefinite.
	SA 17	B	Defense Property Disposal Office		LTM	12/01/04	03/26/12	A	11/01/05	09/30/14		09/01/12	06/01/20		NA	Remedy includes enhanced bioremediation using emulsified oil substrate (EOS) for source control, groundwater monitoring program (to support natural attenuation), LUCs, and annual inspections. LUCs include non-residential use restriction, groundwater use restriction, and construction restrictions.	Prevents residential exposure to soil and groundwater; reduces VOC source concentrations to shorten treatment period.	Potential remaining NAPL in source area. Effectiveness of the EOS treatment; off-site migration; development activities may interfere with RA; GCTLs may not be met.	Groundwater monitoring optimization performed; incorporated into LTM UFP-SAP. LTM Optimization <i>is</i> ongoing.	Land use controls: non-residential, groundwater use prohibited, digging restriction, vapor barrier requirement for existing buildings and new construction.
	SA 2	B	Herndon Annex		IRA/DD	04/01/00	04/01/00	A	10/01/05	10/01/05	A	09/01/09	06/01/37		NA	Remedy includes presumptive remedy for landfill (soil cover), LTM, and LUCs. LUCs on landfill: maintain 2 feet of soil cover, digging restriction, non-residential, groundwater use restriction.	Prevents residential exposure to landfill material and groundwater.	Migration of VOCs in groundwater from offsite source. Public may not agree with remedy. Development may interfere with RA. Potential receptor in private irrigation wells. GCTLs may not be met.	Groundwater monitoring optimization performed and implemented; LTM optimization <i>is</i> ongoing.	Land use restricted to non-residential, groundwater use prohibited, digging restriction for landfill areas. Residential off-site notification performed by hand delivery of fact sheets August 2004, August 2007, and August 2010; next planned fact sheet distribution is August 2013.
4*		C	Base Laundry / Drycleaners		RI/IRA/ROD	09/01/05	06/28/16		10/01/05	06/28/16		09/01/33	06/01/37		NA	Proposed remedy includes injection of EOS for source control/mitigation; groundwater IRA (pump and treat) to mitigate migration into Lake Druid; a groundwater monitoring program, visual inspections, LUCs, and 5-year reviews.	Prevents residential exposure to soil and groundwater; reduces CVOC source concentrations to shorten treatment period for groundwater, reduces impact to surface water.	Potential remaining NAPL in Hawthorne with potential for off-site migration to residential area. Operational issues with pump and treat system. Proposed site redevelopment.	Groundwater pump and treat system issues addressed; remedial alternatives to be revisited. LTM optimization is ongoing.	Land use restricted to non-residential, groundwater use restriction, vapor barrier requirement for new construction, temporary no access for a portion of the property.
	SA 36	B	Public Works Storage Yard		LTM	03/01/05	10/15/05	A	01/01/01	10/15/05	A	09/01/08	09/01/15		NA	Land use controls: groundwater use restriction; IRA vegetable oil treatment of groundwater completed; MNA in progress	Low cost; prevents residential exposure to groundwater	Stall in degradation process approaching GCTLs.	Groundwater monitoring optimization performed and implemented. LTM optimization <i>is</i> ongoing.	LUC: groundwater use restriction
	SA 39	B	Coal Storage Yard and Landfill		IRA/DD	04/05/04	10/31/06	A	12/01/00	10/31/06	A	09/01/08	12/31/13		NA	Land use controls; groundwater use restriction; IRA vegetable oil treatment of groundwater; MNA.	Low cost; prevents residential exposure to groundwater	None.	Two consecutive annual events demonstrated all monitoring wells below GCTLs. Site Rehabilitation Completion Report requesting no further action submitted May 15, 2013.	Following FDEP approval of no further action, the LUC (groundwater use restriction) will be removed and monitoring wells abandoned. The Navy will provide warranty to property owners that all response action necessary have been taken.
	SA 56	B	Area C SW/Bldg 148		IRA	NA	NA		12/01/14	12/01/14		12/01/15	12/01/15		NA	Excavate soils exceeding Residential SCTLs, sample groundwater.	Prevents exposure to soil and allows for clean deed.	Groundwater impacts unknown until wells installed and sampled.	Excavation will be extended to water table to reduce potential for contaminants impacting groundwater.	Soil contamination discovered following property transfer to City of Orlando for recreational use.

* - Operable Unit schedule milestones are tracked in EPA's SCAP database.
Note 1 - NFA sites and documentation are on a worksheet 2
Note 2 - Transfer dates/plan/method as well as OPS are on worksheet 3
Note 3 - For LUC monitoring, indicate any sampling requirements
Note 4 - Indicate if Optimization is planned or last date it was accomplished

PROGRAM:
B = BRAC
C = CERCLA
MR = Munitions Response
P = Petroleum
R = RCRA

Changes shown in bold italics.
RIP = signed ROD or DD and remedy in place
RIP baseline dates based on November 30, 2004 Exit Strategy projections
RIP for OU 2 and OU 3 pending signed RODs
RIP for SA 17 pending deed restriction to be imposed on impacted City property
RIP for OU 4 delayed pending further alternatives review.

INSTALLATION PETROLEUM SITES NTC ORLANDO, FLORIDA (Updated August 15, 2013)																											
		Baseline		Projected																							
Last RIP/RACR Date -		9/28/07		6/28/16																							
Last NFA Date -		9/1/08		6/1/37																							
SMP	SMP	SMP	SMP	SMP		SMP	SMP		SMP	SMF	SMP	SMF	SMP	SMP		SMP	SMP		SMP	SMP		SMP	SMP	SMP			
SITE ID - SWMU, UST, AOC, PSC	Site Name	CNRSE /Team Priority (H,M,L)	Type \$ (ERN, OMN, DESC)	Date Site ID'd	In Progress Status	SAR Date	(A)CTUAL	RAP Baseline Date	RAP Plan Date	(A)CTUAL	RAP Complete	(A)CTUAL	MOP Date	(A)CTUAL	RIP baseline Date	RIP PLAN DATE	(A)CTUAL	Comple - tion Report	(A)CTUAL	NFA/ SRCO baseline Date	NFA/ SRCO Plan Date	(A)CTUAL	Est (CTC if ERN)	LUCs Planned (Y,N)	LUC Planned Date	Interim remedial actions, Exit strategy/remdy & advantages (include media)	Comments/Current Status (NFA Documentation on NFA sheet); LUC Duration/Rational; Date(s) as applicable for Permit Mod, & RACR) Indicate optimizations, remedy concerns or barriers.
SA 36NW	Building 109	M	OMN	09/01/05	LTM	01/12/06	A	N/A	N/A		N/A		03/26/13	A	09/28/07	03/26/13	A			09/01/08	09/01/14		\$ 200,000	N		Groundwater use prohibition included as restrictive covenants to individual property owner deeds but can be modified by homeowners association; monitored natural attenuation selected as remedy.	Property transferred as clean in 1999. Contamination discovered during redevelopment. Delineation completed August 2011. Natural Attenuation Monitoring Plan submitted to FDEP November 2011, approved March 26 2013. Residents receiving off-site notification were notified of selected remedy and point of compliance and had opportunity to comment. Plume dissipating prior to discharge to surface water and close to achieving GCTLs.

RIP date = approved NAM Plan and all wells installed.

Last RIP/RACR Date - 11/1/05
 Last NFA Date - 9/1/33

Baseline 6/28/16
 Projected 6/1/37

NFA SITE DOCUMENTATION
NTC ORLANDO, FLORIDA
 (Updated August 15, 2013)

Group	SITE SWMU AOC PSC	RCRCLA	Site Name	Status		
				NFA (Date)	NFA Documentation (Dates & Source)	Documents in Admin Record (Y/N)

Study Areas and Operating Units

	3		RTC 1st Lt. Storage	04/21/00	RPT- Closure Report, Study Area 3, April 2000, Rev. 0 (w/Transmittal Letter)	Y	OPT approved. groundwater use restriction
	18		Housing Office	03/26/03	LTR- BRAC Site Screening Report, Study Area 18 (Approval)	Y	OPT approved.
	21		Maintenance Shop	06/07/00	LTR- Decision Document, Study Area 21, McCoy Annex (Comments)	Y	OPT approved. Portion of the property restricted to non-residential.
	23		UNF-2: Former officer's swimming pool and bathhouse	03/02/00	LTR- BRAC Environmental Site Screening Report, Study Area 23 (Approval)	Y	OPT approved.
	25		Former DWTP - McCoy Annex	06/06/00	LTR- Decision Document, Study Area 25, McCoy Annex (Comments)	Y	OPT approved. Portion of the property restricted to non-residential.
	27		Visitor's Pass Office	07/01/98	RPT- BRAC Environmental Site Screening Report, Site Screening Investigation, Study Area 27, June 1998	Y	OPT approved.
	29		Grounds Maintenance	12/06/04	LTR - FDEP approval to remove LUCs based on Nodarse & Assoc Soil Sampling/Deed Restriction Status Report	Y	OPT approved. Land use restriction pending release.
	33		Administration Building	07/13/98	LTR- Final Environmental Site Screening Report, Study Area 33 (Approval w/Comment)	Y	OPT approved.
	35		Auto Maintenance Facility	08/27/02	RPT- Rev. 1, Decision Document for Study Area 35, August 2002 (w/Transmittal Letter)	Y	OPT approved.
	37		Flammable Hazardous Waste Storage	01/19/00	RPT- BRAC Environmental Site Screening Report, Study Area 37, January 2000	Y	OPT approved.
	40		Bottle Landfill	06/07/02	LTR- Site Screening Report for Study Area 40 (Approval w/Comments)	Y	OPT approved.
	42		Maintenance Shop	03/03/00	LTR- BRAC Environmental Site Screening Report, Study Area 42 (Approval)	Y	OPT approved.
	50		Former Civil Engineering Yards	08/06/97	RPT- BRAC Environmental Site Screening Report, Study Area 50, June 1997	Y	OPT approved. Non-residential land use restriction for Building 7189.
	52		Former Entomology Lab	08/01/08	LTR-No Further Action Proposal for Study Area 52, February 2006(Approval)	Y	OPT approved. Groundwater use restriction.
	54		Family Camp	07/25/03	LTR- Site Investigation Report for Study Area 54 (Approval)	Y	OPT approved. Non-residential land use restriction and no dig restriction.
	55		Hazardous Material Storage Building	08/11/04	LTR- FDEP approved Decision Document / NFA	Y	OPT approved.
1			North Grinder Landfill	12/09/10	LTR - FDEP approval of 5 Year Review recommendation to cease LTM.	Y	LUCs on landfill: maintain 2 feet of soil cover, digging restriction, non-residential, groundwater use restriction, OSHA notification requirement.

Petroleum Sites

	106			07/13/98	LTR- REMOVED BY PWC, FDEP APPROVED A CLEAN CLOSURE 7/13/98.	N	
	109			03/01/00	LTR - USTs closed in -place March 2000 - Clean Closure, removed and disposed off-site by Nodarse in July 2002	N	
	113			07/08/99	LTR- FDEP approved clean closure 7/8/99.	N	
	128			03/02/01	LTR- The FDEP issued a Site Rehabilitation Completion Order on	N	
	128A			07/06/98	LTR- UST REMOVED BY DET ON 4/18/98, FDEP APPROVED CLEAN CLOSURE 7/6/98	N	
	128B			09/09/99	LTR- TCAR and clean closure approved by FDEP on 9/9/99.	N	
	129			10/28/99	LTR- FDEP issued a NFA Site Rehabilitation Completion Order for Building 129 on 10/28/99.	N	
	129A			07/07/99	LTR- A TCAR was prepared and submitted to the FDEP on 6/15/99. FDEP approved clean closure on 7/7/99.	N	
	131			07/13/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 7/13/98	N	
	138			07/06/98	LTR- UST REMOVED BY DET ON 4/10/98, FDEP APPROVED A CLEAN CLOSURE 7/6/98	N	
	148			03/12/96	LTR- TCAR COMPLETE 2/20/96 CLEAN CLOSURE 3/12/96	N	
	150			03/12/96	LTR- TCAR COMPLETED 2/20/96 CLEAN CLOSURE 3/12/96	N	
	200			12/08/03	LTR- NFA APPROVED BY FDEP 12/08/03.	N	
	206			02/08/96	LTR- TCAR COMPLETED 1/24/96, CLEAN CLOSURE 2/8/96	N	
	208			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	210			02/08/96	LTR- TCAR COMPLETED 1/24/96, CLEAN CLOSURE 2/8/96	N	
	212			02/08/96	LTR- TCAR COMPLETED 1/24/96, CLEAN CLOSURE 2/8/96	N	
	214			02/08/96	LTR- TCAR COMPLETED 1/24/96, CLEAN CLOSURE 2/8/96	N	
	216			02/01/96	LTR- TCAR COMPLETED 12/15/95, CLEAN CLOSURE 2/1/96	N	
	218 and 218A			08/26/98	LTR- FDEP APPROVED AN NFA 8/26/98.	N	
	218B			07/13/98	LTR- FDEP APPROVED A CLEAN CLOSURE 7/13/98.	N	
	220			04/11/97	LTR- CA COMPLETED 1/2/97, CAR COMPLETED 2/25/97, NFA APPROVED BY FDEP 4/11/97	N	
	222			04/11/97	LTR- CA COMPLETED 1/10/97, CAR COMPLETED 2/25/97, NFA APPROVED BY FDEP 4/11/97	N	
	224			07/05/96	LTR- CA COMPLETED 5/8/96, CAR COMPLETED 6/28/96, NFA APPROVED BY FDEP 7/5/96	N	
	226			05/07/96	LTR- CLEAN CLOSURE 5/7/96	N	
	228			02/08/96	LTR- CLEAN CLOSURE 2/8/96	N	
	230			04/06/96	LTR- CLEAN CLOSURE 4/6/96	N	
	230A			11/25/96	LTR- CA COMPLETED 5/28/96, CAR COMPLETED 9/10/96, NFA APPROVED BY FDEP 11/25/96	N	
	232			04/08/96	LTR- CLEAN CLOSURE 4/8/96	N	
	234			05/09/96	LTR- TCAR SUBMITTED TO FDEP, NFA APPROVED BY FDEP 5/9/96	N	
	235			11/13/95	LTR- CLEAN CLOSURE 11/13/95	N	
	238			10/27/95	LTR- CLEAN CLOSURE 10/27/95	N	
	240			10/27/95	LTR- CLEAN CLOSURE 10/27/95	N	

Last RIP/RACR Date - 11/1/05
 Last NFA Date - 9/1/33

Baseline 6/28/16
 Projected 6/1/37

NFA SITE DOCUMENTATION
NTC ORLANDO, FLORIDA
 (Updated August 15, 2013)

			Status				
Group	SITE SWMU UST AOC PSC	R C C E R R A C L A	Site Name	NFA (Date)	NFA Documentation (Dates & Source)	Documents in Admin Record (Y/N)	Comments
	246			06/10/96	LTR- CLEAN CLOSURE 6/10/96	N	
	246B			03/12/96	LTR- CLEAN CLOSURE 3/12/96	N	
	250			12/21/95	LTR- CLEAN CLOSURE 12/21/95	N	
	252			04/08/96	LTR- CLEAN CLOSURE 4/8/96	N	
	303			01/02/96	LTR- CLEAN CLOSURE 1/2/96	N	
	304			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	310			04/11/97	LTR- REMOVED BY PWC, TCAR 3/13/97, CLEAN CLOSURE	N	
	311			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	313			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	316			11/13/97	LTR- TCAR SUBMITTED TO FDEP 10/15/97, FDEP APPROVED CLEAN CLOSURE 11/13/97	N	
	317			11/13/97	LTR- TCAR SUBMITTED TO FDEP 10/15/97, FDEP APPROVED CLEAN CLOSURE 11/13/97	N	
	351			7/13/98	LTR- REMOVED BY PWC, FDEP APPROVED A CLEAN CLOSURE 7/13/98	N	
	352			7/6/98	LTR- UST REMOVED BY DET ON 10/8/98, FDEP APPROVED A CLEAN CLOSURE 7/6/98	N	
	354			7/13/98	LTR- REMOVED BY PWC, FDEP APPROVED NFA AS PER LETTER DATED 7/13/98	N	
	356			03/12/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 3/12/98	N	
	358			03/12/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 3/12/98	N	
	361			03/12/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 3/12/98	N	
	363			03/12/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 3/12/98	N	
	364			03/12/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 3/12/98	N	
	366			03/12/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 3/12/98	N	
	369			11/06/00	LTR- REMOVED BY PWC, Site Rehabilitation Completion Order (SRCO) issued by FDEP on 11/6/00	N	
	371			03/12/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 3/12/98	N	
	375			03/12/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 3/12/98	N	
	384			03/12/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 3/12/98	N	
	386			09/09/99	LTR- TCAR and clean closure approved by FDEP on 9/9/99	N	
	602			11/13/95	LTR- CLEAN CLOSURE 11/13/95	N	
	607			11/25/96	LTR- NFA APPROVED BY FDEP 11/25/96 TO COMPLETE SITE CLOSURE	N	
	610			05/12/97	LTR- TANK REMOVED, CLEAN CLOSURE 5/12/97	N	
	1050			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE ON 7/6/98	N	AST
	1059-1			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE ON 7/6/98	N	AST
	1059-2			03/12/96	LTR- CLEAN CLOSURE 3/12/96	N	
	1063			04/09/98	LTR- TANK REMOVED, TCAR COMPLETED ON 2/11/98, CLEAN CLOSURE ON 4/9/98	N	
	1100			06/13/96	LTR- CLEAN CLOSURE 6/13/96	N	
	2001-1			07/06/98	LTR- AST REMOVED 4/8/98 BY DET, FDEP APPROVED CLEAN CLOSURE 7/6/98	N	AST
	2001-2			07/06/98	LTR- AST REMOVED BY DET 4/8/98, FDEP APPROVED CLEAN CLOSURE ON 7/6/98	N	AST
	2002			07/06/98	LTR- AST REMOVED BY DET, 4/8/98, FDEP APPROVED CLEAN CLOSURE ON 7/6/98	N	AST
	2003			01/02/96	LTR- CLEAN CLOSURE 1/2/96	N	
	2003A			04/08/96	LTR- CLEAN CLOSURE 4/8/96	N	
	2004			01/02/96	LTR- CLEAN CLOSURE 1/2/96	N	
	2005			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	2006			09/09/99	LTR- TCAR and clean closure approved by FDEP on 9/9/99	N	
	2008			10/14/97	LTR- NO TANKS FOUND, FUEL IS PROVIDED FROM BLDG 2011, LETTER TO FDEP 10/14/97 NFA	N	
	2009			10/14/97	LTR- NO TANKS FOUND, FUEL IS PROVIDED FROM BLDG 2011, LETTER TO FDEP 10/14/97 NFA	N	
	2010B			07/13/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 7/13/98	N	
	2010A			06/16/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 6/16/98	N	
	2011			09/09/99	LTR- TCAR and clean closure approved by FDEP on 9/9/99	N	
	2011A			09/09/99	TCAR and clean closure approved by FDEP on 9/9/99	N	
	2011B			09/09/99	TCAR and clean closure approved by FDEP on 9/9/99	N	
	2012			03/12/96	LTR- CLEAN CLOSURE 3/12/96	N	
	2015			06/16/97	LTR- TANK REMOVED, BLDG DEMOLISHED, FDEP APPROVED CLEAN CLOSURE 6/16/97	N	
	2018			07/08/99	LTR- FDEP approved TCAR and clean closure on 7/8/99	N	
	2020			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE 7/6/98	N	AST
	2022			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE 7/6/98	N	AST
	2025			09/09/99	LTR- TCAR and clean closure approved by FDEP on 9/9/99	N	
	2026			05/07/96	LTR- CLEAN CLOSURE 5/7/96	N	
	2033-1			08/07/96	LTR- REMOVED WHEN BLDG DEMOLISHED, CLEAN CLOSURE 8/7/96	N	
	2033-2			08/07/96	LTR- REMOVED WHEN BLDG DEMOLISHED, CLEAN CLOSURE 8/7/96	N	

Last RIP/RACR Date - 11/1/05
 Last NFA Date - 9/1/33

Baseline 2/28/16
 Projected 6/1/37

NFA SITE DOCUMENTATION
NTC ORLANDO, FLORIDA
 (Updated August 15, 2013)

			Status				
Group	SITE SWMU UST AOC PSC	R C E R R A C L A	Site Name	NFA (Date)	NFA Documentation (Dates & Source)	Documents in Admin Record (Y/N)	Comments
	2033-3			08/07/96	LTR- REMOVED WHEN BLDG DEMOLISHED, CLEAN CLOSURE 8/7/96	N	
	2034			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE ON 7/6/98.	N	AST
	2035			07/13/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE 7/13/98.	N	
	2036A			02/20/02	LTR- Site Rehabilitation Completion Order issued by FDEP on 2/20/02.	N	
	2036B			03/12/96	LTR- CLEAN CLOSURE 3/12/96	N	
	2039			07/06/98	LTR- REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE ON 7/6/98.	N	
	2040-1			06/14/99	LTR- No Further Action was approved by the FDEP on 6/14/99.	N	
	2040-2			06/14/99	LTR- The No Further Action proposal was approved by the FDEP on 6/14/99.	N	
	2040-3			06/14/99	LTR- The No Further Action proposal was approved by the FDEP on 6/14/99.	N	
	2049			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	2051			10/01/97	LTR- BLDG DEMOLISHED, NFA REQUESTED 9/23/97, FDEP APPROVED NFA 10/22/97	N	
	2053			05/07/96	LTR- CLEAN CLOSURE 5/7/96	N	
	2053A			07/06/98	LTR- BLDG CLOSED 9/30/97, AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE ON 7/6/98.	N	
	2076			09/09/99	LTR- TCAR and clean closure approved by FDEP on 9/9/99.	N	
	2078-1			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE 7/6/98.	N	AST
	2078-3			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE ON 7/6/98.	N	AST
	2080			02/17/05	FDEP approved NFA on 02/17/05.	N	
	2089			01/02/96	LTR- CLEAN CLOSURE 1/2/96	N	
	2091-1,2			09/09/99	LTR- TCAR and clean closure approved by FDEP on 9/9/99.	N	
	2092			06/10/96	LTR- CLEAN CLOSURE 6/10/96	N	
	2093-1			05/07/96	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 5/7/96	N	
	2093-2			05/07/96	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 5/7/96	N	
	2093-3			03/12/96	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 3/12/96	N	
	2095-1			01/02/96	LTR- CLEAN CLOSURE 1/2/96	N	
	2095-2			01/02/96	LTR- CLEAN CLOSURE 1/2/96	N	
	2097			10/23/95	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 10/23/95	N	
	2101			03/12/96	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 3/12/96	N	
	2102			10/23/95	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 10/23/95	N	
	2103			10/23/95	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 10/23/95	N	
	2104			10/23/95	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 10/23/95	N	
	2105			10/23/95	LTR- CLEAN CLOSURE 10/23/95	N	
	2113			07/06/98	LTR- UST REMOVED BY DET ON 4/13/98, FDEP APPROVED CLEAN CLOSURE 7/6/98.	N	
	2114			11/13/97	LTR- FDEP APPROVED CLEAN CLOSURE 11/13/97	N	
	2115			03/08/02	LTR- Site Rehabilitation Completion Order issued by FDEP on 3/8/02.	N	
	2122			07/13/98	LTR- REMOVED BY PWC, FDEP APPROVED CLEAN CLOSURE ON 7/13/98.	N	
	2262			04/08/96	LTR- CLEAN CLOSURE 4/8/96	N	
	2266			09/09/99	LTR- TCAR and clean closure approved by FDEP on 9/9/99.	N	
	2273			10/14/05	FDEP approved NFA on 10/14/05.	N	MW's abandoned on January 19, 2006.
	2401			07/06/98	LTR- BLDG CLOSED 8/31/97, AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE 7/6/98.	N	
	2402			11/13/97	TCAR SUBMITTED TO FDEP 10/31/97, FDEP APPROVED CLEAN CLOSURE 11/13/97	N	
	2403			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE ON 7/6/98.	N	AST
	2404			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE 7/6/98.	N	AST
	2405			09/09/99	LTR- TCAR and clean closure approved by FDEP on 9/9/99.	N	
	2406			01/09/98	LTR- TANK REMOVED, TCAR SUBMITTED TO FDEP 11/19/97; FDEP approved clean closure 1/9/98	N	
	2409			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	2410			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE ON 7/6/98.	N	
	2411			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	2412			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE 7/6/98.	N	AST
	2415			01/09/98	REMOVED BY NTC PUBLIC WORKS; FDEP approved clean closure 1/9/98	N	
	2416			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE ON 7/6/98.	N	AST
	2417			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE 7/6/98.	N	AST
	2418			11/13/97	LTR- REMOVED, TCAR SUBMITTED TO FDEP 10/15/97, FDEP APPROVED CLEAN CLOSURE 11/13/97	N	
	2419			11/13/97	LTR- REMOVED, TCAR SUBMITTED TO FDEP 10/15/97, FDEP APPROVED CLEAN CLOSURE 11/13/97	N	
	2420			09/09/99	LTR- TCAR and clean closure approved by FDEP on 9/9/99.	N	
	2421			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	2423			03/09/98	LTR- TANK REMOVED, FDEP APPROVED CLEAN CLOSURE 3/9/98	N	
	2424			03/09/98	LTR- TANK REMOVED, FDEP APPROVED CLEAN CLOSURE 3/9/98	N	
	2426			05/19/00	LTR- TANK REMOVED, FDEP APPROVED CLEAN CLOSURE 5/19/00	N	
	2427			04/09/98	LTR- TANK REMOVED, TCAR SUBMITTED TO FDEP 2/18/98, FDEP APPROVED TCAR 4/9/98	N	

Last RIP/RACR Date - 11/1/05
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Baseline 6/28/16
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NFA SITE DOCUMENTATION
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Group	SITE SWMU UST AOC PSC	R C E R C L A	Site Name	Status			
				NFA (Date)	NFA Documentation (Dates & Source)	Documents in Admin Record (Y/N)	Comments
	2434-2			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED A CLEAN CLOSURE ON 7/6/98.	N	AST
	2434-3			07/06/98	LTR- REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE ON 7/6/98.	N	
	2450			05/07/96	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 5/7/96	N	
	2451			07/06/98	LTR- BLDG CLOSED 6/1/97, AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE ON 7/6/98.	N	AST
	2510			03/02/01	A Site Rehabilitation Completion Order was issued on 3/2/01.	N	
	2516-1,2			03/12/96	LTR- CLEAN CLOSURE 3/12/96	N	
	2525			10/23/95	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 10/23/95	N	
	2526			10/23/95	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 10/23/95	N	
	2527			10/23/95	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 10/23/95	N	
	2538			01/02/96	LTR- CLEAN CLOSURE 1/2/96	N	
	2541			06/11/97	LTR- TANK NOT FOUND, NFA FROM FDEP 6/11/97	N	
	2542			10/23/95	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 10/23/95	N	
	2543			10/23/95	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 10/23/95	N	
	2555			10/23/95	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 10/23/95	N	
	2557			10/23/95	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 10/23/95	N	
	2651			06/17/97	LTR- TANK REMOVED, CLEAN CLOSURE BY FDEP 6/17/97	N	
	2709			11/13/95	LTR- TANK REMOVED, CLEAN CLOSURE 11/13/95	N	
	2712			01/02/96	LTR- TANK REMOVED, CLEAN CLOSURE 1/2/96	N	
	2713			06/17/97	LTR- TANK REMOVED, CLEAN CLOSURE 6/17/97	N	
	2717			06/17/97	LTR- TANK REMOVED, BLDG DEMOLISHED, CLEAN CLOSURE 6/17/97	N	
	2718			06/17/97	LTR- TANK REMOVED, BLDG DEMOLISHED, CLEAN CLOSURE 6/17/97	N	
	2719			06/17/97	LTR- TANK REMOVED, BLDG DEMOLISHED, CLEAN CLOSURE 6/17/97	N	
	2720			06/17/97	LTR- TANK REMOVED, CLEAN CLOSURE 6/17/97	N	
	2723			10/27/95	LTR- CLEAN CLOSURE 10/27/95	N	
	2724			03/12/96	LTR- CLEAN CLOSURE 3/12/96	N	
	2816			03/12/96	LTR- CLEAN CLOSURE 3/12/96	N	
	2817			01/02/96	LTR- CLEAN CLOSURE 1/2/96	N	
	3025			05/07/96	LTR- BLDG DEMOLISHED, CLEAN CLOSURE 5/7/96	N	
	3126			01/02/96	LTR- CLEAN CLOSURE 1/2/96	N	
	3127			10/18/95	LTR- CLEAN CLOSURE 10/18/95	N	
	3128			10/18/95	LTR- CLEAN CLOSURE 10/18/95	N	
	3129			10/18/95	LTR- CLEAN CLOSURE 10/18/95	N	
	3132			02/08/96	LTR- CLEAN CLOSURE 2/8/96	N	
	3133			03/12/96	LTR- CLEAN CLOSURE 3/12/96	N	
	3134			10/18/95	LTR- CLEAN CLOSURE 10/18/95	N	
	7107			01/06/00	LTR- FDEP issued a Site Rehabilitation Completion Order on 1/6/00 approving NFA for the site.	N	
	7119			06/12/96	LTR- CLEAN CLOSURE 6/12/96	N	
	7121-A			12/23/97	LTR- REMOVED BY PWC, SA 11/10/97, SAR COMPLETED 12/23/97	N	
	7121-B			12/23/97	LTR- REMOVED BY PWC, SA 11/10/97, SAR COMPLETED 12/23/97	N	
	7121-C			12/23/97	LTR- REMOVED BY PWC, SA 11/10/97, SAR COMPLETED 12/23/97	N	
	7125			09/09/05	FDEP approved NFA 9/9/05.	N	MWs abandoned on January 20, 2006.
	7151			10/19/05	FDEP approved NFA 10/19/05.	N	MWs abandoned on January 19, 2006.
	7153			07/16/98	LTR- FDEP APPROVED NFA 5/5/98; MWS WERE ABANDONED ON 7/16/98.	N	
	7168			05/07/96	LTR- CLEAN CLOSURE 5/7/96	N	LUC: non-residential, groundwater use prohibited.
	7171OWSR			09/21/99	LTR- FDEP issued a Site Rehabilitation Completion Order on 9/21/99.	N	
	7171			07/08/99	LTR- TCAR and clean closure approved by FDEP on 7/8/99.	N	
	7174			03/18/04	LTR- FDEP issued NFA approval.	N	LUC: groundwater use prohibited.
	7175			12/02/02	LTR- Site Rehabilitation Completion Order issued by FDEP on 12/2/02.	N	
	7178			04/09/98	LTR- TANK REMOVED IN PAST, FDEP APPROVED TCAR 4/9/98	N	
	7178-A			03/01/98	LTR- TANK NEVER FOUND. SUBMITTED LETTER TO FDEP ON 3/1/98	N	
	7180			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97, NFA	N	
	7182				LTR- REMOVED BY PWC, FDEP REQUESTED THAT CHLORINATED SOLVENTS BE INVESTIGATED UNDER IR (SA 18).	N	
	7184-B,C,D			07/16/98	LTR- CLEAN CLOSURE 6/12/96; MWS ABANDONED 7/16/98.	N	
	7185			06/13/96	LTR- CLEAN CLOSURE 6/13/96	N	
	7185A			07/06/98	LTR- AST REMOVED BY DET, FDEP APPROVED CLEAN CLOSURE 7/6/98.	N	
	7186			05/07/96	LTR- CLEAN CLOSURE 5/7/96	N	
	7187			07/14/97	LTR- CA COMPLETED 5/29/97, CAR COMPLETE 6/12/97, FDEP APPROVED NFA 7/14/97	N	
	7190			06/13/96	LTR- CLEAN CLOSURE 6/13/96	N	
	7191			03/12/96	LTR- CLEAN CLOSURE 3/12/96, TANK NEVER FOUND	N	
	7201			06/12/96	LTR- CLEAN CLOSURE 6/12/96	N	
	7201A			06/12/96	LTR- CLEAN CLOSURE 6/12/96	N	
	7202			07/14/97	LTR- SA 5/23/97, SAR COMPLETED 6/14/97, NFA APPROVED 7/14/97. MWS ABANDONED 7/16/98.	N	
	7203			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	7203A			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	7210			02/08/96	LTR- CLEAN CLOSURE 2/8/96	N	
	7211			04/01/97	LTR- CA 10/30/96, CAR 12/29/96, IRA ; FDEP APPROVED NFA 4/1/97	N	
	7211A			12/21/95	LTR- CLEAN CLOSURE 12/21/95	N	

Last RIP/RACR Date - 11/1/05
 Last NFA Date - 9/1/33

Baseline 11/1/05
 Projected 6/28/16
 6/1/37

NFA SITE DOCUMENTATION
NTC ORLANDO, FLORIDA
(Updated August 15, 2013)

			Status				
G O r o u p	S I T E S W M U S T A O C P S C	R C E R R A C L A	Site Name	NFA (Date)	NFA Documentation (Dates & Source)	Documents in Admin Record (Y/N)	Comments
	7212			12/21/95	LTR- CLEAN CLOSURE 12/21/95	N	
	7212A			04/08/96	LTR- CLEAN CLOSURE 4/8/96	N	
	7224			06/12/97	LTR- CLEAN CLOSURE 6/12/97	N	
	7234			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	7239			11/12/97	LTR- FDEP APPROVED NFA 11/12/97.	N	
	7239A			11/12/97	LTR- FDEP APPROVED NFA 11/12/97.	N	
	7240			04/24/97	LTR- FDEP APPROVED NFA 4/24/97.	N	
	7240A			06/10/96	LTR- CLEAN CLOSURE 6/10/96	N	
	7241- 2			08/16/01	LTR- Site Rehabilitation Completion Order issued by FDEP on 8/16/01.	N	LUC: groundwater use prohibited.
	7241- 1			06/16/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 6/16/97	N	
	7241- 3			06/16/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 6/16/97	N	
	7242			05/07/96	LTR- CLEAN CLOSURE 5/7/96	N	
	7244			06/13/96	LTR- CLEAN CLOSURE 6/13/96	N	
	7246			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	7247			06/13/96	LTR- CLEAN CLOSURE 6/13/96	N	
	7253			08/25/97	LTR- CA 6/16/97, CAR SUBMITTED 7/29/97, NFA APPROVED 8/25/97, MWS ABANDONED 7/16/98.	N	
	7264			04/11/97	LTR- REMOVED BY PWC, CLEAN CLOSURE 4/11/97	N	
	SA 16			Nov 2000	LTR- PAH contamination was excavated and NFA approved with non-residential use restriction in November 2000.	N	Soil removal
	RV-1				LTR- REMOVED BY PWC, CLEAN CLOSURE (ALSO KNOWN AS 7184-A)	N	
	RV-2				LTR- REMOVED BY PWC, CLEAN CLOSURE	N	
	80001			06/17/97	LTR- EMERGENCY GEN., BUILT IN TANK AKA BLDG 140, CLEAN CLOSURE 6/17/97	N	

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APPENDIX G

SITE SPECIFIC INFORMATION

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OU 2

McCoy Landfill

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Naval Training Center Orlando Florida



Operable Unit 2 (OU2)

*This fact sheet was developed to inform interested citizens about the Naval Training Center (NTC), Orlando environmental program. Fact sheets will be distributed periodically to keep the community informed. Additional copies of these fact sheets can be obtained by contacting **Art Sanford at (843) 743-2135**.*

NTC Orlando's Environmental Program

Environmental studies and cleanup actions are currently underway at the former Naval Training Center (NTC), Orlando as part of the Department of Defense's Installation Restoration (IR) Program. Through this program, areas of known or suspected contamination from past practices and operations are being identified, evaluated, and, if necessary, cleaned up.

Operable Unit 2 Description and History

Operable Unit (OU) 2 (formerly McCoy Annex Landfill) is located 8 miles south of the main base at NTC, Orlando, and is immediately west of the Orlando International Airport and Greater Orlando Airport Authority (GOAA) property as shown on Figure 1. OU2 is an inactive landfill located in the southern part of McCoy Annex. The landfill occupies approximately 114 acres, and its relatively flat topography slopes from north to south.

The southern portion of the site was used as a landfill by the Air Force from about 1960 to 1972, while the northern portion was used as a landfill by the Air Force and the Navy from 1972 until about 1978. Landfill operations consisted of excavating ditches (100 to 200 feet long by 20 to 25 feet wide by 10 to 15 feet deep) into which trucks disposed wastes. Occasional burning of the wastes took place in the ditches. Trenches were filled with waste to within 3 or 4 feet of the ground surface and then backfilled with soil and seeded.



Figure 1: OU 2 (yellow boundary) and adjacent GOAA property (red boundary)

The estimated volume of waste is more than 1,000,000 cubic yards (yd³). Landfill wastes reportedly included hospital wastes, paint and paint thinner, automobile batteries, airplane parts, and asbestos.

A nine-hole golf course occupied the northern half of the site from 1982 to 2007. This area is now the site of an airsoft recreation center. The southern half of the site was wooded, but the trees have been removed and the area was covered with clean soil as part of an Interim Remedial Action (IRA).

A Remedial Investigation (RI) conducted at the site from May 1997 to March 2001 confirmed the boundaries of the landfill and identified volatile organic compound (VOC) contamination in the groundwater (the water below the ground surface). A risk assessment was completed as part of the RI.

Three Interim Remedial Actions (IRAs) for soil have been conducted at OU2. The first, completed in 1999, included the removal of 2,000 yd³ of contaminated surface soil in the northern portion of OU2; the second (2000) involved placement of additional soil cover in the southern portion of OU2; and the third (2005) provided additional soil cover to areas in the northern portion of OU2.

A groundwater IRA implemented in 2007 consisted of the installation of a permeable bioreactive barrier at the eastern border of the southern portion of OU2 to intercept the VOC groundwater plume which was migrating off-site. Groundwater in the shallow zone of groundwater move moves approximately 61 feet per year.

Land Use Controls (LUCs) were developed for OU2 and published in 2008. LUCs include a prohibition on the installation of wells or the extraction of groundwater for any purpose and limitations on allowable land use at OU2. Commercial, industrial, or recreational uses are allowed, while agricultural and residential uses are prohibited. The OU2 property was sold at public auction in January 2008 to a private developer. Combat City, an airsoft center, opened in the northern portion of OU2 in June 2010.

A Feasibility Study (FS) issued in 2011 included a revised risk assessment which identified five contaminants of concern for groundwater the southern area of OU2: benzene, cis-1,2-dichloroethylene,

trichloroethene, (TCE), tetrachloroethene (PCE), and vinyl chloride.

the following plan to address the potential risk from landfill material and groundwater contamination.

What are Benzene, cis-1,2-dichloroethylene, TCE, PCE, and Vinyl Chloride,?

Benzene, a colorless liquid that burns easily and evaporates at room temperature, is a natural part of crude oil, gasoline, and cigarette smoke, and is also found in commonly used products like paints, inks, detergents, and pesticides.

cis-1,2-dichloroethylene, a minimally flammable, highly soluble, colorless liquid with a sharp, harsh odor is used as a solvent for waxes and resins and as an intermediate in the preparation of other chlorinated solvents.

Trichloroethene (TCE), a nonflammable, colorless liquid used mainly as a solvent to remove grease from metal parts, is also an ingredient in adhesives, paint removers, and spot removers.

Tetrachloroethene (PCE) is a manufactured chemical used for dry cleaning and metal degreasing.

Vinyl chloride, a colorless gas that burns easily, is not stable at high temperatures, and has a mild, sweet odor, is a manufactured substance that can be formed when other substances such as trichloroethane, TCE, and PCE are broken down. It is also found in polyvinyl chloride (PVC) products, including pipes, wire and cable coatings, and packaging materials.

More information about these contaminants can be found at the following website:

<http://www.atsdr.cdc.gov/>

For both the Northern Area and the Southern Area, the existing soil cover will be maintained over the landfill to prevent direct human contact with landfill materials. Existing LUCs will be maintained to control or eliminate exposure to buried waste and source area groundwater. Monitoring of landfill containment will include inspections of the landfill cover to ensure that the cover thickness remains 2 feet or more. Monitoring of LUCs will be conducted to ensure that site restrictions remain in place. Monitoring will also include sampling of surface water and groundwater.

In addition, because the current groundwater monitoring program has demonstrated that the existing biobarrier has been effective, the OPT has recommended an extension of the existing biobarrier to a total of approximately 450 feet. The extension would enhance ongoing natural attenuation, contain groundwater contamination in the source area, and prevent off-site migration of groundwater contaminants. The biobarrier would be maintained as long as contaminants in groundwater at the site border are present at concentrations greater than cleanup goals. Ongoing monitoring will be performed to track contaminants as they degrade and to assess the effectiveness of the barrier. Injection of a bio-stimulant within the groundwater plume will enhance ongoing natural biodegradation of chlorinated compounds.

For More Information

The public is invited to submit any questions or comments on the remedial action described in this fact sheet. Comments should be directed to Art Sanford at (843) 743-2135. Reports on the work conducted at OU2 can be reviewed at the Orange County Public Library, Orlando Branch (4th Floor), 101 East Central Boulevard, Orlando, Florida 32801.

The FS identified two alternatives for the Northern Area of OU2 and three alternatives for the Southern Area. For each area, a “no action” alternative and a second alternative comprising Landfill Containment, LUCs, and Monitoring were developed. For the Southern Area, a third alternative was developed, including all of the components of the second alternative, as well as a biobarrier to contain groundwater contamination and prevent it from migrating off-site.

What’s Next?

After careful consideration of the conditions at OU2, comparison of cleanup alternatives, and consideration of the proposed reuse of the area, the Orlando Partnering Team proposed

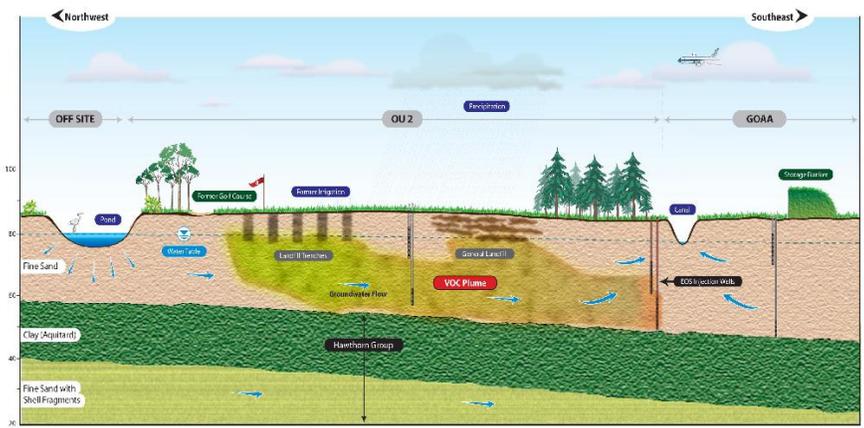


Figure 2: Conceptual Site Model for OU 2 Showing Biobarrier

CTC SUMMARY

NTC Orlando
NORM SITE 00003
Operable Unit (OU) 2 – McCoy Annex Landfill
CTC: \$6,096,291
Reference to NORM information updated 26 October 2009

Acreage: 177 acres (114-acre former landfill)

Current Land Use: Recreational (Combat City), vacant; planned future use is industrial

Location: North of the intersection of Tradeport Drive and Boggy Creek Road

FDEP Oculus Number: DOD_14_2067

Background Information: OU 2, the McCoy Annex landfill, is located about 8 miles south of the Main Base of the former NTC Orlando, Florida, and immediately west of the Orlando International Airport. The western portion of OU 2 was used as a landfill by the Air Force from about 1960 to 1972, and the eastern portion was used as a landfill by the Air Force and Navy from 1972 until about 1978. Landfill operations consisted of excavating ditches (100 to 200 feet long by 20 to 25 feet wide by 10 to 15 feet deep) into which trucks disposed wastes. Occasional burning of the waste took place in these ditches. The ditches were filled with waste to within three or four feet of the ground surface and then backfilled with soil and seeded. The estimated volume of waste is approximately 1,000,000 cubic yards (yd³). Landfill wastes reportedly included hospital wastes, paint and paint thinner, automobile batteries, airplane parts, and asbestos. From 1982 to January 2007, a nine-hole golf course (Boggy Creek Golf Club) covered most of the nearly 114-acre inactive landfill.

Phase I of the Remedial Investigation (RI) was completed in December 1997, and Phase II was completed in October 1998, and Phase III groundwater sampling was completed in 1999. The final RI report was published in March 2001. Quarterly groundwater monitoring began in 2002. Additional site investigation was conducted, focusing on the source and extent of groundwater contamination, and the data was included in the final Feasibility Study (FS) report published in July 2003. OU 2 was included in the Finding of Suitability for Early Transfer (FOSET) Phase II that was published in March 2004 and in the draft Finding of Suitability for Transfer (FOST) dated March 2005. Additional focused groundwater investigation was conducted in 2004 to aid in the selection of a groundwater interim remedial action (IRA) for the southern portion of the site.

Sources: The use of herbicides and pesticides in maintenance of the golf course and the presence of near-surface waste materials are considered to be the source of contaminants in surface soil. Leachate from shallow wastes migrating to groundwater and wastes buried below the water table in a former landfill

area that covers approximately 114 acres have been identified as likely sources of groundwater contamination. The RI identified arsenic and polynuclear aromatic hydrocarbons (PAHs) in surface soil and VOCs, iron and manganese in the surficial aquifer as the primary contaminants of concern.

Florida Groundwater Classification: Class II

Hydrogeology: Soils at the site consist of fine sands that are nearly level to gently sloping and poorly to moderately-well drained. The surface soils and subsurface sediments were deposited in marine environments. The sediments consist primarily of quartz sand with varying amounts of silt, clay, and shell fragments that vary both laterally and vertically. A water table occurs within 8 to 10 feet of the ground surface and the unconfined surficial aquifer extends to approximately 30 feet below grade. The aquifer is recharged by precipitation and the aquifer discharges along the eastern perimeter of the site to drainage canals that intercept the shallow water table. The surface water flows southward from the site and enters Lake Gillooly. There appears to be little flow of groundwater from the shallow surficial aquifer to deeper confined aquifers that lie below the site.

Hydraulic Conductivity: The hydraulic conductivity of the unconfined aquifer ranges from 4 to 25 feet/per day.

Receptors: Potential receptors include human and ecological receptors that contact contaminated surface or subsurface soil, the buried waste material, contaminated groundwater, or potentially impacted surface water. There are no current residential or industrial receptors; however, industrial receptors are possible in future, as the planned use for the site is for industrial warehouses. No significant ecological impacts have been identified. IRAs that included covering of impacted surface soils and near-surface wastes, and excavation and removal of local surface-soil hot spots has been completed. Land use controls and a groundwater IRA have been proposed to control the current and future risks and be protective of human health and the environment.

Nature and Extent of Contamination: Surface soil contamination consisting primarily of arsenic and PAHs was found to exist over a large portion of the site. Arsenic contamination was found mainly over the golf course area but was found not to present unacceptable risk for recreational users (i.e., golfers). The southern portion of the golf course and areas to the south were found to contain near surface wastes and localized hot spots of PAH surface soil contamination. All areas of unacceptable risk due to surface soil have been addressed by hot-spot excavation and removal and by the application of clean soil cover.

Groundwater plumes were found in the northern and southern portions of the site (i.e., to depths of 30 feet below grade). The northern plume area consists of approximately 13 acres and the contaminants

of concern are benzene, tetrachloroethene, iron and manganese. This plume appears to intersect the adjacent drainage canal, but surface water impacts have not been detected. A southern plume area covering approximately 23 acres includes benzene, tetrachloroethene, trichloroethene, and other chlorinated organics (degradation products) as well as iron and manganese as the contaminants of concern. This plume also intersects the adjacent drainage canal and impacts to surface water have been detected.

In March 2007, aboveground storage tanks were removed from the site. Although soil surrounding the tanks was clean, petroleum-impacted soil was found beneath nearby golf course maintenance equipment. The City of Orlando assumed responsibility for cleanup of the stained soil.

Groundwater monitoring frequency was reduced from quarterly to semi-annually beginning in September 2005. In May and June 2007, a pre-injection baseline was conducted for the bio-barrier pilot study. Post-injection data collection was performed in June/July and November 2007. Full scale remediation began in September/October 2008. Post-injection groundwater sampling was performed in January, April, August, and November 2009. In October 2011, additional injection wells were installed to expand and augment the bio-barrier and in February and April 2012, substrate and bioaugmentation injection events were conducted. Post-injection groundwater sampling was conducted from April 2012 to April 2013. Semi-annual groundwater and surface water monitoring is ongoing.

Cleanup Methodology: Guidance for the landfill remedy was provided in the USEPA interim guidance document, Application of the CERCLA Municipal Landfill Presumptive Remedy to Military Landfills (USEPA, 1996). This guidance suggested the following items be considered:

- Landfill cap
- Source area groundwater control to contain plume
- Leachate collection and treatment
- Landfill gas collection and treatment
- Institutional controls to supplement engineering controls.

Based on consideration of these items and the remedial alternatives evaluated in the FS and presented in the Final Proposed Plan, the preferred alternative being implemented at OU 2 consists of:

- Implementation of a groundwater and surface water monitoring program (sampling, analysis, and evaluation).

- Institutional controls (disallow the use of the surficial aquifer groundwater in the vicinity of the landfill for drinking or irrigation, limit intrusive activities within the landfill boundary, and restrict use of the land within the landfill boundary to non-residential uses).
- Periodic visual inspections (to ensure compliance with land use controls).
- Maintaining 2 feet of soil cover over the former landfill area (supplemented by the soil IRA).
- Preventing groundwater contamination from leaving the site and discharging to drainage canals located along the eastern perimeter of the property (engineering controls to be provided by groundwater IRA).
- Establishing a bio-barrier to treat VOC-contaminated groundwater migrating across the GOAA property boundary. This groundwater IRA involves injecting emulsified oil substrate (EOS®) in a series of locations extending approximately 440 ft parallel and adjacent to the canal in the southern portion of the site. Current site conditions indicate natural attenuation is reducing the extent of contaminated groundwater.

Concerns/Barriers to Site Closure: Landfill cover inspections and a groundwater use restriction are in place indefinitely as long as buried waste remains on site.

Recent Events/Changes: The Revised FS Report for OU2 was completed in August 2012 to document changes in site conditions since the 2003 FS and to characterize current risks associated with potential exposures to site-related constituents. The Final Proposed Plan was submitted on May 15, 2013. In October 2011, injection wells were installed along the approximately 440-foot biobarrier, in February 2012, EOS® and AquaBupH™ were injected along the biobarrier, and in April 2012, bioaugmentation culture was injected in the central and northern portion of the biobarrier. Post-injection, semi-annual, and monthly groundwater and surface water sampling have been conducted as indicated in the table below.

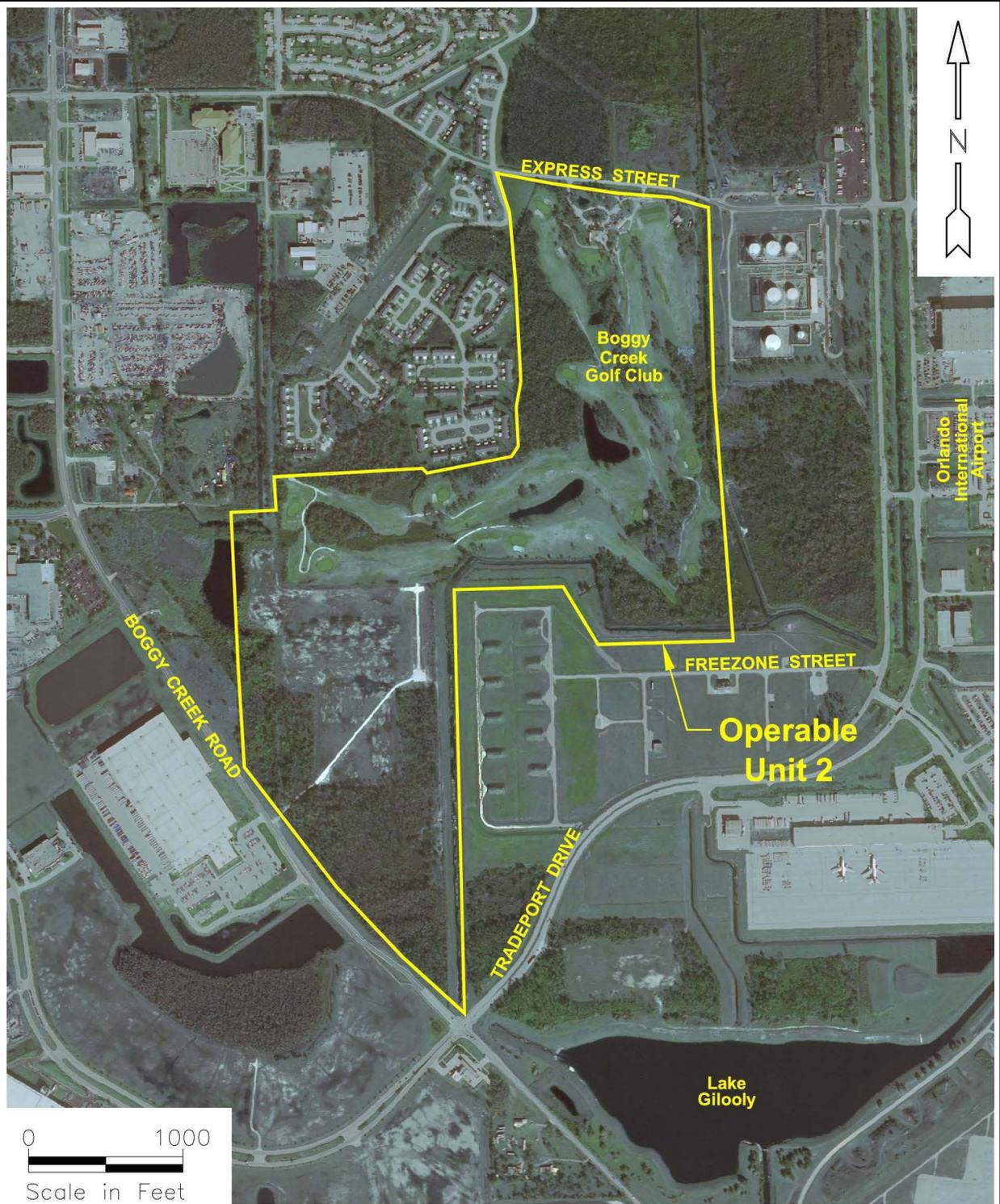
DATE	ACTIVITY
April 2010 through April 2013	Semi-annual groundwater and surface water sampling (BFA)
April 2011	Existing injection well rehabilitation performed by Solutions-IES. Determined existing injection wells IW-12B through IW-22B were negatively impacted and not usable.
October 2011	Eighteen injection wells installed north and south of central portion of bio-barrier wall (Solutions-IES)

DATE	ACTIVITY
February 2012	injection of EOS® and AquaBupHTM along entire bio-barrier wall by Solutions-IES
April 2012	Bioaugmentation culture injection in central and north portion of bio-barrier wall (Solutions-IES)
April, July, October 2012 and April 2013	Post injection groundwater sampling (Solutions)
August 2012	Draft Final SAP (UFP-QAPP) for LTM submitted - defined sampling requirements to be implemented beginning in September 2012 (TT)
August 2012	Final Revised Feasibility Study submitted (TT)
March 2013	Injection Completion Report submitted (Solutions-IES)
May 2013	Final Proposed Plan submitted (TT)
October 2013 to present	Semi-annual groundwater and surface water sampling (Solutions-IES)

**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
OPERABLE UNIT 2
MCCOY ANNEX LANDFILL
NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

1940 to 1947	United States Army
1947 to 1968	United States Air Force; Landfill operations began 1960
1968 to 1999	United States Navy; Landfill operations ended 1978
September 1985	Landfill identified as being of environmental concern. Wastes reportedly include paint and paint thinners, asbestos, hospital wastes, automobile batteries, and airplane parts.
December 1986	Investigated environmental concerns at NTC Orlando. Included one chapter on McCoy Annex Landfill.
May 1997 through November 1997	Remedial Investigation (RI) field operations, Phase I - geophysics to define landfill boundaries; surface soil, sediment, surface water sampling; soil vapor investigations; Direct Push Technology (DPT), hand auger borings.
March 1998 to October 1998	RI field operations, Phase II -monitoring well installation, geophysics to refine west landfill boundary, aquifer testing, DPT groundwater sampling
February 1999 to February 2001	RI field operations, Phase III -additional surface water and sediment sampling; monitoring well sampling; hand auger borings to refine cover thickness over landfill
April 1999	Soil removal of 2000 yd ³ PAH-contaminated soil from sample locations S91 and S103. (Bechtel)
March 2001	RI Report issued.
August 2000	Soil cover placement of 86,000 yd ³ over 25 acres in southern portion of site to ensure 2 foot soil cover. (EEG) Document Date November 2000.
March 2002 to March 2013	Quarterly groundwater sampling implemented in March 2002 to support remedial design. (TtNUS March 2002 to March 2003; Terraine June 2003 to April 2008; BFA June 2008 to March 2013). Sampling frequency changed to semi annual in September 2005.
July 2003	Performed additional groundwater sampling; determined COCs; identified and evaluated remedial alternatives and estimated their costs. Groundwater and landfill material were identified as the media of concern. Benzene, TCE, VC, iron and manganese were selected as COCs
April 2004 to June 2004	Pre-design data collection field effort to better define nature and extent of contaminant migration offsite onto GOAA property.
November 2004 to January 2005	Soil cover placement of 3,600 yd ³ clean fill on selected areas of golf course identified in FS and refined upon visual inspection. Improvement of 1,000 feet of golf cart path. Bahia sod placed over approximately 65,000 ft ² areas of rough; Bermuda sod placed on 6,400 ft ² area of fairway. (CCI)
January through June 2005	Additional pre-design data collection effort to finalize remedy for the site. In-situ enhanced bioremediation remedy selected for site – scheduled for implementation Spring 2006.
November 2005 to April 2010	Monthly surface water sampling for VOCs/Fe.
April 2006	Draft Final ROD issued
August 2006	Submitted for public comment
November 2006	Re-submitted for EPA review; Public comment period early 2007
November 2006	Draft Final Propose Plan issued
January 1, 2007	Boggy Creek Golf Course Closed
March, 2007	ASTs removed from site; petroleum-stained soil found beneath golf course maintenance equipment. The City of Orlando assumed responsibility for cleanup of the stained soil.
May-June 2007	Pilot study injection wells installed, pre-injection baseline sampling
July 2007	Pilot study injections of emulsified oil substrate (EOS)
June/July and November 2007	Post-injection data collection
January 2008	Finding of Suitability to Transfer McCoy Annex, Early Transfer of Operable Unit 2

	issued.
January 31, 2008	Property transferred from the United States Navy to Brian Mulvane, who then sold the property to Bogey Boggy Creek, LLC, a Florida company
September/October 2008	EOS Injection to central portion of bio-barrier wall by AGVIQ-CH2M HILL
October 2008	Semi-annual groundwater sampling performed by BFA.
January, April, August, and November 2009	Post-injection groundwater sampling by AGVIQ-CH2M HILL
April 2011	Existing injection well rehabilitation performed by Solutions-IES. Determined existing injection wells IW-12B through IW-22B were negatively impacted and not usable.
October 2011	Eighteen injection wells installed north and south of central portion of bio-barrier wall (Solutions-IES)
February 2012	injection of EOS® and AquaBupHTM along entire bio-barrier wall by Solutions-IES
April 2012	Bioaugmentation culture injection in central and north portion of bio-barrier wall (Solutions-IES)
April, July, October 2012 and April 2013	Post injection groundwater and surface water (one location) sampling by Solutions-IES
August 2012	Draft Final SAP (UFP-QAPP) for LTM submitted - defined sampling requirements to be implemented beginning in September 2012 (TT)
August 2012	Final Revised Feasibility Study submitted (TT)
March 2013	Injection Completion Report submitted (Solutions-IES)
May 2013	Final Proposed Plan submitted (TT)
October 2013 to present	Semi-annual groundwater and surface water sampling (Solutions-IES)



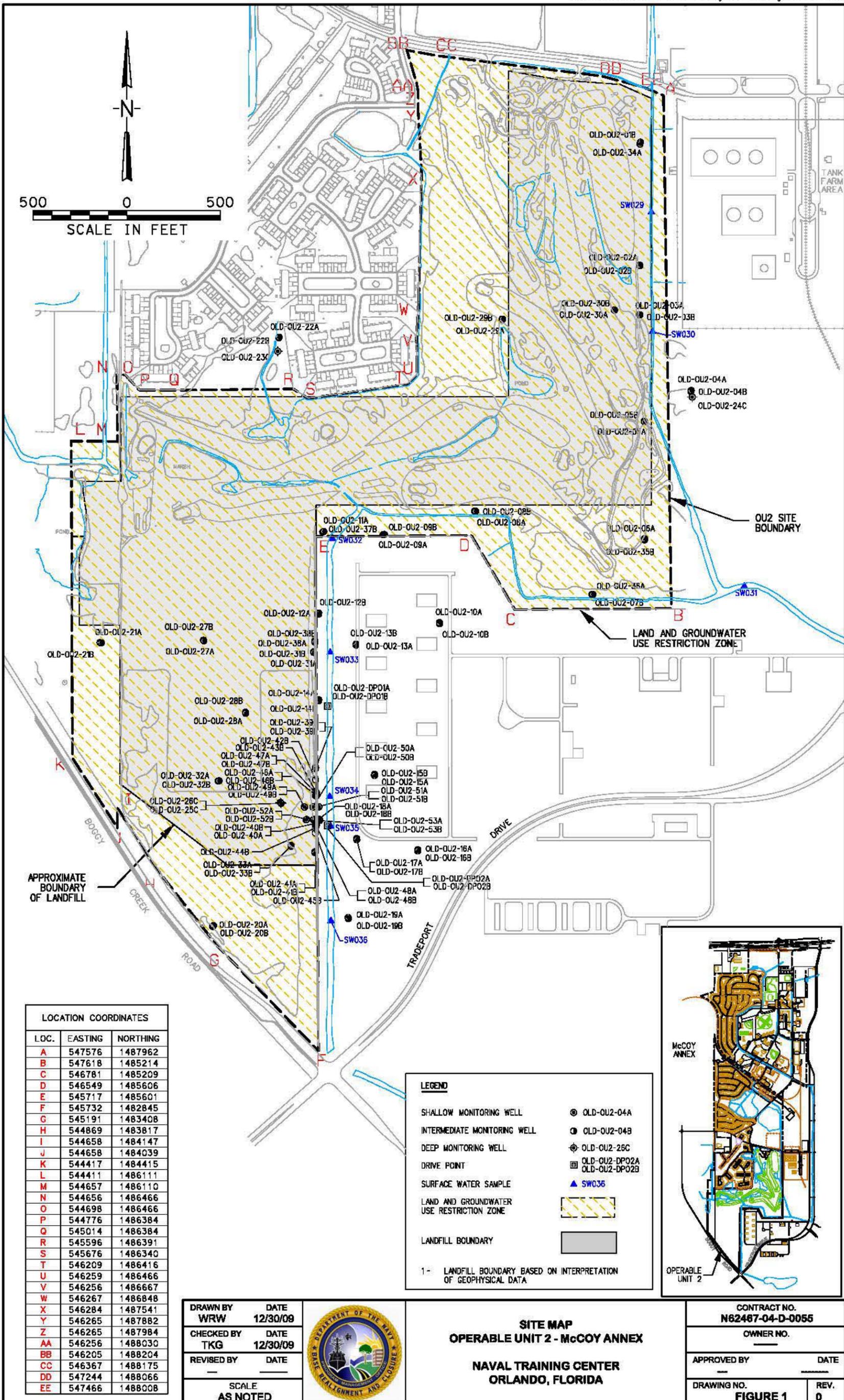
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CHECKED BY TKG	DATE 10-26-06
REVISED BY ---	DATE -----
SCALE AS NOTED	



**AERIAL SITE MAP
OPERABLE UNIT 2 - McCOY ANNEX**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

CONTRACT NO. N62467-04-D-0055	
OWNER NO. 00131	
APPROVED BY ---	DATE -----
DRAWING NO. FIGURE 1	REV. 0



LOCATION COORDINATES		
LOC.	EASTING	NORTHING
A	547576	1487962
B	547618	1485214
C	546781	1485209
D	546549	1485606
E	545717	1485601
F	545732	1482845
G	545191	1483408
H	544869	1483817
I	544658	1484147
J	544658	1484039
K	544417	1484415
L	544411	1486111
M	544657	1486110
N	544656	1486466
O	544698	1486466
P	544776	1486384
Q	545014	1486384
R	545596	1486391
S	545676	1486340
T	546209	1486416
U	546259	1486466
V	546256	1486667
W	546267	1486848
X	546284	1487541
Y	546265	1487882
Z	546265	1487984
AA	546256	1488030
BB	546205	1488204
CC	546367	1488175
DD	547244	1488066
EE	547466	1488008

DRAWN BY WRW **DATE** 12/30/09
CHECKED BY TKG **DATE** 12/30/09
REVISED BY _____ **DATE** _____
SCALE AS NOTED



SITE MAP
OPERABLE UNIT 2 - MCCOY ANNEX
NAVAL TRAINING CENTER
ORLANDO, FLORIDA

CONTRACT NO. N62467-04-D-0055
OWNER NO. _____
APPROVED BY _____ **DATE** _____
DRAWING NO. FIGURE 1 **REV.** 0

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SAP Worksheet No. 18 -- Sampling Locations and Methods/SOP Requirements Table

[\(UFP-QAPP Manual Section 3.1.1\)](#)

18.1 OU 2 SAMPLING LOCATION AND METHODS –

Well Number	Matrix	Screened Interval (feet bgs)	Field Parameters	VOCs	Fe	Mn	MNA Parameters	Number of Samples (identify field duplicates)	Sampling Frequency	Sampling SOP Reference
OLD-OU2-02A	Groundwater	7.5 to 17.5	X	X	X	X		1	Semiannual	FT 1000 FS 2200
OLD-OU2-02B	Groundwater	27 to 32	X	X	X	X		1	Semiannual	FT 1000 FS 2200
OLD-OU2-03A	Groundwater	7.5 to 17.5	X	X	X	X	X	1	Semiannual MNA Annual	FT 1000 FS 2200
OLD-OU2-03B	Groundwater	27.5 to 32.5	X	X	X	X	X	1+ duplicate for VOCs, Fe, Mn	Semiannual MNA Annual	FT 1000 FS 2200
OLD-OU2-12B	Groundwater	29 to 35	X	X	X	X		1	Semiannual	FT 1000 FS 2200
OLD-OU2-18B	Groundwater	28.5 to 33.5	X	X	X	X	X	1	Semiannual MNA Annual	FT 1000 FS 2200
OLD-OU2-21A	Groundwater	7 to 17	X	X	X	X	X	1	Annual	FT 1000 FS 2200
OLD-OU2-21B	Groundwater	27.5 to 32.5	X	X	X	X	X	1	Annual	FT 1000 FS 2200
OLD-OU2-27A	Groundwater	6 to 16	X	X	X	X		1	Annual	FT 1000 FS 2200
OLD-OU2-27B	Groundwater	27 to 32	X	X	X	X		1	Annual	FT 1000 FS 2200
OLD-OU2-28B	Groundwater	27 to 32	X	X	X	X		1	Annual	FT 1000 FS 2200
OLD-OU2-29A	Groundwater	5 to 15	X	X	X	X	X	1	Annual	FT 1000 FS 2200
OLD-OU2-29B	Groundwater	25 to 30	X	X	X	X	X	1	Annual	FT 1000 FS 2200
OLD-OU2-30A	Groundwater	5 to 15	X	X	X	X		1	Annual	FT 1000 FS 2200
OLD-OU2-30B	Groundwater	25 to 30	X	X	X	X		1+ duplicate for VOCs, Fe, Mn	Annual	FT 1000 FS 2200

Well Number	Matrix	Screened Interval (feet bgs)	Field Parameters	VOCs	Fe	Mn	MNA Parameters	Number of Samples (identify field duplicates)	Sampling Frequency	Sampling SOP Reference
OLD-OU2-31A	Groundwater	5 to 15	X	X	X	X		1	Semiannual	FT 1000 FS 2200
OLD-OU2-31B	Groundwater	25 to 30	X	X	X	X		1	Semiannual	FT 1000 FS 2200
OLD-OU2-32A	Groundwater	5 to 15	X	X	X	X		1	Annual	FT 1000 FS 2200
OLD-OU2-32B	Groundwater	25 to 30	X	X	X	X		1	Annual	FT 1000 FS 2200
OLD-OU2-33A	Groundwater	5 to 15	X	X	X	X		1	Annual	FT 1000 FS 2200
OLD-OU2-33B	Groundwater	25 to 30	X	X	X	X		1	Annual	FT 1000 FS 2200
OLD-OU2-37B	Groundwater	25 to 30	X	X	X	X		1	Semiannual	FT 1000 FS 2200
OLD-OU2-41B	Groundwater	30 to 35	X	X	X	X		1	Semiannual	FT 1000 FS 2200
OLD-OU2-42B	Groundwater	34 to 39	X	X	X	X	X	1	Semiannual MNA Annual	FT 1000 FS 2200
OLD-OU2-43B	Groundwater	29.5 to 34.5	X	X	X	X	X	1	Semiannual MNA Annual	FT 1000 FS 2200
OLD-OU2-44B	Groundwater	28.5 to 33.5	X	X	X	X		1	Semiannual	FT 1000 FS 2200
OLD-OU2-47B	Groundwater	30 to 35	X	X	X	X	X	1+duplicate for VOCs	Semiannual MNA Annual	FT 1000 FS 2200
OLD-OU2-51B	Groundwater	24 to 34	X	X	X	X	X	1	Semiannual MNA Annual	FT 1000 FS 2200
OLD-OU2-DP01A	Groundwater	3.5 to 7.5	X	X	X	X		1	Semiannual MNA Annual	FT 1000 FS 2200
OLD-OU2-DP02A	Groundwater	3.5 to 7.5	X	X	X	X	X	1	Semiannual MNA Annual	FT 1000 FS 2200
OLD-OU2-DP02B	Groundwater	17 to 22	X	X	X	X	X	1	Semiannual MNA Annual	FT 1000 FS 2200
OLD-OU2-SW29	Surface Water	NA	X	X	X	X		1+duplicate	Semiannual	FT 1000 FS 2100
OLD-OU2-SW30	Surface Water	NA	X	X	X	X		1	Semiannual	FT 1000 FS 2100
OLD-OU2-SW31	Surface Water	NA	X	X	X	X		1	Semiannual	FT 1000 FS 2100

Project-Specific SAP

Site Name/Project Name: OU 2
 Site Location: NTC Orlando, Florida

Long Term Monitoring SAP for OU 2

Revision: 0
 July 2012

Well Number	Matrix	Screened Interval (feet bgs)	Field Parameters	VOCs	Fe	Mn	MNA Parameters	Number of Samples (identify field duplicates)	Sampling Frequency	Sampling SOP Reference
OLD-OU2-SW33	Surface Water	NA	X	X	X			1	Semiannual	FT 1000 FS 2100
OLD-OU2-SW35	Surface Water	NA	X	X	X			1	Semiannual	FT 1000 FS 2100
OLD-OU2-SW36	Surface Water	NA	X	X	X			1	Semiannual	FT 1000 FS 2100
OLD-OU2-LG01	Surface Water	NA	X	X	X			1	Semiannual	FT 1000 FS 2100

Notes:

Fe – Iron

Mn = Manganese

MNA = Monitored natural attenuation

NA – Not applicable

VOCs include benzene, PCE, TCE, cis-1,2-DCE, and vinyl chloride as identified in Worksheet No. 15.

MNA Parameters include:

Laboratory: alkalinity, TDS, TOC, anions (chloride, nitrate, nitrite, and sulfate), orthophosphate, and dissolved gases (ethene, ethane, methane).

Field: carbon dioxide, DO, ferrous iron, total sulfide, and hydrogen sulfide.



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OU 3

Greenskeepers

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Naval Training Center Orlando Florida



Operable Unit 3 (OU 3)

This fact sheet was developed to inform interested citizens about the Naval Training Center (NTC), Orlando environmental program. Fact sheets will be distributed periodically to keep the community informed. Additional copies of these fact sheets can be obtained by contacting Art Sanford at (843) 743-2135.

NTC Orlando's Environmental Program

Environmental studies and cleanup actions are currently underway at the former NTC, Orlando as part of the Department of Defense's Installation Restoration (IR) Program. Through this program, areas of known or suspected contamination from past practices and operations are being identified, evaluated, and, if necessary, cleaned up.

Site Description

OU 3 is located on the west side of the former NTC, southeast of Lake Baldwin, and occupies 3.27 acres of land (Figure 1). OU 3 is divided into two study areas, SA 8 and SA 9. SA 8 included the former greenskeeper's storage area which was used for golf course maintenance supply storage. SA 9 was the former pesticide handling and storage area which was used as a base for pesticide storage and mixing.

paved walking trail has also been constructed along Lake Baldwin Lane. In 2004 and 2005 site development caused damage to several monitoring wells and temporarily altered groundwater flow. Wells were replaced; however, and groundwater flow returned to pre-construction conditions.

Site Investigation and Remediation History

Initial investigations began in 1994. Arsenic, pesticides, and other contaminants were found in both surface soil and groundwater at concentrations exceeding regulatory cleanup levels. As a result of these investigations, an interim remedial action (IRA) was completed in 1997 to address soil contamination at SA 8 (arsenic) and SA 9 (pesticides). Approximately 40 cubic yards of soil were removed from SA 8 and approximately 2,140 cubic yards of soil were removed from SA 9. **These actions were sufficient to clean up contaminants at the site to levels acceptable for recreational use. Despite the removal of the soil; however groundwater contaminants remained at concentrations greater than their respective Groundwater Cleanup Target Levels. These contaminants required further clean up.**

To treat contaminated groundwater, the Orlando Partnering Team (OPT) designed and installed two permeable adsorptive barriers (PABs), one at SA 8 and one at SA 9. Each barrier was designed to intercept contaminated groundwater and remove arsenic (the primary contaminant of concern) as it flows towards Lake Baldwin. Groundwater flows slowly at both sites, moving 21 feet per year at SA 8 and one foot per year at SA 9.

Each barrier was constructed by filling trenches with material designed to clean contaminated groundwater as it flows through. The barriers are 120 to 160 feet in length and 25 feet deep (Figure 2). A mix of activated alumina and sand was used to fill the trenches created by a one-pass trenching machine. Although activated alumina has been used in drinking water treatment, this is the first-ever application in a PAB to treat contaminated groundwater.

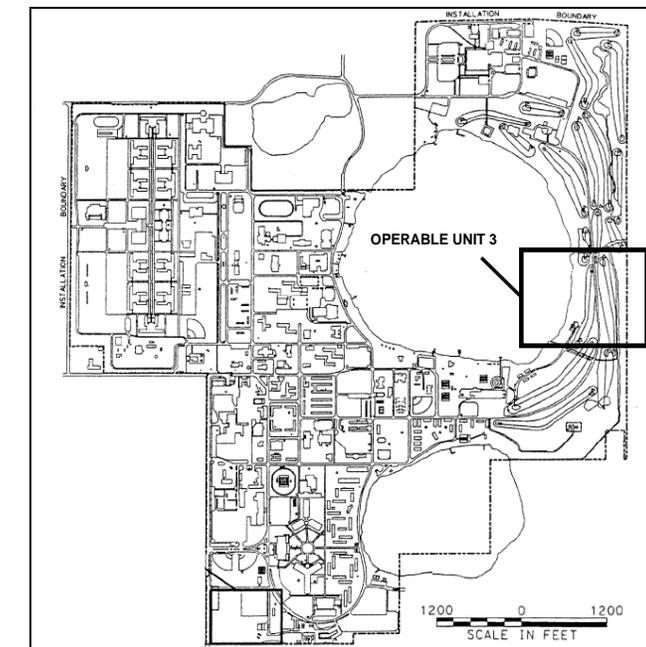


Figure 1: NTC Orlando Base Map with OU 3 Highlighted

The OU 3 property was transferred to the City of Orlando in 2005, for use primarily as a park. A residential building has been constructed at the edge of SA 8. A

In addition to the PABs, land use restrictions have been implemented to protect human health. These include a non-residential restriction for the western portion of SA

8. In addition, groundwater use is prohibited for all of the SA 8 property. At SA 9, groundwater use is restricted across the majority of the property (1.34 acres). Residential use is also prohibited in the northern portion of SA 9.

if arsenic levels are greater than Fresh Surface Water Cleanup Target Levels (FSWCTLs), drive points will be installed below the lake bottom in Lake Baldwin to monitor the potential impact to surface water.

For More Information

The public is invited to submit any questions or comments on the remedial action described in this fact sheet. Comments should be directed to Art Sanford at (843) 743-2135. Reports on the work conducted at OU 3 can be reviewed at the Orange County Public Library, Orlando Branch (4th Floor), 101 East Central Boulevard, Orlando, Florida 32801.

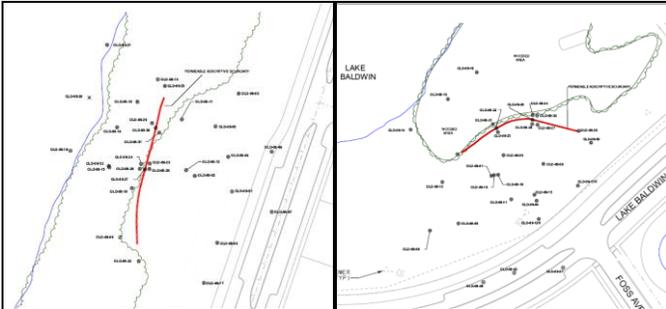


Figure 2: Current layout of SA 9 (left), and SA 9 (right) indicating PABs in red.

What's Next?

Arsenic remains the primary contaminant of concern. Groundwater is monitored quarterly at SA 8 and semi-annually at SA 9. The data collected to date indicate that the PABs are performing as expected and this successful performance of the PABs (with alumina) is expected to continue, thus proving the method to be an effective, reliable, and relatively inexpensive solution of remediating arsenic in groundwater.

If overall concentrations show no significant increases at SA 8, sampling frequency will be decreased to semi-annual.

Although both PABs are performing successfully, arsenic has been detected at areas beyond the reach of the PAB at SA 8. These concentrations are being monitored, and

What is arsenic?

Arsenic is a naturally occurring element widely distributed in the earth's crust. In the environment, arsenic is combined with oxygen, chlorine, and sulfur to form inorganic arsenic compounds. Arsenic in animals and plants combines with carbon and hydrogen to form organic arsenic compounds.

Inorganic arsenic compounds are mainly used to preserve wood. Copper chromated arsenic (CCA) is used to make "pressure-treated" lumber. CCA is no longer used in the U.S. for residential uses; it is still used in industrial applications. Organic arsenic compounds are used as pesticides, primarily on cotton plants.

More information about this contaminant can be found at the following website:

<http://www.atsdr.cdc.gov/>

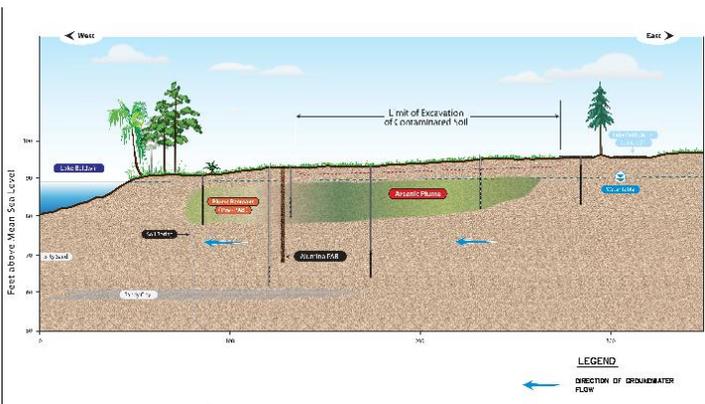


Figure 3: Conceptual Model, SA 8

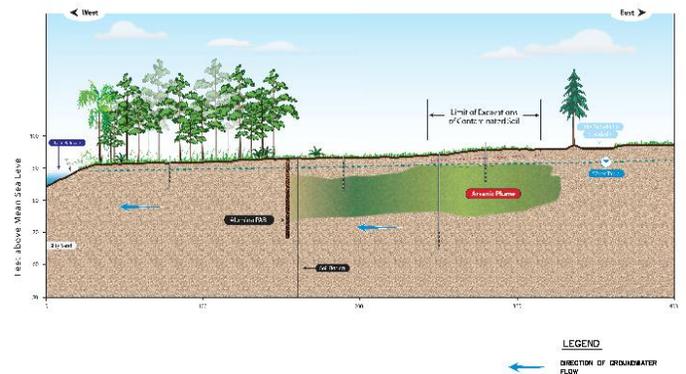


Figure 4: Conceptual Model, SA 9

CTC SUMMARY

NTC Orlando
NORM Site 00008
Operable Unit (OU) 3 – Greenskeeper Storage Area
CTC: \$320,419
Reference to NORM information updated 25 September 2009

Acreage: Study Area (SA) 8 – 1.88 acres
SA 9 – 1.39 acres

Current Land Use: The majority of the land is undeveloped green space. There is a walking path around Lake Baldwin running through both SA 8 and 9. A residential building lies on the eastern edge of SA 8.

Location: Both sites are located along the southeastern shore of Lake Baldwin. SA 8 is just west of Lake Baldwin Lane near its intersection with Reefpoint Drive. SA 9 lies northwest of the intersection of Lake Baldwin Lane and Almond Avenue.

FDEP Oculus Numbers: DOD_14_1992 (SA 8); DOD_14_1994 (SA 9)

Background information: OU 3 is comprised of two separate sites, SAs 8 and 9 which lie approximately 600 feet apart on the southeast shore of Lake Baldwin. SA 8 was the Greenskeeper's Storage area on the golf course formerly located on the Main Base. SA 9 was the former Pesticide Handling and Storage Area. All golf-course related buildings have been removed from the two study areas. Densely wooded wetlands are along the shoreline of Lake Baldwin, and there is a paved walking trail along Lake Baldwin Lane.

Investigations conducted between August 1994 and March 1998 detected arsenic, other inorganics, pesticides, and other organic compounds in surface soil and groundwater at concentrations that exceeded regulatory criteria. The Navy completed Interim Remedial Actions for the removal of contaminated soil in September 1997 and May 1999 and backfilled the excavation with clean soil. No further action is anticipated for soils. An RI/FS report was issued in June 1999, and an Interim ROD was issued in September 2000. A treatability study for the in situ removal of arsenic from groundwater using an activated alumina permeable adsorptive barrier (PAB) was conducted from April 2002 to April 2003.

Site development activities caused damage to several monitoring wells in 2004 and 2005. In addition, development and dewatering adversely impacted remedial progress of the site by unnaturally altering groundwater flow direction and velocity. Since then, the Navy has worked with Baldwin Park Development Company and all damaged site monitoring wells have been repaired or replaced. Following well repairs and replacement, a comprehensive site survey performed to re-evaluate groundwater flow direction confirmed that flow has returned to pre-construction conditions, flowing towards Lake Baldwin through the PABs.

Sources: The contaminants at OU 3 are primarily related to the handling and storage of pesticides and herbicides and the operation and maintenance of landscaping equipment. Direct spills and disposal on the ground surface are the most likely release mechanisms.

Florida Groundwater Classification: Class II

Hydrogeology: Groundwater at OU 3 occurs in the surficial aquifer that consists predominantly of marine quartz sand with shell fragments and is generally less than 10 percent silt and clay. The aquifer is unconfined, and the water table typically lies at a shallow depth of 1.5 to 4 feet below ground surface (bgs). Potentiometric data from several years of water-level monitoring show a water table that mimics topography and slopes gently toward the shoreline of Lake Baldwin at both SA 8 and SA 9. The aquifer is recharged by local precipitation and discharges into Lake Baldwin. The bottom of the surficial aquifer is coincident with the upper, silt and clay dominated beds of the Hawthorn formation that lie at a depth of approximately 60 feet bgs.

Groundwater Flow/Hydraulic Conductivity: Slug tests indicate the average horizontal hydraulic conductivity at SA 8 is 2.74 ft/day. Hydraulic conductivity values were more variable at SA 9, averaging 0.21 ft/day to 0.068 ft/day. The estimated groundwater flow rate at SA 8 is 0.058 ft/day and at SA 9 is 0.0035 ft/day. The higher calculated groundwater velocity at SA 8 is due to the higher hydraulic conductivity in this area, since the hydraulic gradient is approximately the same at both sites.

Receptors: OU 3 borders a multi-family residential development; however the majority of the site will be used for recreational use only. A recreator is the only human receptor in the area with land restrictions. There are ecological receptors for groundwater at discharge points to Lake Baldwin.

Nature and extent of contamination: Investigations detected inorganics and pesticides and herbicides in the surficial aquifer. Arsenic is the primary groundwater COC at SA 8, and the plume covers approximately 1.2 acres to a depth of 15 feet. Arsenic is the principal groundwater COC at SA 9, and the plume covers approximately 0.7 acre to a depth of 26 feet. Contaminated soil was removed during the Interim Remedial Actions, and no further action is necessary for soil.

Cleanup Methodology: The Interim ROD selected Limited Action for the groundwater alternative, consisting of institutional controls (groundwater use restrictions), groundwater monitoring, and site reviews. In addition, in case more proactive remedial actions were warranted by subsequent monitoring, the Interim ROD also recommended a treatability study for the in situ removal of arsenic from groundwater and installation of drive point wells along the shoreline of Lake Baldwin. Permeable absorptive barriers (PABs) were installed in April 2002. A re-evaluation of monitoring data and site risk

levels indicated that Limited Action (monitoring only) is appropriate and protective of human health and the environment.

Concerns/Barriers to Site Closure: Concerns included continued leaching of arsenic from subsurface soil. The horizontal extent of plume is greater than the length of the PAB. During the risk re-evaluation to current CTLs, additional concerns may be identified.

Recent Events/Changes: At SA 8, two monitoring wells (OLD-08-26R and -29R) were replaced in December 2011, and three drive point wells (OLD-08-DP01, -DP02 and -DP03) were installed along the lakeshore in July 2012. These wells are intended to provide groundwater data downgradient of the PAB and prior to contact with surface water.

Thirteen wells at SA 8 and eleven monitoring wells at SA 9 are sampled semi-annually in March/April and September for metals, pesticides, herbicides, SVOCs, and/or arsenic. Six wells at SA 8 are also sampled quarterly in June and December for arsenic.

DATE	ACTIVITY
August 2010	Final UFP SAP submitted to FDEP (TT)
November 2011	Draft Proposed Plan was submitted (TT)
December 2011	Two monitoring wells (OLD-08-26R and -29R) were replaced at SA 8
April 2012	FDEP comments on Draft PP
July 2012	Three drive point wells installed along the shore of Lake Baldwin at SA 8

**CHRONOLOGICAL SUMMARY OF ACTIVITIES
OPERABLE UNIT 3**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

Date	Event
September 1985	Initial Assessment Study (C.C. Johnson, 1985): identified the Study Area 9, the in southern McCoy Annex as being of environmental concern.
August 1994 – March 1998	Site Screening Investigations.
July 1996	Environmental Site Screening Report for SA 9 issued.
April 1997	Environmental Site Screening Report for SA 8 issued.
November 1997	IRA Completion Report documented removal of 36 tons of contaminated soil at SA 8 and 946 tons at SA 9.
June 1999	Final Remedial Investigation/Feasibility Study Report issued.
August 18, 1999	IRA Completion Report documented removal of 95 tons of pesticide contaminated soil and 2,886 tons of arsenic - contaminated soil.
September 2000	Interim ROD stipulated institutional controls on groundwater use and other administrative remedies, groundwater monitoring, and evaluation of three groundwater treatment options.
January 25, 2001	Specifications for Site Monitoring issued.
February 2, 2001	Bench-scale study report issued. Activated alumina was effective in removing arsenic from OU 3 groundwater.
August 2001	Borings confirmed lack of a confining layer in which to key a wall for a funnel and gate design.
February 2002	Fact Sheet issued.
April 2002	Treatability Study: Permeable Adsorptive Barriers (PAB) composed of sand and activated alumina and microwells for monitoring were installed (baseline and performance sampling occurred in May, June, September, December 2002, and March 2003.
March 1999	Quarterly groundwater monitoring initiated.
July 2003	(Draft) FOSET Phase 2 published for Public Comment.
August 2003	(Draft) EBST/FOST for early transfer of OU 3 published for Public Comment.
October 2003	Final PAB Treatability Study report issued.
March and June 2004	Monitoring wells damaged and/or destroyed during site development activities.
October 2004	Nodarse reinstalled wells 09-12R and 09-17R.
April 2005	The OU 3 property was transferred to the City of Orlando
June 2005	Additional wells damaged and/or destroyed during site development activities.
June 2005	FDEP approval to discontinue herbicide sampling at SA 8.
November 2005	Additional wells damaged and/or destroyed during site development activities.
December 2005	Baldwin Park reinstalled some of the lost monitoring wells.
October 2006	Wells OLD-08-02R, -06R, -14R, OLD-09-04R reinstalled by Nodarse.
May 2008	BOA contract awarded to Barnes, Ferland, and Associates (BFA) for quarterly groundwater sampling
July 2008 – March 2013	Quarterly/semi-annual sampling events performed by BFA

Date	Event
July 2010	Draft UFP SAP submitted to FDEP (TT)
August 2010	Final UFP SAP submitted (TT)
November 2011	Draft Proposed Plan submitted (TT)
December 2011	Two monitoring wells (OLD-08-26R and -29R) were replaced at SA 8.
April 2012	FDEP comments on Draft PP
July 2012	Three drive point wells installed along the shore of Lake Baldwin at SA 8

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LAKE
BALDWIN

Lake Baldwin Lane

Reefpoint Drive



Monitoring Well

- DPT Well
- ◆ Shallow Well
- ◆ Deep Well

○ Approximate Extent of Arsenic Contamination in Groundwater (December 2012)

— Permeable Adsorptive Barrier

□ Study Area 8 Boundary

➡ Groundwater Flow Direction



Basemap Sources: Esri World Imagery
http://services.arcgisonline.com/arcgis/services/World_Imagery
 © 2011 Esri, I-cubed, USDA FSA, USGS, AEX, GeoEye, AeroGRID, Getmapping, IGP
 Orange County GIS

FIGURE 2-2a
 SITE LAYOUT/WELL LOCATION MAP
 Operable Unit 3 - Study Area 8
 Main Base
 Orlando, Florida

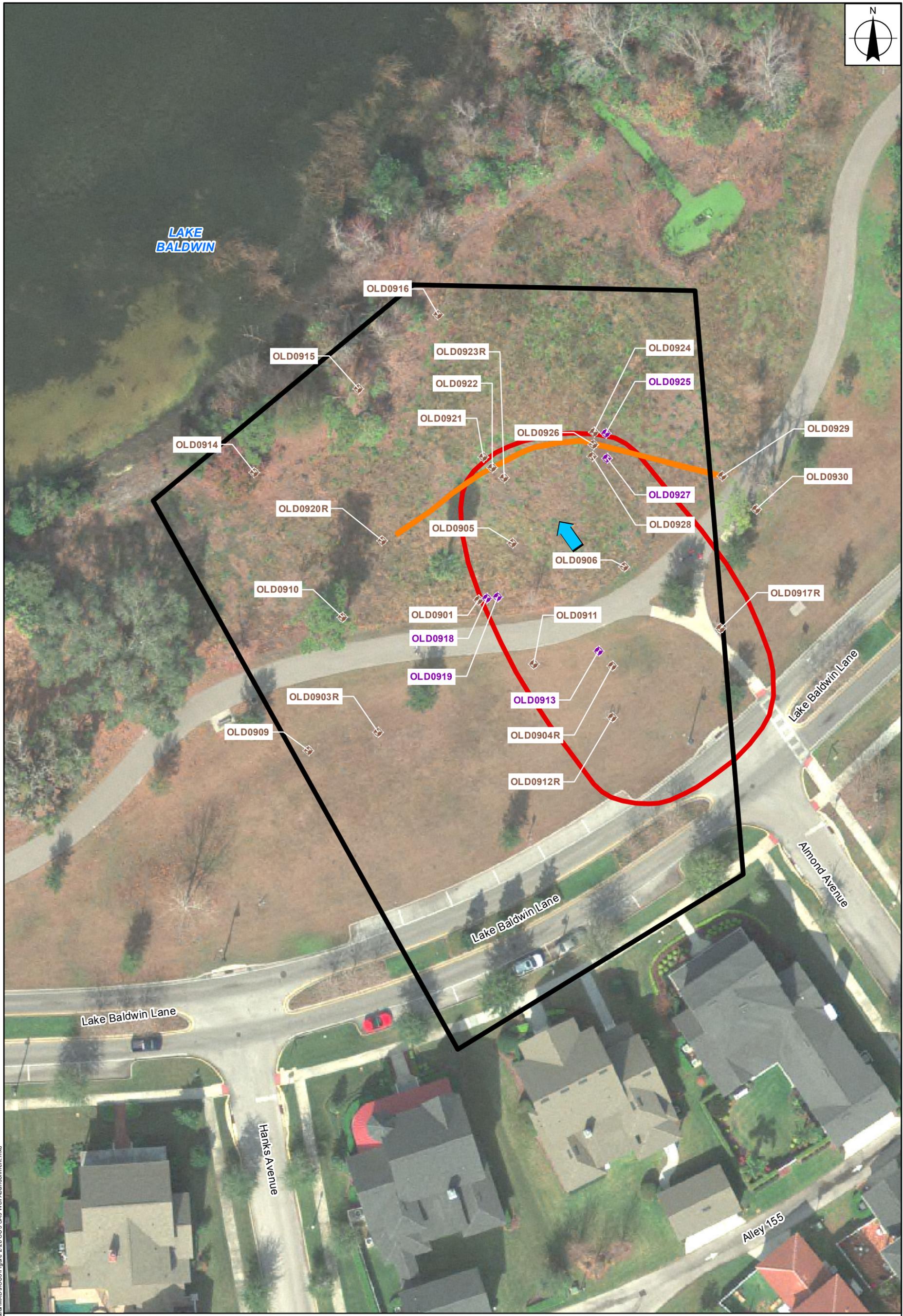


REQUESTED BY: OggerID	DATE: 6/17/2013
DRAWN BY: MartinM	TASK ORDER NUMBER: XXXXX

\\usorfp002\data\projects\Navy_CLEAN\NTC_Orlando\9.0_Geospacial\MXDs\OU3\Figure 2-2_OU3_SA8 (June 2013).mxd



LAKE BALDWIN



Monitoring Well

-  Shallow Well
-  Deep Well

 Permeable Adsorptive Barrier

 Approximate Extent of Arsenic Contamination in Groundwater (September 2012)

 Study Area 9 Boundary

 Groundwater Flow Direction



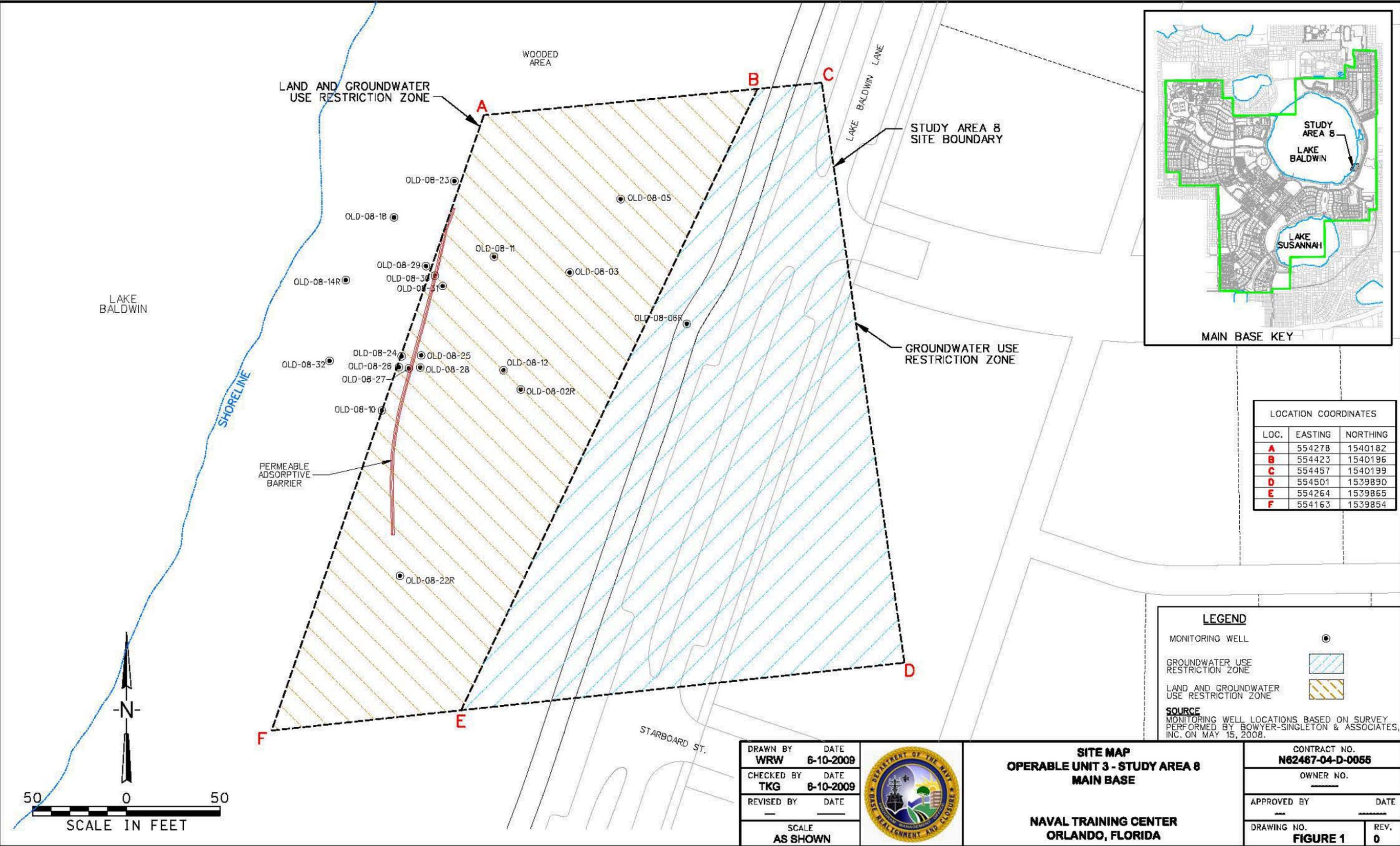
FIGURE 2-2b
SITE LAYOUT/WELL LOCATION MAP
Operable Unit 3 - Study Area 9
Main Base
Orlando, Florida



REQUESTED BY: OggerID	DATE: 11/4/2013
DRAWN BY: MartinM	TASK ORDER NUMBER: XXXXX

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Basemap Sources: Esri World Imagery
http://services.arcgis.com/arcgis/services/World_Imagery
© 2011 Esri, I-cubed, USDA FSA, USGS, AEX, GeoEye, AeroGRID, Getmapping, IGP
Orange County GIS



LOCATION COORDINATES		
LOC.	EASTING	NORTHING
A	554278	1540182
B	554423	1540196
C	554457	1540199
D	554501	1539890
E	554264	1539865
F	554163	1539854

LEGEND

MONITORING WELL

GROUNDWATER USE RESTRICTION ZONE

LAND AND GROUNDWATER USE RESTRICTION ZONE

SOURCE
MONITORING WELL LOCATIONS BASED ON SURVEY PERFORMED BY BOWYER-SINGLETON & ASSOCIATES, INC. ON MAY 15, 2008.

DRAWN BY **WRW** DATE **6-10-2009**
 CHECKED BY **TKG** DATE **6-10-2009**
 REVISED BY _____ DATE _____
 SCALE **AS SHOWN**

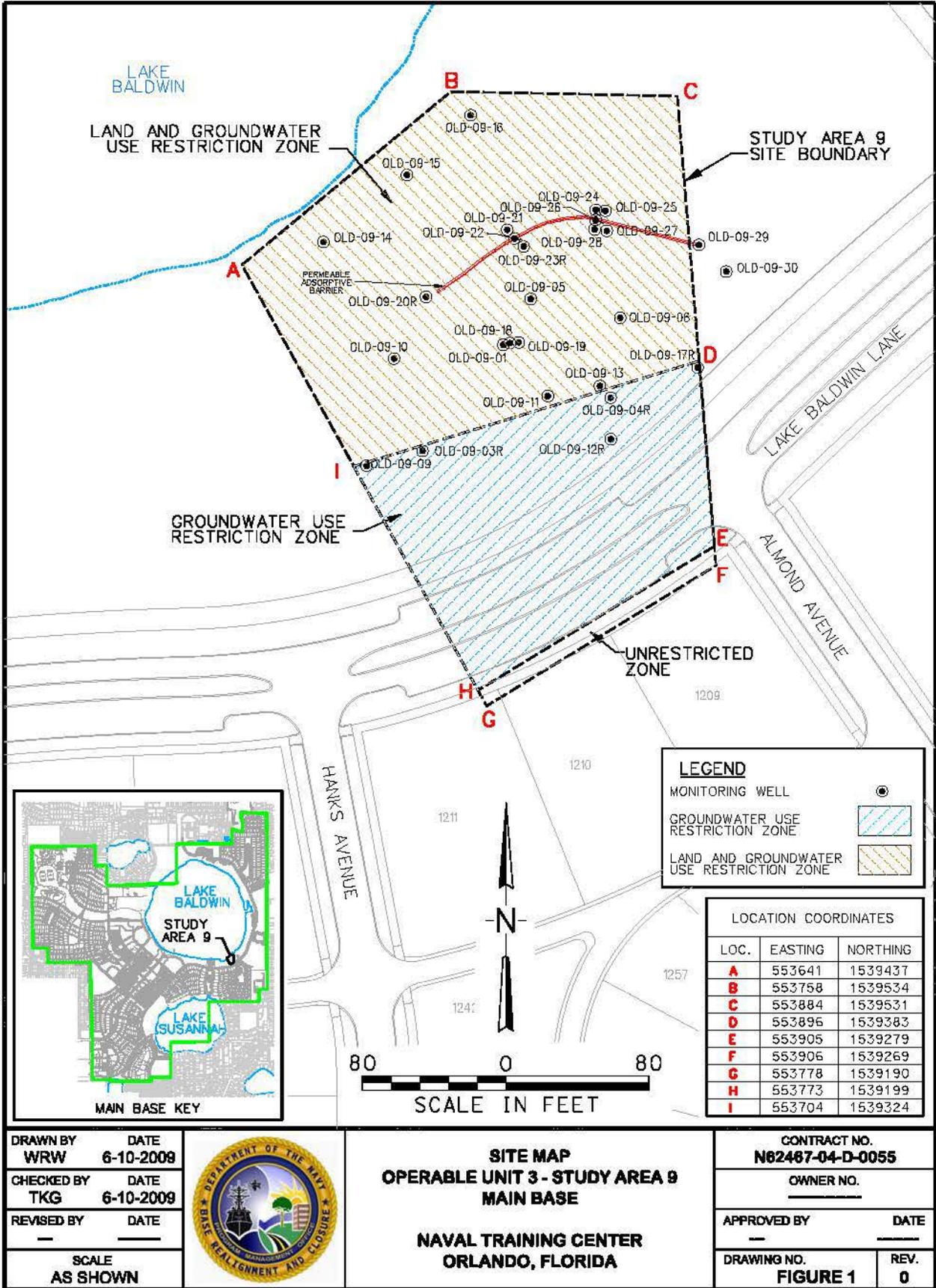


SITE MAP
OPERABLE UNIT 3 - STUDY AREA 8
MAIN BASE

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

CONTRACT NO. N62467-04-D-0055	
OWNER NO. _____	
APPROVED BY _____	DATE _____
DRAWING NO. FIGURE 1	REV. 0

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LEGEND

- MONITORING WELL
- GROUNDWATER USE RESTRICTION ZONE
- LAND AND GROUNDWATER USE RESTRICTION ZONE

LOCATION COORDINATES

LOC.	EASTING	NORTHING
A	553641	1539437
B	553758	1539534
C	553884	1539531
D	553896	1539383
E	553905	1539279
F	553906	1539269
G	553778	1539190
H	553773	1539199
I	553704	1539324

DRAWN BY WRW	DATE 6-10-2009
CHECKED BY TKG	DATE 6-10-2009
REVISED BY —	DATE —
SCALE AS SHOWN	



**SITE MAP
OPERABLE UNIT 3 - STUDY AREA 9
MAIN BASE**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

CONTRACT NO. N62467-04-D-0055	
OWNER NO. —	
APPROVED BY —	DATE —
DRAWING NO. FIGURE 1	REV. 0

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Project-Specific SAP

Site Name/Project Name: OU 3
 Site Location: NTC Orlando, Florida

Long Term Monitoring SAP for OU 3

Revision: 0
 August 2010
 Worksheet 18

SAP Worksheet No.18 -- Sampling Locations and Methods/SOP Requirements Table

[\(UFP-QAPP Manual Section 3.1.1\)](#)

18.1 SA 8 – GREENSKEEPER’S STORAGE AREA

Well ID	Matrix	Depth Screened Interval (feet bgs)	Aluminum	Antimony	Arsenic	Iron	Manganese	Number of Samples (identify field duplicates)	Sampling Frequency	Sampling SOP Reference
OLD-08-02R	Groundwater	2-12			X		X	1	Semi-annual	FT 1000 and FS 2200
OLD-08-03	Groundwater	3-13		X	X		X	1		
OLD-08-10	Groundwater	1-10			X	X	X	1 + duplicate		
OLD-08-12	Groundwater	23-29	X			X		1		
OLD-08-14R	Groundwater	2-12			X			1 + duplicate	Quarterly	
OLD-08-22R	Groundwater	2-12			X			1	Quarterly	
OLD-08-23	Groundwater	7-12			X			1	Quarterly	
OLD-08-25	Groundwater	26-31	X			X		1	Semi-annual	
OLD-08-27	Groundwater	8-13			X			1		
OLD-08-28	Groundwater	8-13			X			1		
OLD-08-30	Groundwater	8-13			X			1		
OLD-08-31	Groundwater	8-13		X	X			1		
OLD-08-32	Groundwater	1-11			X			1	Quarterly	

18.2 SA 9 – PESTICIDE STORAGE AND HANDLING AREA

Well ID	Matrix	Depth Screened Interval (feet bgs)	Arsenic	Iron	Manganese	2 – methylnaphthalene	Naphthalene	Alpha-BHC	Beta-BHC	Delta-BHC	Gamma-BHC	Number of Samples (identify field duplicates)	Sampling Frequency	Sampling SOP Reference
OLD-09-01	Groundwater	3-13	X	X	X							1	Semi-annual	FT 1000 FS 2200
OLD-09-05	Groundwater	1-10	X									1		FT 1000 FS 2200
OLD-09-06	Groundwater	1-10	X									1		FT 1000 FS 2200
OLD-09-11	Groundwater	1-10	X	X		X	X	X				1 + duplicate		FT 1000 FS 2200
OLD-09-12R	Groundwater	5-10	X	X	X	X	X	X	X	X	X	1		FT 1000 FS 2200
OLD-09-17R	Groundwater	5-10	X									1 + duplicate		FT 1000 FS 2200
OLD-09-21	Groundwater	8-13	X									1		FT 1000 FS 2200
OLD-09-23R	Groundwater	2-12	X									1		FT 1000 FS 2200
OLD-09-24	Groundwater	8-13	X									1		FT 1000 FS 2200
OLD-09-28	Groundwater	8-13	X									1		FT 1000 FS 2200
OLD-09-30	Groundwater	7-12	X									1	FT 1000 FS 2200	

OU 4

Drycleaners

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Update on Environmental Actions at Operable Unit 4 Naval Training Center Orlando, Florida



This fact sheet was prepared to inform interested citizens about the former Naval Training Center (NTC) Orlando environmental program. Fact sheets are distributed as needed to keep the community updated on cleanup progress. Additional information may be obtained by calling the Navy's Remedial Project Manager, Art Sanford, at (843) 743-2135.

Environmental Studies at Operable Unit 4

Environmental studies and cleanup actions are ongoing at Operable Unit (OU) 4, located at Area C of the former Naval Training Center (NTC) Orlando (see Figure 1). These studies have identified chlorinated solvents in groundwater (water below the ground surface). Chlorinated solvents are industrial chemicals commonly used in dry cleaning and to degrease and clean metal. While the studies completed to date do not show any health concerns associated with this contamination, the Navy is completing additional studies and cleanup actions to further ensure the health and safety of the community.

This fact sheet has been prepared to share the results of environmental studies and cleanup actions, present information about upcoming activities, and invite you to contact us with any questions or concerns.

Location of Clean up

A dry cleaning facility (Building 1100), operated by the former NTC Orlando, was located in the northern part of Area C, south of the Audubon Place City Condominiums along Plaza Terrace Drive. Lake Druid is located west of the former dry cleaning facility.



Figure 1. Location Map

History of the Site

Building 1100 was constructed in 1943 and used as the base laundry facility. Dry cleaning began around 1958, and the common chlorinated solvent tetrachloroethene or perchloroethene (also known as PCE) was used there.

As part of base closure, an environmental investigation was performed at the property in 1994 during which PCE contamination associated with the dry cleaning facility was found in the groundwater. Initial investigations identified contamination migrating west with groundwater flow toward Lake Druid.

To protect Lake Druid from impacts due to contaminated groundwater, the Navy installed a recirculation well system in 1997 between the laundry facility and the lake to intercept contaminated groundwater. In 2001, the system was upgraded to a groundwater extraction and treatment system that continues to operate to date.

In addition to operating the groundwater extraction and treatment system, the Navy has taken measures to clean up the source of contamination. In 2004, Building 1100 was demolished; giving access to the location where solvents were originally spilled (called the source area). This allowed direct treatment of the source area and allowed access for additional investigations directly beneath the building.

Shallow Groundwater Cleanup

The plan to clean up the shallow groundwater includes treating the contamination in the source area so that natural processes will reduce concentrations to safe levels before reaching Lake Druid. In the meantime, the groundwater extraction and treatment system will continue to collect and treat contaminated groundwater to prevent adverse impacts to the lake.

PCE naturally degrades in the ground over time, producing other chlorinated solvents as byproducts and eventually breaks down to harmless chemicals. Degradation occurs with the assistance of naturally-occurring bacteria. To encourage degradation, the Navy has injected a soybean product, known as emulsified oil substrate (EOS[®]) into the ground in the areas of highest contamination. EOS[®] acts as a food source for these bacteria, speeding up the cleanup process.

What is tetrachloroethene (PCE)?

PCE is a nonflammable, colorless liquid that evaporates easily and has a sweet odor. It has been used as an ingredient in consumer products such as spot removers and fabric finishers, and is also used at dry cleaning facilities and for cleaning metal. People who work with PCE have the greatest chance of exposure to it. It can be released to air and water by evaporation or emissions from industrial and dry cleaning plants, and from landfills. PCE is not very soluble in water and is denser than water (sinks).

Hawthorn Zone of Groundwater

Additional investigations performed following demolition of Building 1100 identified deeper contamination than previously observed. In 2006, samples were collected to further assess the size and depth of this deeper contaminated groundwater and to ensure the protection of the drinking water aquifer. The Floridan aquifer, which begins more than 300 feet below the ground surface, is a source of drinking water. No contamination from the site has reached the Floridan aquifer.

Because PCE has a higher density than water, some of the PCE migrated down to the Hawthorn water zone approximately 80 to 130 feet below ground surface. Figure 2 shows the zones of water and soil below ground at the site. Unlike the groundwater flow in the surficial aquifer that flows west toward Lake Druid, groundwater in the Hawthorn zone flows north. Groundwater flow in this zone is very slow – less than 9 feet per year and contaminants are approximately 120 feet below ground.

Two monitoring wells were installed north of the OU 4 property boundary on the Audubon Place City Condominiums property in March 2009. No contaminants have been detected in these two wells. Natural degradation processes appear sufficient to clean up the contamination in the Hawthorn zone without adverse impacts to human health or the environment.

Current Conditions

Ongoing evaluations of monitoring data and performance of the groundwater extraction and treatment system have shown that most of the contaminated groundwater is captured by the extraction system. The contaminated groundwater that was either already near

the lake or that has migrated beyond the reach of the extraction system, has naturally degraded primarily to the breakdown chemical cis-1,2-dichloroethene (DCE) which is not harmful to surface water. Contamination has not been detected in Lake Druid due to further dilution of the small quantities of solvents.

What's Next?

Although the OU 4 property has been transferred, the Navy remains responsible for the environmental cleanup associated with past site operations. Future use of the property is limited to non-residential uses and groundwater use is restricted.

The eastern portion of OU 4 is currently owned by Orlando Heights, LLC and the planned future use is industrial. The western portion of the property has been transferred to the City of Orlando through the Department of Interior for future use as a park.

Groundwater will continue to be sampled twice each year at OU 4 to evaluate cleanup progress. The groundwater treatment system will continue to operate, including monthly maintenance and sampling. Additional EOS® injections may be performed if necessary.

For More Information...

If you have questions about OU 4 or about the environmental program at the former NTC Orlando in general, please contact the Navy Base Environmental Coordinator (BEC) Mark Davidson at (843) 743-2124. Reports on the work at the former NTC can be reviewed at the Orange County Public Library, Orlando Branch (4th floor), 101 East Central Boulevard, Orlando, Florida 32801 (407) 835-7323.

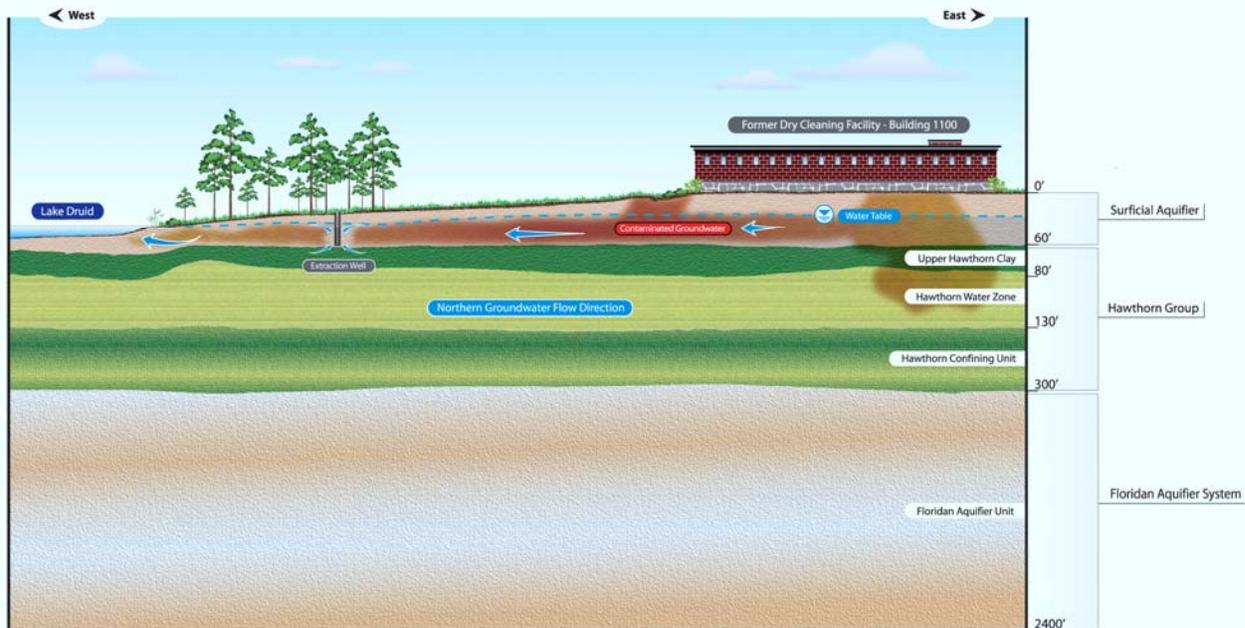


Figure 2. Water-bearing Zones and Soil Below Ground Surface

CTC SUMMARY

NTC Orlando
NORM SITE 00005
Operable Unit (OU) 4 – Base Laundry Drycleaners
CTC: \$2,582,742
Reference to NORM information updated 27 October 2009

Acreage: OU 4 West – 6.63 acres
OU 4 East - 9.22 acres

Current Land Use: Eastern portion – vacant, under contract for sale to be developed for residential use. Former Navy warehouses were demolished in March 2013.

Western Portion – vacant, under transfer to City of Orlando.

Location: OU 4 lies along the northern part of Port Hueneme Avenue and borders Lake Druid.

FDEP Oculus Number: DOD_14_1997

Background information: OU 4 is located within Area C at NTC Orlando and consists of Study Area (SA) 12 (former Defense Reutilization and Marketing Office [DRMO] warehouses and salvage yard, SA 13 (former base laundry and dry cleaning facility), and SA 14 (former DRMO storage area). Building 1100, previously located in SA 13, was constructed in 1943 and used as a laundry and dry cleaning facility until 1994 and was demolished in 2004.

OU 4 includes the former base laundry (Building 1100), the former Defense Reutilization and Marketing Office and a salvage yard. Hazardous materials including paints, solvents, insecticides, transformers potentially containing polychlorinated biphenyls (PCBs), and asbestos were stored at several locations within the site during its long history. Tetrachloroethene (PCE) was used in the laundry as a dry cleaning agent, and there have been at least three documented spills of PCE at the facility. Contaminants of concern (COCs) include polynuclear aromatic hydrocarbons (PAHs) and PCE in soil. A focused soil excavation was performed and no further action is anticipated for soil. Groundwater and surface water COCs are PCE, trichloroethene (TCE), cis-1, 2-dichloroethene (cis-DCE), vinyl chloride, and antimony.

Sources: Soil and groundwater contamination at OU 4 is attributed to leaks and spills from the former laundry and dry cleaning operations at Building 1100. The remediation goal (RG) for the site is to reduce the contaminant concentrations to Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs) and Industrial soil cleanup target levels (SCTLs).

Nature and Extent of Contamination:

- **Surface Soil.** PCE was observed in surface soil beneath the former dry cleaning building at a maximum concentration greater than the industrial FDEP Soil Target Cleanup Level (SCTL). The site was resampled in early 2009 to establish the contamination boundary.
- **Groundwater—Surficial aquifer.** Tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (DCE), vinyl chloride and antimony are chemicals of concern (COCs) in groundwater at the site. Concentrations for PCE, TCE, cis-1,2 DCE, and vinyl chloride in the source area have exceeded FDEP Groundwater Target Cleanup Levels (GCTLs). The surficial aquifer flows west towards Lake Druid.
- **Groundwater —Hawthorn water-bearing zone.** The Hawthorn zone plume covers an area of about 0.5 acres and lies at a depth of about 80 to 120 feet bgs. The plume has migrated north toward the property line, but concentrations north of the property line did not exceed GCTLs when sampled in October 2012. Contaminant velocity is low (<9 feet/yr) and the geochemical conditions appear favorable for natural attenuation, but additional monitoring is required to project trends in contaminant migration.

The upper Hawthorn clay that lies at the top of the Hawthorn water bearing zone is highly contaminated (concentrations orders of magnitude greater than the Leaching SCTL) over an area of approximately 0.3 acres at a depth of 60 to 90 feet bgs. This zone of contamination is likely contributing ongoing contamination to the bottom of the surficial aquifer and to the underlying Hawthorn water bearing zone.

Free product was observed in well OLD-13-62D during semi-annual groundwater monitoring in July 2006 when the sample tubing was inadvertently placed below the screen interval. Lab results indicated that the product was 81.9% PCE.

- **Surface Water —Lake Druid:** OU 4 borders Lake Druid. There are ecological receptors for groundwater at discharge points to Lake Druid. A human health risk re-evaluation of surface water conditions completed in April 2006 considered two receptors: (1) the resident/trespasser/recreational user (adult and child) exposed to near-shore surface water at OU 4 by wading (incidental and dermal contact); and (2) the resident (adult and child) assumed to be exposed to surface water away from OU 4 by wading (incidental and dermal contact).

Risk estimates indicated no unacceptable risks for the resident receptor. Risk estimates for the resident/trespasser/recreational user wading in near-shore surface water at OU 4 exceeded the state of Florida cancer risk benchmark but were within the USEPA target cancer risk range.

All risks in the central tendency exposure evaluation were below the FDEP benchmark, indicating no unacceptable risk.

Florida Groundwater Classification: Class II

Hydrogeology: Three distinct zones of groundwater have been identified at OU 4. The uppermost is the shallow surficial aquifer approximately five to 60 feet below ground surface. Below this zone is a layer of silty clay, underlain by a second zone of water from 80 to 130 feet below ground surface. A layer of very thick (more than 150 feet), dense clay separates the top two zones of groundwater from the much deeper Floridan aquifer below. The Floridan aquifer, which begins more than 300 feet below the ground surface, is a source of drinking water. The groundwater contamination at OU 4 has not been detected greater than 135 feet below ground surface.

Because PCE has a higher density than water, some of the PCE migrated more than 60 feet down to the layer of silty clay soil. Eventually the PCE penetrated through this layer and entered the Hawthorn water zone beneath it (approximately 80 feet below ground surface).

Unlike the groundwater flow in the shallow surficial aquifer that flows west toward Lake Druid, the Hawthorn zone of groundwater flows northward. Contaminants have been detected at a depth of approximately 110 feet below ground in Hawthorn groundwater sampled from monitoring wells located near the northern property boundary. It is suspected that groundwater contamination extends north beyond the former Navy property, but to what extent is not known at this time. The groundwater contaminants migrating northward are approximately 110 feet below ground and the affected Hawthorn groundwater is not used as a drinking water supply.

Flow/Hydraulic Conductivity: The surficial aquifer can be separated into two layers with different hydraulic conductivities. Values are provided in the following table.

Layer	Horizontal Hydraulic Conductivity	Vertical Hydraulic Conductivity
Upper (0-20 feet below ground surface)	10 feet per day	3.8 feet per day
Lower (20-60 feet below ground surface)	40 feet per day	17 feet per day

Groundwater levels were measured in the Hawthorn wells on March 16, 2009. The groundwater flow direction within the central portion of the Hawthorn WBZ is toward the north with a calculated hydraulic gradient of 0.003 feet/foot and an average linear groundwater velocity of 0.036 feet/day, or about 13.1 feet per year (feet/year).

Remedial Action Objectives: The Draft Record of Decision (ROD) (Tetra Tech NUS [TtNUS], 2001), indicates RAOs for non-residential future use of the site as follows:

- **RAO 1:** Reduce the potential for human ingestion of groundwater containing chemicals of concern (COCs) that exceed drinking water-based regulatory requirements or risk-based acceptable exposure levels.
- **RAO 2:** Gain control over groundwater migration of VOC concentrations that contribute to exceedances of Florida Department of Environmental Protection (FDEP) surface water standards to Lake Druid.

Considering the RAOs, chemical-specific remediation goals (RGs) were developed based on the State of Florida Groundwater Cleanup Target Levels (GCTLs).

Cleanup Methodology: The selected Remedial Action for OU 4 currently includes the following components:

- **Groundwater Extraction and Treatment System:** To intercept the plume, a recirculation well system began operation in January 1998. Frequent repairs were necessary, and did not efficiently control VOC migration. As a result, the two recirculation wells were retrofitted as a groundwater extraction system in March 2001. The groundwater extraction and treatment system consists of two extraction wells (UVB-1 and UVB-2), a low-profile tray air stripper, and associated field piping and controls. Treated groundwater is no longer discharged by permit to the City of Orlando sanitary sewer, but is transferred to an exfiltration gallery constructed in 2012. In February 2013 extraction well UVB-1 was replaced with UVB-1R.
- **Phytoremediation:** In March 2002, a phytoremediation system was installed to enhance bioremediation and remove VOCs through phytodegradation. Poplar and cottonwood trees were planted within the plume and upgradient of the source area. A small wetland area consisting of willows was also constructed downgradient of the source area along the edge of Lake Druid. Many of the phytoremediation trees remain on-site.
- **Groundwater Monitoring:** A semi-annual groundwater sampling program is in place to monitor the decrease in COC concentrations resulting from the treatment systems and NA processes until RGs have been reached.
- **Enhanced Reductive Dechlorination:** In January 2007, a groundwater treatment pilot study was initiated to determine the effectiveness of enhanced reductive dechlorination as a remedial

alternative. Treatment involved injecting an emulsified oil substrate into areas of high VOC concentrations and groundwater recirculation. Although recirculation of groundwater was ultimately discontinued due to low soil permeability, EOS solution was injected at two different deep zones and two shallow zones. EOS injection will be repeated if monitoring results show rebounding concentrations of contaminants.

- Land Use Controls:** LUCs have been implemented to limit the use of contaminated groundwater until COC concentrations have been reduced to RGs and to restrict the future use of the site to non-residential use. Only industrial, commercial, and recreational uses are allowed. Residential uses (including housing, daycare, and schools) and agricultural uses are prohibited. Temporary access restrictions and restrictions on tampering with remedial systems are also in place to protect cleanup efforts.

Concerns/Barriers to Site Closure: Source zone treatment may not be effective in minimizing deep groundwater contamination and complete degradation may not be achieved. The public may not agree with the remedy. GCTLs may not be met.

Recent Events/Changes:

In 2011 UVB-1 became damaged and was shut down. Well UVB-1R was installed in February 2013 to replace UVB-1 which was properly abandoned at the time of the replacement well installation. The extraction system was restarted in April 2013.

DATE	ACTIVITY
January 2010	Draft Investigation of the Hawthorn Formation, Addendum 1 submitted (Tetra Tech)/approved by FDEP.
April 2010	Community Relations Fact Sheet updated for OU 4
April, October 2010 - ongoing	Semi-annual groundwater monitoring performed by Solutions-IES.
December 2011	Extraction well UVB-1 shut down due to damage to the pump and piping caused by sand.
August 2012	FS Addendum (Tetra tech) addressing new alternatives for CVOC contamination in surficial aquifer and Hawthorne Zone.
October 2012	FDEP approved FS Addendum
February-April 2013	Extraction well UVB-1 replaced (UVB-1R) and the system restarted
May 2013	UVB-2 well down due to sand and silt buildup in well.
May 2013	Draft Proposed Plan (Tetra Tech)

**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
OPERABLE UNIT 4
NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 1 OF 2

Prior to 1959	Eight original tracts of land, three belonging to individual landowners, five belonging to the McCrory Holding Company.
November 20, 1959	United States Air Force
July 1, 1968	United States Navy
December 1994	Submittal of Baseline Survey Report.
February – April 1995	Screened as Study Areas 12, 13, and 14.
Fall 1995	Elevated to Operable Unit status.
May 1996	Focused field investigation.
July 1996	Site Screening Reports issued.
March through April 1997	Characterization with DPT concentrating on surge tank on west end of Building 1100.
May 1997	Interim Remedial Action Focused Field Investigation Report issued.
September 1997 to March 1998	Remedial Investigation field studies (install 11 additional monitoring wells, 5 microwells, collect 11 surface/20 subsurface soil samples, collect 11 surface water/sediment sample pairs.
December 1997	Two recirculation wells installed.
January 1998	Groundwater IRA operation began.
May 1999	Soil remediation by Environmental Detachment Charleston (DET) in three areas of PAH-contaminated soil.
February 2000	Startup of potassium permanganate injection pilot study, to determine effectiveness of this technology in treating contaminated groundwater near the contaminant source
January 2001	RI Report and Feasibility Study (FS) issued (HLA).
March 2001	Extraction wells (former recirculation wells) retrofit and begin operation as pump and treat groundwater system; discharge goes to city sanitary sewer.
September 2001	(Draft) Proposed Plan issued for review
December 2001	(Draft) ROD issued for review
February 2002	Remedial Design Report (90% Design) issued
March 2002	Phytoremediation implemented: bio-engineered poplars and willows planted; vegetation with deep roots will “polish” shallow groundwater prior to entry into Lake Druid
April 2002 through September 2003	Performed quarterly groundwater sampling.
March 2003	The full-scale, in situ chemical oxidation system to treat source area groundwater was completed and system operation began.
June 2003	RA Construction Documentation Report issued
January through March 2004	Demolition of Building 1100
March 2004 to present	Performed semi-annual groundwater sampling.
April 2004	Initiation of post-remediation investigation
March 2005	Summary of Source Zone Investigation Activities Report Issued
March 22, 2005	Area C Northeast and Area C Southeast transferred to private owner Mr. Abe Saada.
January 2006	Optimization Study for Source Zone Reduction Report issued
June through August 2006	Hawthorn Zone groundwater investigation /surface and subsurface soil investigation immediately beneath the former location of Building 1100.
October 2006	Additional vadose zone soil samples collected. No additional exceedances of industrial SCTLs were observed.

**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
OPERABLE UNIT 4
NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 2 OF 2

November 2006	Site surveying completed for installation of injection, extraction and monitoring wells in preparation for the enhanced reductive dechlorination (ERD) remedial action using emulsified oil substrate (EOS [®]).
December 2006-January 2007	Installation of injection, extraction and monitoring wells. Well development commenced in conjunction with well installation activities.
February 2007	Baseline sampling of observation monitoring wells and semi-annual groundwater monitoring
June/July 2007	EOS recirculation and direct injection
August 2007	FOST approved by Florida Department of Environmental Protection (FDEP)
January/February 2008	DPT used to advance soil borings and install 10 wells near shore of Lake Druid in support of pump and treat optimization study.. Five drive points installed in Lake Druid.
January 2008	Semi-annual groundwater monitoring performed
March 2008	Quarterly treatment monitoring sampling event conducted.
April 2008	Resample CMT well OLD-13-69D to confirm results from Jan 2008 event.
June-July 2008	Quarterly treatment monitoring sampling event conducted. Direct injection of EOS in the shallow zone A at the source area completed.
September/October 2008	Groundwater samples collected from 3 CMT wells along northern property line from each chamber, total of 18 wells.
October 2008	Quarterly treatment monitoring sampling event conducted.
November 2008	Semi-annual groundwater monitoring performed.
February 2009	Work Plan Addendum No 1 for Groundwater Investigation of Hawthorn Group submitted (TT)
March 2009	Two off-site wells installed in the Hawthorn Zone downgradient of the plume. Wells were installed 180 feet from the property line.
March 2009	Community Relations Fact Sheet distributed door-to-door for OU 4.
July 2009	Semi-annual groundwater monitoring performed by CH2M Hill.
October 2009 - current	Semi-annual groundwater monitoring performed by Solutions-IES.
December 2009	Remedial Action Completion Report for the Enhanced Reductive Dechlorination submitted
January 2010	Draft Investigation of the Hawthorn Formation, Addendum 1 submitted (Tetra Tech) /approved by FDEP.
April 2010	Community Relations Fact Sheet updated for OU 4
March – July 2011	Treatment system repairs including blower, transfer pump and submersible pump replacement. (Tetra Tech)
December 2011	Extraction well UVB-1 down due to damage to the pump and piping caused by sand.
April 2012	Treatment system discharge rerouted to newly constructed exfiltration gallery (Tetra Tech).
August 2012	FS Addendum (Tetra Tech)
October 2012	FDEP approved FS Addendum
February-April 2013	Extraction well UVB-1 replaced (UVB-1R) and the system restarted
May 2013	UVB-2 well down due to sand and silt buildup in well.
May 2013	Draft Proposed Plan (Tetra Tech)

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Figure View

Legend

- ▲ Drive Point
- Operable Unit 4
- ◆ Zone A - Shallow
- ◆ Zone B - Intermediate
- ◆ Zone C - Deep
- ◆ Zone D - Hawthorne



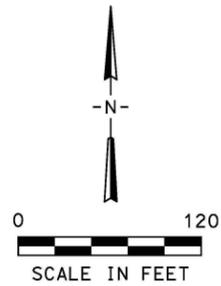
Sources:
 Basemap Sources: Esri World Imagery
http://services.arcgisonline.com/arcgis/services/World_Imagery
 © 2011 Esri, i-cubed, USDA FSA, USGS, AEX, GeoEye,
 AeroGRID, Getmapping, IGP
 Orange County GIS

FIGURE 2-2
 SITE LAYOUT/WELL LOCATION MAP
 OU 4, Area C
 McCoy Annex
 Orlando, Florida




REQUESTED BY: OggerID	DATE: 6/20/2013
DRAWN BY: BarronM	TASK ORDER NUMBER: JM42

L:\projects\Navy CLEAN\NTC Orlando\9_0_Geospatial\MXDs\OU4\FIGURE 2-2 Site Map_2013_0620.mxd

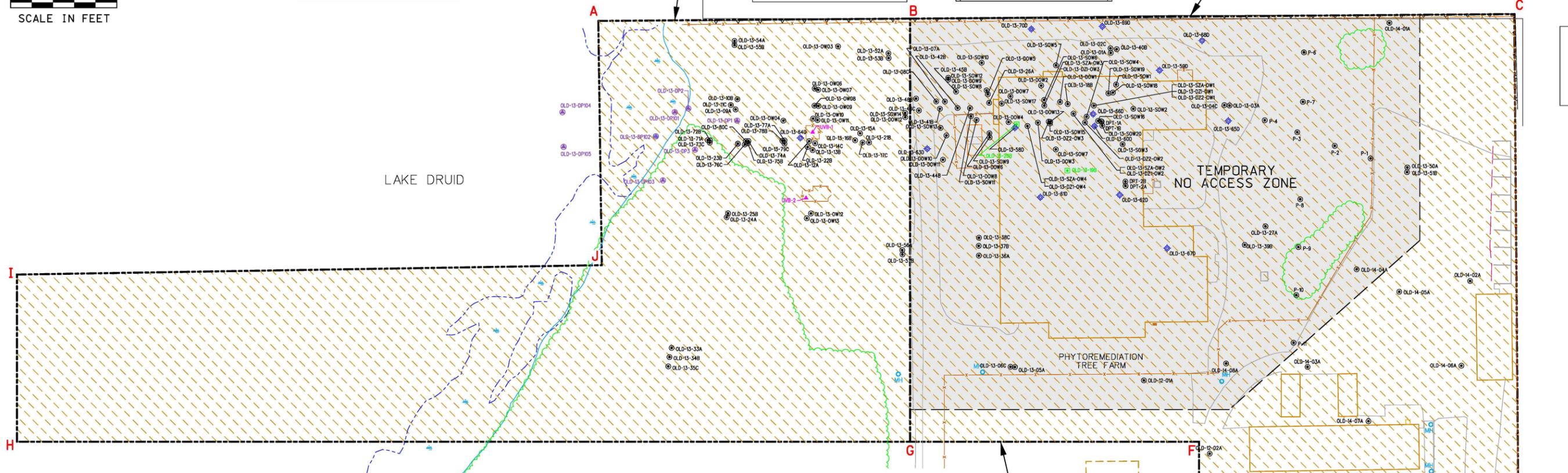


LOCATION COORDINATES		
LOC.	EASTING	NORTHING
A	544451	1536945
B	544803	1536948
C	545486	1536953
D	545492	1536283
E	545130	1536283
F	545130	1536472
G	544803	1536472
H	543793	1536472
I	543793	1536660
J	544455	1536670

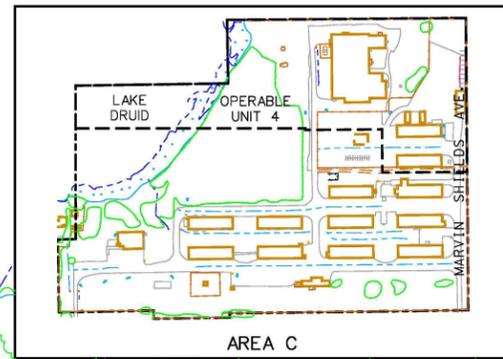
AREA C NORTHWEST
SITE BOUNDARY

AUDUBON PLACE
CITY CONDOMINIUMS

AREA C NORTHEAST
OU4 SITE BOUNDARY



SOURCE:
ROADS, BUILDINGS, ETC. ARE FROM A PHOTOGRAMMETRIC
SURVEY BY DEMAPS, INC. AND REPS, INC. IN 1997.



DRAWN BY JAW	DATE 12/15/2011
CHECKED BY TKG	DATE 12/15/2011
REVISED BY ---	DATE -----
SCALE AS NOTED	



SITE MAP
OPERABLE UNIT 4 - AREA C NORTHEAST
AND AREA C NORTHWEST

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

CONTRACT NO. N62467-04-D-0055	
OWNER NO. -----	
APPROVED BY -----	DATE -----
DRAWING NO. FIGURE 1-3	REV. 0

Project-Specific SAP

Site Name/Project Name: OU 4
 Site Location: NTC Orlando, Orlando, Florida

Long-Term Monitoring SAP for OU 4

Revision: 0
 October 2012

SAP Worksheet No.18 -- Sampling Locations and Methods/SOP Requirements Table

[\(UFP-QAPP Manual Section 3.1.1\)](#)

Well Number	Matrix	Screened Interval (feet bgs)	Analytical Group	Number of Samples	Sampling Frequency	Sampling SOP Reference
OU 4 LTM						
Shallow Surficial Aquifer Zone						
OLD-13-01A	Groundwater	5-15	VOCs	1	Semiannual	FDEP FS 2200
OLD-13-03A	Groundwater	4-14	VOCs and NA	1	Annual - April	FDEP FS 2200
OLD-13-12A	Groundwater	1.5-11.5	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-15A	Groundwater	2.5-12.5	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-36A	Groundwater	4-14	VOCs and NA	1	Annual - April	FDEP FS 2200
OLD-13-52A	Groundwater	4-19	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-71A	Groundwater	2-12	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-77A	Groundwater	4-14	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-SOW13	Groundwater	10-20	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-SZAOW2	Groundwater	5-20	VOCs and NA*	1	Semiannual	FDEP FS 2200
Intermediate Surficial Aquifer Zone						
OLD-13-10B	Groundwater	16-21	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-21B	Groundwater	27-32	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-22B	Groundwater	27-32	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-37B	Groundwater	20-25	VOCs and NA	1	Annual - April	FDEP FS 2200
OLD-13-39B	Groundwater	20-25	VOCs	1	Semiannual	FDEP FS 2200
OLD-13-40B	Groundwater	20-25	VOCs	1	Semiannual	FDEP FS 2200
OLD-13-46B	Groundwater	20-30	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-53B	Groundwater	35-52	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-72B	Groundwater	16-26	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-78B	Groundwater	18-28	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-DPT-1A	Groundwater	56.9-59.4	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-DPT-2A	Groundwater	57.5-59.5	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-DZ1OW1	Groundwater	25-30	VOCs	1	Semiannual	FDEP FS 2200
OLD-13-DZ1OW2	Groundwater	25-30	VOCs and NA	1	Annual - April	FDEP FS 2200

Project-Specific SAP

Site Name/Project Name: OU 4
 Site Location: NTC Orlando, Orlando, Florida

Long-Term Monitoring SAP for OU 4

Revision: 0
 October 2012

Well Number	Matrix	Screened Interval (feet bgs)	Analytical Group	Number of Samples	Sampling Frequency	Sampling SOP Reference
Deep Surficial Aquifer Zone						
OLD-13-02C	Groundwater	57-62	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-04C	Groundwater	59-64	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-14C	Groundwater	59-64	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-17C	Groundwater	58-63	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-73C	Groundwater	46-56	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-79C	Groundwater	44-54	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-DPT-2B	Groundwater	78.5-81	VOCs	1	Annual - April	FDEP FS 2200
OLD-13-DOW10	Groundwater	28-48	VOCs and NA*	1	Semiannual	FDEP FS 2200
Hawthorn Group						
OLD-13-58D	Groundwater	101-111	VOCs	1	Annual - October	FDEP FS 2200
OLD-13-59D	Groundwater	100-110	VOCs	1	Annual - October	FDEP FS 2200
OLD-13-60D	Groundwater	100-110	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-62D	Groundwater	110-120	VOCs	1	Semiannual	FDEP FS 2200
OLD-13-67DC4	Groundwater	110-115	VOCs and NA	1	Annual - April	FDEP FS 2200
OLD-13-69DC4	Groundwater	100-105	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-69DC5	Groundwater	110-115	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-69DC6	Groundwater	122-127	VOCs and NA*	1	Annual - April	FDEP FS 2200
OLD-13-70DC4	Groundwater	101-106	VOCs	1	Annual - October	FDEP FS 2200
OLD-13-81D	Groundwater	97-102	VOCs and NA*	1	Semiannual	FDEP FS 2200
OLD-13-82D	Groundwater	115-120	VOCs and NA*	1	Semiannual	FDEP FS 2200
Antimony Plume						
OLD-13-27A	Groundwater	6.5-15.5	Antimony**	1	Annual - October	FDEP FS 2200
OLD-14-03A	Groundwater	5-15	Antimony**	1	Annual - October	FDEP FS 2200
OLD-14-04A	Groundwater	5-15	Antimony**	1	Annual - October	FDEP FS 2200
OLD-14-05A	Groundwater	6-15	Antimony**	1	Annual - October	FDEP FS 2200
OLD-14-08A/ P-11	Groundwater	6-15	Antimony**	1	Annual - October	FDEP FS 2200
OU 4 Field Duplicates						
Duplicate 1 (Well ID TBD)	Groundwater	TBD	VOCs	1	Semiannual	FDEP FS 2200
Duplicate 2 (Well ID TBD)	Groundwater	TBD	VOCs	1	Semiannual	FDEP FS 2200

Project-Specific SAP

Site Name/Project Name: OU 4
 Site Location: NTC Orlando, Orlando, Florida

Long-Term Monitoring SAP for OU 4

Revision: 0
 October 2012

Well Number	Matrix	Screened Interval (feet bgs)	Analytical Group	Number of Samples	Sampling Frequency	Sampling SOP Reference
Duplicate 3 (Well ID TBD)	Groundwater	TBD	VOCs	1	Semiannual	FDEP FS 2200
Duplicate 4 (Well ID TBD)	Groundwater	TBD	VOCs	1	Annual - April	FDEP FS 2200
Duplicate 5 (Well ID TBD)	Groundwater	TBD	VOCs	1	Annual - April	FDEP FS 2200
Duplicate 6 (Well ID TBD)	Groundwater	TBD	Antimony**	1	Annual - October	FDEP FS 2200
OU 4 Monthly O&M Sampling						
Influent	Influent	--	VOCs, Total Manganese, and pH	1	Monthly	FDEP FS 2400
Effluent	Effluent	--	VOCs, Total Manganese, and pH	1	Monthly	FDEP FS 2400

Natural Attenuation (NA) Parameters = Anions - nitrate/nitrite, sulfate, chloride; Dissolved Gases - methane, ethane and ethane; TOC; and field test kits for ferrous iron and alkalinity. No PALs are associated with these target analytes – they are used to monitor natural attenuation effectiveness.

* NA Parameters will only be collected during the April sampling event.

** For antimony, total metals are needed.

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SA 2

Herndon Annex

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Update on Environmental Actions In Azalea Park Neighborhood

Naval Training Center Herndon Annex Orlando, Florida



This fact sheet was prepared to inform interested citizens about the former Naval Training Center (NTC) Orlando environmental program. Fact sheets are distributed as needed to update the community on clean up progress. Additional information may be obtained by calling David Criswell, Navy BRAC Environmental Coordinator at (843) 743-2130.

Environmental Studies in the Azalea Park Neighborhood

Environmental studies at the Herndon Annex of NTC Orlando and in the Azalea Park Neighborhood to the east (see Figure 1) have identified benzene and other chemicals in groundwater deep below the ground surface. Groundwater contaminants have migrated east of the Herndon Annex site under nearby residential properties. Studies completed to date do not show any health concerns associated with the contamination and the Navy is continuing to monitor the groundwater to further ensure the health and safety of the community.

This fact sheet has been prepared to share the results of these environmental studies, briefly summarize the history of investigations, share information about upcoming activities, and invites you to contact us with any questions or concerns.

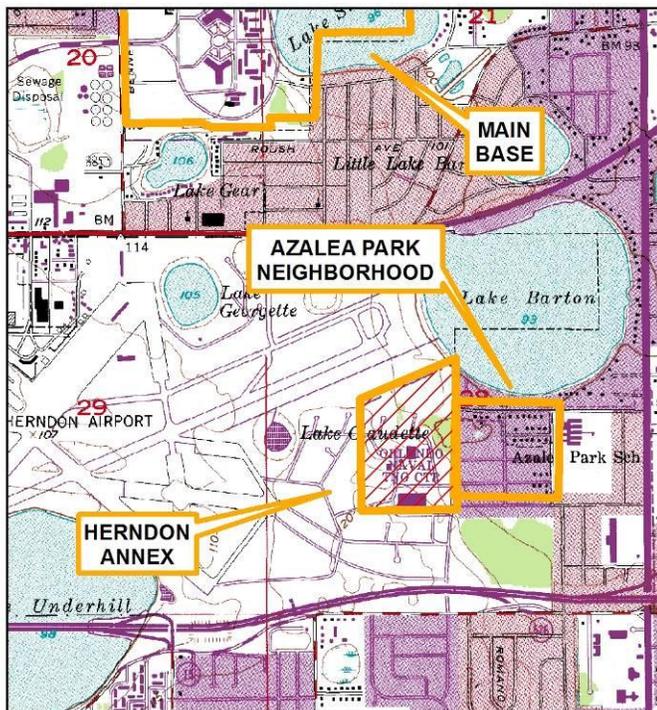


Figure 1. Location Map

Location of Cleanup

The areas being studied (Herndon Annex and the Azalea Park Neighborhood) are shown on Figures 1 and 2.

History of the Site

The U.S. Army Air Corps acquired the undeveloped Herndon Annex property in 1943 and used it for aviation-

related activities including runways, hangars, and airplane parking pads. In 1947, the U.S. Air Force assumed command of the facilities and the property became known as the Orlando Air Force Base. Portions of Herndon Annex were used as sanitary landfill areas by the Air Force in the 1950s and early 1960s. In 1968, the Air Force ceased operations and the property was operated by the U.S. Navy. The Navy constructed several buildings at the Herndon Annex for various uses, including warehouse space, offices, and laboratories and the property became part of the NTC Orlando.

In 1993 NTC Orlando was listed for closure under the Defense Base Closure and Realignment Act (BRAC). As part of base closure activities, environmental studies were performed to determine potential impacts from past site operations.

The site screening investigation, performed from 1994 through 1998, included geophysical surveys to define the limits of two landfill areas, soil sampling, and groundwater sampling. Benzene was found in groundwater at concentrations exceeding the State of Florida Groundwater Cleanup Target Level (GCTL) of 1 microgram per liter ($\mu\text{g/L}$) in the southeastern corner of the Herndon Annex and in the Azalea Park neighborhood at depths ranging from 40 to 62 feet below ground surface (bgs). The groundwater table averages about 6 to 12 feet bgs in the vicinity of the groundwater contaminant plume, and no contaminants have been identified in shallow groundwater (less than 40 feet bgs).

What are Benzene, PCE, and TCE?

Benzene is a colorless liquid that smells like gasoline. It evaporates at room temperature and burns easily. Benzene occurs naturally in coal tar and petroleum. It is also found in commonly used products like paints, inks, gasoline and other motor fuels, and insecticides.

Tetrachloroethene (PCE) is a manufactured chemical used for dry cleaning and metal degreasing.

Trichloroethene (TCE) is a nonflammable, colorless liquid used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, and spot removers.

Additional investigations completed in 2005, revealed a deeper area of groundwater contamination, including tetrachloroethene (PCE) and trichloroethene (TCE) along

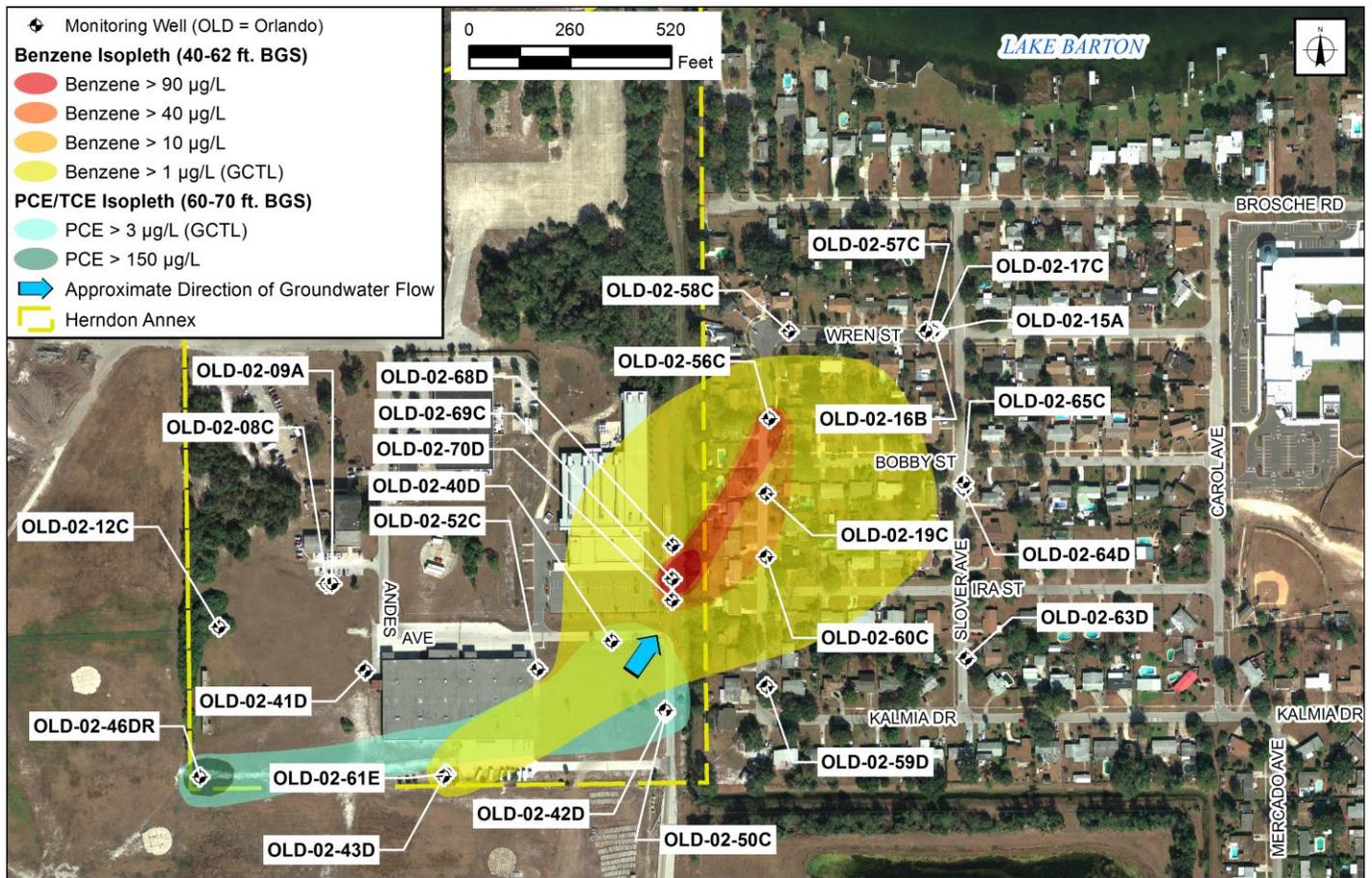


Figure 2. Estimated extent of benzene and PCE/TCE in groundwater (December 2012)

the southern portion of the Herndon Annex at depths of approximately 60 to 70 feet bgs. The PCE/TCE plume has not been detected at concentrations exceeding the GCTL of 3 $\mu\text{g/L}$ in the groundwater beneath the neighborhood. Investigations concluded that the benzene and PCE/TCE groundwater contamination is the product of a former removed source.

Cleanup Technologies

The Navy began a quarterly groundwater sampling program in 1999. In 2001, the Navy initiated a treatability study in an effort to speed up cleanup. Oxygen Release Compound (ORC), a trade name for magnesium peroxide, was injected into the ground at a depth of approximately 55 feet. This effort was designed to stimulate microorganisms in groundwater to naturally break down benzene; however this treatment had little effect.

A PHOSter[®] remediation system was installed on Navy property in 2004 to enhance the natural degradation (also called natural attenuation) of contaminants in groundwater. Natural degradation is a process by which some contaminants, including benzene, PCE, and TCE, biologically break down to form harmless chemicals. PHOSter[®] treatment involves injection of oxygen, nitrate, and phosphorous into the groundwater. A full scale treatment system ran until 2008. The system performed as designed and contaminants decreased overall. The PHOSter[®] system was dismantled in 2008 in order to construct the Police Training Facility at the site. With

concurrency from FDEP, the quarterly groundwater monitoring program required during system operation was reduced to a semi-annual frequency in 2010.

Current Conditions

Currently, the benzene plume is more than 40 feet below ground surface in the neighborhood, and appears to be stable with decreasing tendencies. The deeper PCE/TCE plume has not been detected in the neighborhood. The area of groundwater contamination is located below a clean surficial aquifer which limits the potential for vapor intrusion. Residents in the Azalea Park neighborhood have been advised not to use groundwater for irrigation or potable uses.

What's Next?

The semi-annual groundwater monitoring program is expected to continue for several more years. The Navy will continue to evaluate the benzene and PCE/TCE plumes to confirm that the natural degradation process is working.

For More Information

If you have questions about the Navy's action in the Azalea Park Neighborhood or the environmental program at the former NTC, Orlando in general, please contact David Criswell Navy BRAC Environmental Coordinator at (843) 743-2130. Reports on the work at the NTC can be reviewed at the Orange County Public Library, Orlando Branch (4th floor), 101 East Central Boulevard, Orlando, Florida 32801.

CTC SUMMARY

NTC Orlando
NORM AOC Group 1
Study Area (SA) 2, Herndon Annex
CTC: \$760,000
Reference to NORM information updated 08 October 2009

Acreage: 12.37 acres

Current Land Use: Orlando Police Department Training Facility and the Herndon Communications Center

Location: East of Orlando Executive Airport, north of East-West Expressway on Andes Avenue

FDEP Oculus Number: DOD_14_1985

Background information: The U.S. Army Air Corps acquired the undeveloped Herndon Annex property in 1943 and used it for aviation-related activities including runways, hangars, and airplane parking pads. In 1947, the U.S. Air Force assumed command of the facilities and the property became known as the Orlando Air Force Base. Portions of Herndon Annex were used as sanitary landfill areas by the Air Force in the 1950s and early 1960s. In 1968, the Air Force ceased operations and the property was taken over by the U.S. Navy. The Navy constructed several buildings in other areas of the Herndon Annex for various uses, including warehouse space, offices, and laboratories.

SA 2 consists of former Navy property encompassing three separate parcels (SA 2A, SA 2B, SA 2C) within the Herndon Annex.

SA 2A and SA 2C are the locations of former landfills. An abandoned septic system (Facility 6001) and the remains of two concrete parking aprons are also located on SA 2B. The septic system served Building 602 (General Warehouse), which is located on a previously transferred portion of Herndon Annex.

Former Landfill Areas. Site investigation activities included monitoring well installation, surface soil sampling, and a direct push technology (DPT) investigation for collection of groundwater samples. The semivolatile organic compounds (SVOCs) benzo(a)pyrene (700 µg/kg) and dibenz(a,h)anthracene (190 µg/kg) were detected at concentrations exceeding their respective residential SCTLs (100 µg/kg for both) in only one of 10 composite surface soil samples collected in the landfill areas. The Orlando Partnering Team (OPT) concluded that the surface soil does not have contaminants at concentrations that justify the need for additional delineation or remediation because the current and future planned use

of SA 2 is industrial. Only benzo(a)pyrene from one surface soil sample exceeded the industrial SCTL of 500 mg/kg. To prevent direct or indirect exposure to buried wastes, the transfer deed(s) include a prohibition on invasive activities that would disturb the landfill covers and contents, and also a requirement to maintain at least 2 feet of cover over the landfill areas.

Groundwater: Contamination of groundwater was initially identified in 1995 in the southeastern corner of Herndon Annex at depths ranging from 40 to 62 feet below ground surface (bgs). The primary contaminants exceeding GCTLs were the volatile organic compounds (VOCs) benzene (200 µg/L), perchloroethene (PCE) (10 µg/L), and trichloroethene (TCE) (5 µg/L). Initial site investigation results indicated that groundwater contamination appeared to have migrated onto Herndon Annex based on the low number of positive detections of VOCs in the interval above 40 feet bgs. Attempts to identify the source of contamination were unsuccessful. A treatability study consisting of the injection of magnesium oxide (Oxygen Release Compound[®]) into the contaminated aquifer was implemented in 2001. There was no significant reduction in contaminant concentrations as a result of the injection. A groundwater investigation utilizing DPT and the installation of 26 additional monitoring wells was completed in June 2004 to better define the vertical and horizontal extent of the VOC plume. A pilot test of the PHOSter[®] system was completed in December 2004. This technology involves the injection of oxygen, nitrate, and phosphorous into the aquifer. The full scale PHOSter[®] system was operated by Navy EMAC Contractor Bhate until until September 2006 and included quarterly treatment efficiency monitoring. System operation and maintenance and treatment efficiency monitoring responsibility were transferred to Terraine, Inc. in October 2006. The PHOSter system was shut down in April 2008 and injection wells were abandoned in May 2008, along with several monitoring wells. As of 2009, there has been no observed rebound in contaminant concentrations; and there are decreasing trends observed in Azalea Park.

Sources: Unknown. Results of the Remedial Investigation indicate that the SA 2 groundwater contamination is the product of an offsite, depleted source.

Florida Groundwater Classification: Class II

Hydrogeology: Groundwater at SA 2 occurs in the unconfined surficial aquifer that consists of approximately 60 feet of quartz sand with varying amounts of silt and clay-sized grains, with some shell fragments. The "sand" lithology varies both laterally and vertically, and is interbedded with cemented, fine, sand, locally called "hardpan", in some areas. At SA 2 the hardpan layer was frequently encountered at depths of 17 to 23 feet below ground surface. The bottom of the surficial aquifer coincides with the Hawthorne Group of sediments that typically consists of gray-green calcareous sandy clay and clayey sand interbedded with phosphatic sands and limestones.

Groundwater flow in the shallow portion of the aquifer is generally northeast with an easterly component toward the north-flowing drainage ditch that discharges to Lake Barton. Groundwater flow in the deeper portion of the aquifer, in which the benzene plume is primarily located is north in the southern portion of the site and becomes more northeasterly to the north in the vicinity of Lake Barton. The groundwater flow velocity in the surficial aquifer is approximately 1 to 1.5 ft/day.

Hydraulic Conductivity:

Hydraulic conductivity is summarized in the table below.

SA 2 Hydraulic Conductivity

Aquifer Depth Interval	Well ID	Test Date	Screen Bottom Elevation, ft amsl	Horizontal Hydraulic Conductivity, K, ft/day	Depth Interval K Range/GeoMean, ft/day
Shallow Surficial Aquifer	OLD-02-9A	March-98	96.2	44	9 to 46 / 22
	OLD-02-11A	March-98	92.1	13	
	OLD-02-15A	March-98	83.9	46	
	OLD-02-20B	April-05	66.2	9.0*	
Intermediate Surficial Aquifer	OLD-02-13C	April-05	58.9	254	60 to 254 / 145
	OLD-02-51C	April-05	58.0	60*	
	OLD-02-56C	April-05	54.5	199	
Deep Surficial Aquifer	OLD-02-19C	April-05	49.3	112	6 to 112 / 25
	OLD-02-10C	March-98	49.9	35	
	OLD-02-17C	March-98	48.6	6.2	
	OLD-02-40D	April-05	47.1	9.0*	
	OLD-02-08C	March-98	46.1	26	
	OLD-02-46D	April-05	43.5	46*	

* Value is average of slug in and slug out results.

Receptors: Potential receptors include residents of adjacent Azalea Park neighborhood. A groundwater use advisory was issued by the Navy to local residents of Azalea Park, warning them of the benzene contamination at depths of 36 to 62 feet bls and the potential hazards associated with using the surficial aquifer for drinking purposes.

Nature and Extent of Contamination: Benzene, PCE, and TCE concentrations in groundwater greater than the Florida GCTLs occur at a depth of approximately 45 to 70 feet below ground surface. The benzene plume covers approximately 20 acres and the PCE/TCE plume covers approximately 5 acres.

Cleanup Methodology: A PHOSter system involving the injection of oxygen, nitrogen, and phosphorous into the aquifer operated from 2004 to 2008. In addition, land use controls have been implemented to protect human health. Groundwater use, well installation, tampering with remediation equipment, and residential use of the site are prohibited. In former landfill areas, soil disturbance is prohibited.

Concerns/Barriers to Site Closure: The unknown source may not be depleted. Upgradient well OLD-02-46DR was replaced in 2011, and PCE concentrations are higher in the new well than in the older well 46D. Also, concentrations in the second sampling event of 46DR showed increased concentrations over the initial sampling event.

The public may not agree with the selected remedy. Site development may interfere with remedial action. Private irrigation wells may be an exposure pathway to receptors. GCTLs may not be met.

Recent Events/Changes:

Groundwater at the site is monitored semi-annually in June and December.

DATE	ACTIVITY
April 2010	Tech Memo – Optimization of Groundwater Monitoring Program recommends reduction in sampling frequency to semi-annual (TT)
April 2010	FDEP approval of Optimization recommendations including reduction in sampling frequency to semi-annual.
July 2011	Final LTM SAP submitted (TT)
August 2011	Final LTM SAP approved by FDEP (Figure 1 revised)
December 2011	Monitoring well OLD-02-46D replaced (TT)
September 2013	Fact Sheet distributed

**CHRONOLOGICAL SUMMARY OF SITE USE AND ENVIRONMENTAL ACTIVITIES
HERNDON ANNEX AND STUDY AREA 2**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 1 OF 2

Date	Event
Pre-1940	City of Orlando Municipal Airport
August 1940	United States Army Air Corps, Orlando Army Air Base
1947	USAF, Orlando Air Force Base
1968	U.S. Navy, NTC, Herndon Annex
1994 – 1998	Phases I through V: Septic Field Evaluation (soil, wastewater, and groundwater samples); General Investigation of Herndon Annex: geophysics investigation of former landfill areas; surface and subsurface soil samples; shallow, intermediate, and deep groundwater samples from wells 1A through 19C; cone penetrometer test (CPT) stratigraphic logging; installation of temporary piezometer clusters for evaluating aquifer head distribution; DPT groundwater sampling on and off-site; temporary well and drive-point groundwater sampling along eastern drainage canal; surface water sampling of Lake Barton. (HLA)
December 1994	Base Realignment and Closure (BRAC) Environmental Baseline Survey Report (ABB-ES)
March 1995	Environmental Baseline Survey, Herndon Annex (NAVFAC EFD SOUTH)
November 1995	Aboveground storage tank (AST) at Building 602 removed; clean closed (ABB-ES)
July 1996	U.S. Army Corps of Engineers TerraProbe® groundwater investigation for the Greater Orlando Airport Authority; area located immediately south of Herndon Annex; samples collected to depth of 40 feet bgs.
October 1996	Asbestos Containing Materials (ACM) Survey (Cape Environmental Management, Inc.)
November 1996	Underground storage tank (UST) at Building 610 removed; clean closed (ABB-ES)
May 1997	UST at Building 607 removed; contaminated soil excavated; NFA approved by FDEP (ABB-ES)
May 1999	Indoor Air Quality Assessment; Asbestos Survey Report; and Lead Based Paint Survey Report (Universal Engineering Sciences, Inc.)
July 1999 – March 2003	Quarterly Groundwater Monitoring (TtNUS)
November 1999	BRAC Focused Feasibility Study, Herndon Annex (HLA)
March 2000	Environmental Baseline Survey for Transfer, Herndon Annex (NAVFAC EFD SOUTH)
April 2000	Draft Decision Document, SA 2 (TtNUS)
August 2000	6.8 acres of Herndon Annex transferred to the City of Orlando

**CHRONOLOGICAL SUMMARY OF SITE USE AND ENVIRONMENTAL ACTIVITIES
HERNDON ANNEX AND STUDY AREA 2**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 2 OF 2

Date	Event
September 2000	38 acres of Herndon Annex transferred to the Greater Orlando Airport Authority
December 2000 – February 2001	Oxygen Release Compound (ORC [®]) was injected into the area of the benzene plume (TtNUS)
May, July 2001; March 2002	ORC [®] Treatability Study sampling events
July 2002	ORC [®] Treatability Study Technical Memorandum (TtNUS)
June 2003	Evaluation of Remedial Technologies, SA 2 (TtNUS)
June – October 2003	Phase I DPT on- and off-site groundwater investigation; install eight deep aquifer wells (OLD-02-39D through OLD-02-46D) (TtNUS)
June 2003 to present	Quarterly groundwater monitoring (Terraine)
April 2004	Phase II DPT off-site groundwater investigation (TtNUS)
April – May 2004	Landfill Soil Cover Installation (Bhate)
May 2004	Phase II monitoring well installation; install 11 intermediate “C”, 5 deep “D”, and 2 Hawthorn “E” aquifer wells (OLD-02-48C through OLD-02-65C) (TtNUS)
May – December 2004	PHOSter [®] groundwater treatment pilot test (Bhate)
August 25, 2004	Fact sheets distributed
July 2005 - September 2006	PHOSter [®] groundwater treatment system O&M (Bhate)
October 2006 to April 2008	PHOSter [®] groundwater treatment system O&M (Terraine)
August 28-29, 2007	Fact sheets distributed
May 2008	PHOSter system and several monitoring wells abandoned to allow for site development.
May 2009	Construction of Police Training Facility complete.
May 2009	City of Orlando Contractor Stillwater Technologies installed monitoring wells OLD-02-68D, 69C, and 70D
April 2010	Tech Memo – Optimization of Groundwater Monitoring Program recommends reduction in sampling frequency to semi-annual (TT)
April 2010	FDEP approval of Optimization recommendations including reduction in sampling frequency to semi-annual.
July 2011	Final LTM SAP submitted (TT)
August 2011	Final LTM SAP approved by FDEP (Figure 1 revised)
December 2011	Monitoring well OLD-02-46D replaced (TT)
September 2013	Fact Sheet distributed



DRAWN BY JFF	DATE 10-27-06
CHECKED BY TKG	DATE 10-27-06
REVISED BY ---	DATE -----
SCALE AS NOTED	



**AERIAL SITE MAP
STUDY AREA 2 - HERNDON ANNEX

NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

CONTRACT NO. N62467-04-D-0055	
OWNER NO. 00131	
APPROVED BY ---	DATE -----
DRAWING NO. FIGURE 1	REV. 0

SAP Worksheet No.18 -- Sampling Locations and Methods/SOP Requirements Table

(UFP-QAPP Manual Section 3.1.1)

Well ID	Matrix	Depth (screened Interval)	VOCs	MNA Parameters	Number of Samples (identify field duplicates)	Sampling Frequency	Sampling SOP Reference
OLD-02-08C	Groundwater	60 to 65	X		1	Annual	FT 1000 FS 2200
OLD-02-12C	Groundwater	53 to 58	X		1	Annual	FT 1000 FS 2200
OLD-02-17C	Groundwater	45 to 50	X		1	Semi-annual	FT 1000 FS 2200
OLD-02-19C	Groundwater	49 to 54	X	X	1	Semi-annual	FT 1000 FS 2200
OLD-02-40D	Groundwater	60 to 65	X	X	1	Semi-annual	FT 1000 FS 2200
OLD-02-41D	Groundwater	60 to 65	X		1	Semi-annual	FT 1000 FS 2200
OLD-02-42D	Groundwater	60 to 65	X	X	1	Semi-annual	FT 1000 FS 2200
OLD-02-43D	Groundwater	60 to 65	X	X	1	Semi-annual	FT 1000 FS 2200
OLD-02-46D Damaged, will be replaced	Groundwater	65 to 70	X		1	Semi-annual	FT 1000 FS 2200
OLD-02-50C	Groundwater	40 to 45	X		1	Annual	FT 1000 FS 2200
OLD-02-52C	Groundwater	45 to 50	X		1	Annual	FT 1000 FS 2200
OLD-02-56C	Groundwater	35 to 40	X	X	1+ duplicate for VOCs and MNA	Semi-annual	FT 1000 FS 2200
OLD-02-57C	Groundwater	35 to 40	X		1	Semi-annual	FT 1000 FS 2200

Project-Specific SAP

Site Name/Project Name: SA 2
 Site Location: NTC Orlando, Florida

Long Term Monitoring SAP for SA 2

Revision: 0
 July 2011
 Worksheet 18

Well ID	Matrix	Depth (screened Interval)	VOCs	MNA Parameters	Number of Samples (identify field duplicates)	Sampling Frequency	Sampling SOP Reference
OLD-02-58C	Groundwater	35 to 40	X		1	Semi-annual	FT 1000 FS 2200
OLD-02-59D	Groundwater	55 to 60	X		1	Semi-annual	FT 1000 FS 2200
OLD-02-60C	Groundwater	40 to 45	X	X	1	Semi-annual	FT 1000 FS 2200
OLD-02-61E	Groundwater	85 to 90	X		1	Annual	FT 1000 FS 2200
OLD-02-63D	Groundwater	55 to 60	X		1	Annual	FT 1000 FS 2200
OLD-02-64D	Groundwater	55 to 60	X		1	Semi-annual	FT 1000 FS 2200
OLD-02-65C	Groundwater	35 to 40	X		1	Semi-annual	FT 1000 FS 2200
OLD-02-68D	Groundwater	50 to 55	X	X	1	Semi-annual	FT 1000 FS 2200
OLD-02-69C	Groundwater	40 to 45	X	X	1+ duplicate for VOCs	Semi-annual	FT 1000 FS 2200
OLD-02-70D	Groundwater	55 to 60	X		1	Semi-annual	FT 1000 FS 2200
OLD-02-SW1	Surface Water	NA	X		1	Semi-annual	FT1000 FS 2100
OLD-02-SW2	Surface Water	NA	X		1	Semi-annual	FT1000 FS 2100
OLD-02-SW3	Surface Water	NA	X		1	Semi-annual	FT1000 FS 2100

VOCs include benzene, tetrachloroethene, trichloroethene, cis-1,2-dichloroethene, vinyl chloride, isopropylbenzene, 1,3,5-trimethylbenzene, 1,2,4-trimethylbenzene, as identified in Worksheet No. 15.

MNA Parameters includes TDS, TOC, anions (nitrate, nitrite, and sulfate), and metals (manganese and iron), as identified in Worksheet No. 15.

MNA Field Parameters include ferrous iron and carbon dioxide.

SA 17

McCoy Annex

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Naval Training Center Orlando Florida



Study Area 17 (SA 17)

This fact sheet was developed to inform interested citizens about the Naval Training Center (NTC), Orlando environmental program. Fact sheets will be distributed periodically to keep the community informed. Additional copies of these fact sheets can be obtained by contacting Art Sanford at (843) 743-2135.

NTC Orlando's Environmental Program

Environmental studies and cleanup actions are currently underway at the former NTC, Orlando as part of the Department of Defense's Installation Restoration (IR) Program. Through this program, areas of known or suspected contamination from past practices and operations are being identified, evaluated, and, if necessary, cleaned up.

Site Description

Study Area 17 is located in the central portion of the McCoy Annex at the former NTC, and occupies 9.082 acres (Figure 1). This site is the former Defense Property Disposal Office. Several buildings were located there. One of these buildings was a motor pool and included a wash rack with drainage to a former leach bed, and another building stored hazardous and flammable materials. In addition there were also drum and transformer (with polychlorinated biphenyls) storage areas. All buildings were demolished in 2009.



Figure 1: Study Area 17 Location Map

Site Investigation and Remediation History

Environmental work at began with an initial site screening in 1995. During this work, polynuclear aromatic hydrocarbons (PAHs) were found in soil at concentrations exceeding cleanup standards, and chlorinated volatile organics were found in groundwater at concentrations exceeding cleanup standards. Natural groundwater flow is towards a drainage canal, and

offsite to adjacent City of Orlando property known as Study Area 50. Subsurface conditions at Study Area 17 are shown in Figure 2.

In 1999, PAH contaminated surface soil was removed to levels acceptable for non-residential use. Groundwater treatment began in 2000 and consisted of injection of hydrogen peroxide and trace quantities of metallic salts under pressure. This system was designed to work by destroying (oxidizing) organic contaminants in the soil below the water table and in the groundwater.

In 2003, trichloroethene (TCE) sampling results prompted additional investigation of both subsurface soil and groundwater. Enhanced bioremediation was selected as a cleanup strategy, using Emulsified Oil Substrate (EOS®) injected into groundwater to promote anaerobic degradation of contaminants. Enhanced bioremediation (using EOS®) wells were installed in 2006. The most recent EOS® polishing injections were performed in 2008.

Study Area 17 property was transferred to the City of Orlando in 2008. The planned future use for the property is commercial/industrial.

In addition to groundwater treatment and soil removal, land use restrictions have been implemented to protect human health and prevent exposure to groundwater. Use of the property is limited to non-residential and disturbance or removal of soil is prohibited. A groundwater use restriction is also in place. To prevent possible exposure to contaminants migrating upwards from contaminated groundwater, construction of new buildings is prohibited without prior written approval. To address groundwater migration towards adjacent property owned by the City of Orlando, the city has agreed to impose groundwater restrictions there as well. Groundwater velocity at SA 17 has been measured in three zones (shallow, intermediate, and deep) as 7, 34, and 20 ft/year, respectively.

What's Next?

Groundwater is monitored semi-annually at SA 17. Trichloroethene (TCE) and cis-1,2-dichloroethene (DCE) and their degradation products remain the contaminants of concern at the site. The overall goal is to reduce

contaminant concentrations to Florida Department of Environmental Protection Groundwater Cleanup Target Levels. EOS injections will be repeated in 2011 to enhance natural degradation.

The final decision document for SA 17 is underway and is expected to be complete in 2011.

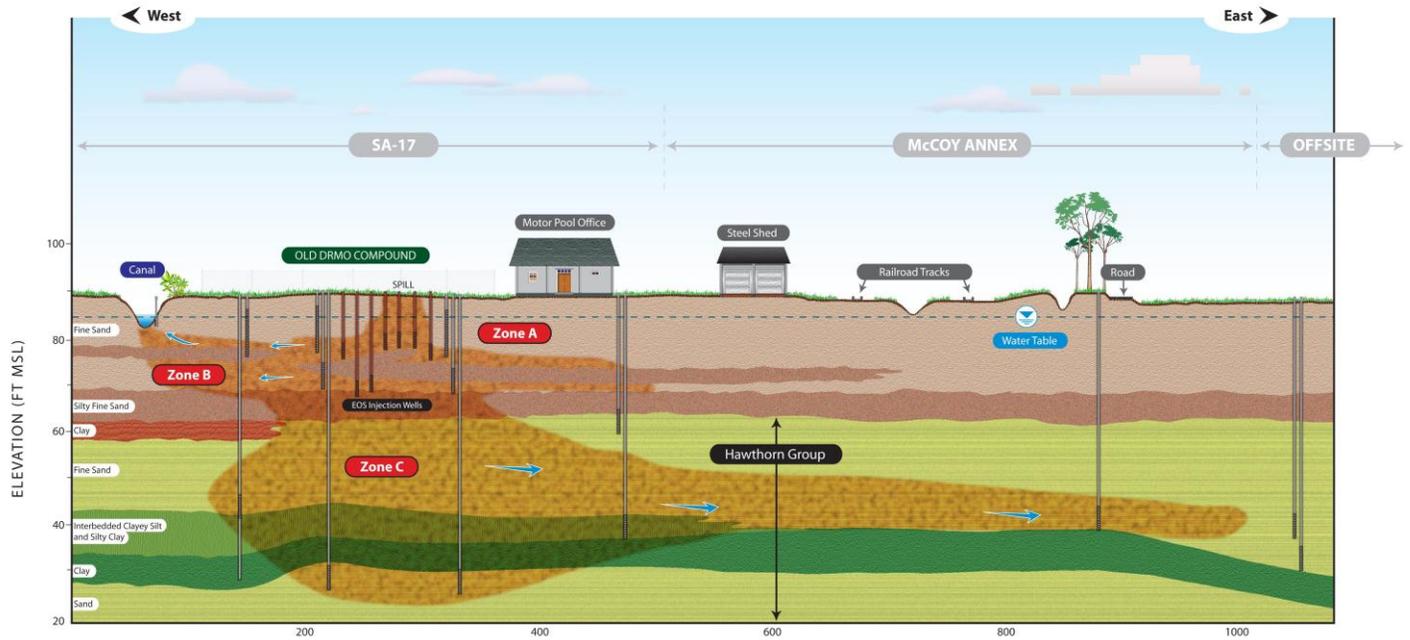


Figure 2: Subsurface conditions showing the former Motor Pool Office building and groundwater flow direction.

For More Information

The public is invited to submit any questions or comments on the remedial action described in this fact sheet. Comments should be directed to Art Sanford at (843) 743-2135. Reports on the work conducted at SA 17 can be reviewed at the Orange County Public Library, Orlando Branch (4th Floor), 101 East Central Boulevard, Orlando, Florida 32801.

What are PAHs, TCE, and DCE?

Polynuclear aromatic hydrocarbons (PAH) are a group of over 100 different chemicals that are formed during the incomplete burning of coal, oil and gas, garbage, or other organic substances like tobacco or charbroiled meat. PAHs are usually found as a mixture containing two or more of these compounds, such as soot.

Trichloroethene (TCE) is a nonflammable, colorless liquid used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, and spot removers.

Cis-1,2-dichloroethene (DCE) is an odorless liquid. It is used as a solvent, in the extraction of rubber, as a refrigerant, in the manufacture of pharmaceuticals and artificial pearls; in the extraction of oils and fats from fish and meat.

More information about these contaminants can be found at the following website:

<http://www.atsdr.cdc.gov/>

CTC SUMMARY DOCUMENTATION

NTC Orlando
NORM AOC Group 3
Study Area (SA) 17: DPDO, Army Motor Pool
CTC: \$743,346
Reference to NORM information updated 24 September 2009
Acreage: 9.082

Current Land Use: Unused. SA 17 was transferred from the Navy to the City of Orlando on April 30, 2008.

Location: SA 17 lies north of the intersection of Andros Place and Avenue C.

FDEP Oculus Number: DOD_14_2005

Background information: SA 17 is located in the central portion of McCoy Annex at Naval Training Center (NTC) Orlando. All buildings were demolished in 2009 including:

- Building 7141 (Chlorination Station).
- Building 7178 (Training Material and Flammable/Hazardous Material Storage Shed).
- Building 7190 (Maintenance Office).
- Building 7191 (Inert Material Storage).
- Building 7193 (General Warehouse).

Building 7190 and the area to the southwest of it were used by the motor pool. This area is where the highest concentrations of groundwater contamination have been identified.

Environmental activities at SA 17 have been conducted in six separate investigations including an initial site screening, supplemental site screening, soil interim remedial action (IRA), groundwater IRA, and site investigation action and source area investigation. Findings from these investigations indicated exceedances of screening criteria for polynuclear aromatic hydrocarbons (PAHs) in soil, and chlorinated volatile organic compounds (CVOCs) in groundwater.

A soil interim remedial action (IRA) was performed by Environmental Detachment Charleston (DET) in May 1999 to remove PAH contaminated surface soil. The removal action mitigated PAH-contaminated soil to levels compatible with a future non-residential land use.

A groundwater IRA consisting of in situ chemical oxidation (ISCO) for source control/reduction of the chlorinated solvent plume at SA 17 was performed November 2000 through 2002. The IRA involved the

simultaneous injection of hydrogen peroxide and trace quantities of metallic salts under pressure into the subsurface to destroy organic contaminants in the soil below the water table and in the groundwater.

The detection of TCE in 2003 sampling results at levels indicating the presence of a dense non-aqueous phase liquid (DNAPL) prompted additional source area investigation. As a result of this investigation, the locations and depths of the most contaminated soil and groundwater zones were identified. In addition, the results indicated that the vadose zone is not a significant source of groundwater contamination and that the groundwater at SA 17 is being contaminated from "source areas" within the saturated zone.

Study Area 17 Remedial Status

Injection, extraction, and additional monitoring wells were installed at SA 17 in May/June 2006. EOS[®] recirculation was performed in June/July 2006. Subcontractor error and tight lithology in Zone B resulted in less EOS[®] being injected into the B zone than planned and more into the C zone. Additional polishing injections in the B zone were performed in March and October of 2008. TCE rebound was observed in April 2011. EOS[®] and AquaBupH[™] were injected in B and C zones in February 2012.

Sources: Groundwater contamination at SA 17 is attributed to leaks and spills from the former motor pool and wash rack operations at the site. Trichloroethene (TCE), cis-1,2-dichloroethene (DCE) and associated VOC breakdown products are chemicals of concern (COCs) in groundwater at the site. The remediation goal (RG) for the site is to reduce the contaminant concentrations to Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs).

Florida Groundwater Classification: Class II

Hydrogeology: Soils at SA 17 are typically tan to gray, fine-grained, quartz sand to silty quartz sand, extending to a depth of approximately 26 feet below grade, comprising a shallow surficial aquifer overlying the Hawthorn Group. Groundwater is initially encountered at approximately 6 feet below grade.

Groundwater quality at SA 17 is slightly acidic, with pH ranging from 5.4 to 6.3, total alkalinity ranging from 8.6 to 111 milligrams per liter (mg/L), and iron concentration ranging from 0.4 to 74 mg/L. Plume migration has been impacted by the natural groundwater flow pattern. Groundwater flows horizontally in the source areas in a radial pattern, with the steeper gradient toward the south.

Hydraulic Conductivity: The horizontal gradient ranges from 0.003 to 0.004 feet/foot. A downward vertical hydraulic gradient of 0.007 to 0.020 feet/foot exists within the surficial aquifer. Hydraulic

conductivity in the surficial aquifer ranges from 0.5 to 1.5 feet/day with lower conductivity in the deeper intervals of the surficial aquifer.

Receptors: The Site Screening Report (HLA, 1999) indicated that the only apparent potential exposure pathways of the chlorinated solvents are through ingestion and/or inhalation via media associated with an offsite drainage canal. The VOC concentrations in surface water and sediments associated with the canal are currently relatively low, but the natural groundwater flow patterns continue to transport contaminants with high concentrations of contaminants in the direction of the canal.

Remedial Action Objectives: The RAOs for the site are as follows:

- **RAO 1:** Source reduction.
- **RAO 2:** Prevent plume migration from the source area to receptors consistent with the intended land use (non residential)

Considering the RAOs, chemical-specific RGs were developed based on the State of Florida GCTLs.

Cleanup Methodology:

The selected Remedial Action for SA 17 includes the following components:

- **Enhanced Bioremediation:** Emulsified oil substrate (EOS[®]) is injected to enhance biodegradation occurring at the site. The EOS[®] was delivered in a recirculation mode in the source treatment area. Reapplication of the EOS[®] may occur in the future.
- **Groundwater Monitoring:** A groundwater sampling program is monitoring the decrease in COC concentrations resulting from the treatment systems and NA processes and will continue until RGs have been reached.
- **Land Use Controls:** LUCs have been implemented to limit the use of contaminated groundwater and prohibit interference with existing remedial equipment until COC concentrations have been reduced to RGs. Use of the site is limited to non-residential and disturbance or removal of soil without prior approval is prohibited. To prevent possible exposure to VOCs migrating from contaminated groundwater, construction of new buildings is prohibited without prior written approval. This is a temporary control established because vapor barrier or other measures to mitigate vapor intrusion may be required to prevent VOC exposure.

Concerns/Barriers to Site Closure: If DNAPL is present in subsurface soil; EOS® treatment may be insufficient for complete remediation.

Recent Events/Changes:

DATE	ACTIVITY
March 2009 through March 2013	Semi-annual groundwater sampling (BFA)
December 2010	Final SAP (UFP-QAPP) for LTM submitted - defined sampling requirements to be implemented beginning in March 2011 (Tetra Tech)
February 2012	EOS® and AquaBupH™ injections in B and C zones; wells OLD-17-31AR, -32AR and -33AR replaced in ditch (Solutions-IES)
March 2012	Final Decision Document (Tetra Tech)
April 2012 to April 2013	Post-injection groundwater sampling (Solutions-IES)
March 2013	Injection Completion Report (Solutions-IES)
April - May 2013	Two deep wells (OLD-17-59D and 60D) installed in April and sampled in May (Solutions-IES)
October 2013	Semi-annual groundwater sampling (Solutions-IES)

**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
STUDY AREA 17**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 1 OF 3

Date	Event
1940 to 1947	Active use of the site by the United States Army
1947 to 1968	Active use of the site by the United States Air Force
1968 to 1999	Active use of the site by the United States Navy
December 1994	Submittal of Baseline Survey Report (ABB-ES)
February through May 1995	Initial Site Screening: Conducted geophysics survey, passive soil gas survey, surface and subsurface soil sampling, and surface water and sediment sampling of drainage ditch. Installed and sampled wells OLD-17-01A through OLD-17-05A and OLD-17-24T (ABB-ES).
October through November 1996	Initial Site Screening: Conducted PAH evaluation in soil using field immunoassay analysis. (ABB-ES)
January through February 1997	Supplemental Site Screening Phase I: Installed and sampled monitoring wells OLD-17-06 through OLD-17-10. (HLA)
November 1997	Supplemental Site Screening: Conducted confirmatory soil sampling for PAHs. (HLA)
March through April 1998	Supplemental Site Screening: Conducted CPT at nine locations to evaluate subsurface lithology, and DPT groundwater sampling at 31 locations. Installed nine piezometers in surficial aquifer. Performed soil vapor headspace survey at 20 locations with 2 samples analyzed at laboratory. (HLA)
April through August 1998	Supplemental Site Screening Phase II: Installed and sampled monitoring wells OLD-17-11 through OLD-17-28 and drive points OLD-17-29A through OLD-17-33A. (HLA)
November 1998	SA 17 fact sheet submitted for public distribution.
May 1999	DET soil IRA excavation
February 2000	Groundwater IRA Phase I confirmation. Re-sampled 14 monitoring wells. (CCI)
March through April 2000, August 2000	Groundwater IRA Phase II confirmation. Conducted DPT groundwater sampling at locations 1 through 20. Installed monitoring wells OLD-17-34 through OLD-17-37. Replaced monitoring wells OLD-17-23A and OLD-17-24B. (CCI)
October 2000	Groundwater IRA: Collected basis of comparison groundwater samples from three shallow injection wells, nine intermediate injection wells, eight deep injection wells, and two monitoring wells. (CCI)
November 2000 through January 2001	Groundwater IRA Phase I-A IRA Injection. Injected ISCO in shallow, intermediate, deep zones. Conducted post-injection sampling. Phase I-B IRA Injection. Installed eight deep injection wells and injected ISCO in deep zone. (CCI)
January through February 2001	Groundwater IRA: Conducted post-injection sampling (CCI)

**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
STUDY AREA 17**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 2 OF 3

Date	Event
May through June 2001	Groundwater IRA: Collected groundwater samples from seven very deep injection wells. Installed very deep injection wells 39 through 48. Conducted DPT groundwater sampling at locations 21 through 35. Installed very deep injection wells 51 through 76. (CCI)
March 2002, August 2002, and September 2002	Groundwater IRA Phase II IRA injection. Injected ISCO in very deep zone. Polishing of intermediate and deep zones. (CCI)
July 2002, October 2002, January 2003, and June 2003	Groundwater IRA: Conducted performance evaluation groundwater monitoring (CCI)
August 2002	Downgradient site investigation: DPTs groundwater sampling at locations P100 through P121. Installed monitoring wells OLD-17-38 through OLD-17-45. (TtNUS)
November/December 2002	Downgradient site investigation: DPTs groundwater sampling at locations P122, P123, P126, and P128 through 130. Installed monitoring wells OLD-17-46 through OLD-17-51. (TtNUS)
January 2003	FDEP issued approval to reduce sampling frequency to semi-annual
August 2003	Source Area Investigation and Focused Feasibility Study: Installed 48 MIP borings to depths of 50 feet and obtained 24 groundwater samples. (CCI)
October 2003	Source Area Investigation and Focused Feasibility Study: Collected 28 additional DPT samples. Installed 10 soil borings using DPT. (CCI)
January 2004	TtNUS issued the final Site Investigation Report to the OPT
August 2004 and March 2005	Source Area Investigation and Focused Feasibility Study: Performed groundwater sampling. (CCI)
March 2005	Source Area Investigation and Focused Feasibility Study: Optimization Study Report (CCI)
May/June 2006	Groundwater IRA: Installation of injection, recirculation, and monitoring wells for in-situ bioremediation (CCI)
July 2006	Groundwater IRA: EOS Injection Activities (CCI)
October 2006	Completed first quarterly groundwater monitoring to evaluate effectiveness of bioremediation treatment and disposal of investigative-derived waste (IDW)
November 2006	Old ISCO injector wells abandoned.
December 2006	Visual site inspection performed to support property transfer.
January 2007	Completed second quarterly groundwater monitoring to evaluate effectiveness of bioremediation treatment
April 2007	Completed third quarterly groundwater monitoring to evaluate effectiveness of bioremediation treatment and additionally, sampled wells near the property boundary to evaluate contaminant migration towards the property boundary.

**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
STUDY AREA 17**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 3 OF 3

Date	Event
July 2007	Completed fourth quarterly groundwater monitoring to evaluate effectiveness of bioremediation treatment. Deeper zone C contaminant concentrations have reduced by an average of about 90% during the first year after EOS injections. Persistent contamination in some areas of shallow zone B will be treated with polishing injections of EOS.
July 18, 2007	Finding of Suitability to Transfer (FOST) signed by the Navy.
September 2007	Sampled all monitoring wells to determine sampling schedule.
December 2007	Began reduced sampling schedule at site.
March 2008	Scheduled direct injections in shallow zone B using DPT.
October 2008	Polishing injections of EOS® conducted at two shallow zone (B zone) locations within the shallow aquifer.
2009	All buildings demolished
March 2009 through March 2013	Semi-annual groundwater sampling (BFA)
December 2010	Final SAP (UFP-QAPP) for LTM submitted - defined sampling requirements to be implemented beginning in March 2011 (Tetra Tech)
February 2012	EOS® and AquaBupH™ injections in B and C zones; wells OLD-17-31AR, -32AR and -33AR replaced in ditch (Solutions-IES)
March 2012	Final Decision Document (Tetra Tech)
April 2012 to April 2013	Post-injection groundwater sampling (Solutions-IES)
March 2013	Injection Completion Report (Solutions-IES)
April - May 2013	Two deep wells (OLD-17-59D and 60D) installed in April and sampled in May (Solutions-IES)
October 2013	Semi-annual groundwater sampling (Solutions-IES)

CPT - Cone penetrometer testing
DPT - Direct push technology
ISCO - In situ chemical oxidation



DRAWN BY WRW	DATE 12/22/09
CHECKED BY WRW	DATE 12/22/09
REVISED BY ---	DATE -----
SCALE AS NOTED	



**AERIAL SITE MAP
STUDY AREA 17 - MCCOY ANNEX

NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

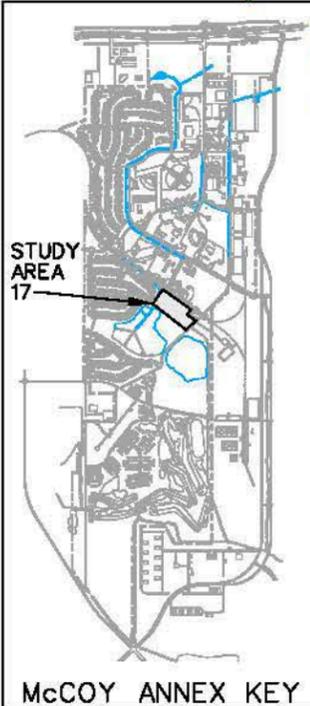
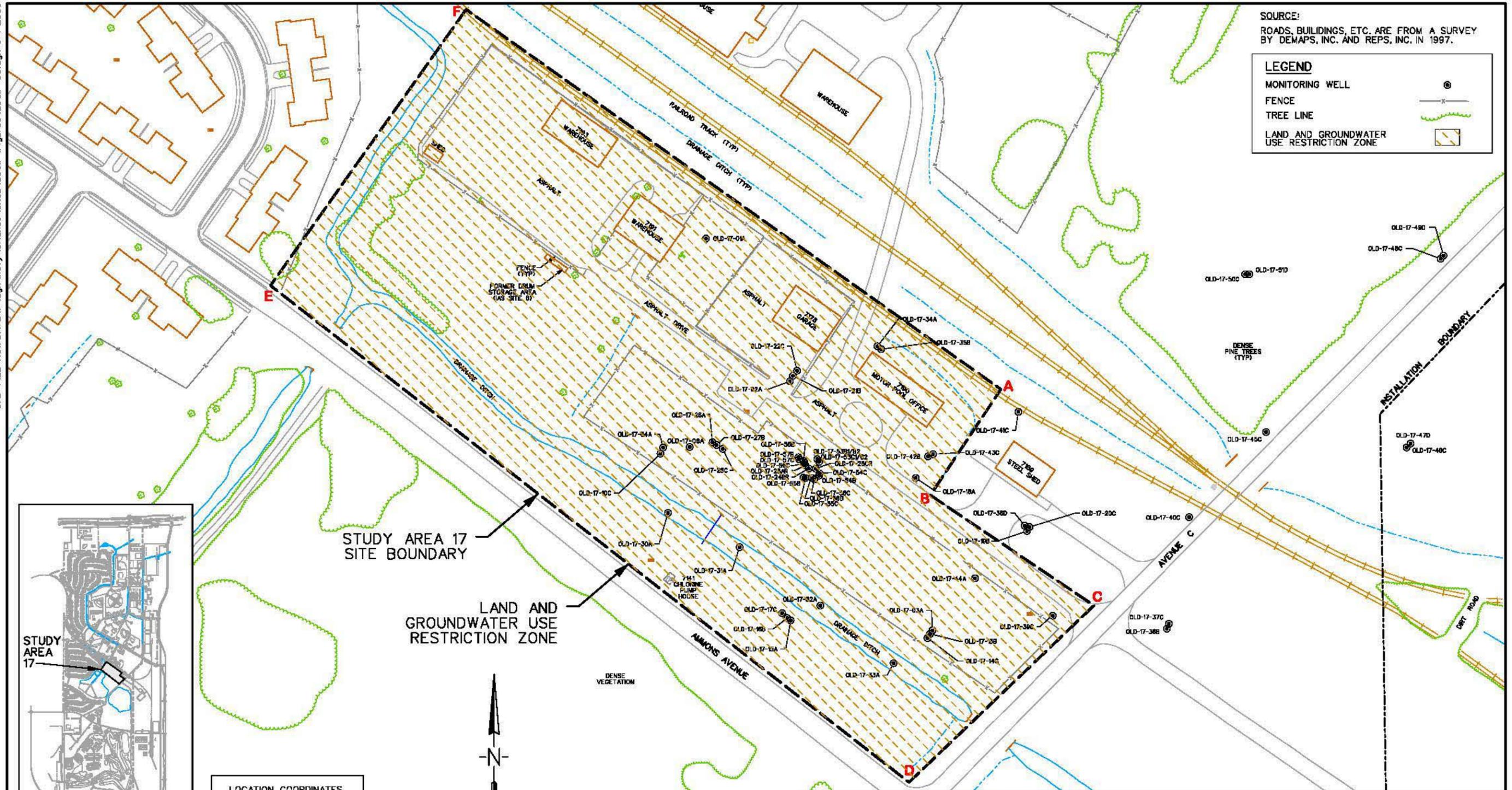
CONTRACT NO. N62467-04-D-0055	
OWNER NO. -----	
APPROVED BY ---	DATE -----
DRAWING NO. FIGURE 1	REV. 0

CAD FILE NO./DATE:k:\navy\orlando\sites\LUICIP\Figures\LUICIP-03.dgn 9-1-2009

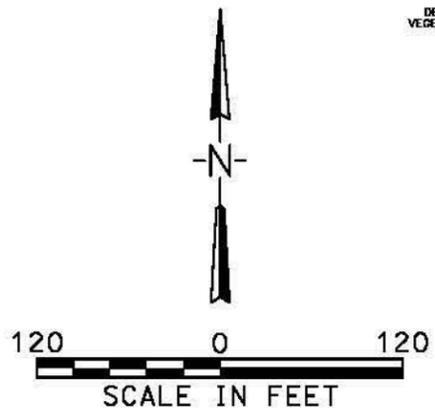
SOURCE:
ROADS, BUILDINGS, ETC. ARE FROM A SURVEY
BY DEMAPS, INC. AND REPS, INC. IN 1997.

LEGEND

- MONITORING WELL 
- FENCE 
- TREE LINE 
- LAND AND GROUNDWATER USE RESTRICTION ZONE 



LOCATION COORDINATES		
LOC.	EASTING	NORTHING
A	547082	1490495
B	546997	1490368
C	547194	1490236
D	546971	1490024
E	546205	1490619
F	546440	1490950



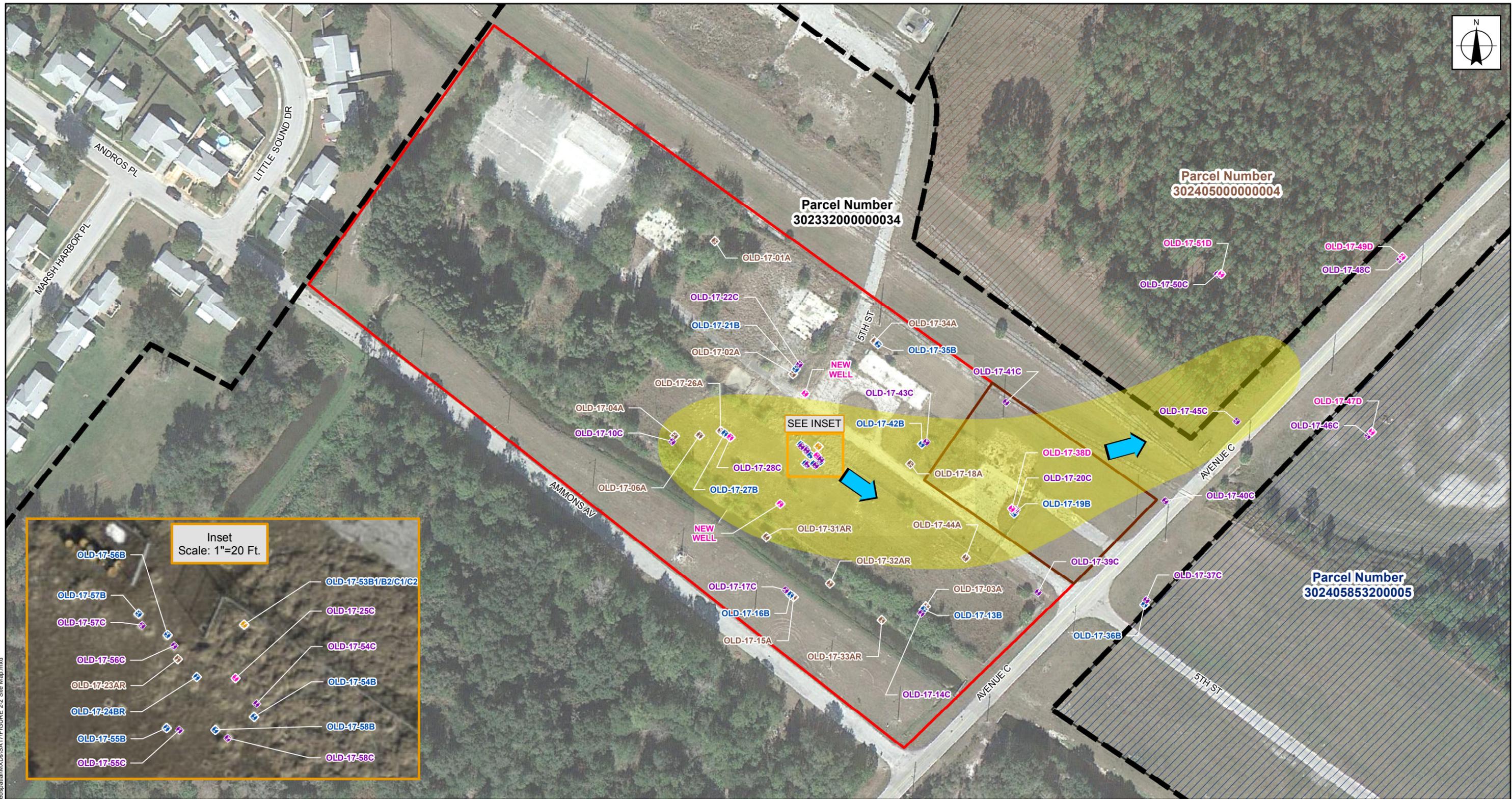
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TJG	9-1-2009
REVISED BY	DATE
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AS NOTED	



SITE MAP
STUDY AREA 17 - McCOY ANNEX

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

CONTRACT NO. N62467-04-D-0055	
OWNER NO.	
APPROVED BY	DATE
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\\usor02\p02_data\projects\Navy_CLEAN\INTC_Orlando\09_0_Geospacial\MXDs\SA17\FIGURE 2-2_Site_Map.mxd

Legend

- | | | | |
|--|---|--|---|
| | Zone A | | Approximate Direction of Groundwater Flow |
| | Zone B | | Estimated Extent of VOC Contamination |
| | Zone C, upper | | Parcel Boundaries |
| | Zone C, lower | | Study Area 17 |
| | Zone D, semi-confined | | Study Area 50 |
| | Zones B1, B2, C1, C2 (Multi-chamber Well) | | |



Note:
Monitoring Well OLD-17-53 is a multi-chamber well screened in zones B1, B2, C1 and C2.
Sources:
Basemap Sources: Esri World Imagery
http://services.arcgisonline.com/arcgis/services/World_Imagery
© 2011 Esri, i-cubed, USDA FSA, USGS, AEX, GeoEye,
AeroGRID, Getmapping, IGP
Orange County GIS

FIGURE 2-2
SITE LAYOUT/WELL LOCATION MAP
SA 17
McCoy Annex
Orlando, Florida

REQUESTED BY: OggerID	DATE: 6/11/2013
DRAWN BY: BarronM	TASK ORDER NUMBER: XXXXX

SAP Worksheet No.18 -- Sampling Locations and Methods/SOP Requirements Table

(UFP-QAPP Manual Section 3.1.1) –

18.1 STUDY AREA 17 SAMPLING LOCATION AND METHODS

Well Number	Matrix	Screen Interval (feet bgs)	VOCs	Methane	Ethane	Ethene	Sulfate	TOC	Number of Samples (identify field duplicates)	Sampling Frequency	Sampling SOP Reference
OLD-17-04A	Groundwater	2 to 12	x	x	x	x	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-17-10C	Groundwater	42 to 47	x	x	x	x	x		1	Semi-annual	FT 1000 FS 2200
OLD-17-13B	Groundwater	15 to 20	x	x	x	x	x		1	Semi-annual	FT 1000 FS 2200
OLD-17-16B	Groundwater	15 to 20	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-19B	Groundwater	25 to 30	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-20C	Groundwater	47 to 52	x	x	x	x	x	x	1+ duplicate for VOCs	Semi-annual	FT 1000 FS 2200
OLD-17-23AR	Groundwater	1.5 to 11.5	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-24BR	Groundwater	15 to 20	x	x	x	x	x		1	Semi-annual	FT 1000 FS 2200
OLD-17-25CR	Groundwater	58 to 63	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-26A	Groundwater	2 to 12	x	x	x	x	x		1	Semi-annual	FT 1000 FS 2200
OLD-17-27B	Groundwater	15 to 20	x	x	x	x	x		1	Semi-annual	FT 1000 FS 2200
OLD-17-28C	Groundwater	58 to 63	x	x	x	x	x		1	Semi-annual	FT 1000 FS 2200
OLD-17-31A (Once replaced)	Groundwater	5 to 6	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-32A (Once replaced)	Groundwater	5 to 6	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-33A (Once replaced)	Groundwater	5 to 6	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-38D	Groundwater	65 to 70	x	x	x	x	x		1	Semi-annual	FT 1000 FS 2200

Well Number	Matrix	Screen Interval (feet bgs)	VOCs	Methane	Ethane	Ethene	Sulfate	TOC	Number of Samples (identify field duplicates)	Sampling Frequency	Sampling SOP Reference
OLD-17-40C	Groundwater	45 to 50	x	x	x	x	x		1	Semi-annual	FT 1000 FS 2200
OLD-17-41C	Groundwater	46 to 51	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-43C	Groundwater	46 to 51	x	x	x	x	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-17-45C	Groundwater	45 to 50	x	x	x	x	x		1	Semi-annual	FT 1000 FS 2200
OLD-17-46C	Groundwater	45 to 50	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-47D	Groundwater	52 to 57	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-48C	Groundwater	45 to 50	x	x	x	x	x		1	Semi-annual	FT 1000 FS 2200
OLD-17-49D	Groundwater	52 to 57	x	x	x	x	x		1+ duplicate for VOCs	Semi-annual	FT 1000 FS 2200
OLD-17-50C	Groundwater	45 to 50	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-51D	Groundwater	52 to 57	x						1	Semi-annual	FT 1000 FS 2200
OLD-17-53C1	Groundwater	30 to 34.5	x	x	x	x	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-17-54B	Groundwater	20 to 25	x	x	x	x	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-17-55C	Groundwater	35 to 40	x	x	x	x	x	x	1+ duplicate for VOCs & MNA	Semi-annual	FT 1000 FS 2200
OLD-17-56B	Groundwater	20 to 25	x	x	x	x	x	x	1	Semi-annual	FT 1000 FS 2200

SA 36

Main Base

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Naval Training Center Orlando Florida



Study Area 36 (SA 36)

This fact sheet was developed to inform interested citizens about the Naval Training Center (NTC), Orlando environmental program. Fact sheets will be distributed periodically to keep the community informed. Additional copies of these fact sheets can be obtained by contacting Art Sanford at (843) 743-2135.

NTC Orlando's Environmental Program

Environmental studies and cleanup actions are currently underway at the former NTC, Orlando as part of the Department of Defense's Installation Restoration (IR) Program. Through this program, areas of known or suspected contamination from past practices and operations are being identified, evaluated, and, if necessary, cleaned up.

Study Area 36 Location and History

One area where work is being performed is SA 36. The property is located in the southwest corner of the former main base at NTC Orlando as shown on Figure 1.

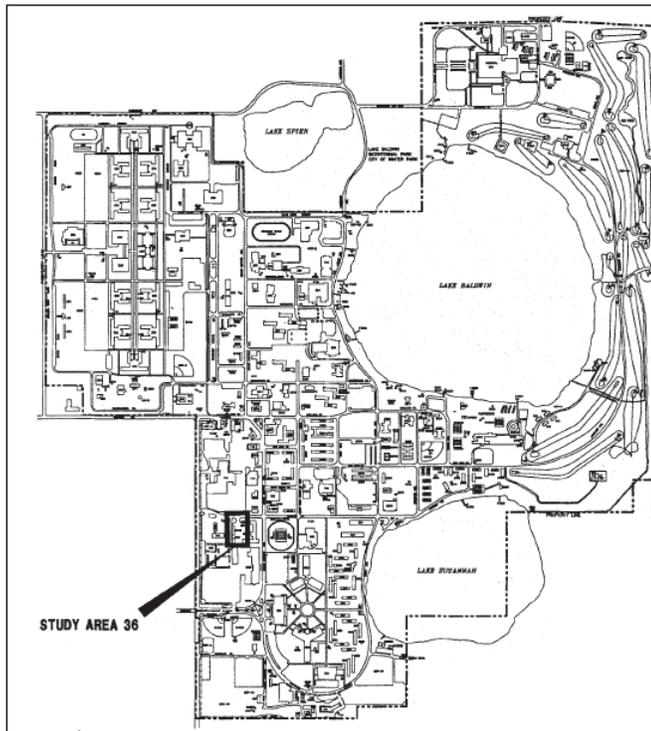


Figure 1: NTC Orlando Base Map Showing Study Area 36

Study Area 36 previously contained Buildings 2121 and 2122 and the western half of the public works yard. The areas to the east and south of Building 2121 were used

to store a variety of items including pipes, fire hydrants, bricks, and hazardous materials such as waste oil drums, transformers, and batteries. 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.

In 2002, the Navy transferred the property to the City of Orlando as part of the Baldwin Park housing development. Residences and a small park have been constructed Study Area 36.

Site Investigation and Monitoring History

An initial site screening investigation was conducted by Harding Lawson Associates (HLA) in 1997. Metals, total recoverable petroleum hydrocarbons (TRPH), and polynuclear aromatic hydrocarbons (PAHs) were detected in soil samples exceeding screening criteria. The investigation also detected volatile organic compound (VOC) concentrations in groundwater samples above screening criteria.

Additional investigation work in 1998 evaluated and characterized the VOC contamination at the site. Concentrations of the chlorinated solvents trichloroethene (TCE) and tetrachloroethene (PCE) were detected in the groundwater that exceeded Florida's Groundwater Cleanup Target Levels (GCTLs). In addition, arsenic, barium, mercury, TRPH, and benzo(a)pyrene were found in surface soil at concentrations exceeding the regulatory screening criteria. This contaminated surface soil was removed from the site.

In groundwater, TCE and PCE concentrations exceeded the GCTL in an area of approximately 5,000 square feet, to a depth of 35 feet below land surface. An interim remedial action (IRA) was performed, consisting of enhanced biodegradation using vegetable oil. Microorganisms exist in the oxygen-poor, or anaerobic, environment beneath SA 36. The injection of vegetable oil provides organic carbon, an energy source, for these microorganisms. In the process of digesting the vegetable oil, the microorganisms help break down the TCE. This is an example of enhanced bioremediation, in which the natural processes that break down TCE are

What are TCE and PCE?

Trichloroethene (TCE) is a nonflammable, colorless liquid used mainly as a solvent to remove grease from metal parts, but it is also an ingredient in adhesives, paint removers, and spot removers.

Tetrachloroethene (PCE) is a manufactured chemical used for dry cleaning and metal degreasing.

More information about these contaminants can be found at the following website:

<http://www.atsdr.cdc.gov/>

enhanced by adding energy sources for the microorganisms in the soil, in this case, vegetable oil. Two injections of vegetable oil were performed in January and November of 2001.

Due to the Baldwin Park property development, the existing monitoring wells and injection points were properly abandoned by the developer's environmental consulting firm in December 2001. The monitoring wells were re-installed in March and April 2002 in their current locations. Groundwater monitoring resumed after well re-

installation. A groundwater use restriction is also in place to protect human health, and will remain in place until cleanup standards are met.

What's Next?

The data collected to date indicate that the presence of vegetable oil in the aquifer at the site has created a reducing environment. The vegetable oil injections completed in November 2001 have enhanced the biodegradation process by ensuring a continued source of organic carbon. Based on the sampling data obtained to date and its associated trends, groundwater monitoring is scheduled to continue on a semi-annual basis.

For More Information

The public is invited to submit any questions or comments on the remedial action described in this fact sheet. Comments should be directed to Art Sanford at (843) 743-2135. Reports on the work conducted at SA 36 can be reviewed at the Orange County Public Library, Orlando Branch (4th Floor), 101 East Central Boulevard, Orlando, Florida 32801.

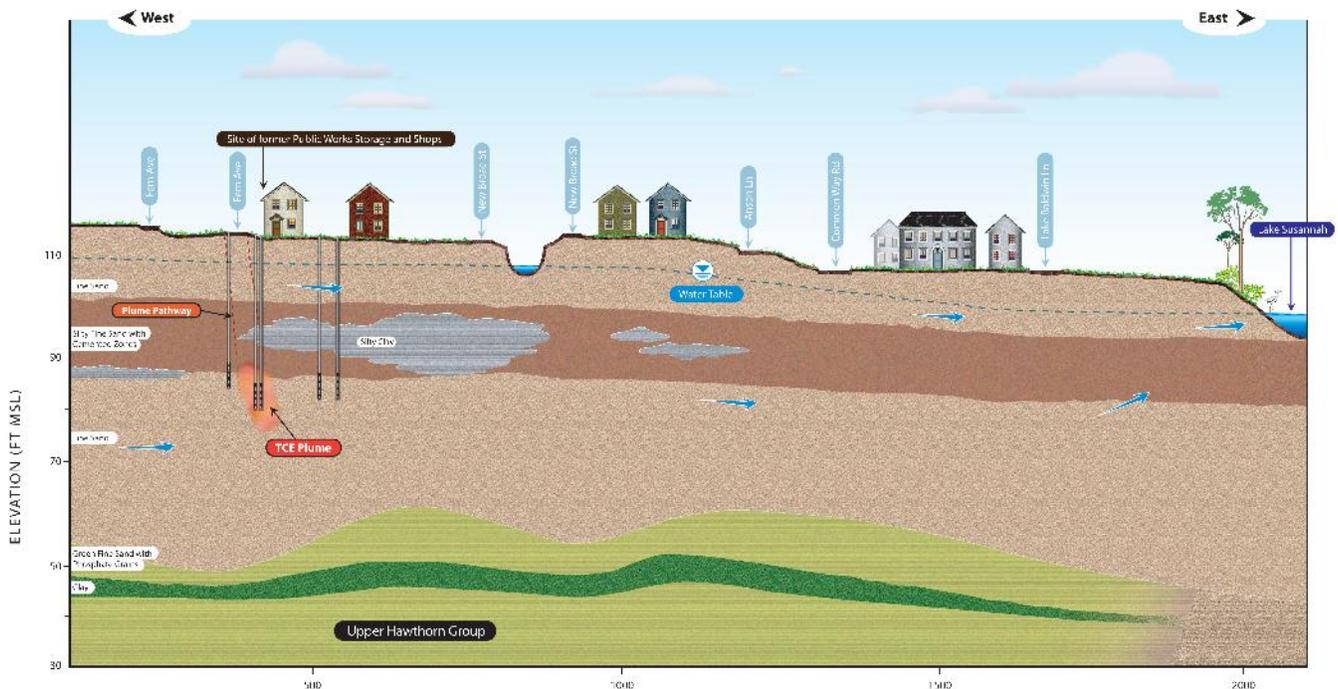


Figure 2: Conceptual Site Model of SA 36 Showing Subsurface TCE Contamination

CTC SUMMARY

NTC Orlando
NORM AOC Group 1
Study Area (SA) 36 – Public Works Storage
CTC: \$ 585,000
Reference to NORM information updated 08 October 2009

Acreage: 1.94 acres

Current Land Use: Residential and a small park

Location: SA 36 intersects Fern Avenue, Hove Street, and New Broad Street

FDEP Oculus Number: DOD_14_2038

Background information: Site screening activities began in 1997. The Site Screening Report was submitted in 1999. Additional site investigation activities were conducted between April 2000 and August 2000. The Site Investigation Report was submitted in February 2003. The primary chemicals of concern are the chlorinated solvents tetrachloroethene (PCE) and trichloroethene (TCE) in groundwater. An Interim Remedial Action was implemented in November 2000 and consisted of vegetable oil injection and groundwater monitoring.

Groundwater analytical results indicate that reductive dechlorination is occurring. Remediation goals are to reach Florida Groundwater Cleanup Target Levels (GCTLs). Optimization efforts accomplished in FY05 included a reduction in groundwater monitoring frequency from quarterly to semi-annual and a reduction in the number of monitoring wells included in the monitoring program. No other active remediation is anticipated. The selected site remedy of long-term monitoring and Land Use Controls was approved in the Decision Document in October 2005.

The property was transferred to the City of Orlando in December 2002 as part of the Baldwin Park housing development. Residences and a small park have been constructed on the property overlying the existing groundwater contaminant plume.

Sources: Contamination attributed to past site practices. The property included a paint shop, a lumber storage facility, and part of the Public Works Yard.

Florida Groundwater Classification: Class II

Geology/Hydrogeology: Soil consists of gray to dark brown, predominantly quartz sand with varying amounts of silt and clay-sized grains, and shell fragments. An interval consisting of cemented fine sand, interbedded fine sand and silt, and indurated, cemented sand exists at a depth of from 15 to 25 feet below ground surface (bgs). Beneath the cemented sand interval is another unit of brown to dark brown, sand and silty sand with some clay lenses, and an interval containing shell fragments at about 60 feet bgs. A water table lies at a depth of about 7 to 14 feet bgs across the site, with 5 to 6 feet of seasonal variation observed in some wells. The surficial aquifer extends to a depth of about 60 to 65 feet. Affected groundwater occurs primarily under the cemented sand layer at 30 to 35 feet bgs and to a lesser extent in the shallow aquifer at 20 to 25 feet bgs.

Hydraulic Conductivity: In November 2000, CCI conducted slug testing in 15 of the site monitoring wells to estimate the hydraulic conductivity of the surficial aquifer at SA 36 (CCI, 2001). Subsequently, CCI revised the slug test results for the A depth wells downward. Based on the slug test results, the average hydraulic conductivities for the different aquifer depth intervals are as follows: A wells = 6.3 ft/day; B wells = 6.0 ft/day; and C wells = 4.4 ft/day.

Receptors: Potential receptors include residents. This potential risk has been addressed through the implementation of LUCs prohibiting the use of groundwater.

Nature and extent of contamination: Chlorinated solvents in groundwater occur over an area of approximately 0.4 acre to a depth of approximately 35 feet.

Cleanup Methodology: The selected remedy for the PCE- and TCE-contaminated groundwater in the northern portion of SA 36 consists of:

- **Enhanced Biodegradation:** The PCE/TCE plume was addressed by injecting vegetable oil into the aquifer to serve as a carbon source for biological activity. The IRA vegetable injections were performed in 2001 and have proven successful. Additional injections are not planned at this time.
- **Groundwater Monitoring:** Groundwater monitoring for CVOCs is being performed on a semi-annual schedule until evidence indicates that the remedy is or will be successful at reducing the PCE/TCE plume.
- **Land Use Controls (LUCs):** LUCs have been implemented to limit the use of contaminated groundwater and prohibit interference with existing remedial equipment until COC concentrations have been reduced to GCTLs.

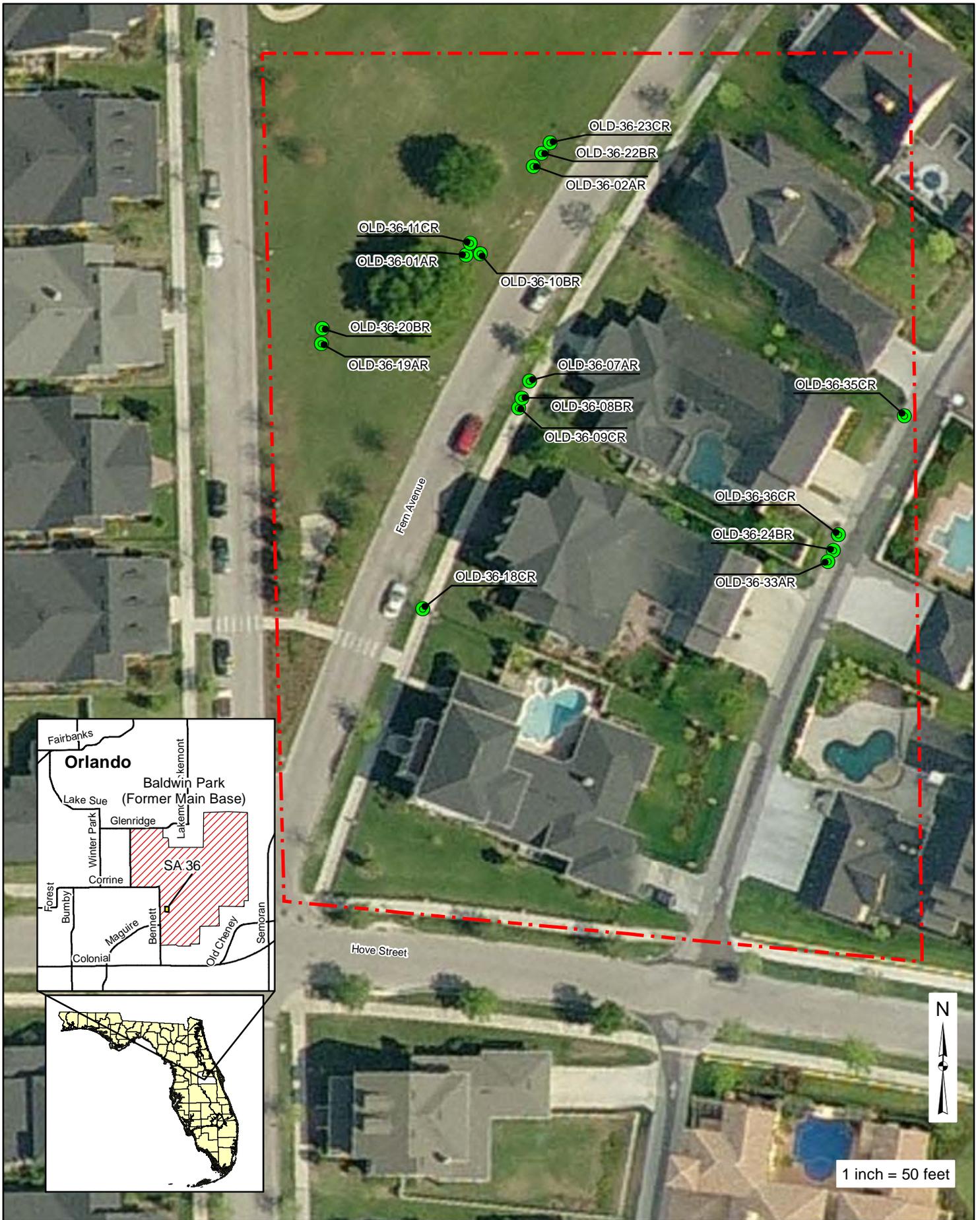
Concerns/Barriers to Site Closure: If the degradation process stalls, GCTLs may not be met.

DATE	ACTIVITY
November 2012	LTM SAP submitted to FDEP (TT)
March 2013	Annual groundwater sampling (BFA)

**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
STUDY AREA 36**

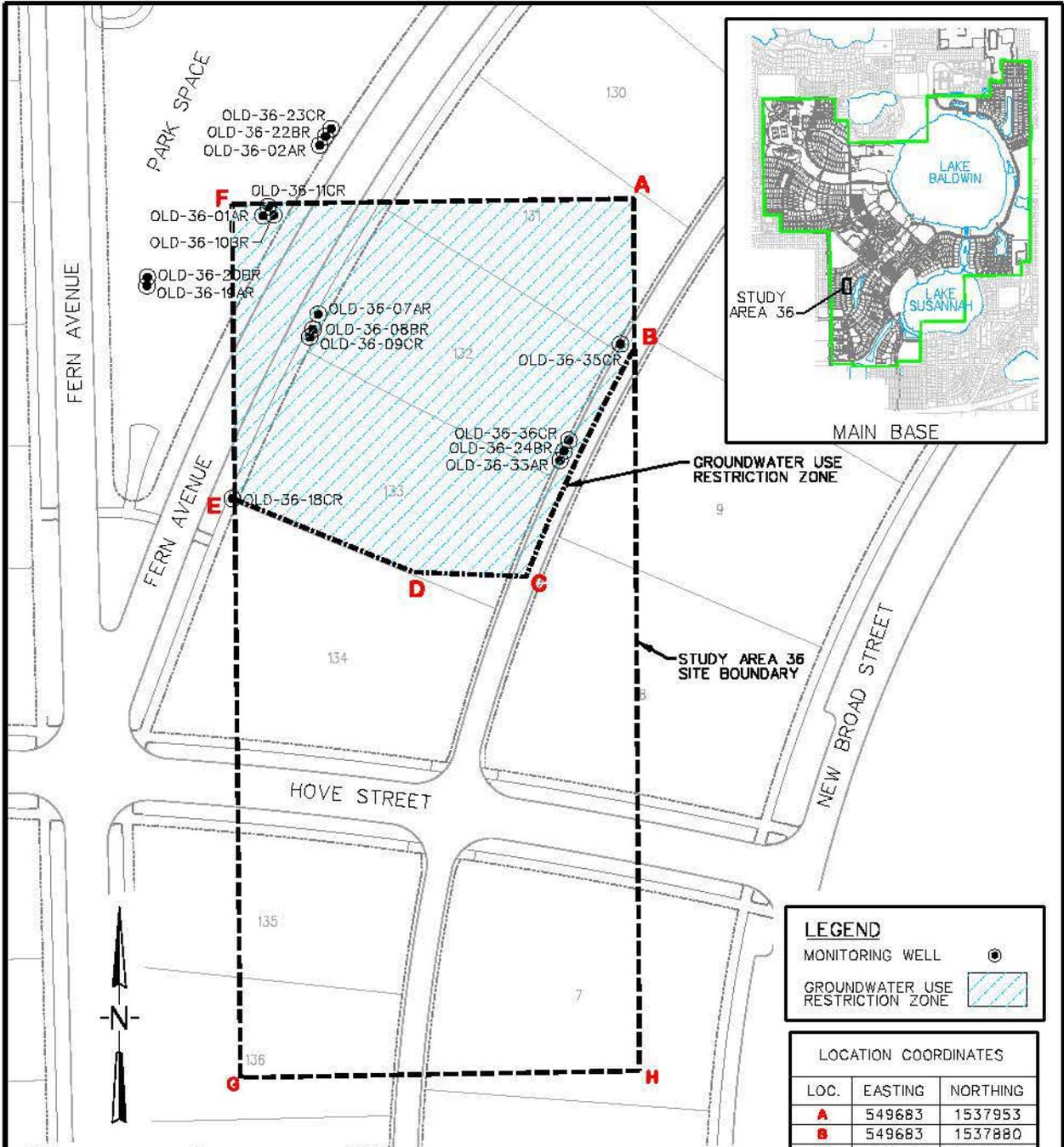
**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

Date	Event
1940 to 1947	Site used by the United States Army
1947 to 1968	Site used by the United States Air Force
1968 to 1999	Site used by the United States Navy
December 1994	Submittal of Baseline Survey Report (ABB-ES)
August 1997	Initial site screening: passive soil gas survey. (HLA)
October - November 1997	Surface and subsurface soil sampling for initial site screening MW-1A through MW-6A. (HLA)
March - April 1998	Supplemental site screening: direct push technology groundwater sampling. (HLA)
June - July 1998	Supplemental site screening: MW-7A through MW 11C. (HLA)
October 1998	Supplemental site screening: MW-12C through MW 14D. Wells MW-3A, MW-4A, and MW-5A in South Storage Area were abandoned. (HLA)
December 1998	Supplemental site screening: Groundwater sampling for natural attenuation parameters. (HLA)
July 1999	Submittal of Site Screening Report. (HLA)
April 2000	Site investigation: confirmatory surface soil samples. MW-15A in South Storage Area. (TtNUS)
August 2000	Site investigation: Installation and sampling of wells MW-16A through MW-25C. (TtNUS)
November-December 2000	Installation and sampling of wells MW-33A through MW-37C by CCI.
November 2000	Groundwater IRA: Installation of wells MW-26A through MW-32C and 15 injection points. (CCI)
December 2000	Baseline groundwater IRA sampling. (CCI)
January 2001	Groundwater IRA: Initial vegetable oil injection (900 gallons). (CCI)
March, August, and October 2001 April/May 2002	Quarterly IRA groundwater sampling. (CCI)
November 2001	Second groundwater IRA vegetable oil injection (540 gallons). (CCI)
December 2001	Developer abandoned all existing monitoring wells.
April 2002	Seventeen replacement monitoring wells installed.
December 2002	Property transferred to City of Orlando
February 2013	Final Site Investigation Report submitted (TtNUS)
March 2003 – September 2005	Quarterly Groundwater Monitoring. (Terraine)
October 2005	Decision Document approved; remedy of vegetable oil injections followed by semi-annual NAM/LUCs
March 2006 – September 2008	Semi-annual Groundwater Monitoring. (Terraine)
March 2009 – March 2011	Semi-annual groundwater monitoring. (BFA)
November 2012	Long Term Monitoring Sampling and Analysis Plan submitted to FDEP (TT)
April 2012 - March 2013	Annual groundwater monitoring. (BFA)



SA36 Monitor Well Sampling Location Map

Figure 2



LEGEND

MONITORING WELL

GROUNDWATER USE RESTRICTION ZONE

LOCATION COORDINATES

LOC.	EASTING	NORTHING
A	549683	1537953
B	549683	1537880
C	549630	1537767
D	549575	1537769
E	549487	1537805
F	549485	1537950
G	549490	1537520
H	549686	1537524

LOT NUMBER	STREET ADDRESS
131	1315 FERN AVENUE
132	1277 FERN AVENUE
133	1239 FERN AVENUE

SOURCE
 MONITORING WELL LOCATIONS BASED ON SURVEY PERFORMED BY BOWYER-SINGLETON & ASSOCIATES, INC. ON MAY 15, 2008.

DRAWN BY WRW	DATE 6-10-2009
CHECKED BY TKG	DATE 6-10-2009
REVISED BY ---	DATE ---
SCALE AS SHOWN	

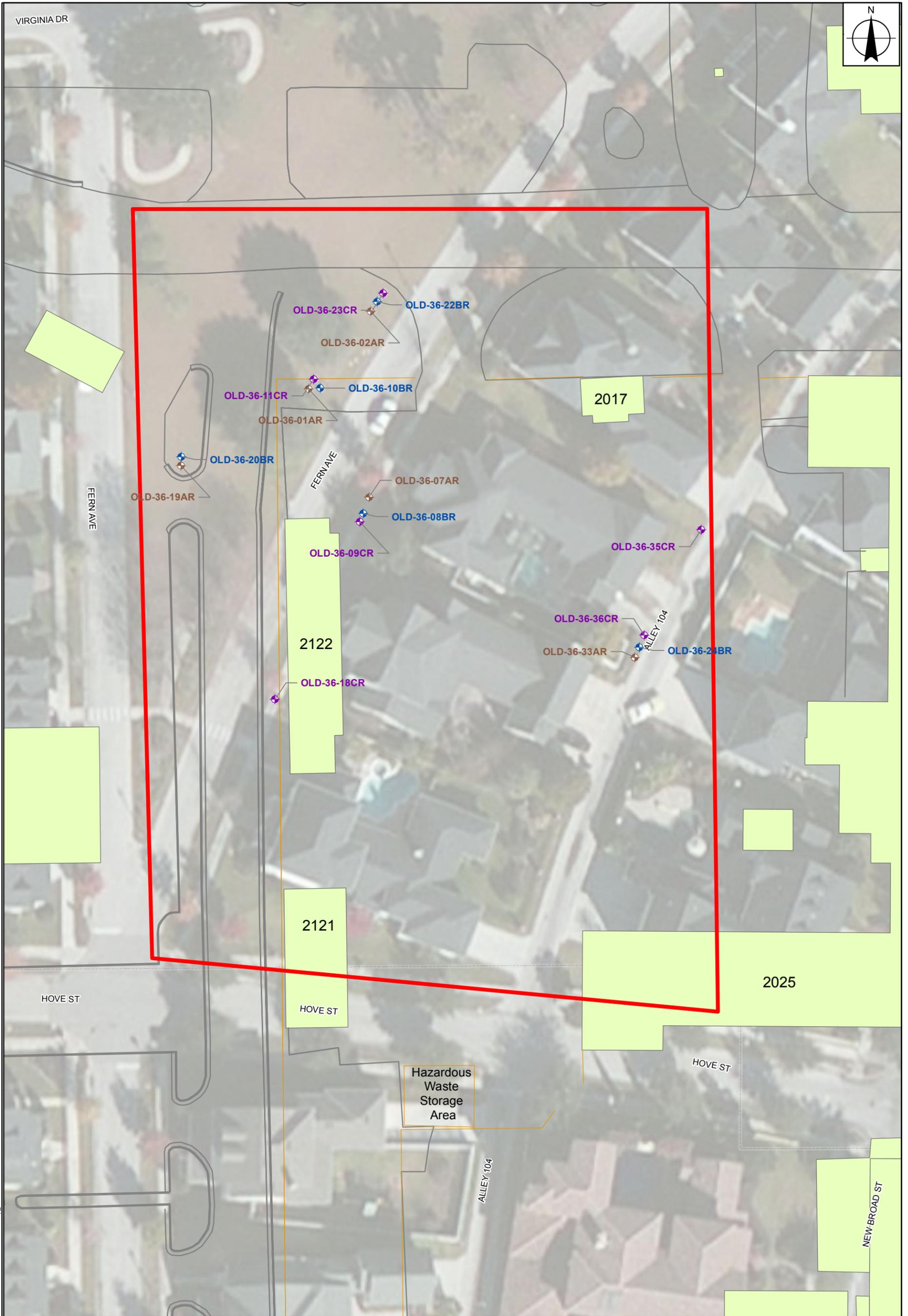


SITE MAP
STUDY AREA 36 - MAIN BASE

NAVAL TRAINING CENTER
OLANDO, FLORIDA

CONTRACT NO. N62467-04-D-0055	
OWNER NO. ---	
APPROVED BY ---	DATE ---
DRAWING NO. FIGURE 1	REV. 0

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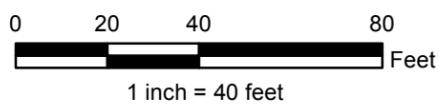


Legend

- Study Area 36 Site Boundary
- Parcel Boundary

Monitoring Wells

- ◆ Zone A - Shallow
- ◆ Zone B - Upper Intermediate
- ◆ Zone D - Deep, unconfined



Basemap Sources: Esri World Imagery
http://services.arcgis.com/arcgis/services/World_Imagery
 © 2011 Esri, i-cubed, USDA FSA, USGS, AEX, GeoEye,
 AeroGRID, Getmapping, IGP
 Orange County GIS

FIGURE 2-2
 SITE LAYOUT/WELL LOCATION MAP
 Study Area 36
 Main Base
 Orlando, Florida



REQUESTED BY: OggerID	DATE: 1/7/2013
DRAWN BY: BarronM	TASK ORDER NUMBER: XXXXX

L:\Projects\Navy CLEAN\NTC Orlando\9.0_Geospatial\MXDs\SA36\FIGURE 2-2_Site Map_F1.mxd

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Project-Specific SAP

Site Name/Project Name: SA 36
 Site Location: NTC Orlando, Orlando, Florida

Long-Term Monitoring SAP for SA 36

Revision: 19
~~October-November~~ 2012

SAP Worksheet No.18 -- Sampling Locations and Methods/SOP Requirements Table

(UFP-QAPP Manual Section 3.1.1)

Well Number	Matrix	Screened Interval (feet bgs)	Analytical Group	Number of Samples ¹	Sampling Frequency	Sampling SOP Reference
SA 36 LTM						
Upper Intermediate Surficial Aquifer (Zone B)						
OLD-36-08BR	Groundwater	13-18	VOCs	1	Annual	FDEP FS 2200
OLD-36-10BR	Groundwater	16-21	VOCs	1	Annual	FDEP FS 2200
OLD-36-20BR	Groundwater	18-23	VOCs	1	Annual	FDEP FS 2200
OLD-36-22BR	Groundwater	14.5-19.5	VOCs	1	Annual	FDEP FS 2200
OLD-36-24BR	Groundwater	18-23	VOCs	1	Annual	FDEP FS 2200
Intermediate Surficial Aquifer (Zone C)						
OLD-436-09CR	Groundwater	27-32	VOCs	1	Annual	FDEP FS 2200
OLD-436-11CR	Groundwater	27-32	VOCs	1	Annual	FDEP FS 2200
OLD-436-18CR	Groundwater	26-31	VOCs	1	Annual	FDEP FS 2200
OLD-436-23CR	Groundwater	28-33	VOCs	1	Annual	FDEP FS 2200
OLD-436-35CR	Groundwater	29-34	VOCs	1	Annual	FDEP FS 2200
OLD-436-36CR	Groundwater	29-34	VOCs	1	Annual	FDEP FS 2200
SA 36 Field Duplicates						
Duplicate 1 (Well ID TBD)	Groundwater	TBD	VOCs	1	Annual	FDEP FS 2200
Duplicate 2 (Well ID TBD)	Groundwater	TBD	VOCs	1	Annual	FDEP FS 2200

¹ One field duplicate sample shall be collected from a Zone B location and one field duplicate sample shall be collected from a Zone C location during each sampling event. Each field duplicate sample should be biased toward selecting the most impacted well from that zone based on historical site data to maximize the quality of the data generated from the duplicate samples.

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SA 36NW/SA 38

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Update on Environmental Actions In Baldwin Park Neighborhood

Naval Training Center Orlando, Florida



This fact sheet was prepared to inform interested citizens about the former Naval Training Center (NTC) Orlando environmental program. Fact sheets are distributed as needed to keep the community updated on clean up progress. Additional information may be obtained by calling Mark Davidson at (843) 743-2124.

Environmental Studies in the Baldwin Park Neighborhood

Environmental studies and cleanup actions are ongoing in the Baldwin Park Neighborhood of the former Naval Training Center (NTC) Orlando (see Figure 1). These studies have identified benzene and other petroleum related products in groundwater (the water deep below the ground surface). While the studies completed to date do not show any health concerns associated with this contamination, the Navy is completing additional studies to further ensure the health and safety of the community.

This fact sheet has been prepared to share the results of these environmental studies, to briefly summarize the history of the investigations, share information about upcoming activities, and invite you to contact us with any questions or concerns.

History of the Site

In November 1993, as part of routine sampling required to ensure the integrity of underground fuel tanks, benzene and other petroleum products were found in groundwater samples near the base service station. In response, three 20,000-gallon underground fuel tanks were removed in 1994. Cleanup included removing approximately 126,900 gallons of fuel and contaminated water and approximately 1,115 cubic yards of contaminated soil. Cleanup was completed with approval from the state; no further cleanup was required or planned. Because the base was still operational, three new 20,000-gallon, double-walled, fiberglass underground fuel tanks were installed. The installation also included a concrete secondary containment structure, level indicators, and over-fill protection.

Between 1995 and 1999 the base closure was completed. There was no known contamination at the time of transfer and the property was transferred to the City of Orlando without restrictions. In 1999, as part of the base closure, the base service station was taken out of service by pumping out the underground fuel tanks and dispenser lines and filling the tanks with sand. There were no indications of any petroleum contamination at that time.

In 2002, as part of preparations for developing the site, the property development company identified petroleum contaminants in soil and groundwater near the former filling station. Aggressive cleanup efforts followed, including the removal of the underground fuel tanks and recovery and treatment of nearly 3 million gallons of contaminated groundwater, and removal of over 2,200 tons of petroleum contaminated soil.

These efforts successfully cleaned up the groundwater near the surface (approximately 16 feet below the ground). However, benzene from the tanks was detected in deeper groundwater (35 to 55 feet below ground surface) flowing to the east.



Figure 1. Location Map

Location of Clean up

The area being studied is shown on Figures 1 and 2. A gasoline service station, operated by the former NTC Orlando, was located within this area of investigation between what are now 1276 and 1352 Fern Avenue.

What is Benzene?

Benzene is a colorless liquid that smells like gasoline. It evaporates at room temperature and burns easily. Benzene occurs naturally in coal tar and petroleum. It is also found in commonly used products like paints, inks, gasoline and other motor fuels, and insecticides. People are exposed to benzene by inhaling gasoline vapors, working with carpet glue, varnish, and paints, and through the use of tobacco products.

CTC SUMMARY

NTC Orlando
NORM SITE
Study Area (SA) 36NW/38
CTC: \$ 1,500,000
Reference to NORM information updated 08 October 2009

Acreage: Undefined

Current Land Use: Residential

Location: SA 36NW is in the vicinity of Fern Avenue, Virginia Drive, Hopper Lane and New Broad Street. SA 38 is in the vicinity of New Broad Street and Common Way Road

FDEP Oculus Number: DOD_14_2041 (SA 38)

Background information: The property was transferred in October 1999 and believed to be uncontaminated. In April 2002, pre-development activities identified petroleum contaminants in soil and groundwater near the former location of Building 109. Aggressive remedial efforts conducted between July and September 2002 included the recovery and treatment of nearly 3 million gallons of contaminated groundwater and the excavation and disposal of over 2,200 tons of petroleum impacted soil.

The remedial efforts successfully cleaned up the shallow portion of the aquifer (16 feet below ground surface). However, deeper groundwater flowing to the east from the former release at the Main Base Auto Service Station resulted in benzene being detected in monitoring wells associated with the investigation of the chlorinated solvent plume at SA 36. At SA 36NW, the primary contaminants of concern are benzene and methyl-tert-butyl-ether; at SA 38, benzene is the primary COC.

Following a SA 38 site assessment completed in May 2010 it was recommended that SA 36NW and SA 38 be monitored as a single comprehensive site for future evaluations and reporting because it was determined that groundwater at both areas was impacted from a release at the former Main Base Auto Service Station. Starting in 2010, SA 36 NW and SA 38 have been combined into one study area.

Sources: A release of petroleum fuel from the former Main Base Auto Service Station (Facility No. 109) that was located to the northwest of SA 36.

Florida Groundwater Classification: Class II

Hydrogeology: Soil consists of gray to dark brown, predominantly quartz sand with varying amounts of silt and clay-sized grains, and shell fragments. An interval consisting of cemented fine sand, interbedded fine sand and silt, and indurated, cemented sand exists at a depth of from 15 to 25 feet below ground

surface (bgs). Beneath the cemented sand interval is another unit of brown to dark brown, sand and silty sand with some clay lenses, and an interval containing shell fragments at about 60 feet bgs. A water table lies at a depth of about 7 to 14 feet bgs across the site, with 5 to 6 feet of seasonal variation observed in some wells. The surficial aquifer extends to a depth of about 60 to 65 feet. Affected groundwater occurs within a single layer of the aquifer under the cemented sand layer at 30 to 35 feet bgs.

Hydraulic Conductivity: The hydraulic conductivity established in the SA 36NW site investigation averages 8.37 feet per day.

Receptors: Potential receptors include residents. Although there are currently no deed restrictions, a homeowners covenant was implemented by the developer. All residences use city water supply.

Nature and extent of contamination: Benzene, toluene, ethylbenzene, xylenes, and methyl-tert-butyl-ether concentrations in groundwater greater than the Florida GCTLs occur over an area of approximately 8 acres to a depth of 35 feet below ground surface.

Cleanup Methodology: A monitored natural attenuation (MNA) approach was implemented to address the groundwater plume. Modeling indicates that concentrations of contaminants will be below fresh surface water cleanup target levels (FSWCTLs) by the time the plume reaches surface water. The MNA approach is appropriate for petroleum contamination at low levels.

Concerns/Barriers to Site Closure: Residential development may interfere with remedial actions, the public may not agree with the proposed remedy; or GCTLs may not be met. There is also a potential impact to surface water.

Recent Events/Changes:

DATE	ACTIVITY
August 2008 to March 2013	Quarterly groundwater sampling (BFA)
August 2011	Supplemental Groundwater Investigation including two groundwater well installations (63C and 64C)
December 2011	Draft Final SAP submitted (TT)
December 2011	Final NAM Plan submitted (TT)
March 2012	Provisional NAM Plan approval (FDEP)
January 2013	Public Notice of Temporary Point of Compliance issued (TT)
June 2013 to present	Quarterly groundwater sampling (Solutions-IES)

**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
STUDY AREA 36 NW AND STUDY AREA 38**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 1 OF 2

Date	Event
1940 to 1947	United States Army
1947 to 1968	United States Air Force
1968 to 1999	United States Navy
1974	Construction of Building 109
November 1993	Benzene and other volatiles were detected in compliance wells at concentrations greater than GCTLs. (Virogroup, Inc.)
January 1994	Three 20,000-gallon unleaded gasoline USTs (installed in 1974) were removed by Environmental Recovery Inc. Cleanup included the removal of 126,900 gallons of fuel and contaminated water and 1,115 cubic yards of contaminated soil. Three new 20,000-gallon fiberglass tanks were installed in secondary containment with leak detection and overflow protection.
December 1994	Basewide Environmental Baseline Survey Report published (ABB-ES)
November 1995	Contamination assessment activities were conducted by ABB-ES to evaluate soil and groundwater conditions. No soil or groundwater contamination was detected.
December 28, 1995	Letter report submitted to FDEP (ABB-ES)
January 19, 1996	FDEP requested additional investigation
March 1996	Main Base CAR submitted (ABB-ES)
July 1996	Two wells were installed and sampled. No contamination detected. (ABB-ES)
October 30, 1996	Contamination Assessment Report (CAR) requesting NFA submitted by ABB-ES
November 19, 1996	200 Gallon UST removed from east side of Building 109 by PWC. NFA requested.
November 25, 1996	FDEP approved NFA
February 25, 1999	1000-gallon waste oil AST removed by Environmental Detachment Charleston. Clean closure.
September 9, 1999	FDEP approved CAR and clean closure.
October 1999	Property transferred
March 8, 2000	Three 20,000-gallon gasoline USTs and associated piping were emptied, cleaned, capped, and closed in place (as part of Base closure) by EEG.
April 7, 2000	Submittal of the UST Closure Report for Building 109 recommending NFA
August 2000	Building 109 demolished
October 2001	Development of Baldwin Park Infrastructure initiated
March/April 2002	Pre-development activities identified petroleum contaminants in soil and groundwater near the former Building 109. Assessment activities included soil sampling, temporary well installation, and groundwater sampling. (Nodarse)
April 26, 2002	Submittal of Limited Contamination Assessment Report.
May 24, 2002	Request for Alternative Procedures submitted. (Nodarse)
June 11, 2002	Submittal of Addendum to the Request for Alternative Procedures (Nodarse)
July 15, 2002	Submittal of Revised Source Removal/Interim Measures Plan.
July through September 2002	Aggressive remedial efforts including recovery and treatment of nearly 3 million gallons of contaminated groundwater and the excavation and disposal of over 2,200 tons of impacted soil. (Nodarse)

**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
STUDY AREA 36 NW AND STUDY AREA 38**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 2 OF 2

February 4, 2003	Submittal of Source Removal Report requesting NFA.
April 14, 2003	FDEP letter requiring investigation of deeper portion of the aquifer. The letter noted that a work plan to investigate benzene identified at SA 36 had already been submitted by TtNUS that included investigating the deeper portion of the aquifer.
May 15 through 16, 2003	SA 36NW deep groundwater investigation: Direct Push Technology (DPT) sampling used to screen locations for new wells. (TtNUS)
September 2003	Deep groundwater investigation at SA 36 NW: Seven wells (MW-38C through MW-44C) installed and sampled.
March 2004 to March 2008	Quarterly groundwater monitoring performed by Terraine.
August 2004	Deep well MW-40D was abandoned and replaced with MW-46D during the deep groundwater investigation. Additional downgradient well MW-45C installed. (TtNUS)
April 2005	Two wells MW-47C and MW-48C installed and sampled to complete plume delineation during the deep groundwater investigation (TtNUS).
December 2005	Initial Notice of Contamination Beyond Boundaries submitted to FDEP
January 2006	Final Site Assessment Report for SA 36NW submitted (TtNUS)
May 2007	Work Plan for Contamination Source Investigation at SA 38 submitted (TtNUS)
June 2007	<ul style="list-style-type: none"> -Advanced 4 soil borings (SB01 through SB04) -Continuously cored borings SB01 through SB04. -Groundwater profile samples (VOCs) collected from SB01 - SB04 -Installed 7 MWs (nested pairs in SB02 through SB04) -Sampled new wells OLD-38-49D, -50C, -51D, -52C, -53D, -54C, and 55D for VOCs and TPH -Sampled New Broad Street Pond (SA38-SW-1)
August 2007	Installed and sampled wells 56C, 57A, and 58 (3 channel CMT)
September 2007	Results of groundwater sampling presented to OPT
April 2008	Addendum No.1 to Work Plan (TtNUS)
April to June 2008	Advanced borings SB05 through SB16 soil coring, groundwater profile sampling installed and sampled wells 59C, 60C, 61C, 62D
August 2008 to March 2013	Quarterly groundwater sampling (BFA)
September 2009	Draft Site Assessment Report for SA 38 submitted December 28, 2009
May 2010	Final Site Assessment Report for SA 38 submitted (TT)
August 2010	SA 36NW Fact Sheet updated
July 2011	Draft SAP submitted (TT)
August 2011	Supplemental Groundwater Investigation including two groundwater well installations (63C and 64C were installed in proximity to wells 62D and 61C)
December 2011	Draft Final SAP submitted (TT)
December 2011	Final NAM Plan submitted (TT)
March 2012	Provisional NAM Plan approval (FDEP)
January 2013	Public Notice of Temporary Point of Compliance issued (TT)
June 2013 to present	Quarterly groundwater sampling (Solutions-IES)

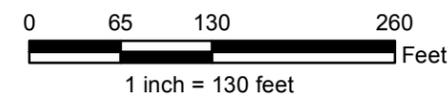


Legend

Monitoring Well

- Zone A - Shallow
- Zone B - Upper Intermediate
- Zone D - Deep, unconfined
- Zone D - Deep, semi-confined

- Study Area 36 NW Boundary
- Parcel Boundary



Basemap Sources: Esri World Imagery
http://services.arcgis.com/arcgis/services/World_Imagery
 © 2011 Esri, I-cubed, USDA FSA, USGS, AEX, GeoEye,
 AeroGRID, Getmapping, IGP
 Orange County GIS

FIGURE 2-2
 SITE LAYOUT/WELL LOCATION MAP
 Study Area 36NW
 McCoy Annex
 Orlando, Florida



REQUESTED BY: OggerID	DATE: 1/2/2013
DRAWN BY: MartinM	TASK ORDER NUMBER: JM22

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SAP Worksheet No.18 -- Sampling Locations and Methods/SOP Requirements Table

(UFP-QAPP Manual Section 3.1.1)

18.1 SA 36NW SAMPLING LOCATION AND METHODS

Well Number	Matrix	Screen Interval	VOCs	TRPH	Number of Samples (identify field duplicates)	Sampling Frequency	Sampling SOP Reference
MW-38C	Groundwater	30-35	x	x	1	Semi-annual	FT 1000 FS 2200
MW-48C	Groundwater	31-36	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-38-51D	Groundwater	45-50	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-38-52C	Groundwater	35-40	x	--	1	Semi-annual	FT 1000 FS 2200
OLD-38-54C	Groundwater	35-40	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-38-55D	Groundwater	45-50	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-38-58 (C-2)	Groundwater	40-45	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-38-59C	Groundwater	35-40	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-38-60C	Groundwater	30-35	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-38-61C	Groundwater	30-35	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-38-62D	Groundwater	55-60	x	x	1	Semi-annual	FT 1000 FS 2200
OLD-38-TBD	Groundwater	Est. 40-45	x	x	1	Quarterly	FT 1000 FS 2200
OLD-38-TBD	Groundwater	Est. 55-60	x	x	1	Quarterly	FT 1000 FS 2200
OLD-38-TBD	Groundwater	Est. 30-35	x	x	1	Quarterly	FT 1000 FS 2200

Project-Specific SAP

Site Name/Project Name: SA 36NW
Site Location: NTC Orlando, Florida

Long Term Monitoring SAP for SA 36NW

Revision: 0
July 2011
Worksheet 18

Well Number	Matrix	Screen Interval	VOCs	TRPH	Number of Samples (identify field duplicates)	Sampling Frequency	Sampling SOP Reference
OLD-38-TBD	Groundwater	Est. 30-35	x	x	1	Quarterly	FT 1000 FS 2200
OLD-38-TBD	Groundwater	Est. 30-35	x	x	1	Quarterly	FT 1000 FS 2200
Duplicate 1 (Well ID TBD)	Groundwater	TBD	x	x	1	Quarterly	FT 1000 FS 2200
Duplicate 2 (Well ID TBD)	Groundwater	TBD	x	x	1	Quarterly	FT 1000 FS 2200

SA 39

Main Base

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CTC SUMMARY

NTC Orlando
NORM AOC Group 1
Study Area (SA) 39 – Hazardous Material Storage
CTC: \$255,000
Reference to NORM information updated 08 October 2009

Acreage: 12.88

Current Land Use: Residential

Location: SA 39 is located at the intersection of Fox Street and Fern Avenue.

FDEP Oculus Number: DOD_14_2044

Background information: Site screening activities began in 1996 and the Site Screening Report was submitted in 1999. Additional site investigation activities were conducted between July 1999 and March 2000 and a Site Investigation Report was submitted in August 2000. The primary chemical of concern was the chlorinated solvent tetrachloroethene (PCE) in groundwater. An Interim Remedial Action was implemented in September 2000 and consisted of vegetable oil injection and groundwater monitoring.

The property was transferred to the City of Orlando in December 2002 as part of the Baldwin Park housing development. Residences were constructed on the property overlying the existing groundwater contaminant plume.

The selected site remedy of long-term monitoring and Land Use Controls was approved in the Decision Document in August 2006. Annual groundwater monitoring has occurred at the site following the August 2007 approval by FDEP to reduce the sampling frequency from semi-annual. In April 2011 a Technical Memorandum – Recommendation for Reduction in LTM Monitoring was submitted to FDEP. Following the review by FDEP, some of the recommendations took effect. The number of chemical analyses of groundwater was reduced as well as the number of wells sampled and monitored for water levels. This reduction took effect with the September 2011 annual groundwater monitoring event.

Sources: Contamination was attributed to past site practices. The property included a coal storage/staging facility and a hazardous materials storage facility. A small, off-site landfill that lay to the north may have extended into the northwest corner of the site.

Florida Groundwater Classification: Class II

Hydrogeology: Near-surface soils are light-colored, fine to medium grained, loose sand with some silty layers. With increasing depth, the color becomes darker and grain size increases. A very dense layer lies about 25 to 30 feet below the surface. Layers of silty clay are encountered at depths of 80 feet.

Groundwater lies 10 to 12 feet below ground surface and the affected groundwater lies at depths between 10 and 30 feet. Recharge is from direct precipitation recharge. Groundwater flow is to the east and southeast, toward Lake Gear.

Hydraulic Conductivity: Hydraulic conductivity test results from the 1999 site investigation of the surficial aquifer showed a range of 2.88 to 5.76 ft/day for the six wells tested with an average value of 4.11 ft/day. Historically, the direction of groundwater flow at SA 39 for all depths monitored in the surficial aquifer has been east-southeast.

Receptors: The property was developed for residential use. Potential risk was addressed through the implementation of LUCs prohibiting the use of groundwater.

Nature and extent of contamination: Chlorinated solvents in groundwater greater than the Florida GCTLs occurred over an area of approximately 0.43 acre to a depth of approximately 30 feet. The affected groundwater was in the southeast corner of the site.

Cleanup Methodology: Remedial cost was based on soil removal to remove the source of contamination to groundwater, and vegetable oil injection to enhance reductive dechlorination. LUCs prohibiting groundwater use were applied because groundwater contaminants were above the Florida GCTLs. The exit strategy is to meet Florida GCTLs for groundwater. Regulatory requirements drive groundwater cleanup.

Concerns/Barriers to Site Closure: If the degradation process stalls, GCTLs may not be met.

Recent Activity

Remediation goals were achieved in September 2010 and confirmed in September 2011. A Site Rehabilitation Completion Report (SRCR) was submitted in May 2013. No Further Action approval was received in September 2013.

DATE	ACTIVITY
September 2010	Annual groundwater monitoring
April 2011	BFA submitted a Technical Memorandum, Recommendation for Reduction in LTM Monitoring, Study Area 39.
August 2011	FDEP submitted a review and approval of parts of the Technical Memorandum, Recommendation for Reduction in LTM Monitoring.
September 2011	Annual groundwater monitoring (reduced per recommendations)
January 2012	FDEP requested submittal of SRCR
May 2013	SRCR submitted to FDEP (TT)
September 2013	FDEP approved SRCR; issued NFA
October 2013	Site monitoring wells were abandoned

**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
STUDY AREA 39 – MAIN BASE**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

Date	Event
1940 to 1947	Site used by the United States Army
1947 to 1968	Site used by the United States Air Force
1968 to 1999	Site used by the United States Navy
December 1994	Environmental Baseline Survey Report (ABB-ES)
January 1996 – September 1997	Site Screening Field Investigation (HLA)
April 1999	Site Screening Report (HLA)
July 1999 - March 2000	Site investigation fieldwork performed
August 2000	Site Investigation Report (TtNUS)
April - July 2001	Soil removal and off-site disposal (Nodarse)
2001	Soil Remediation Report (Nodarse)
September 2000	Installation of wells and injection points for groundwater IRA (CCI)
October 2000	Baseline IRA groundwater sampling
December 2000	Initial vegetable oil injection (CCI)
February, June, and September 2001	Quarterly IRA groundwater sampling (CCI)
November 2001	Second vegetable oil injection (CCI)
December 2001	All site monitoring wells abandoned for Baldwin Park development (CCI)
April - May 2002	Replacement monitoring wells installed
May 2002 - March 2003	IRA groundwater monitoring resumed (CCI)
June and July 2004	Installation and initial sampling of Zones B and C well pairs three near Lake Gear (CCI)
June 2003 - December 2004	IRA Monitoring (Nodarse)
March 2003 – September 2005	Quarterly Groundwater Monitoring. (Terraine)
January 2006	FDEP approval letter to reduce groundwater monitoring frequency to semi-annual.
March 2006 – September 2007	Semi-annual Groundwater Monitoring. (Terraine)
April 2006	Final Decision Document submitted
August 2006	FDEP approved Decision Document
August 2007	FDEP approval letter to reduce groundwater monitoring frequency to annual.
September 2008 – September 2011	Annual groundwater monitoring (BFA)
April 2011	Technical Memorandum for Reduction in LTM Monitoring, Study Area 39 (BFA).
August 2011	FDEP approval of reduction in LTM Monitoring.
January 2012	FDEP requested completion and submittal of Site Rehabilitation Completion Report (SRCR)
May 2013	SRCR submitted to FDEP (TT)
September 2013	FDEP approved SRCR; issued NFA
October 2013	Site monitoring wells were abandoned



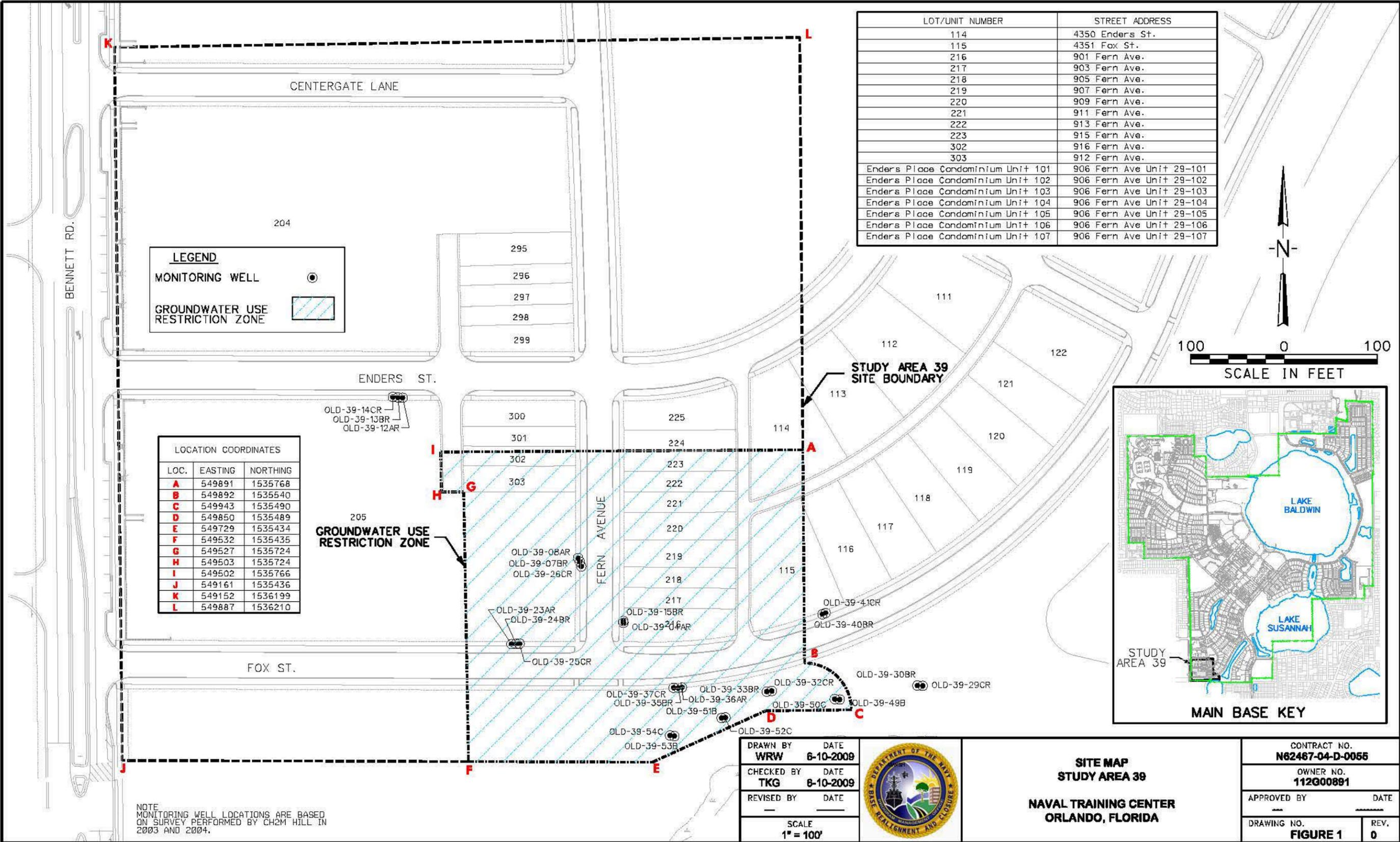
DRAWN BY JFF	DATE 10-27-06
CHECKED BY TKG	DATE 10-27-06
REVISED BY ---	DATE -----
SCALE AS NOTED	



**AERIAL SITE MAP
STUDY AREA 39 - MAIN BASE**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

CONTRACT NO. N62467-04-D-0055	
OWNER NO. 00131	
APPROVED BY ---	DATE -----
DRAWING NO. FIGURE 1	REV. 0



LOT/UNIT NUMBER	STREET ADDRESS
114	4350 Enders St.
115	4351 Fox St.
216	901 Fern Ave.
217	903 Fern Ave.
218	905 Fern Ave.
219	907 Fern Ave.
220	909 Fern Ave.
221	911 Fern Ave.
222	913 Fern Ave.
223	915 Fern Ave.
302	916 Fern Ave.
303	912 Fern Ave.
Enders Place Condominium Unit 101	906 Fern Ave Unit 29-101
Enders Place Condominium Unit 102	906 Fern Ave Unit 29-102
Enders Place Condominium Unit 103	906 Fern Ave Unit 29-103
Enders Place Condominium Unit 104	906 Fern Ave Unit 29-104
Enders Place Condominium Unit 105	906 Fern Ave Unit 29-105
Enders Place Condominium Unit 106	906 Fern Ave Unit 29-106
Enders Place Condominium Unit 107	906 Fern Ave Unit 29-107

LEGEND

MONITORING WELL

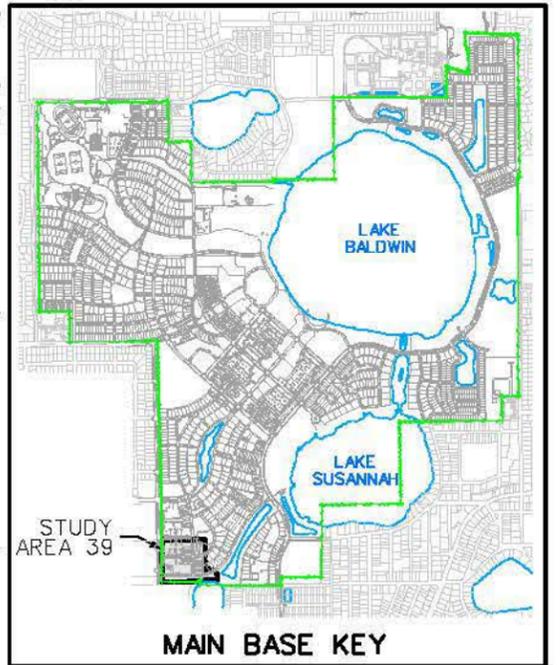
GROUNDWATER USE RESTRICTION ZONE

LOCATION COORDINATES

LOC.	EASTING	NORTHING
A	549891	1535768
B	549892	1535540
C	549943	1535490
D	549850	1535489
E	549729	1535434
F	549532	1535435
G	549527	1535724
H	549503	1535724
I	549502	1535766
J	549161	1535436
K	549152	1536199
L	549887	1536210

100 0 100

SCALE IN FEET



NOTE
MONITORING WELL LOCATIONS ARE BASED
ON SURVEY PERFORMED BY CH2M HILL IN
2003 AND 2004.

DRAWN BY WRW	DATE 6-10-2009
CHECKED BY TKG	DATE 6-10-2009
REVISED BY	DATE
SCALE 1" = 100'	



SITE MAP
STUDY AREA 39

NAVAL TRAINING CENTER
ORLANDO, FLORIDA

CONTRACT NO. N62467-04-D-0055	
OWNER NO. 112G00891	
APPROVED BY	DATE
DRAWING NO. FIGURE 1	REV. 0

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SA 56/Bldg 148

Area C SW

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Update on Environmental Actions at Area C SW

Former Naval Training Center
Orlando, Florida



This fact sheet was prepared to inform interested citizens about the former Naval Training Center (NTC) Orlando environmental program. Fact sheets are distributed as needed to update the community on clean-up activities. Additional information may be obtained by calling David Criswell, Navy BRAC Environmental Coordinator at (843) 743-2130.

Area C is the former industrial area located on the southeast shore of Lake Druid just north of E. Colonial Dr. and west of Maguire Blvd. in Orlando, FL. Area C was included in the Naval Training Center (NTC) Orlando property transfers following base closure in 1999. Area C SW is a 19.73 acre parcel in the southwest portion of Area C that was transferred to the City of Orlando (the City) in January 2009 through the Federal Lands to Parks Program of the United States Department of Interior, National Park Service, for Public Park and public recreation area purposes.

The City plans to develop this property into Lake Druid Park. However, environmental studies conducted following property transfer have identified polynuclear aromatic hydrocarbons (PAHs) and the pesticide dieldrin in soil at concentrations exceeding Florida Department of Environmental Protection (FDEP) Soil Cleanup Target Levels (SCTLs) within Area C SW. Park construction is on hold until impacted soil within the area is addressed.

This fact sheet has been prepared to share the results of the environmental studies, provide information about upcoming cleanup activities, and invite you to contact us with any questions or concerns.



Figure 1. Area C SW Location Map

(Source: Orange County, Florida GIS, January 2012)

History of the Site

Area C was developed in 1942 to provide support services for the Orlando Air Force Base. Prior to that time, the property was undeveloped. The U. S. Navy acquired the property on July 1, 1968. Area C was used to provide support services and warehousing for NTC Orlando until it

was closed in April 1999. The area was last used as an office and storage space for base closure operations and for storage and vehicle maintenance.

As part of base closure activities, environmental studies were performed to determine potential impacts from past site operations. A BRAC Environmental Baseline Survey was completed by the Navy in 1994. Areas of concern were identified within the property and further site assessment was recommended. Site assessment activities, including soil and groundwater sampling, were conducted by the Navy. PAHs in soils within approximately one-quarter acre south of Seabee Street exceeded the SCTL established for residential property and were excavated and removed in 2004. Following the soil excavation activities, the Finding of Suitability for Transfer and Environmental Baseline Survey for Transfer Addendums completed in 2006 concluded that the area was suitable for residential reuse.

What are PAHs and dieldrin?

Polynuclear Aromatic Hydrocarbons (also known as Polycyclic Aromatic Hydrocarbons or PAHs) are chemicals that naturally occur in organic deposits such as oil, coal, and tar. In addition to their presence in fossil fuels, they are also formed by incomplete combustion of carbon-containing fuels such as wood, coal, diesel, fat, tobacco, and incense. PAHs are one of the most widespread organic pollutants.

Dieldrin is a synthetic chemical that was widely used to control insects from the 1950s until 1970.

A baseline assessment of Area C SW was completed by the City prior to transfer of the property. The Baseline Assessment Report, dated 2007, identified dieldrin in soil in the area of Building 148 but concentrations were well below the Residential SCTL.

Building 148, formerly located at the west end of Seabee Street, was built in 1942, and was erected on an elevated concrete slab supported by soil so that the floor of the building was level with the truck loading dock along the front of the building. The 7,000 square foot building was originally used by the USAF to store paints, oils, and photographic supplies. It later served as a cold storage facility for food service at the NTC Orlando Main Base.

Building 148 was demolished by the City in May 2011 in preparation for park site development. Following

demolition, foundation soils which had been used to raise the building to accommodate the loading dock were sampled by the City prior to disposal. The Navy was notified on July 22, 2011 that soil sampling results from the Building 148 foundation soils indicated concentrations of PAHs and dieldrin greater than Residential SCTLs. The Navy confirmed the presence of soil contamination in September 2011 and properly disposed of the soil off-site in March 2012. Further sampling by the Navy of soil beneath and in the vicinity of the former Building 148 indicated the presence of PAHs and dieldrin at concentrations above Residential SCTLs in surface and subsurface soil.

estimate of over 9,500 cubic yards of soil is proposed for excavation and offsite disposal. Excavation activities are planned to begin in the late fall of 2013 and continue through winter of 2014. The excavation will be backfilled with clean soil, which will be pre-tested to meet FDEP Residential SCTLs before use, and then the area will be seeded for erosion control. Over 1,000 dump truck trips are anticipated to transport contaminated soil off site and bring in clean fill. Trucks will not utilize Coy Drive or other neighborhood streets for site access. A portion of Cady Way Trail west of Maguire Blvd. and adjacent to Coy Drive will be closed during excavation, although this closure will be minimized to the extent possible.

Cleanup Target Levels
<p>Residential Soil Cleanup Target Levels (SCTLs) are chemical values that the FDEP has determined are safe for unrestricted direct exposure by children and adults.</p>
<p>Groundwater Cleanup Target Levels (GCTLs) were primarily developed for the protection of human health and are calculated using a lifetime excess cancer risk of one in a million. Some GCTLs are based on aesthetic factors including altered taste, odor, or color of the water.</p>

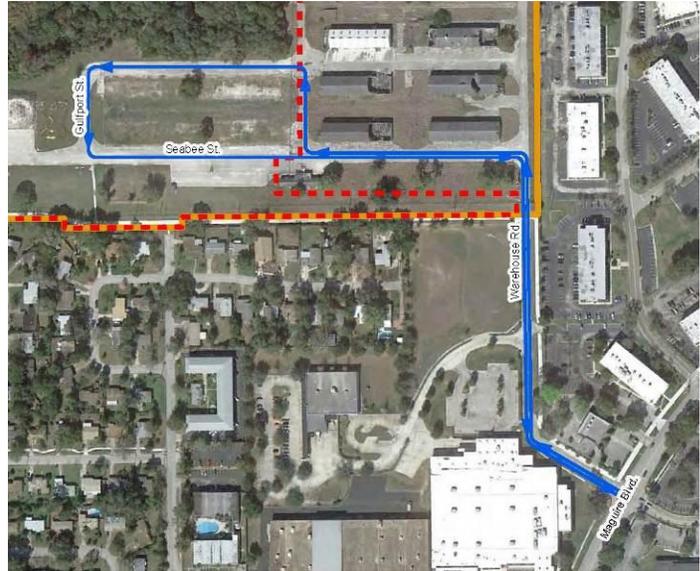


Figure 2. Truck Route

Soil samples were also collected by the City south of Seabee Street in 2011, in areas surrounding the previous removal effort. Concentrations of PAHs greater than FDEP Residential SCTLs were detected in soil, prompting additional soil investigation activities by the Navy in the southern portion of the property. From May 2012 through June 2013, further soil sampling was completed by the Navy at Area C SW with the objective of delineating soil impacts. A total of 769 samples were analyzed for PAHs.

Following excavation, the Navy will install groundwater monitoring wells in and around the excavated areas. Groundwater sample results from these monitoring wells will be evaluated to determine if groundwater has been impacted by overlying contaminated soils. If contaminants of concern are not detected or are detected at concentrations below the FDEP GCTLs in the groundwater samples, then a minimum of one year of monitoring will be completed before the site is recommended for no further action.

Current Environmental Conditions

PAHs have been detected at concentrations greater than Residential SCTLs in soil samples in the vicinity of former Building 148 and across large areas of the Area C SW property. Dieldrin has also been detected at concentrations above the Residential SCTLs in the vicinity of former Building 148. The current extent of PAHs and dieldrin in soil has been delineated to the FDEP Residential SCTLs both horizontally and vertically. Contamination is mostly present in surface soil to a depth of 24 inches. Soil contamination at greater depths is present only in the area of the former Building 148.

If contaminants of concern are detected at concentrations above the FDEP GCTLs in the groundwater samples, then the Navy will conduct a site assessment to determine the nature and extent of groundwater contamination. Depending on the extent of groundwater contamination, the Navy will evaluate remedial alternatives to address the impacted groundwater. Site assessment and any proposed remedial activities will be coordinated with the City of Orlando Families, Parks & Recreation department.

Groundwater occurs at a depth of approximately 8 feet below the surface of the park property. Groundwater is closer to the surface near Lake Druid. This groundwater is not used as a drinking water source. Contaminant concentrations in filtered groundwater samples collected from temporary wells installed on the property during past investigations did not exceed FDEP Groundwater Cleanup Target Levels (GCTLs).

For More Information

If you have questions about the Navy’s environmental action at Area C SW or the environmental program at the former NTC Orlando in general, please contact David Criswell at (843) 743-2130 or david.criswell@navy.mil.

What’s Next?

The Navy is preparing to excavate soil that exceeds Residential SCTLs for PAH and dieldrin. A preliminary

CTC SUMMARY DOCUMENTATION

NTC Orlando
NORM AOC Group (TBD)
Study Area 56/Building 148 (Area C SW)
CTC: \$TBD
Reference to NORM information updated (TBD)
Acreage: 19.73

Current Land Use: Unused. Study Area 56/Building 148 (Area C SW) was transferred from the Navy to the City of Orlando in March 2009 through the Federal Lands to Parks Program of the United States Department of Interior, National Park Service, for public park and public recreation area purposes.

Location: Located northeast and southeast of the intersection of Coy Drive and Seabee Street (western-most intersection of these streets).

Background information: Building 148 and SA 56 are located in Area C Southwest (SW). Building 148 was a Former Cold Storage Warehouse and has historically been referred to as SA 11. SA 56 encompasses the southern part of Area C SW, including Building 1104 (Former Hazardous Material Storage Building), referred to as SA 55. Area C was used to provide support services and warehousing for NTC Orlando up until NTC Orlando was closed in April 1999 as part of the Defense BRAC Act of 1990. The area was last used as an office and storage space for base closure operations and for storage and vehicle maintenance by the Veteran's Administration. Area C SW was transferred to the City of Orlando in January 2009 for public park and recreation area purposes. SA 56 is proposed for development as a play area, playground, community garden, and dog run (see Lake Druid Park Master Plan).

Soil sampling by the City of Orlando's environmental consultant, PSI, in May and August 2011 indicated PAHs were present in soil in Building 148/SA 56, with dieldrin also present in soil at Building 148, at concentrations exceeding residential criteria. The Navy was notified and delineation of these soil impacts by the Navy was completed in May 2013. Soil excavation is anticipated in late Fall 2013.

Building 148/SA 56 Remedial Status

In February 2004, soil excavation was conducted in SA 55 to remove PAH-contaminated soils exceeding residential criteria. Building 148 was demolished in May 2011. The building was erected on an elevated concrete slab, and following demolition, the soil beneath the slab was stockpiled and sampled prior to disposal by the City of Orlando's environmental consultant, PSI.

Sources: The specific source of carcinogenic PAHs and dieldrin contamination is unknown. Based on the distribution of dieldrin concentrations, with higher concentrations adjacent to and in the front of the building where deliveries would occur, the dieldrin may be related to routine pesticide spraying to control pests. PAHs beneath the former building footprint may be a result of a kerosene-based pesticide. The widespread distribution of PAHs across the site, with generally higher concentrations of carcinogenic PAHs adjacent to the roadways and parking areas, indicates some of the PAHs may be related to runoff from the asphalt or exhaust from motor vehicles. The former Building 148, SA 56, and surrounding areas were used for industrial operations prior to transferring ownership to the City of Orlando in January 2009.

Nature and Extent of Contamination: Contaminants of concern (COCs) in soil in Building 148/SA 56 are carcinogenic PAHs (i.e., BaP and the other six carcinogenic PAHs used in calculation of the BaP equivalents). Dieldrin is also a COC in the Building 148 area. Delineation of the extent of soil contamination is currently in progress. COCs in groundwater at the site are currently unknown. Groundwater sampling is planned to determine if groundwater contamination exists.

Florida Groundwater Classification: Class II

Hydrogeology: No permanent wells have been installed at Building 148/SA 56, and therefore, minimal hydrogeological data is available for the area. The groundwater level was reported to be 8 feet below land surface in the shallow microwell installed at SA 55 in August 1998. The groundwater flow direction determined from the three shallow temporary wells installed in November 2006 for the Baseline Survey of Area C SW was to the northwest toward Lake Druid. Water levels in these three wells were not measured relative to ground surface or to ground surface elevation, and therefore, the depth to water in these wells is unknown. The hydrogeology may be similar to OU 4 which is located northeast of Building 148/SA 56

Hydraulic Conductivity: No permanent wells have been installed at Building 148/SA 56, and therefore, hydraulic conductivity information is unknown.

Receptors: Access to Building 148/SA 56 is currently controlled by a six-foot chain link fence installed on the east, west, and south perimeters of the site. There is a locked access gate at the southwest corner. Under the current land use, potential receptors to Area C contaminants include trespassers. Future land use scenarios may also include construction workers (particularly excavation and park construction) and recreators (children and adult). Future residential use of the site is prohibited by deed restrictions. Building 148/SA 56 provides minimal potential habitat for ecological receptors. The site

consists of an open area with dense trees to the north towards Lake Druid. The area to the south and southwest of former Building 148/SA 56 is residential.

Cleanup Methodology:

Soils identified with concentrations exceeding residential criteria will be excavated.

Concerns/Barriers to Site Closure: PAH contamination in soil extends to the Lake Druid shoreline, and also extends to the water table in one location beneath the former Bldg 148 footprint. There is a possibility that groundwater, surface water, and/or sediment may be impacted.

Recent Events/Changes:

DATE	ACTIVITY
March 2009	Area C SW transferred to City of Orlando via US Department of Interior
May 2011	Building 148 demolished by City of Orlando.
June 2, 2011	PAH and dieldrin contamination in soil reported by City of Orlando
June 2011	Limited Soil Sampling/Analysis Report, Building 148 (PSI). Samples collected May 2011 indicated PAHs and dieldrin in stockpiled soil from beneath building and dieldrin in one sample adjacent to pile exceeded residential criteria.
September 2011	Limited Soil Sampling/Analysis Report, Proposed Garden, Dog Run, and Playground, SA56 (PSI). Soil samples collected August 2011 exceeded residential criteria.
October 2011	Limited Soil Sampling/Analysis Report, Building 148 (Tetra Tech). Samples collected September 2011 from stockpiled soil exceeded residential, industrial, and leachability criteria for PAHs and pesticides. Determined unable to spread onsite.
January and February 2012	Soil sampling around perimeter of stockpiled soil by Tetra Tech and CH2MHill. PAHs and dieldrin exceeded residential criteria.
March 2012	Interim Source Removal Work Action Plan submitted
March 2012	Stockpiled soil disposed of offsite.
January 2012 - January 2013	Soil sampling to delineate extent of dieldrin contamination near Building 148 and PAH contamination near Building 148 and SA 56 (Tetra Tech).
April – May 2013	Soil sampling to delineate extent of PAH contamination near Building 148 and SA 56 (Resolution Consultants)
October 2013	Interim Source Removal Action Work Plan Addendum submitted

**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
STUDY AREA 56/ BUILDING 148 (AREA C SW)**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 1 OF 2

Date	Event
1942	United States Army
November 20, 1959	United States Air Force
July 1, 1968	United States Navy
December 1994	Submittal of Baseline Survey Report (ABB-ES)
July 1996	Initial Site Screening Report, SA 11 (ABB-ES). Two areas of concern at Building 148: 1) stained soil and stressed vegetation north and south ends of generator pad; and 2) abandoned 55-gallon drum north of northwest corner of the building. Soil sample at drum indicated no contamination; recommended drum removal. Stained soil/stressed vegetation area addressed in Tank Closure Assessment Report (January 4, 1996) with recommendation for no further assessment; approved by FDEP on March 12, 1996.
April 1999	NTC Orlando closed as part of the Defense BRAC Act of 1990
January 1999	Initial Site Screening Report, SA 55 (ABB-ES). Arsenic and BaP in surface soil exceed residential, but not industrial. Land use currently industrial, so no cleanup conducted. Groundwater sample from one microwell. No exceedances of GCTLs, but detection limits greater than GCTLs.
August 2000	Submitted EBST for Area C in preparation for property transfer to Veterans Administration (VA). VA subsequently declined the transfer.
March 2003	Finding of Suitability for Transfer (FOST) and EBST for South Area C. Documented South Area C, excluding SA 55, was suitable for transfer.
June 2004	SA 55 Site Investigation Report. Sampled soil for arsenic and PAHs and delineated extent of PAHs exceeding residential criteria in soil for removal. Included Tech Memo summarizing soil removal activities
June 2004	SA 55 Decision Document. Summarized investigations and concluded that following soil removal and clean fill replacement, surface soil meets Residential SCTLs and groundwater has not been impacted, and therefore, SA 55 was suitable for transfer for unrestricted use.
July 2006	FOST and EBST (Addendum1), Area C SW. FOST documented that Area C SW was suitable for transfer. EBST documented environmental condition of Area C SW; EBST considered addendum to March 2003 EBST for Area C, South as provided information available as of July 2006.

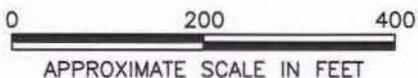
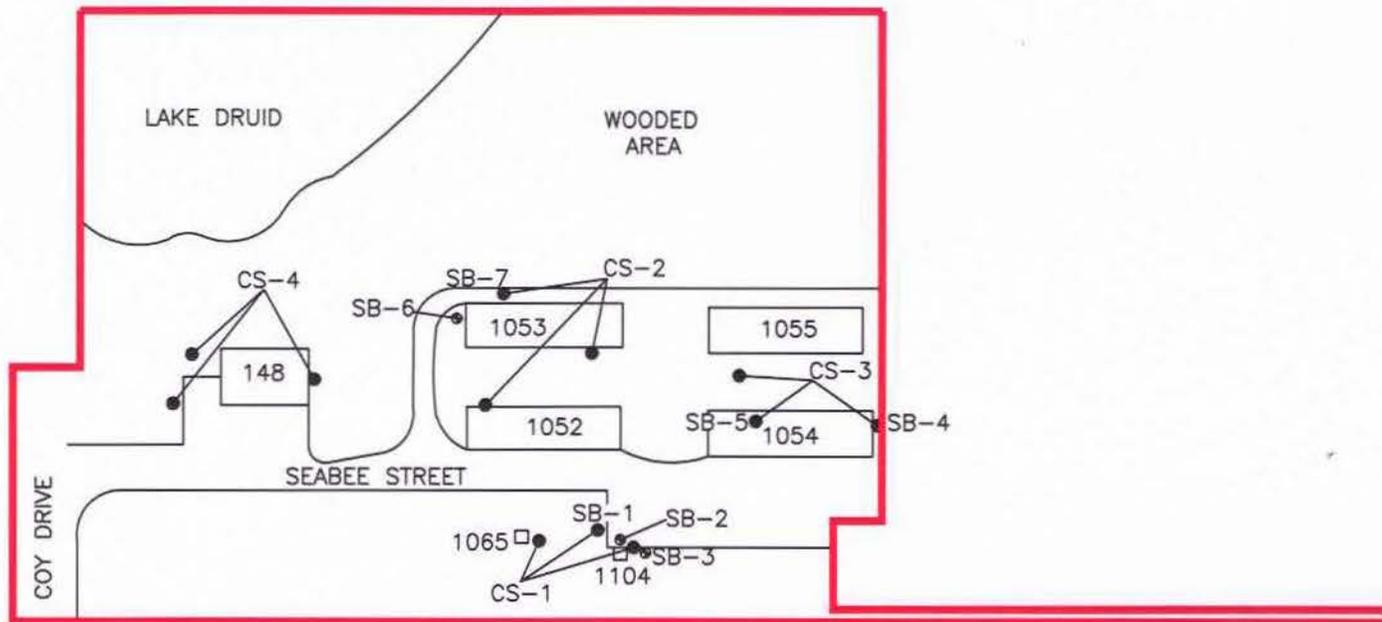
**CHRONOLOGICAL SUMMARY OF ENVIRONMENTAL ACTIVITIES
STUDY AREA 56/ BUILDING 148 (AREA C SW)**

**NAVAL TRAINING CENTER
ORLANDO, FLORIDA**

PAGE 2 OF 2

Date	Event
January 2007	Baseline Assessment Report (PSI, City of Orlando consultant). Collected soil and groundwater samples near Building 148 and SA56. Dieldrin exceeded leachability SCTL near Building 148. Groundwater not impacted.
March 2009	Transferred to the City of Orlando through the Federal Lands to Parks Program of the United States Department of Interior, National Park Service, for Public Park and public recreation area purposes.
May 2011	Building 148 demolished by City of Orlando.
June 2, 2011	PAH and dieldrin contamination in soil reported by City of Orlando
June 2011	Limited Soil Sampling/Analysis Report, Building 148 (PSI). Samples collected May 2011 indicated PAHs and dieldrin in stockpiled soil from beneath building and dieldrin in one sample adjacent to pile exceeded residential criteria.
September 2011	Limited Soil Sampling/Analysis Report, Proposed Garden, Dog Run, and Playground, SA56 (PSI). Soil samples collected August 2011 exceeded residential criteria.
October 2011	Limited Soil Sampling/Analysis Report, Building 148 (Tetra Tech). Samples collected September 2011 from stockpiled soil exceeded residential, industrial, and leachability criteria for PAHs and pesticides. Determined unable to spread onsite.
January and February 2012	Soil sampling around perimeter of stockpiled soil by Tetra Tech and CH2MHill. PAHs and dieldrin exceeded residential criteria.
March 2012	Interim Source Removal Work Action Plan submitted
March 2012	Stockpiled soil disposed of offsite.
January 2012 - January 2013	Soil sampling to delineate extent of dieldrin contamination near Building 148 and PAH contamination near Building 148 and SA 56 (Tetra Tech).
April – May 2013	Soil sampling to delineate extent of PAH contamination near Building 148 and SA 56 (Resolution Consultants)
October 2013	Interim Source Removal Action Work Plan Addendum submitted

PSI - Professional Service Industries, Inc.
Area C SW - Area C Southwest
PAH - polynuclear aromatic hydrocarbon
EBST - Environmental Baseline Survey for Transfer



LEGEND

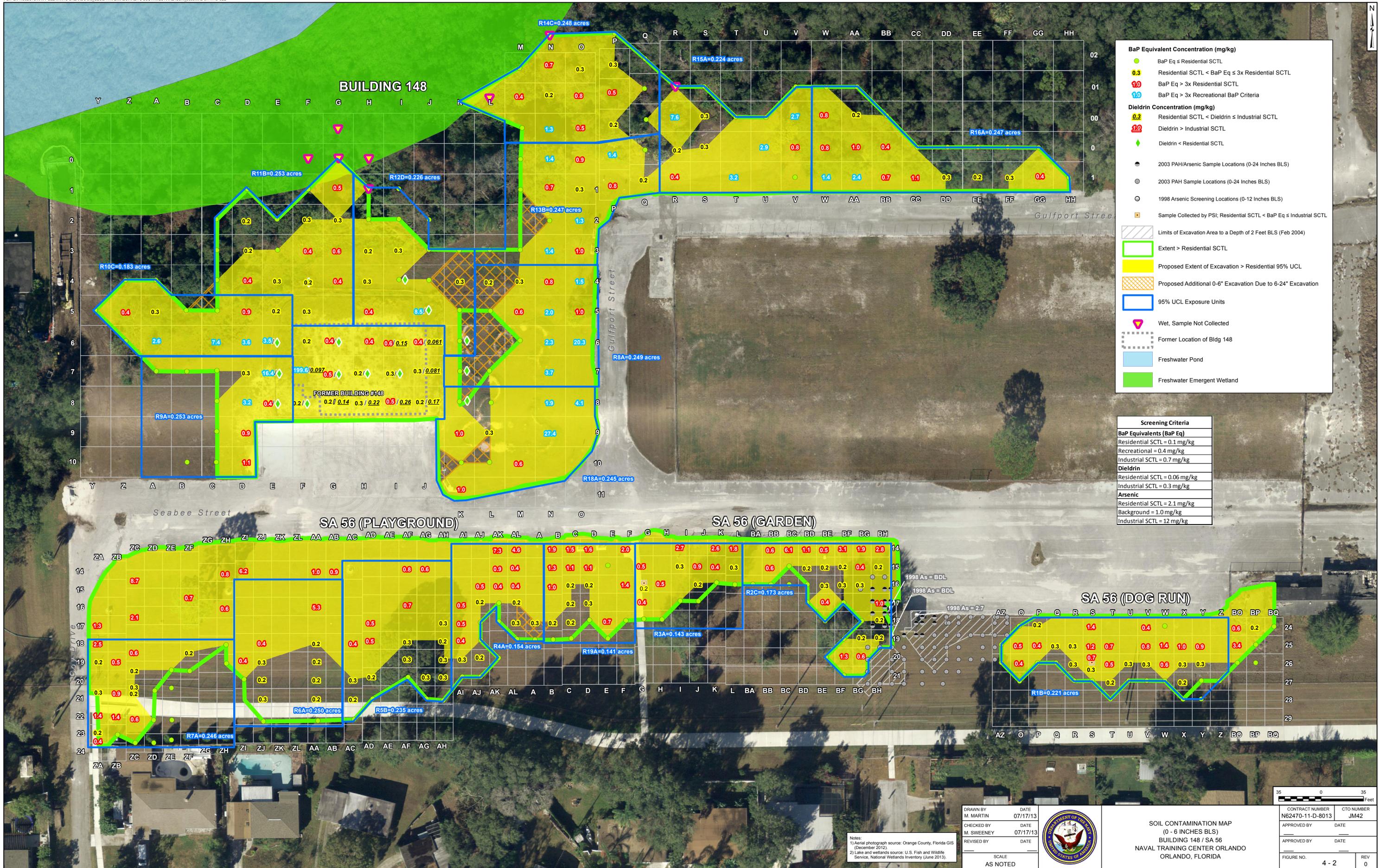
-  SUBJECT PROPERTY BOUNDARY
-  BUILDING NUMBER
-  APPROXIMATE COMPOSITE SOIL SAMPLE LOCATION
-  APPROXIMATE SOIL BORING LOCATION

SOIL SAMPLE LOCATION MAP
FORMER NAVAL TRAINING CENTER
AREA C SOUTHWEST
ORLANDO, ORANGE COUNTY, FLORIDA



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BaP Equivalent Concentration (mg/kg)

- BaP Eq ≤ Residential SCTL
- 0.3 Residential SCTL < BaP Eq ≤ 3x Residential SCTL
- 1.0 BaP Eq > 3x Residential SCTL
- 1.0 BaP Eq > 3x Recreational BaP Criteria

Dieldrin Concentration (mg/kg)

- 0.2 Residential SCTL < Dieldrin ≤ Industrial SCTL
- 1.0 Dieldrin > Industrial SCTL

- ◆ Dieldrin < Residential SCTL

- 2003 PAH/Arsenic Sample Locations (0-24 Inches BLS)
- 2003 PAH Sample Locations (0-12 Inches BLS)
- 1998 Arsenic Screening Locations (0-12 Inches BLS)
- Sample Collected by PSI: Residential SCTL < BaP Eq ≤ Industrial SCTL

- ▨ Limits of Excavation Area to a Depth of 2 Feet BLS (Feb 2004)
- ▭ Extent > Residential SCTL
- ▭ Proposed Extent of Excavation > Residential 95% UCL
- ▨ Proposed Additional 0-6" Excavation Due to 6-24" Excavation
- ▭ 95% UCL Exposure Units
- ◆ Wet, Sample Not Collected
- ▭ Former Location of Bldg 148
- ▭ Freshwater Pond
- ▭ Freshwater Emergent Wetland

Screening Criteria	
BaP Equivalents (BaP Eq)	
Residential SCTL =	0.1 mg/kg
Recreational =	0.4 mg/kg
Industrial SCTL =	0.7 mg/kg
Dieldrin	
Residential SCTL =	0.06 mg/kg
Industrial SCTL =	0.3 mg/kg
Arsenic	
Residential SCTL =	2.1 mg/kg
Background =	1.0 mg/kg
Industrial SCTL =	12 mg/kg

Notes:
 1) Aerial photograph source: Orange County, Florida GIS (December 2012).
 2) Lake and wetlands source: U.S. Fish and Wildlife Service, National Wetlands Inventory (June 2013).

DRAWN BY: M. MARTIN DATE: 07/17/13
 CHECKED BY: M. SWEENEY DATE: 07/17/13
 REVISED BY: DATE: _____
 SCALE: AS NOTED



SOIL CONTAMINATION MAP
 (0 - 6 INCHES BLS)
 BUILDING 148 / SA 56
 NAVAL TRAINING CENTER ORLANDO
 ORLANDO, FLORIDA

CONTRACT NUMBER N62470-11-D-8013	CTO NUMBER JM42
APPROVED BY: _____	DATE: _____
APPROVED BY: _____	DATE: _____
FIGURE NO. 4 - 2	REV 0



BaP Equivalent Concentration (mg/kg)

- BaP Eq ≤ Residential SCTL
- 0.3 Residential SCTL < BaP Eq ≤ 3x Residential SCTL
- 1.0 BaP Eq > 3x Residential SCTL
- 1.9 BaP Eq > 3x Recreational BaP Criteria
- 0.3 Sample Collected at 1 Foot and 2 Feet BLS, Highest Concentration Shown

Dieldrin Concentration (mg/kg)

- ◆ Dieldrin ≤ Residential SCTL
- ◆ 0.3 Residential SCTL < Dieldrin ≤ Industrial SCTL
- ◆ 1.0 Dieldrin > Industrial SCTL

- 2003 PAH/Arsenic Sample Locations (0-24 Inches BLS)
- 2003 PAH Sample Locations (0-24 Inches BLS)
- 1998 Arsenic Screening Locations (0-12 Inches BLS)

- ▨ Limits of Excavation Area to a Depth of 2 Feet BLS (Feb 2004)
- ▭ Extent > Residential SCTL
- ▭ Proposed Extent of Excavation > Residential 95% UCL
- ▭ 95% UCL Exposure Units
- Subsurface Soil Sample Collected At This Location
- ▭ Former Location of Bldg 148
- ▭ Freshwater Pond
- ▭ Freshwater Emergent Wetland

Screening Criteria

BaP Equivalents (BaP Eq)	
Residential SCTL	= 0.1 mg/kg
Recreational	= 0.4 mg/kg
Industrial SCTL	= 0.7 mg/kg
Dieldrin	
Residential SCTL	= 0.06 mg/kg
Industrial SCTL	= 0.3 mg/kg
Arsenic	
Residential SCTL	= 2.1 mg/kg
Background	= 1.0 mg/kg
Industrial SCTL	= 12 mg/kg

SUBSURFACE SOIL SAMPLE RESULTS

AREA	SAMPLE LOCATION	SAMPLE DEPTH	BaP Eq (mg/kg)
Bldg 148	C5	2-3'	0.1
	C5	3-5'	NC
	C9	2-3'	NC
	D5	3-5'	0.02
	D7	2-3'	0.3
	D9	2-3'	0.8
	D9	3-5'	0.06
	D10	2-3'	0.02
	E5	3-5'	0.4
	E6	2-4'	0.1
Playground	Z15	2-3'	0.1
	AB15	2-3'	NC
	AK14	2-3'	NC
	B16	2-3'	NC
	BH14	2-3'	NC
	Dog Run	Y26	2-3'
BO24		2-3'	0.03

SUBSURFACE SOIL SAMPLE RESULTS

AREA	SAMPLE LOCATION	SAMPLE DEPTH	BaP Eq (mg/kg)
Bldg 148	F6	5-7'	0.1
	F6	7-9'	NC
	F7	2-3'	0.7
	F7	3-5'	0.5
	F7	5-7'	0.2
	F7	7-8'	0.4
	F8	3-5'	42.8
	F8	5-7'	0.02
	F8	7-9'	0.08
	G7	3-5'	0.8
Bldg 148	G7	5-7'	0.1
	G7	7-9'	0.02
	H4	2-3'	0.1
	H4	3-5'	0.02
	I5	3-5'	0.5
	I5	3-5'	0.5

SUBSURFACE SOIL SAMPLE RESULTS

AREA	SAMPLE LOCATION	SAMPLE DEPTH	BaP Eq (mg/kg)
Bldg 148	I8	5-7'	NC
	J4	2-3'	NC
	J4	3-5'	NC
	J5	2-3'	0.7
	J5	3-5'	61.1/0.6
	J5	5-7'	0.03
	J6	3-5'	1.8
	K4	2-3'	NC
	K5	2-3'	6.3
	K5	3-5'	0.02
Bldg 148	K7	3-5'	3.4
	K7	5-7'	0.02
	K8	3-5'	NC
	L7	3-5'	0.3
	L10	2-3'	NC
	L10	2-3'	NC

SUBSURFACE SOIL SAMPLE RESULTS

AREA	SAMPLE LOCATION	SAMPLE DEPTH	BaP Eq (mg/kg)
Bldg 148	M7	2-4'	0.1
	O1	2-4'	NC
	O6	2-4'	0.02
	O9	2-3'	0.04
	S1	2-3'	NC
	S1	2-3'	NC

SUBSURFACE SOIL SAMPLE RESULTS

AREA	SAMPLE LOCATION	SAMPLE DEPTH	BaP Eq (mg/kg)
Bldg 148	S1	2-3'	NC
	S1	2-3'	NC

NC = BaP Eq not calculated (BDL)

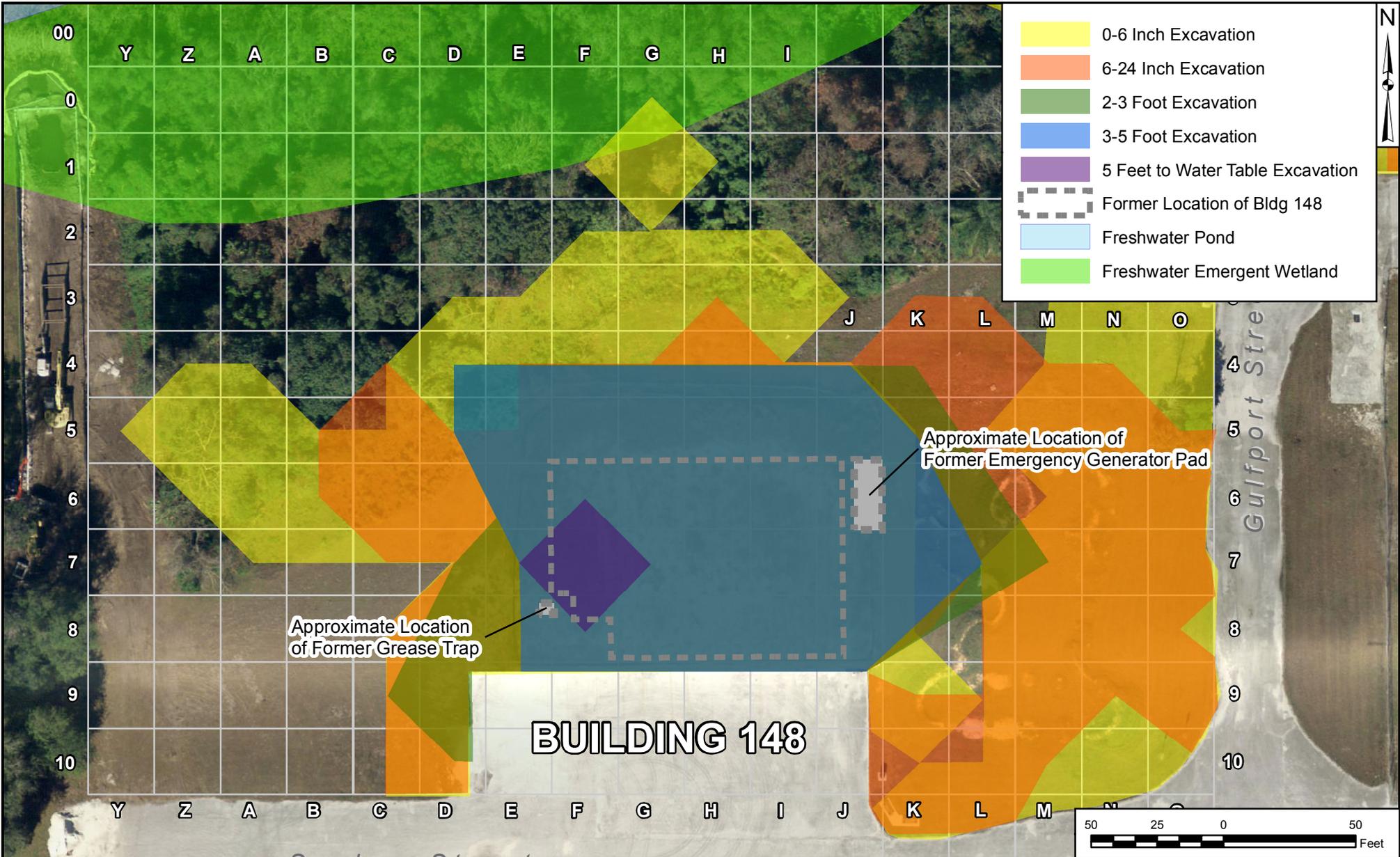
Notes:
1) Aerial photograph source: Orange County, Florida GIS (December 2012)

DRAWN BY: M. MARTIN DATE: 07/17/13
 CHECKED BY: M. SWEENEY DATE: 07/17/13
 REVISED BY: DATE: _____
 SCALE: AS NOTED



SOIL CONTAMINATION MAP
 (6-24 INCHES BLS)
 BUILDING 148 / SA 56
 NAVAL TRAINING CENTER ORLANDO
 ORLANDO, FLORIDA

CONTRACT NUMBER N62470-11-D-8013	CTO NUMBER JM42
APPROVED BY: _____	DATE: _____
APPROVED BY: _____	DATE: _____
FIGURE NO. 4-3	REV 0



Approximate Location of Former Grease Trap

Approximate Location of Former Emergency Generator Pad

BUILDING 148

Notes:
1) Aerial photograph source: Orange County, Florida GIS (December 2012).

DRAWN BY M. MARTIN	DATE 07/03/13
CHECKED BY M. SWEENEY	DATE 07/03/13
REVISED BY	DATE
SCALE AS NOTED	



SUBSURFACE EXCAVATION MAP
(0 FEET BLS TO WATER TABLE)
BUILDING 148 / SA 56
NAVAL TRAINING CENTER ORLANDO
ORLANDO, FLORIDA

CONTRACT NUMBER N62470-11-D-8013	CTO NUMBER JM42
APPROVED BY	DATE
APPROVED BY	DATE
FIGURE NO. 4 - 8	REV 0

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