National Aeronautics and Space Administration

John F. Kennedy Space Center
Kennedy Space Center, FL 32899

February 29, 2024

Reply to Attn of: SI-E2

Mr. Touraj Touran
Florida Department of Environmental Protection
Division of Waste Management
Federal Facilities Section
Bob Martinez Center
Mail Station 4535
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

Subject: Land Use Control (LUC) Inspections Report 2023 for John F. Kennedy Space Center (KSC), Florida

This letter report documents the quarterly LUC inspections the KSC Remediation Group conducts at sites with approved LUC Implementation Plans (LUCIP). In addition to quarterly inspections, the Remediation Group also ensures compliance with LUCs by:

- Providing master planning annual updates on the extent of our Potential Release Locations (PRL) and Solid Waste Management Units (SWMU), with corresponding land use control information, so the KSC workforce can view land use control information within the KSC Geographic Information System (GIS) Portal,
- Participating in the reviews of an Environmental Assessment or an Environmental Baseline Survey,
- Reviewing dig permits,
- Reviewing environmental checklists,
- Participating in construction design meetings and working with Environmental Points of Contacts for construction projects,
- Reviewing dewatering plans, and
- Coordinating with the other stakeholders (KSC workforce, tenants, and other Government entities), when applicable.

A total of 71 sites had formal LUCs at the end of the calendar year 2023. A summary of all sites with approved LUCIPs are provided in Enclosure 1. Copies of the quarterly inspection reports are included in Enclosure 2.

KSC uses the Remediation Information System (RIS) database to document LUC inspections throughout the year. Inspections are performed each quarter, documented electronically, and uploaded to RIS. Each inspection report is then reviewed, and corrective actions are taken for any discrepancies noted. RIS serves as a permanent repository for KSC's LUC inspections. Quarterly inspections determined all controls were maintained; no discrepancies were identified. For your reference, copies of the LUCIPs and Interim LUCIPs are provided in Enclosure 3.

A corrective action spill response was conducted at the KSC Child Development Center (M6-0883) due to the release of arsenic-contaminated soil from beneath the playground pour and play surface during a construction project. The construction project included the installation of new playground equipment and footers, which required the project proponent to core drill through the pour and play cover. A KSC Environmental Checklist and Record of Environmental Consideration were generated for the construction project. Guidance to properly handle arsenic-contaminated soils and maintain LUCs were provided to the project proponent. During construction, larger than anticipated penetrations through the pour and play cover were necessary for the installation of the playground equipment footers. Heavy rainfall subsequently occurred during the week of 17 July 2023, causing arsenic-contaminated soil from beneath pour and play cover to wash out onto the grassy area located east of the pour and play cover. The KSC Remediation Group was able to quickly assess the extent of the release and coordinated the spill cleanup through the NASA Environmental and Medical Contract (NEMCON). NEMCON personnel performed the spill cleanup during the week of 24 July 2023. Soils with arsenic concentrations above the State of Florida residential Soil Cleanup Target Level (SCTL) east of the pour and play cover were excavated from five contiguous areas, totaling approximately 1,753 square feet. Two areas were excavated to a depth of 0.5 feet below land surface (bls) and the other three areas were excavated to a depth of one foot bls. All excavated soil was placed in lined roll-off containers, transported under manifest, and was disposed as industrial waste at the JED Landfill in St. Cloud, Florida. Two confirmation soil samples were collected from the excavations. Analytical results from the confirmation samples indicated that arsenic concentrations were below the residential SCTL of 2.1 mg/kg. A total of 64.91 tons (approximately 53 cubic yards) of arsenic-contaminated soil exceeding the Residential SCTL were excavated from the KSC Child Development Center. Spill response activities are documented in NEMCON's KSC Child Development Center Spill Report, which is provided as Enclosure 4.

In addition to formal LUCs, KSC has adopted informal LUCs for sites in the assessment, confirmatory sampling (CS), or Resource Conservation and Recovery Act (RCRA) facility investigation phase of our RCRA Program. To ensure up-to-date information is provided to the KSC workforce, tenants, and commercial partners, the KSC Remediation Group provides information on the status of these sites during an Environmental Assessment or an Environmental Baseline Survey review, design package reviews, dig permit reviews, environmental checklist reviews, consultations on construction design projects, and

dewatering plan reviews. A LUCIP or revised LUCIP will be submitted for Florida Department of Environmental Protection (FDEP) approval upon completion of delineation activities at these sites.

Sites with informal LUCs include:

1. SWMU #036, General Service Administration (GSA) Reclamation Yard West
2. SWMU #112, Q6 Radar Station
3. SWMU #113, False Cape Data Collection Annex
4. SWMU #121, South Repeater Building (Per- and Polyfluoroalkyl Substances (PFAS) investigation area; formerly known as Area 3 Repeater Building, PRL #210)
5. PRL #213, South Water Pump Station
6. PRL #227a, Stand Alone Electrical Equipment - Location of Concern (LOC) 3
7. PRL #229, Unnumbered Operational Areas
8. PRL #237, Center-Wide PFAS Investigation (multiple areas) and other PFAS areas identified below
9. PRL #239, Corrosion Atmospheric Exposure Facility

Previously, the KSC Remediation Group performed Interim Measures (IM) activities at PRL #204 and CS activities at PRL #227d. As a result of the remedial activities at these sites, No Further Action (NFA) requests under Risk Management Option (RMO) 1 received KSC Remediation Team (KSCRT) consensus. The request for PRL #204 was submitted to FDEP in January 2023 through a site-specific Site Rehabilitation Completion Order (SCRO) Request Letter. A CS Report for PRL #227d was submitted to FDEP in May 2021. KSCRT Meeting Minutes and Decision Items regarding NFA consensus at these two sites is provided in Enclosure 5. Quarterly inspections at these two sites were conducted during 2022, but as a result of the NFA consensus, quarterly inspections were not conducted in 2023. Remediation details for these two sites are provided below.

- PRL #204 - Manhole Dewatering Operations: An IM was conducted in 2020. The KSCRT reached consensus for NFA at PRL #204 (Meeting Minute 2012-M10, Decision Item 2012-D14). An SRCO Request Letter for NFA under RMO 1 was submitted to FDEP in January 2023.
- PRL #227d - Stand Alone Electrical Equipment, LOC 30: CS activities were performed in 2020. Based on the sampling results, the KSCRT reached consensus for NFA at PRL #227d (Meeting Minute 2104-M5, Decision Item 2104-D21). A CS Report recommending NFA was submitted to FDEP in May 2021.

In 2023, the KSC Remediation Group performed IMs at the South Water Pump Station (PRL #213) and the Fish and Wildlife/National Park Service Support Buildings (PRL #228). As a result of these remedial activities, the KSC Remediation Group will be requesting NFA requests under RMO 1. These requests will be submitted to FDEP through site-specific

SCRO Request Letters. Quarterly inspections at PRL #213 and PRL #228 will continue to be conducted until the SRCO letter requests are approved by FDEP.

KSC maintains and implements Institutional Controls (IC) for projects with manhole operations. ICs are present for soils within a 25-feet radius around manholes at KSC. If handling the soil (excavation and any other activity in which soil is disturbed or handled by workers) within 25 feet of a manhole, the project proponent must contact their company's Safety and Health Office for recommendations on personal protective equipment. All disturbed soil must remain within the 25-feet radius around the manhole. If this is not possible, the soil must be properly characterized and disposed.

Under the Center-wide PFAS Investigation and other environmental Site Assessments, PFAS has been identified in the groundwater, soil, and surface water at KSC. To ensure the protection of human health and the environment, KSC has adopted the informal LUCs previously described for the areas with identified PFAS impacts. Upon receipt of groundwater, soil, or surface water PFAS sampling results, PFAS analytical results are screened against the current U.S. Environmental Protection Agency Regional Screening Levels, FDEP Provisional Soil and Groundwater Cleanup Target Levels, and/or the FDEP Surface Water Screening Levels. Based on results of those evaluations, conservative plumes or impacted areas are identified and are uploaded into the KSC GIS Portal semi-annually. This information is provided to the KSC workforce, tenants, and commercial partners. The KSC Remediation Group further provides this information and guidance for the PFAS areas during an Environmental Assessment or an Environmental Baseline Survey review, design package reviews, dig permit reviews, environmental checklist reviews, consultations on construction design projects, and dewatering plan reviews. The areas identified with PFAS impacts are listed below. A LUCIP or revised LUCIP will be submitted for FDEP approval upon completion of PFAS delineation activities at these sites.

PFAS Impacted Areas:

1. SWMU #003, Ransom Road Landfill (includes PRL #237, LOC 33)
2. SWMU #007, Hydrocarbon Burn Facility (includes PRL #237, LOC 16)
   – PRL #237, LOC 18, Schwartz Road Landfill, is being evaluated in conjunction with SWMU #007
3. SWMU #008, Launch Complex 39A (includes PRL #237, LOC 6, Former Sewage Treatment Plant (STP) #5 and Percolation Pond)
4. SWMU #009, Launch Complex 39B (includes PRL #237, LOC 7, Former STP #6 and Percolation Pond)
5. SWMU #010, GSA Reclamation Yard (includes PRL #237 LOC 26, Former STP #14 and LOC 31, Ransom Road Sandblast Area)

6. SWMU #030, Components Cleaning Facility (PFAS investigation area) will also include:
   – PRL #237, LOC 10, Former STP #9 and Abandoned Treatment Pond,
   – SWMU# 089, Converter/Compressor Building (PFAS investigation area)
7. SWMU# 041, Components Refurbishment and Chemical Analysis Facility (includes PRL #237 Area of Potential Concern (AOPC) 7)
8. SWMU #055, Contractors Road Heavy Equipment Area (includes PRL #237 LOC 17, Former STP #15 and Polishing Pond)
9. SWMU #077, Vertical Processing Facility (includes Former STP #13 and Effluent Disposal Area)
10. SWMU #099, Visitor Center Maintenance Area, includes:
    – PRL #237, LOC 23, Former STP #10 and Effluent Disposal Area
    – PRL #237, AOPC 11, Bush Wash Station within KSC Visitors Center
11. SWMU #105 - Vehicle Assembly Building (VAB) Area, includes:
    – Former Fire Station #2 (former PRL #237 LOC 3)
    – SWMU #115, VAB North Area, Former STP #4 and Sludge Disposal Area (former PRL #237 LOC 5 and AOPCs 3, 4, 5, and 10)
    – SWMU #122, Former Flight Crew Rescue Area (former PRL #237 LOC 1)
    – SWMU #123, Logistics Facility (K6-1547) (former PRL #237 AOPC 6)
    – SWMU #127, Former STP #7 (former PRL #237 LOC 8)
12. SWMU #106, Fire Station #3 (formerly known as Fire Station #6) (former PRL #237 LOC 4)
13. SWMU #112, Q6 Radar Station (former PRL #237 AOPC 13)
14. SWMU #114 - Former Shuttle Landing Facility (SLF) Area, includes:
    – Fire Station #2 and Towway Area (former PRL #237 LOC 2), STP #17 (former PRL #237 LOC 12), Remote Launch Vehicle Hangar (former PRL #237 LOC 15), and Contractor Support Building #7 (former PRL #237 AOPC 2)
    – SWMU #119, Morpheus Test Area (former PRL #237 LOC 14)
    – SWMU #120, Former SLF Fire and Rescue Building (former PRL #237 AOPC 1)
    – PRL #237 LOC 13, Former STP #18
15. SWMU #116 - KSC Industrial Area, includes:
    – Fire Station #1 Area (former PRL #237 LOC 19)
    – SWMU #014 Base Support Building Area (formerly known as Maintenance and Operations Building) (former PRL #237 LOC 32)
    – SWMU #117, STP #1 and Sludge Disposal Area (former PRL #237 LOC 20)
    – SWMU #118, Kennedy Athletic, Recreation, and Social (KARS) Park II (former PRL #237 LOC 30)
    – SWMU #126, Former Central Instrumentation Facility Residuals Application Area (former PRL #237 LOC 28)
16. SWMU #121, South Repeater Building (PFAS investigation area; formerly known as Area 3 Repeater Building, PRL #210)

17. SWMU #124, Weather Site #509 (former PRL #237 AOPC 9)
18. SWMU #125, Former STP #11 and Percolation Pond (former PRL #237 LOC 24)
19. SWMU #128, Former STP #8 and Drainfield Area (former PRL #237 LOC 9)
20. Proposing a new SWMU #129, Former STP #12 and Percolation Pond (PRL #237, LOC 11) to evaluate the PFAS affected groundwater in this area.
21. Proposing a new SWMU #130, Merritt Island National Wildlife Refuge Visitors Information Center (formerly PRL #237 AOPC 17) to further evaluate the PFAS affected media in this area.
22. PRL #237, Center-Wide PFAS Investigation (multiple areas)
    – LOC 22, Former STP #3 and Percolation Pond
    – LOC 27, Former STP #16 and Abandoned Treatment Pond
    – AOPC 15, Crawlerway Residuals Disposal Area near Saturn Causeway
    – AOPC 16, KARS Park 1 (PFAS investigation area)

At KSC, a dewatering plan is required to be submitted with construction design packages, if any dewatering activities will be associated with construction activities in identified areas where PFAS is present in the groundwater. The project proponent is required to submit these dewatering plans in advance to the KSC Remediation Group. The construction dewatering plans are reviewed by the KSC Remediation Group and were submitted to FDEP for concurrence. Each dewatering plan includes the location; method of dewatering (e.g., pump out manhole, wellpoint dewatering); pumping rate; depth of dewatering; estimated duration of dewatering (hours/days); an estimated amount to be dewatered (gallons); any dewatering sequence, if applicable; proposed discharge location, and any controls to be employed to prevent direct or indirect discharge to surface water. Project proponents were notified of concurrence and any other guidance that was received from FDEP. The KSC Remediation Group submitted dewatering plans for FDEP concurrence in 2023. Enclosure 6 summarizes the dewatering plans, discharge locations, and guidance that was provided to each project proponent. The locations of the dewatering discharge locations and proposed PFAS dewatering assessments are included as Enclosure 7 and include 2022 locations that have not yet been sampled during PFAS Assessment Activities.

Based on the guidance received from FDEP in December 2023, routine PFAS dewatering plans will no longer be submitted to FDEP for concurrence. Routine dewatering is defined as those areas or sites that are regularly dewatered and are or will be part of PFAS groundwater delineations and assessments. For these routine dewatering projects, the KSC Remediation Group will provide guidance internally and will track internal dewatering plans, discharge locations, and guidance that was provided to each project proponent.

If you have any questions, please contact me at (321) 867-5964 or by email at christopher.d.adkison@nasa.gov.

Sincerely,

Christopher Adkison Digitally signed by Christopher Adkison
Date: 2024.02.29 09:48:06 -05'00'

Christopher Adkison
Senior Remediation Project Manager

Enclosures:

1. KSC Remediation Sites with Formal LUCIPs
2. Quarterly LUC Inspection Reports
3. LUCIPS (for the 71 Sites with Formal Land Use Controls)
4. NEMCON Spill Report for the KSC Child Development Center (M6-0883)
5. KSCRT Meeting Minutes and Decisions
6. KSC PFAS Dewatering Construction Projects
7. KSC PFAS Dewatering Sampling Locations

ENCLOSURE 1

KSC Remediation Sites with Formal LUCIPs

Enclosure 1
KSC Remediation Sites with Formal LUCIPs

	SWMU / PRL	Name	LUC met?	KSC RCRA Permit Table
1	SWMU #001	Wilson Corners	Yes	A.4
2	SWMU #003	Ransom Road Landfill	Yes	A.4
3	SWMU #004	Orsino Yard Storage Facility	Yes	A.4
4	SWMU #007	Hydrocarbon Burn Facility	Yes	A.4
5	SWMU #008	Launch Complex 39A (LC-39A)	Yes	A.4
6	SWMU #046	LC-39A Deluge Basin	Yes	A.4
7	SWMU #047	LC-39A Compressor Building (J8-1659)	Yes	A.4
8	SWMU #048	LC-39A Fuel Farm (J8-1906)	Yes	A.4
9	SWMU #049	LC-39A Oxidizer Farm (J8-1862)	Yes	A.4
10	SWMU #050	LC-39A ECS Site (J8-1708C)	Yes	A.4
11	SWMU #051	LC-39A HVAC Facility (J8-1708G)	Yes	A.4
12	SWMU #009	Launch Complex 39B (LC-39B)	Yes	A.4
13	SWMU #032	LC-39B Compressor Building	Yes	A.4
14	SWMU #052	LC-39B ECS Site (J7-286)	Yes	A.4
15	SWMU #053	LC-39B HVAC Facility (J7-337C)	Yes	A.4
16	SWMU #061	LC-39B Fuel Farm (J7-534)	Yes	A.4
17	SWMU #062	LC-39B Oxidizer (J7-490)	Yes	A.4
18	SWMU #010	General Services Administration (GSA) Reclamation Yard	Yes	A.4
19	SWMU #013	GSA Vehicle Maintenance Facility	Yes	A.4
20	SWMU #014	Base Support Building (formerly known as Maintenance and Operations [M&O] Building)	Yes	A.4
21	SWMU #021	Ransom Road Sandblast Yard	Yes	A.4
22	SWMU #030	Component Cleaning Facility	Yes	A.4
23	SWMU #037	Former Drum Storage Area (J7-2112)	Yes	A.4
24	SWMU #039	Building M7-505	Yes	A.4
25	SWMU #041	Components Refurbishment and Chemical Analysis Facility	Yes	A.2
26	SWMU #043	East Crawler Park Site (K7-0188)	Yes	A.4
27	SWMU #044	West Crawler Park Site (K6-0743)	Yes	A.4
28	SWMU #045	Central Heat Plant (M6-0595)	Yes	A.4
29	SWMU #055	Contractors Road Heavy Equipment Area	Yes	A.4
30	SWMU #015	Contractors Road Acid Dump Site	Yes	A.4
31	SWMU #016	Sewage Treatment Plant #15	Yes	A.4
32	SWMU #031	Printed Circuit Board Shop	Yes	A.4
33	SWMU #056	Mobile Launch Platform (MLP) Park Sites/Vehicle Assembly Building (VAB) Area	Yes	A.4
34	SWMU #064	Suspect Rail Car Siding	Yes	A.4
35	SWMU #066	C-5 Electrical Substation Facility (K6-1141)	Yes	A.4

Enclosure 1
KSC Remediation Sites with Formal LUCIPs

	SWMU / PRL	Name	LUC met?	KSC RCRA Permit Table
36	SWMU #067	Paint and Oil Locker (POL) Area	Yes	A.4
37	SWMU #068	Jay-Jay Railroad Yard (H2-1245)	Yes	A.4
38	SWMU #069	FIREX Water Tank (M7-1362A)	Yes	A.4
39	SWMU #070	Hypergol Maintenance Facility (HMF) Hazardous Waste South Staging Areas (M7-1410)	Yes	A.4
40	SWMU #071	Wilson's Railroad Yard	Yes	A.4
41	SWMU #075	Former Development and Testing Laboratory	Yes	A.4
42	SWMU #076	Operations and Checkout Building	Yes	A.4
43	SWMU #077	Vertical Processing Facility (M7-1469)	Yes	A.4
44	SWMU #079	Environmental Health Facility (L7-1557)	Yes	A.4
45	SWMU #081	Shuttle Flight Operation Contract (SFOC) Generator Maintenance Facility	Yes	A.4
46	SWMU #082	Communications, Maintenance, and Storage (M6-0791)	Yes	A.4
47	SWMU #084	Kennedy Athletic Recreation and Social (KARS) Park I	Yes	A.4
48	SWMU #085	Engineering Development Laboratory (M7-0409)	Yes	A.4
49	SWMU #088	Supply Warehouse No. 3 (M6-0891)	Yes	A.4
50	SWMU #089	Converter/Compressor Building (K7-0468)	Yes	A.2
51	SWMU #090	HMF North (M7-0961)	Yes	A.3
52	SWMU #091	Launch Equipment Test Facility	Yes	A.4
53	SWMU #092	Central Supply Warehouse (M6-0744)	Yes	A.4
54	SWMU #093	Citgo Service Station (M6-0596)	Yes	A.4
55	SWMU #095	GSA Seized Property (M6-0880)	Yes	A.4
56	SWMU #096	Orsino Power Substation (M6-0996)	Yes	A.4
57	SWMU #098	Space Station Processing Facility (M7-0360)	Yes	A.4
58	SWMU #099	Visitors Complex Maintenance Area (M6-0504)	Yes	A.4
59	SWMU #100	Area South of K7-0516	Yes	A.2
60	SWMU #102	Propellants Storage Building Area (K7-0416B)	Yes	A.2
61	SWMU #104	KSC Headquarters Building Area (M6-0399)	Yes	A.4
62	SWMU #106	Fire Station #3 (J7-1339) (formerly known as Fire Station #6)	Yes	A.4
63	SWMU #107	Launch Complex 39 Observation Gantry Area (K7-0140)	Yes	A.2
64	SWMU #108	Mission Support Building Area (K6-1298)	Yes	A.4
65	SWMU #111	Launch Complex 39A Operations Support Building Area (J8-2109)	Yes	A.2
66	SWMU #CC054	Launch Complex 34	Yes	A.3

Enclosure 1
KSC Remediation Sites with Formal LUCIPs

	SWMU / PRL	Name	LUC met?	KSC RCRA Permit Table
67	PRL #051	Launch Equipment Shop (K6-1247)	Yes	A.4
68	PRL #149	KSC Child Development Center (M6-0883)	Yes*	A.4
69	PRL #150	Sewage Treatment Plant #1 (M6-0895)	Yes	A.4
70	PRL #157	Fuel Storage Area #1 Underground Storage Tank (Building 1044)	Yes	A.4
71	PRL #228	Fish and Wildlife/National Park Service Support Buildings	Yes	A.1

Notes:
RCRA = Resource Conservation and Recovery Act
SWMU is being managed under LC-39A, SWMU #008
SWMU is being managed under LC-39B, SWMU #009
SWMU is being managed under Contractors Road Heavy Equipment Area, SWMU #055
PRL is being managed in coordination with Sewage Treatment Plant #1, SWMU #117. PRL #150 will be placed under Sewage Treatment Plant #1, SWMU #117 during the next RCRA permit modification.
* Denotes that a corrective action spill response was performed.

ENCLOSURE 2

Quarterly LUC Inspection Reports

Consolidated Land Use Control Inspection Checklists for 2023

Subject: Land Use Control Inspections Report 2023 for John F. Kennedy Space Center, FL

Total # of Violations: 0

WILSON CORNERS (SWMU 001)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/22/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/22/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

RANSOM ROAD LANDFILL (SWMU 003)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/14/2023	Prohibit groundwater and residential use at the site.	Yes	Cogan grass (invasive species) noted on site.
Michelle Moore	6/26/2023	Prohibit groundwater and residential use at the site.	Yes	Cogan grass (invasive species) noted on site.
Michelle Moore	9/21/2023	Prohibit groundwater and residential use at the site.	Yes	Cogan grass (invasive species) noted on site.
Michelle Moore	12/15/2023	Prohibit groundwater and residential use at the site.	Yes	Cogan grass (invasive species) noted on site.
Resolution: Not Applicable				**Reviewed By: C. Adkison**

ORSINO STORAGE YARD (SWMU 004)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

HYDROCARBON BURN FACILITY (SWMU 007)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

LAUNCH COMPLEX 39A (SWMU 008)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/29/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/22/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

LAUNCH COMPLEX 39B (SWMU 009)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/22/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

GSA RECLAMATION YARD (SWMU 010)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/14/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

GSA VEHICLE MAINTENANCE FACILITY (SWMU 013)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

BASE SUPPORT BUILDING (FORMERLY M&O BUILDING) (SWMU 014)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

RANSOM ROAD SANDBLAST YARD (SWMU 021)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/14/2023	Prohibit residential use/exposure to soils. The site is to maintain the existing pavement to restrict industrial use access to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit residential use/exposure to soils. The site is to maintain the existing pavement to restrict industrial use access to soils.	Yes	
Michelle Moore	9/14/2023	Prohibit residential use/exposure to soils. The site is to maintain the existing pavement to restrict industrial use access to soils.	Yes	
Michelle Moore	12/11/2023	Prohibit residential use/exposure to soils. The site is to maintain the existing pavement to restrict industrial use access to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

COMPONENT CLEANING FACILITY (SWMU 030)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

GSA RECLAMATION YARD WEST (SWMU 036)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/14/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

FORMER DRUM STORAGE AREA, J7-2112 (SWMU 037)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/11/2023	Prohibit the use of groundwater at the site. No planned use of land for residential community. Prevent groundwater discharge to surface water.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site. No planned use of land for residential community. Prevent groundwater discharge to surface water.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site. No planned use of land for residential community. Prevent groundwater discharge to surface water.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site. No planned use of land for residential community. Prevent groundwater discharge to surface water.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

BUILDING M7-505 (SWMU 039)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site and industrial/residential access to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site and industrial/residential access to soils.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site and industrial/residential access to soils.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site and industrial/residential access to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS LABORATORY (SWMU 041)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

EAST CRAWLER PARK SITE (SWMU 043)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/21/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/11/2023	Prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

WEST CRAWLER PARK SITE (SWMU 044)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/11/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

CENTRAL HEAT PLANT (SWMU 045)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and maintain the swale configuration.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

CONTRACTORS ROAD HEAVY EQUIPMENT AREA (SWMU 55)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

MOBILE LAUNCH PLATFORM/VEHICLE ASSEMBLY BUILDING AREA (SWMU 056)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/11/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/27/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

SUSPECT RAIL CAR SIDING (SWMU 064)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/11/2023	Prohibit residential use/exposure to soils.	Yes	Construction clearing on adjacent property noted, but no current impacts to site
Michelle Moore	6/26/2023	Prohibit residential use/exposure to soils.	Yes	Construction in the vicinity but outside of LUC boundary.
Michelle Moore	9/14/2023	Prohibit residential use/exposure to soils.	Yes	Construction in the vicinity but outside of LUC boundary.
Michelle Moore	12/12/2023	Prohibit residential use/exposure to soils.	Yes	Construction in the vicinity but outside of LUC boundary.
Resolution: Not Applicable				**Reviewed By: C. Adkison**

C-5 ELECTRICAL SUBSTATION FACILITY, K6-1141 (SWMU 066)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/11/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

PAINT AND OIL LOCKER SITE (SWMU 067)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

JAY JAY RAILROAD YARD (SWMU 068)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/14/2023	Maintain site usage as a Rail Road Yard.	Yes	
Michelle Moore	6/22/2023	Maintain site usage as a Rail Road Yard.	Yes	
Michelle Moore	9/14/2023	Maintain site usage as a Rail Road Yard.	Yes	
Michelle Moore	12/12/2023	Maintain site usage as a Rail Road Yard.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

FIREX WATER TANK (SWMU 069)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Maintain swale configuration and limit human activity within the swale to intermittent maintenance.	Yes	
Michelle Moore	6/26/2023	Maintain swale configuration and limit human activity within the swale to intermittent maintenance.	Yes	
Michelle Moore	9/14/2023	Maintain swale configuration and limit human activity within the swale to intermittent maintenance.	Yes	
Michelle Moore	12/15/2023	Maintain swale configuration and limit human activity within the swale to intermittent maintenance.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

HMF HAZARDOUS WASTE SOUTH STAGING AREAS (SWMU 070)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore		Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

WILSON'S RAILROAD YARD (SWMU 071)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/14/2023	Maintain site usage as a Rail Road Yard.	Yes	
Michelle Moore	6/22/2023	Maintain site usage as a Rail Road Yard.	Yes	
Michelle Moore	9/14/2023	Maintain site usage as a Rail Road Yard.	Yes	
Michelle Moore	12/12/2023	Maintain site usage as a Rail Road Yard.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

FORMER DEVELOPMENT AND TESTING LABORATORY (SWMU 075)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/29/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/13/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

OPERATION AND CHECKOUT BUILDING (SWMU 076)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/27/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

VERTICAL PROCESSING FACILITY, M7-1469 (SWMU 077)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

ENVIRONMENTAL HEALTH FACILITY, L7-1557 (SWMU 079)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

SFOC GENERATOR MAINTENANCE FACILITY (SWMU 081)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

COMMUNICATIONS, MAINTENANCE, & STORAGE, M6-0791 (SWMU 082)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

KARS PARK 1 (SWMU 084)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/22/2023	Prohibit the use of groundwater at the site.	Yes	Heavy equipment noted on site.
Michelle Moore	9/13/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

ENGINEERING DEVELOPMENT LABORATORY, M7-0409 (SWMU 085)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

SUPPLY WAREHOUSE #3, M6-0891 (SWMU 088)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

CONVERTOR/COMPRESSOR BUILDING, K7-0468 (SWMU 089)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/11/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

HMF NORTH, M7-0961 (SWMU 090)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site. Prevent exposure to soil beneath active transformer.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site. Prevent exposure to soil beneath active transformer.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site. Prevent exposure to soil beneath active transformer.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site. Prevent exposure to soil beneath active transformer.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

LAUNCH EQUIPMENT TEST FACILITY (SWMU 091)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

CENTRAL SUPPLY WAREHOUSE, M6-0744 (SWMU 092)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/14/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/15/2023	Prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

CITGO SERVICE STATION, M6-0596 (SWMU 093)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

GSA SEIZED PROPERTY, M6-0880 (SWMU 095)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

ORSINO POWER SUBSTATION, M6-0996 (SWMU 096)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/21/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/15/2023	Prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

SPACE STATION PROCESSING FACILITY, M7-0360 (SWMU 098)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

VISITOR COMPLEX MAINTENANCE AREA, M6-0504 (SWMU 099)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/14/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

AREA SOUTH OF K7-0516 (SWMU 100)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

PROPELLANT SUPPORT BUILDING AREA, K7-0416B (SWMU 102)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/11/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

KSC HEADQUARTERS BUILDING AREA (SWMU 104)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit residential use/exposure to soil and maintain concrete pad encapsulation. Also maintain the use of bollards with chains and signs in the concrete pad areas.	Yes	Contaminated soils and concrete have been removed from this location through an Interim Measure.
Michelle Moore	6/26/2023	Prohibit residential use/exposure to soil and maintain concrete pad encapsulation. Also maintain the use of bollards with chains and signs in the concrete pad areas.	Yes	Contaminated soils and concrete have been removed from this location through an Interim Measure.
Michelle Moore	9/14/2023	Prohibit residential use/exposure to soil and maintain concrete pad encapsulation. Also maintain the use of bollards with chains and signs in the concrete pad areas.	Yes	Contaminated soils and concrete have been removed from this location through an Interim Measure.
Michelle Moore	12/15/2023	Prohibit residential use/exposure to soil and maintain concrete pad encapsulation. Also maintain the use of bollards with chains and signs in the concrete pad areas.	Yes	Contaminated soils and concrete have been removed from this location through an Interim Measure.
Resolution: Not Applicable				**Reviewed By: C. Adkison**

VAB AREA (SWMU 105)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/11/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	6/27/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

FIRE STATION #3 (FORMERLY FIRE STATION #6), J7-1339 (SWMU 106)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2023	Prohibit the use of groundwater at the site. Prevent exposure to soil beneath active transformer.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site. Prevent exposure to soil beneath active transformer.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site. Prevent exposure to soil beneath active transformer.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site. Prevent exposure to soil beneath active transformer.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

LC-39 OBSERVATION GANTRY AREA, K7-0140 (SWMU 107)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

MISSION SUPPORT BUILDING AREA, K6-1298 (SWMU 108)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/11/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

LAUNCH COMPLEX 39 OPERATIONS SUPPORT BUILDING AREA (SWMU 111)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/22/2023	Prohibit the use of groundwater at the site.	Yes	The area cleared by OFW to install air sparge system is growing back in.
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

Q6 RADAR STATION (SWMU 112)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	6/22/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	Contaminated soils have been removed from this location through an Interim Measure.
Michelle Moore	9/13/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	Contaminated soils have been removed from this location through an Interim Measure.
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	Contaminated soils have been removed from this location through an Interim Measure.
Resolution: Not Applicable				**Reviewed By: C. Adkison**

FALSE CAPE DATA COLLECTION ANNEX (SWMU 113)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2024	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	6/22/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	Contaminated soils have been removed from this location through an Interim Measure.
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	Contaminated soils have been removed from this location through an Interim Measure.
Resolution: Not Applicable				**Reviewed By: C. Adkison**

FORMER SHUTTLE LANDING FACILITY (SLF) AREA (SWMU 114)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/11/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	12/12/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

KSC INDUSTRIAL AREA (SWMU 116)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	9/14/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site and residential exposure to soil.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

SOUTH REPEATER BUILDING (SWMU 121)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/22/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/13/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

WEATHER SITE #509 (SWMU 124)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/29/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/13/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

FORMER SEWAGE TREATMENT PLANT #11 (SWMU 125)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/14/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/13/2023	Prohibit the use of groundwater at the site.	Yes	Ditch cleaning operations were taking place adjacent to the site
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

FORMER SEWAGE TREATMENT PLANT #8 (SWMU 128)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/29/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/27/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/22/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

LAUNCH COMPLEX 34 (SWMU CC054)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2023	Prohibit the use of groundwater at the site and residential/industrial exposure to soil and concrete.	Yes	
Michelle Moore	6/22/2023	Prohibit the use of groundwater at the site and residential/industrial exposure to soil and concrete.	Yes	Construction on site for air sparge well installation taking place.
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site and residential/industrial exposure to soil and concrete.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site and residential/industrial exposure to soil and concrete.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

LAUNCH EQUIPMENT SHOP, K6-1247 (PRL 051)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	6/26/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site.	Yes	
Michelle Moore	12/11/2023	Prohibit the use of groundwater at the site.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

KSC CHILD DEVELOPMENT CENTER, M6-0883 (PRL 149)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/29/2023	Concrete sidewalks in playground area maintained. Pour in place surfaces in playground area maintained.	Yes	Repairs have been made to previously cracked locations.
Michelle Moore	6/29/2023	Concrete sidewalks in playground area maintained. Pour in place surfaces in playground area maintained.	Yes	This site is under construction and the sidewalks have been removed and are in the process of being replaced. Construction activities were coordinated with the KSC Remediation Group.The concrete base is still in place but the soft covering has been removed and is being replaced. Guidance to properly handle contaminated soil and maintain LUCs were provided to the project proponent.
Michelle Moore	9/13/2023	Concrete sidewalks in playground area maintained. Pour in place surfaces in playground area maintained.	Yes	Heavy rainfall occurred during the week of 17 July 2023, causing arsenic-contaminated soil from beneath pour and play cover to wash out onto the grassy area located east of the pour and play cover. A corrective action spill cleanup to excavated aresenic-impacted soil was completed the week of 24 July 2023. A total of 64.91 tons of imapcted soil were excavated.
Michelle Moore	12/15/2023	Concrete sidewalks in playground area maintained. Pour in place surfaces in playground area maintained.	Yes	
Resolution: A spill cleanup corrective action was completed the week of 24 July 2023.				**Reviewed By: C. Adkison**

SEWAGE TREATMENT PLANT #1, M6-0895 (PRL 150) (SWMU #117)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/14/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/15/2023	Prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

FUEL STORAGE AREA #1 UNDERGROUND STORAGE TANK, BUILDING 1044 (PRL 157)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2023	Prohibit the use of groundwater at the site. No uncontrolled excavation or disturbance of soil. No planned use of land for residential community. Site activities limited to industrial uses.	Yes	
Michelle Moore	6/22/2023	Prohibit the use of groundwater at the site. No uncontrolled excavation or disturbance of soil. No planned use of land for residential community. Site activities limited to industrial uses.	Yes	
Michelle Moore	9/21/2023	Prohibit the use of groundwater at the site. No uncontrolled excavation or disturbance of soil. No planned use of land for residential community. Site activities limited to industrial uses.	Yes	
Michelle Moore	12/15/2023	Prohibit the use of groundwater at the site. No uncontrolled excavation or disturbance of soil. No planned use of land for residential community. Site activities limited to industrial uses.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

SOUTH WATER PUMP STATION (PRL 213)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/22/2023	Prohibit residential use/exposure to soils.	Yes	Soil Interim Measure sampling was completed in early 2023. Sampling results indicated that soil removal is no longer required.
Michelle Moore	9/13/2023	Prohibit residential use/exposure to soils.	Yes	Soil Interim Measure sampling was completed in early 2023. Sampling results indicated that soil removal is no longer required.
Michelle Moore	12/11/2023	Prohibit residential use/exposure to soils.	Yes	Soil Interim Measure sampling was completed in early 2023. Sampling results indicated that soil removal is no longer required.
Resolution: Not Applicable				**Reviewed By: C. Adkison**

STAND ALONE ELECTRICAL EQUIPMENT, LOC 3 (PRL 227a)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	6/26/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	9/14/2023	Prohibit residential use/exposure to soils.	Yes	
Michelle Moore	12/15/2023	Prohibit residential use/exposure to soils.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

US FISH AND WILDLIFE NATIONAL PARK SERVICE SUPPORT BUILDING & AREAS (PRL 228)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/14/2023	Prohibit residential exposure to surface soil.	Yes	
Michelle Moore	6/22/2023	Prohibit residential exposure to surface soil.	Yes	Contaminated soils and concrete pad have been removed from this location through an Interim Measure.
Michelle Moore	9/14/2023	Prohibit residential exposure to surface soil.	Yes	Contaminated soils and concrete pad have been removed from this location through an Interim Measure.
Michelle Moore	12/12/2023	Prohibit residential exposure to surface soil.	Yes	Contaminated soils and concrete pad have been removed from this location through an Interim Measure.
Resolution: Not Applicable				**Reviewed By: C. Adkison**

UN-NUMBERED OPERATIONAL AREAS (PRL 229)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2023	Prohibit residential exposure to surface soil.	Yes	
Michelle Moore	6/22/2023	Prohibit residential exposure to surface soil.	Yes	
Michelle Moore	9/21/2023	Prohibit residential exposure to surface soil.	Yes	
Michelle Moore	12/15/2023	Prohibit residential exposure to surface soil.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

Center-Wide PFAS Investigation (PRL 237)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/10/2023	Prohibit residential exposure to surface soil.	Yes	Inspections on multiple dates to include 03/10, 3/11, 3/14, and 03/27/2023
		Prohibit the use of groundwater at the site.	Yes	Inspections on multiple dates to include 03/10, 3/11, 3/14, and 03/27/2023
Michelle Moore	6/22/2023	Prohibit residential exposure to surface soil.	Yes	Inspections on multiple dates to include 06/22 and 06/26/2023 06/26/2023
		Prohibit the use of groundwater at the site.	Yes	Inspections on multiple dates to include 06/22 and 06/26/2023 06/26/2023
Michelle Moore	9/13/2023	Prohibit residential exposure to surface soil.	Yes	Inspections on multiple dates to include 09/13, 09/14, and 09/21/2023
		Prohibit the use of groundwater at the site.	Yes	Inspections on multiple dates to include 09/13, 09/14, and 09/21/2023
Michelle Moore	12/11/2023	Prohibit residential exposure to surface soil.	Yes	Inspections on multiple dates to include 12/11, 12/12, and 12/15/2023. Stock pile of construction soils noted in the the area near PFAS soil LUCs at the midfield SLF site.
		Prohibit the use of groundwater at the site.	Yes	Inspections on multiple dates to include 12/11, 12/12, and 12/15/2023. Construction and dewatering operations within the boundary but has been precoordinated with FDEP at the SLF area.
Resolution: Not Applicable				**Reviewed By: C. Adkison**

CORROSION ATMOSPHERIC EXPOSURE FACILITY (PRL 239)

Inspector	Inspection	Controls	Maintained	Inspector Comments
Michelle Moore	3/27/2024	Prohibit residential exposure to surface soil.	Yes	
Michelle Moore	6/22/2023	Prohibit residential exposure to surface soil.	Yes	
Michelle Moore	9/21/2023	Prohibit residential exposure to surface soil.	Yes	
Michelle Moore	12/11/2023	Prohibit residential exposure to surface soil.	Yes	
Resolution: Not Applicable				**Reviewed By: C. Adkison**

ENCLOSURE 3

Land Use Control Implementation Plans

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Wilson Corners
Solid Waste Management Unit No. 1
CONTAMINANTS: Volatile Organic Compounds in Groundwater
CONTROL: Prohibit Use of Groundwater

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of Wilson Corners of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with Wilson Corners, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI and supplemental sampling activities that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were volatile organic compounds (VOCs) in groundwater.

SITE DESCRIPTION

Wilson Corners was originally the location of a general store, as space-related activities developed in the area, the site was converted to a rocket engine components cleaning laboratory, which was operated by a private aerospace contractor. NASA acquired the site in 1963 and remodeled the facility into the offices and laboratory of the Propellant and Systems Components Laboratory (PSCL). Ancillary structures were added to the site, including an open cleaning tower for the solvent cleaning of fuel lines and other large components. Both domestic and laboratory wastes discharged to on-site drain fields. The predominant solvent used at the facility until the early 1970's was trichloroethene (TCE). The PSCL operated from 1963 until 1974. NASA razed the buildings and ancillary structures, and the site was abandoned for two years. In 1976, the National Park Service (NPS) placed temporary prefabricated office buildings on

1. This LUCIP summarizes institutional controls regarding the NASA KSC Wilson Corners Site. For detailed information on the site, consult the Wilson Corners administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

the site which became the headquarters for the nearby Canaveral National Seashore. In November 1977, a routine analysis of a water sample from an on-site potable well revealed TCE in concentrations of several thousand micrograms per liter (µg/l).

SITE LOCATION

Wilson Corners is located on the north side of State Road 402 (Beach Road), immediately northwest of the intersection of State Road 3 (Kennedy Parkway).

The area of the Wilson Corners covered by this LUCIP is situated predominantly north of State Road 402 (Figure 1). The site is located within Section 22 of Township 21 South, Range 36 East of the Wilson Quadrangle. The groundwater control area is rectangular in shape and encompasses approximately 18 acres of land (Figure 2). Coordinates of the corners of the LUC area are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater within the site boundary contains VOCs at concentrations above the FDEP's groundwater cleanup target levels. LUCs are therefore required to prohibit the use of groundwater. Indoor air quality shall be evaluated prior to any construction within the groundwater control area.

DECISION DOCUMENT

The Hazardous and Solid Waste Amendments (HSWA) portion of the Resource Conservation Recovery Act (RCRA) Permit (HSWA Part XVI) establishes institutional controls as a component of the remedy for this site. The Permit is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspection, condition certification and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no groundwater use is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

This LUCIP will remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by EPA and FDEP and implemented by modification of NASA's operating permit.

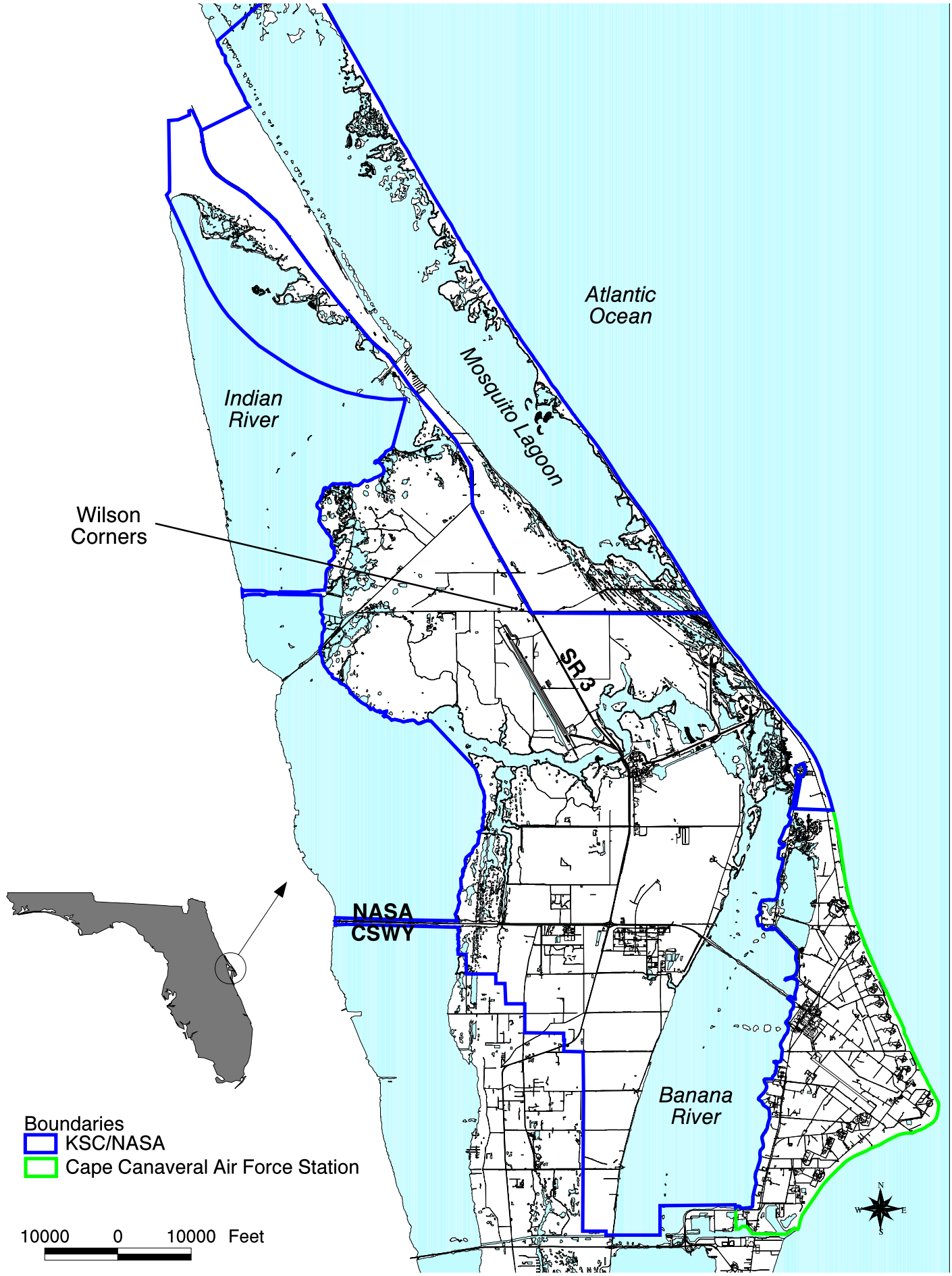


Figure 1. Location of Wilson Corners on Kennedy Space Center, FL.

12/19/2002

Figure 2. Wilson Corners (SWMU 01) Land Use Control Implementation Plan
Kennedy Space Center, FL



Groundwater Control Area

Survey coordinates are in State Plane Coordinate System
NAD 1983 meters, Florida East.

200 0 200 400 Feet

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LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Ransom Road Landfill
Solid Waste Management Unit No. 3
CONTAMINANTS: VOCs and Ammonia in Groundwater
CONTROL: Prohibit Groundwater and Residential Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Ransom Road Landfill of institutional controls that have been implemented at the site[1]. Although there are no unacceptable risks to human health or the environment associated with the Ransom Road Landfill, institutional land use controls (LUCs) are necessary to: (i) prohibit the use of groundwater from the site; and (ii) prohibit residential use of the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were volatile organic compounds (VOCs) and ammonia in groundwater.

SITE DESCRIPTION

The Ransom Road Landfill is a closed facility that was operated by NASA during the initial construction of facilities at KSC from 1964 through 1970. Landfilling activities included the excavation of trenches that had approximate dimensions of 600’ x 30’ x 10’ deep. The trenches ran east to west in the southern portion of the site. The trenches were unlined, dug to below the water table, and received all waste types during its years of operation. The trenches were then filled with soils that were excavated from the site. The site is approximately 24 acres in size (Figure 2).

SITE LOCATION

The Ransom Road Landfill is located on the south side of Ransom Road, one mile south of the Visitors Center at KSC and approximately one mile west of Kennedy Parkway (Figures 1 and 2). The site is located within Section 12 of Township 23S, Range 36E which is in the Orsino Quadrangle. The groundwater use control area covered by the LUCIP is shown on

1. This LUCIP summarizes institutional controls regarding the NASA KSC Ransom Road Landfill. For detailed information on the site, consult the Ransom Road Landfill administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs and ammonia above FDEP's groundwater cleanup target levels. The past, current, and projected future land use of the Ransom Road Landfill is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at this site and prohibit residential use. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area. Methane monitoring shall be conducted prior to any future construction adjacent to the site.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA- 6495, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential and groundwater use is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

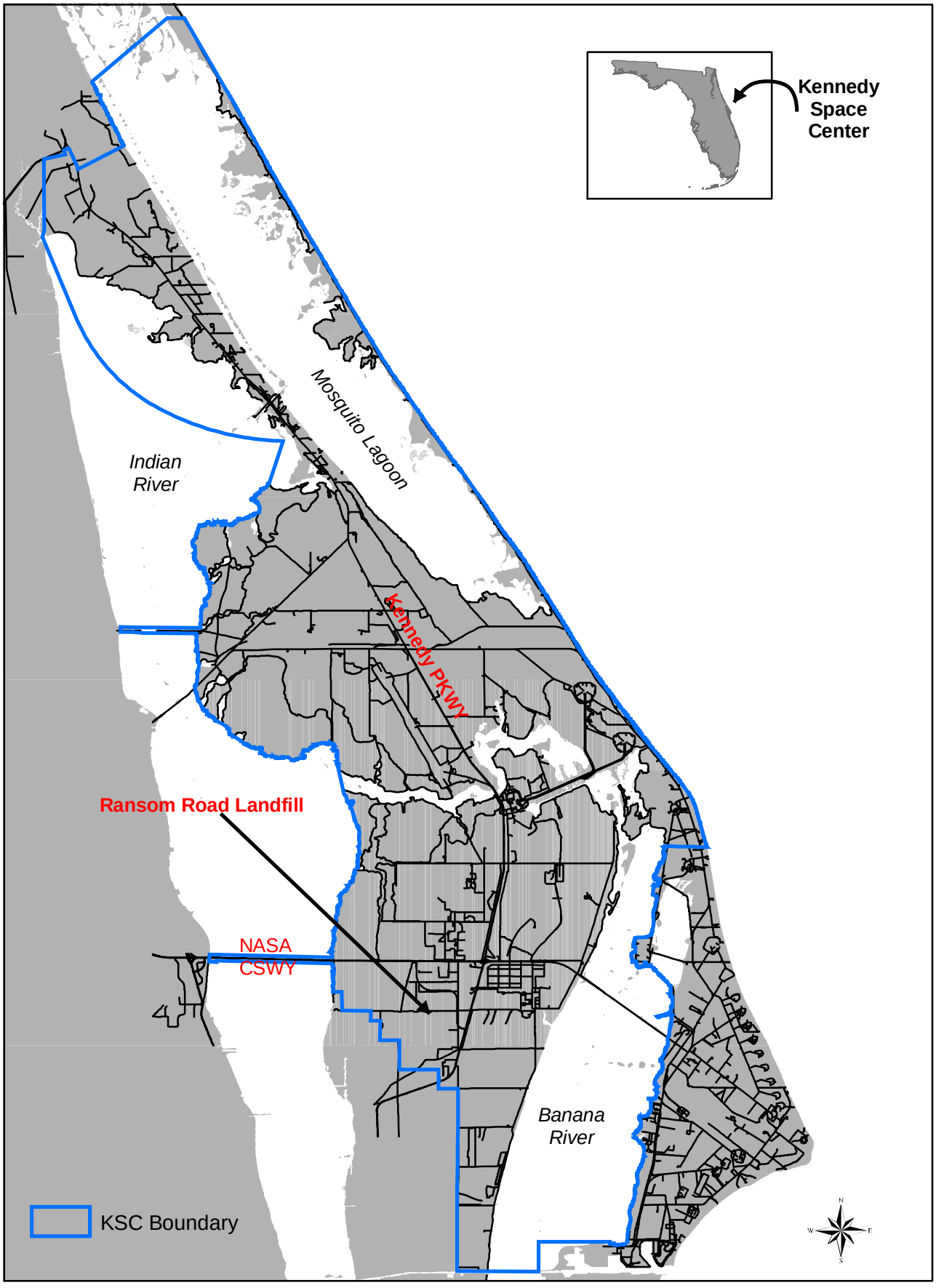
ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

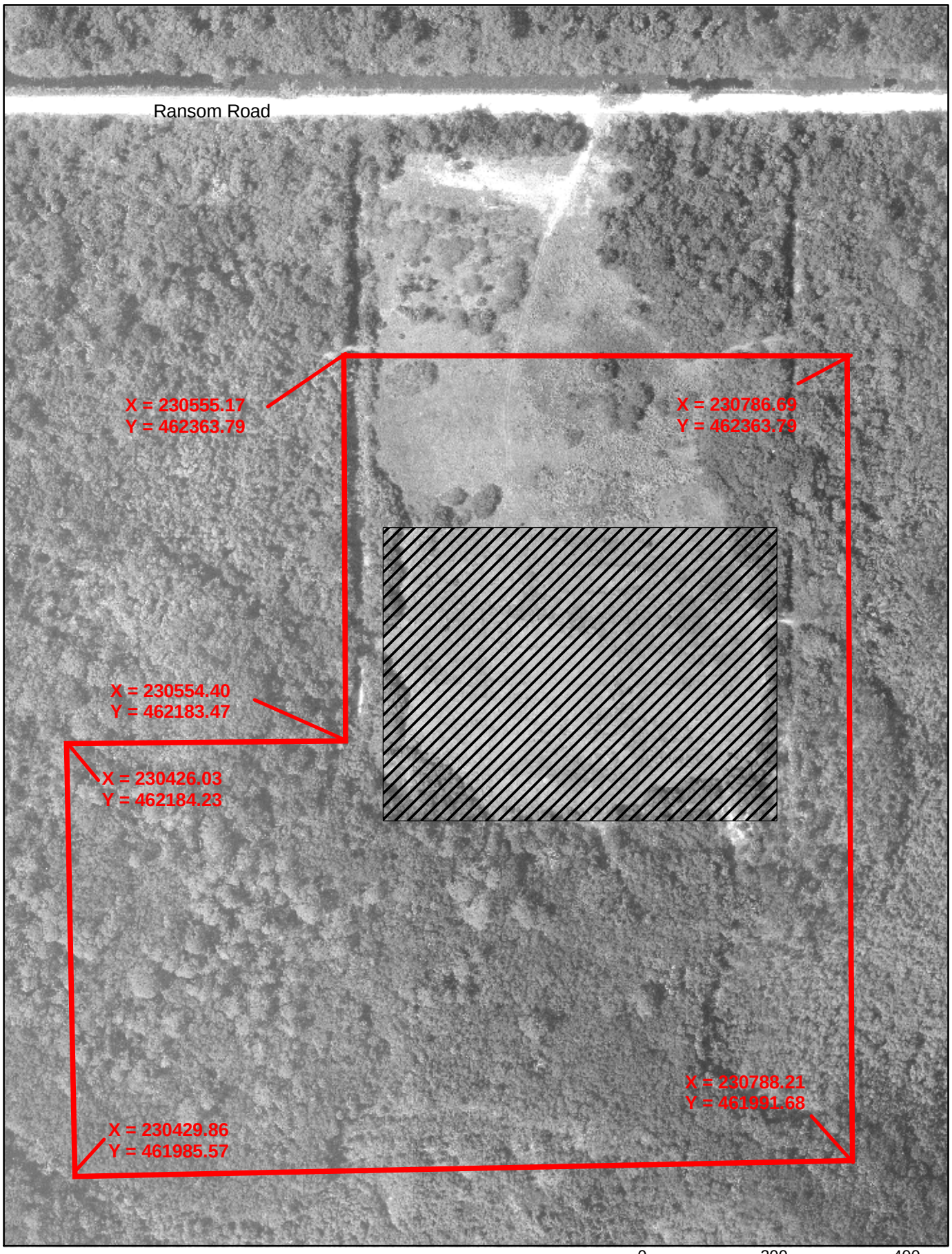
The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

Figure 1. Location of Ransom Road Landfill on Kennedy Space Center, FL.



05/02/2005

Figure 2. Ransom Road Landfill (SWMU 03) Land Use Control Implementation Plan.



Coordinates are in US State Plane North American Datum 1983 meters, Florida East.

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Orsino Storage Yard Facility Solid Waste Management Unit No. 4
CONTAMINANTS:	VOCs in Groundwater and PCBs and PAHs in Soil
CONTROL:	Prohibit Residential and Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Orsino Storage Yard Facility of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with Orsino Storage Yard, institutional land use controls (LUCs) are necessary to: (i) prohibit the use of groundwater from the site; and (ii) prohibit residential use of the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were volatile organic compounds (VOCs) in groundwater, and polychlorinated biphenyls (PCBs) and polynuclear aromatic hydrocarbons (PAHs) in soil.

SITE DESCRIPTION

The Orsino Storage Yard is a NASA-operated facility that has been used as a staging facility for electrical equipment since 1966. The facility comprises an area of approximately 2.6 acres and contains several storage trailers/ offices that are permanently staged at the facility. The facility has no buildings onsite and generally is unpaved, with the exception of a concrete area used for drum storage. Past and current operations at Orsino Storage Yard include storage of wooden electric poles, transformers containing PCBs, electric cables, control panels, metal pipes, oil-based switches, 55-gallon drums containing dielectric fluid drained from discarded transformers, and other miscellaneous equipment, as well as maintenance and repair activities.

1. This LUCIP summarizes institutional controls regarding the NASA KSC Orsino Storage Yard Facility. For detailed information on the site, consult the Orsino Storage Yard administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

SITE LOCATION

The Orsino Storage Yard is located southeast of the intersection of Southeast 5th Street and C Avenue in the KSC Industrial Area. (Figure 1). The site is located within Section 5 of Township 23S, Range 37E which is in the Orsino Quadrangle. The soil and groundwater use control areas covered by the LUCIP are shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs above FDEP's groundwater cleanup target levels. PCBs and PAHs are present in soil above FDEP's residential soil cleanup target level (SCTL). PAHs are present in soil below FDEP's industrial SCTL. The past, current, and projected future land use of Orsino Storage Yard is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-7756, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential or groundwater use is occurring and that pavement in the specified area remains intact.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

REPORTING

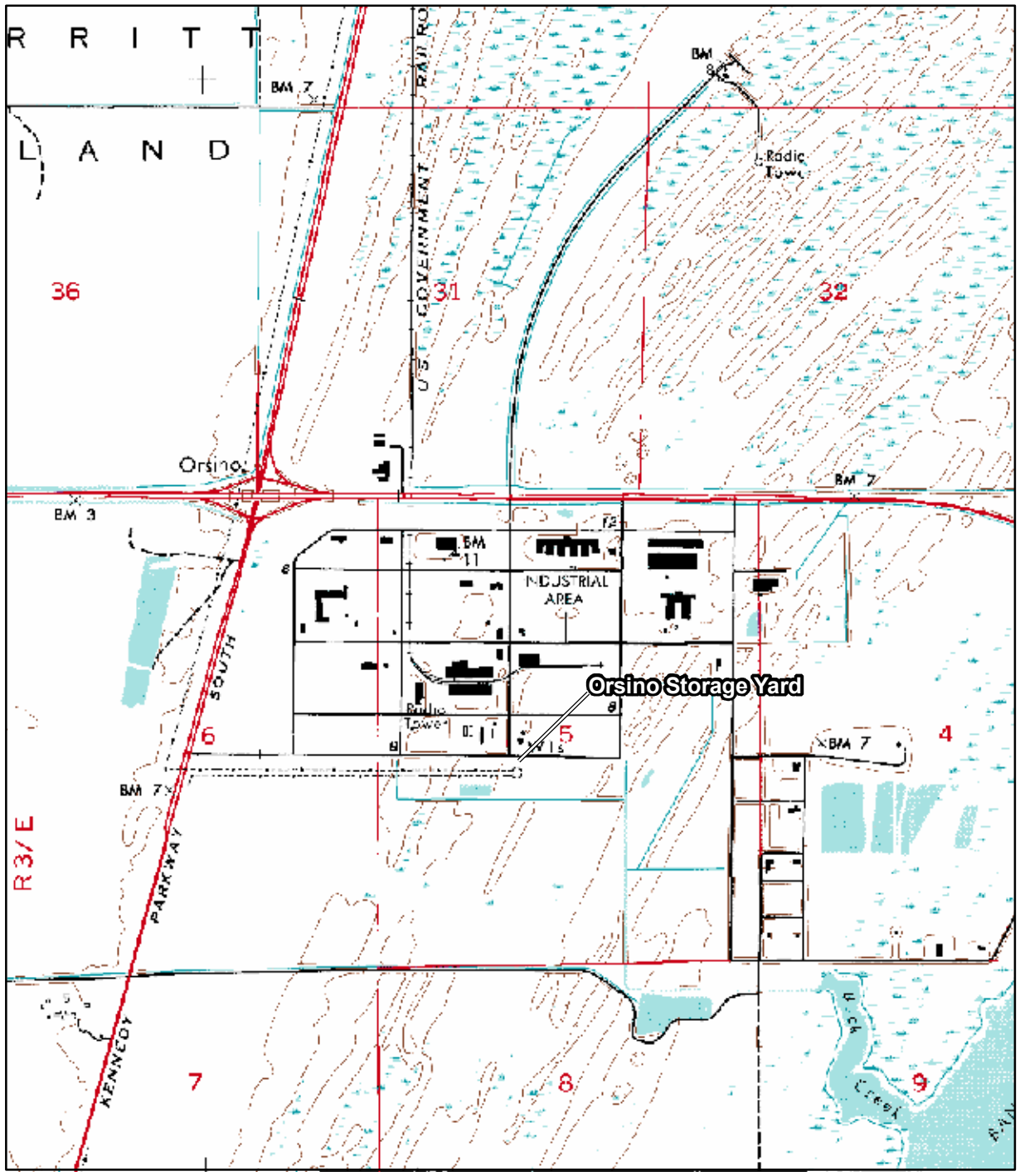
KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

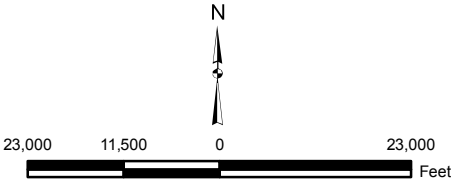
MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

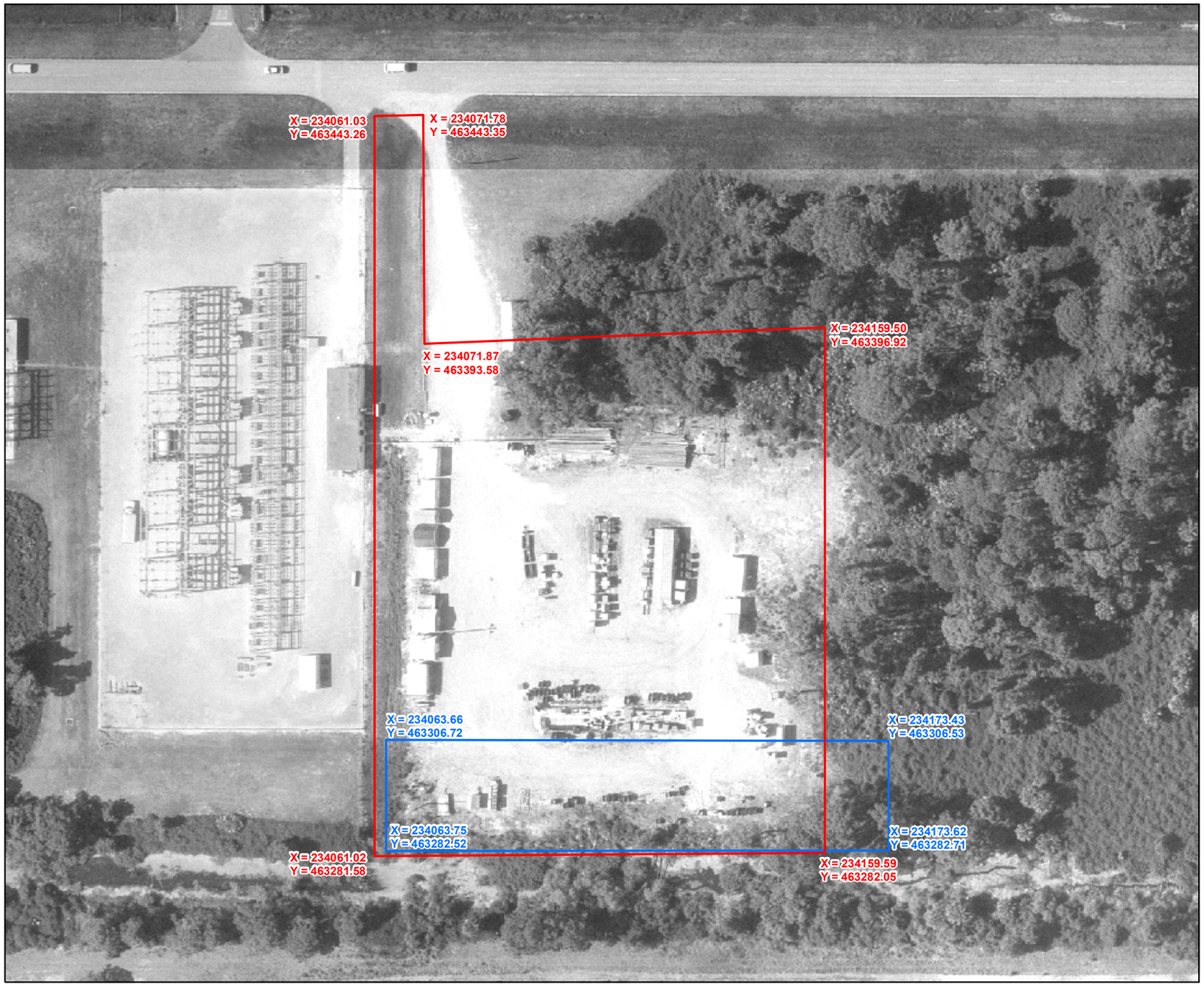


1976 USGS 7.5 Minute Orsino Quadrangle

Figure 1
Location Map
Orsino Storage Yard



\FR0129\MXDs\LUCIPfig1.mxd



N

80 40 0 80
Feet

Legend

- Area Covered by Statement of Basis and Groundwater Use Control
- Area Covered by Statement of Basis and Soil Use Control

Note:
Coordinates are presented in US State Plane Coordinate System NAD1983 Meters, Florida East, .

D:\0GIS\FR0129\LUCIPFig2.MXD

Figure 2
Site Map of Orsino Storage Yard (SWMU 04) Area

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Hydrocarbon Burn Facility Solid Waste Management Unit 007
CONTAMINANTS:	Volatile Organic Compounds and Light Non-Aqueous-Phase Liquid in Groundwater; Total Recoverable Petroleum Hydrocarbon (TRPH) in Soil
CONTROL:	Prohibit Groundwater Use and Industrial and Residential Use Access to Soil

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Hydrocarbon Burn Facility (HBF) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with HBF, institutional land use controls (LUCs) are necessary to prohibit future use of groundwater and soil at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern (COCs) were identified as being potentially unacceptable for human health risk during the RFI. The identified COCs that exceeded Florida Department of Environmental Protection (FDEP) cleanup target levels were volatile organic compounds (VOCs) and petroleum-related light non-aqueous-phase liquids (LNAPL) in groundwater, and total recoverable petroleum hydrocarbon (TRPH) in soil.

SITE DESCRIPTION

SWMU 007 occupies the northwestern portion of the National Aeronautics and Space Administration (NASA)-operated fire-fighting training facility that was operational between 1966 and 1994. HBF includes a former effluent disposal area, large and small burn pans, and former above-ground storage tank (AST) area. Conventional petroleum fuels mixed with waste solvents were used during fire-fighting training activities in the area. In 1992, 170 tons of oil-stained soils were removed from the former effluent disposal area as part of an Interim Remedial Action. Former site structures were removed as part of an Interim Measure (IM) conducted during 2002 and 2003. Chlorinated ethene- and petroleum-contaminated soils were also

[1] *This Interim LUCIP summarizes institutional controls regarding the NASA HBF site. For detailed information on the site, consult the HBF administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

excavated from the large and small burn pans and former AST area during this IM. The primary contaminants at HBF are VOCs, primarily trichloroethene (TCE) and its daughter products, and petroleum hydrocarbon compounds.

SITE LOCATION

HBF consists of a sparsely-vegetated open space formerly used for fire-fighting training operations and is surrounded by forested areas and a wetland area to the north. The site is located west of Static Test Road and north of NASA Parkway East (Figure 1). HBF is found in Section 28, Township 22S, Range 37E, as shown on the 7.5-minute False Cape topographic quadrangle map. The groundwater and soil use control areas covered by this Interim LUCIP are shown on Figure 2. Coordinates of the corners of the LUC areas are provided on Figure 2 in the State Plane Coordinate System, North American Datum (NAD) 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs at concentrations greater than FDEP Groundwater Cleanup Target Levels. LNAPL is also present in limited areas. Soils exceed the industrial and leachibility soil cleanup target levels for TRPH. The past, current, and projected future land use of HBF is industrial in nature. LUCs are required to prohibit the use of groundwater at the site and maintain the site to limit exposure to contaminated soil until cleanup levels are achieved. The current and projected land use of HBF does not include the use of site groundwater; therefore, there is no current or projected future exposure risk.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for HBF, KSC document number KSC-TA-7131, is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321)867-8402. The Kennedy Space Center (KSC)Remediation Team determined that interim institutional controls should be implemented at HBF. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and United States Environmental Protection Agency (EPA), effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the HBF LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring and exposure to soils is restricted at HBF.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

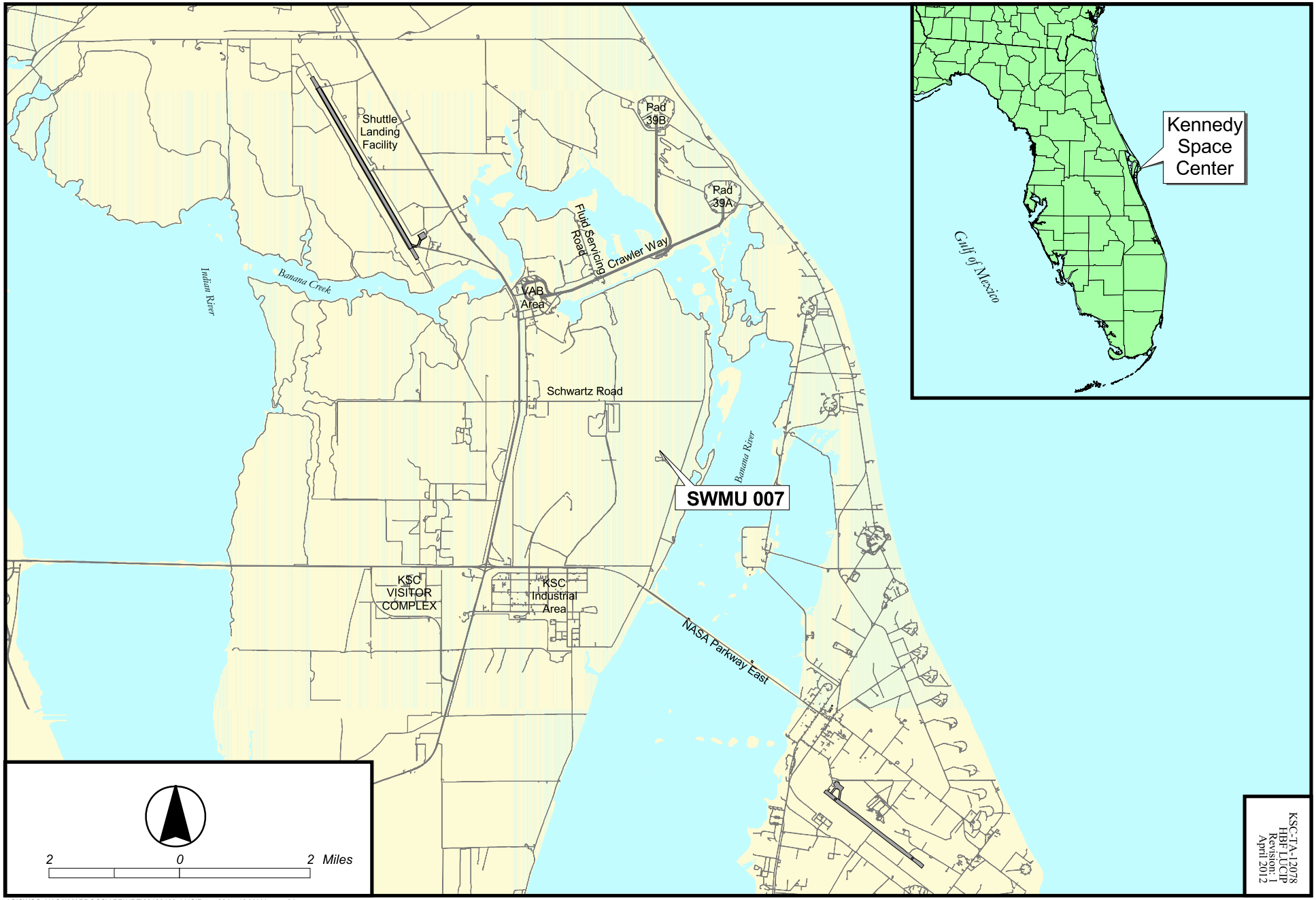
KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this Interim LUCIP.

MAINTENANCE

The Interim LUCIP shall remain in place until a land use change is implemented or the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based on analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.

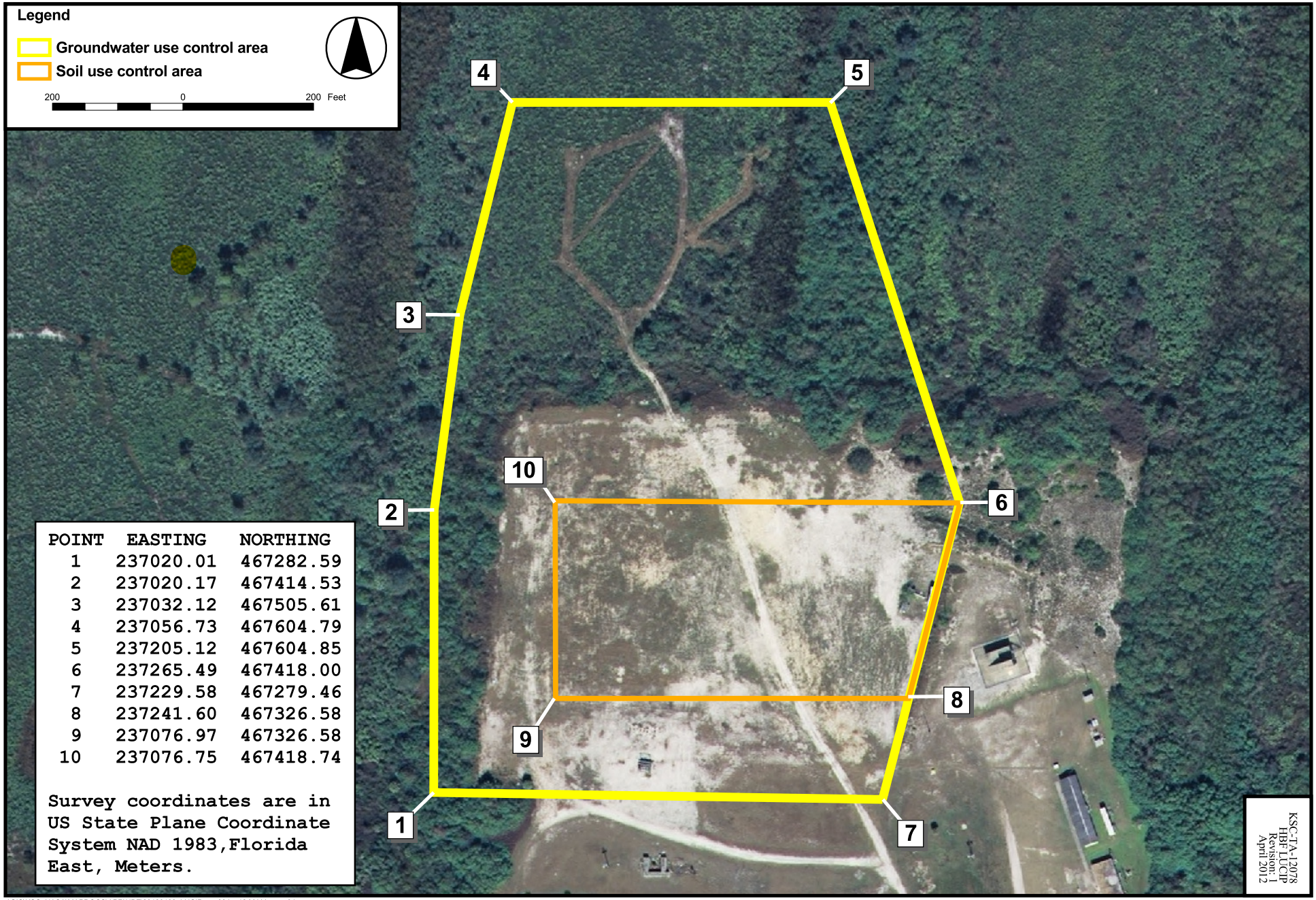
FIGURE 1 LOCATION OF KENNEDY SPACE CENTER AND SWMU 007

SWMU 007 - HYDROCARBON BURN FACILITY, KENNEDY SPACE CENTER, FLORIDA



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FIGURE 2 LAND USE CONTROL AREA
SWMU 007 - HYDROCARBON BURN FACILITY, KENNEDY SPACE CENTER, FLORIDA



POINT	EASTING	NORTHING
1	237020.01	467282.59
2	237020.17	467414.53
3	237032.12	467505.61
4	237056.73	467604.79
5	237205.12	467604.85
6	237265.49	467418.00
7	237229.58	467279.46
8	237241.60	467326.58
9	237076.97	467326.58
10	237076.75	467418.74

Survey coordinates are in US State Plane Coordinate System NAD 1983,Florida East, Meters.

:\GIS\KSC_NASA\MAPDOCS\APR\HBF\20120103_LUCIP.apr 03Jan12 MJJ Layout04

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Launch Complex 39A
Solid Waste Management Unit 008
CONTAMINANTS: Volatile Organic Compounds in Groundwater
CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of Launch Complex 39A (LC39A) of institutional controls that have been implemented at the site.[1] Although there are no current unacceptable risks to human health or the environment associated with LC39A, institutional land use controls (LUCs) are necessary to prohibit future use of groundwater at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

During the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) conducted from March 1998 to May 2000 and RFI Addendum in 2003, soil, sediment, groundwater, and surface water at LC39A were investigated. Contaminants of concern (COCs) were identified in each medium. As a result of elevated concentrations of polychlorinated biphenyls (PCBs) and polycyclic aromatic hydrocarbons (PAHs) detected in soils, a soil removal to achieve Florida Department of Environmental Protection (FDEP) Industrial Soil Cleanup Target Levels (SCTLs) was conducted as part of an interim measure (IM) in 2000. A site-wide groundwater and soil investigation was conducted between December 2011 and October 2012 to further evaluate contaminants resulting from former launch activities. The investigation confirmed the presence of COCs in groundwater and soil at concentrations greater than FDEP Groundwater Cleanup Target Levels (GCTLs) and SCTLs, respectively. The COCs in soil at LC39A included arsenic, barium, copper, lead, nickel, thallium, carcinogenic PAHs, total PCBs, dioxins/furans, and total recoverable petroleum hydrocarbons (TRPH). An IM was conducted in 2014 and 2015 to mitigate human health risks associated with direct contact exposure to soil by removing soil with COCs concentrations greater than residential SCTLs. Following completion of the soil removal and confirmation that residential SCTLs were achieved for COCs,

[1] *This Interim LUCIP summarizes institutional controls regarding the NASA LC39A site. For detailed information on the site, consult the LC39A administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-6971.*

no further action (NFA) was recommended for soil at the site in the IM Report dated October 2015 and approved by FDEP in November 2015. Groundwater is the only remaining medium of concern at LC39A. The primary contaminants detected in groundwater at LC39A are: trichloroethene, cis-1,2-dichloroethene, and vinyl chloride. The remedy for groundwater is air sparging (initiated in 2015) and monitored natural attenuation.

SITE DESCRIPTION

SWMU 008 includes a launch pad that was designed to support the Apollo program and modified for space shuttle launch operations in 1975. Launches were conducted at the site from 1981 to 2011. Acids, bases, fuel compounds, grease, metals, oils, solvents, and oxidizer compounds were used at the site during launch operations. The quantities and locations of spills of any chemicals at the site are unknown. SpaceX, who leases the pad, has made modifications and began additional launches in 2017. Stormwater runoff generated from the launch pad drains to various manmade grassed swales that radiate from the pad. The grassed swales discharge via culverts to a swale that runs parallel to the perimeter access road and discharges to receiving waters on the periphery of the site.

SITE LOCATION

LC39A includes a launch pad surrounded by a grassy area located on the eastern end of Crawler Way (Figure 1). LC39A is located in Section 3, Township 22S, Range 37E, as shown on the 7.5-minute False Cape topographic quadrangle map. The groundwater use control area covered by this Interim LUCIP is shown on Figure 2.

Coordinates of the corners of the groundwater LUC area are provided on Figure 2 in the State Plane Coordinate System, North American Datum (NAD) of 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains volatile organic compounds (VOCs) at concentrations greater than FDEP GCTLs. The past, current, and projected future land use of LC39A is industrial in nature. Because groundwater COC concentrations exceed GCTLs, LUCs are required to prohibit the use of groundwater at the site until cleanup levels are achieved through the selected remedy. The current and projected use of LC39A does not include the use of site groundwater; therefore, there are no current or projected exposures to contaminants in groundwater. To assess potential risks from vapor intrusion into future buildings at the site, indoor air quality will be evaluated prior to the construction of any structures within the groundwater use control area.

DECISION DOCUMENT

The Kennedy Space Center (KSC) Remediation Team determined that interim institutional controls should be implemented at LC39A. The interim institutional controls are temporary while investigation, IMs, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between National Aeronautics and Space Administration (NASA), FDEP, and United States Environmental Protection Agency (EPA), effective February 23, 2001. Property transfer (if implemented in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUC areas. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating and will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring and that no buildings have been constructed in restricted areas at LC39A.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this Interim LUCIP.

MAINTENANCE

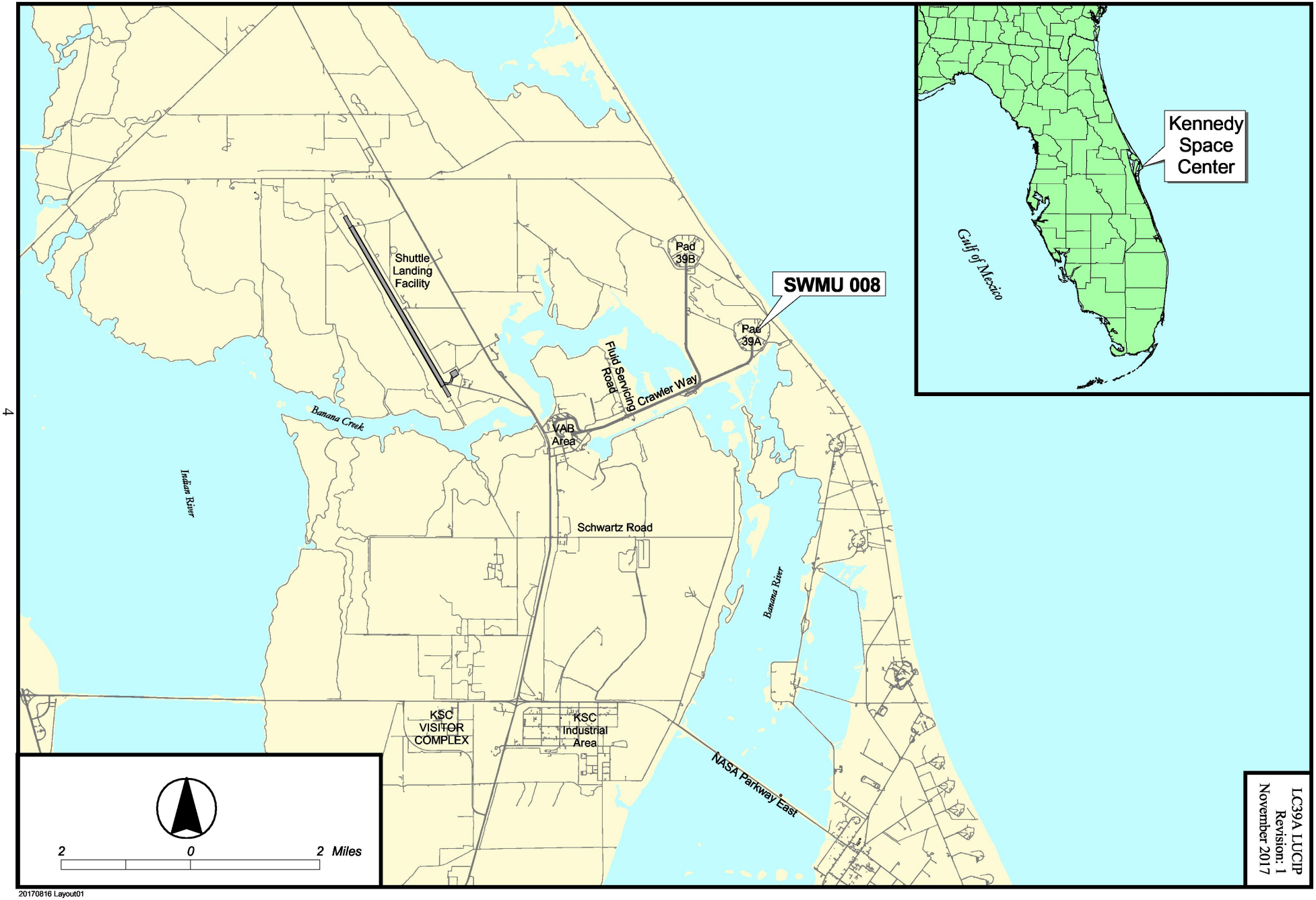
The Interim LUCIP shall remain in place until a land use change is implemented or the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based on analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

FIGURE 1 LOCATION OF KENNEDY SPACE CENTER AND SWMU 008

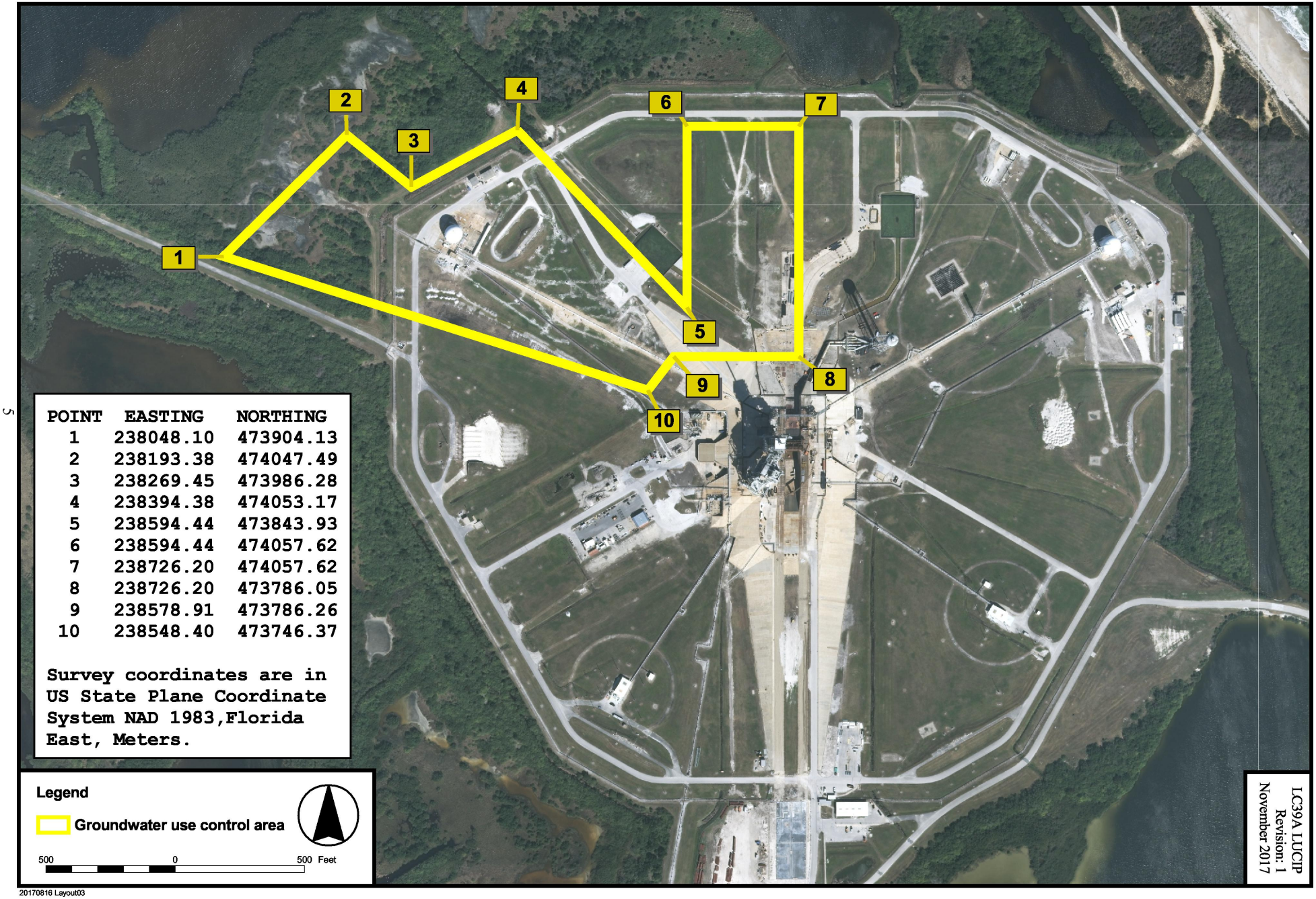
SWMU 008, KENNEDY SPACE CENTER, FLORIDA



4

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FIGURE 2 GROUNDWATER LAND USE CONTROL AREA
SWMU 008, KENNEDY SPACE CENTER, FLORIDA



20170816 Layout03

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Launch Complex 39B
Solid Waste Management Unit 9 (Group B)

CONTAMINANTS: Chlorinated Solvents and Metals in Groundwater, Benzo(a)pyrene, Polychlorinated Biphenyls, Arsenic, and Nickel in Surface Soil and Zinc in Swale Soil

CONTROL: Prohibit Groundwater Use and Residential Exposure to Surface and Swale Soil and prevent migration of contamination from select swales to the outside perimeter swale

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of Launch Complex 39B (LC39B) of institutional controls that have been implemented at the site [1]. Institutional land use controls (LUCs) are necessary to: prohibit the use of groundwater from the site; and prohibit residential exposure to soil and swale soil present at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were volatile organic compounds (VOCs) and metals (aluminum, arsenic, barium, lead, mercury, and thallium) in groundwater, and benzo(a)pyrene and metals (arsenic and nickel) in soil, and zinc in swale soil.

SITE DESCRIPTION

LC39B is an active National Aeronautics and Space Administration (NASA)-operated facility. The area where LC39B resides was undeveloped prior to the mid-1960s when construction for the Apollo Space Program commenced. The facility encompasses approximately 170 acres at Kennedy Space Center (KSC). The pad structure was retrofitted to support Space Transportation System (STS) operations in 1975. It is the northernmost of the two space shuttle launch sites situated along the eastern boundary of KSC (Figure 1). The launch pad is located in the center of the LC39B site. The facility is registered as a National Historic Site located within Brevard County.

1 This LUCIP summarizes institutional controls regarding the NASA KSC Launch Complex 39B. For detailed information on the site, consult the LC39B administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

SITE LOCATION

A portion of LC39B is located within the northwest corner of the False Cape, Florida 7.5- minute United States Geological Survey (USGS) Quadrangle Map [USGS 1976] and a portion is in the southeast corner of the Wilson, Florida Quadrangle Map [USGS 1949]. The site is located within Sections 28 and 33 of Township 21S and Range 37E. The groundwater use and soil residential control area covered by this LUCIP is shown on Figure 2. Coordinates of the corners of the LUCIP provided on Figure 2 are in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs and metals above the FDEP groundwater cleanup target level values. Soil remaining on site contains benzo(a)pyrene (Heating, Ventilation, and Air Conditioning [HVAC]) area, polychlorinated biphenyls (PCBs) (Deluge Basin Area [DBA]), arsenic (HVAC), and nickel (Compressed Air Building Area [CBA]) and swale soil contains zinc all at concentrations above Residential Soil Cleanup Target Level (SCTL) values as discussed in the Corrective Measures Study (CMS) Report [1]. The past, current, and projected future land use of LC39B is and will remain as an active launch pad in nature. LUCs are therefore required to prohibit the use of residential exposure to surface soil and swale soil. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-7022, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA) [2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

2 By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Centerwide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no groundwater use or residential exposure to surface soil is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to the FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the FDEP and implemented by modification of NASA's operating permit.

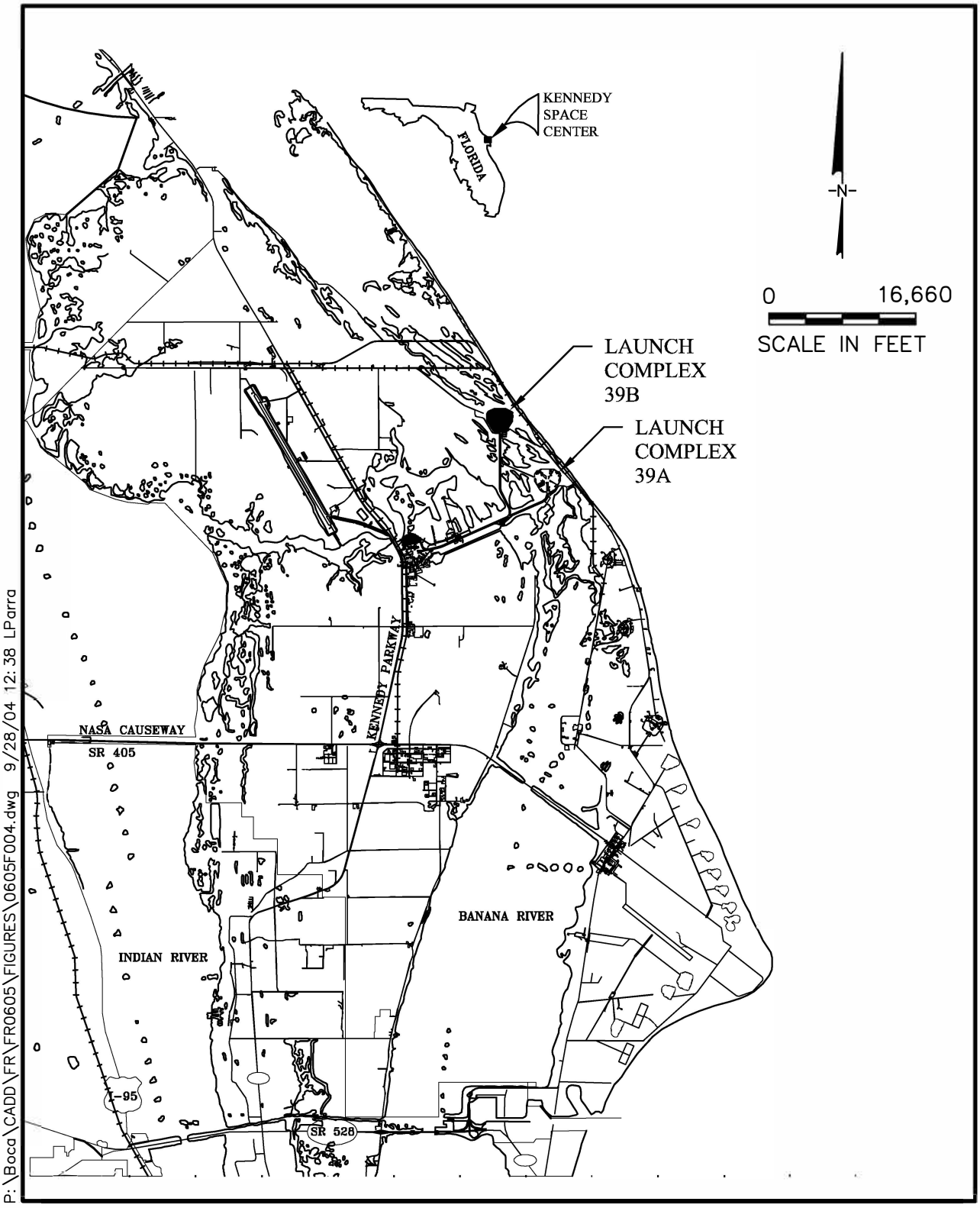
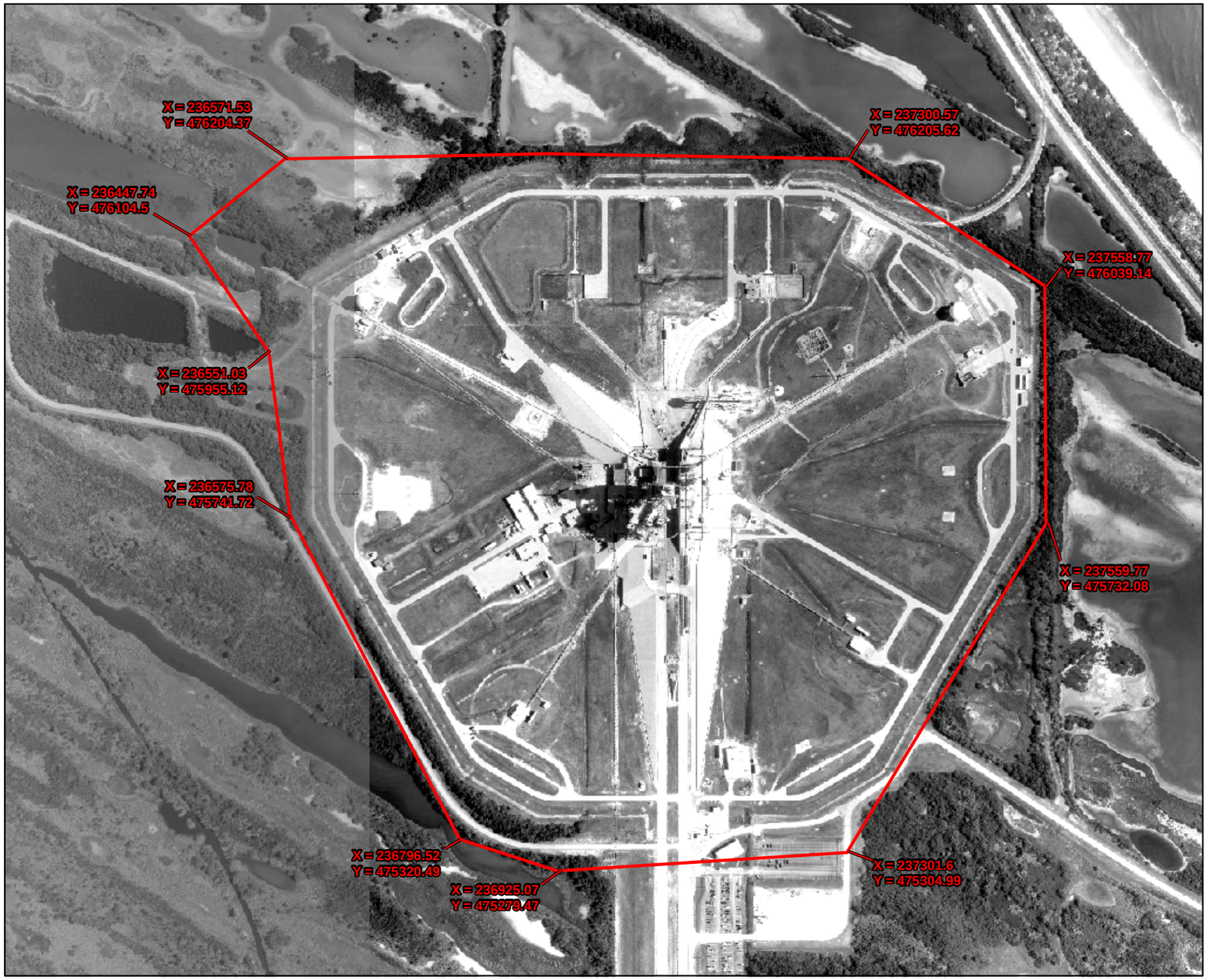


Figure 1
Location of Launch Complex 39B
at Kennedy Space Center



N

500 250 0 500
Feet

LEGEND

Monitoring well location, showing screened interval (ft BLS)

Area covered by the Statement of Basis and Land Use Control Plan

Note:
Survey Coordinates are in U. S. State Plane Coordinate System NAD1983, Meters, Florida East

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Figure 2
Site Map of LC39B

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: General Services Administration (GSA) Reclamation Yard
Solid Waste Management Unit No. 10
CONTAMINANTS: VOCs in Groundwater and PCBs in Soil
CONTROL: Prohibit Groundwater Use and Residential Exposure to Surface Soils

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the General Services Administration (GSA) Reclamation Yard of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the GSA Reclamation Yard, institutional land use controls (LUCs) are necessary to: (i) prohibit the use of groundwater from the site; and (ii) prohibit residential exposure to site soils. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and United States Environmental Protection Agency (EPA) cleanup target levels were volatile organic compounds (VOCs), polychlorinated biphenyls (PCBs) and chlorobenzenes in groundwater and PCBs in soil.

SITE DESCRIPTION

The GSA Reclamation Yard is a NASA-operated facility that was constructed in the late 1960s to facilitate the recycling of a variety of equipment and chemicals used by the Kennedy Space Center (KSC). The facility includes a former hazardous materials building and several storage warehouses and sheds that comprise an area of approximately 7 acres. Past and current operations at the GSA Reclamation Yard include the storage of office equipment, air conditioners, transformers, batteries, lawn mowers, paints, solvents, pesticides, oils, and adhesives. Solvents are no longer stored onsite. The site location and facility map are included as Figures 1 and 2, respectively.

SITE LOCATION

The GSA Reclamation Yard is located on the south side of Ransom Road and west of

1. This LUCIP summarizes institutional controls regarding the NASA KSC General Services Administration (GSA) Reclamation Yard. For detailed information on the site, consult the GSA Reclamation Yard administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

Kennedy Parkway (Figure 1). The site is located within Section 7 of Township 23S, Range 37E which is in the Orsino Quadrangle. The soil and groundwater use control areas covered by the LUCIP are shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs, PCBs and chlorobenzenes above FDEP's groundwater cleanup target levels. PCBs also are present above FDEP's residential soil cleanup target levels (SCTLs). The past, current, and projected future land use of the GSA Reclamation Yard is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site and prohibit residential use and exposure to soil. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-6703, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that neither residential exposure to soils nor groundwater use is occurring, and that site swales meet the alternative SCTL assumptions.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

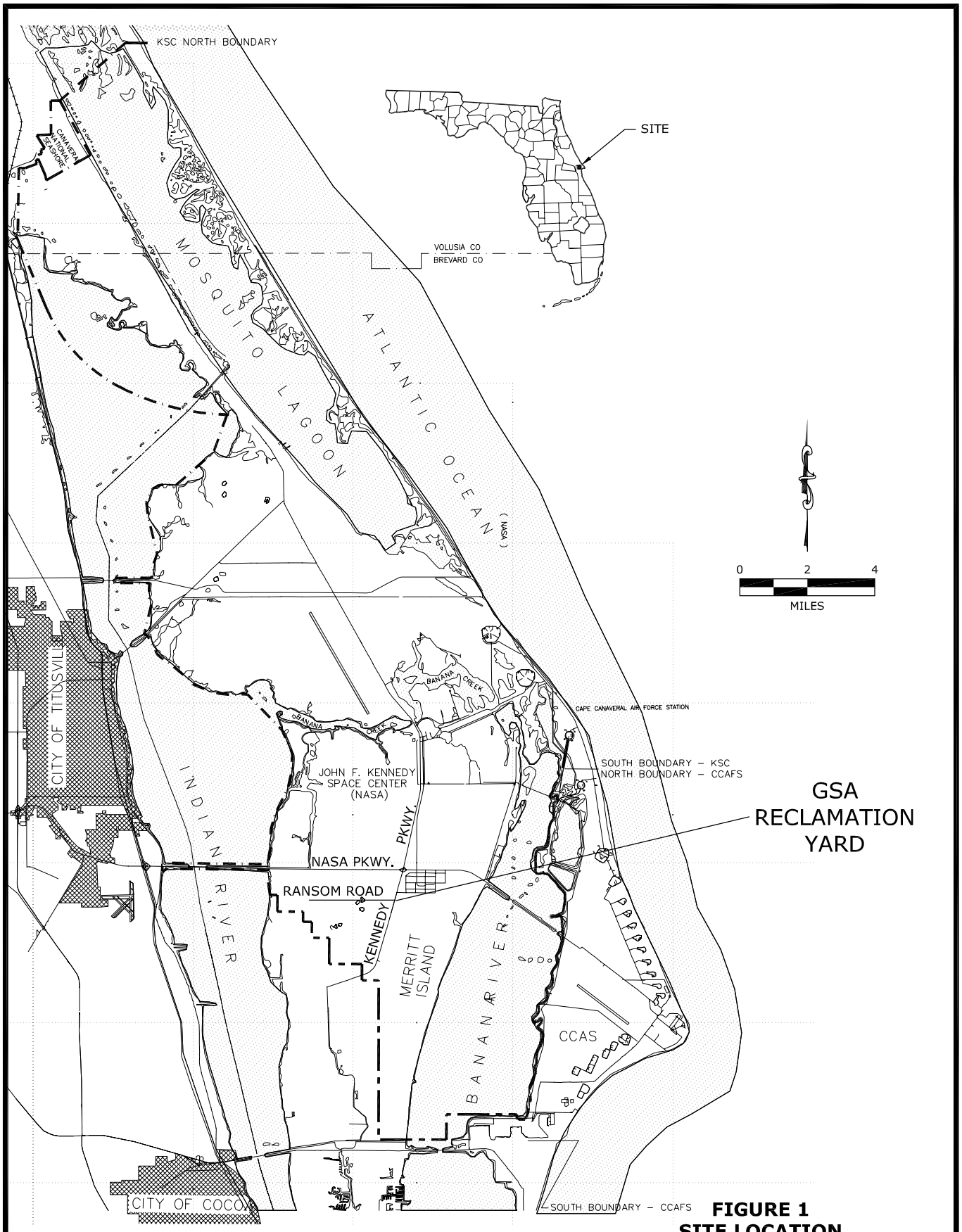
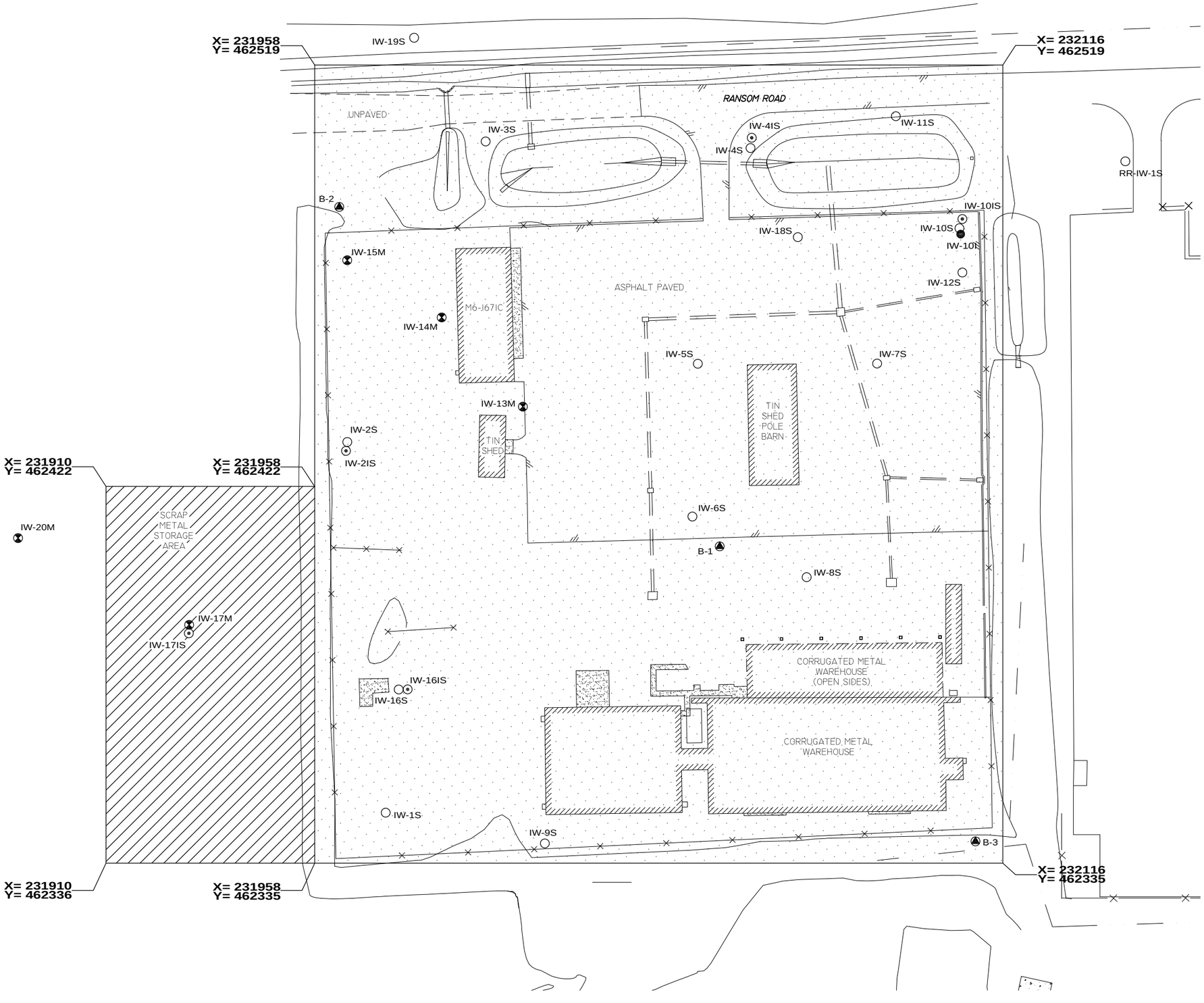


FIGURE 1
SITE LOCATION
GSA RECLAMATION YARD
KENNEDY SPACE CENTER, FLORIDA



EXPLANATION

- SHALLOW WELL (±12 FT BLS)
- MEDIUM WELL (±20 FT BLS)
- INTERMEDIATE SHALLOW WELL (±30 FT BLS)
- INTERMEDIATE WELL (±50 FT BLS)
- PIEZOCONE-HYDROCONE PUSH WELL (±70 FT BLS)

FT BLS — FEET BELOW LAND SURFACE

FENCE

ASPHALT PAVED

CONCRETE SLAB

BUILDING / SHED

AREA COVERED BY STATEMENT OF BASIS AND GROUNDWATER USE CONTROL AREA

AREA COVERED BY STATEMENT OF BASIS AND SOIL AND GROUNDWATER USE CONTROL AREA

NOTES:
1. SURVEY COORDINATES ARE IN STATE PLANE COORDINATE SYSTEM NAD 1983 METERS, FLORIDA EAST

0 40 80
FEET

FIGURE 2
FACILITY MAP
GSA RECLAMATION YARD
SWMU #10
KENNEDY SPACE CENTER
FLORIDA

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: GSA Vehicle Maintenance Facility
Solid Waste Management Unit No. 13

CONTAMINANTS: VOCs in Groundwater and
PAHs and Metals in Soil and Swale Soil

CONTROL: Prohibit Residential Use and Maintain the Swale Configuration

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the GSA Vehicle Maintenance Facility (GSA VMF) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the GSA VMF site, institutional land use controls (LUCs) are necessary to: (i) prevent residential exposure to surface soil; and (ii) ensure the swales at the site remain in their current configuration and that human activity within the swale is limited to intermittent maintenance. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were volatile organic compounds (VOCs) in groundwater, and polynuclear aromatic hydrocarbons (PAHs) and metals in soil and swale soil. Groundwater issues associated with this site are being addressed under activities for the Communications, Maintenance, and Storage Facility (SWMU 82).

SITE DESCRIPTION

The GSA VMF site is a NASA-operated facility that consists of four numbered buildings that were constructed between 1966 and 1985 and four unnumbered structures that are used for support operations. The GSA VMF historically was used for vehicle service, maintenance, and fueling operations at KSC. Fueling operations were terminated in 1999. A natural gas facility was constructed at the site in 1994 and is still active, as are propellant refueling, storage, and testing operations. Due to the nature of the previous operations, various chemicals have been used at the facility, including motor oil,

1. This LUCIP summarizes institutional controls regarding the NASA KSC GSA Vehicle Maintenance Facility (GSA VMF). For detailed information on the site, consult the GSA VMF administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

hydraulic fluids, transmission fluid, engine coolant, automotive battery acid, solvents, and fuels.

SITE LOCATION

The GSA VMF site is located in the western portion of the KSC Industrial Area (Figure 1) and comprises approximately 9 acres. It is situated southwest of the intersection of 3rd Street S.E. and B Avenue. The site is located within Section 4 of Township 23 South, Range 37 East which is in the Orsino Quadrangle. The soil use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

PAHs and metals were detected in soil and swale soil above FDEP's residential and/or industrial soil cleanup target levels (SCTLs). Alternative SCTLs were developed for a groundskeeper scenario at the site and all soil contaminants were below the alternative SCTLs. The past, current, and projected future land use of the GSA VMF is industrial in nature. LUCs are therefore required to prohibit residential exposure to surface soil and to ensure the swales remain in their current configuration and that human activity within the swale is limited to intermittent maintenance. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for this site. The SB for the site, KSC document number KSC-TA-6428, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Centerwide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential exposure to site soils is occurring. The inspection will further verify that the swale maintenance activities meet the alternative SCTL assumptions for groundskeepers.

REPORTING

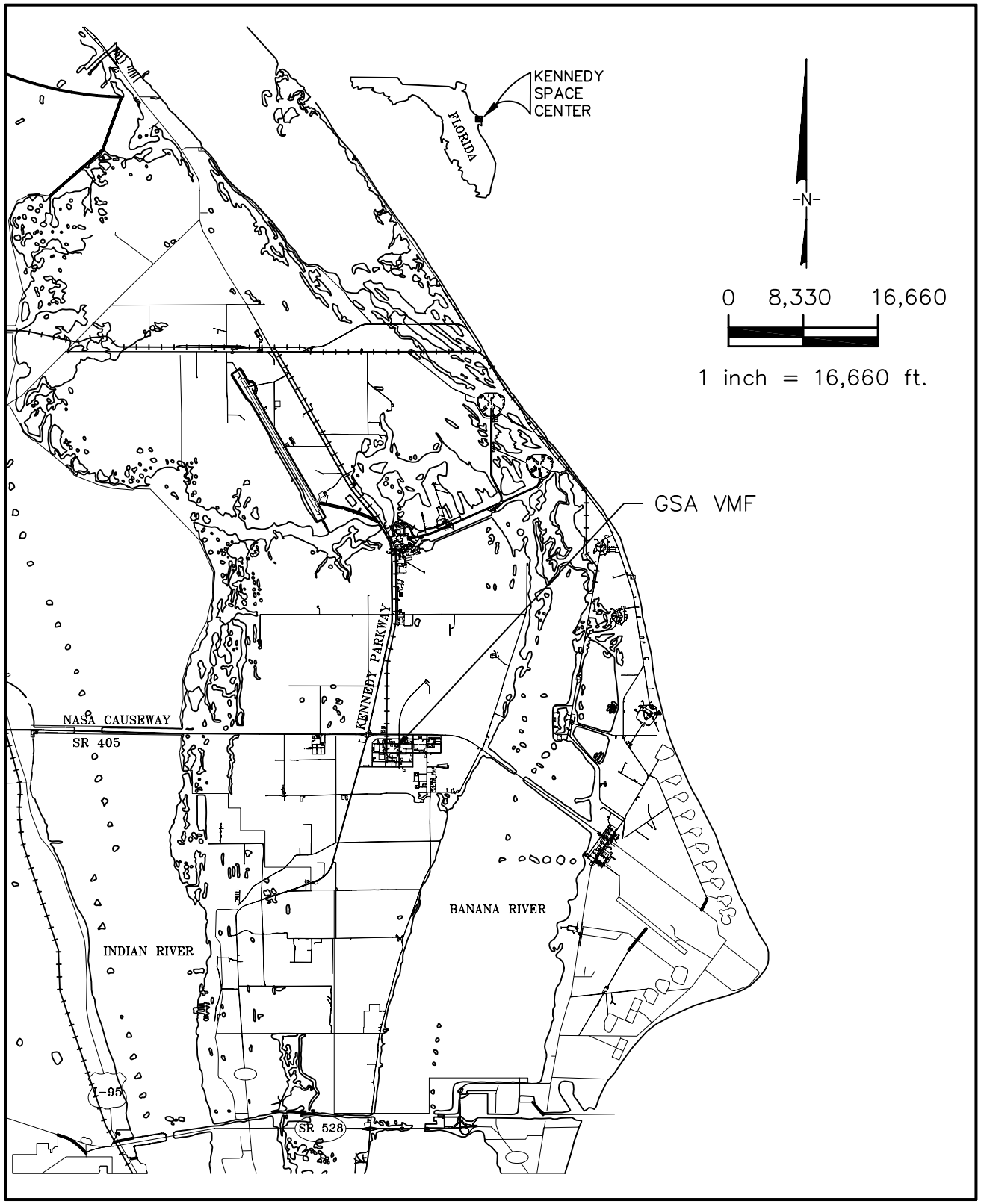
KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

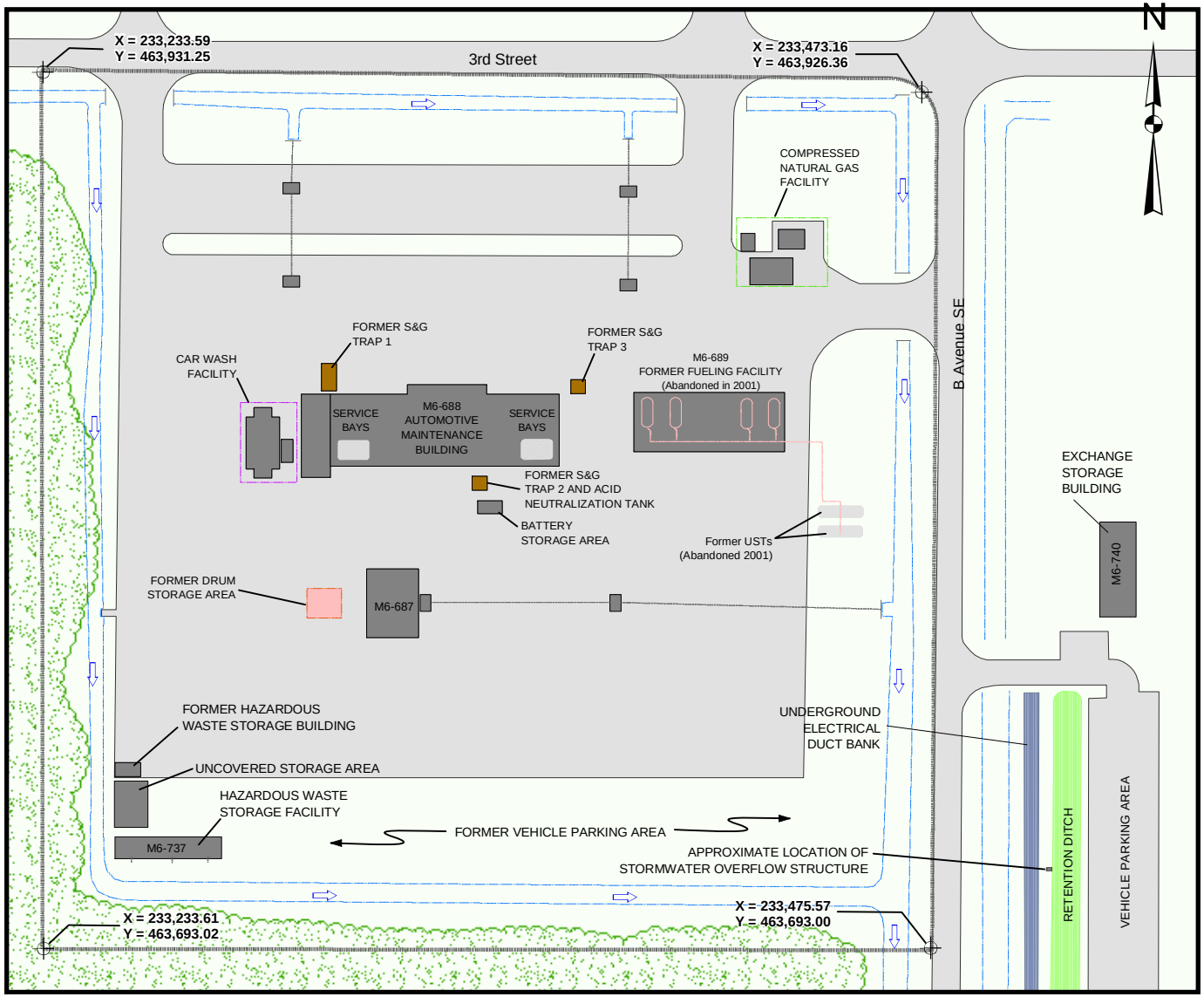
MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.



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FIGURE 1
SITE LOCATION MAP
GSA VMF



LEGEND

- Drainage Swales
- Compressed Natural Gas Fueling Area (Since 1994)
- Former Drum Storage Area
- Car Wash Facility (Since 1995)
- Headwall/Stormwater Discharge Point
- Underground Drain Pipe
- Former Fuel Islands
- Former Fuel Lines
- Former USTs
- Limits of GSA Facility*
- Underground Electrical Duct Bank
- Depression
- Paved Areas
- Buildings/Open Storage
- Drainage Grates
- Sand & Grease Traps
- Wooded Area
- Surface Water Flow Direction

*Area Covered by Statement of Basic & Soil Use Control Area.

Notes:

1. Dimensions of Former Fuel Underground Storage Tanks & Appurtenances from UST Closure Report, IT Corporation, May 2001.
2. Groundskeeper Scenario Applies to all Drainage Swales Within Dashed Area.
3. Land Use Control for the Swales will Ensure that the Groundskeeper Scenario Assumptions, as Determined in the Risk Assessment Remain Valid.
4. Survey Coordinates are in State Plane Coordinate System NAD 1983 Meters, Florida East.

D:\0GIS\FR0342\MXDs\FIG2_SOIL_USE_CONTROL_AREA.MXD

Figure 2
Soil Use Control Area
GSA VMF (SWMU #13)

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Maintenance and Operations Building
Solid Waste Management Unit No. 14

CONTAMINANTS: VOCs and Iron in Groundwater and PCBs, PAHs, and Arsenic in Soil/Dry Sediment

CONTROL: Prohibit Residential and Groundwater Use and Maintain the Swale Configuration

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Maintenance and Operations (M&O) Building of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the M&O Building, institutional land use controls (LUCs) are necessary to: (i) prohibit the use of groundwater from the site; (ii) prohibit residential use of the site; and (iii) ensure the swales at the site remain in their current configuration and that human activity within the swale is limited to intermittent maintenance. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were volatile organic compounds (VOCs) and iron in groundwater, and polychlorinated biphenyls (PCBs), polynuclear aromatic hydrocarbons (PAHs), and arsenic in soil/dry sediment.

SITE DESCRIPTION

The M&O Building is a NASA-operated facility that was constructed in the early 1960s to support space flight efforts at KSC. The facility includes the M&O Building and numerous appurtenant structures and storage areas that comprise an area of approximately 23 acres (Figure 1). Past and current operations at the M&O Building include painting, carpentry, electrical, metal work, heavy equipment maintenance, fueling, steam cleaning, battery maintenance, and storage.

1. This LUCIP summarizes institutional controls regarding the NASA KSC Maintenance and Operations (M&O) Building. For detailed information on the site, consult the M&O Building administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

SITE LOCATION

The M&O Building is located in the northwestern corner of the KSC Industrial Area (Figure 1). It is located at the intersection of Third Street S.E. and A Avenue S.E. The site is located within Section 4 of Township 23S, Range 37E which is in the Orsino Quadrangle. The soil and groundwater use control areas covered by the LUCIP are shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs and iron above FDEP's groundwater cleanup target levels. PCBs and arsenic were present in soil/dry sediment above FDEP's residential soil cleanup target level (SCTL). One PAH was present in soil/dry sediment above FDEP's industrial SCTL. Alternative SCTLs were developed for a groundskeeper scenario at the site and all soil contaminants were below the alternative SCTLs. The past, current, and projected future land use of the M&O Building is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site, prohibit residential use/exposure to soils, and to ensure the swales remain in their current configuration and that human activity in swales is limited to intermittent maintenance. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-5717, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential or groundwater use is occurring and that the swales meet the alternative SCTL assumptions.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

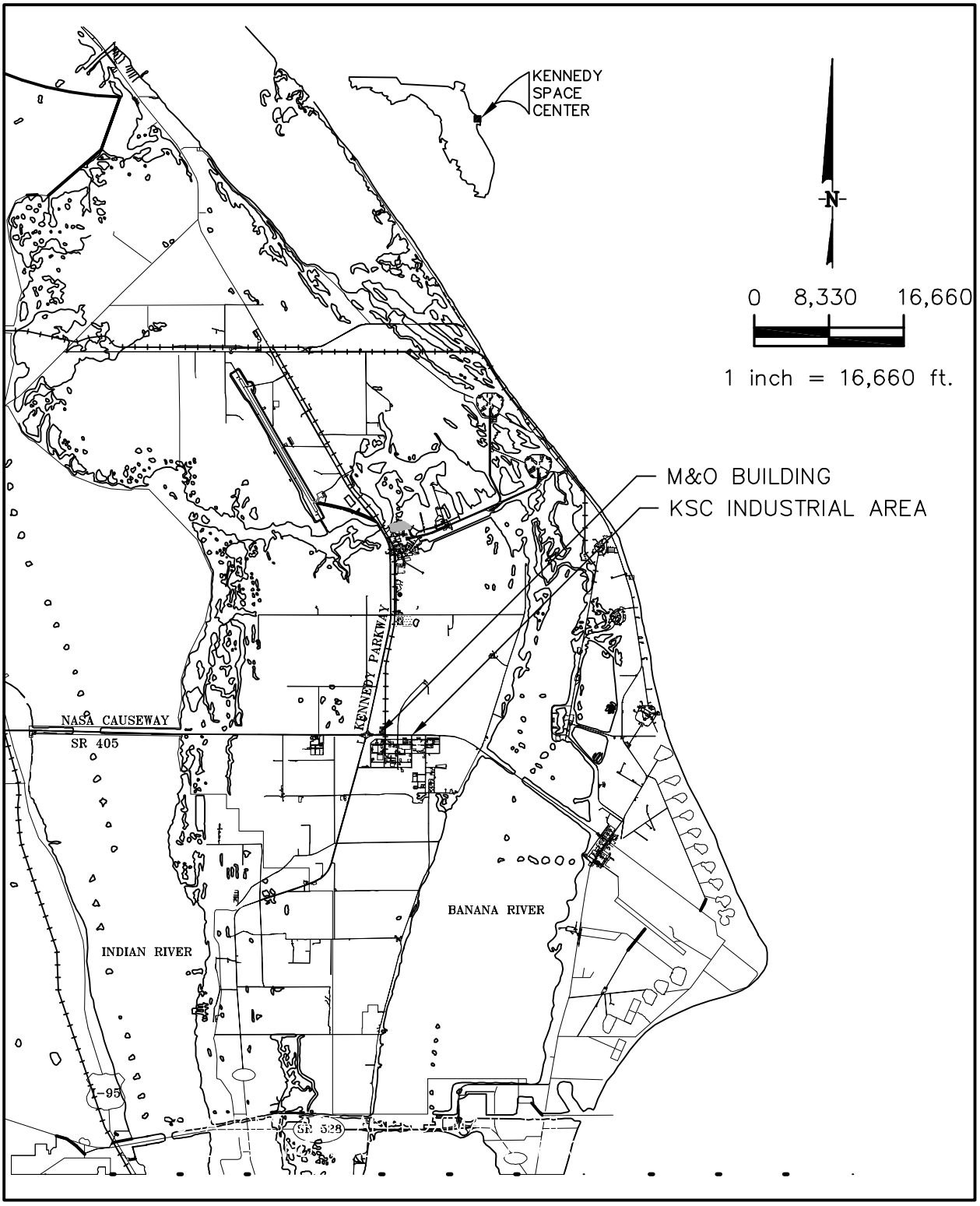
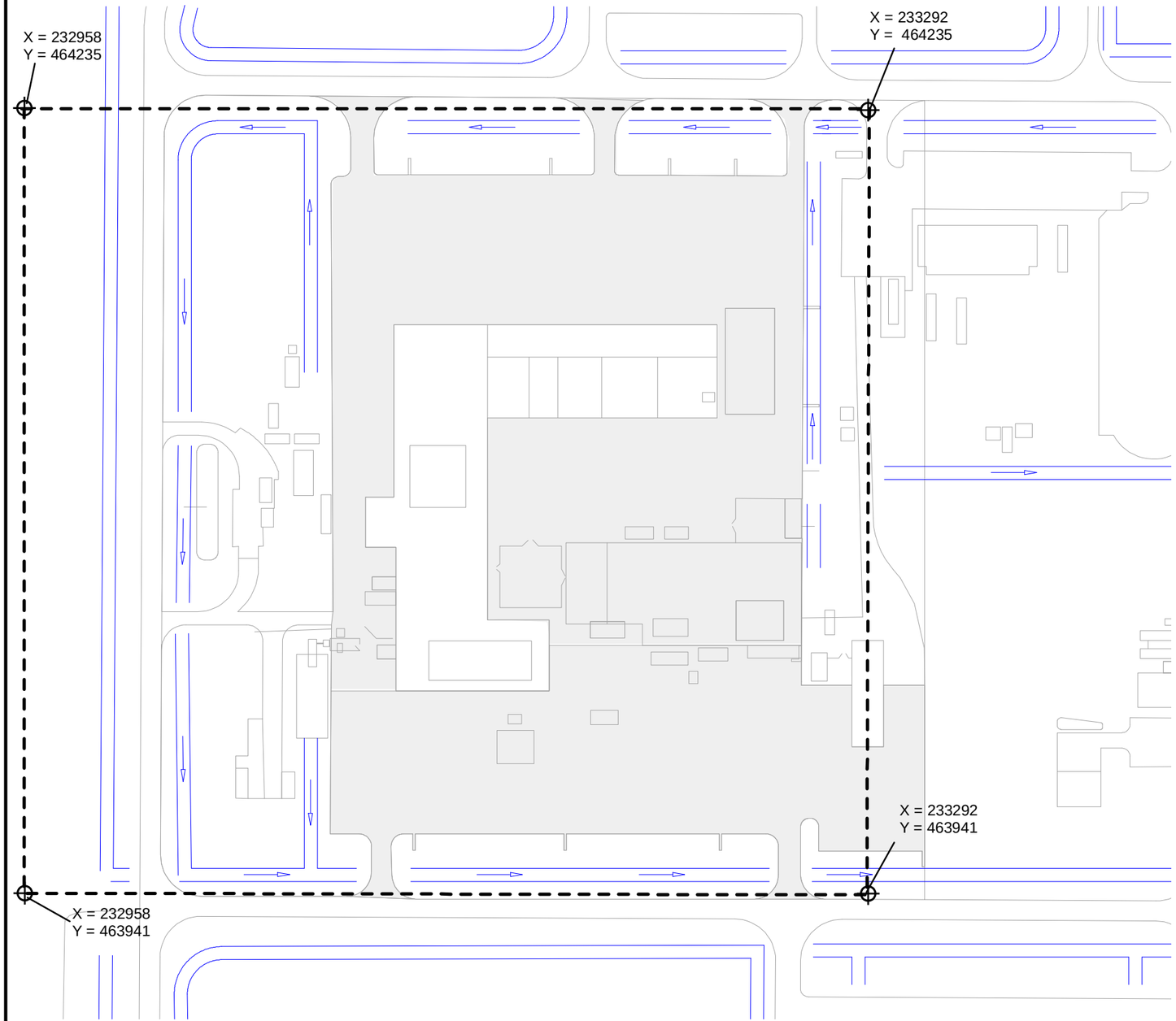
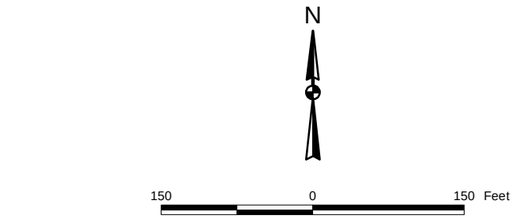


FIGURE 1

KENNEDY SPACE CENTER
M&O BUILDING SITE LOCATION MAP





Legend

Drainage Swale

Paved Areas

Surface water flow direction

Area covered by Statement of Basis
and soil and groundwater use control area

Notes:

1. Groundskeeper scenario applies to all drainage swales within dashed area.
2. Land use control for the swales will ensure that the groundskeeper scenario assumptions, as determined in the risk assessment, remain valid.
3. Survey coordinates are in State Plane Coordinate System NAD 1983 meters, Florida East.

R:\NASA\FR0138\NEW_GIS\M&O_NEW1.APR-Figure 2 Site Map M&O Building

Figure 2
Site Map
M&O Building

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Ransom Road Sandblast Area Solid Waste Management Unit No. 21
CONTAMINANTS:	PCBs in Soil
CONTROL:	Prohibit Residential Use and Restrict Industrial Use Access to Soil

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Ransom Road Sandblast Area (RRSA) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the RRSA, institutional land use controls (LUCs) are necessary to prohibit residential use of the site and restrict industrial use access to soils. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI and supplemental sampling activities that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were polychlorinated biphenyls (PCBs) in surficial soils.

SITE DESCRIPTION

The RRSA is a NASA-operated facility that has been used as a sandblasting area and painting facility since 1967. Sandblasting is currently conducted inside a sandblast facility and was formerly conducted outside the facility to the east. Objects to be sandblasted are reportedly degreased and steam cleaned offsite before delivery to the RRSA, although pressure washing of objects to be sandblasted is occasionally conducted at the site. The entire site within the fenced boundary, exclusive of drainage ditches, is paved with asphalt or concrete.

SITE LOCATION

The RRSA is located on the south side of Ransom Road immediately southwest of the intersection of Ransom Road with Kennedy Parkway South, approximately 1.5 miles

1. This LUCIP summarizes institutional controls regarding the NASA KSC Ransom Road Sandblast Area (RRSA). For detailed information on the site, consult the RRSA administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

south of the intersection of Kennedy Parkway and NASA Parkway (Figure 1). The RRSA SWMU encompasses the entire facility including all improvements within a surrounding fence and adjacent stormwater infiltration ditches where releases may have occurred (Figure 2). The Government Services Administration (GSA) equipment-for-auction storage yard (SWMU No. 10) is located immediately west of the RRSA. Wooded areas surround the RRSA and GSA sites to the north, east, and south; orange groves exist to the west.

The site is located within Section 7 of Township 23 South, Range 37 East, which is in the Orsino Quadrangle. Coordinates of the corners of the soil use control areas are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

PCBs were detected at a concentration exceeding the FDEP/EPA industrial cleanup target level in one soil sample (that was not removed during interim corrective measures excavation) collected from under asphalt pavement. LUCs are therefore required to prohibit industrial site workers access to contaminated soils under the pavement in the area shown on Figure 2. Also, PCBs have been detected at concentrations over residential cleanup target levels in soils at the northwest corner of the site adjacent to the GSA SWMU. LUCs are therefore required to prohibit residential use of the site within the security fence.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for this site. The SB for the site, KSC document number KSC-TA-5655, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspection, condition certification and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential use is occurring and pavement in the specified area remains intact.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

This LUCIP will remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by EPA and FDEP and implemented by modification of NASA's operating permit.

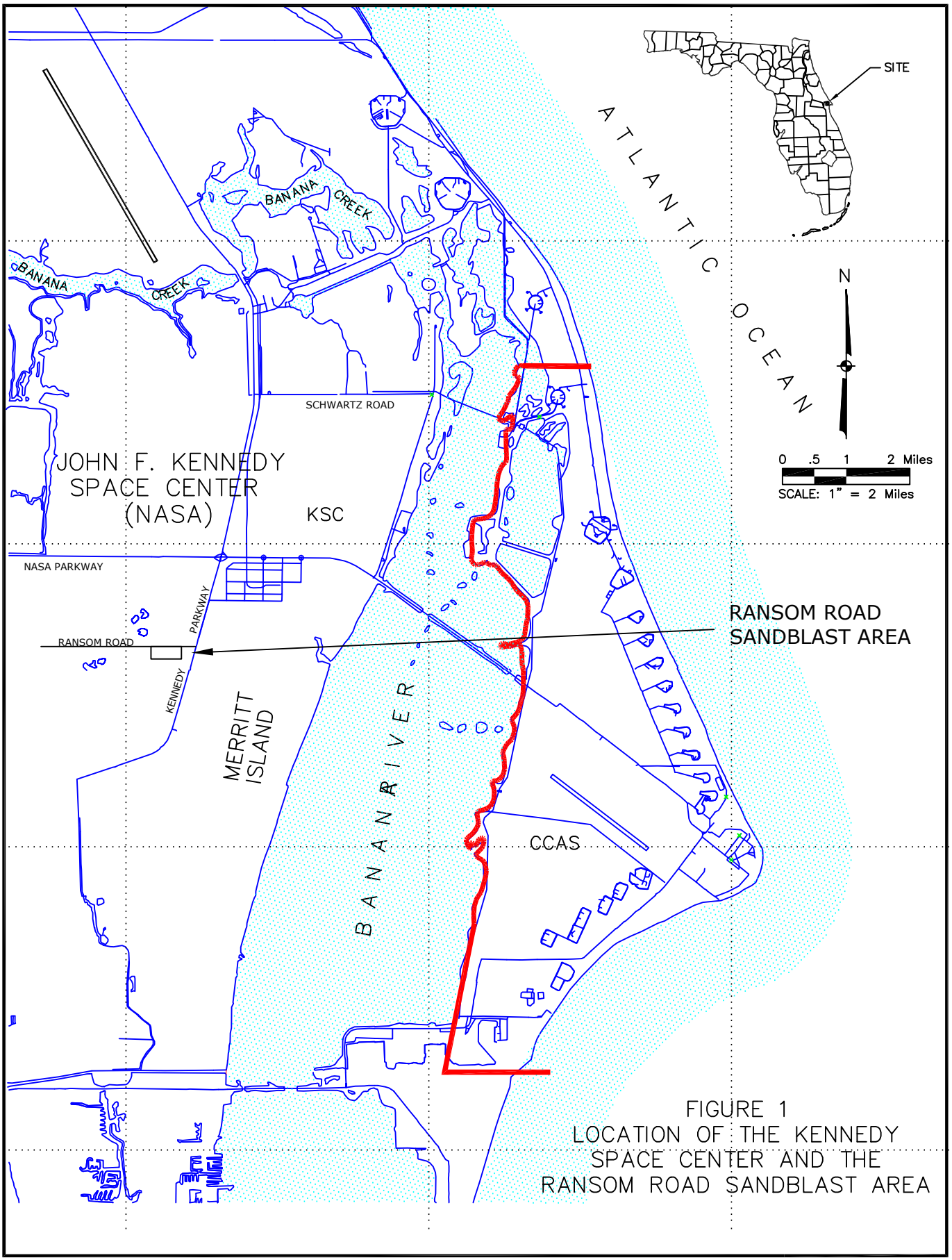
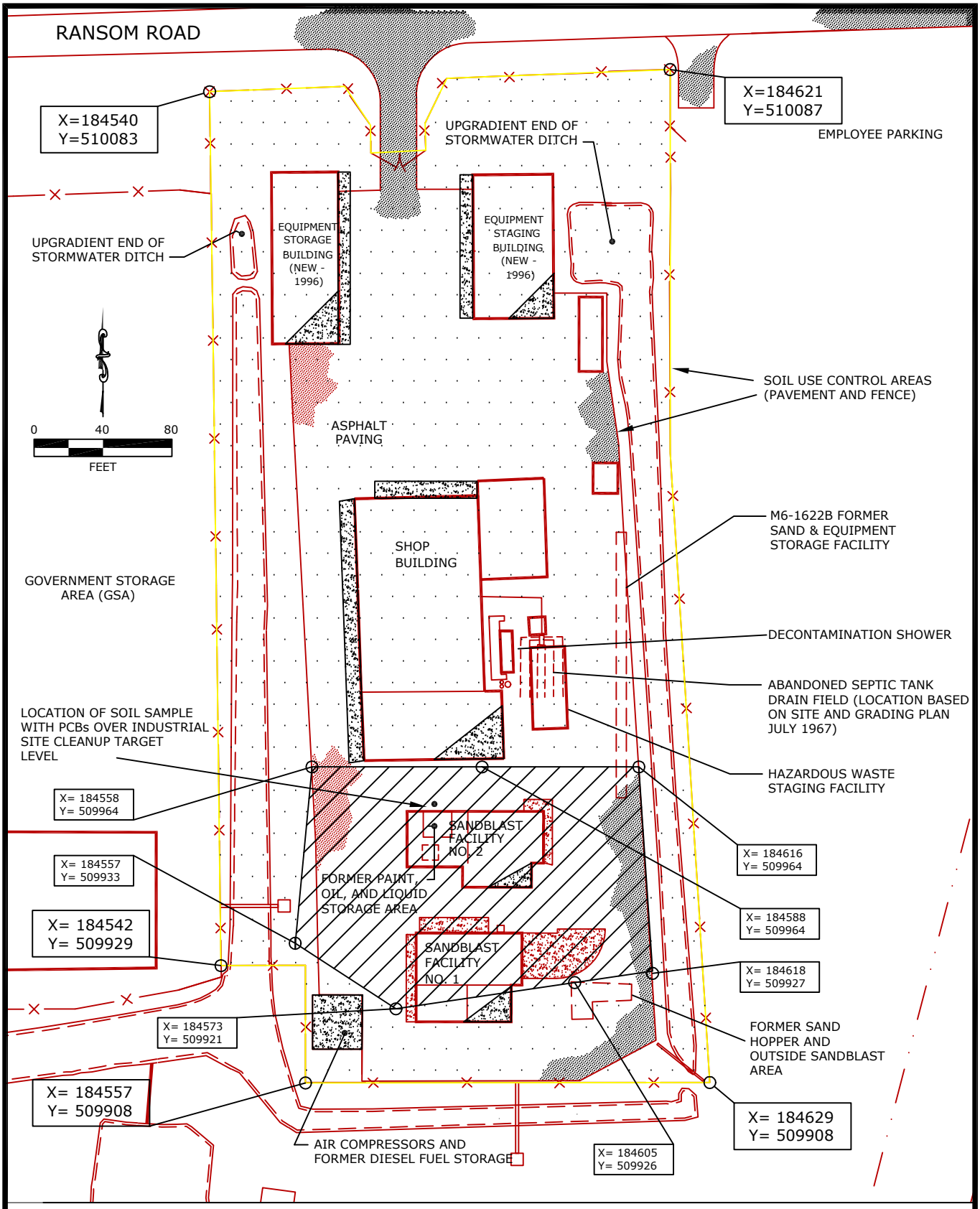


FIGURE 1
LOCATION OF THE KENNEDY
SPACE CENTER AND THE
RANSOM ROAD SANDBLAST AREA

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EXPLANATION

SOIL USE CONTROL AREA; RESIDENTIAL USE PROHIBITED.

INDUSTRIAL USE (ACCESS TO SOIL) RESTRICTED; PAVEMENT TO BE MAINTAINED.

SURVEY COORDINATES ARE IN STATE PLANE COORDINATE SYSTEM NAD 1983 METERS, FLORIDA EAST

FIGURE 2
RANSOM ROAD SANDBLAST AREA

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HSW

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Component Cleaning Facility
Solid Waste Management Unit No. 30
CONTAMINANTS: VOCs and SVOCs in Groundwater
CONTROL: Prohibit Use of Groundwater

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Component Cleaning Facility (CCF) of institutional controls that have been implemented at the site[1]. Institutional land use controls (LUCs) are necessary to prohibit groundwater use at the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI and supplemental sampling activities that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels include volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) in groundwater.

SITE DESCRIPTION

The CCF is a NASA-operated facility comprising approximately 14 acres that originally was used for converting liquid nitrogen to nitrogen gas, which was then piped to launch pads. NASA later established a component refurbishment (cleaning) facility at the CCF. The CCF consisted of several operations that were conducted in facility buildings including equipment maintenance and cleaning, laboratory analyses, industrial water treatment, water deionization, freon storage and reclamation, compressed gas loading, charging, and bottle storage, clean components and equipment storage, dry chemical storage, and hazardous waste staging. All operations at the CCF were suspended in November 2001 to facilitate the environmental cleanup effort. Based on the history of operations at the SWMU, suspected sources of contamination include discharges to ditches from underground

1. This LUCIP summarizes institutional controls regarding the NASA KSC Component Cleaning Facility (CCF). For detailed information on the site, consult the CCF administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

wastewater sumps, and runoff from the site and adjacent roadways.

SITE LOCATION

The CCF facility is north of the crawlerway and Saturn Causeway and between the Vehicle Assembly Building and the launch complexes at Kennedy Space Center, Florida (Figure 1). The CCF area covered by this LUCIP is situated predominantly north of the north crawler track with a smaller portion south of the track (Figure 2). The site is located within Section 8 of Township 22 South, Range 37 East of the Orsino Quadrangle. The groundwater use control area is roughly rectangular in shape and is approximately 22.3 acres in size (Figure 2). Coordinates of the corners of the LUCs are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater within the site boundary contains VOCs and SVOCs at concentrations above the FDEP's groundwater cleanup target levels. LUCs are therefore required to prohibit the use of groundwater. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for this site. The SB for the site, KSC document number KSC-TA-5672, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspection, condition certification and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no groundwater use is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

This LUCIP will remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by EPA and FDEP and implemented by modification of NASA's operating permit.

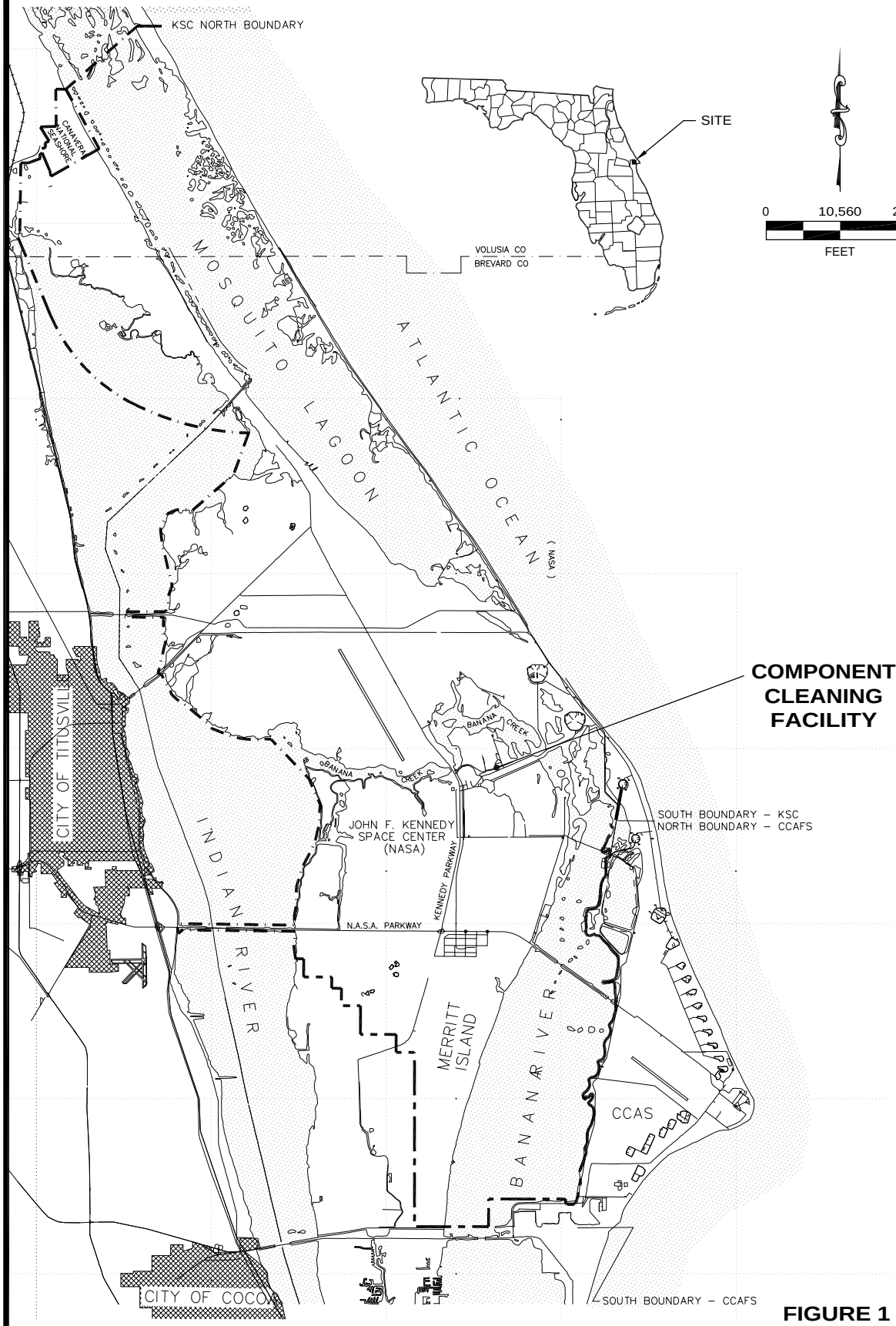


FIGURE 1
COMPONENT CLEANING FACILITY
LOCATION MAP

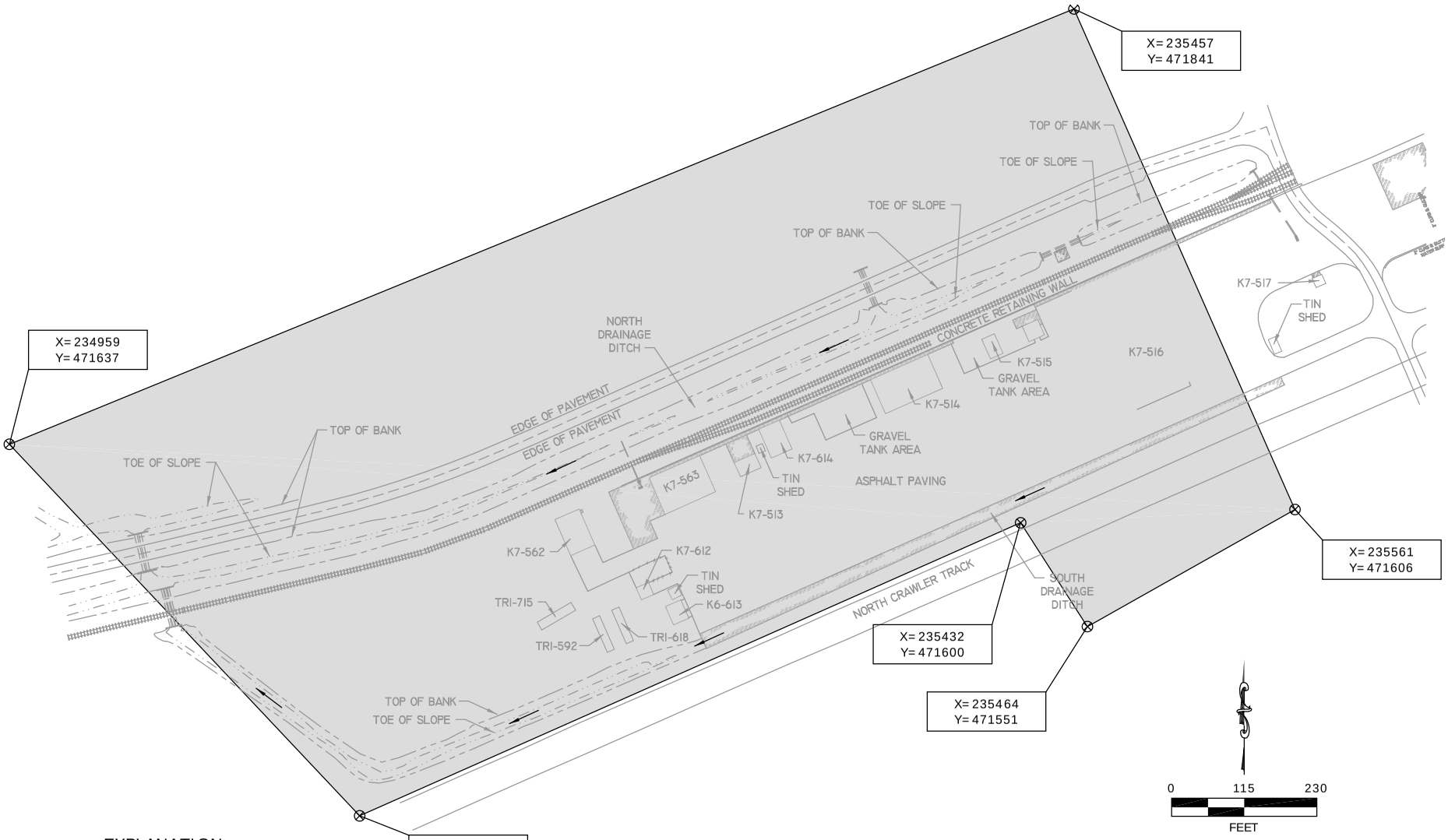


FIGURE 2
COMPONENT CLEANING FACILITY
SITE MAP

HSW

11/05/2002

LAND USE CONTROL IMPLEMENTATION PLAN

FORMER DRUM STORAGE AREA (SWMU 037)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Former Drum Storage Area Solid Waste Management Unit 037
CONTAMINANTS:	VOCs in Groundwater
CONTROL:	Prohibit Groundwater Use, Prevent Hypothetical Future Residential Exposure to Groundwater, and Prevent Potential Discharge of Contaminated Groundwater to Adjacent Surface Water

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Former Drum Storage Area (FDSA) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with FDSA, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater from the site, to prevent hypothetical future residential exposure to groundwater, and to prevent potential discharge of contaminated groundwater to adjacent surface water bodies that have been designated at Outstanding Florida Waters (OFW). Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of FDSA Confirmatory Sampling activities in 2005. No ecological risks were identified; therefore, ecological risks were not evaluated further. Human health risks were updated based on additional data collected during the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were chlorinated volatile organic compounds (VOCs) in groundwater.

SITE DESCRIPTION

Approximately 100 drums were stored by NASA at FDSA from 1988 through 1994, primarily on a concrete pad in the northern portion of the site but also at multiple locations across the site (Figure 1). Three tankers reported at the site during this period were parked in the southern retention area; the contents of the tankers are not known. The contents of the drums were reported as asbestos materials, solidified paint and debris, adhesives, petroleum-contaminated soils and absorbents, aerosol cans, photo developer solutions, wastewater, latex paints, hydrazine-

[1] *This LUCIP summarizes institutional controls regarding the NASA FDSA. For detailed information on the site, consult the FDSA administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

contaminated materials (hoses) contained in dilute citric acid solutions, nitrogen tetroxide-contaminated materials contained in dilute ammonium hydroxide solution, glycol-based coolants, polyol resin foam components, polymeric isocyanates foam components, polychlorinated biphenyl (PCB) and non-PCB lighting ballasts, and fluorinated oils.

SITE LOCATION

FDSA includes approximately 6 acres located on the northeastern portion of the turnaround loop of Fluid Servicing Road and consists of the Building J7-2112A area (Figure 1). The site is located within Section 5 of Township 22S, Range 37E which is in the Orsino Quadrangle. The groundwater use control area covered by the LUCIP are shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs at concentrations greater than FDEP's Groundwater Cleanup Target Levels. The past, current, and projected future land use of FDSA is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-10432, is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

[2] By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating and will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no residential groundwater use is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

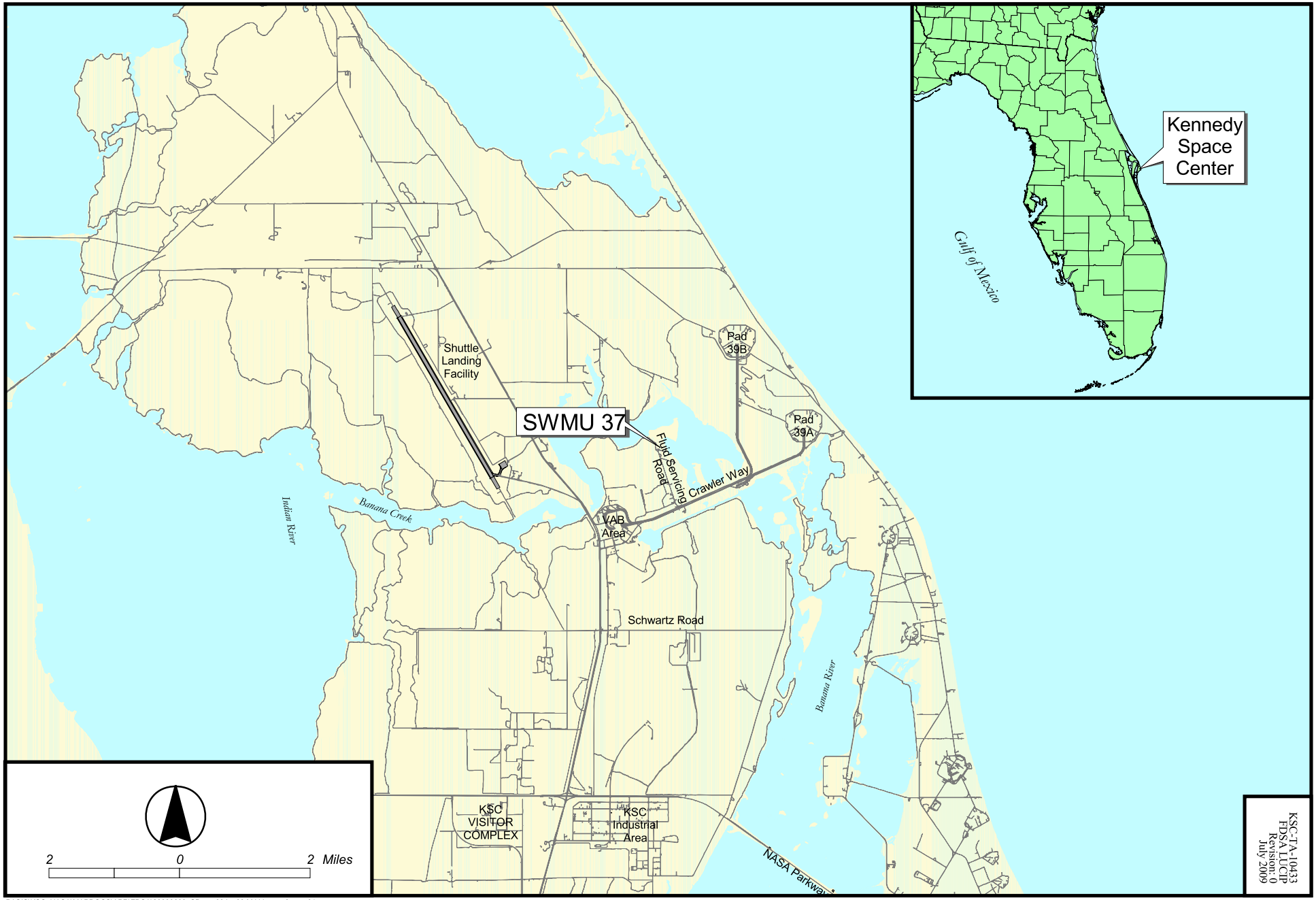
KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

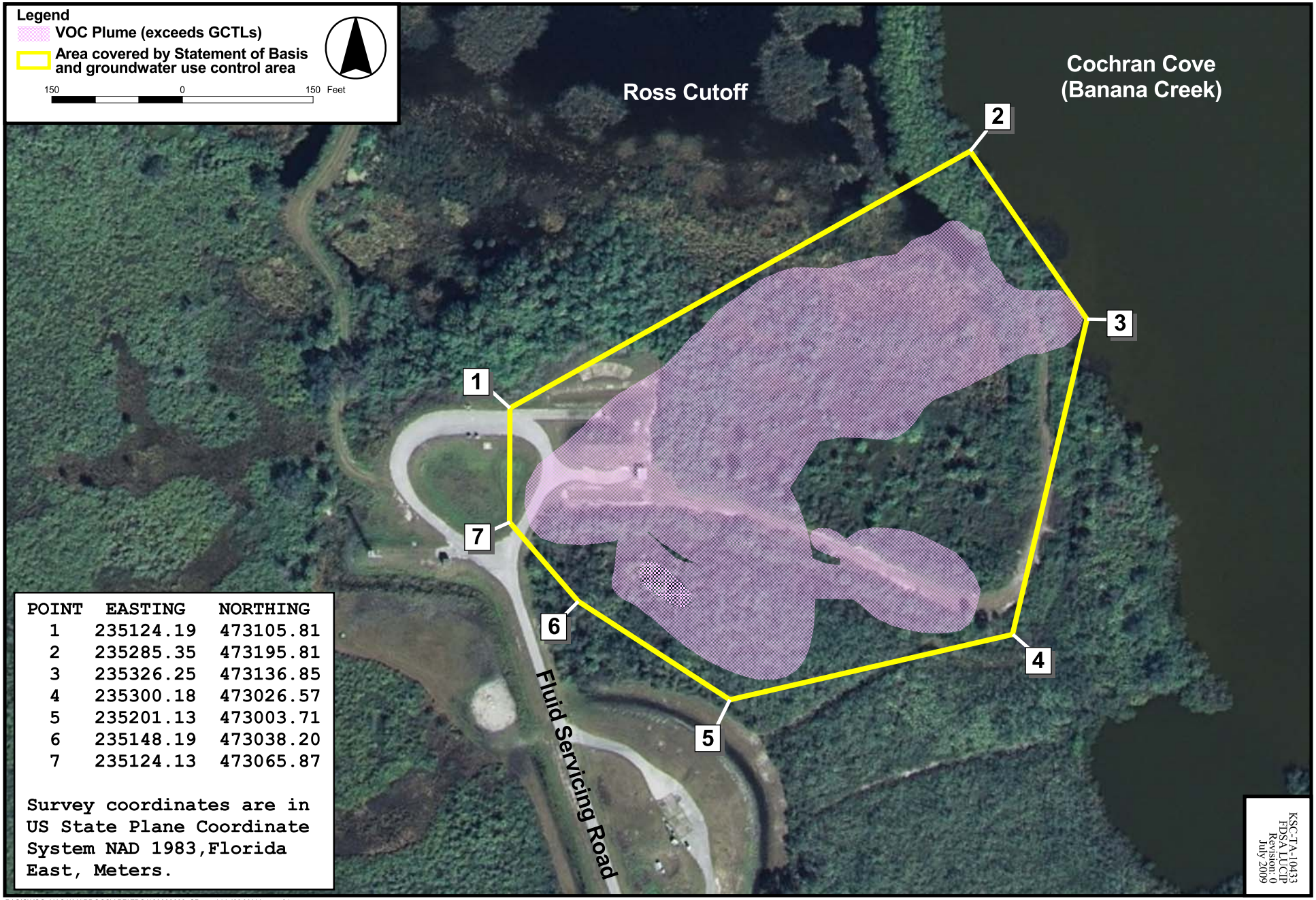
FIGURE 1 LOCATION OF KENNEDY SPACE CENTER AND SWMU 37

SWMU 37 - FORMER DRUM STORAGE AREA, KENNEDY SPACE CENTER, FLORIDA



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FIGURE 2 GROUNDWATER LAND USE CONTROL AREA
SWMU 37 - FORMER DRUM STORAGE AREA, KENNEDY SPACE CENTER, FLORIDA



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LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Building M7-505 Treatment Tank Solid Waste Management Unit 039
CONTAMINANTS:	Volatile organic compounds (VOCs) in groundwater and polychlorinated biphenyls (PCBs) in soil
CONTROL:	Prohibit groundwater use and industrial / residential access to soil

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of Building M7–505 of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with Building M7-505, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater from the site. LUCs are also necessary to prevent access to soil under electrical equipment in the northwest portion of the site. Controls necessary to prevent human exposure will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and Corrective Measure Implementation (CMI). Constituents of concern that exceed Florida Department of Environmental Protection (FDEP) cleanup target levels are chlorinated VOCs (trichloroethene, cis-1,2-dichloroethene, and vinyl chloride) in groundwater and PCBs in soil.

SITE DESCRIPTION

The M7-505 Building is a National Aeronautics and Space Administration (NASA)-operated facility that was constructed in the early 1960s. The facility includes the M7-505 Building, roads, parking lots and storage areas (Figure 1). Past and current operations at the Building M7-505 include material testing, metal treatment and machine shop activities. The treatment tank was used for pH neutralization of waste solutions generated in the metal treatment laboratory.

SITE LOCATION

The M7-505 Building is located in the southeastern portion of the Kennedy Space Center (KSC) Industrial Area at the intersection of D Avenue SE and within Section 5 of Township 23S, Range 37E, which is in the Orsino Quadrangle. The groundwater use control and soil areas covered by the LUCIP are shown on Figure 2.

[1] *This LUCIP summarizes institutional controls regarding the NASA M7-505 Building. For detailed information on the Site, consult the M7-505 Building administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

Coordinates of the corners of the LUC areas are provided on Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs above the FDEP Groundwater Cleanup Target Levels. Polynuclear aromatic hydrocarbons (PAHs) were also present in swale soil above the FDEP Residential-Soil Cleanup Target Levels, however interim measures have mitigated potential risk to human health and ecological receptors from the swale soil. Soil under electrical equipment in an area in the northwest portion of the site contains PCBs above FDEPs soil cleanup target levels. The past, current and projected future land use of the Building M7-505 is industrial in nature. However, LUCs are required to prohibit the potential future use of groundwater from the site and to restrict access to the soil. Indoor air quality shall also be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The institutional controls are temporary while long term monitoring documents the reduction of VOCs in groundwater through natural processes and until the PCB-affected soil is removed.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

The KSC Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by the KSC Environmental Assurance Branch. The inspections will verify that no groundwater use or unauthorized disturbance to soils is occurring at the site.

REPORTING

The KSC Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

[2] By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.

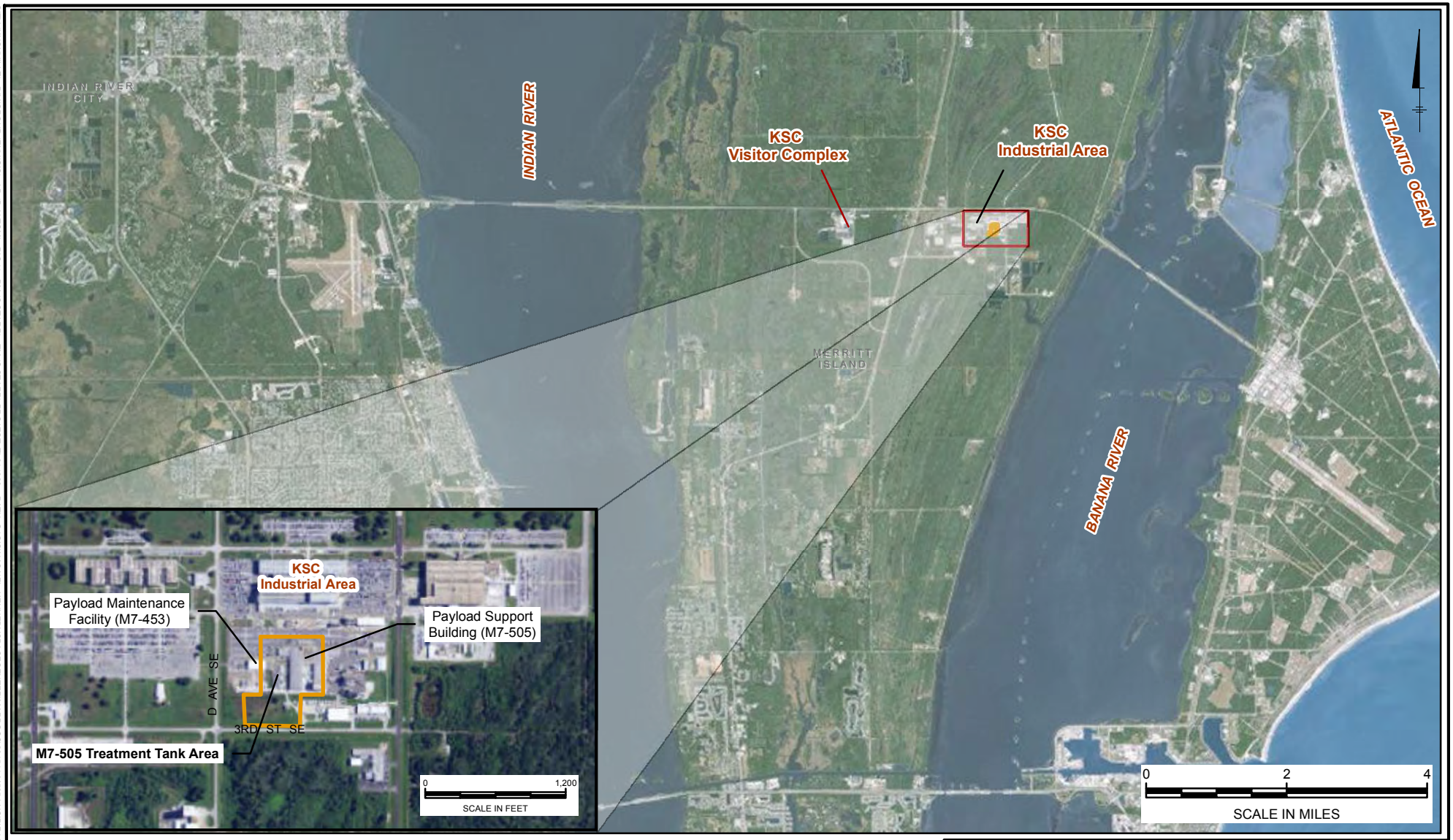
Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

ENFORCEMENT

The KSC Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or until there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the FDEP and implemented by modification of NASA's operating permit.



PROJECTION: NAD 1983 StatePlane Florida East FIPS 0901
AERIAL SOURCE: ESRI Online Services (NAIP, June 2013).

LEGEND

SWMU 039 Boundary

NASA - National Aeronautics and Space Administration
KSC - Kennedy Space Center
LUCIP - Land Use Control Implementation Plan
SWMU - Solid Waste Management Area

Site Location Map
Land Use Control Implementation Plan

M7-505 Treatment Tank Area
NASA Kennedy Space Center, Florida

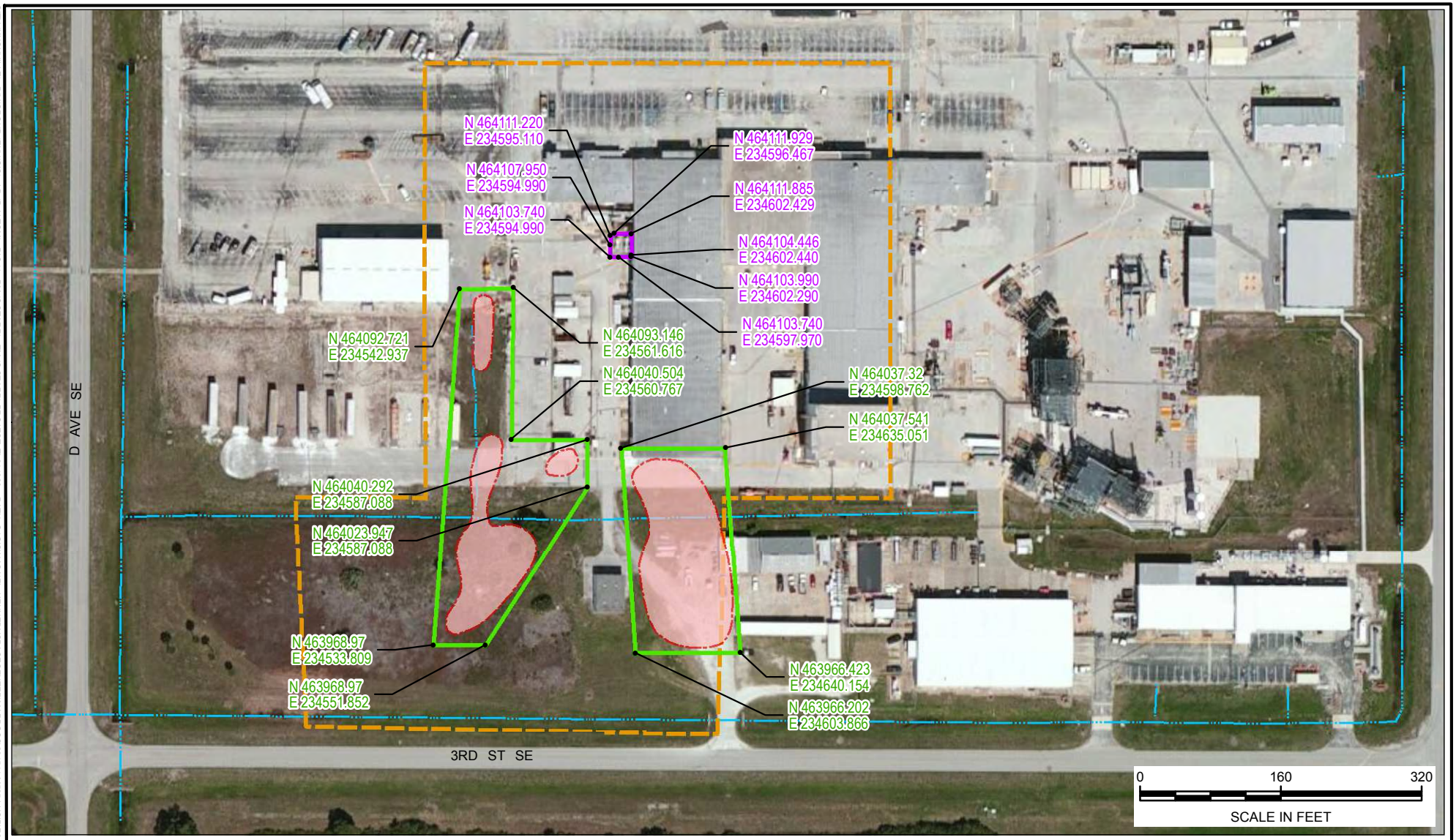
Project Number: TL014020

Figure 1

12/30/2015

CITY:(KNOXVILLE) DIV/GROUP:(ENV/GIS) LD:(BALTOM) PIC:() PM:(S.STARR) TM:(S.STARR) PROJECT: TL014020 PATH: G:\GIS\NASA\FL_KENNEDY\SPACECENTER\MAPDOCS\20151111 M505 LUCIP\F1 M7-505_LUCIP SITE LOC.MXD USER: BALTOM
SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY

LUCIP - SWMU 039



PROJECTION: NAD 1983 StatePlane Florida East FIPS 0901
AERIAL SOURCE: ESRI Online Services (NAIP, June 2013).

LEGEND

- SWMU 039 Boundary
- Swale/Ditch
- VOCs Detected in Groundwater >GCTL (2015)
- Soil LUCIP Area
- Groundwater LUCIP Area

NASA - National Aeronautics and Space Administration
KSC - Kennedy Space Center
LUCIP - Land Use Control Implementation Plan
SWMU - Solid Waste Management Area

VOCs - Volatile Organic Compounds
GCTL - Groundwater Cleanup Target Level
LUCIP North and East Coordinates are in State Plane Florida East (meters).
Groundwater shown in green; Soil shown in purple.

Site Plan
Land Use Control Implementation Plan

M7-505 Treatment Tank Area
NASA Kennedy Space Center, Florida

Project Number: TL014020

Figure 2

12/30/2015

CITY;(KNOXVILLE)_DIV/GROUP;(ENV/GIS)_LD;(GALTOM)_PIC;( )_PM;(S.STARR)_TM;(S.STARR)_PROJECT; TL014020_PATH; G:\GIS\NASA\FL_KENNEDY\SPACECENTER\MAPDOCS\201511 M505 LUCIP\F2 M7-505_LUCIP SITE PLAN.MXD_USER; BALTOM
SERVICE LAYER CREDITS: SOURCE: ESRI, DIGITALGLOBE, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEX, GETMAPPING, AEROGRID, IGN, IGP, SWISSTOPO, AND THE GIS USER COMMUNITY

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Components Refurbishment and Chemical Analysis Facility
Solid Waste Management Unit 041

CONTAMINANTS: Volatile Organic Compounds in Groundwater and Polychlorinated Biphenyls in Soil

CONTROL: Prohibit Groundwater Use and Residential Use Access to Soil

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Components Refurbishment and Chemical Analysis (CRCA) Facility of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with CRCA, certain land use controls (LUCs) are necessary to prevent the potential for future risks at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Confirmation Sampling (CS) identified five Locations of Concern (LOCs) at the CRCA site. No Further Action was approved for LOCs 3, 4, and 5 in the CS Report. Polychlorinated biphenyls (PCBs) were identified in shallow soils at concentrations exceeding the Florida Department of Environmental Protection (FDEP) residential Soil Cleanup Target Levels (SCTLs) but less than industrial SCTLs at LOC 1. The Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) in 2005 and 2006 confirmed that at LOC 1 there are no leachability, industrial, or groundwater concerns and that the extent of soil with the PCB concentrations exceeding residential SCTLs was defined. The RFI also identified volatile organic compounds (VOCs), specifically, cis-1,2-dichloroethene (cDCE), trans-1,2-dichloroethene (tDCE), and vinyl chloride, in groundwater at CRCA at concentrations greater than FDEP Groundwater Cleanup Target Levels (GCTLs) and Natural Attenuation Default Concentrations (NADCs) at LOC 2. Based on the CS and RFI results, the source of groundwater impacts appeared to be located in the vicinity of the Chemical Processing Area (CPA) near Building K6-1696B.

SITE DESCRIPTION

SWMU 041 includes the CRCA building (K6 -1696), dry chemical storage building (K6-1748 and 1748A), a waste water treatment plant (K6-1696A), and a parts

[1] *This Interim LUCIP summarizes institutional controls regarding the NASA CRCA site. For detailed information on the site, consult the CRCA administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

decontamination building (K6-1747). The site was vacant undeveloped land prior to construction of the CRCA Facility in 1996. The CRCA building contains a laboratory for analysis of environmental media obtained from the KSC facility. The majority of solvent use and storage was east of the CRCA building in the CPA. The solvent was formerly stored in bulk tanks in a containment area east of the CPA for use in cleaning of various spacecraft components. A solvent is currently used for cleaning operations in the northeastern corner of the property. The surface in the area is concrete and asphalt with adjacent storm drains for collection of precipitation. The primary contaminants in groundwater at CRCA are trans-1,2-dichloroethene (tDCE), cis-1,2-dichloroethene (cDCE), and vinyl chloride (VC).

SITE LOCATION

CRCA is located east of Contractor Road, approximately 1 mile north of Schwartz Road (Figure 1). CRCA is located in Section 18, Township 22S, Range 37E, as shown on the 7.5-minute Orsino topographic quadrangle map. The groundwater and soil use control areas covered by the Interim LUCIP are shown on Figure 2. Coordinates of the corners of the LUC are provided on Figure 2 in the State Plane Coordinate System, North American Datum (NAD) of 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Concentrations of COCs in groundwater and soil are greater than FDEP GCTLs and SCTLs, respectively. The past, current, and projected future land use of CRCA is industrial in nature. LUCs are therefore required at LOC 1 to restrict use of this area to industrial activities and at LOC 2 to prohibit the use of groundwater until cleanup levels are achieved. The asphalt currently present at LOC 1 prevents exposure to soil in this area. The current and projected land use of CRCA does not include the use of site groundwater; therefore, there is no current or projected groundwater exposure risk.

DECISION DOCUMENT

The Kennedy Space Center (KSC) Remediation Team determined that interim institutional controls should be implemented at CRCA. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Property transfer (if implemented in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUC areas. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating and will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring and that exposure to subsurface soils is restricted.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

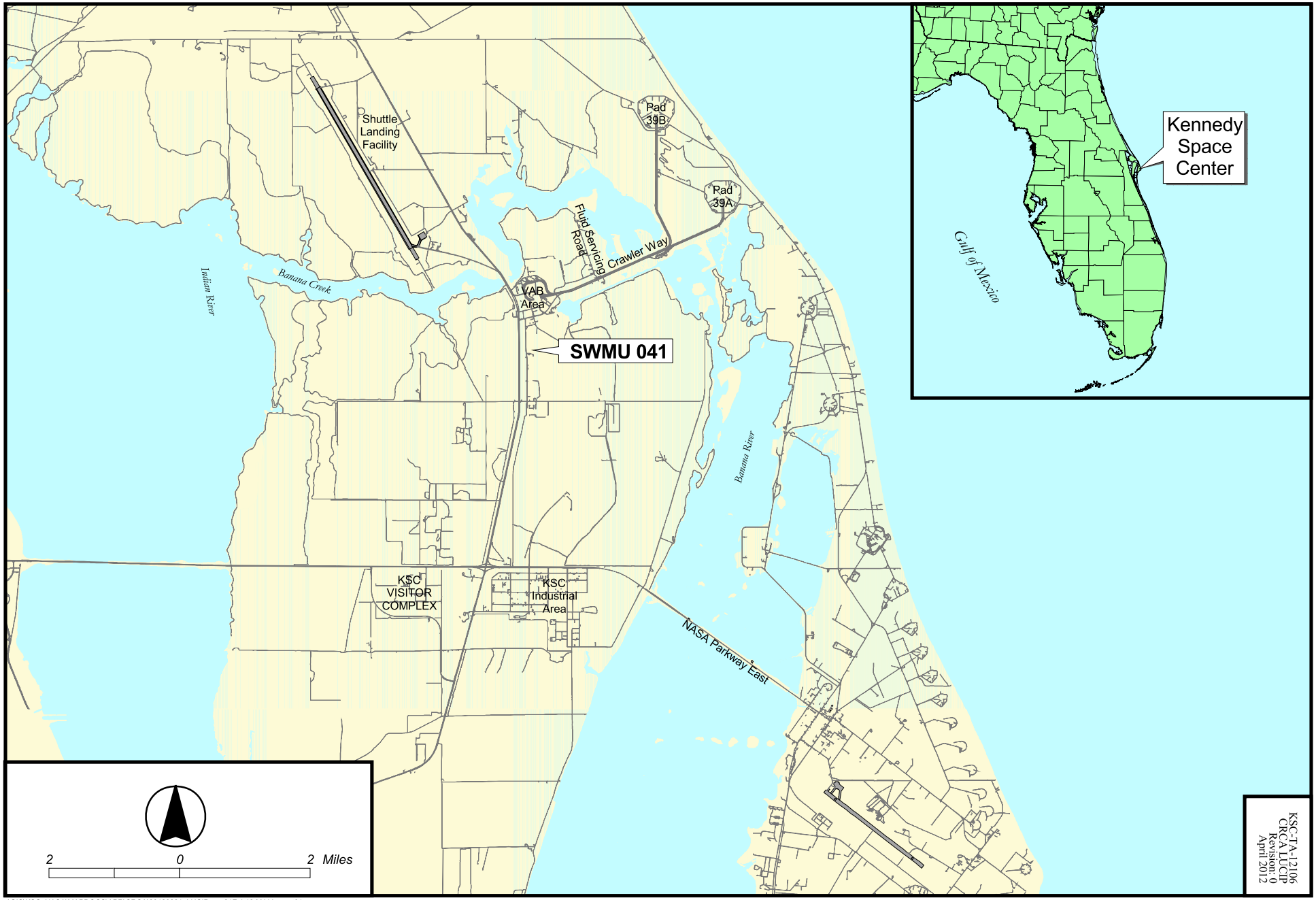
KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this Interim LUCIP.

MAINTENANCE

The Interim LUCIP shall remain in place until a land use change is implemented and the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based on analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.

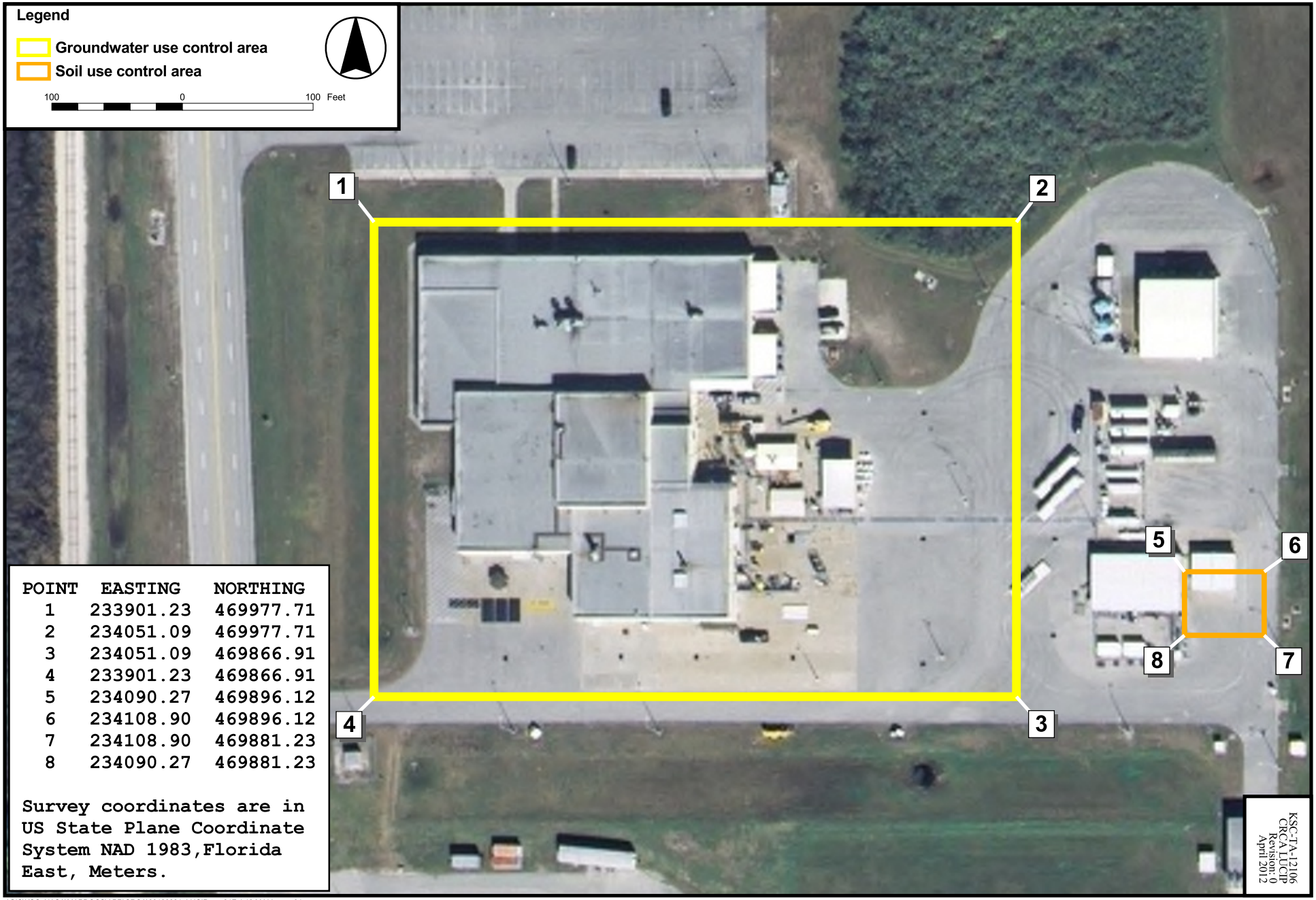
FIGURE 1 LOCATION OF KENNEDY SPACE CENTER AND SWMU 041

SWMU 041 - COMPONENT REFURBISHMENT AND CHEMICAL ANALYSIS FACILITY, KENNEDY SPACE CENTER, FLORIDA



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FIGURE 2 LAND USE CONTROL AREA
SWMU 041 - COMPONENT REFURBISHMENT AND CHEMICAL ANALYSIS FACILITY, KENNEDY SPACE CENTER, FLORIDA



POINT	EASTING	NORTHING
1	233901.23	469977.71
2	234051.09	469977.71
3	234051.09	469866.91
4	233901.23	469866.91
5	234090.27	469896.12
6	234108.90	469896.12
7	234108.90	469881.23
8	234090.27	469881.23

Survey coordinates are in US State Plane Coordinate System NAD 1983,Florida East, Meters.

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LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER, FLORIDA
BREVARD COUNTY, FLORIDA

FACILITY: East Crawler Park Site
Solid Waste Management Unit 043
CONTAMINANTS: Polychlorinated Biphenyls in Soil
CONTROL: Prohibit Residential Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the East Crawler Park Site (ECPS) of revised institutional controls that have been implemented at the site[1]. Although most areas at ECPS do not pose risks to human health or the environment, areas of soil with polychlorinated biphenyl (PCB) concentrations greater than the Florida Department of Environmental Protection (FDEP) residential Soil Cleanup Target Level (RSCTL) have been identified. Institutional land use controls (LUCs) are necessary to prohibit residential exposure to soils at the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI and supplemental sampling activities that exceeded FDEP and Environmental Protection Agency (EPA) cleanup target levels were PCBs in surficial soils.

Since the implementation of the original land use control area, several investigations and interim measures (IMs) have been completed at the ECPS under Kennedy Space Center's RCRA program to eliminate/reduce the footprint of PCB contamination. However, residual PCB concentrations exceeding the RSCTL still remain in the central Crawlerway area of the site.

SITE DESCRIPTION

The site was used for staging and routine maintenance of NASA's shuttle transport vehicles (Crawlers) formerly used to transport Space Shuttles from the VAB to the launch pads. During the Apollo Program era, the site was used for parking the Mobile Service Structure (MSS) used for that program and was referred to as the MSS Park Site. PCB contamination at this site is suspected to be from paint chips from operation and maintenance of the former MSS and potentially from oil from the

[1] *This revised LUCIP summarizes institutional controls regarding the NASA ECPS. For detailed information on the site, consult the ECPS administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-6971.*

Crawler. The site is currently unoccupied.

SITE LOCATION

The ECPS is located on the southeast side of KSC's crawlerway between the VAB and the launch pads (Figure 1). The ECPS SWMU area is shown on Figure 2. The site is a spur of the crawlerway and is bounded on the north by the crawlerway and the south by Saturn Causeway. The site is located within Section 9 of Township 22 South, Range 37 East, which is in the False Cape Quadrangle.

SITE CONTAMINATION AND REMEDY

Site-wide soil investigations conducted from 2012 to 2014 and 2016 to 2018 delineated PCB contamination to the FDEP industrial Soil Cleanup Target Level (ISCTL). Delineation to the RSCTL was achieved in some areas. Soils with PCBs detected at concentrations greater than FDEP's ISCTL have been removed sitewide. Soils with PCBs detected at concentrations greater than FDEP's RSCTL have been removed in most areas or have been evaluated using a risk-based 95-percent upper confidence level (UCL) approach; however, some exceedances of the RSCTL not covered by the 95-percent UCL still remain in the central Crawlerway area. Figure 2 shows areas of soil that have been remediated within the ECPS. Projected future land use of the ECPS is industrial in nature and site remediation goals were established based on the risk and potential for exposure in an industrial setting. LUCs are therefore required to prohibit residential use of the site. Coordinates of the revised land use control area are provided in Figure 3 in the State Plane Coordinate System NAD 1983 meters, Florida East.

DECISION DOCUMENT

A Statement of Basis (SB) established institutional controls as a component of the remedy for this site. The SB for the site is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-6971.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspection will verify that no residential exposure to soil is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

This LUCIP will remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern.

SITE-SPECIFIC DOCUMENT RERFENCES

Site-specific documentation is available for review by contacting the Environmental Assurance Branch at telephone number (321) 867-6971.

FIGURE 1 LOCATION OF KENNEDY SPACE CENTER AND EAST CRAWLER PARK SITE
SWMU 043, KENNEDY SPACE CENTER, FLORIDA

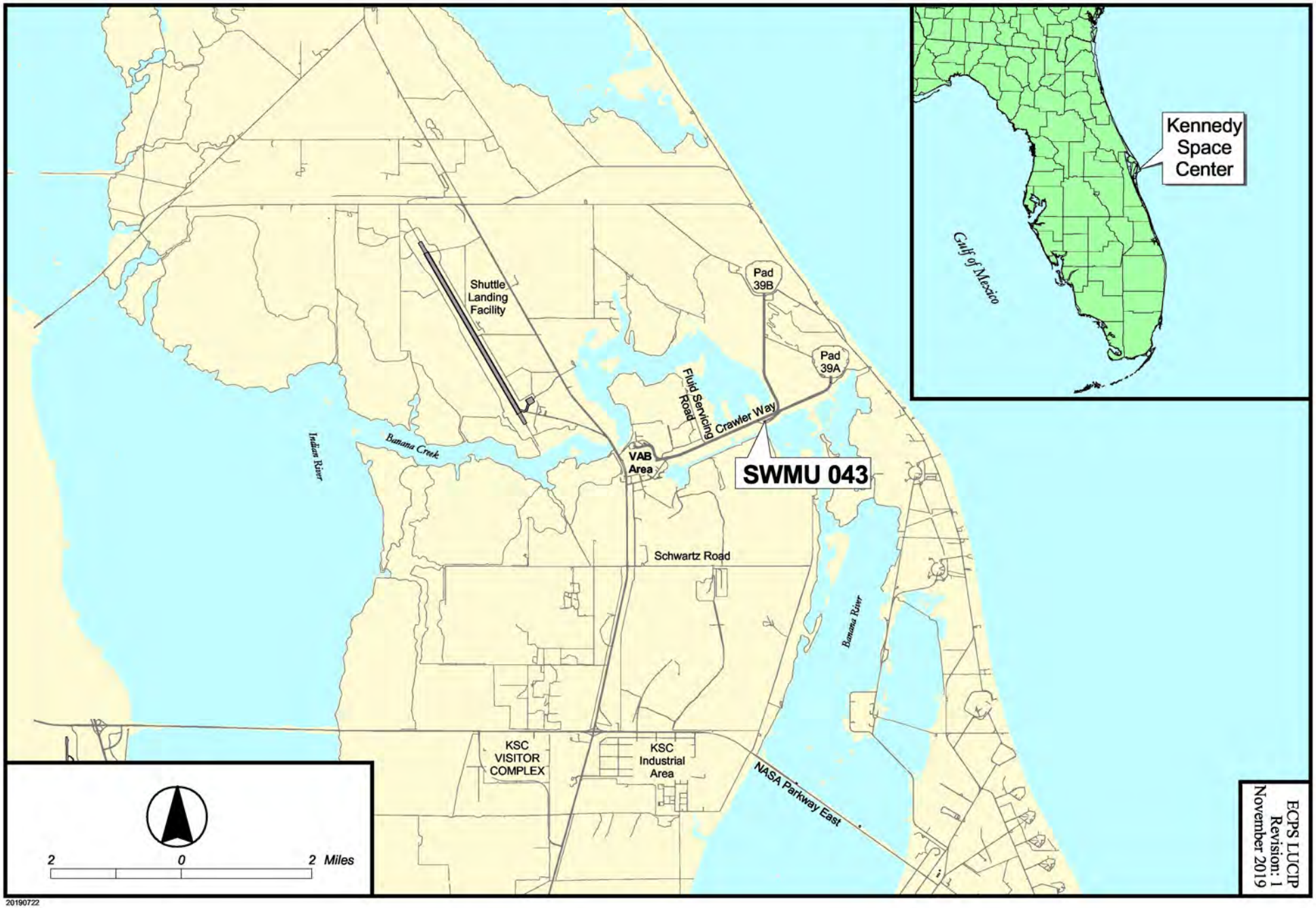
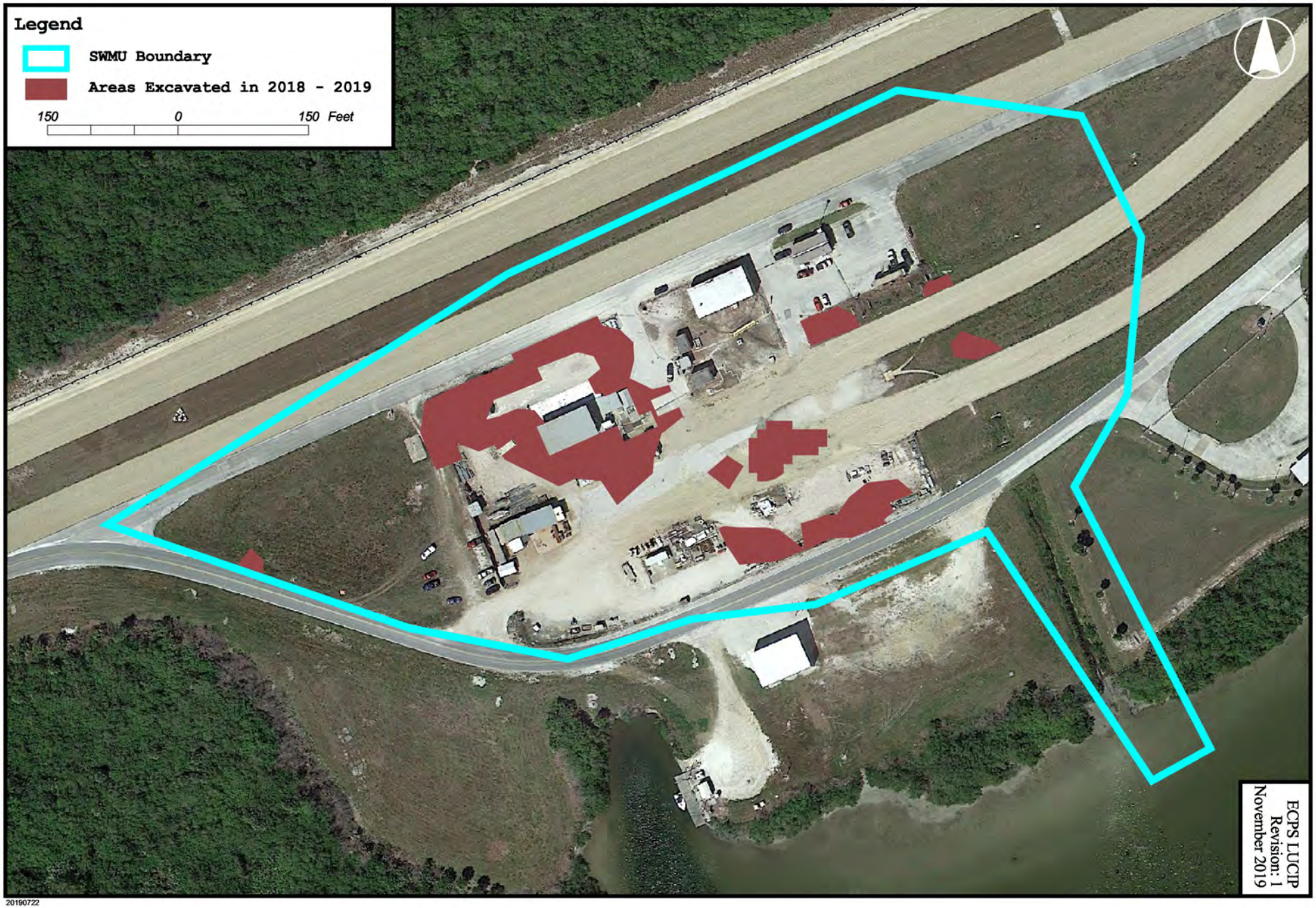


FIGURE 2 SWMU BOUNDARY WITH AREAS EXCAVATED IN 2018 - 2019
SWMU 043, KENNEDY SPACE CENTER, FLORIDA

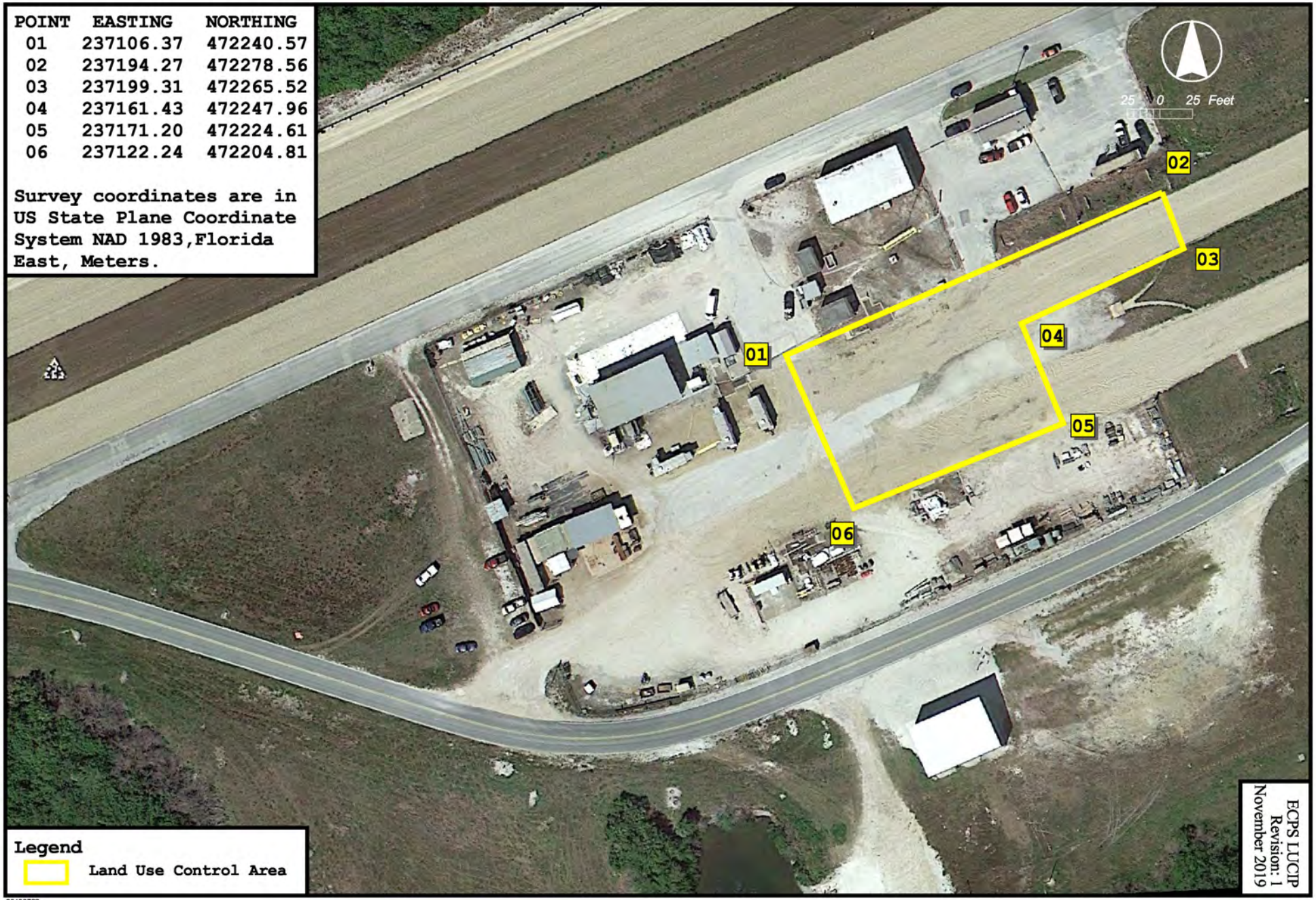


20190722

FIGURE 3 REVISED LUCIP SITE PLAN
SWMU 043, KENNEDY SPACE CENTER, FLORIDA

POINT	EASTING	NORTHING
01	237106.37	472240.57
02	237194.27	472278.56
03	237199.31	472265.52
04	237161.43	472247.96
05	237171.20	472224.61
06	237122.24	472204.81

Survey coordinates are in US State Plane Coordinate System NAD 1983,Florida East, Meters.



20190722

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	West Crawler Park Site Solid Waste Management Unit 044
CONTAMINANTS:	Vinyl Chloride in groundwater
CONTROL:	Prevent contact with groundwater

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the West Crawler Park Site (WCPS; "the Site") located at Kennedy Space Center (KSC) of institutional controls that have been implemented at the Site[1]. Although there are no current unacceptable risks to human health or the environment associated with the WCPS, an institutional land use control (LUC) is necessary to prevent human health exposure to groundwater affected with vinyl chloride at the Site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

One chemical of concern (COC; vinyl chloride) exceeded applicable Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Level (GCTL) screening criteria.

SITE DESCRIPTION

The WCPS is one of two NASA-operated areas used for parking shuttle transport vehicles (crawlers) that transport the Space Shuttles from NASA's Vehicle Assembly Building (VAB) to the launch pads. The roadway that the crawlers ride and park on is referred to as the crawlerway and is comprised of gravel to cobble-sized quartz river rock underlain by several feet of compacted limestone road-base material. Routine operation and maintenance of the crawlers is conducted at the WCPS. Based on the history of operations at the WCPS, suspected sources of contamination included lubricating oil and grease, and solvents that have been used during operation and maintenance of the crawlers. Based on the environmental assessments conducted, the only media present with COCs above regulatory screening criteria is groundwater.

SITE LOCATION

The WCPS is located in the VAB area (Figure 1), north of the Thermal Protection System Facility (K6-794). The Crawler

[1] *This LUCIP summarizes institutional controls regarding the NASA WCPS. For detailed information on the Site, consult the WCPS administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

Maintenance Building (K6-743) exists between the north and south halves of the WCPS, which comprise the SWMU that is about 400 feet by 600 feet (5.5 acres). Hazardous waste staging buildings are located in each half, and both halves are within restricted access fenced areas. The Site is located within Section 7 of Township 22 South, Range 37 East, which is in the Orsino Quadrangle.

The areas covered and the coordinates of the corners of the LUCIP are shown on Figure 2. The coordinates are in the State Plane Coordinate System North American Datum (NAD) 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Groundwater contaminated with vinyl chloride at concentrations exceeding the FDEP GCTL is being monitored to assure that the affected groundwater is not expanding and that vinyl chloride is naturally attenuating. LUCs are therefore required to prohibit groundwater use at the site. Potential for effects on indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

The KSC Remediation Team (KSCRT), consisting of FDEP and NASA personnel, determined that institutional controls should be implemented at WCPS.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no residential or groundwater use is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the LUCs.

[2] By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until the scenarios managed by the LUCIP are no longer a concern.



Legend

SWMU Boundary

Notes:
KSC - Kennedy Space Center
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
SWMU - Solid Waste Management Unit
VAB - Vehicle Assembly Building
WCPS - West Crawler Park Site

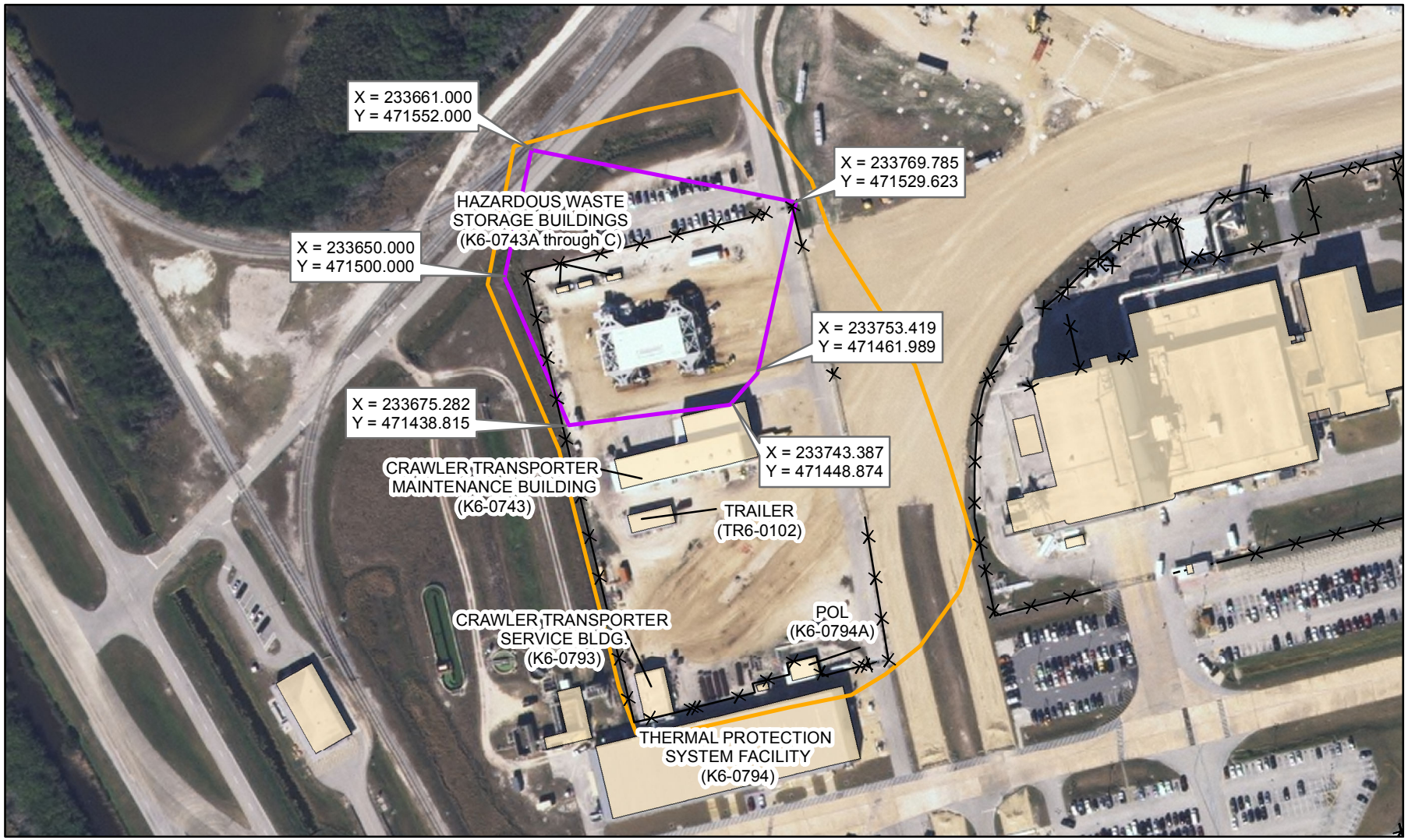
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Site Location Map
Land Use Control Implementation Plan

West Crawler Park Site
NASA Kennedy Space Center, Florida

Project Number: TL014021.0010

Figure 1



Legend

- Fence
- SWMU Boundary
- Groundwater LUC Area
- Structure

Notes:
Coordinates are in State Plane Coordinate System
North American Datum 1983, Florida East, meters
LUC - Land Use Contro
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
SWMU - Solid Waste Management Unit
WCPS - West Crawler Park Site

0 100 200
Scale in Feet

N

Groundwater Land Use Control Area
Land Use Control Implenmentation Plan

West Crawler Park Site
NASA Kennedy Space Center, Florida

Project Number: TL014021.0010

Figure 2

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Central Heat Plant
Solid Waste Management Unit No. 45
CONTAMINANTS: VOCs in Groundwater and Nickel in Swale Soils
CONTROL: Prohibit Groundwater Consumption and Residential Use of Swale Soils

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Central Heat Plant of institutional controls that have been implemented at the site[1]. Although there are no unacceptable risks to human health or the environment associated with the Central Heat Plant, institutional land use controls (LUCs) are necessary to: (i) prohibit the use of groundwater from the site; and (ii) prohibit residential use of the swale soils. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern (COC) identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were volatile organic compounds (VOCs) in groundwater and COC identified in the Corrective Measures Study that exceeded the residential soil cleanup target (SCTL) level was nickel in the swale soils.

SITE DESCRIPTION

The CHP is a NASA-operated facility that was constructed in 1964. The facility includes the heat plant building, a bulk fuel oil aboveground storage tank, a storage building, a storage shed, a cooling tower, and a support building. Past and current operations at the CHP are to heat water for the high temperature hot water distribution system serving the KSC Industrial Area. A copier contractor is currently using the support building.

SITE LOCATION

The Central Heat Plant is located on the northwest corner of the intersection of C avenue SE and 3rd street SE in the Industrial Area of Kennedy Space Center. (Figures 1 and 2). The site is located within Section 8 of Township 22S, Range 37E which is in the Orsino Quadrangle. The groundwater use and swale soil control area covered by the LUCIP is shown on Figure 2. Coordinates

1. This LUCIP summarizes institutional controls regarding the NASA KSC Central Heat Plant. For detailed information on the site, consult the Central Heat Plant administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs above FDEP's groundwater cleanup target levels and swale soils contain nickel above the residential STCLs. The past, current, and projected future land use of the Central Heat Plant is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at this site and residential use of swale soils. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-6670, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential groundwater use is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

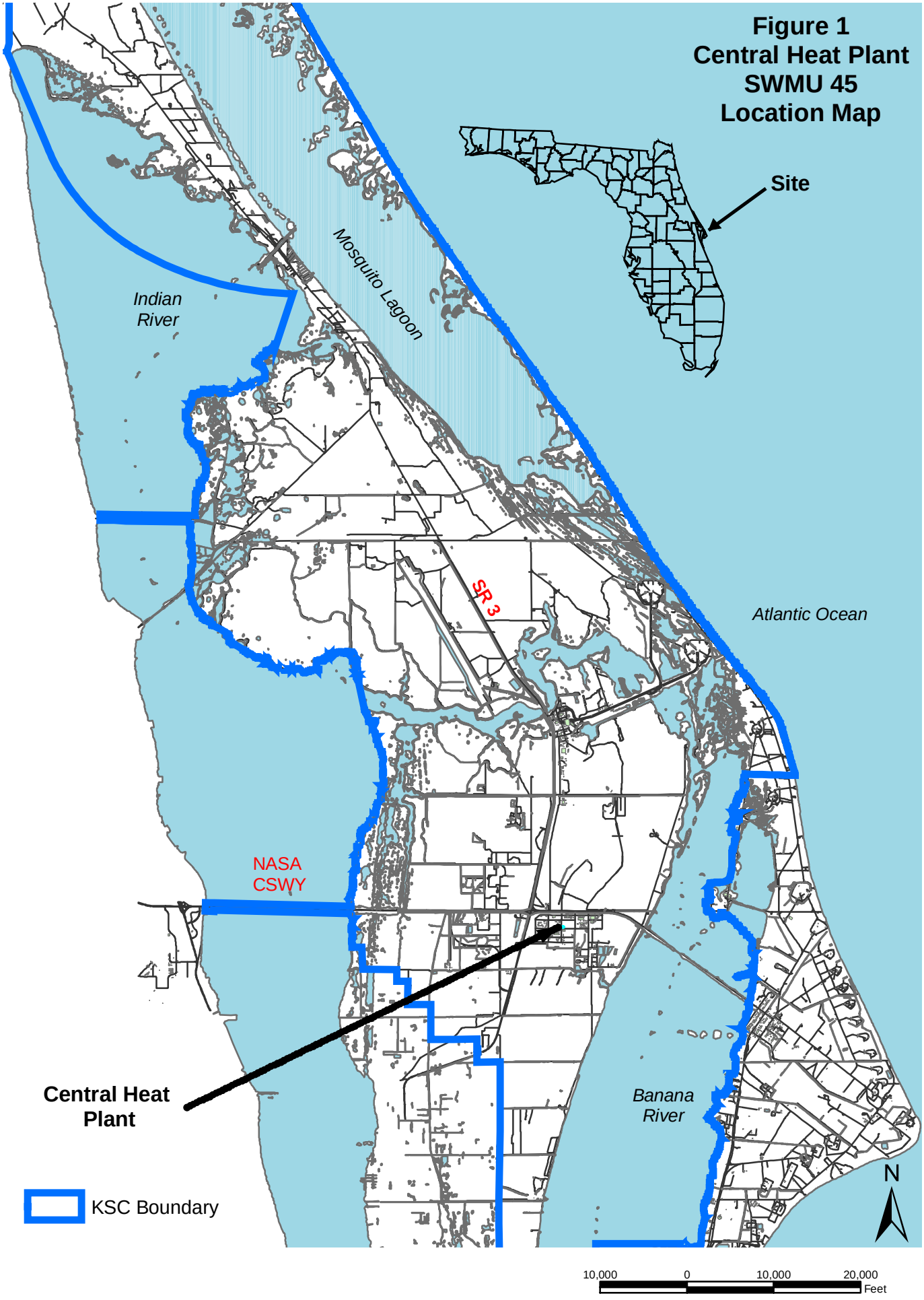
Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

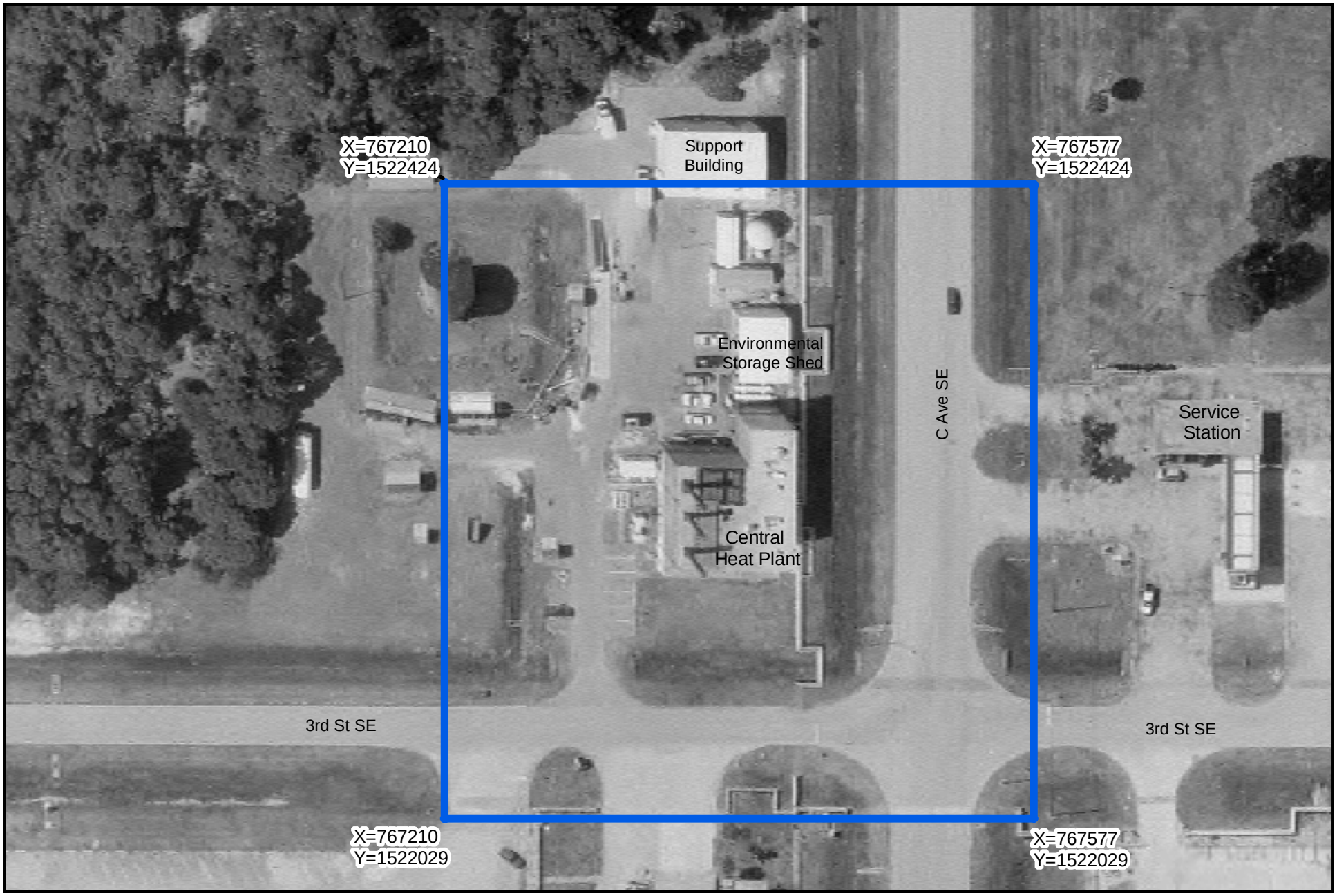
ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.


Figure 1
Central Heat Plant
SWMU 45
Location Map
Site
Indian River
Mosquito Lagoon
SR 3
Atlantic Ocean
NASA CSWY
Central Heat Plant
Banana River
KSC Boundary
N
10,000
0
10,000
20,000
Feet



Area Controlled by Land Use Control Implementation Plan

Figure 2
Site Map
Central Heat Plant (SWMU 45)

N

50 0 50 100
Feet

Survey coordinates are in State Plane Coordinate System, NAD 1983 meters, Florida East.

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Contractors Road Heavy Equipment (CRHE) Area Solid Waste Management Unit 055
CONTAMINANTS:	Volatile Organic Compounds in groundwater
CONTROL:	Prevent contact with groundwater

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Kennedy Space Center (KSC) Contractors Road Heavy Equipment (CRHE) Area (SWMU 055; "the Site") of institutional controls that have been implemented at the Site[1]. Although there are no current unacceptable risks to human health or the environment associated with the CRHE Area, an interim institutional land use control (LUC) is necessary to prevent human health exposure to volatile organic compound (VOC)-affected groundwater at the Site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

VOCs have been identified in groundwater at the Site above applicable Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Level (GCTL) and Natural Attenuation Default Concentration (NADC) screening criteria.

SITE DESCRIPTION

The CRHE Area is a group of NASA-operated facilities that includes the Printed Circuit Board Shop (PCBS-SWMU No. 31) and associated Acid Dump Site (SWMU No. 15); Sewage Treatment Plant (STP) No. 15 (SWMU No. 16); a polishing pond on the eastern edge of the SWMU boundary; a fenced area at the north end of the SWMU boundary where sandblasting and painting operations took place in the past; and Heavy Equipment Area buildings and parking areas south of the PCBS (SWMU No. 055). The CRHE Area buildings and parking areas have been used for a variety of operations including heavy equipment storage and maintenance dating back to the construction of NASA's Vehicle Assembly Building (VAB), and for staging of regulated and hazardous waste. Currently, the area is used

[1] *This LUCIP summarizes institutional controls regarding the NASA CRHE. For detailed information on the Site, consult the CRHE administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

for heavy equipment storage and maintenance. Hazardous wastes are no longer stored on site.

The PCBS facility has been used for manufacturing printed circuit boards, silk screening, plating, and laminating road signs. Spent chemicals from the circuit board process were temporarily stored in an underground storage tank (UST) located immediately east of the PCBS. The UST ruptured during removal on August 7, 1990 and the location was identified as the Acid Dump Site in a subsequent report. In addition, printed circuit board rinsate water and equipment cooling water were discharged to a hole or drum in a wetland area immediately east of STP No. 15. Printed circuit board manufacturing operations have been discontinued; however, some "closed-loop" plating operations are ongoing. A hazardous waste staging area structure that currently is only used for non-regulated waste is located adjacent to the PCBS building K6-1996.

The STP No. 15 and Polishing Pond were used for treatment of domestic wastewater from the PCBS building and the office building north of the PCBS. Wastewater was reportedly discharged to STP No. 15 from November 1971 until July 1986 when domestic wastes that this unit would have treated were redirected to STP No. 4, which serves the VAB area. From July 1986 to October 1996, STP No. 15 served as a grease treatment plant, where grease collected from grease traps was brought for biological treatment. In October 1996 STP 15 was abandoned.

SITE LOCATION

The CRHE Area is located at KSC on Contractors Road approximately 0.5 mile north of the intersection with Schwartz Road (Figure 1). The CRHE Area is about 1,100 by 1,350 feet.

The site is bounded on the north and east by woodlands, on the south by KSC's Roads and Grounds Facility, and on the west by Contractors Road and woods. The site is located within Section 18 of Township 22 South, Range 37 East, which is in the Orsino Quadrangle. Survey coordinates in the State Plane Coordinate System North American Datum (NAD) 1983 meters, Florida East for the corners of the groundwater use control area are shown on Figure 2.

SITE CONTAMINATION AND CONTROL

Groundwater contaminated with VOCs at concentrations over FDEP GCTLs are currently being monitored to assure that off site migration does not occur and contaminants are naturally attenuating. LUCs are therefore required to prohibit groundwater use at the site. Potential for effects on indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

The KSCRT determined that institutional controls should be implemented at the CRHE Area. A Statement of Basis (SB) establishes institutional controls as a component of the remedy for this site. The institutional controls are temporary while long term monitoring documents the reduction of VOCs through natural processes.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a

Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Upon approval of this Interim LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this LUCIP.

MAINTENANCE

The Interim LUCIP shall remain in place until the scenarios managed by the LUCIP are no longer a concern.

[2] By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.



Legend

SWMU Boundary

Notes:
CRHE - Contractors Road Heavy Equipment Area
KSC - Kennedy Space Center
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
SWMU - Solid Waste Management Unit
VAB - Vehicle Assembly Building

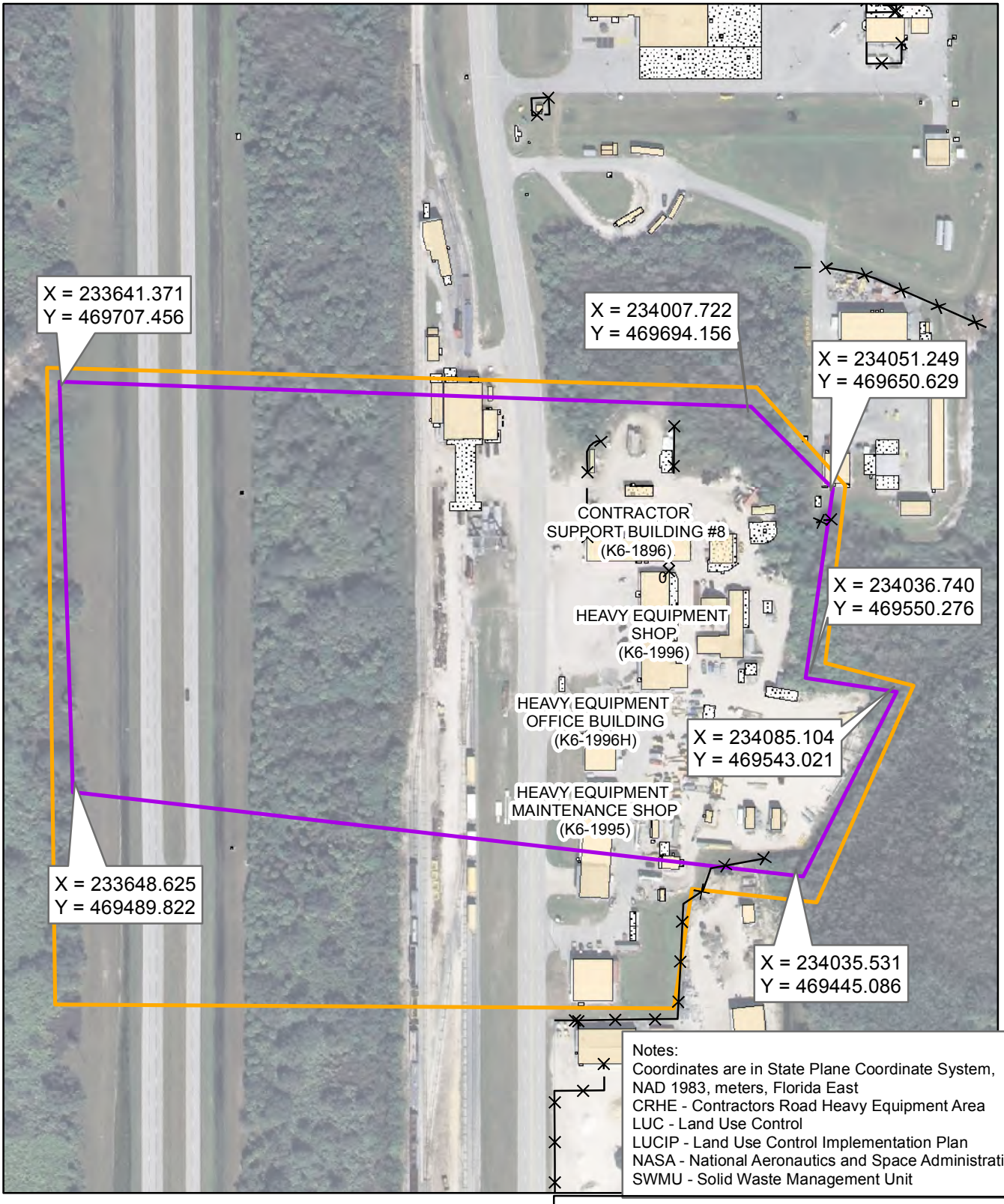
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Site Location Map
Land Use Control Implementation Plan

Contractors Road Heavy Equipment Area
NASA Kennedy Space Center, Florida

Project Number: TL014021.0010

Figure 1
11/30/14



Site Plan
Land Use Control Implementation Plan

Contractors Road Heavy Equipment Area
NASA Kennedy Space Center, Florida

Project Number: TL014021.0000

Figure 2

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Mobile Launch Platform Rehabilitation Sites and the Vehicle Assembly Building Area Solid Waste Management Unit 56
CONTAMINANTS:	Volatile Organic Compounds in Groundwater and Polychlorinated Biphenyls in Soil
CONTROL:	Prohibit Groundwater Use and Residential Exposure to Surface Soil

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Kennedy Space Center (KSC) Mobile Launch Platform (MLP) Rehabilitation Sites and the Vehicle Assembly Building (VAB) (MLPV) Area ("the Site") of institutional controls that have been implemented at the Site[1]. Although most areas at MLPV do not pose current unacceptable risks to human health or the environment, areas of soil with contaminant concentrations greater than the Florida Department of Environmental Protection (FDEP) residential and industrial Soil Cleanup Target Levels (SCTL) and areas of groundwater with concentrations greater than the FDEP Groundwater Cleanup Target Levels (GCTL) have been identified. Institutional land used controls (LUCs) are necessary to prohibit groundwater use and residential and industrial exposure to soils at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Concentrations of volatile organic compounds (VOC) were identified in groundwater at concentrations greater than the applicable FDEP GCTL and soil has concentrations of PCBs greater than the FDEP Residential (R-) and Industrial (I-) SCTLs.

SITE DESCRIPTION

The MLPV Area contains active National Aeronautics and Space Administration (NASA) operated facilities that were originally built to support Apollo/Saturn-V vehicle assembly and later modified (1976) to support Space Transportation System (STS) shuttle missions. Construction of the MLPV started approximately in 1963 and was completed in 1966.

Solid Waste Management Unit (SWMU) 056 includes the three MLP Rehabilitation sites and the VAB. For remediation purposes, the VOCs present in the

1. This Interim LUCIP summarizes institutional controls regarding the NASA KSC MLPV Area. For detailed information on the site, consult the MLPV administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-6971.

groundwater at the Thermal Protection Facility (SWMU 040), the West Crawler Park Site (SWMU 044), the Orbiter Processing Facility 1 and 2 (SWMU 072), KSC Press Site (SWMU 074), the Former Saturn-V Rocket Display Area (SWMU 080), and the Mission Support Building Area (SWMU 108) have all been incorporated into SWMU 056.

SITE LOCATION

The MLPV Area is located within Sections 7 and 18 of Township 22 South, Range 37 East, which is in the Orsino, Florida Quadrangle. The MLPV Area is shown on Figure 1. Coordinates of the corners of the groundwater LUC covered by this Interim LUCIP are provided in Figure 2 in the State Plane Coordinate System, North American Datum of 1983, Florida East, meters. The coordinates for the soil LUCs covered by this Interim LUCIP are provided in Figure 3.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs at concentrations greater than FDEP's GCTLs. Soil at the site contains PCBs at concentrations greater than FDEP R- and I-SCTLs. The soil LUCs include two areas with impacted soil beneath concrete pads (Areas 1 and 2 presented on Figure 3) and with impacted soil which was not excavated due to proximity to the crawlerway (Area 3 presented on Figure 3). The soil beneath the concrete pad located at Area 2 exceeds I-SCTLs. The past, current, and projected future land use of the MLPV Area is industrial in nature. LUCs will be implemented to prohibit the use of groundwater and prevent residential contact with PCB-affected soil at the Site. Due to groundwater concentrations greater than the FDEP GCTL, potential risks from vapor intrusion into future buildings at the site will be evaluated prior to the construction of any structures within the groundwater use control area.

DECISION DOCUMENT

The KSC Remediation Team determined that interim institutional controls should be implemented at the Site. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their Resource Conservation and Recovery Act permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Property transfer (if

[2] *By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse of the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspection will verify that no groundwater use or residential exposure to soil is occurring.

REPORTING

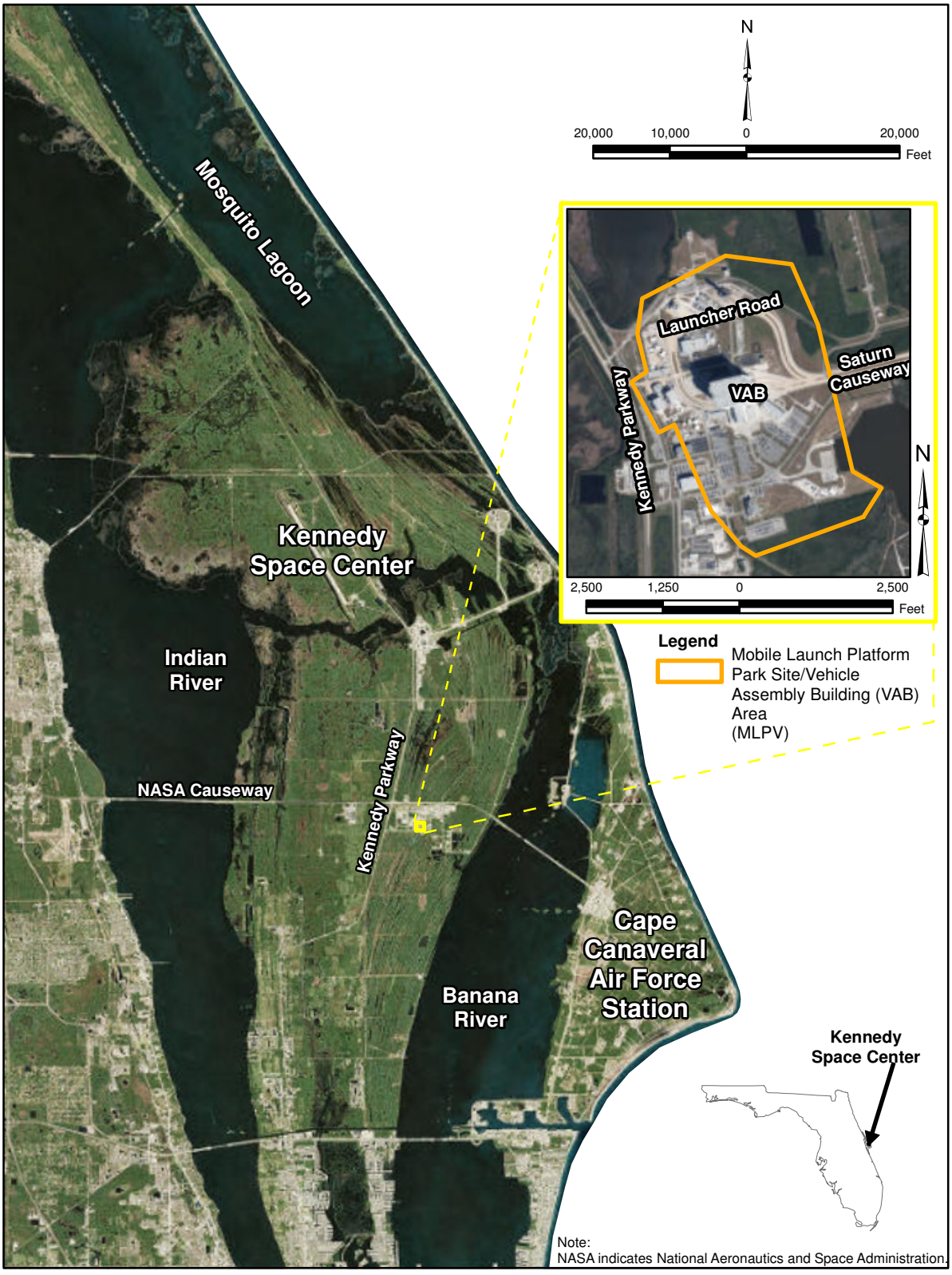
KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this Interim LUCIP.

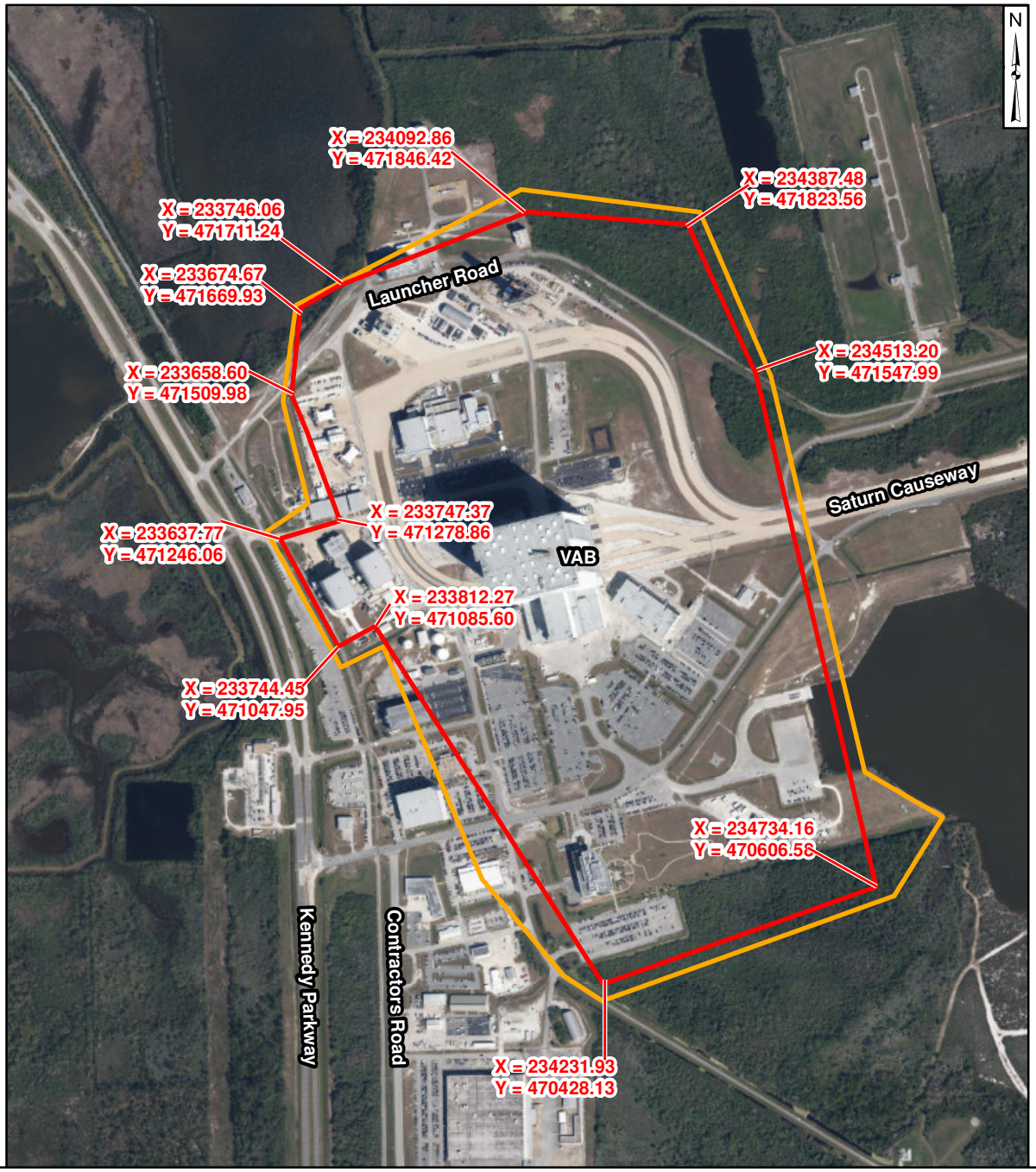
MAINTENANCE

The Interim LUCIP shall remain in place until a land use change is implemented or the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based on analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.



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Figure 1
Site Location Map



Legend

1,000 500 0 1,000 Feet

Groundwater Land Use Control Area

Mobile Launch Platform Park Site/Vehicle Assembly Building (VAB) Area (SWMU 056)

Notes:
1. SWMU indicates Solid Waste Management Unit.
2. LUCIP indicates Land Use Control Implementation Plan.
3. X and Y coordinates are provided in United State Plane North American Datum of 1983, Florida East, meters.
4. 2015 World Imagery Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, and the GIS User Community.

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Figure 2
Groundwater Land Use Control Area

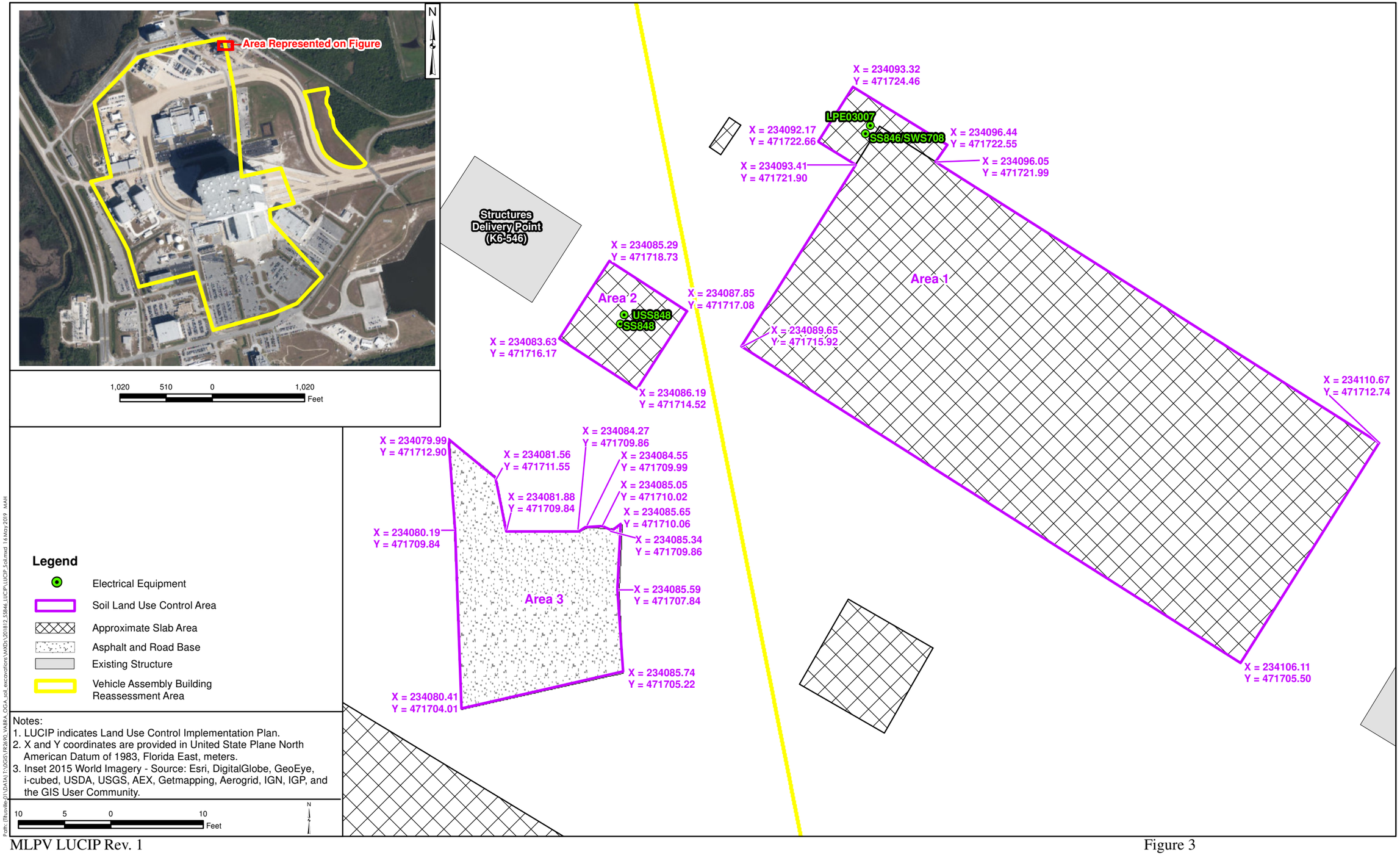


Figure 3
LUCIP Site Plan- Area of Transformers SS846, SWS708, and SS848

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Rail Car Siding Site
Solid Waste Management Unit No. 64
CONTAMINANTS: PAHs in Soil
CONTROL: Prohibit Residential Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Rail Car Siding Site (RCSS) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the RCSS, institutional land use controls (LUCs) are necessary to prohibit residential use of the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern (COCs) identified for human health risk during the RFI and supplemental sampling activities that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were Polynuclear Aromatic Hydrocarbons (PAHs) in surficial soils.

SITE DESCRIPTION

The RCSS is a NASA-operated facility that serves as a temporary staging area for railroad cars containing Space Shuttle hardware. The site includes a current railroad spur, the location of a former railroad spur, and the location of a former concrete plant and associated retention pond. Based on the history of operations at the SWMU, suspected sources of contamination include the activities associated with the storage of Space Shuttle components, former storage of rocket components from the Apollo program, former fueling activities, and operations conducted at the former asphalt plant.

SITE LOCATION

The RCSS is located in the vicinity of the intersection of North Kennedy Parkway and 39th Street NW (Figure 1).

The area of the RCSS covered by this LUCIP is situated immediately southwest of the North Kennedy Parkway/39th Street NW intersection. The site is located within Sections 26 and 27 of Township 21 South, Range 36 East. The soil use control area is an irregular-shaped portion of the site that

[1] *This LUCIP summarizes institutional controls regarding the NASA KSC Rail Car Siding Site. For detailed information on the site, consult the RCSS administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.*

includes approximately 1.4 acres of land (Figure 2). Coordinates of the corners of the LUCs are provided in Figure 2 in the State Plane Coordinate System NAD 1983.

SITE CONTAMINATION AND CONTROL

Surficial soils in the soil use control area contain PAHs (benzo(a)anthracene, benzo(b)fluoranthene, benzo(g,h,i)perylene, fluoranthene, indeno(1,2,3-cd)pyrene, phenanthrene, benzo(a)pyrene, and pyrene) at concentrations above the FDEP's soil cleanup target levels. Further statistical analysis (as presented in the RFI Addendum) revealed that benzo(a)pyrene is the only COC in the surficial soils. The PAH-impacted surficial soils were not removed during the RFI and supplemental sampling activities because the past, current, and projected future land use of the RCSS is industrial in nature, and site rehabilitation goals were established based on the risk and potential for exposure in an industrial setting. Therefore, LUCs are required to prohibit residential use/exposure to contaminated soils.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for this site. The SB for the site, KSC document number KSC-TA-5738, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential use is occurring.

[2] By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspection, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUC's.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA, KSC, EPA and FDEP that the comtemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying continued retention of the implemented LUCs.

ENFORCEMENT

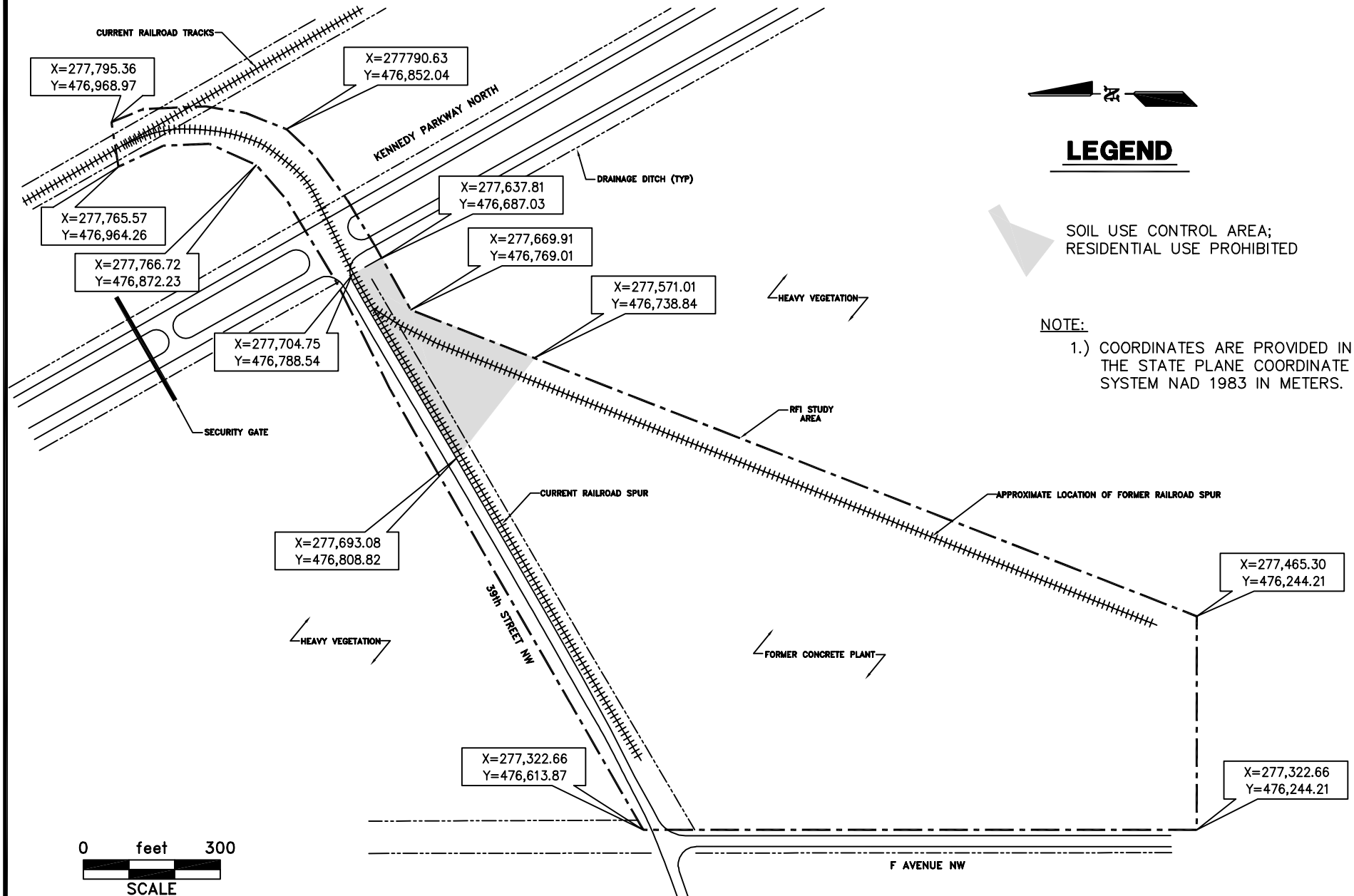
KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

This LUCIP will remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by EPA and FDEP and implemented by modification of NASA's operating permit.



NASA National Aeronautics and Space Administration Kennedy Space Center, Florida	RAIL CAR SIDING SITE KENNEDY SPACE CENTER, FLORIDA	SITE LOCATION MAP	1 Fig. No.



NASA National Aeronautics and Space Administration Kennedy Space Center, Florida	**RAIL CAR SIDING SITE** KENNEDY SPACE CENTER, FLORIDA	**SITE PLAN**	**2** Fig No.

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: C-5 Electrical Substation
Solid Waste Management Unit No. 66
CONTAMINANTS: Volatile Organic Compounds in Groundwater
REMEDY: Long-Term Monitoring with Land Use Controls

SITE DESCRIPTION

The C-5 Electrical Substation (C-5 Substation – also referred to as "site") is a NASA-operated electrical power substation that includes banks of transformers, associated buildings, a Florida Power and Light (FP&L) Switching Station, parking lots, and dirt roads. Inside the fenced area, which houses the transformers and power structures, the ground is covered with 0.5 to 1 ft of crushed limerock. The C-5 Substation encompasses approximately 4.5 acres of land. Since the 1960s, the C-5 Substation has been used to provide power for the Apollo and space shuttle programs. During the 1970s, drums of waste polychlorinated biphenyl (PCB) oil were stored in the southwest corner of the fenced area.

SITE LOCATION

The C-5 Substation is located on the Kennedy Space Center (KSC) immediately west of the intersection of Kennedy Parkway North (SR3) and Vehicle Assembly Building (VAB) Road. The site is bounded on the east by Kennedy Parkway North, on the north and northeast by marshland, on the west by adjacent wetlands and a surface-water impoundment, and on the south by undeveloped land. The site is located within Section 18 of Township 22S, Range 37E. The coordinates of the approximate four corners of the site are: 610382 easting; 1544710 northing (northeast), 610387 easting; 1544006 northing (southeast), 609706 easting; 1544006 northing (southwest), and 609937 easting; 1544710 northing (northwest) (Florida State Plane Coordinate East Zone NAD1927 in feet). Figures 1 and 2 present location maps.

SITE CONTAMINATION AND REMEDY

Groundwater at the site is contaminated with volatile organic compounds (VOCs), primarily vinyl chloride and dichloroethene. The maximum concentrations and greatest lateral extent of the plume is located in the southwest corner of the site at depths of 0 to –17 ft mean sea level (MSL). A smaller plume exists on the east side of the site and extends to a depth of approximately –33 ft MSL. The remedy includes institutional controls and long-term monitoring of groundwater.

LAND USE CONTROL (LUC) OBJECTIVES

Although there are no current unacceptable risks to human health or the environment associated with the C-5 Substation, certain land use restrictions are necessary to prevent the potential for future risks. The goals of the institutional controls at the C-5 Substation are to prevent the potential exposure or consumption of groundwater that exceeds State and Federal maximum contaminant levels (MCLs) and State groundwater cleanup target levels for VOCs.

LUC(S) IMPLEMENTED TO ACHIEVE OBJECTIVE(S)

Specific Restrictions on the Use of Groundwater: Extraction of groundwater from the site for human consumption or irrigation is

prohibited by NASA. Disturbance of on-site groundwater monitoring wells is prohibited by NASA.

Establishing the Institutional Controls: Institutional controls will be implemented in accordance with the Land Use Control Plan. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the Land Use Control Plan. Notification of any major changes in land use will be conducted in accordance with Section VII of the Land Use Control Plan.

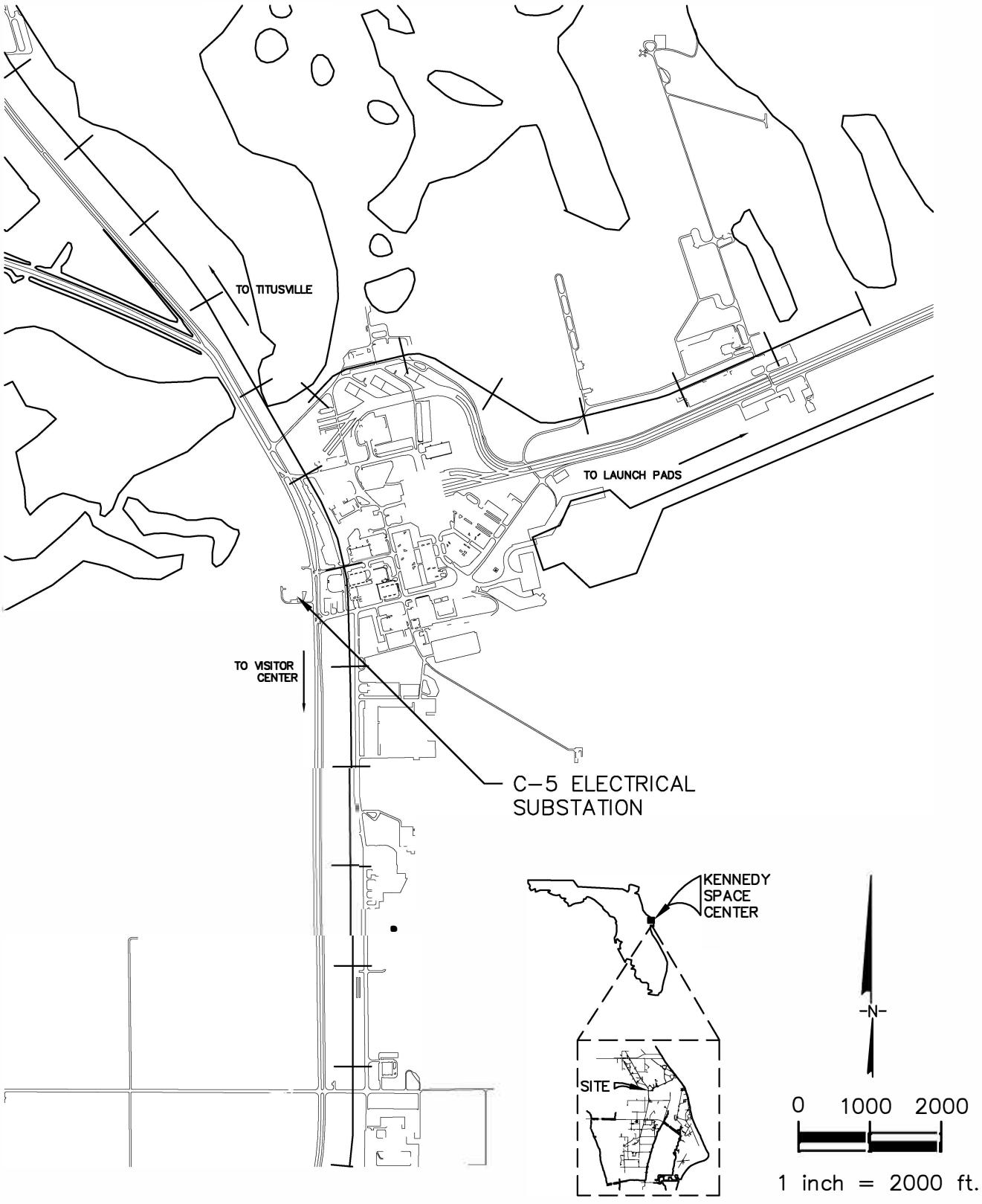
DECISION DOCUMENT

The institutional controls are also included in the Statement of Basis (SB) for the site, KSC document number KSC-TA5372.

OTHER PERTINENT INFORMATION

Inspections: Quarterly inspections to ensure that the institutional controls are in place and operating will be conducted since the institutional controls are part of the site remedy. The inspection will verify that no new supply wells have been installed and existing monitoring wells are still intact. An annual report will be submitted to EPA and FDEP certifying continued retention of the implemented LUCs.

Modifying and Terminating Institutional Controls: The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated in lieu of the change, or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. For as long as land use restrictions are necessary to protect human health and the environment, deed restrictions will restrict the type of development and reuse for the area upon deed transfer of the site. Any change in regard to LUCIP management must be approved by the USEPA and FDEP.



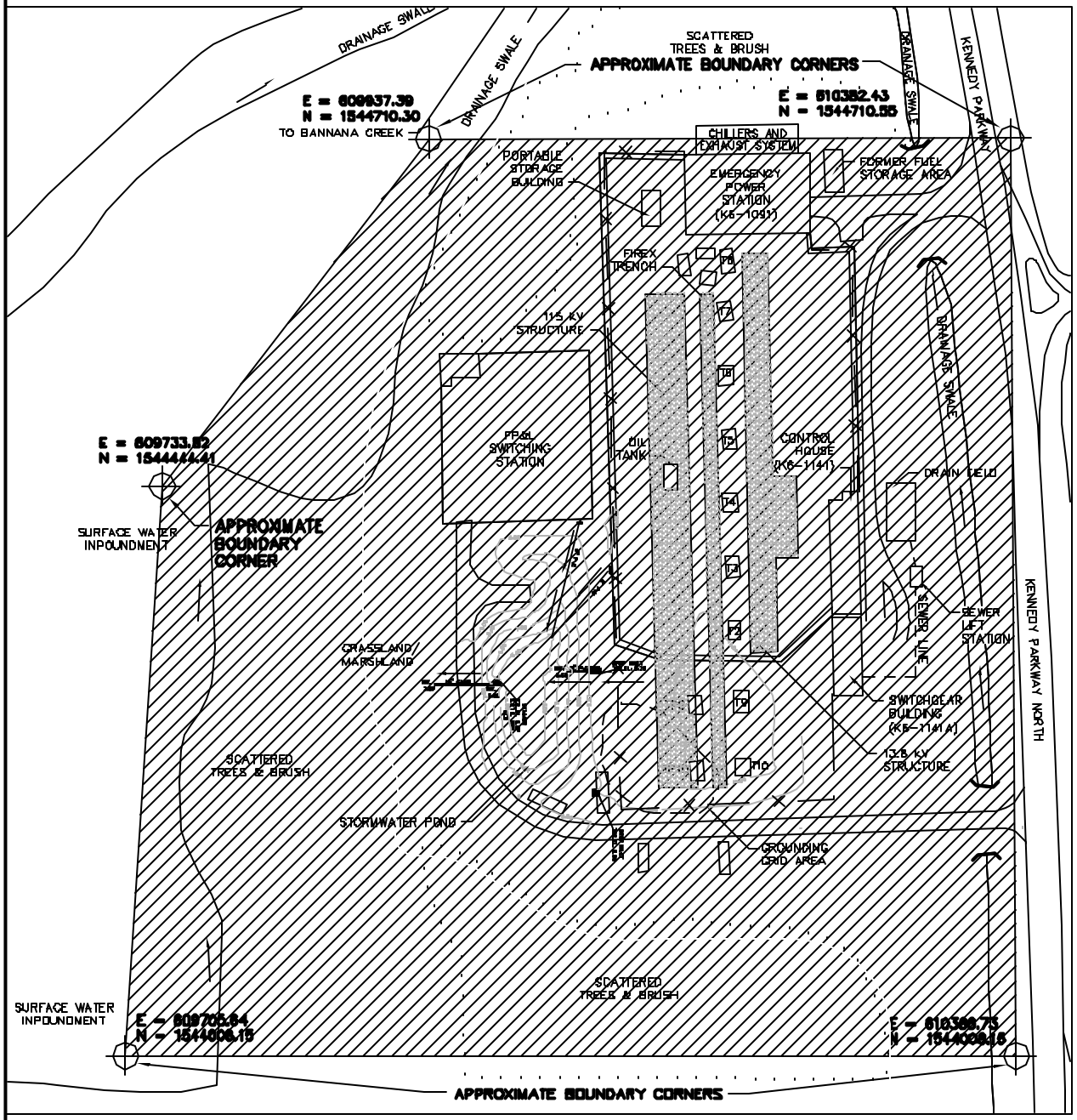
C-5 ELECTRICAL SUBSTATION SITE LOCATION MAP

PROJECT NO. FR0076

FIGURE NO. 1

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06/25/2001

C-5 ELECTRICAL SUBSTATION SITE MAP

PROJECT NO. FR0076

FIGURE NO. 2

0076COR2.DWG

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Paint and Oil Locker Facility
Solid Waste Management Unit No. 67
CONTAMINANTS: VOCs and Aluminum in Groundwater;
PCBs and benzo(a)pyrene in Soil
CONTROL: Prohibit Residential and Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Paint and Oil Locker (POL) Facility of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the POL Facility, institutional land use controls (LUCs) are necessary to: prohibit the use of groundwater from the site and prohibit residential exposure to site soils and swale soil at the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were volatile organic compounds (VOCs) and aluminum in groundwater, and polychlorinated biphenyls (PCBs) and polynuclear aromatic hydrocarbons (PAHs) in soil.

SITE DESCRIPTION

The POL Facility is a NASA-operated facility that was constructed between 1965 and 1972 to support space flight efforts at KSC. The facility includes the POL Building, an acid storage facility, a gas cylinder storage structure, a covered storage structure, and a storage area that comprise an area of approximately 7 acres. Past and current operations at the POL Facility include storage of chemicals, such as solvents, adhesives, photographic and printing chemicals, detergents, insecticides, greases, oils, lubricants, and waxes at the POL Building; storage of acids, corrosives, oils, and alcohols at the acid storage area and the covered storage structure; storage of gas cylinders at the gas cylinder storage structure; and storage of construction material, such as metal, wood, plastic, and other unknown commodities.

1. This LUCIP summarizes institutional controls regarding the NASA KSC Paint and Oil Locker (POL) Facility. For detailed information on the site, consult the POL Facility administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

SITE LOCATION

The POL Facility is located in the southern central portion of the KSC Industrial Area (Figure 1). It is located at the intersection of Fourth Street S.E. and C Avenue S.E. The site is located within Section 4 of Township 23S, Range 37E which is in the Orsino Quadrangle. The soil and groundwater use control areas covered by the LUCIP are shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs and aluminum above FDEP's groundwater cleanup target levels. PCBs and PAHs were present in soil above FDEP's residential soil cleanup target level (SCTL). The past, current, and projected future land use of the POL Facility is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site and to prohibit residential use/exposure to soils. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-6818, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential exposure to site soils or swale soils or groundwater use is occurring.

REPORTING

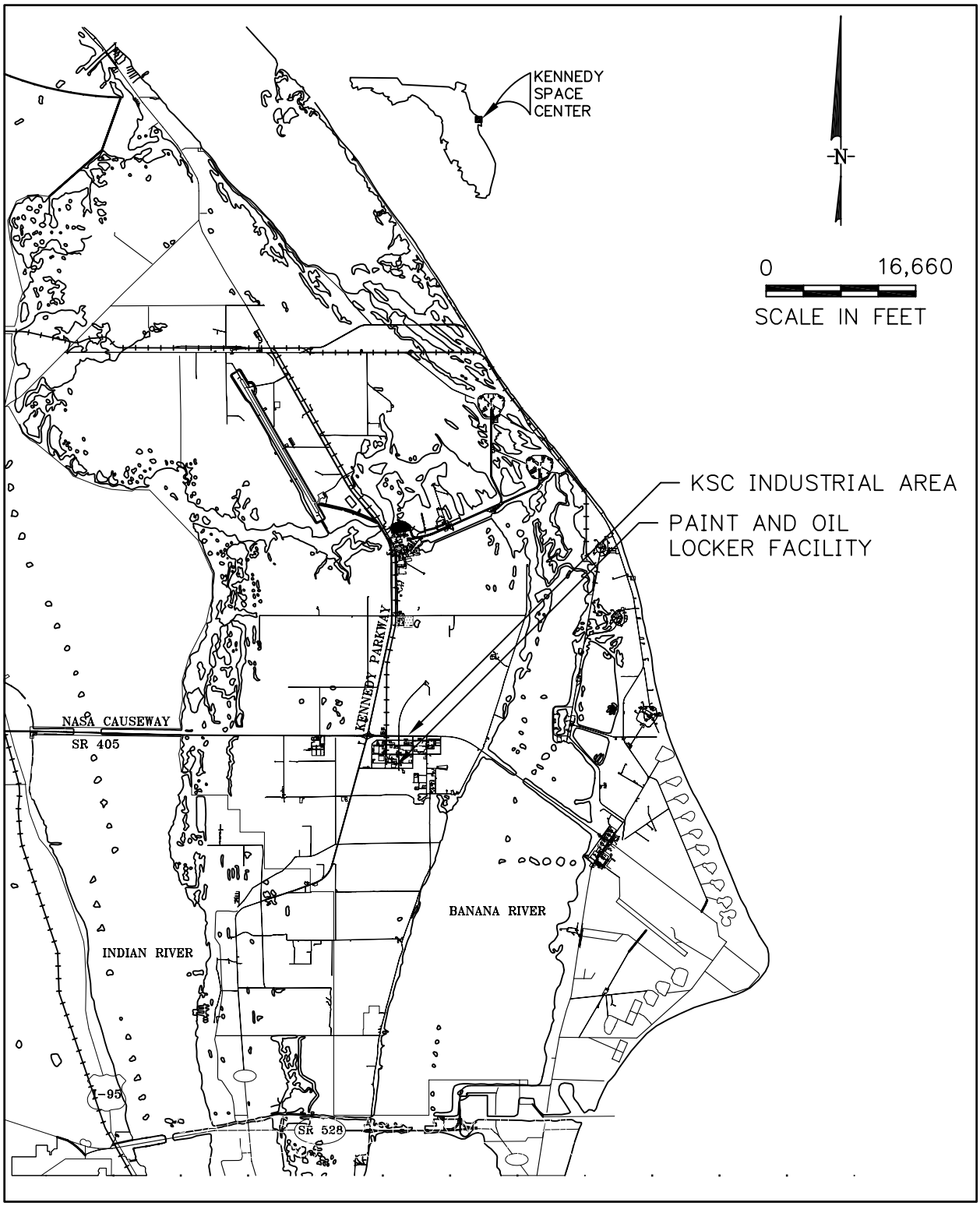
KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.



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Figure 1
POL Facility (SWMU 56)
Location Map

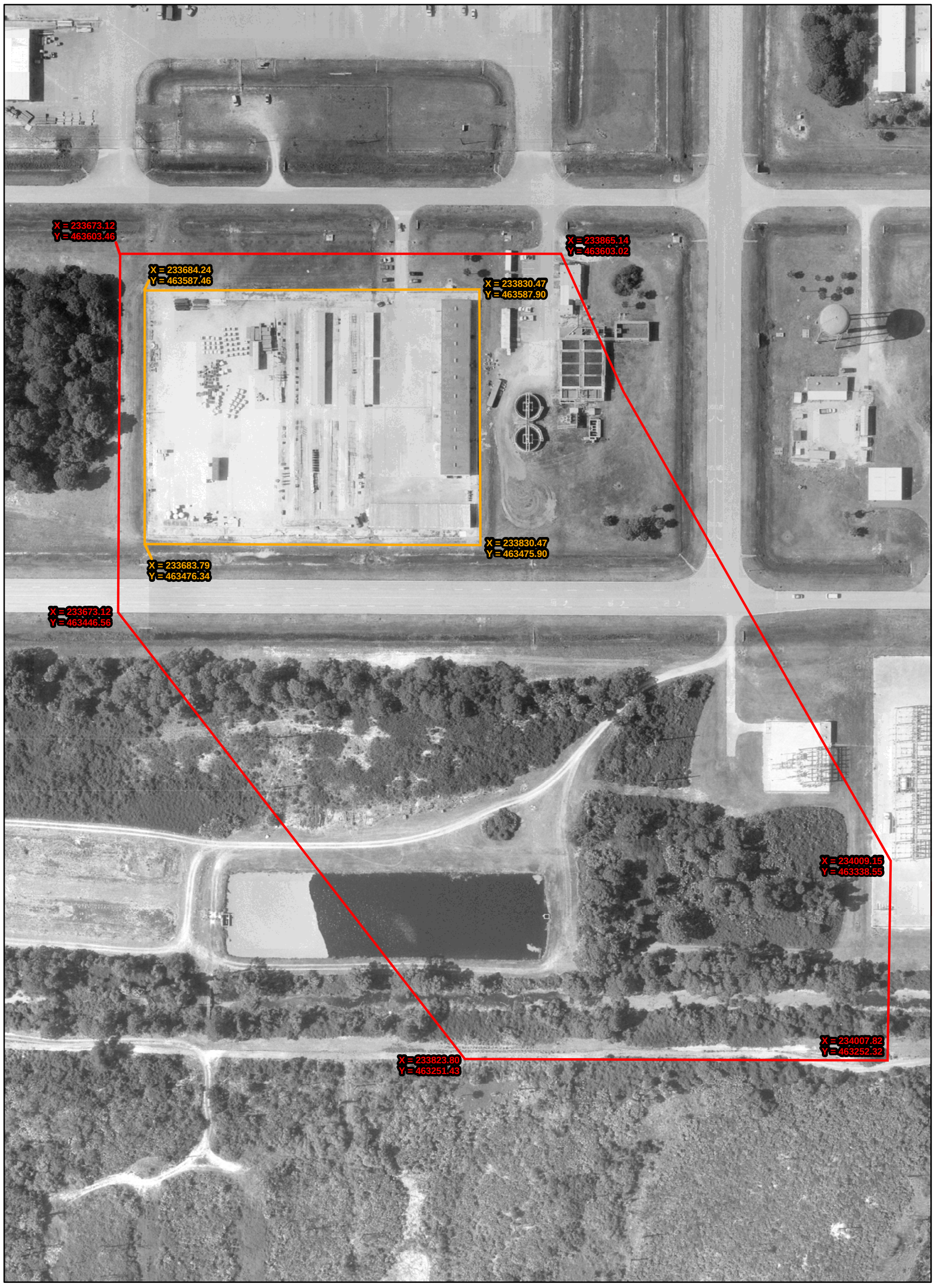


Figure 2
Site Map of the POL Facility (SWMU 56)

Area Covered by Statement of Basis and Groundwater Use Control Area
Surface Soil Use Control Area

Survey Coordinates are in US State Plane
Coordinate System NAD 1983 Meters, Florida East

140 70 0 140 Feet

N

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LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Jay Jay Railroad Yard
Solid Waste Management Unit No. 68
CONTAMINANTS: Arsenic, PAHs, and TRPHs in Soil
CONTROL: Maintain Site as Railroad Yard

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Jay Jay Railroad Yard (JJRY) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the JJRY, institutional land use controls (LUCs) will maintain site use as a railroad yard. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI included arsenic, polynuclear aromatic hydrocarbons (PAHs), and total recoverable petroleum hydrocarbons (TRPHs) in soils.

SITE DESCRIPTION

The JJRY site is a NASA-operated facility that includes a series of rail lines that span the entire length of the JJRY peninsula, and a generator building (H2-1245), located on the southeast corner of the peninsula. The generator building houses a diesel generator and a double-walled above ground fuel storage tank. Evidence of unauthorized dumping and debris burning was identified in an area located in the northeast corner of the peninsula (approximately 150 feet due north of Building H2-1245). The JJRY site is used to convey materials to and from the KSC. Based on the history of operations at the SWMU, suspected sources of contamination include the chemical and fuel storage areas, and areas in which unauthorized activities have occurred.

SITE LOCATION

The JJRY is located approximately 1.5 miles north of the city of Titusville, Florida (Figure 1) at the east end of Parrish Road on the

1. This LUCIP summarizes institutional controls regarding the NASA KSC Jay Jay Railroad Yard. For detailed information on the site, consult the Jay Jay Railroad Yard administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 876-8411.

property divided between Florida East Coast Railroad (FEC) and NASA.

The area of the JJRY covered by this LUCIP is situated within the footprint of the rail lines and 10 feet on either side of the rail lines at the site. The site is located within the N ½, SE ¼ of Section 21 and the N ½, SW ¼ of Section 22 of Township 21 South, Range 35 East, Mims, Florida Quadrangle. The soil use control area is comprised of the materials, including rock aggregate and soils, used for construction of the subbase of the railway. Coordinates of the corners of the LUCs are provided in Figure 2 in the State Plane Coordinate System NAD 1983.

SITE CONTAMINATION AND CONTROL

Soil within the LUC boundary may contain contaminants above the Florida Department of Environmental Protection (FDEP) soil cleanup target levels (SCTLs). Sampling has not been conducted in the immediate vicinity of the railroad tracks. Some soil from the area in which unauthorized burning had occurred contained PAHs above the FDEP's industrial SCTLs. Approximately 72 cubic yards of soil were removed from this area in December 2001. Soils in the vicinity of the rail lines were not assessed because the past, current, and projected future land use of the JJRY is continued use as a railroad yard. LUCs are therefore required to prohibit non-railroad yard use/exposure to the soils immediately adjacent to the railroad tracks.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for this site. The SB for the site, KSC document number KSC-TA-5750, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and the Environmental Protection Agency (EPA), effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspection, condition certification and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that the site is being operated exclusively as an industrial railroad facility and that no unauthorized use of the site is taking place that may result in adverse environmental impacts.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

This LUCIP will remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by EPA and FDEP and implemented by modification of NASA's operating permit.

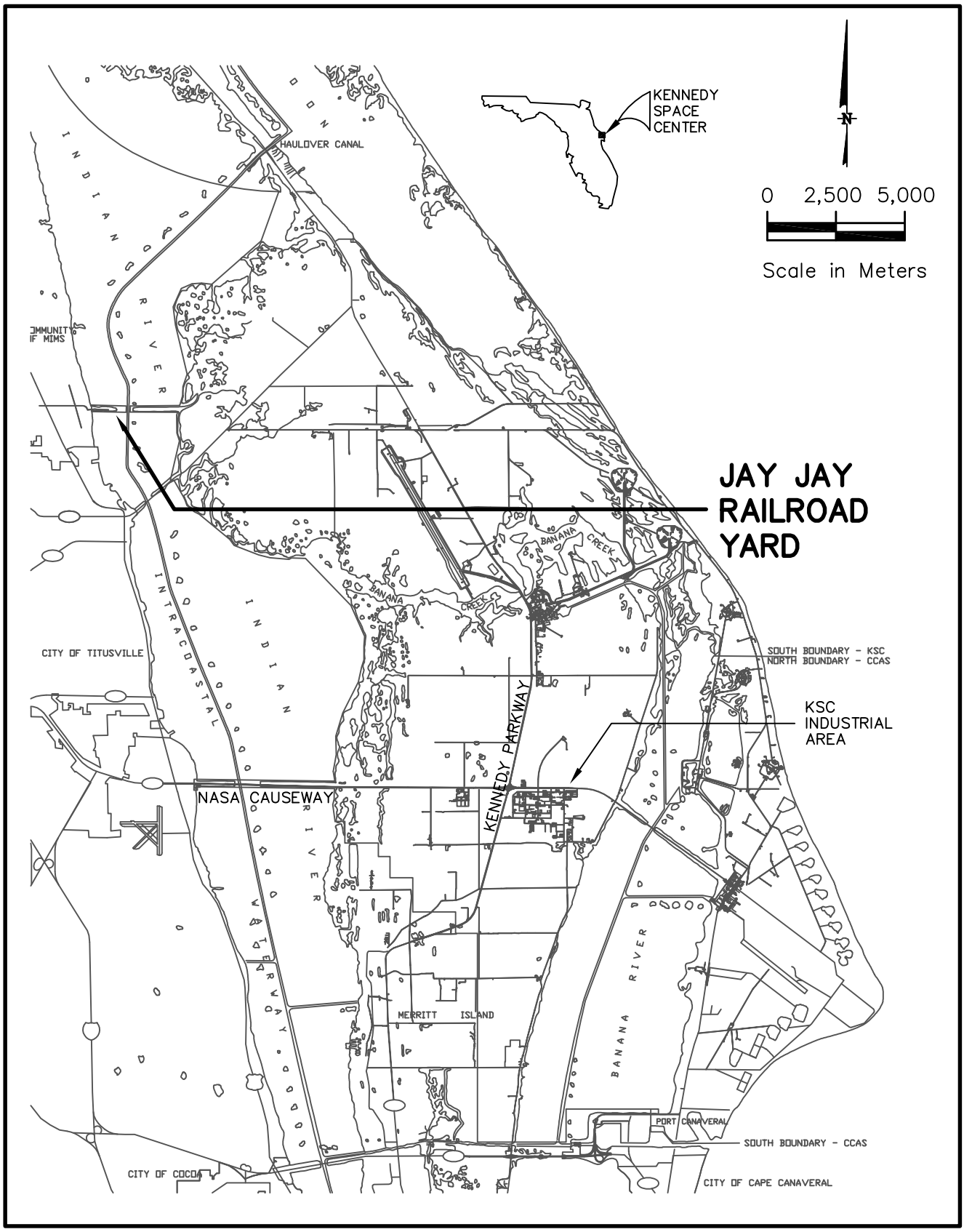
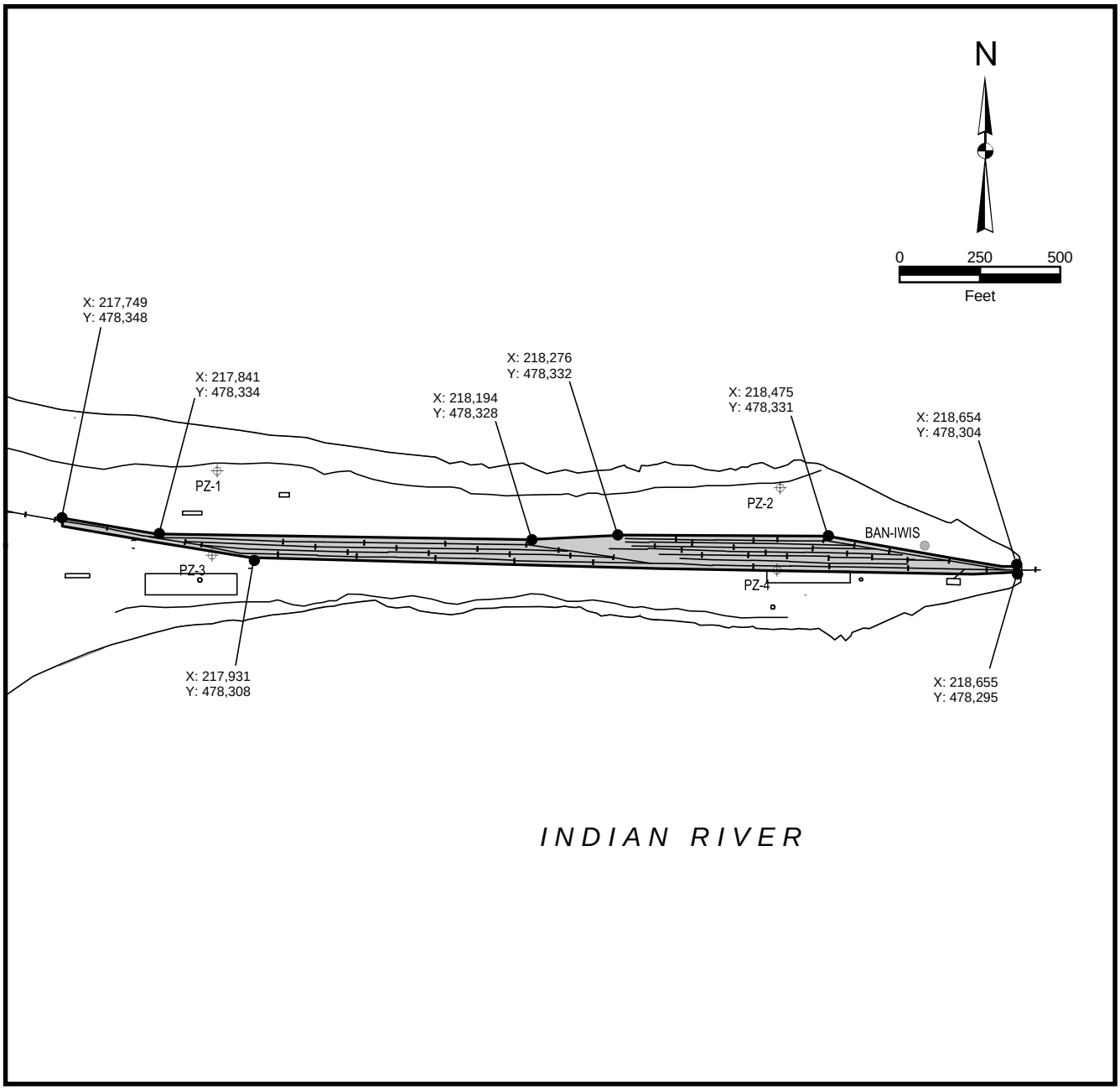


FIGURE 1

KENNEDY SPACE CENTER
JAY JAY RAILROAD YARD SITE LOCATION MAP

157F01-m.DWG



Survey Coordinates are in State Plane coordinate system, North American Datum 1983, Zone Florida East (0901)

LEGEND

- Monitoring Well Location
- Piezometer Location
- Basemap
- Boundary of Soil Use Control

Notes:

1. Soil use control area is identified as the shaded area.

2. Land Use Control for the site soils will be limited to property in the immediate vicinity of the rail lines including all rock aggregate and soil material used for construction of the railroad subbase (10 feet on either side of the tracks).

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FIGURE 2

KENNEDY SPACE CENTER
JAY JAY RAILROAD YARD SITE MAP

LAND USE CONTROL IMPLEMENTATION PLAN
FIREX WATER TANK SWMU 69
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER

FACILITY: Firex Water Tank
Solid Waste Management Unit No. 69
CONTAMINANTS: PAHs and Arsenic in Soil/Dry Sediment
CONTROL: Maintain Swale Configuration

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Firex Water Tank (FWT) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the FWT site, institutional land use controls (LUCs) are necessary to: (i) ensure the swales at the site remain in their current configuration and that human activity within the swale is limited to intermittent maintenance. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were polynuclear aromatic hydrocarbons (PAHs), and arsenic in soil/dry sediment.

SITE DESCRIPTION

The FWT site is a NASA-operated facility that includes a one- million gallon capacity steel and concrete tank, pump station including several back- up diesel generators, a 15,000 gallon diesel above ground storage tank, and a 1,000-gallon waste oil underground storage tank. The FWT was constructed in 1964 and moved to its current location in 1986. The pump station and other appurtenant structures were constructed in 1986. The FWT site is used to support fire suppression systems in the KSC Industrial Area.

SITE LOCATION

The FWT site is located in the Hypergol/ Payload Test Area in the southeastern corner of the KSC Industrial Area (Figure 1). It is located at the intersection of Ninth Street S.E. and G Avenue S.E. The site is located within Section 4 of Township 23S, Range 37E which is in the Orsino Quadrangle. The soil use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are pro-

1. This LUCIP summarizes institutional controls regarding the NASA Firex Water Tank Site. For detailed information on the site, consult the Firex Water Tank Site administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

vided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

PAHs and arsenic are present in soil/dry sediment above FDEP's residential and/or industrial soil cleanup target level (SCTL). Alternative SCTLs were developed for a groundskeeper scenario at the site and all soil contaminants were below the alternative SCTLs. The past, current, and projected future land use of the FWT site is industrial in nature. A LUC is therefore required to ensure the swales remain in their current configuration and that human activity within the swale is limited to intermittent maintenance.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for this site. The SB for the site, KSC document number KSC-TA-5721, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA. KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that the swales meet the alternative SCTL assumptions.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUC.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

2. *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

   Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

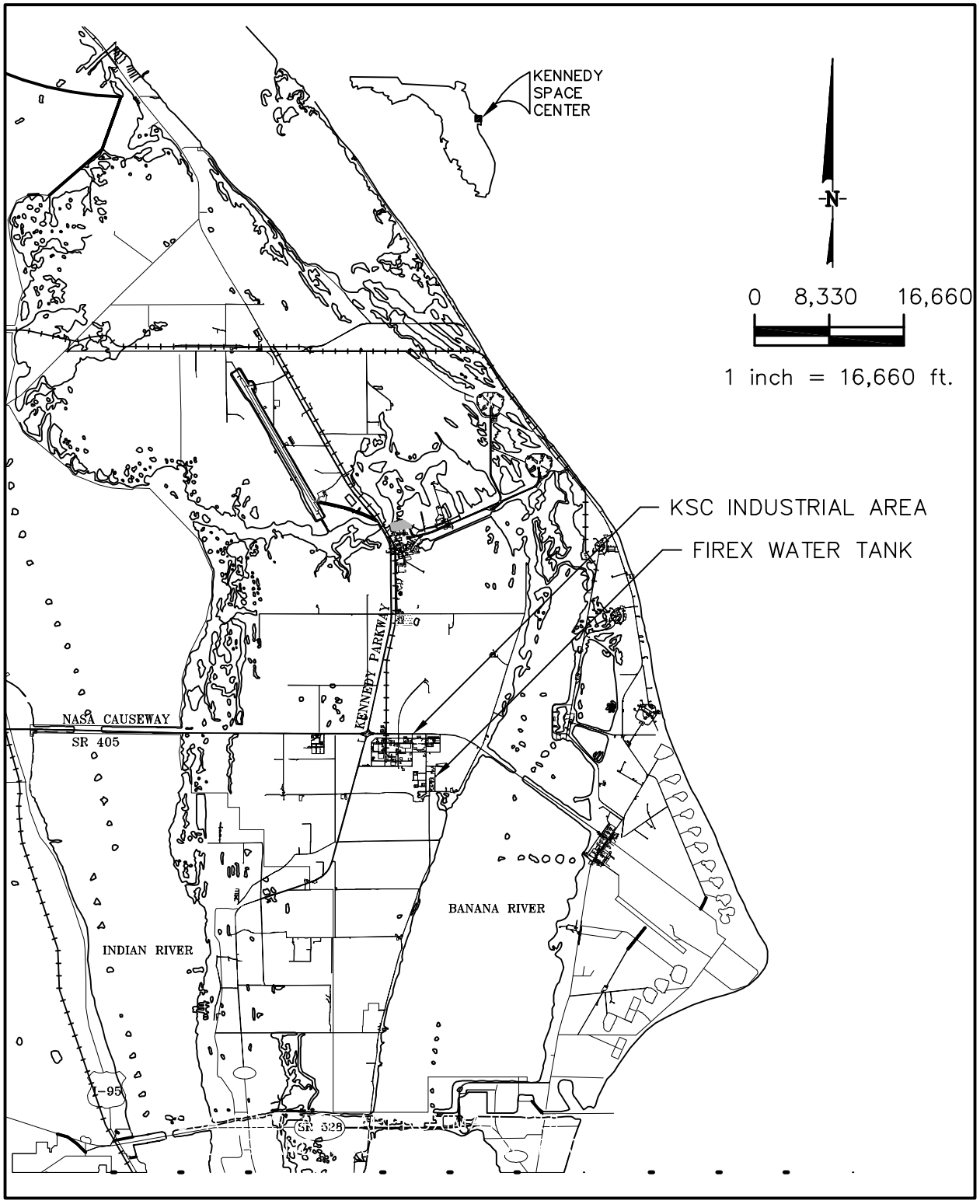


FIGURE 1

KENNEDY SPACE CENTER
FIREX WATER TANK SITE LOCATION MAP

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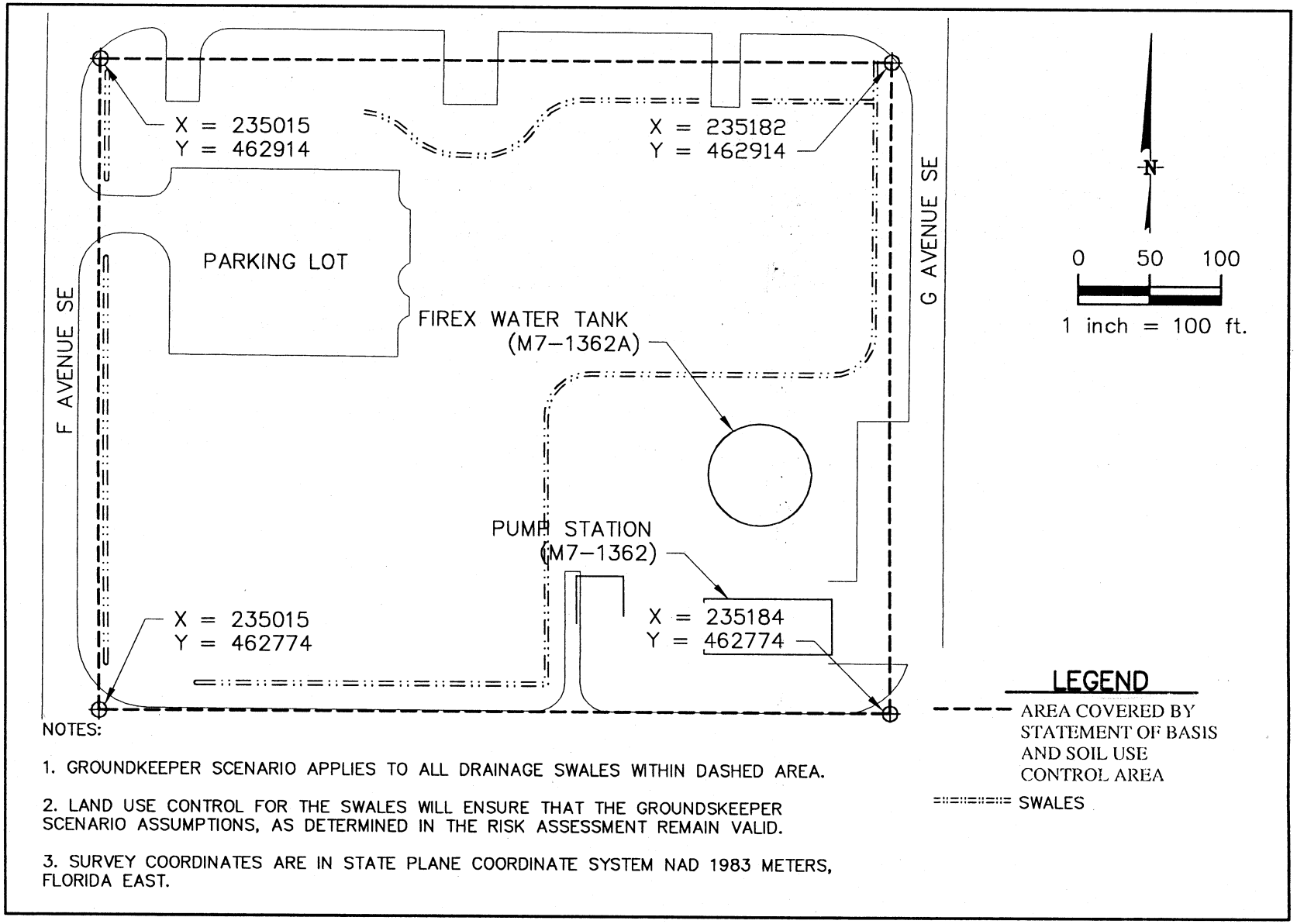


FIGURE 2
SITE MAP
FIREX WATER TANK

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Hypergol Maintenance Facility
Hazardous Waste South Staging Areas
Solid Waste Management Unit No. 70

CONTAMINANTS: VOCs, Aluminum, and Iron in Groundwater

CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Hypergol Maintenance Facility Hazardous Waste South Staging Areas (HMF) Facility of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the HMF Facility, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater from the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern (COCs) identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were volatile organic compounds (VOCs), aluminum, and iron in groundwater. No COCs were identified for ecological receptors.

SITE DESCRIPTION

The HMF is a NASA-operated facility that was constructed between 1964 and 1985 to support the Apollo and Shuttle Space Programs at KSC; however, most of the buildings were constructed in 1964. The HMF facility includes the East Hypergol Module Storage Building, West Hypergol Module Storage Building, Hazardous Waste Staging Shelter, Hazardous Waste Staging Area (formerly the Liquid Oxygen Fuel Pad), former Liquid Hydrogen Fuel Pad, two leaching ponds, and two equipment shelters; which comprise an area of approximately 8 acres.

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1. This LUCIP summarizes institutional controls regarding the NASA KSC Hypergol Maintenance Facility. For detailed information on the site, consult the HMF Facility administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

Past operations at the HMF include cryogenic testing for the Apollo Space Program and "hot-testing" of the Solid Rocket Booster Aft Skirt. In addition, from 1981 to 1998, the Hazardous Waste Staging Area operated as a permitted RCRA Temporary Storage and Disposal (TSD) facility. The TSD was closed in 1998. The facility is currently inactive and used for the storage of miscellaneous equipment.

SITE LOCATION

The HMF Facility is located in the northeast of the intersection of F Avenue SE and 10th Street SE in the KSC Industrial Area (Figure 1). The HMF is located within Section 4 of Township 23S, Range 37E, as shown on the Orsino Quadrangle Map. The groundwater use control areas covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs, aluminum, and iron above FDEP's groundwater cleanup target levels (GCTLs). The past, current, and projected future land use of the HMF is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-6840, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

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2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no groundwater use is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

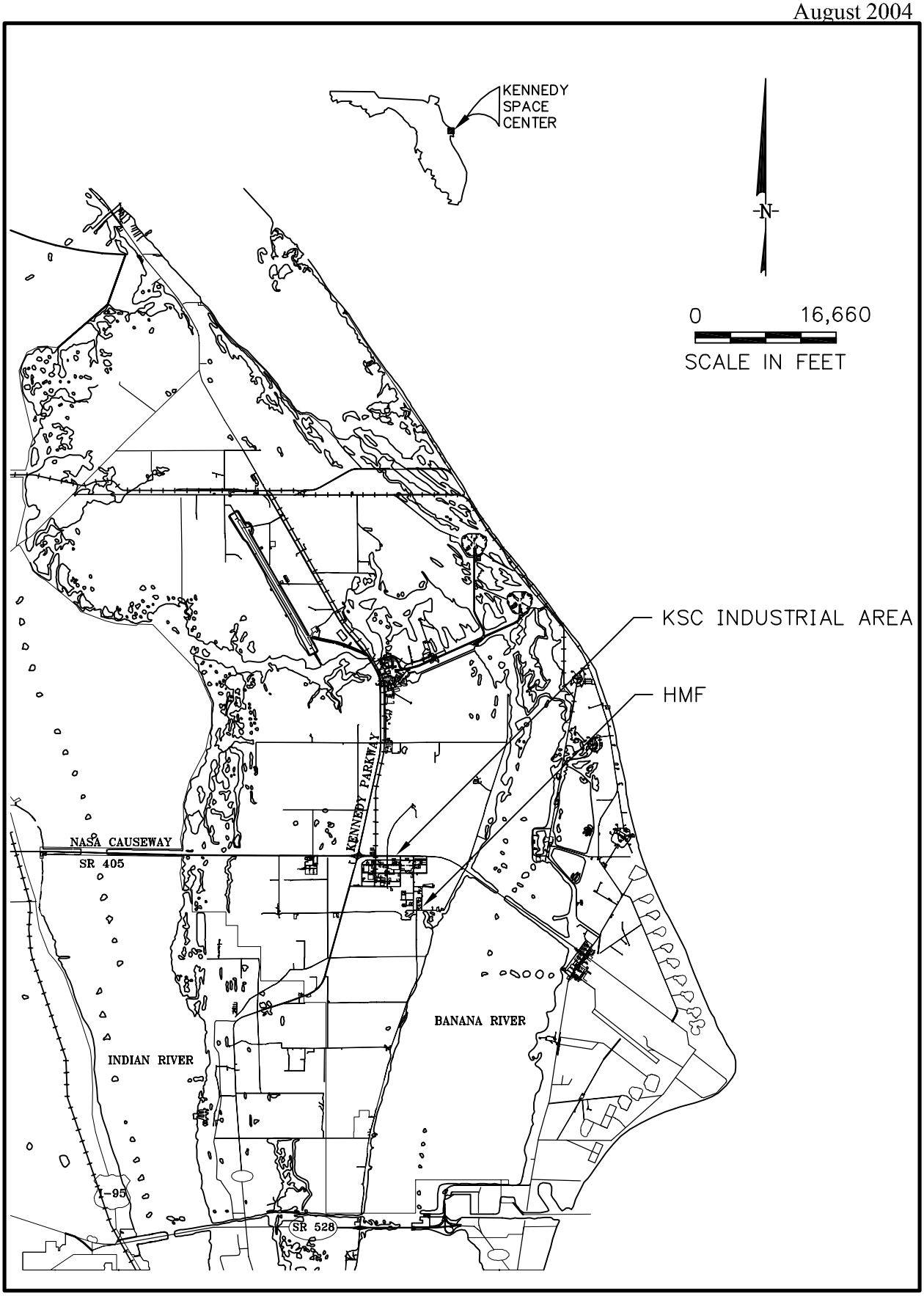
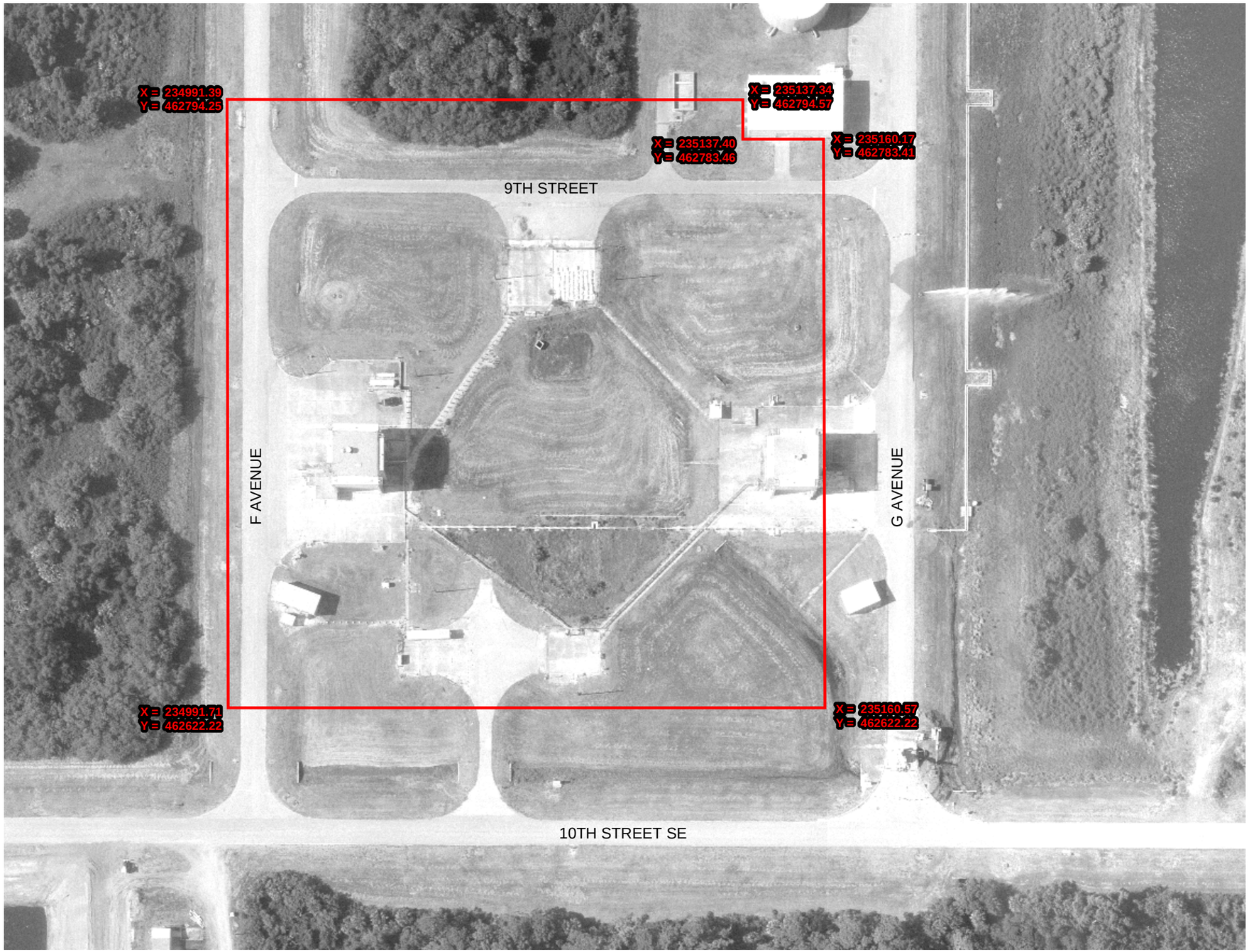
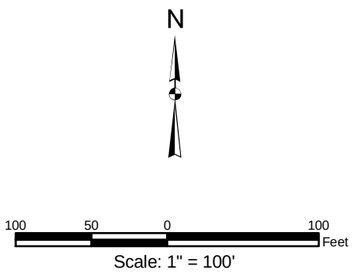


FIGURE 1
HMF Facility (SWMU 70)
Location Map





LEGEND

Area Covered by Statement of Basis and Groundwater Use Control

Note:

BLS = below land surface

Survey Coordinates are in US State Plane Coordinate System NAD 1983 Meters, Florida East

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Figure 2
Site Map of HMF (SWMU 70) Area

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Wilson's Railroad Yard
Solid Waste Management Unit No. 71
CONTAMINANTS: PAHs in Soil/Dry Sediment (Swale Soil)
CONTROL: Maintain Site as Railroad Yard

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Wilson's Railroad Yard (WRRY) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the WRRY, institutional land use controls (LUCs) will maintain site use as a railroad yard. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were polynuclear aromatic hydrocarbons (PAHs) in soil/dry sediment (swale soil).

SITE DESCRIPTION

The WRRY is a NASA-operated facility that was constructed in the early 1960s to support space flight efforts at KSC. The facility includes an approximately 3,200-foot section of railroad track with three railroad sidings, a former asphalt plant area (constructed in 1993), and the Wilson's Support Area, which is located approximately 1,600 feet to the northeast. Hammock Trail, a hiking trail accessible to the public, crosses the extreme western portion of the WRRY. The entire facility comprises an area of approximately 16 acres (Figure 1). Past and current operations at the WRRY include the temporary storage of railroad cars and the performance of various railroad-related maintenance activities. Large debris piles which contained wooden railroad ties, metal rails/spikes, various rail fasteners, used oil containers, and/or miscellaneous debris have been removed from the site. The Wilson's Support Area is used solely for the storage of maintenance vehicles.

SITE LOCATION

WRRY has no marked or legally designated property boundaries and is located on the northern portion of KSC (Figure 1). It is

1. This LUCIP summarizes institutional controls regarding the NASA KSC WRRY site. For detailed information on the site, consult the WRRY site administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

located approximately (i) 3,000 feet west of the intersection of Kennedy Parkway North (State Road 3) and Beach Road (State Road 402), and (ii) 1,200 feet west of the Wilson Corners groundwater remediation site. The site is located within Sections 21 and 22 of Township 21S, Range 36E which is in the Wilson Quadrangle. The soil and sediment use control areas covered by the LUCIP are shown on Figure 1. Coordinates of the corners of the LUC are provided in Figure 1 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Soil/dry sediment within the LUC boundary contains contaminants above the FDEP's industrial soil cleanup target levels (SCTLs). Sampling has not been conducted in the immediate vicinity of the railroad tracks. Soil in the vicinity of the railroad lines were not assessed because the past, current, and projected future land use of the WRRY is continued use as a railroad yard. LUCs are therefore required to prohibit non-railroad yard use/exposure to the soil/dry sediment (swale soil) (i) in isolated areas across the site and (ii) immediately adjacent to the railroad tracks.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-6848, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that the site is being operated exclusively as an industrial railroad facility and that no unauthorized use of the site is taking place that may result in adverse environmental impacts.

REPORTING

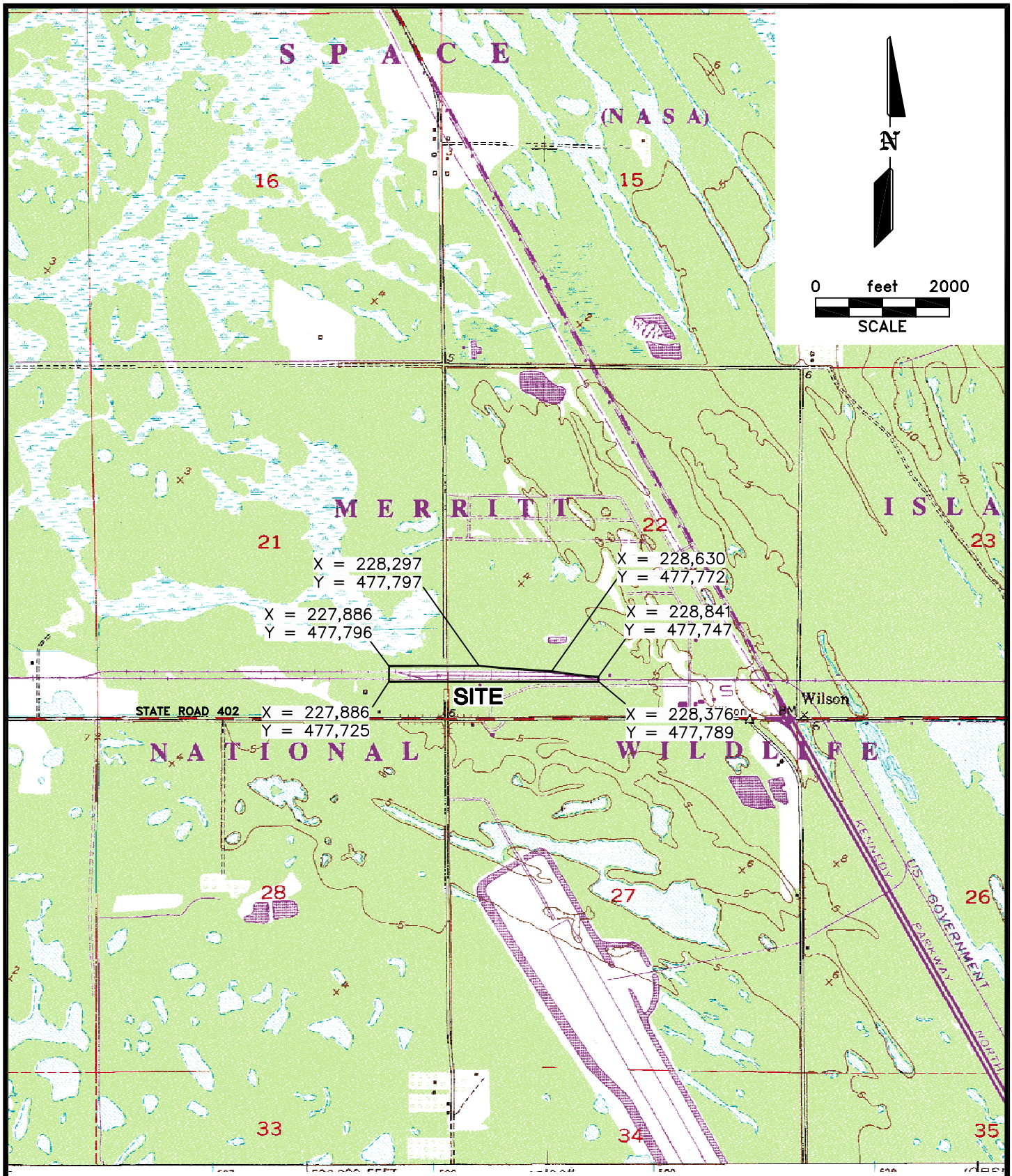
KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.



SOURCE: 7.5 MINUTE SERIES USGS QUADRANGLE MAP, WILSON, FLORIDA, DATED 1979.

SURVEY COORDINATES ARE IN STATE PLANE COORDINATE SYSTEM NAD 1983 METERS, FLORIDA EAST.

SECTIONS: 21 AND 22 TOWNSHIP: 21 S RANGE: 36 E

FIGURE 1

WILSON'S RAILROAD YARD
SOIL USE CONTROL AREA
SWMU NO. 71

LAND USE CONTROL IMPLEMENTATION PLAN
FORMER DEVELOPMENT AND TESTING LABORATORY, SWMU 075
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FACILITY: Former Development and Testing Laboratory
Solid Waste Management Unit 075
CONTAMINANTS: Chlorinated Volatile Organic Compound Contamination In Groundwater
CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Former Development and Testing Laboratory (FDTL) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the FDTL site, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater from the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

A human health risk assessment was completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). The chemicals of concern identified for human health risk during the RFI that exceeded the Florida Department of Environmental Protection (FDEP) cleanup target levels are chlorinated volatile organic compounds (CVOCs) in groundwater.

SITE DESCRIPTION

FDTL is currently a vacant site with only a former paved parking lot remaining. Prior to their demolition in 2005, the Frequency Control and Analysis (FCA) Building (L5-683) and the Preamplifier Building (L5-734) were located on the site. Historically, the FDTL facility has supported the Cape Canaveral Air Force Station Missile Test Program, and later housed the Prototype Laboratory, the Development and Testing Laboratory, an asbestos laboratory, office space, and a portion of the FCA building was modified into a kennel for feral cats. An onsite weather station was historically used for small weather rocket launches and the parking lot was formerly used for impact foam testing. Various portions of the site have been used for equipment, vehicle, and salvage materials storage. The site location with inset showing the site layout is shown on Figure 1.

[1] *This LUCIP summarizes institutional controls regarding the FDTL. For detailed information on the site, consult the FDTL administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.*

SITE LOCATION

The FDTL site encompasses approximately 5 acres, located approximately 4 miles southwest of the Vehicle Assembly Building (VAB) area and 1 mile east of the Indian River on the south side of Schwartz Road. The vacant site is surrounded to the north, south and west sides by wetlands, and to the east the site is bordered by a large man-made pond. The groundwater use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains CVOCs above FDEP's Groundwater Cleanup Target Levels (GCTLs). A Preliminary Risk Evaluation showed that assuming future use of groundwater for drinking water, cancer and non-cancer risks would be unacceptable. The estimated lifetime excess cancer risk for the hypothetical future resident was determined to be 1.5 x 10^{-5}, which exceeds FDEP's acceptable level of 1.0 x 10^{-6}. However, there is no current use of site groundwater; therefore, no exposure or current risk. The past, current, and projected future land use of FDTL is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

IMPLEMENTATION

Institutional controls will be implemented by the Kennedy Space Center (KSC) Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between the National Aeronautics and Space Administration (NASA), FDEP, and the Environmental Protection Agency (EPA), effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential groundwater use is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to the EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the FDEP and implemented by modification of NASA's operating permit.

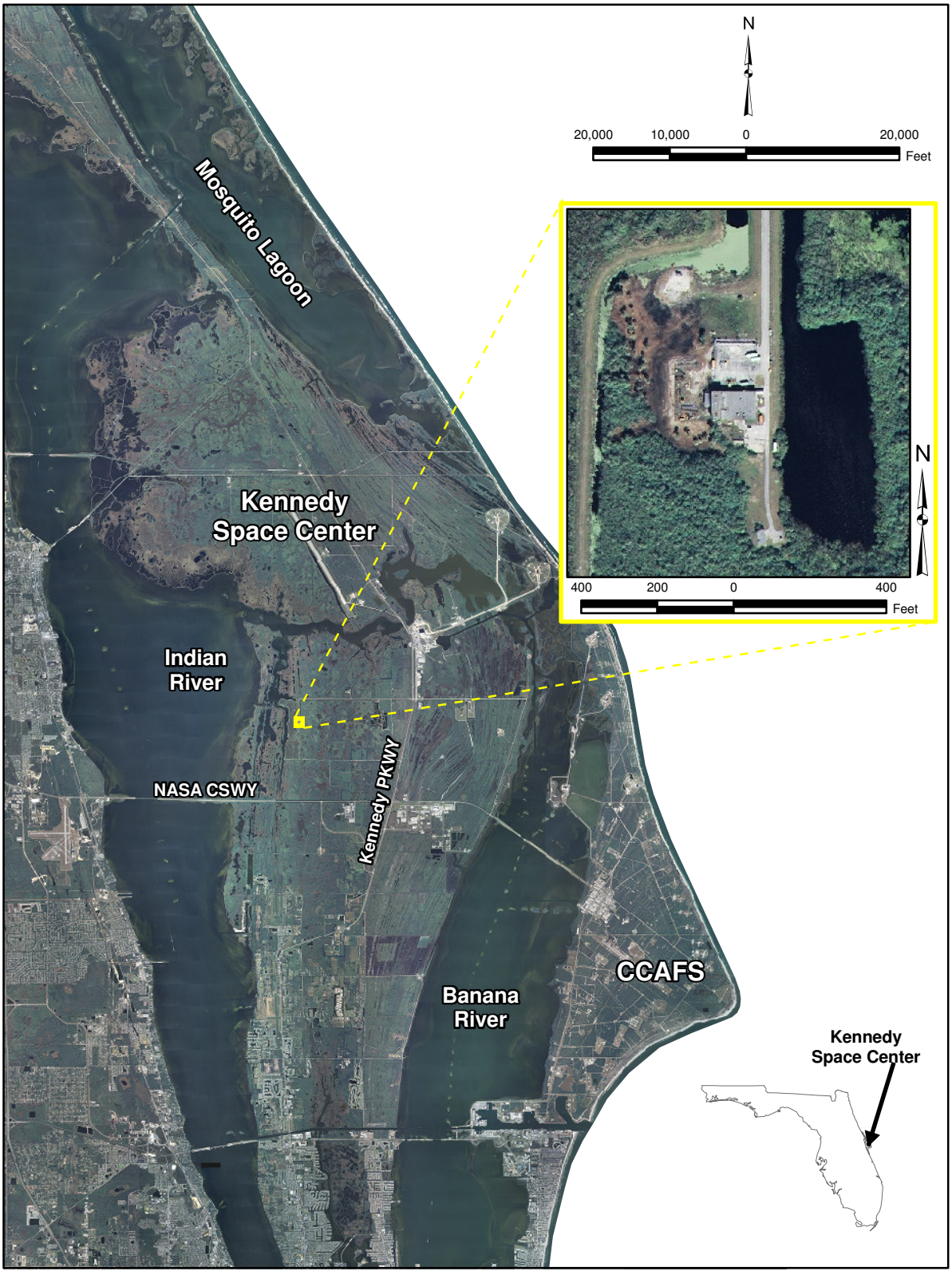


Figure 1
Former Development and Testing Laboratory Location Map

Titusville-01\Data\0GIS\FJ0374\MXDs\Figure1_LUCIP.mxd



Figure 2
Groundwater Use Control Area

Legend

Groundwater Use Control Area

N

Note: Survey Coordinates are in US State Plane Coordinate System NAD1983 meters, Florida East.

100 50 0 100 Feet

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LAND USE CONTROL IMPLEMENTATION PLAN

OPERATIONS AND CHECKOUT BUILDING SWMU 76
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Operations and Checkout Building Solid Waste Management Unit No. 76
CONTAMINANTS:	PCBs and PAHs in Soil and VOCs and Iron in Groundwater
CONTROL:	Prohibit Groundwater Use and Residential Exposure to Surface Soil

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Operations and Checkout (O&C) Building of institutional controls that have been implemented at the site[1]. Institutional land use controls (LUCs) are necessary to prohibit the use of groundwater from the site and prohibit residential exposure to surface soils between the building wings. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were polychlorinated biphenyls (PCBs) and polynuclear aromatic hydrocarbons (PAHs) in soils and volatile organic compounds (VOCs) and iron in groundwater.

SITE DESCRIPTION

The O&C Building is a NASA-operated facility that was constructed in the early 1960s to support space flight efforts at KSC. The facility includes the O&C Building and numerous appurtenant structures and storage areas that comprise an area of approximately 38 acres. The facility houses offices, laboratories, a fitness center, astronaut quarters, and an assembly and test bay. During the 1960s and 1970s the O&C assembly bay was used for the assembly and testing of the Apollo Spacecraft. The O&C bay has since been retrofitted and is now used to process payloads for the Space Shuttle program and integrated testing of components for the International Space Station.

1. *This LUCIP summarizes institutional controls regarding the NASA KSC O&C Building. For detailed information on the site, consult the O&C Building administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.*

SITE LOCATION

The O&C Building is located in the KSC Industrial Area as shown on Figure 1. The site is located within Section 4 of Township 23S, Range 37E of the Orsino, Florida Quadrangle. The groundwater use control area covered by this LUCIP is shown on Figure 2. The soil residential exposure control area covered by this LUCIP is shown on Figure 3. Coordinates of the corners of the control areas are provided in Figure 2 and 3 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND REMEDY

Groundwater at the site contains VOCs and iron above FDEP's groundwater cleanup target levels. Surface soils in the grassed area between the building wings contains benzo(a)pyrene above FDEP's residential soil cleanup target levels. The current and projected future land use of the O&C Building is industrial in nature. LUCs are therefore required to prohibit use of the groundwater and residential exposure to surface soil. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for this site. The SB for the site, KSC document number KSC-TA-6832, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)2 between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

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2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspection, condition certification and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no groundwater use or residential exposure to surface soil is occurring.

REPORTING

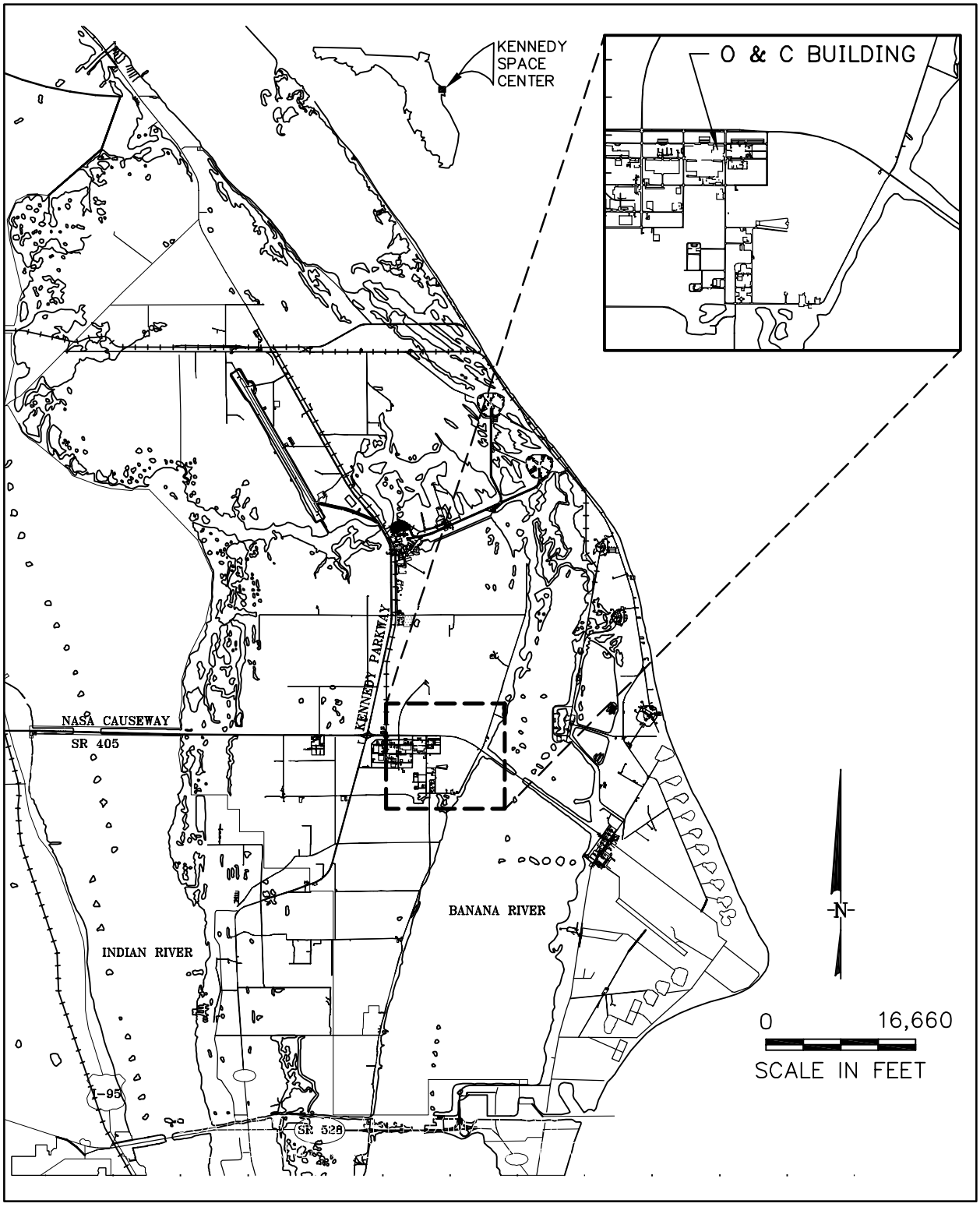
KSC's Environmental Program Office will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

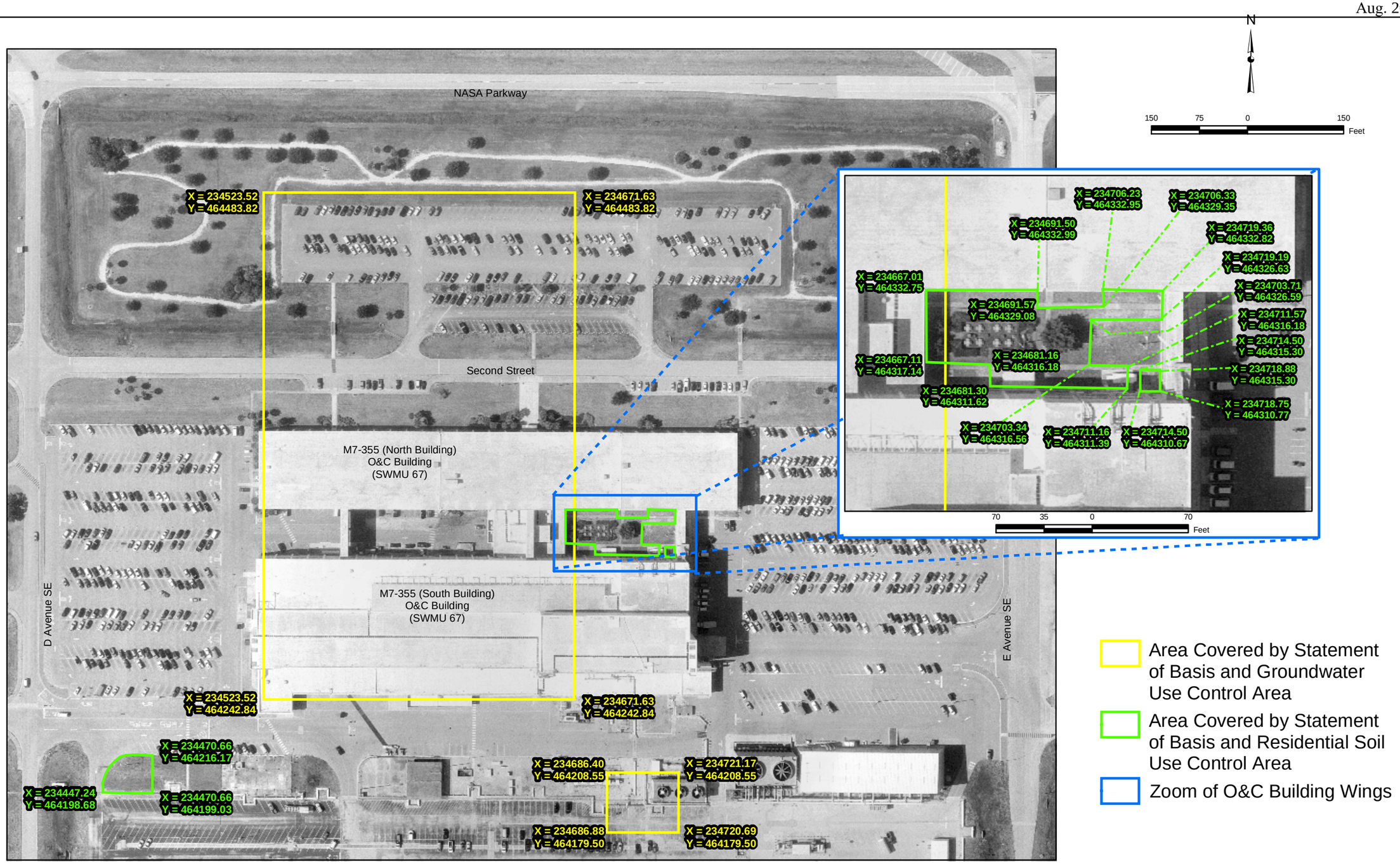
MAINTENANCE

This LUCIP will remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the FDEP and implemented by modification of NASA's operating permit.



0552F004.DWG

Figure 1
O & C Building (SWMU 76)
Location Map



Survey coordinates are in US State Plane Coordinate Sytem NAD1983, Florida East, Meters.

Ogis\FI0388\MXDs\LUICP_fig2.MXD

Figure 2
Site Map Operations and
Operations and Checkout (O & C) Building (SWMU 76)

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Former Vertical Processing Facility Solid Waste Management Unit 077
CONTAMINANTS:	Chlorinated Volatile Organic Compounds in Groundwater
CONTROL:	Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Former Vertical Processing Facility (VPF) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with VPF, an institutional land use control (LUC) is necessary to prohibit groundwater use at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Groundwater impacts were documented during the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and supplemental investigation activities. Three chlorinated volatile organic compounds (CVOCs) [trichloroethene (TCE), cis-1,2-dichloroethene (cDCE), and vinyl chloride (VC)] exceeded their Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs) and were identified as a potential human health risk, therefore a LUC is required.

SITE DESCRIPTION

The VPF facility was originally used as a support facility for former manned space programs and for occasional staging and processing of shuttle flight payloads. The main building onsite (VPF, M7-1469) is no longer an active facility and the building was demolished during the summer of 2010.

SITE LOCATION

The Former VPF Area is located in the Industrial area of the Kennedy Space Center (KSC) within Section 4 of Township 22S, Range 37E, on the United States Geological Survey's 7.5-minute Orsino topographic quadrangle map and encompasses approximately 2 acres (Figure 1). The facility is bordered by wooded areas immediately to the north, 10th street and wooded areas to the south, Ordnance Lab #2 (M7-1417) to the

[1] *This LUCIP summarizes institutional controls regarding the NASA VPF. For detailed information on the site, consult the VPF administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

west, and Ordinance Storage (M7-1472), Operations Support Building (OSB; M7-1521) and OSB Annex (M7-1522) to the east. The groundwater land use control areas covered by the Interim LUCIP are presented on Figure 2. The Coordinates of the corners of the LUCs provided on Figure 2 are in the US State Plane Coordinate System NAD 1983, meters, Florida East.

SITE CONTAMINATION AND CONTROL

The concentration of CVOCs present in groundwater are above the FDEP's GCTLs. Since groundwater exceeds the FDEP GCTLs, LUCs prohibiting the use of groundwater are required until the cleanup level is achieved. The current and projected land use of the VPF Area does not include the use of site groundwater; therefore, there is no current or projected exposure risk.

DECISION DOCUMENT

The Kennedy Space Center (KSC) Remediation Team determined that interim institutional controls should be implemented at the former VPF facility. The interim institutional controls are temporary while interim measures and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring at the site.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this Interim LUCIP.

[2] *By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MAINTENANCE

The Interim LUCIP shall remain in place until the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based upon analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.

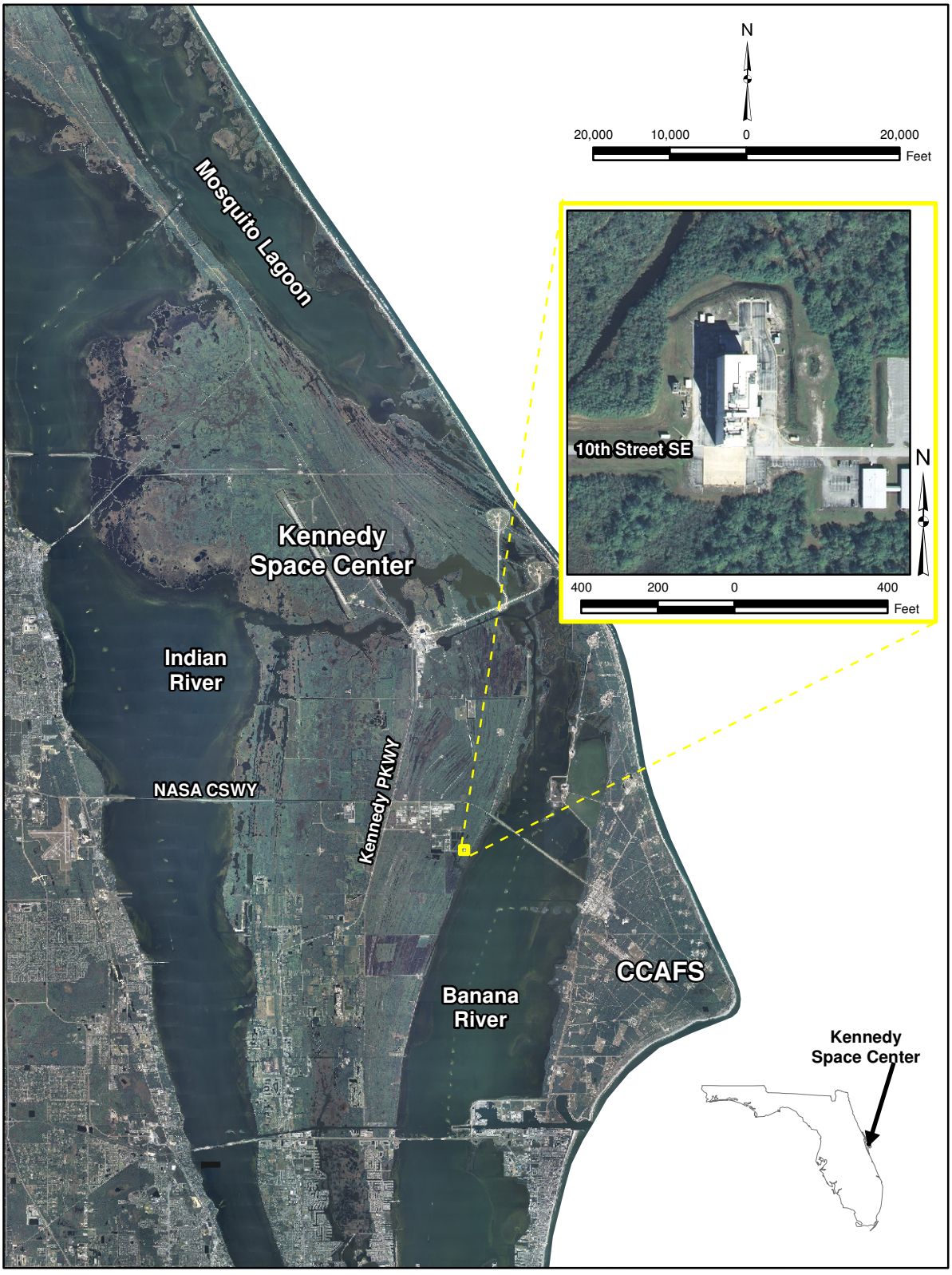


Figure 1
Vertical Processing Facility Site Location Map

Titusville-01\Data\0GIS\FR0738\MXDs\MARCH 2012LUCIPfig1.mxd 21 MARCH 2012 MAH

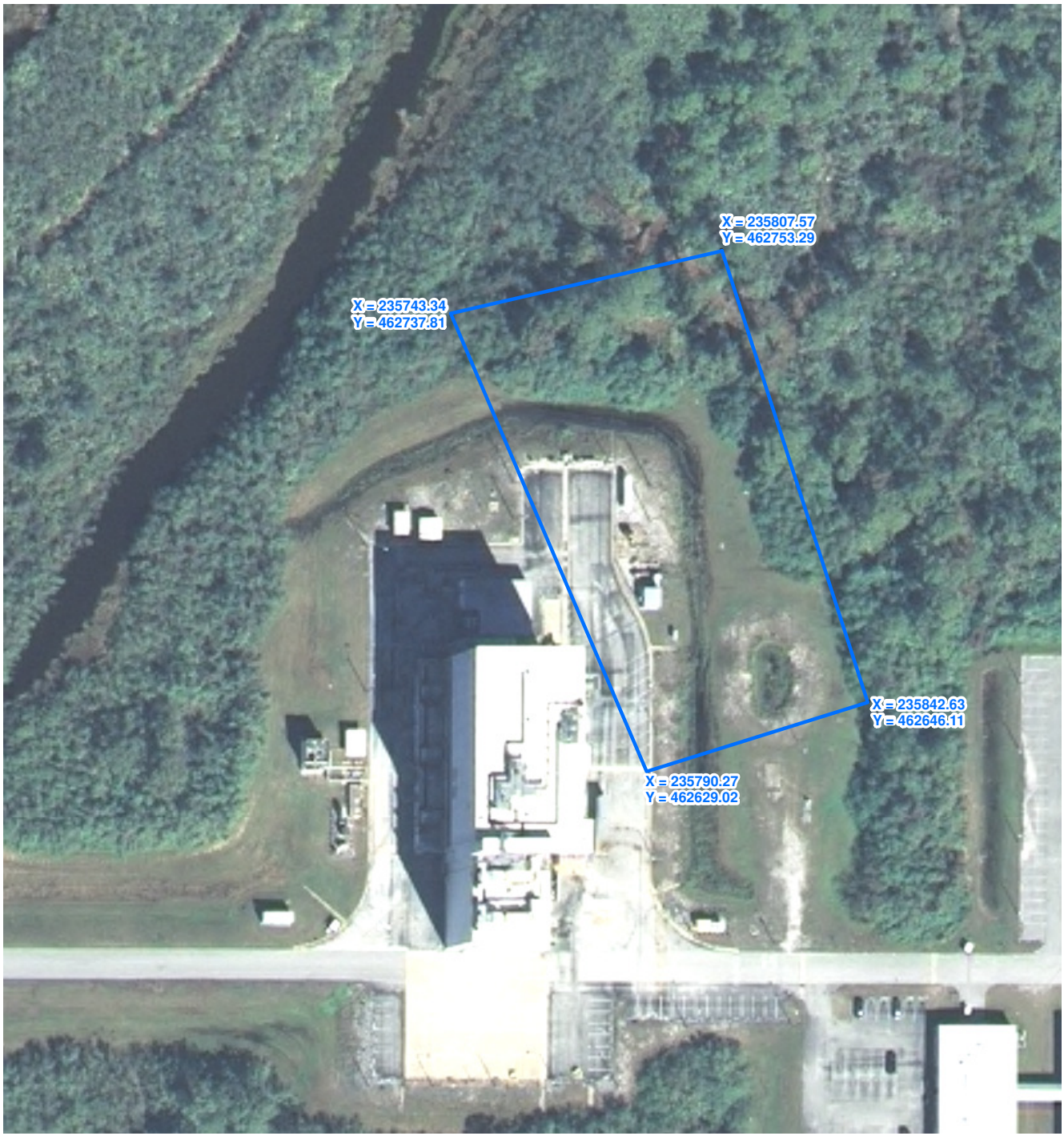


Figure 2
VPF Groundwater Use Control Area

Legend

Area Covered by Groundwater Use Control

N

Notes:
1. Vertical Processing Facility (VPF; M7-1469) was demolished in the summer of 2010.
2. Survey Coordinates are in US State Plane Coordinate System NAD1983 Meters, Florida East.

120 60 0 120 Feet

Titusville-01\Data\0GIS\FR0738\MXDs\MARCH 2012\LUCIP_fig2.mxd 21 MARCH 2012 MAH

LAND USE CONTROL IMPLEMENTATION PLAN
ENVIRONMENTAL HEALTH FACILITY, SWMU 79
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER

FACILITY: Environmental Health Facility
Solid Waste Management Unit No. 79
CONTAMINANTS: Vinyl Chloride Contamination In Groundwater
CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Environmental Health Facility (EHF) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the EHF, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater from the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). The chemical of concern identified for human health risk during the RFI that exceeded the Florida Department of Environmental Protection (FDEP) cleanup target level is vinyl chloride in groundwater.

SITE DESCRIPTION

The main facility building L7-1557, was constructed in 1966. From 1966 to 1982, the building was utilized as the Central Instrumentation Facility (CIF). While operated as the CIF, the building was used for housing of computers and some maintenance activities. The main building was also equipped with an ionization detection system. Since 1982, the central office of Environmental Health (EH) Services has occupied the building. EH comprises Industrial Hygiene, Environmental Compliance/Public Health (EC&PH), and Health Physics. The EHF site also includes three numbered structures that were constructed between 1966 and 1985; the main building, L7-1557, an equipment storage shed, L7-1557C, and the asbestos lab, L7-1557D. The asbestos laboratory and Industrial Hygiene equipment storage building, L7-1557D, was constructed in 1985 and is located to the northeast of the main building. The structure is divided equally, with one side being used as an asbestos identification laboratory and the other side as an equipment storage area. A boiler was formerly housed on the western side of the building but was removed in 1985, and the area was converted to an EC&PH labora-

[1] *This LUCIP summarizes institutional controls regarding the EHF. For detailed information on the site, consult the EHF administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.*

tory and storage area. An equipment storage shed, L7-1557C, was originally constructed in 1967 as a shelter for backup electrical generators. The generators were removed in 1983, and the building has since been used for equipment storage. Adjacent to the storage shed on the southeastern side is an electrical transformer pad. where the original transformers were installed in 1966 to support the facility. The transformers were replaced in the early 1980s. Adjacent to the storage shed on the northwestern side, is the former location of a 1,500-gallon diesel underground storage tank (UST). The tank may have been used to support the boiler formerly located in the EC&PH lab area and/or the backup generators located in L7-1557C. The tank has not been used since the removal of the backup generators in 1983. An abandoned cooling tower is located on the northwestern side of the main building adjacent to the abandoned acid storage tank. A Domestic Treatment Plant (DTP) septic system and drain field were formerly located in the southwestern corner of the site. The original drain field was replaced in the late 1980s. The facility was then connected to the Industrial Area sanitary sewer system in 1999, and the septic tank and drain field were removed. In 1986 five communication antennas were installed and are located to the northeast of the current facility buildings. Southeast and northwest of these antennas are two other concrete structures. These concrete structures are believed to have supported two previous communication antennas. Approximately 1,200 feet to the southeast of the main building are two additional antennas, a former antenna pad, and two small buildings.

SITE LOCATION

The EHF is located on the northern portion of Merritt Island, between the Indian and Banana Rivers in Brevard County, Florida. The EHFDL is south of the Space Station Processing Facility on the eastern site of E Avenue, in the KSC Industrial Area. The EHF is found in Section 5, Township 23S, Range 37E, as seen on the 7.5-minute Orsino topographic quadrangle map (USGS 1986). The groundwater use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains vinyl chloride above FDEP's groundwater cleanup target levels. A Preliminary Risk Evaluation showed that assuming future use of groundwater for drinking water, cancer and non-cancer risks would be unacceptable. The estimated excess lifetime cancer risk for the hypothetical future resident was determined to be 8.9×10^{-5} which exceeds FDEP's acceptable level of 1×10^{-6} in a million. However, there is no current use of site groundwater and therefore no exposure or current risk. The past, current and projected future land use of the EHF is industrial in nature. LUCs are therefore required to prohibit residential use of groundwater at the site and to prohibit residential use/exposure to soils. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-7911, is available for review by contacting the KSC

Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential exposure to site soils or groundwater use is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

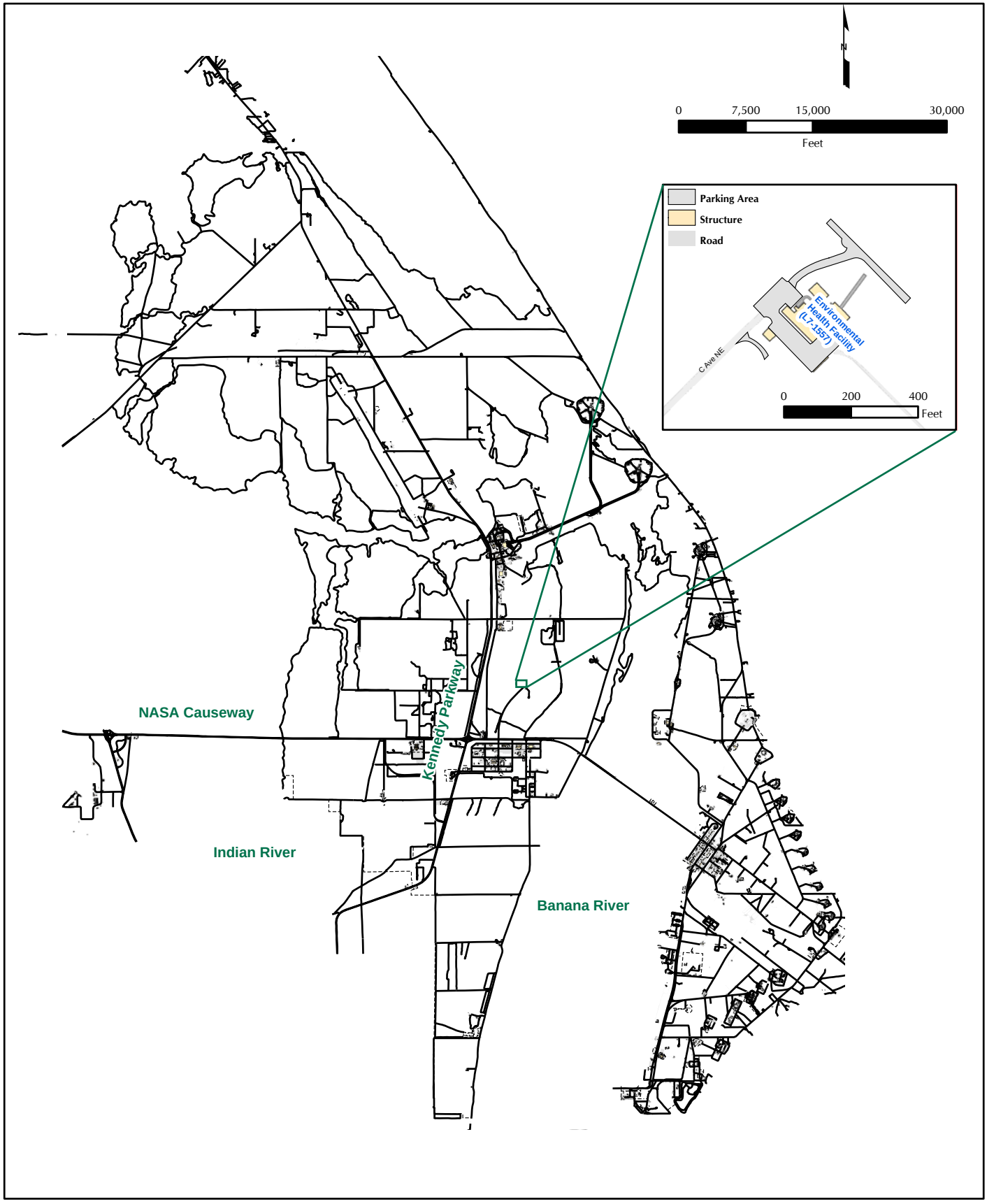
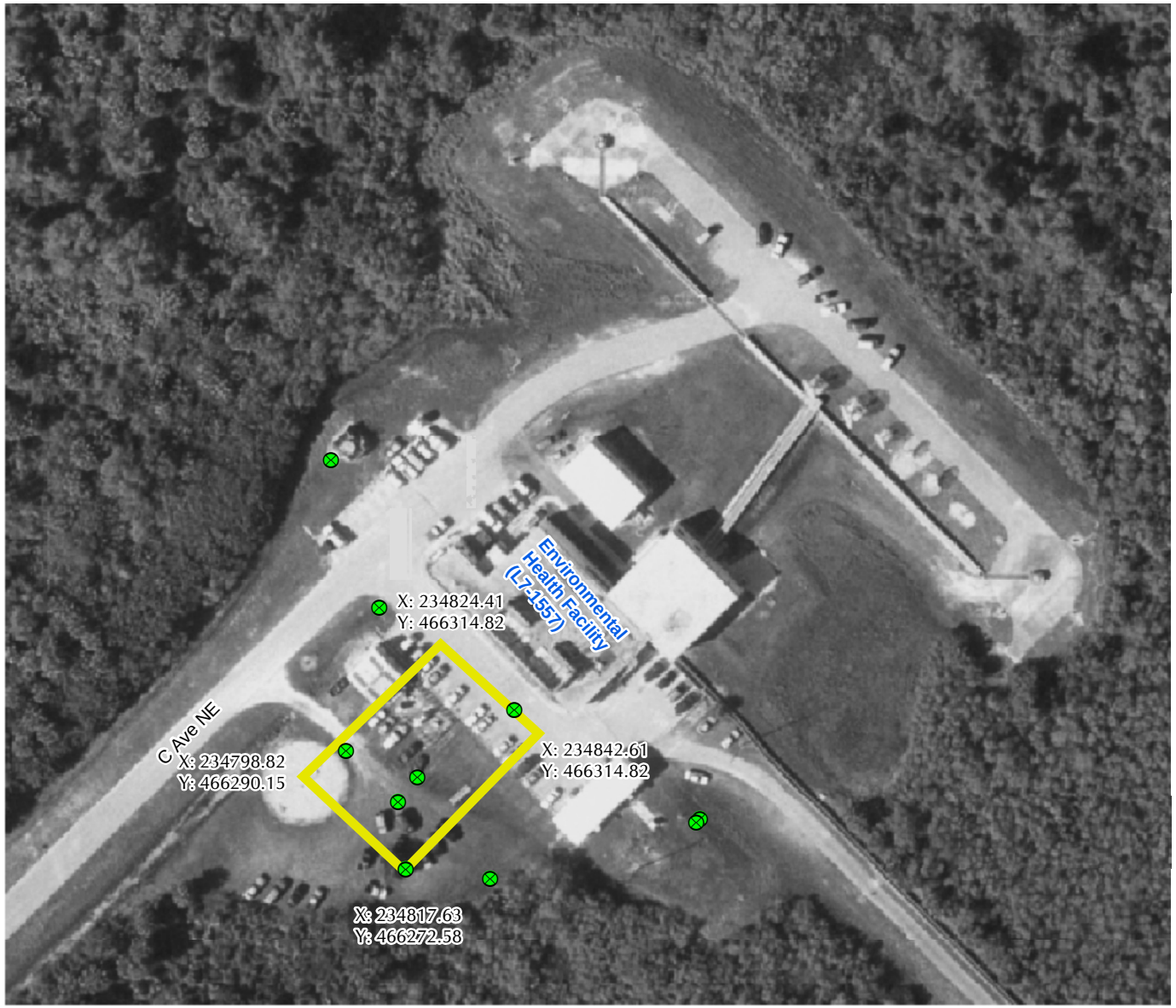


Figure 1
Location Map
Environmental Health Facility (EHF; SWMU 79)



Survey coordinates are in US State Plane Coordinate System NAD 1983, Florida East, Meters.

Figure 2
Site Map
Environmental Health Facility (EHF; SWMU 79)

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Shuttle Flight Operations Contract Generator Maintenance Facility (SFOC) Solid Waste Management Unit 081
CONTAMINANTS:	Antimony in groundwater
CONTROL:	Prevent contact with groundwater

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Kennedy Space Center (KSC) Shuttle Flight Operations Contract Generator Maintenance Facility (SFOC; SWMU 081; "the Site") of institutional controls that have been implemented at the Site[1]. Although there are no current unacceptable risks to human health or the environment associated with the SFOC, an institutional land use control (LUC) is necessary to prevent human health exposure to antimony-affected groundwater at the Site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

One constituent of concern (COC; antimony) exceeded applicable Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs) screening criteria.

SITE DESCRIPTION

The SFOC was constructed in 1988 to be utilized as the main generator maintenance shop and storage facility for the SFOC at KSC. The facility was designed to accommodate maintenance and storage operations for portable generators and portable aboveground diesel fuel storage tanks. The SFOC is currently operated by United Space Alliance (USA). The facility has formerly been referred as the Shuttle Processing Contract (SPC) Generator Shop, the Launch Support Operations Contract (LSOC) Generator Shop and the Lockheed Generator Shop.

SITE LOCATION

SFOC (K6-1844) is located east of Contractor's Road and northeast of Contractors Support Building (K6-1869) south of the Vehicle Assembly Building (VAB) Area in Section 18, Township 22S and Range 37E, Orsino Topographic Quadrangle (USGS 1976) (Figure 1).

[1] *This LUCIP summarizes institutional controls regarding the NASA SFOC. For detailed information on the Site, consult the SFOC administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

The areas covered and the coordinates of the corners of the LUCIP are shown on Figure 2. The coordinates are in the State Plane Coordinate System North American Datum (NAD) 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains antimony concentrations above the FDEP GCTL. The current and projected future land use of the SFOC is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site.

DECISION DOCUMENT

The KSC Remediation team (KSCRT) determined that institutional controls should be implemented at SFOC. The institutional controls are temporary while long term monitoring documents the reduction of antimony through natural processes.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until the scenarios managed by the LUCIP are no longer a concern.

[2] By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional



Legend

- SWMU Boundary
- Structure

Notes:
KSC - Kennedy Space Center
LUCIP - Land Use Control Implenmentation Plan
NASA - National Aeronautics and Space Administration
SFOC - Shuttle Flight Operations Contract Generator Maintenance Facility
VAB - Vehicle Assembly Building

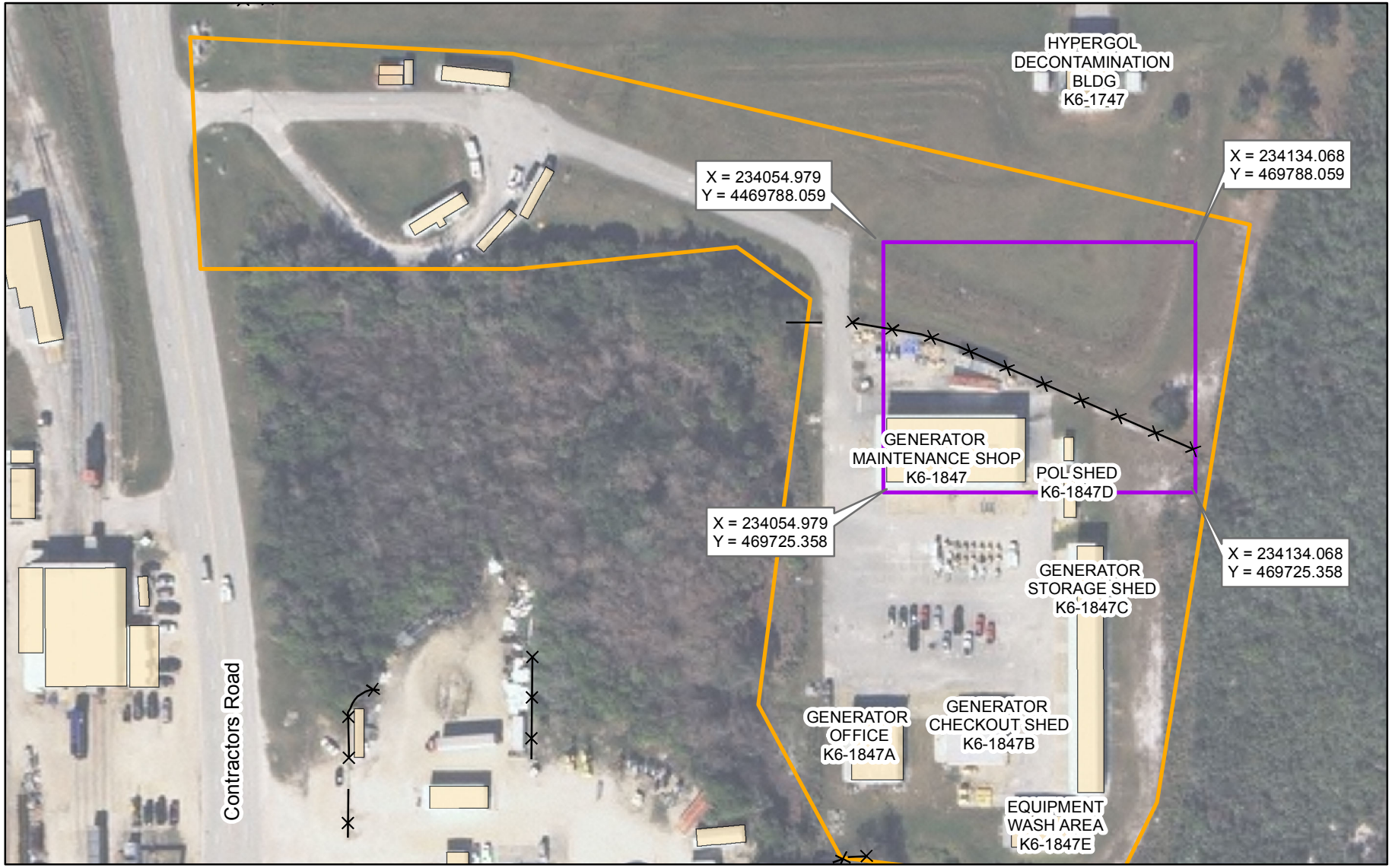
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Site Location Map
Land Use Control Implementation Plan

SFOC Generator Maintenance Facility
NASA Kennedy Space Center, Florida

Project Number: TL014021.0010

Figure 1



Legend

- Fence
- SWMU Boundary
- Groundwater LUC Area
- Structure

Notes:
Coordinates are in State Plane Coordinate System, NAD 1983, meters, Florida East
LUC - Land Use Control
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
SFOC - Shuttle Flight Operations Contract Generator Maintenance Facility
SWMU - Solid Waste Management Unit

0 60 120
Scale in Feet

N

Site Plan
Land Use Control Implementation Plan

SFOC Generator Maintenance Facility
NASA Kennedy Space Center, Florida

Project Number: TL014021.0000

Figure 2

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Communications, Maintenance, and Storage Facility Solid Waste Management Unit (SWMU) 082
CONTAMINANTS:	Tetrachloroethene, Trichloroethene, *cis*-1,2-Dichloroethene, Vinyl Chloride, and 1,1-Dichloroethene in Groundwater
CONTROL:	Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Communications, Maintenance, and Storage (CM&S) Facility of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the CM&S Facility, institutional land use controls (LUCs) are necessary to prohibit groundwater use at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

A human health risk assessment was completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). In addition, post-RFI groundwater assessment was completed to further evaluate groundwater impacts at the site. Five chemicals of concern [tetrachloroethene (PCE), trichloroethene (TCE), *cis*-1,2-dichloroethene (cDCE), vinyl chloride (VC), and 1,1-dichloroethene (1,1-DCE)] exceeded their Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs) and were identified as a potential human health risk, therefore a LUC is required.

SITE DESCRIPTION

The CM&S Facility site consists of eight numbered structures that were constructed between 1964 and 2000. These include: Communications, Maintenance, and Storage Building (M6-791); Loading Dock (M6-791A); Hazardous Waste Staging Building (M6-791B); Cardboard Baler Building (M6-791C); Radio Tower (M6-791D); Communication Cross Connect (M6-790); Cable Storage Shed (M6-792); and NASA Exchange Storage Building (M6-740). The CM&S Facility is currently and has historically been used for storage of communications equipment, equipment maintenance, and repair activities.

[1] *This LUCIP summarizes institutional controls regarding the NASA CM&S Facility. For detailed information on the site, consult the CM&S Facility administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

SITE LOCATION

The CM&S Facility is located in the Industrial Area of KSC within Section 5 of Township 23S, Range 37E, on the United States Geological Survey's 7.5-minute Orsino topographic quadrangle map and encompasses approximately 6.5 acres at the northern terminus of Cape Canaveral (Figure 1). The facility is bordered by Third Street then wooded area to the north, Central Supply Facility (SWMU 092) to the east, Fourth Street then Supply Warehouse #3 (SWMU 088) to the south, and Avenue B then General Services Administration (GSA) Vehicle Maintenance Facility (VMF) (SWMU 013) to the west. The groundwater use control area covered by the LUCIP, including coordinates of the corners of the LUC (in the US State Plane Coordinate System NAD 1983, meters, Florida East), are provided on Figure 2.

SITE CONTAMINATION AND CONTROL

The concentrations of PCE, TCE, 1,1-DCE, cDCE, and VC present in groundwater are above the FDEP's GCTLs. Since groundwater concentrations exceed the FDEP GCTLs, LUCs prohibiting the use of groundwater are required until the cleanup level is achieved. The current and projected land use of the CM&S Facility does not include the use of site groundwater; therefore, there is no current or projected exposure risk.

DECISION DOCUMENT

The Kennedy Space Center (KSC) Remediation Team determined that interim institutional controls should be implemented at the CM&S Facility. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

[2] By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring at the site.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until the concerns managed by the LUCIP are mitigated, or until there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern.

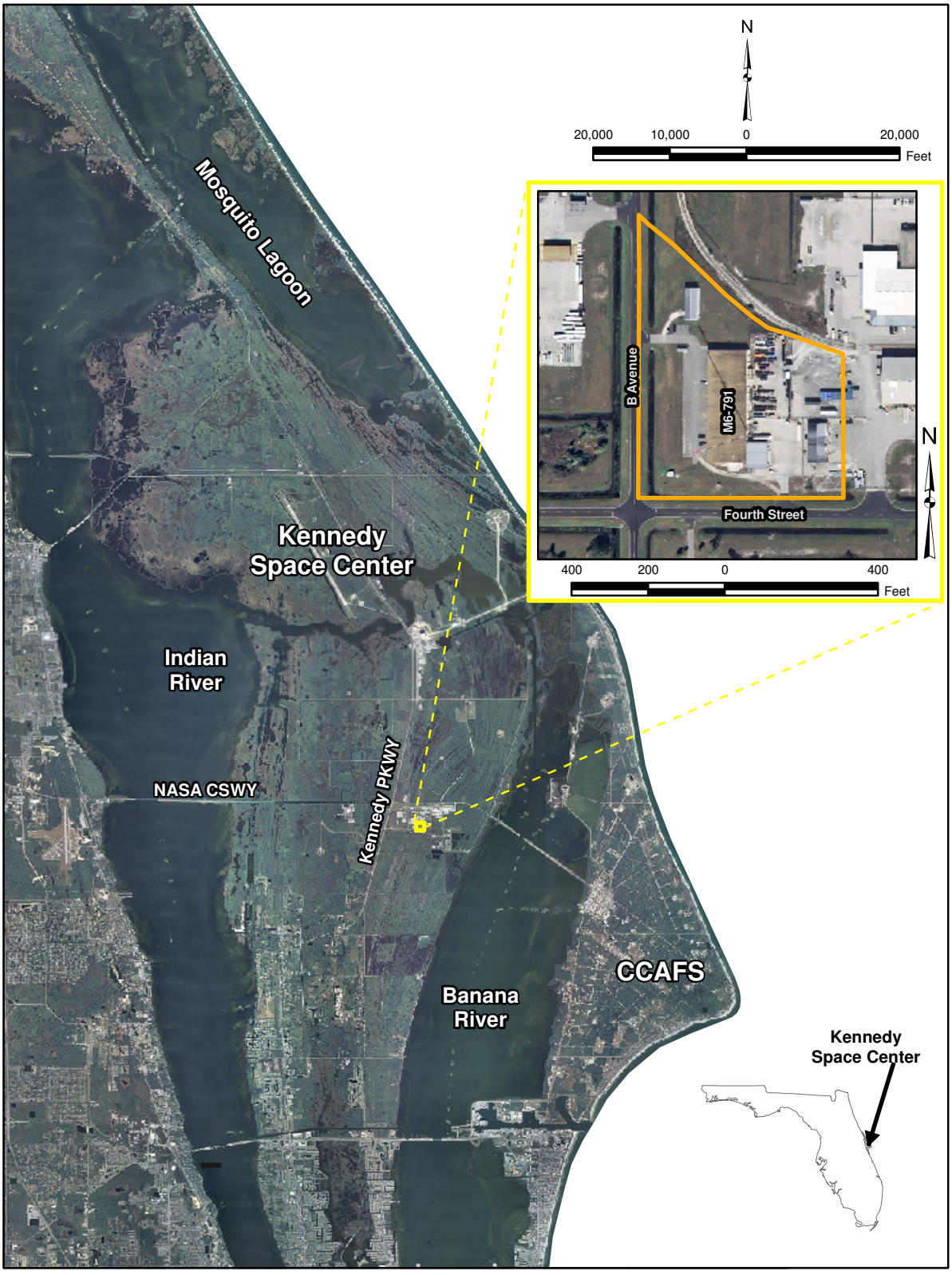


Figure 1
Site Location Map

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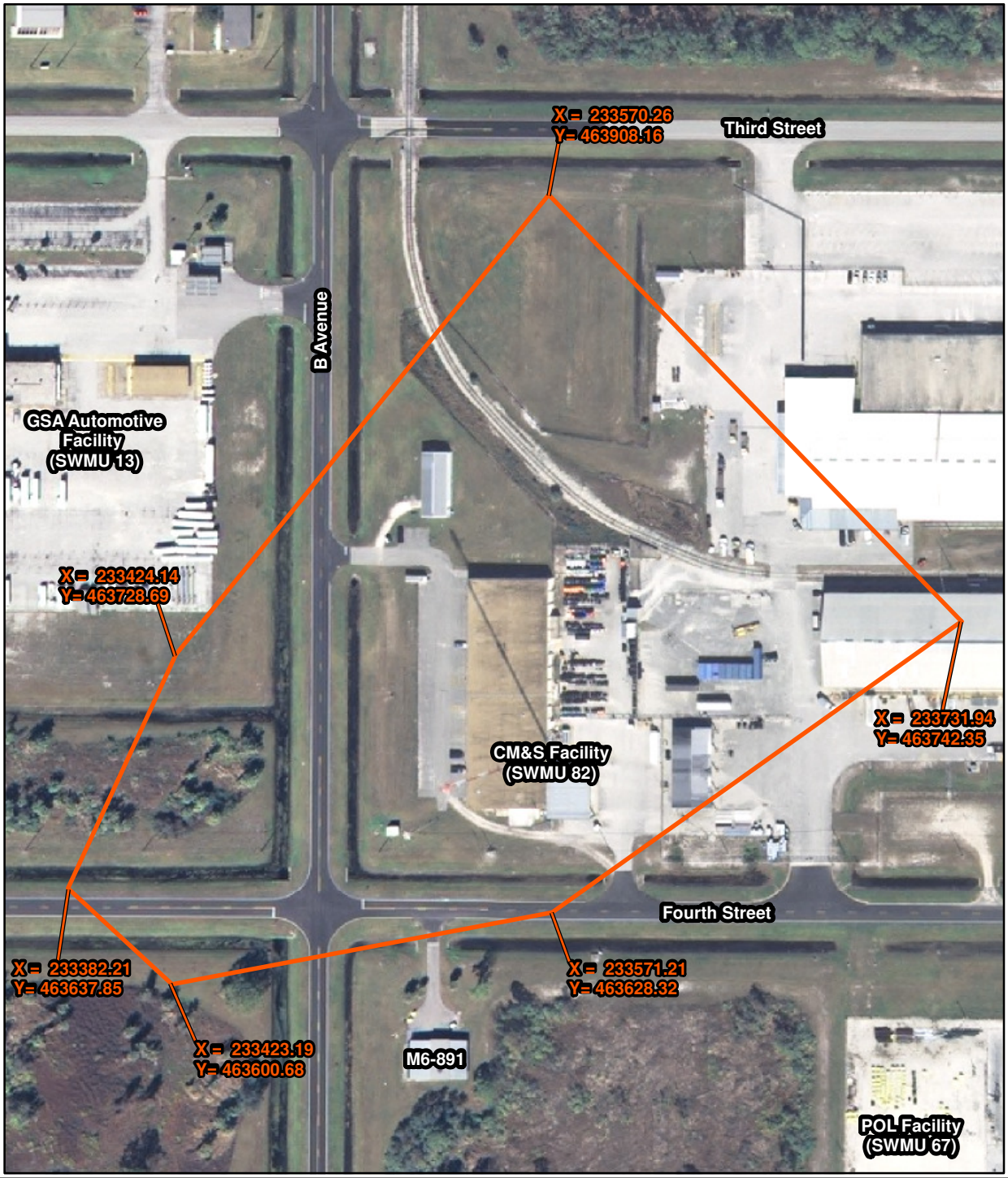


Figure 2
CM&S Groundwater Use Control Area

Legend

Area Covered by Groundwater Use Control

Note: Survey Coordinates are in US State Plane Coordinate System NAD1983 Meters, Florida East.

N

200 100 0 200 Feet

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LAND USE CONTROL IMPLEMENTATION PLAN
KARS PARK I - LOCs 2, 7, AND 9
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER

FACILITY: KARS Park I - LOCs 2, 7, and 9
Solid Waste Management Unit 084
CONTAMINANTS: Groundwater: LOC 2: 1,1'-Biphenyl, LOC 7: Arsenic, LOC 9: Lead
CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of Kennedy Athletic Recreation and Social (KARS) Park I of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the KARS Park I site, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

A human health risk assessment was completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). The chemicals of concern (COCs) detected during the RFI and subsequent investigations at concentrations exceeding Florida Department of Environmental Protection (FDEP) cleanup target levels were 1,1'-biphenyl in LOC 2 groundwater, arsenic in LOC 7 groundwater, and lead in LOC 9 in groundwater.

SITE DESCRIPTION

KARS Park I is a recreational facility for current and past National Aeronautics and Space Administration (NASA) personnel at which 11 Locations of Concern (LOCs) were identified (Figure 1). Park amenities include picnic areas, recreational vehicle and tent camp sites, racquetball, tennis, volleyball, basketball, and shuffleboard courts, marina, horseshoe pits, fish pond, roller blade area, playgrounds, softball fields, conference/activity rooms, and retail store. The central section of the park is used mainly for camping, and the playgrounds, picnic areas, and athletic fields are located in the southern portion of the park. The northern portion of the site includes a storage area and inactive gun ranges.

Improper use, storage, and disposal of materials used for maintenance of the park resulted in contaminated media at many of the LOCs. The remaining LOCs include former shooting ranges and associated areas, and shooting activities resulted in the deposition of lead shot and target debris throughout the LOCs.

[1] *This LUCIP summarizes institutional controls regarding the KARS Park I. For detailed information on the site, consult the NASA KARS Park I administrative file, which is available for review by contacting the KSC Environmental Program Office at (321) 867-8411.*

SITE LOCATION

KARS Park I is located east of State Route 3 along the western shore of the Banana River and approximately 5 miles south of the KSC Industrial Area. The KARS Park I site is fenced and encompasses approximately 135 acres. LOC2, the Gun Range storage Area, is located in the southern portion of LOC 9. LOC 7, the Bonfire Area, is located in the eastern portion of the park near the camping area. LOC 9, the Gun Ranges, includes inactive Skeet, Rifle, and Pistol Ranges and a storage area.

The LOCs 2, 7, and 9 groundwater use control areas covered by this LUCIP are shown on Figures 2, 3, and 4, respectively. Coordinates of the corners of the LUC areas are provided in the U.S. State Plane Coordinate System NAD 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Groundwater contaminants at concentrations greater than FDEP's Groundwater Cleanup Target Levels (GCTLs) include 1,1'-biphenyl at LOC 2, arsenic at LOC 7, and lead at LOC9. 1,1'-Biphenyl at LOC 2 and lead at LOC 9 were chosen as COCs based on exceedances of GCTLs. The non-cancer hazard index (HI) associated with 1,1'-biphenyl was less than FDEP's acceptable risk level, and risks were not estimated for lead in groundwater at LOC 9. A Preliminary Risk Evaluation showed that, assuming future use of LOC 7 groundwater for drinking water, cancer and non-cancer risks would be unacceptable. The estimated lifetime excess cancer risk and non-cancer HI for the hypothetical future resident were determined to be 9×10^{-3} and 97, respectively, which exceed FDEP's respective acceptable levels of 1.0×10^{-6} and 1. However, there is no current use of site groundwater and therefore no exposure or current risk. The past, current, and projected future land use of the KARS Park I site is recreational in nature. LUCs are required to prohibit the use of groundwater at the site, thereby preventing exposure that would result in unacceptable risks.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-9501, is available for review by contacting the KSC Environmental Program Office at (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[(2)]

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

between NASA, FDEP, and the United States Environmental Protection Agency (EPA), effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if it occurs in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUC areas at KARS Park I. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating and will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential groundwater use is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

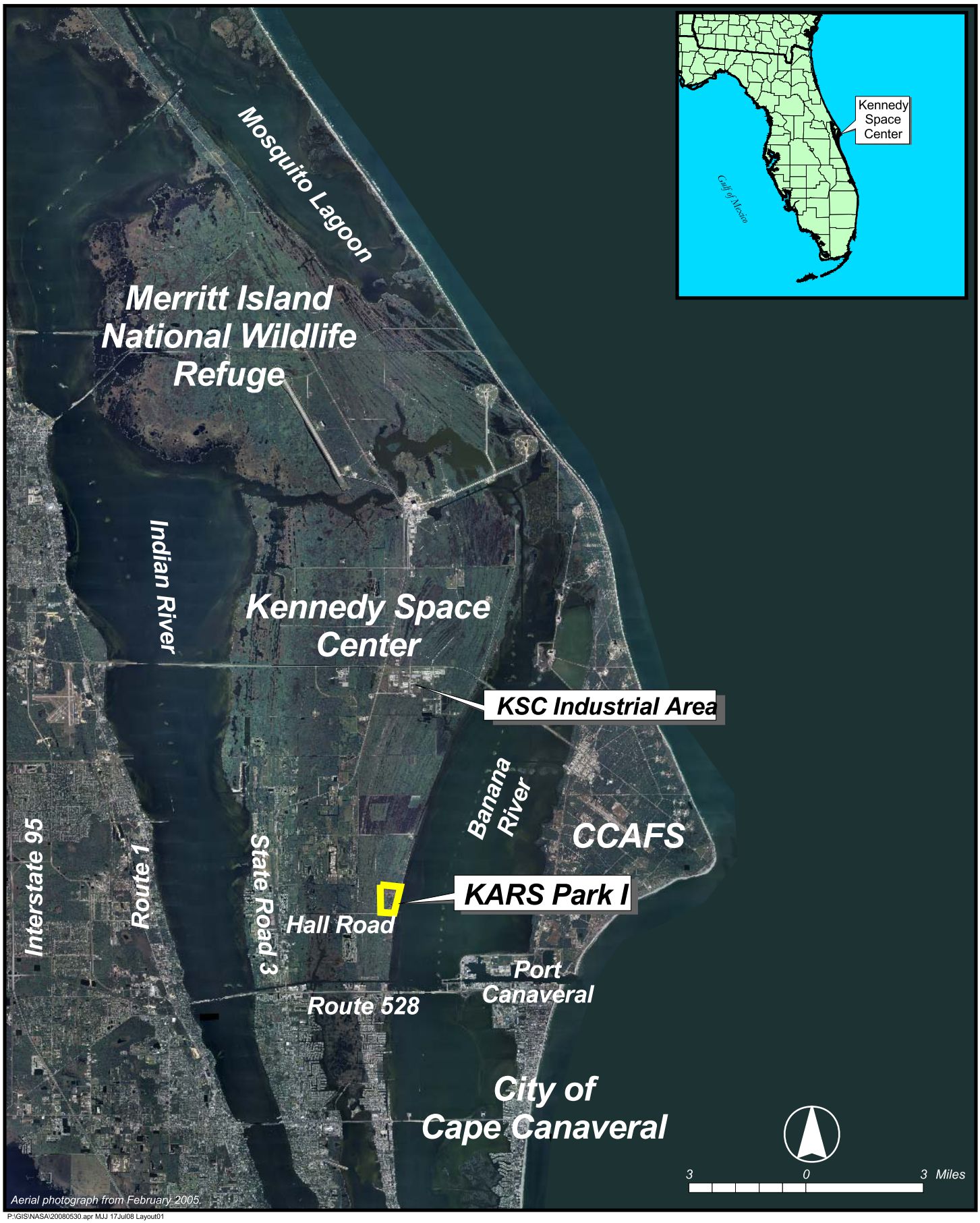
ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

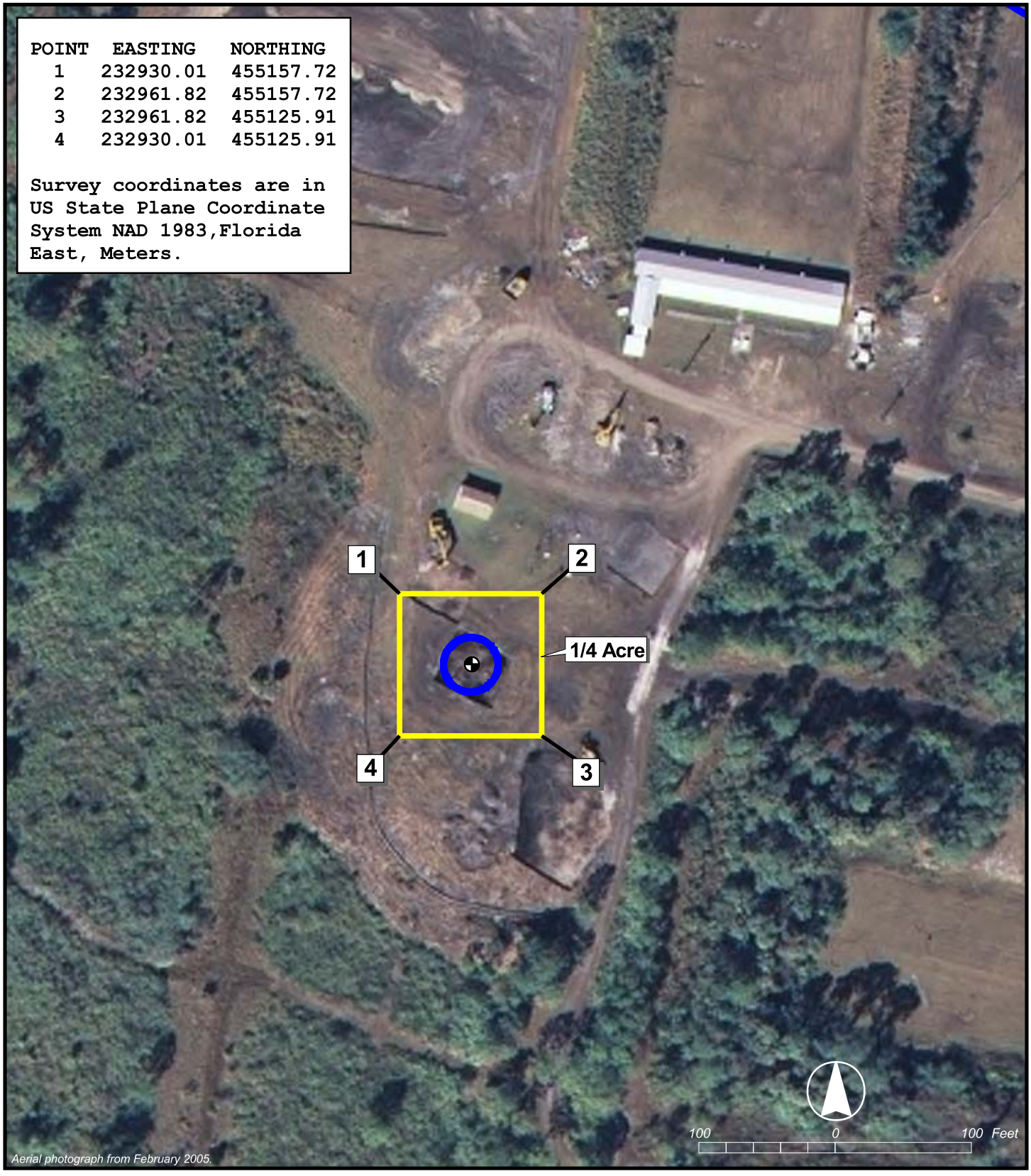
The LUCs shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated, or there is a discovery, based on analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by EPA and FDEP and implemented by modification of NASA's operating permit.

FIGURE 1 FACILITY LOCATION MAP
KARS PARK I, KENNEDY SPACE CENTER, FLORIDA



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FIGURE 2 LOC 2 SITE MAP
KARS PARK I, KENNEDY SPACE CENTER, FLORIDA



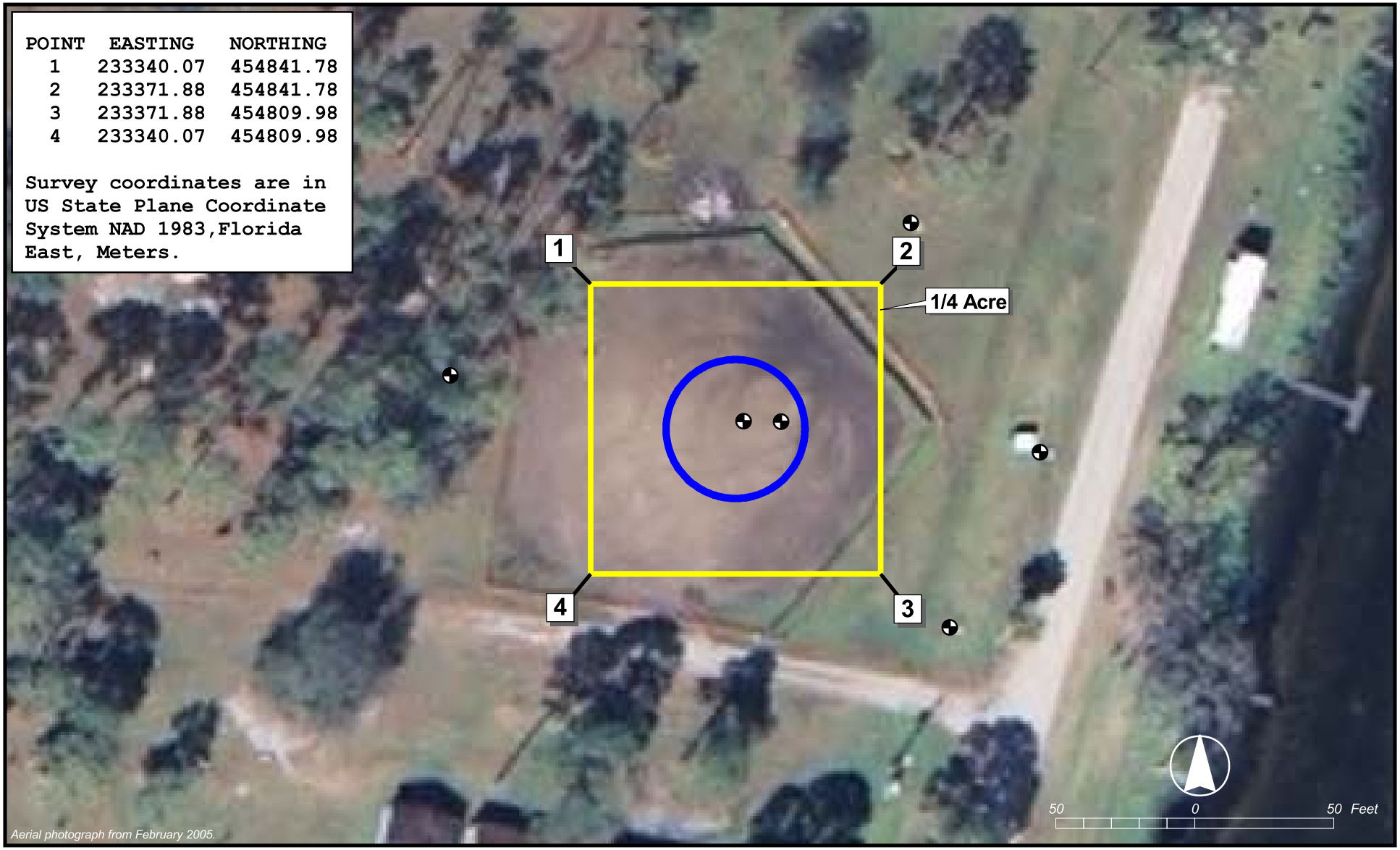
Legend:
- Monitoring Well
- 1,1-Biphenyl Plume (GCTL 0.5 ug/L)
- Area covered by Statement of Basis and groundwater use control areas

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FIGURE 3 LOC 7 SITE MAP
KARS PARK I, KENNEDY SPACE CENTER, FLORIDA

POINT	EASTING	NORTHING
1	233340.07	454841.78
2	233371.88	454841.78
3	233371.88	454809.98
4	233340.07	454809.98

Survey coordinates are in US State Plane Coordinate System NAD 1983,Florida East, Meters.



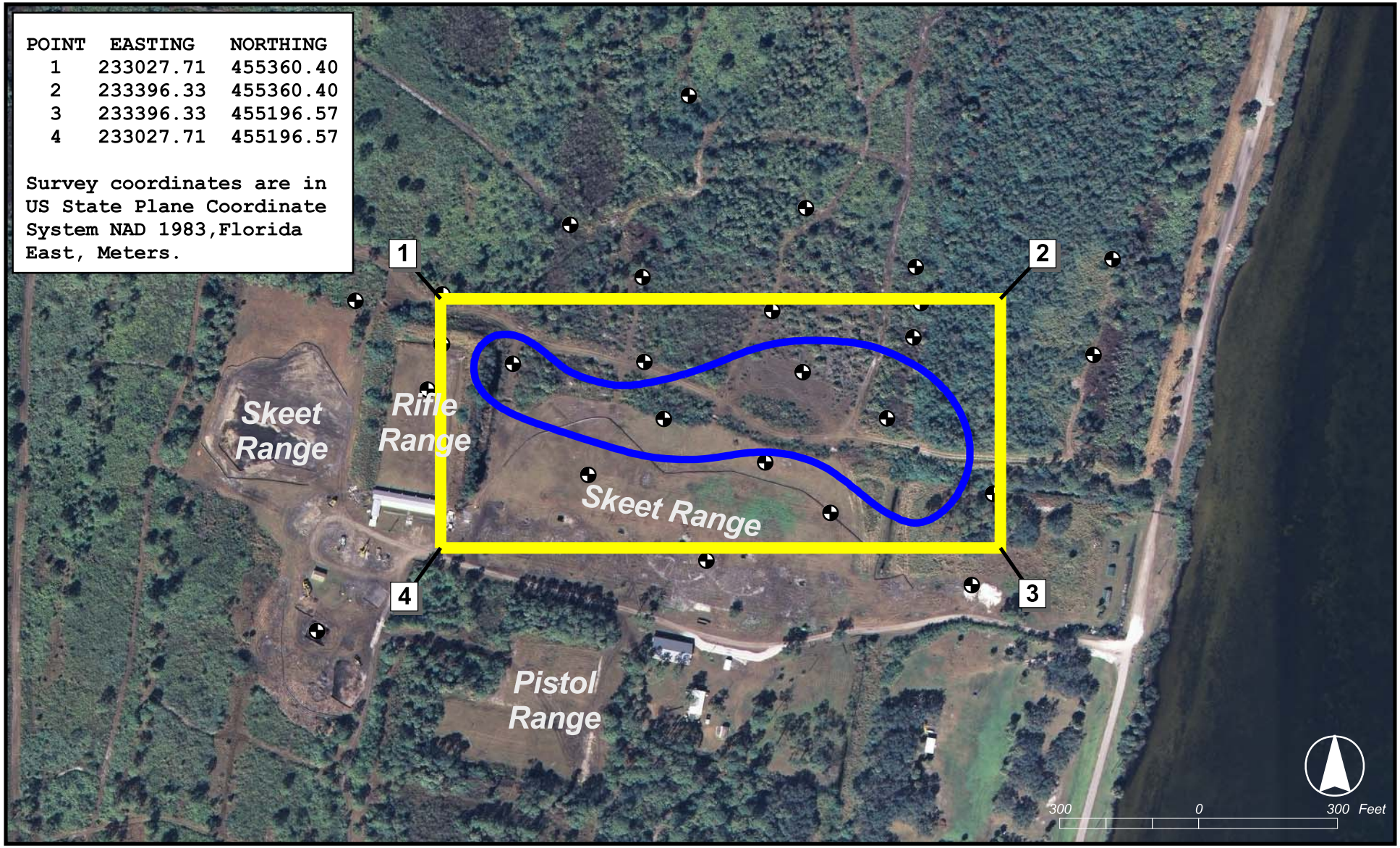
Legend:
- Monitoring Well
- Arsenic Plume (Background 30 ug/L)
- Area covered by Statement of Basis and groundwater use control areas

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FIGURE 4 LOC 9 SITE MAP
KARS PARK I, KENNEDY SPACE CENTER, FLORIDA

POINT	EASTING	NORTHING
1	233027.71	455360.40
2	233396.33	455360.40
3	233396.33	455196.57
4	233027.71	455196.57

Survey coordinates are in US State Plane Coordinate System NAD 1983,Florida East, Meters.



Legend:
- Monitoring Well
- Dissolved Lead Plume based on May 2006 results (GCTL 15 ug/L)
- Area covered by Statement of Basis and groundwater use control areas

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LAND USE CONTROL IMPLEMENTATION PLAN ENGINEERING DEVELOPMENT LABORATORY SWMU 85 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION KENNEDY SPACE CENTER

FACILITY: Engineering Development Laboratory
Solid Waste Management Unit No. 85
CONTAMINANTS: Vinyl Chloride Contamination In Groundwater
CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Engineering Development Laboratory (EDL) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the EDL, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater from the site to ensure an acceptable risk to human health. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

A human health assessment was completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). The only chemical of concern retained for potential human health risk during the RFI is vinyl chloride in groundwater.

SITE DESCRIPTION

The EDL is a NASA-operated facility that consists of six permanent structures constructed from 1966 to 2001 (Figures 1 and 2). The EDL Building (M7-409) was constructed to support astronaut training for the Apollo Program, including the use of mock-ups such as the Lunar Lander. This building is currently being used as office space, a prototype machine shop and material testing, and for development activities. The Equipment Building (M7-409A) houses a large bank of electrical transformers. This building is currently used for the storage of refurbished compressors and office space. The former Generator Building (M7-409B) was constructed in December 1968, but is no longer used as a generator facility and is now classified as a storage building. The International Space Station Center Tour Stop Concession Building (M7-459) was constructed in December 1998 and provides food, restrooms, and retail items for visitors on the KSC tour. The Tour Stop Concession Building was constructed in the former location of two cooling towers, which provided climate control for the EDL from 1966 until 1994.

[1] This LUCIP summarizes institutional controls regarding the NASA EDL Site. For detailed information on the site, consult the EDL administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

The cooling towers were designated PRL #66 and a Solid Waste Management Unit (SWMU) Assessment (SA) and Confirmation Sampling (CS) were performed from 1995 to 2000. The Storage Buildings (M7-460 and M7-460A) were constructed in July 2001. The buildings are a staging annex for the EDL and are used to stage and kit the Mobile Launch Platform Hazardous Gas Detection System. KSC performed an RFI in 2005 to determine the nature and extent of contamination from SWMU No. 85, EDL.

SITE LOCATION

The EDL is located on the northern portion of Merritt Island, between the Indian and Banana Rivers in Brevard County, Florida. The EDL is south of the Space Station Processing Facility on the eastern site of E Avenue, in the KSC Industrial Area. The EDL is found in Section 5, Township 23S, Range 37E, as shown on the 7.5-minute Orsino topographic quadrangle map (USGS 1986). The groundwater use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains vinyl chloride above the Florida Department of Environmental Protection (FDEP) groundwater cleanup target level. A Preliminary Risk Evaluation (PRE) indicated that the estimated lifetime excess cancer risk for the hypothetical future resident is 3.8×10^{-6}, which exceeds FDEP's acceptable excess lifetime risk of 1×10^{-6}. This assumes use of site groundwater as a drinking water source. There is no current use of site groundwater and therefore no exposure or current risk. The past, current and projected future land use of the EDL is industrial in nature. However, LUCs are required to prohibit potential future residential use of groundwater at the site. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-7919, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into

[2] By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA. KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that groundwater is not used as drinking water.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

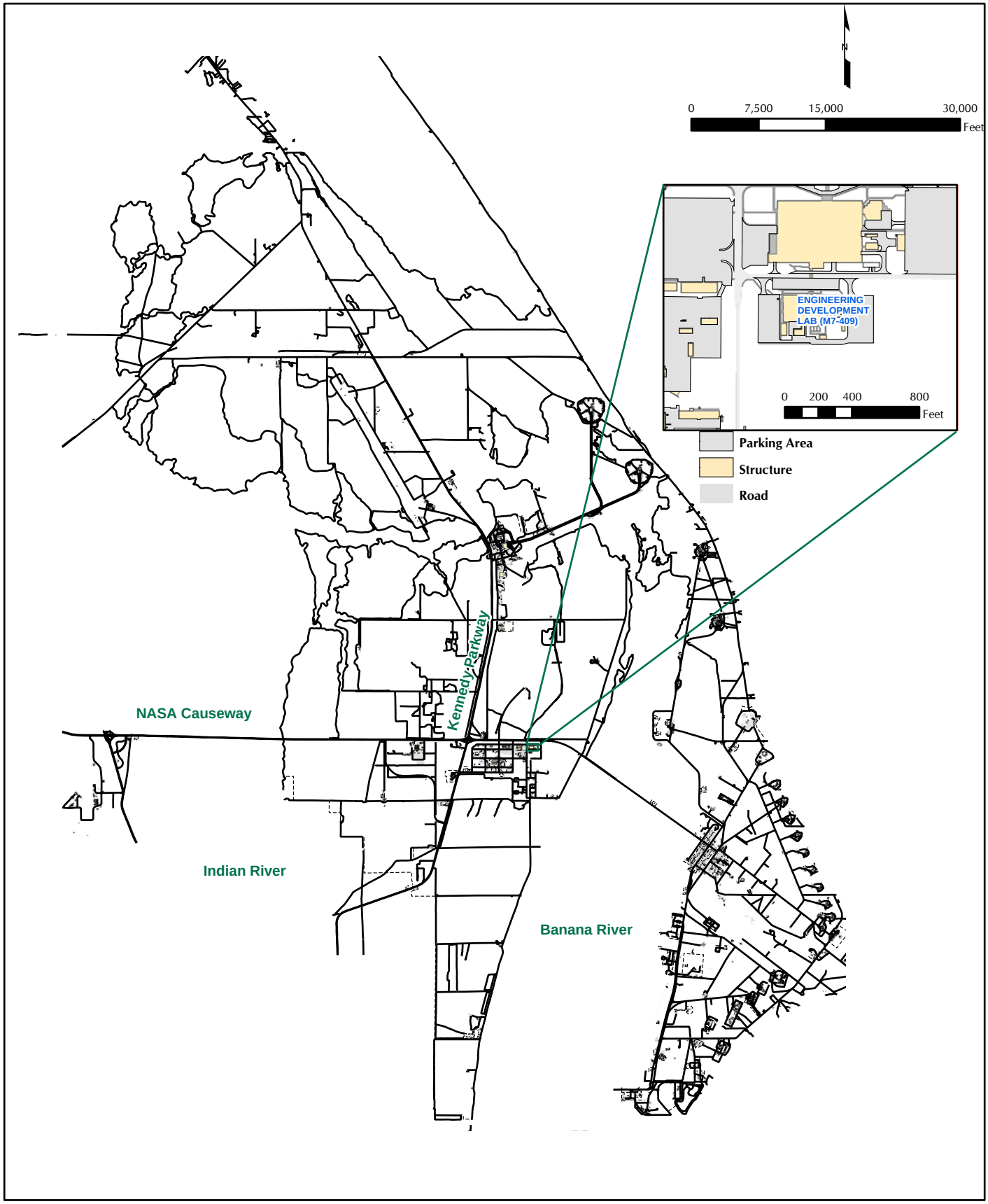
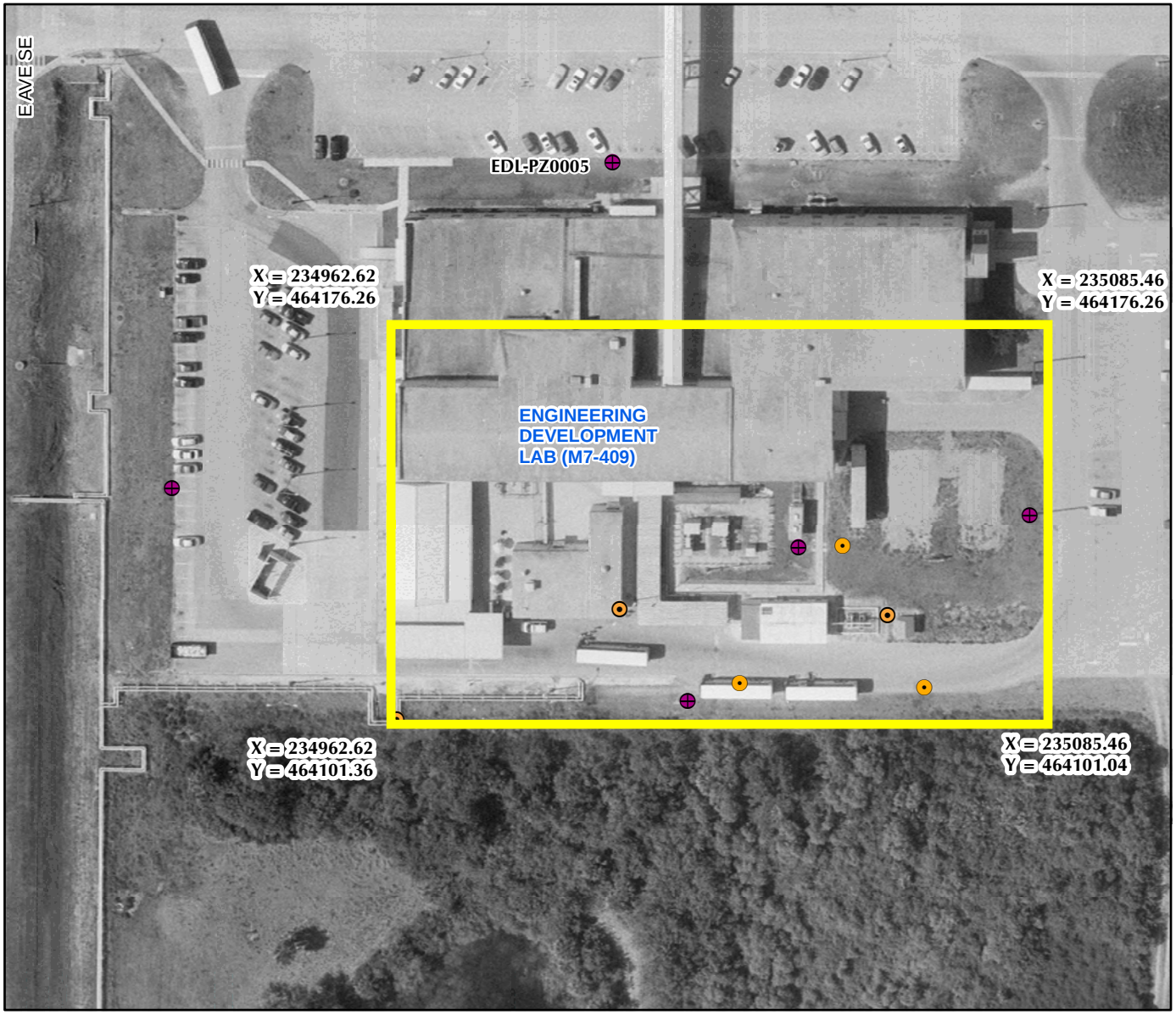


Figure 1
Location Map
Engineering Development Laboratory (EDL; SWMU 85)



Survey coordinates are in US State Plane Coordinate System NAD 1983, Florida East, Meters.

Figure 2
Site Map
Engineering Development Laboratory (EDL; SWMU 85)

LAND USE CONTROL IMPLEMENTATION PLAN
SUPPLY WAREHOUSE NO. 3, SWMU 88
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER

FACILITY: Supply Warehouse No. 3
Solid Waste Management Unit No. 88
CONTAMINANTS: Chlorinated Volatile Organic Compound Contamination In Groundwater
CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Supply Warehouse No. 3 (SW3) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the SW3 site, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater from the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

A human health risk assessment was completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). The chemicals of concern identified for human health risk during the RFI that exceeded the Florida Department of Environmental Protection (FDEP) cleanup target levels are chlorinated volatile organic compounds (CVOCs) in groundwater.

SITE DESCRIPTION

The SW3 site contains one numbered building, M6-891. SW3 is used as a storage building for drywall, door frames and other building materials. Kennedy Space Center (KSC) was required to perform an investigation to determine the nature and extent of contamination at Solid Waste Management Unit (SWMU) No. 88, SW3 (Figure 1).

SITE LOCATION

The SW3 site encompasses approximately 12 acres, which includes the parcel located southeast of the intersection of B Avenue and 4th Street, as well as the approximate area of impacted groundwater to the south and southwest. The Paint and Oil Locker Facility (POL) is located adjacent to the east side of SW3, the General Service Administration (GSA) Vehicle Maintenance Facility (VMF) is located adjacent to the northwest, and the Communications, Maintenance and Storage Facility (CM&S) is

[1] *This LUCIP summarizes institutional controls regarding the SW3. For detailed information on the site, consult the SW3 administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.*

located adjacent to the north. The groundwater use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains CVOCs above FDEP's groundwater cleanup target levels (GCTLs). A Preliminary Risk Evaluation showed that assuming future use of groundwater for drinking water, cancer and non-cancer risks would be unacceptable. The estimated lifetime excess cancer risk for the hypothetical future resident was determined to be 6.4×10^{-3}, which exceeds FDEP's acceptable level of 1.0×10^{-6}. However, there is no current use of site groundwater; therefore, no exposure or current risk. The past, current, and projected future land use of SW3 is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site. Indoor air quality shall be evaluated prior to any construction within the groundwater use control area.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between the National Aeronautics and Space Administration (NASA), FDEP, and the Environmental Protection Agency (EPA), effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential groundwater use is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to the EPA and

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the FDEP and implemented by modification of NASA's operating permit.

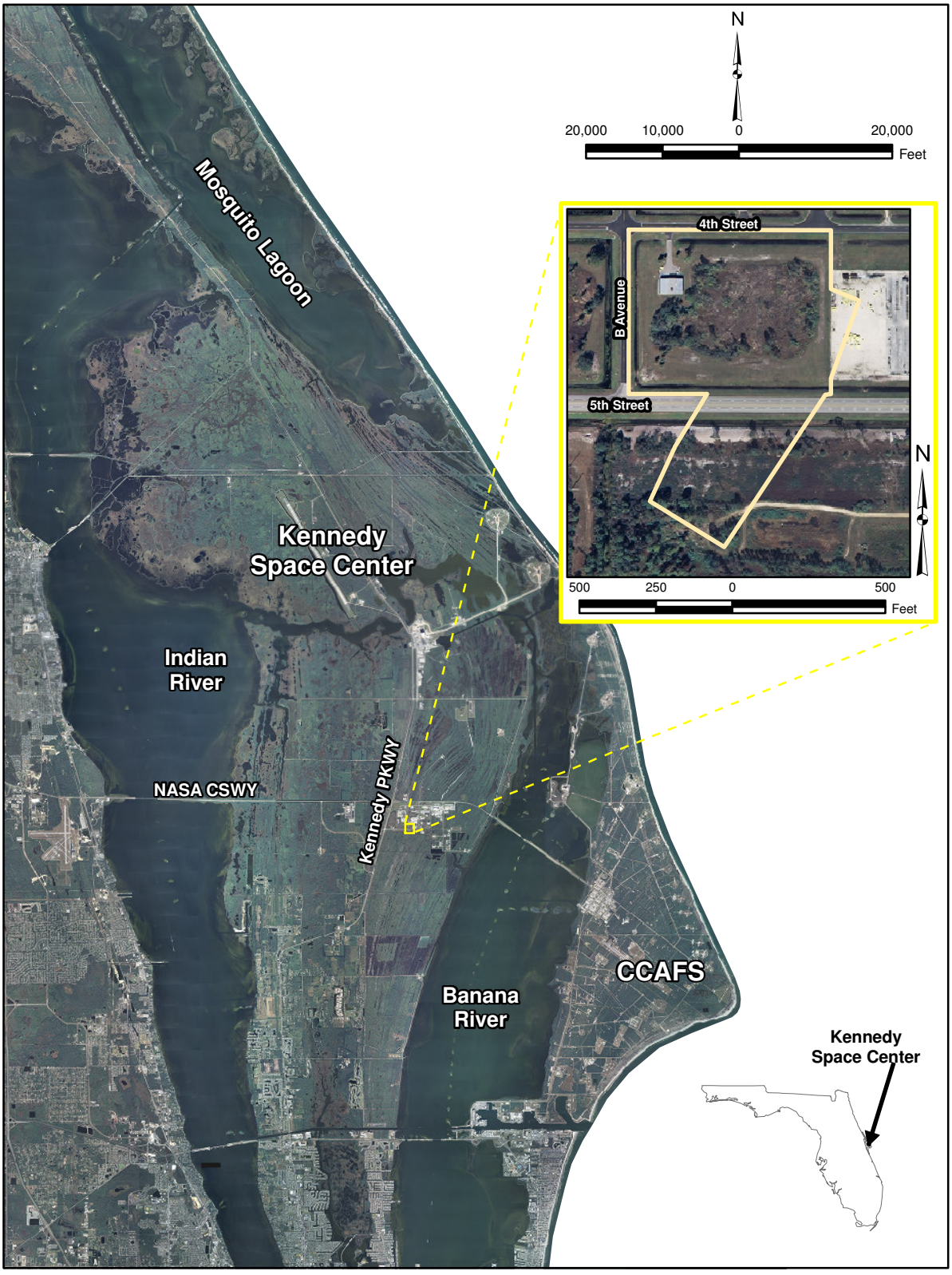


Figure 1
Site Location Map

Titusville-01\data\0GIS\FR0943\MXDs\Figure1_LUCIP.mxd

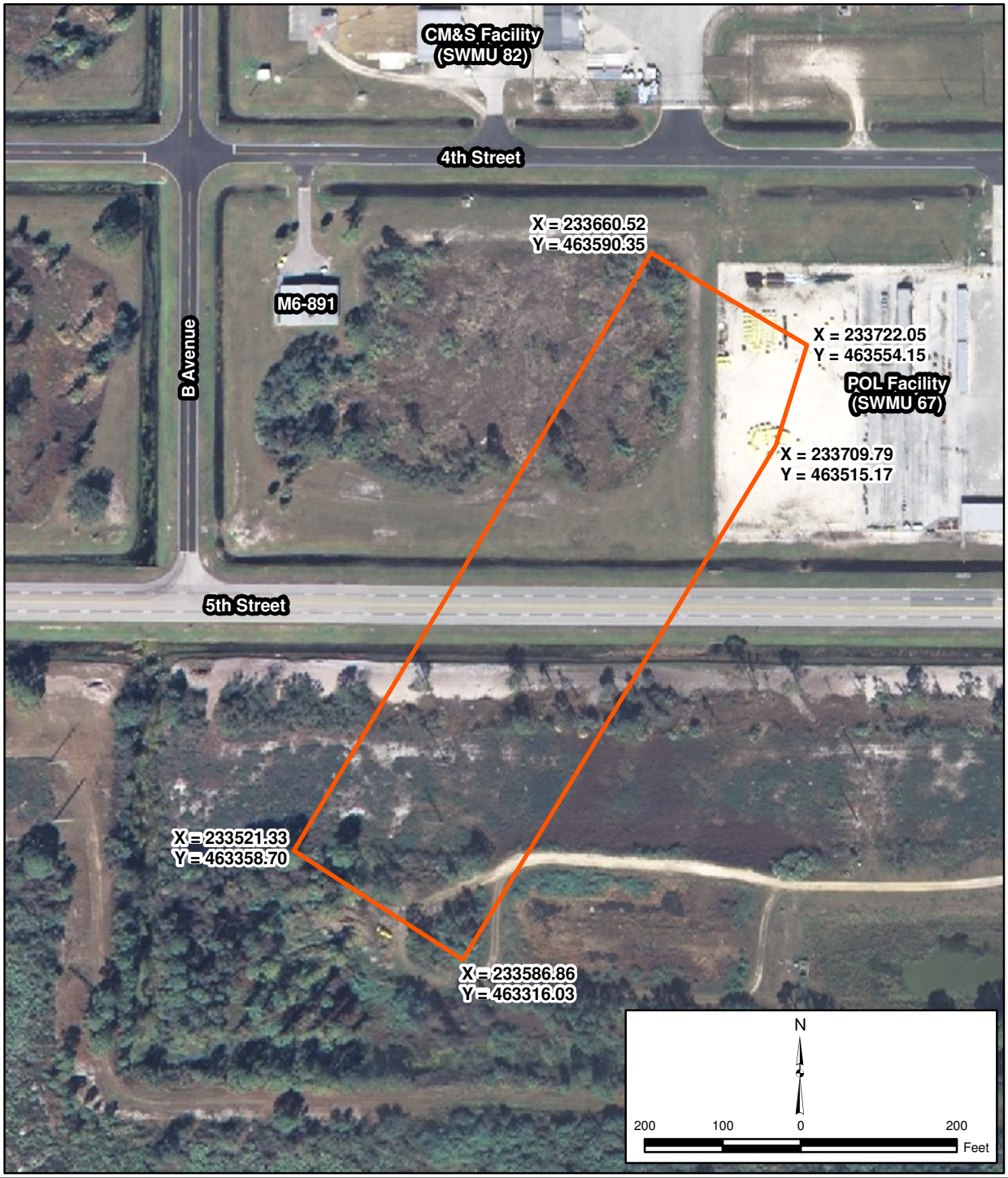


Figure 2
Groundwater Use Control Area

Legend

Area Covered by Groundwater Use Control

Note: Survey Coordinates are in US State Plane Coordinate System NAD1983 meters, Florida East.

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INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Converter Compressor Building
Solid Waste Management Unit 089
CONTAMINANTS: Volatile Organic Compounds in Groundwater
CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Converter Compressor Building (CCB) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with CCB, institutional land use controls (LUCs) are necessary to prohibit future use of groundwater at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

During the Solid Waste Management Unit (SWMU) Assessment for CCB, four Locations of Concern (LOCs) were identified. Soil, groundwater, and surface water samples were collected as part of Confirmatory Sampling (CS) activities in June 2004 and March 2005. The CS results indicated chemicals of potential concern present in all media sampled at concentrations exceeding cleanup criteria. However, surface water is very limited in extent and is only present during periods of high precipitation, and it was recommended in the CS Report (CSR) that no further evaluation of surface water be conducted in the RFI. Three additional LOCs were identified during initial Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) efforts. A soil investigation of all the LOCs resulted in No Further Action (NFA) determinations for all soils at CCB LOCs except for LOC 1 in December 2007. An Interim Measure (IM) was conducted in October 2009 to mitigate human health risks associated with polynuclear aromatic hydrocarbons (PAHs) and polychlorinated biphenyls (PCBs) at LOC 1, and NFA was recommended in the IM Report dated January 2010 and approved by Florida Department of Environmental Protection (FDEP) in February 2010. Groundwater is the only remaining medium of concern at CCB.

[1] *This Interim LUCIP summarizes institutional controls regarding the NASA CCB site. For detailed information on the site, consult the CCB administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

SITE DESCRIPTION

SWMU 089 includes one primary building (K7-468) and several supporting structures supporting CCB and several buildings supporting Propellants North K7-367, K7-415, K7-416, and K7-417. CCB (K7-468) was constructed from 1963 to 1965. In 1967, the Petroleum, Oil, and Lubricant (POL) Flammables Storehouse (K7-417) and Operations Building (K7-416) were constructed. CCB converts liquid helium received in tankers to a low-pressure helium gas that is pumped to high-pressure compressors and stored in railcars, pipeline, and customer storage batteries. The site also controls and maintains high-pressure gaseous nitrogen that is supplied through an underground pipeline to various customers. During the 1980s, the storage tank for nitrogen was removed and replaced with a pipeline connecting to an off-site facility. In 1993, the Ammonia Boiler Refurbishment/ Test Building (K7-367) was constructed, and in 2005, the Cylinder Test and Fill Facility (K7-415) and retention pond were constructed. No record of spills were identified for the CCB area. The primary contaminants at CCB are trichloroethene (TCE) and degradation daughter products.

SITE LOCATION

SWMU 089 includes approximately 35 acres bordered by wooded areas to the north and east, open land including Crawlerway to the south, and Fluid Servicing Road and CCF to the west (Figure 1). SWMU 089 is found in Section 8, Township 22S, Range 37E, as shown on the 7.5-minute Orsino topographic quadrangle map. The groundwater use control area covered by this Interim LUCIP is shown on Figure 2. Coordinates of the corners of the LUC area are provided on Figure 2 in the State Plane Coordinate System, North American Datum (NAD) 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains volatile organic compounds (VOCs) at concentrations greater than FDEP Groundwater Cleanup Target Levels. The past, current, and projected future land use of CCB is industrial in nature. LUCs are required to prohibit the use of groundwater at the site until cleanup levels are achieved. The current and projected land use of CCB does not include the use of site groundwater; therefore, there is no current or projected future exposure risk.

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

DECISION DOCUMENT

The Kennedy Space Center (KSC) Remediation Team determined that interim institutional controls should be implemented at CCB. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between National Aeronautics and Space Administration (NASA), FDEP, and United States Environmental Protection Agency (EPA), effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the CCB LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating and will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring at CCB.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

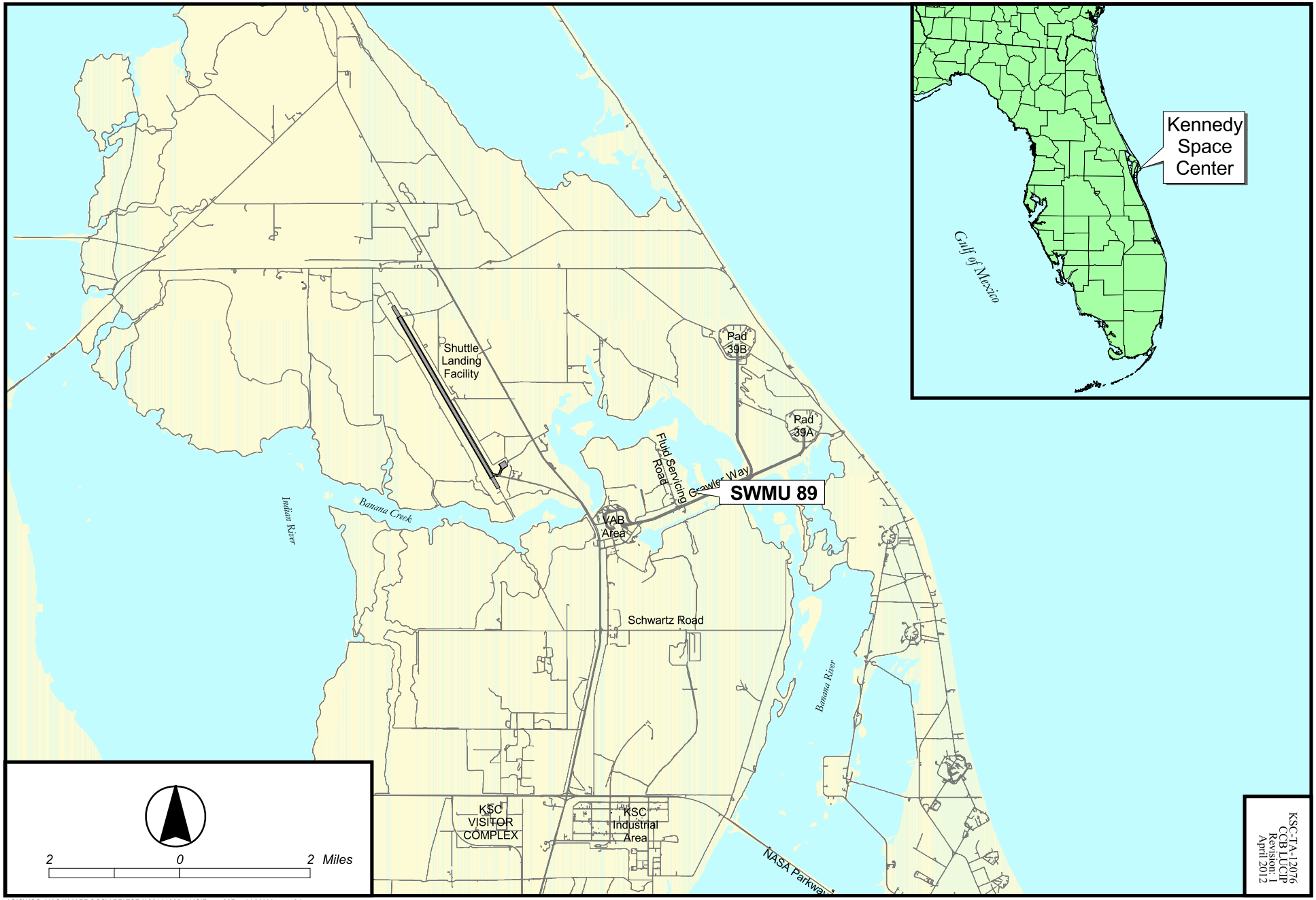
KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this Interim LUCIP.

MAINTENANCE

The Interim LUCIP shall remain in place until a land use change is implemented or the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based on analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.

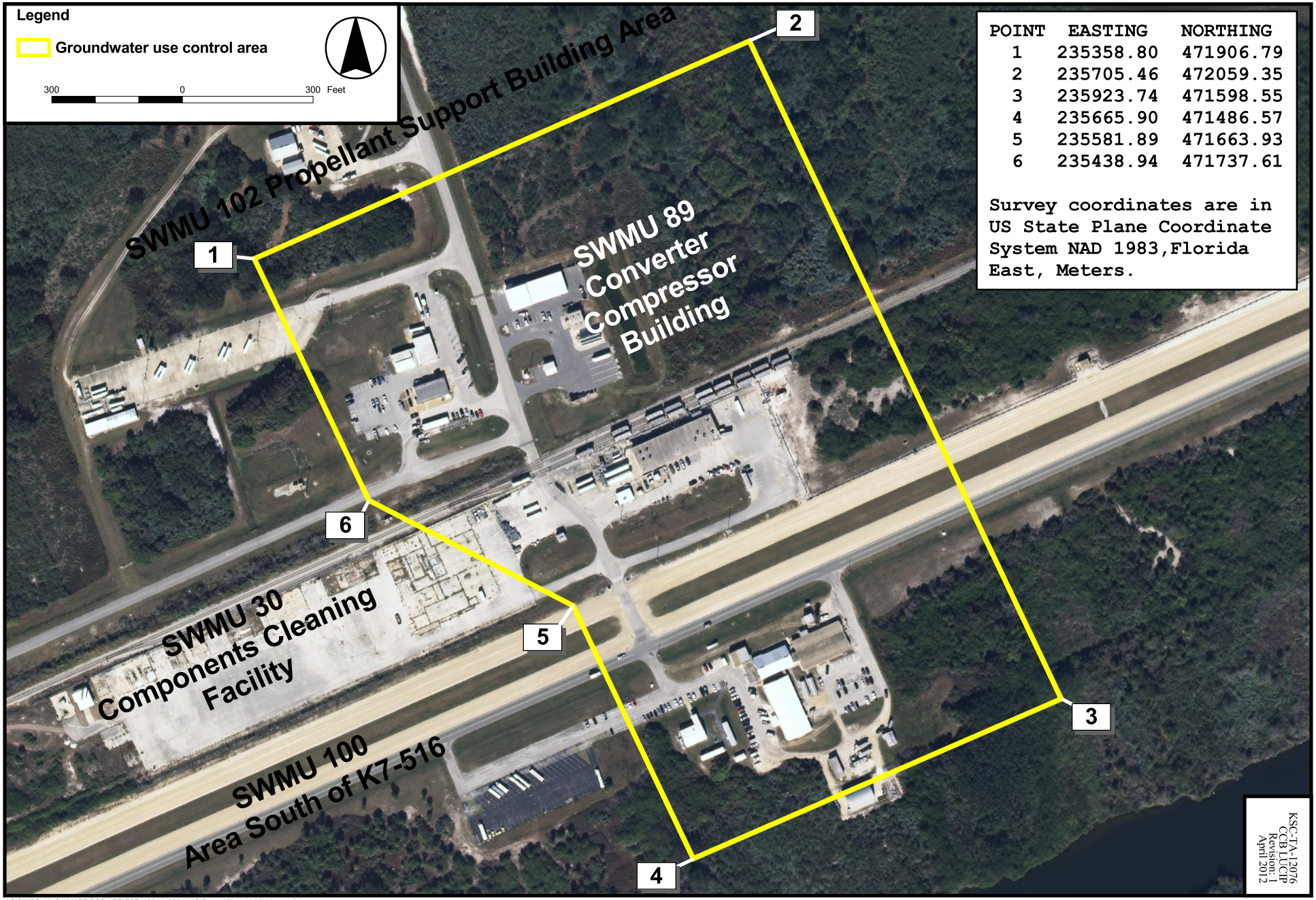
FIGURE 1 LOCATION OF KENNEDY SPACE CENTER AND SWMU 89

SWMU 89 - CONVERTER COMPRESSOR BUILDING K7-0468, KENNEDY SPACE CENTER, FLORIDA



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FIGURE 2 GROUNDWATER LAND USE CONTROL AREA
SWMU 89 - CONVERTER COMPRESSOR BUILDING K7-0468, KENNEDY SPACE CENTER, FLORIDA



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INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Hypergol Maintenance Facility North Solid Waste Management Unit 090
CONTAMINANTS:	Volatile Organic Compounds and 1,4-dioxane in Groundwater and Polychlorinated Biphenyls in Soil
CONTROL:	Prohibit Groundwater Use and Industrial/Residential Access to Soil

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Hypergol Maintenance Facility North (HMFN) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with HMFN, institutional land use controls (LUCs) are necessary to prohibit groundwater use and to prohibit industrial/residential use/exposure to soils at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

A human health risk assessment was completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chlorinated volatile organic compounds (CVOCs), including tetrachloroethene (PCE), trichloroethene (TCE), *cis*-1,2-dichloroethene (cDCE), 1,1-dichloroethene (1,1-DCE), 1,1-dichloroethane (1,1-DCA), and vinyl chloride (VC) exceed the Florida Department of Environmental Protection (FDEP) groundwater cleanup target levels (GCTLs) and were identified as a potential human health risk during the RFI. Post-RFI investigations have also documented the presence of 1,4-dioxane exceeding the GCTL. Soil polychlorinated biphenyl (PCB) concentrations were identified exceeding the FDEP residential and industrial soil cleanup target levels (SCTLs). These exceedances remain after interim measure (IM) excavation; however, a complete exposure pathway does not exist due to the presence of electrical transformers and their associated concrete slabs above the affected soils. LUCs are necessary to ensure that the transformer slabs remain unaltered.

SITE DESCRIPTION

The HMFN site is located in the Kennedy Space Center (KSC) industrial area and consists of six numbered structures that were constructed between 1963 and 1976. These include; HMFN Building (M7-961, also

[1] *This Interim LUCIP summarizes institutional controls regarding the NASA HMFN. For detailed information on the site, consult the HMFN administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

known as the HMP-North Building) and formerly, its associated trailers (TR1-469, TR1-717, TR1-615); the Boresight Control Building (M7-867); General Warehouse (M7-912) (formerly Clamshell #3 M7-864); Hazardous Waste Staging Area (M7-862); Weather Tower 506 (M7-913); and Ground Support Equipment Storage Building (M7-1011) and formerly, its adjacent trailers (TR1-469, TR1-585 and TRM-038). HMFN is a customer-operated hazardous processing facility. Previous operations included refurbishment disassembly/assembly, testing, encapsulation, propellant loading, and pressurization of fuel and oxidizer lines on the Space Shuttle Aft Orbital Maneuvering Subsystem Pods.

SITE LOCATION

The HMFN is located in the Industrial Area of KSC, at the intersection of G Avenue and Fifth Street Southeast. The facility is located in Section 4, Township 23 South, Range 37 East of the Orsino, Florida quadrangle map. The facility is bordered by undeveloped scrub pine and pine flatwoods to the north and east, coniferous/hardwood forest and upland scrub to the west, and developed industrial area to the south (Figure 1). The groundwater use control area covered by the Interim LUCIP is shown on Figure 2 and the soil control areas are shown on Figure 3. Coordinates of the corners of the groundwater LUC are provided on Figure 2 and of the soil LUCs are provided on Figure 3 in the US State Plane Coordinate System North American Datum (NAD) 1983, meters, Florida East.

SITE CONTAMINATION AND CONTROL

The concentrations of CVOCs (PCE, TCE, cDCE, 1,1-DCE, 1,1-DCA, and VC) and 1,4-dioxane in groundwater are above the FDEP's GCTLs. Concentrations of PCBs in soil are above FDEP residential and industrial SCTLs. Since groundwater exceeds GCTLs and soil exceeds residential and industrial SCTLs, LUCs prohibiting industrial/residential land use, the use of groundwater, and alteration of transformer pads which could result in exposure to soils, are required until the cleanup levels are achieved. The current and projected land use of the HMFN does not include the use of site groundwater or disturbance of transformer pads; therefore, there is no current or projected exposure risk.

DECISION DOCUMENT

The KSC Remediation Team determined that interim institutional controls should be implemented at HMFN. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in

[2] *By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

the Memorandum of Agreement (MOA)[2] between the National Aeronautics and Space Administration (NASA) and the FDEP, effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring at the site, and that the transformer pads are maintained; therefore, preventing potential exposure to soils beneath the pads.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this Interim LUCIP.

MAINTENANCE

The Interim LUCIP shall remain in place until the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based upon analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.

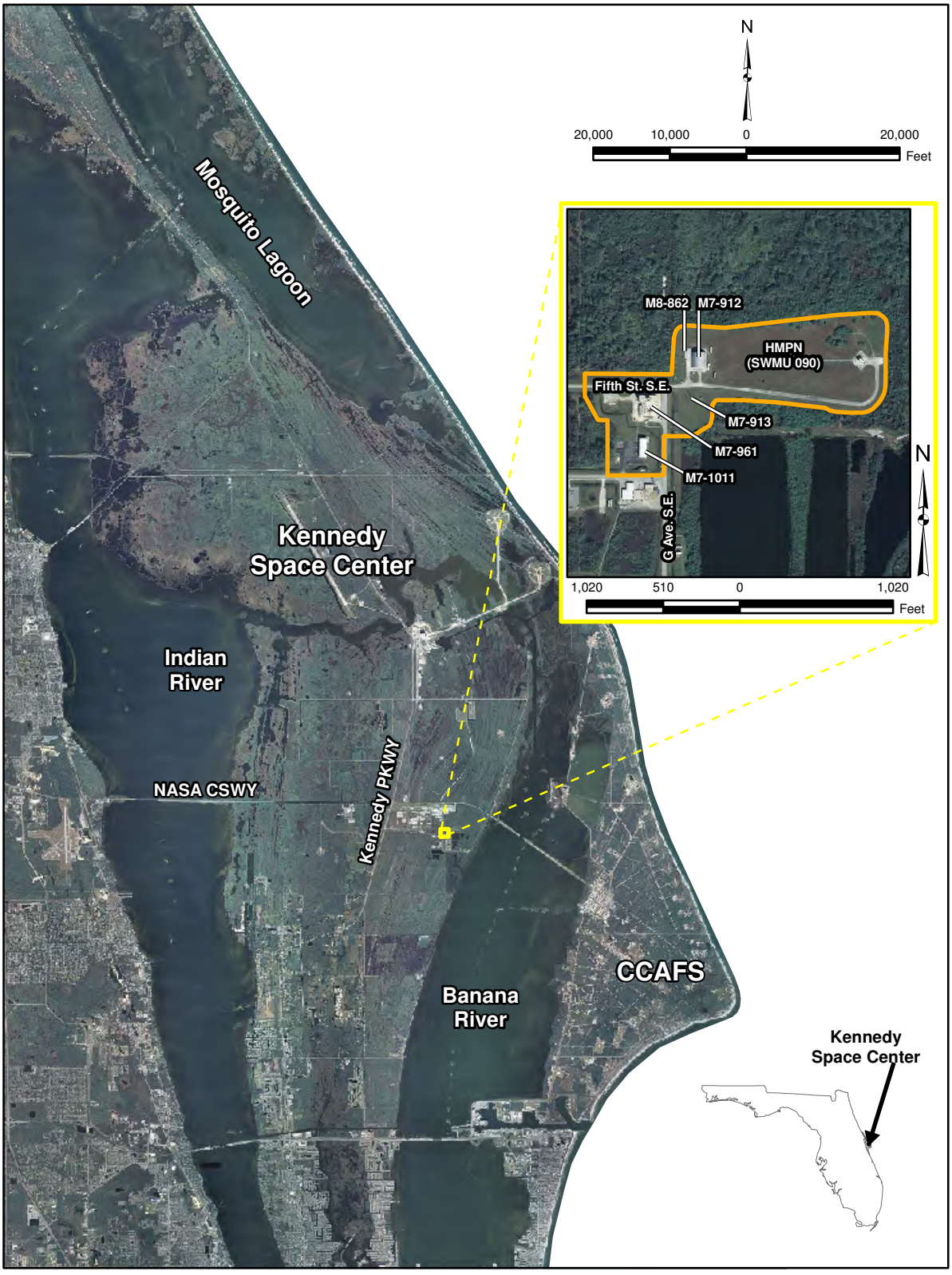
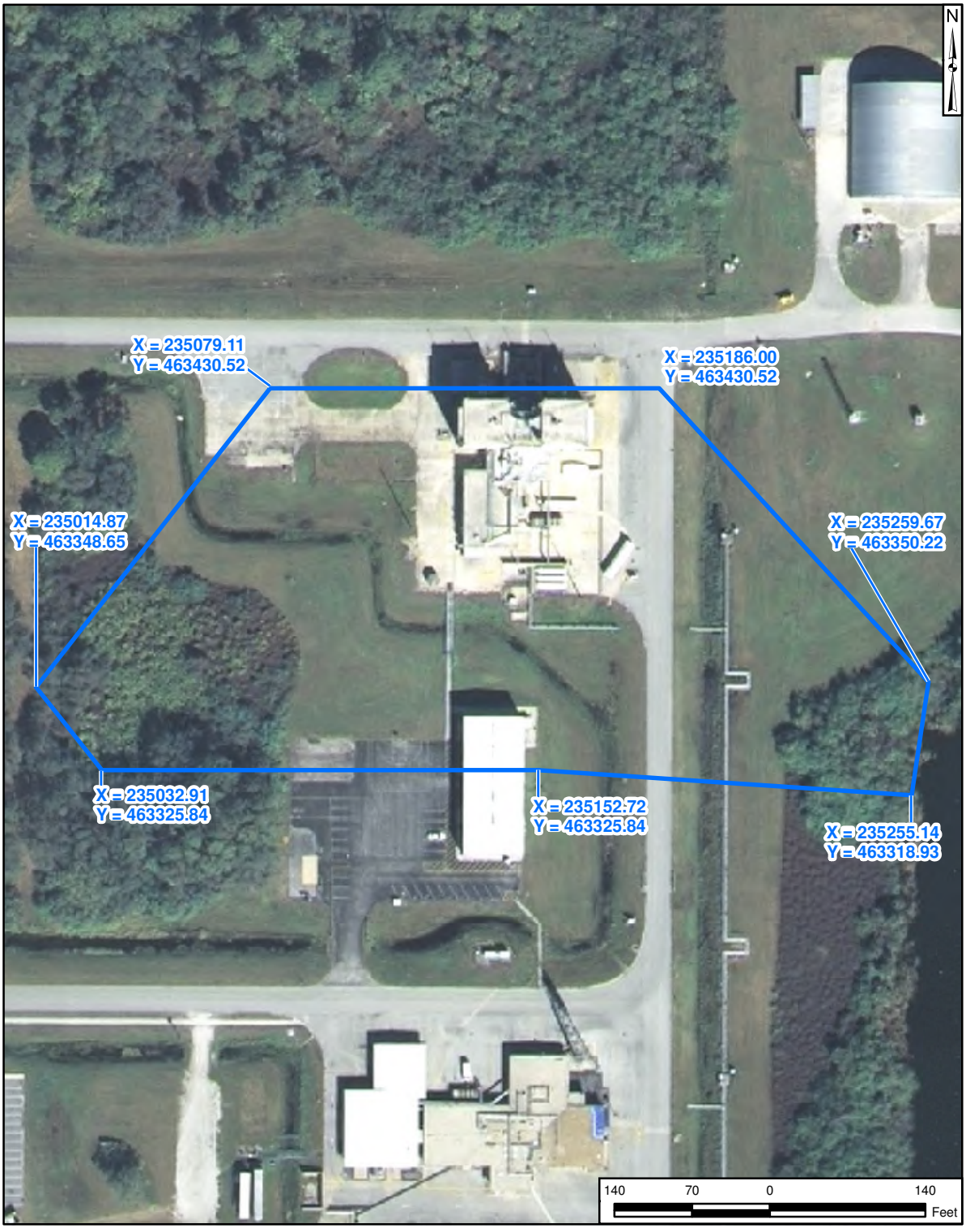


Figure 1
Site Location Map

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Legend

Area Covered by Groundwater Use Control

Note:
Coordinates are in U.S. State Plane
Coordinate System NAD 1983, Florida East, Meters.

Figure 2
HMPN Groundwater Use Control Area

Titusville-01\data\0GIS\FR0734\MXDs\LUCIP_DEC2011\Figure2_LUCIP.mxd 20 MARCH 2012 MAH

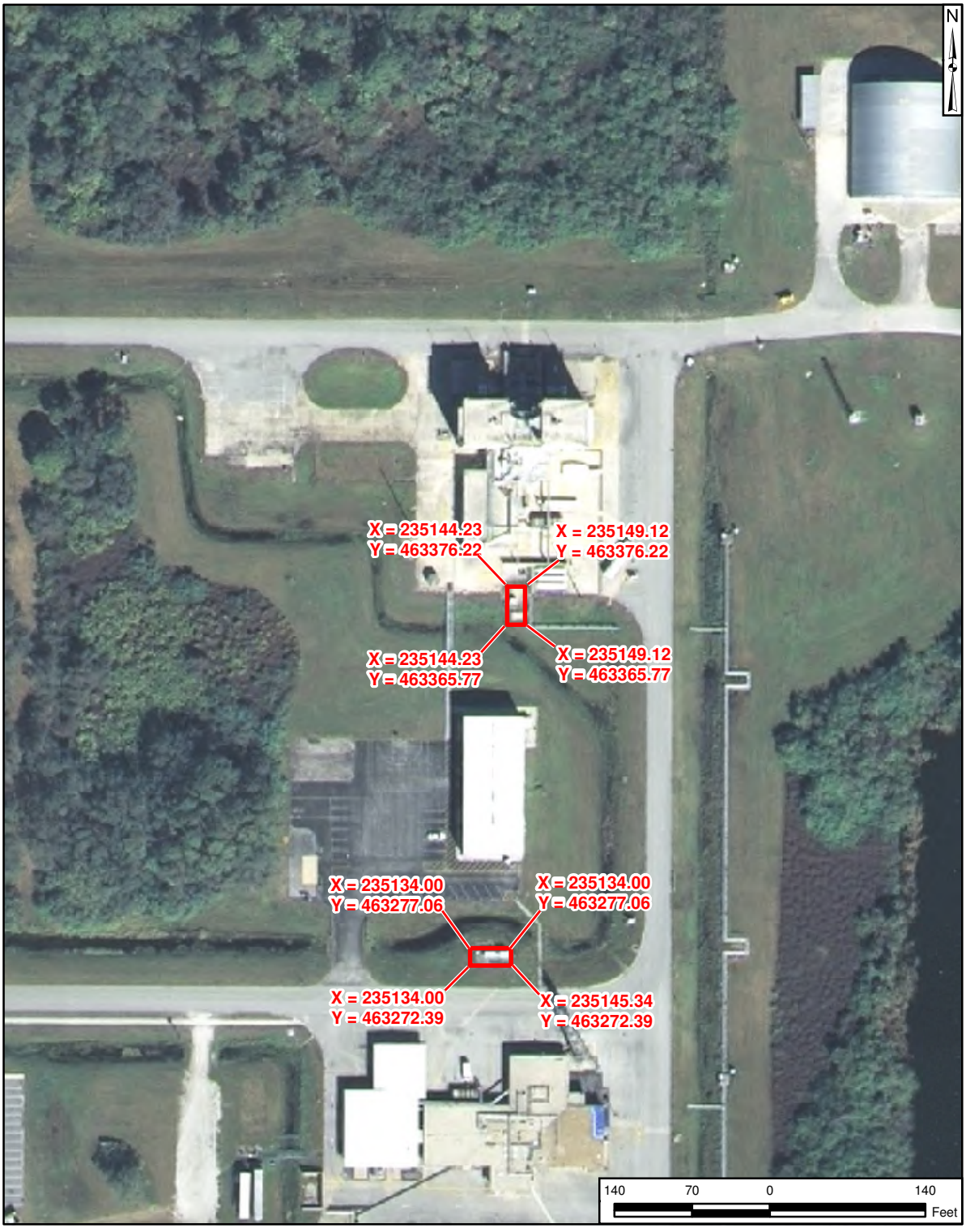


Figure 3
HMPN Soil Use Control Area

Titusville-01\data\0GIS\FR0734\MXDs\Soil_LUCIP_JULY2012\Figure3_LUCIP.mxd 05 JULY 2012 JRB

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Launch Equipment Test Facility Solid Waste Management Unit 091
CONTAMINANTS:	Vinyl chloride in groundwater
CONTROL:	Prohibit groundwater use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Kennedy Space Center (KSC) Launch Equipment Test Facility (LETF) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health and the environment associated with the LETF, institutional Land Use Controls (LUCs) are necessary to prohibit the use of groundwater affected with vinyl chloride at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

During the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI), one chemical of concern (vinyl chloride) was identified above the Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Level (GCTL) and was identified as a potential human health risk. An LUC was developed to ensure contact with the groundwater at the site is prohibited to prevent human health exposure.

SITE DESCRIPTION

The Supply, Shipping, and Receiving Warehouse (M7-504) was the first building constructed in this area between 1963 and 1964. In 1966, this building was incorporated into the Payload Support Building (M7-505). The area of investigation for the site included the LETF, eastern portion of Building M7-505 , the Prototype Shop, and the Cryogenics building. A release from a former waste treatment tank, recorded on the western side of Building M7-505, is currently being managed under Solid Waste Management Unit (SWMU) 039. The eastern and southern portions of the site contain asphalt areas that have launch equipment testing structures. East of E Avenue S.E. and north of the Cryogenics building and Prototype Shop, there are mowed and maintained grassy areas.

[1] *This LUCIP summarizes institutional controls regarding the NASA LETF. For detailed information on the Site, consult the LETF administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

SITE LOCATION

The LETF is located south of the Operations and Checkout Building (M7-355) on the western side of E Avenue S.E. and north of Third Street S.E., in the southern portion of the KSC Industrial Area. The LETF is located in Section 19, Township 22S, Range 37E in the Orsino Quadrangle. The site is located on the eastern side of the Payload Support Building (M7-505) and encompasses the steel structures on the eastern side of the facility that are used for launch equipment testing (Figure 1).

The groundwater use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided on Figure 2 in the U.S. State Plane Coordinate System NAD 1983, meters, Florida East.

SITE CONTAMINATION AND CONTROL

Concentrations of vinyl chloride in groundwater are present at the LETF above the FDEP GCTL. The past, current, and projected land use of the LETF is industrial in nature and does not include the use of site groundwater. LUCs are, therefore, required to prohibit the use of groundwater at this site. Indoor air quality will be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-12187, is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in

[2] By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to Center-wide implementation of periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will include a review of current groundwater data to verify the LUC is still required at the site, and will verify that no groundwater use is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until the concerns managed by the LUCIP are mitigated, or until there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the FDEP and implemented by modification of the National Aeronautics and Space Administration's operating permit.



Legend

SWMU Location

Notes:
KSC - Kennedy Space Center
LETF - Launch Equipment Test Facility
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
SWMU - Solid Waste Management Unit

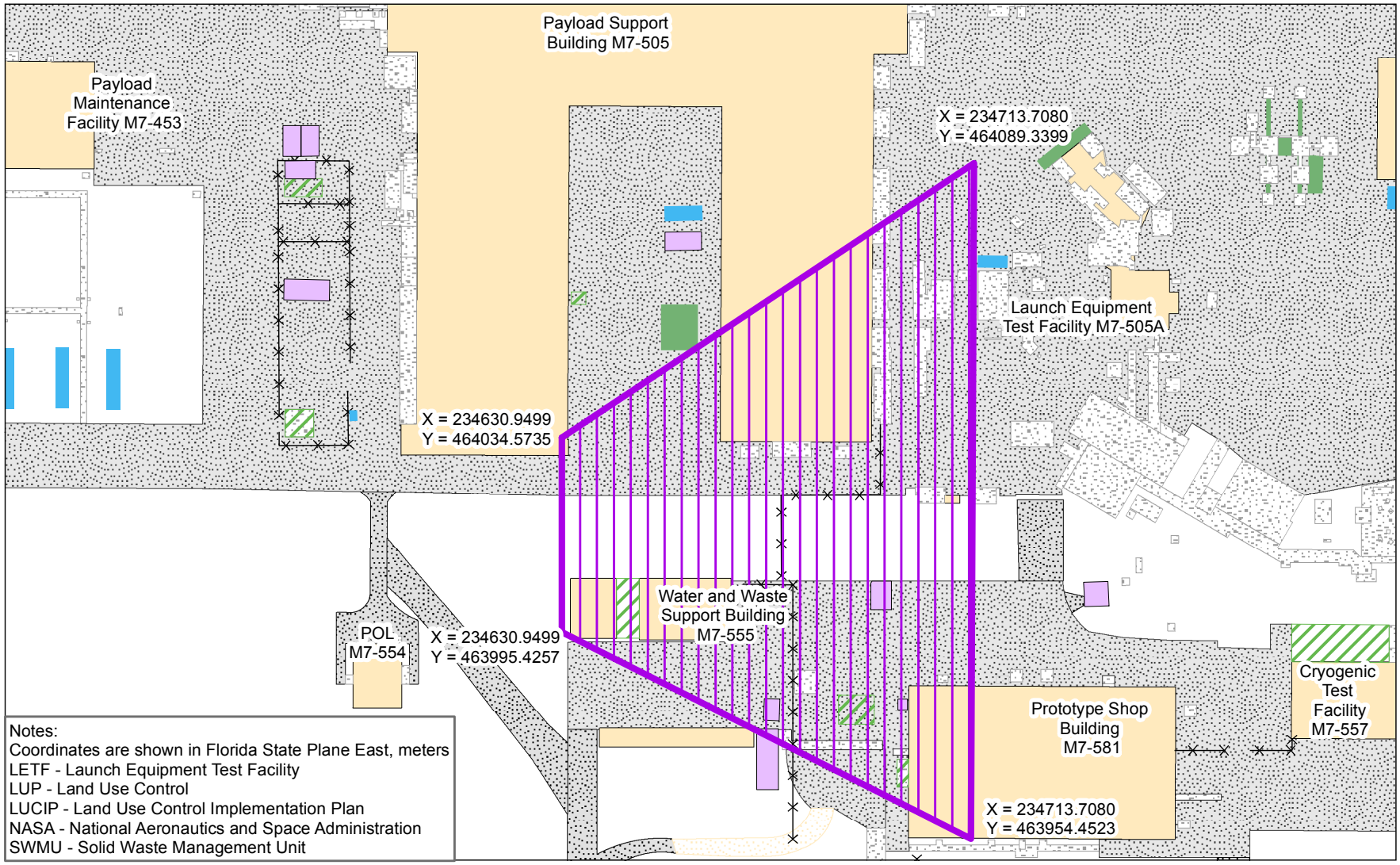
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Site Location Map - SWMU 091
Land Use Control Implementation Plan

Launch Equipment Test Facility
NASA Kennedy Space Center, Florida

Project Number: TL014018.0001

Figure 1



Legend

- Fence
- LUC Area
- Permanent Shed Location
- Temporary Shed Location
- Canopy Area
- Concrete Slab or Sidewalk
- Permanent Structure
- Temporary Structure
- Pavement
- Dirt Road

N

0 50 100

Scale in Feet

LUC Area - SWMU 091
Land Use Control Implementation Plan

Launch Equipment Test Facility
NASA Kennedy Space Center, Florida

Project Number: TL014018.0000

Figure 2

LAND USE CONTROL IMPLEMENTATION PLAN

CENTRAL SUPPLY WAREHOUSE, SWMU 92
(FORMERLY PRL 121)
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Central Supply Warehouse
Solid Waste Management Unit No. 92
CONTAMINANTS: PCBs and PAHs in Soil
CONTROL: Prohibit Residential Land Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Central Supply Warehouse (CSW) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with CSW, institutional land use controls (LUCs) are necessary to prohibit potential future residential use of the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

A Preliminary Risk Evaluation (PRE) was completed as part of a Resource Conservation and Recovery Act (RCRA) Confirmation Sampling (CS). Chemicals of concern identified for human health risk during the CS that exceeded Florida Department of Environmental Protection (FDEP) residential cleanup target levels were polychlorinated biphenyls (PCBs) and polynuclear aromatic hydrocarbons (PAHs) in soil.

SITE DESCRIPTION

The CSW is a NASA-operated facility that is the main facility for the receiving, storage, and distribution operations for KSC. The facility comprises an area of approximately 18 acres and contains four numbered buildings, the CSW (M6-744), Supply Warehouse No. 1 (M6-744A), and two pump houses (M6-744A and M6-744B), as well as several other non-numbered buildings. The CSW facility contains two electrical substations, railroad spurs, loading and unloading docks with hydraulic platform levelers, a ground vehicle weigh station, parking areas, outdoor storage areas, and a stormwater surface-grated drainage system. Construction of the CSW (M6-744) began in July 1963 and was completed in March 1966. Past and current operations at the CSW include material and equipment storage, container staging, loading and unloading trucks and rail cars, vehicle weighing, use of transformers containing PCBs, oil-based switches, fuel tank truck parking, and other miscellaneous trucking activities.

1. This LUCIP summarizes institutional controls regarding the NASA KSC Central Supply Warehouse (CSW). For detailed information on the site, consult the CSW administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

SITE LOCATION

The CSW facility is located southwest of the intersection of C Avenue SE and Third Street SE in the KSC Industrial Area (Figure 1). The site is located within Section 5 of Township 23S, Range 37E which is in the Orsino Quadrangle. The soil use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

PCBs and PAHs were detected in soil above FDEP's residential soil cleanup target levels (SCTLs) but below FDEP's industrial SCTLs. The past, current, and projected future land use of the CSW is industrial in nature. LUCs are therefore required to prohibit residential use/exposure to soils.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-8127, is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Program Office. The inspection will verify that no residential use is occurring and that pavement in the specified area remains intact.

2. By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

REPORTING

KSC's Environmental Program Office will submit annual reports to EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

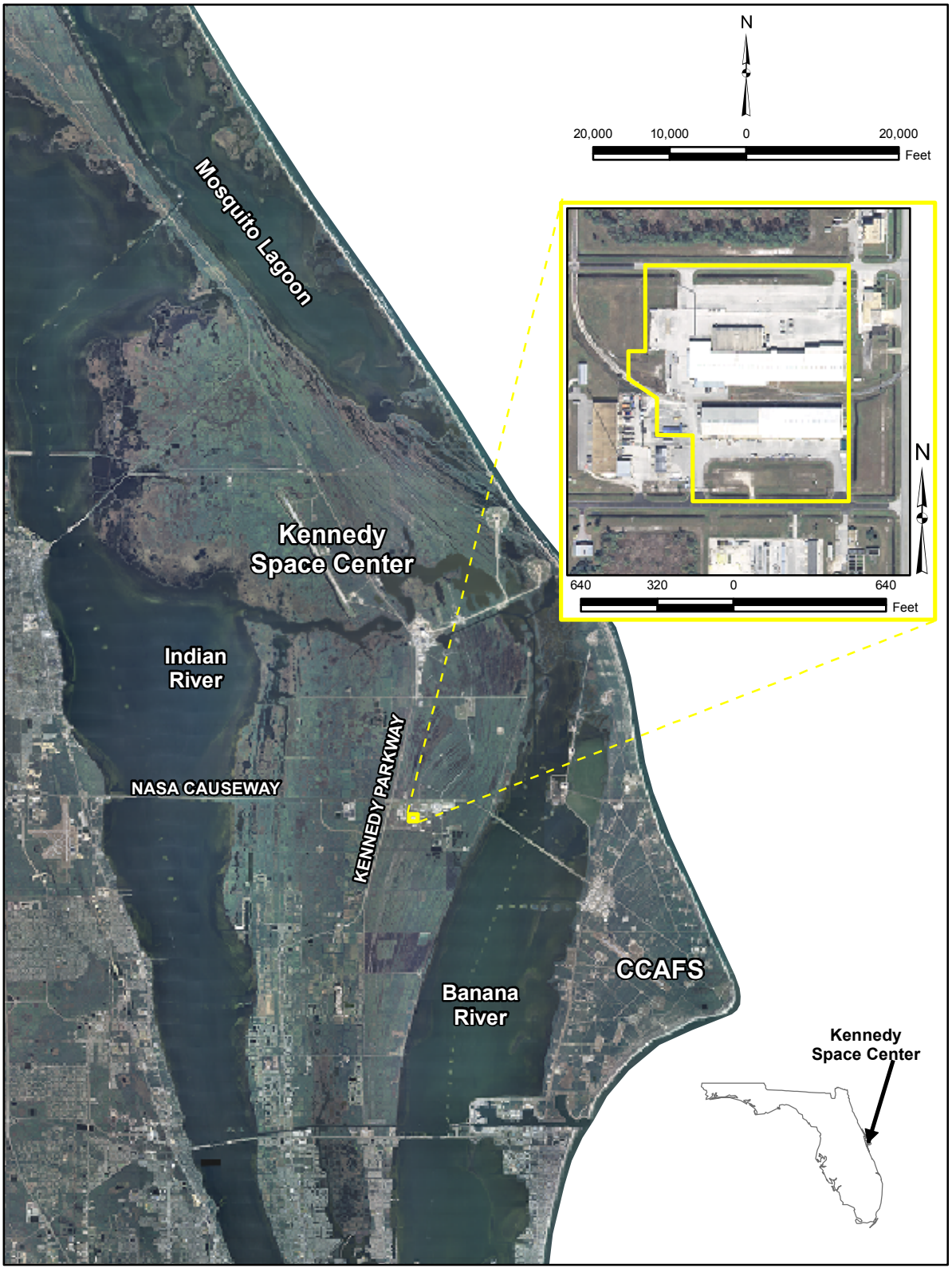
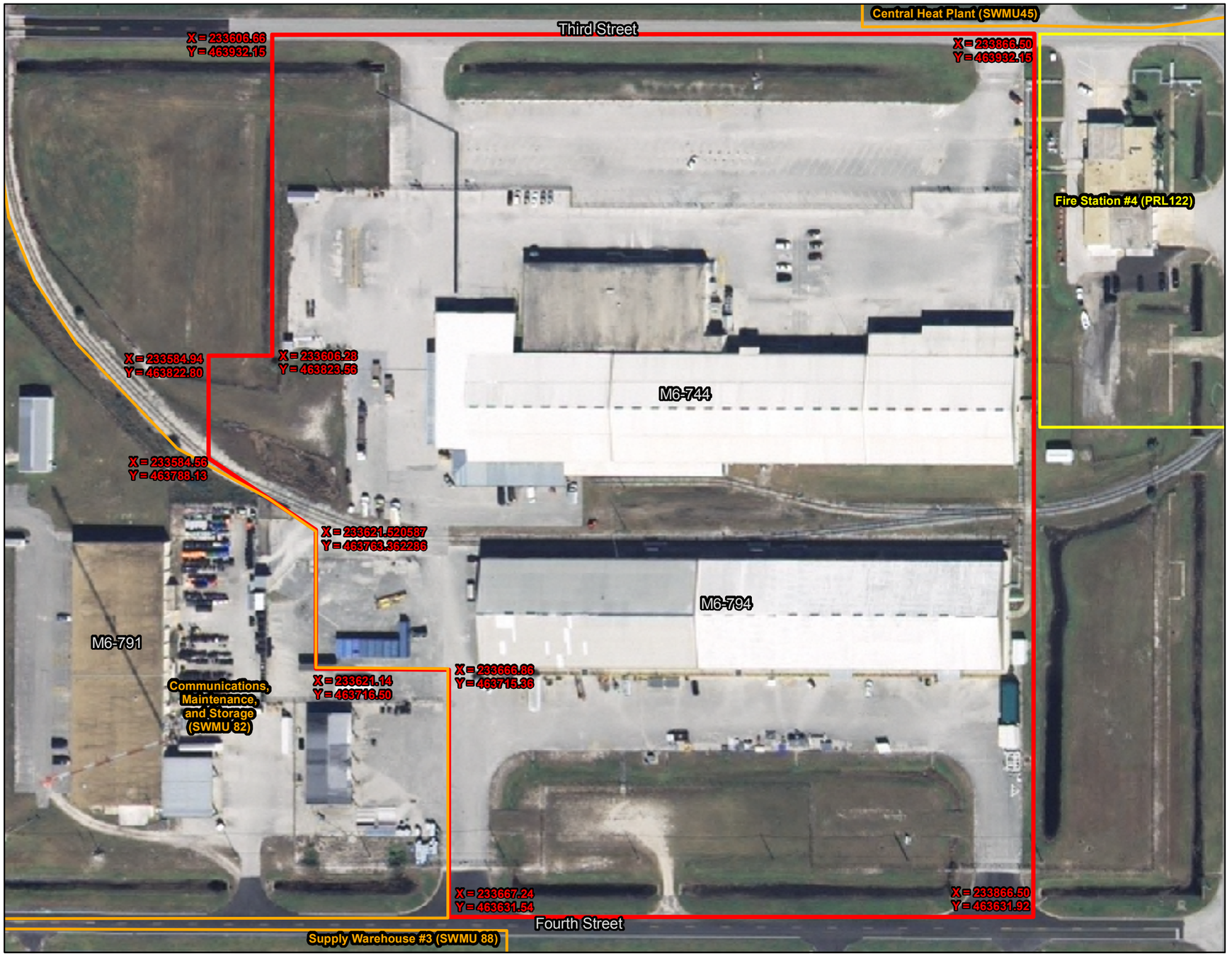
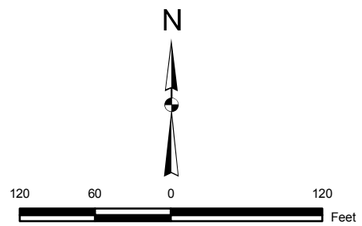


Figure 1
Central Supply Warehouse (SWMU 92) Location Map

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Legend

- Area Covered by Statement of Basis and Soil Control Area
- Potential Release Location (PRL) Boundary
- Solid Waste Management Unit (SWMU) Boundary

Note:
Coordinates are presented in US State Plane NAD 1983, Florida East, Meters.

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Figure 2
Central Supply Warehouse (SWMU 92) Soil Control Area

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	CITGO Service Station Potential Release Location 129
CONTAMINANTS:	Benzene, total xylenes, MTBE, and naphthalene in groundwater
CONTROL:	Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the CITGO Service Station (CGO; the Site) of institutional controls that have been implemented at the Site[1]. In 2011, the Site was rebranded to a Mobil Station. Although there are no current unacceptable risks to human health or the environment associated with the CGO, an institutional land use control (LUC) is necessary to prohibit groundwater use at the Site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Four chemicals of concern (COCs; total xylenes, methyl tert-butyl ether [MTBE], and naphthalene) exceeded the Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs) and one COC (benzene) exceeded the Natural Attenuation Default Concentration (NADC). The four COCs were identified as posing potential human health risks during a Petroleum Site Assessment.

SITE DESCRIPTION

The Site is currently developed with the Mobil Service Station (CGO; M6-0596) and a fuel canopy (M6-0596A). The CGO currently maintains one compartmentalized 22,000-gallon underground storage tank (UST) containing unleaded gasoline and diesel fuel, one 5,000-gallon ethanol aboveground storage tank, and the associated dispensers.

SITE LOCATION

The CGO is located in the Industrial Area of Kennedy Space Center (KSC), south of the Headquarters Building (M6-0399). The facility is located in Section 5, Township 23S, and Range 37E, in the Orsino Quadrangle. The facility is bordered by a vacant parcel to the north and east, by 3rd Street SE to the south, and by C Avenue SE to the west. (Figure 1). The groundwater use control area covered by the LUCIP is shown on Figure 2.

[1] *This LUCIP summarizes institutional controls regarding the NASA CGO. For detailed information on the site, consult the CGO administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

Coordinates of the corners of the LUC are provided on Figure 2 in the U.S. State Plane Coordinate System NAD 1983, meters, Florida East.

SITE CONTAMINATION AND CONTROL

Concentrations of total xylenes, MTBE, and naphthalene are present in groundwater above the FDEP GCTLs but are less than the FDEP NADCs. The concentration of benzene in one monitoring well is above the NADC. Two pilot tests were performed at the Site prior to the installation of the compartmentalized UST in March 2010. In October 2008, an in-situ air sparge and vapor extraction system was installed. The results indicated that lithologic constraints hindered the remedial effectiveness of the system. In 2009, a chemical oxidation pilot study was conducted to determine the effectiveness of injecting RegenOx to reduce the remaining petroleum hydrocarbons at the Site. The results of the chemical oxidation pilot test indicated that the subsurface lithology limited the distribution of the oxidant; therefore this technology was not retained for further consideration. Based on the pilot test results and the lithologic constraints at the Site, a long-term monitoring (LTM) plan was recommended and approved for the Site. Since groundwater exceeds the FDEP GCTLs and NADCs, LUCs prohibiting the use of groundwater are required until the cleanup level is achieved. The current and projected land use of the CGO does not include the use of site groundwater; therefore, there is no current or projected exposure risk.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the Site. The SB for the site, KSC document number KSC-TA-12114, is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

[2] *By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring at the Site.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until the concerns managed by the LUCIP are mitigated, or until there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the FDEP and implemented by modification of NASA's operating permit.



Legend

PRL Boundary

Notes:
CGO - CITGO Service Station
KSC - Kennedy Space Center
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
PRL - Potential Release Location
VAB - Vehicle Assembly Building

N

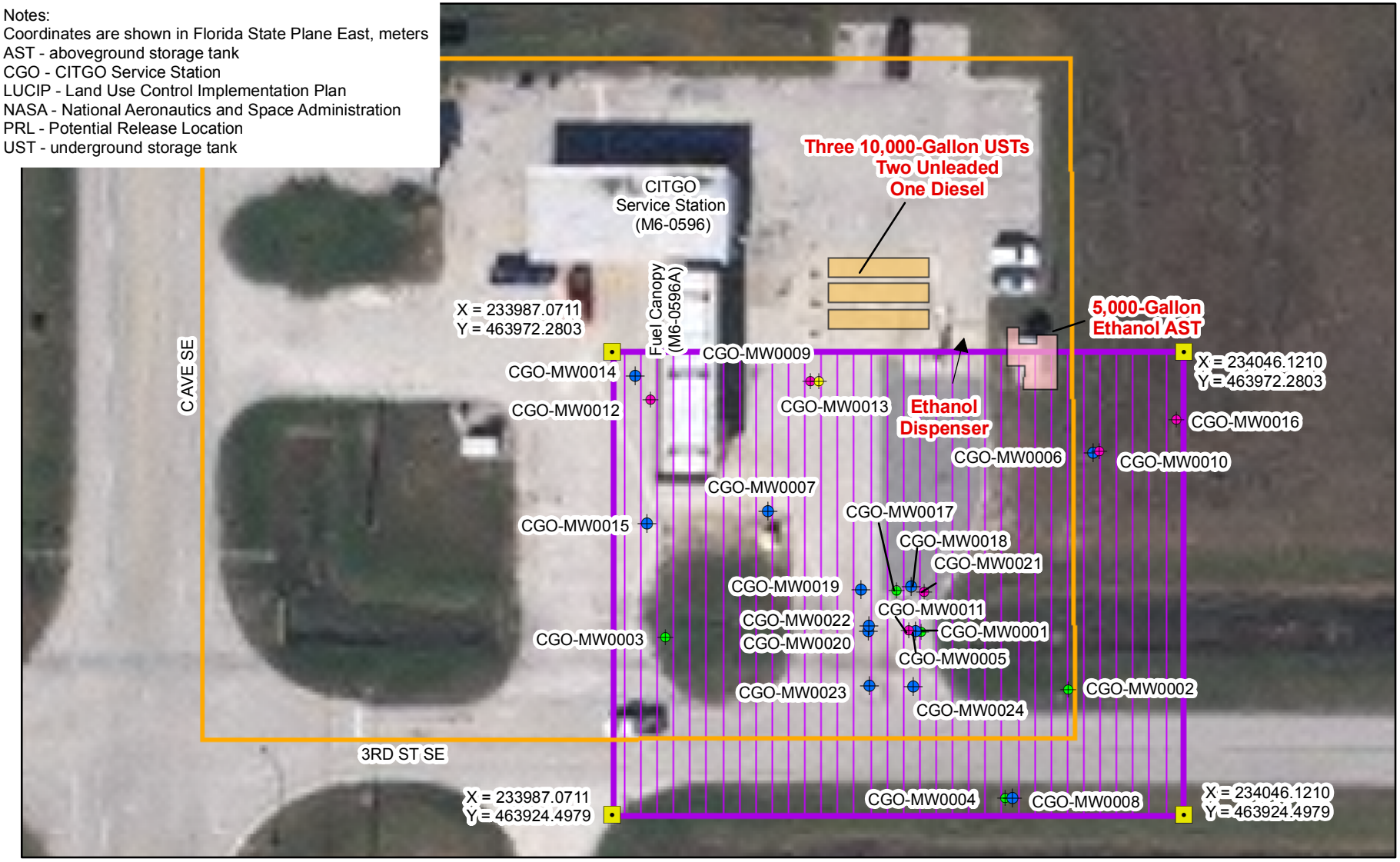
Site Location Map - PRL 129
Land Use Control Implementation Plan

CITGO Service Station
NASA Kennedy Space Center, Florida

Project Number: TL014022.0000

Figure 1

Notes:
Coordinates are shown in Florida State Plane East, meters
AST - aboveground storage tank
CGO - CITGO Service Station
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
PRL - Potential Release Location
UST - underground storage tank



Legend

- Monitoring Well Screened 2 to 12 ft bls
- Monitoring Well Screened 20 to 30 ft bls
- Monitoring Well Screened 30 to 40 ft bls
- Monitoring Well Screened 40 to 50 ft bls
- AST
- UST
- PRL Boundary
- LUCIP Area

0 25 50
Scale in Feet

N

Area Under Institutional Controls - PRL 129
Land Use Control Implementation Plan

CITGO Service Station
NASA Kennedy Space Center, Florida

Project Number: TL014022.0000

Figure 2

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	GSA Seized Property Solid Waste Management Unit 095
CONTAMINANTS:	Volatile Organic Compounds in Groundwater
CONTROL:	Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the GSA Seized Property (GSSP) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with GSSP, an institutional land use control (LUC) is necessary to prohibit groundwater use at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

A human health risk assessment was completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chlorinated volatile organic compounds (CVOCs), including trichloroethene (TCE), *cis*-1,2-dichloroethene (cDCE), and vinyl chloride (VC) exceeded the Florida Department of Environmental Protection (FDEP) groundwater cleanup target levels (GCTLs) and were identified as a potential human health risk during the RFI.

SITE DESCRIPTION

The GSSP site is located in the KSC industrial area. It consists of an unpaved, fenced area, approximately six acres in size (M6-0880) containing one structure, which functions as an administrative trailer (TR3-0035). Formerly, various administrative trailers (TR3 -0022, TR3-0029, TR3-0030 and TR3-0031) have occupied the site. Vehicles, seized by the U.S. Marshall's office, were stored at the site prior to auction. Minor maintenance was performed onsite.

SITE LOCATION

The GSSP is located in the Industrial Area of KSC, on the northeast corner of the intersection of Kennedy Parkway/State Road 3 and Fifth Street Southeast. The GSSP is located at Section 5 of Township 23S, Range 37E, on the United States Geological Survey's 7.5-minute Orsino topographic quadrangle map. The facility is bordered by

[1] *This Interim LUCIP summarizes institutional controls regarding the NASA GSSP. For detailed information on the site, consult the GSSP administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

undeveloped scrub pine to the north, the Child Development Center to the east (M6-883), Fifth Street SE to the south, and Kennedy Parkway/State Road 3 to the west (Figure 1). The groundwater use control area covered by the Interim LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided on Figure 2 in the US State Plane Coordinate System NAD 1983, meters, Florida East.

SITE CONTAMINATION AND CONTROL

The concentrations of TCE, cDCE, and VC present in groundwater are greater than FDEP GCTLs. Since groundwater exceeds the GCTLs, LUCs prohibiting the use of groundwater are required until the cleanup level is achieved. The current and projected land use of the GSSP does not include the use of site groundwater; therefore, there is no current or projected exposure risk.

DECISION DOCUMENT

The Kennedy Space Center (KSC) Remediation Team determined that interim institutional controls should be implemented at GSSP. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring at the site.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

[2] By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this Interim LUCIP.

MAINTENANCE

The Interim LUCIP shall remain in place until the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based upon analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.

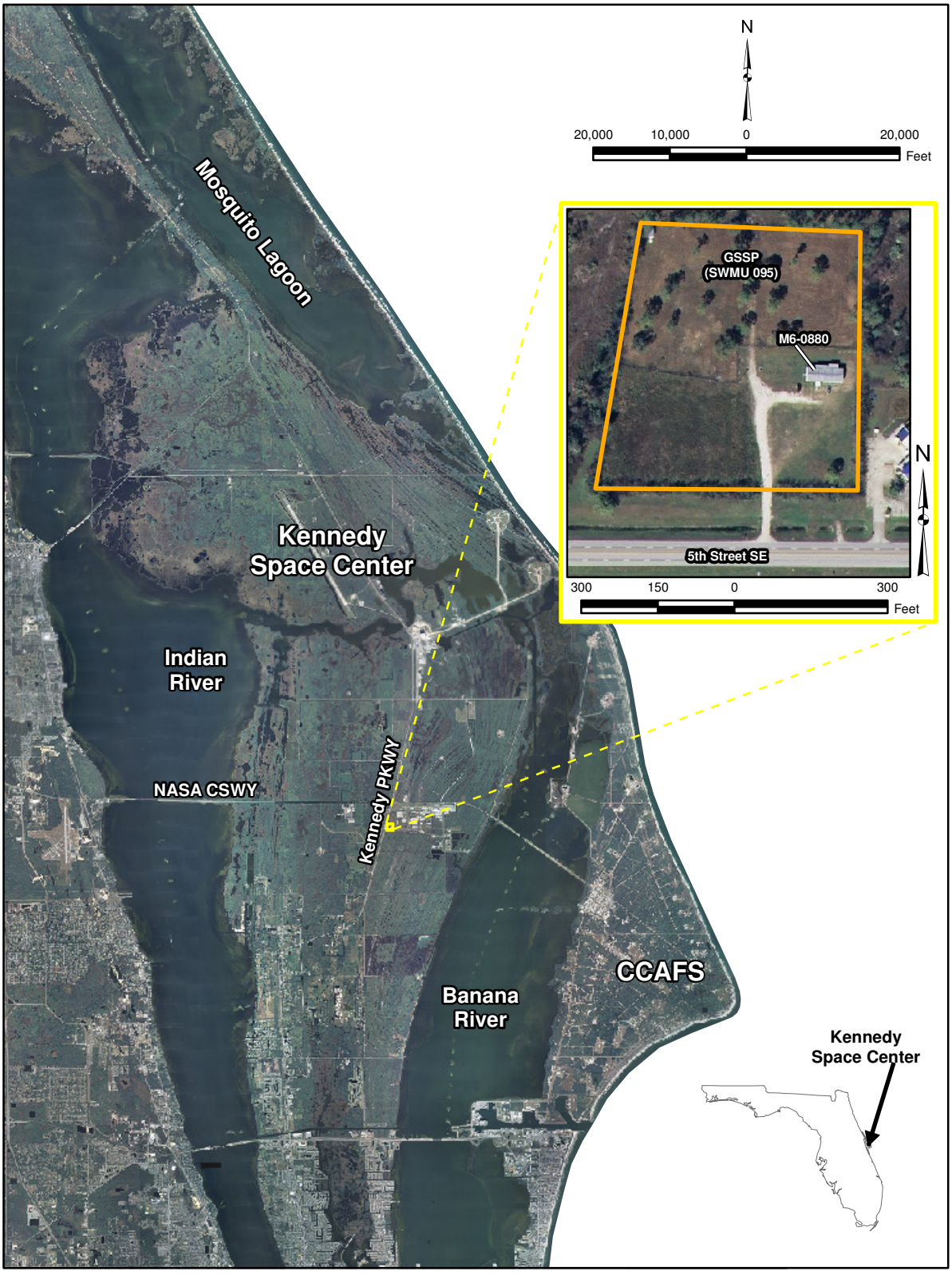


Figure 1
Site Location Map

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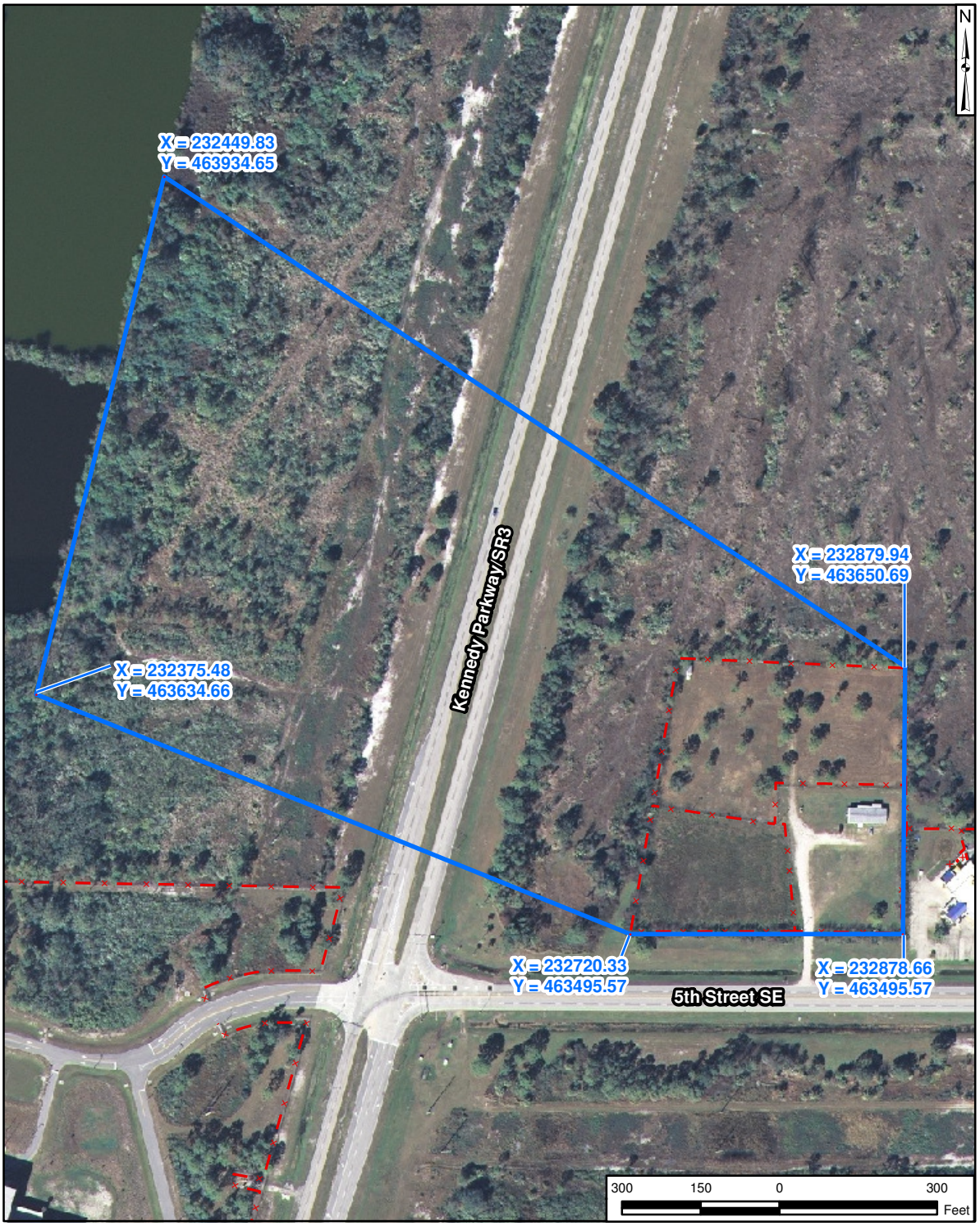


Figure 2
GSSP Groundwater Use Control Area

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LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Orsino Power Substation
Solid Waste Management Unit No. 96
CONTAMINANTS: Barium, Copper, PCBs, and TPH in Soil
CONTROL: Prohibit Residential Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Orsino Power Substation of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the Orsino Power Substation, institutional land use controls (LUCs) are necessary to prohibit residential use of the site. Controls will include periodic inspection, condition certification and agency notification.

The proposed remedy for SWMU 96 includes implementation of soil LUCs. Soil contamination levels are below the Florida Department of Environmental Protection's (FDEP) industrial commercial soil cleanup target levels (SCTLs). Soils remaining in place will require a land use control to restrict the site to non-residential use only. Non-residential land use restrictions prohibit residential or residential-like uses, including but not limited to, any form of housing, child-care facilities, any kind of school including pre-schools, elementary schools, and secondary schools, playgrounds, and adult convalescent and nursing care facilities.

WHY LAND USE CONTROLS ARE NEEDED

Soil and groundwater sampling were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded FDEP and Environmental Protection Agency (EPA) cleanup target levels were barium, copper, polychlorinated biphenyls (PCBs) and Total Petroleum Hydrocarbons in soil.

SITE DESCRIPTION

The Orsino Power Substation is a NASA-operated facility that has been used to provide electrical power to the KSC Industrial Area since 1964. The facility comprises an area of approximately 3.5 acres and contains transformers, circuit breakers, power structures, sheds, a control building, and a Florida Power and Light (FP&L) substation. The facility is mostly fenced and is unpaved with crushed rock covering the ground surface

[1] *This LUCIP summarizes institutional controls regarding the NASA KSC Orsino Power Substation. For detailed information on the site, consult the Orsino Power Substation administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8411.*

within the fenced area. Past and current operations at the Orsino Power Substation include equipment storage, battery storage, and electrical power distribution.

SITE LOCATION

The Orsino Power Substation is located southeast of the intersection of Southeast 5th Street and C Avenue in the KSC Industrial Area (Figure 1). The site is located within Section 5 of Township 23S, Range 37E which is in the Orsino Quadrangle. The soil use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Barium, copper, PCBs, and TPH are present in soil above FDEP's residential SCTL but are less than FDEP's industrial SCTL. The past, current, and projected future land use of the Orsino Power Substation is industrial in nature. LUCs are therefore required to prohibit residential use/exposure to soils, including gravel.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-8620, is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspection will verify that no residential use is occurring.

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this LUCIP

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

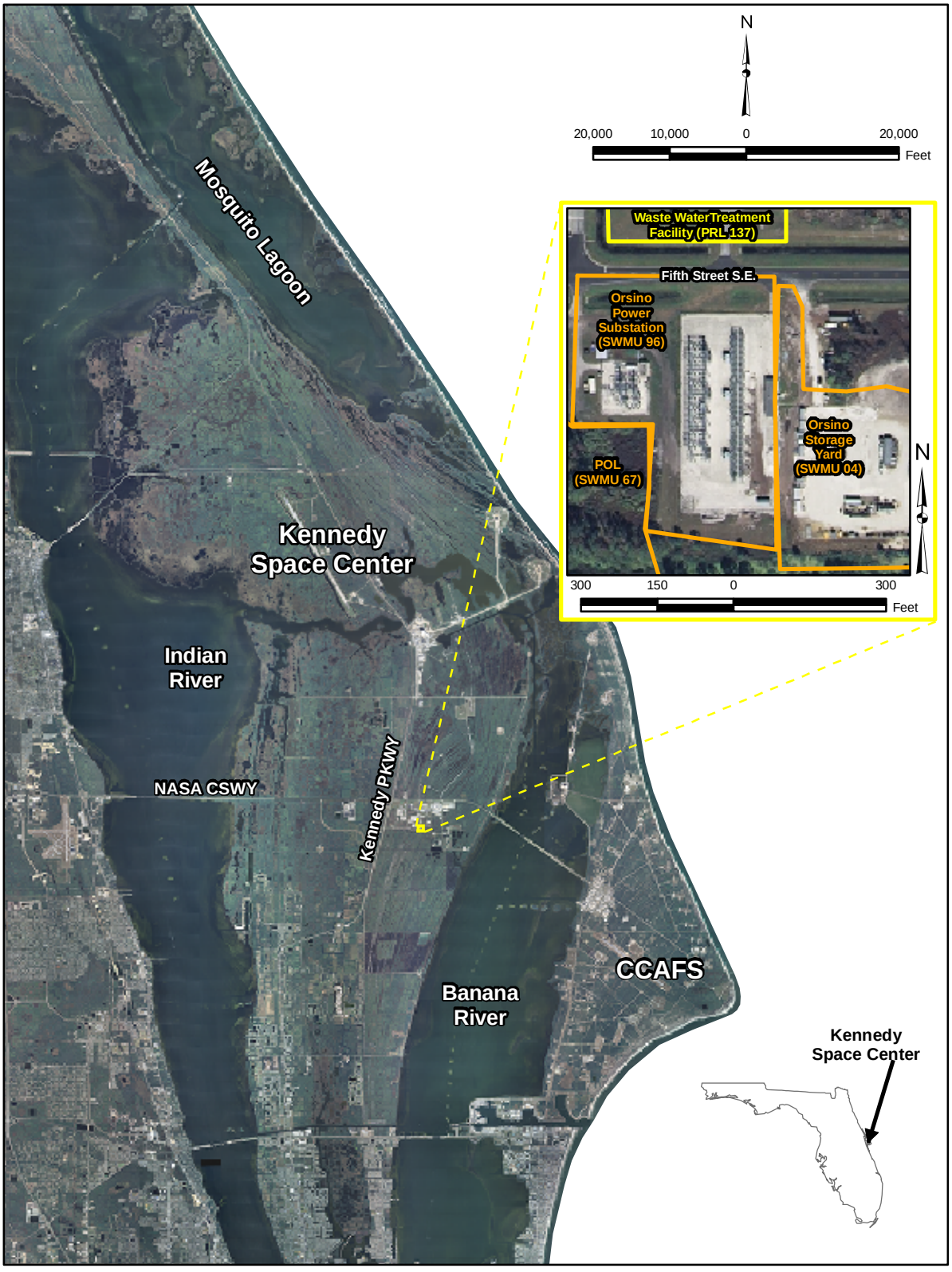
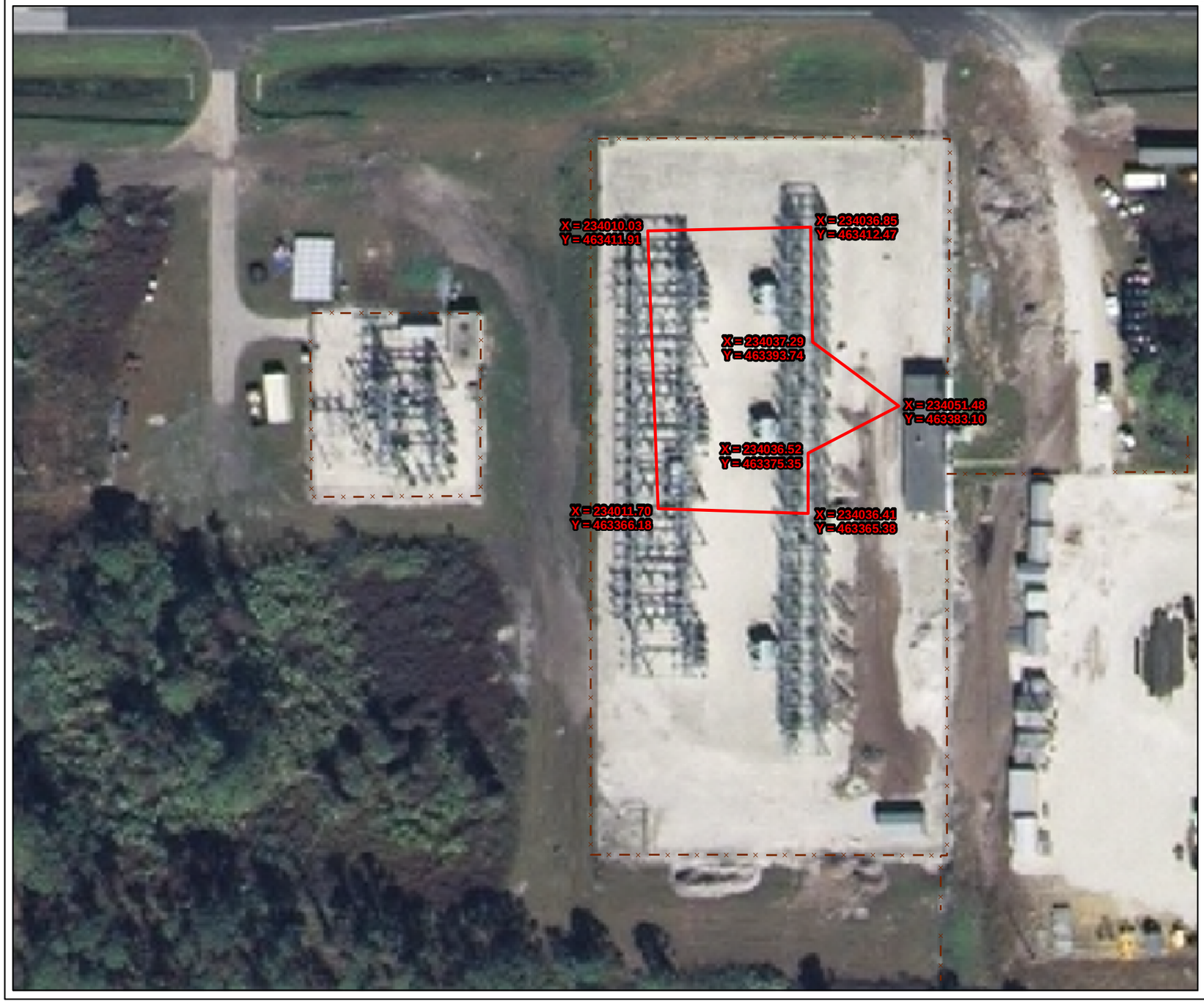
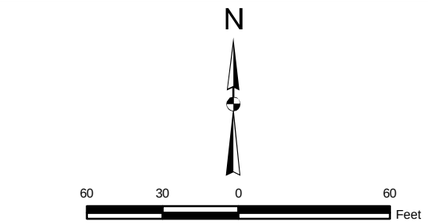


Figure 1
Orsino Power Substation Location Map

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Legend

Area Covered by Statement of Basis and Soil Use Control

Fence Line

Note:
Coordinates are in US State Plane Coordinate System NAD1983 Meters, Florida East.

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Figure 2
Site Map of Orsino Power Substation (SWMU 96) Area

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Space Station Processing Facility Solid Waste Management Unit 098
CONTAMINANTS:	Ammonia in Groundwater
CONTROL:	Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Space Station Processing Facility (SSPF) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the SSPF, an institutional land use control (LUC) is necessary to prohibit groundwater use at the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

A human health risk assessment was completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). One chemical of concern (ammonia) exceeded the Florida Department of Environmental Protection (FDEP) cleanup target levels and was identified as a potential human health risk during the RFI.

SITE DESCRIPTION

The SSPF site contains the SSPF (M7-0360) Building, two Operations Support Buildings (M7-0361 and M7-0362), one Ammonia Vapor Containment Building (M7-0361A), and a Hazardous Waste Storage Area (M7-0360A). The SSPF has two loading docks and the southern and western sides are enclosed by a security fence. The SSPF serves as the primary facility at KSC for prelaunch/ postlanding processing of space station elements, payloads and experiments.

SITE LOCATION

The SSPF is located in the Industrial Area of KSC, southeast of the intersection of NASA Parkway and E Avenue SE. The facility is bordered by 1st Street SE to the north, 2nd Street SE and the Engineering Development Laboratory (EDL) Facility (M7-0409) to the south, a parking area and H Avenue SE to the east and E Avenue SE and the Operations and Checkout (O&C) Building (M7-0355) to the west (Figure 1). The groundwater use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the

[1] *This LUCIP summarizes institutional controls regarding the NASA SSPF. For detailed information on the site, consult the SSPF administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

LUC are provided on Figure 2 in the US State Plane Coordinate System NAD 1983, meters, Florida East.

SITE CONTAMINATION AND CONTROL

The concentration of ammonia present in groundwater is above the FDEP's Groundwater Cleanup Target Level (GCTL) but is less than the FDEP Natural Attenuation Default Concentration. Since groundwater exceeds the KSC site-specific ammonia background screening value, LUCs prohibiting the use of groundwater are required until the cleanup level is achieved. The current and project land use of the SSPF does not include the use of site groundwater; therefore, there is no current or projected exposure risk.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-11205, is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring at the site.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this LUCIP.

[2] *By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MAINTENANCE

The LUCIP shall remain in place until the concerns managed by the LUCIP are mitigated, or until there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the FDEP and implemented by modification of NASA's operating permit.



Legend

SSPF SWMU Boundary

Notes:
KSC - Kennedy Space Center
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
SSPF - Space Station Processing Facility
SWMU - Solid Waste Management Unit
VAB - Vehicle Assembly Building

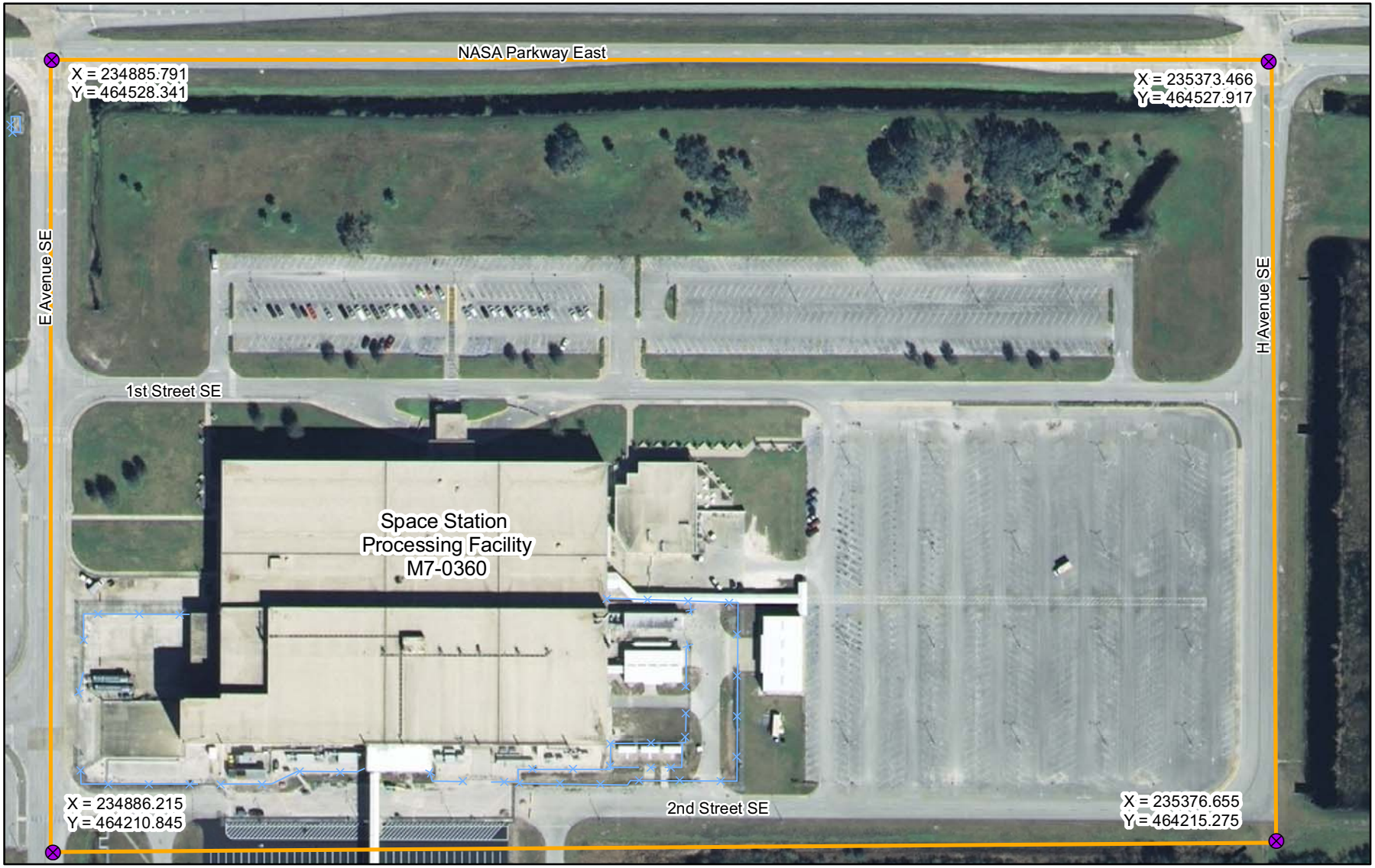
N

Site Location Map - SWMU 098
Land Use Control Implementation Plan

Space Station Processing Facility
NASA Kennedy Space Center, Florida

Project Number: TL011302.0027

Figure 1



Legend

- SSPF SWMU Boundary
- Fence

Notes:
Coordinates are shown in Florida State Plane East, meters
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
SSPF - Space Station Processing Facility
SWMU - Solid Waste Management Unit

N

0 100 200
Scale in Feet

Area Under Institutional Controls - SWMU 098
Land Use Control Implementation Plan

Space Station Processing Facility
NASA Kennedy Space Center, Florida

Project Number: TL011302.0027

Figure 2

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Visitor Complex Maintenance Area Solid Waste Management Unit 099
CONTAMINANTS:	Total Benzo(a)Pyrene Equivalents (BaP TEQ) in Soil and Isopropylbenzene in Groundwater
CONTROL:	Prohibit Residential Soil and Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Visitor Complex Maintenance Area (VCMA) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the VCMA, institutional land use controls (LUCs) are necessary to prohibit residential soil and groundwater use at the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Human health and ecological risk assessments were completed as part of a Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI). Chemicals of concern identified for human health risk during the RFI that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were Total Benzo(a)Pyrene Equivalents (BaP TEQ) in soil and isopropylbenzene in groundwater.

SITE DESCRIPTION

The VCMA is a NASA-subcontractor operated facility that was built to support the Visitor Complex. The VCMA consists of office, storage, and maintenance buildings and also has an open storage area on the western side of the site and bus wash and maintenance facilities on the northeast side. Past and current operations at the VCMA include equipment and material storage, equipment and fleet maintenance, and fleet fueling.

SITE LOCATION

The VCMA is located on NASA Parkway West between the KSC Industrial Area and U.S. 1. The site is bordered by wooded property to the north, the KSC Visitor Complex to the east, wooded property and retention ponds to the south, and wooded property to the west (Figure 1). The groundwater use control area covered by the LUCIP is shown on Figure 2. The soil use control areas are shown on Figures 3 and 4. Coordinates of the corners of the LUC are provided on Figure 2, Figure 3, and Figure 4 in the US State Plane Coordinate System NAD 1983, meters, Florida East.

[1] *This LUCIP summarizes institutional controls regarding the NASA VCMA. For detailed information on the site, consult the VCMA administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8411.*

SITE CONTAMINATION AND CONTROL

BaP TEQ are present in soil above FDEP's Residential Soil Cleanup Target Level (SCTL) but are less than FDEP's Industrial SCTL. The past, current, and projected future land use of the VCMA is industrial in nature. LUCs are therefore required to prohibit residential use/exposure to soils. In addition, isopropylbenzene in groundwater is present above FDEP's Groundwater Cleanup Target Level (GCTL) but less than the FDEP Natural Attenuation Default Concentration. Since groundwater exceeds the GCTL, LUCs prohibiting the use of groundwater are required until the GCTLs are achieved. The current and project land use of the VCMA does not include the use of site groundwater; therefore, there is no exposure or current risks.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-10370, is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8411.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their Resource Conservation and Recovery Act (RCRA) permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no residential use is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities at

[2] By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA, and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

the KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated, or until there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

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Legend

Site Boundary

Notes:
KSC - Kennedy Space Center
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
VCMA - Visitor Complex Maintenance Area
VAB - Vehicle Assembly Building

Site Location Map
Land Use Control Implementation Plan

Visitor Complex Maintenance Area
NASA Kennedy Space Center, Florida

Figure 1

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KSC-TA-10371
VCMA LUCIP
Revision: 0
July 2009

X= 230861.09
Y= 464122.39

X= 230844.44
Y= 464117.11

X= 230834.64
Y= 464111.27

X= 230889.72
Y= 464113.99

TOUR BUS
SERVICING
BUILDING
(M6-0455)

X= 230841.33
Y= 464095.68

X= 230887.47
Y= 464096.32

X= 230873.02
Y= 464091.92

X= 230859.92
Y= 464087.51

STORAGE BUILDINGM6-0503

NURSERY
(M6-0555)

TOUR BUS
FUELING FACILITY
(M6-0505)

STORAGE
BUILDING
(M6-0556)

ROADS GROUNDS
MAINTENANCE#2
(M6-0506)

Legend

- Assessment Area
- Existing Structure
- Groundwater LUCIP Area
- SWMU 20 Boundary
- Coordinate Location

0 25 50
Scale in Feet

N

Notes:
Coordinates are in US State Plane Coordinate System, NAD 1983, meters, Florida East.
KSC - Kennedy Space Center
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
SWMU - Solid Waste Management Unit
VCMA - Visitor Complex Maintenance Area

Groundwater Land Use Control Area
Land Use Control Implementation Plan

Visitor Complex Maintenance Area
NASA Kennedy Space Center, Florida

Figure 2

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KSC-TA-10371
VCMA LUCIP
Revision: 0
July 2009





Notes:
Coordinates are in US State Plane Coordinate System, NAD 1983, meters, Florida East.
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
VCMA - Visitor Complex Maintenance Area

Legend

- Assessment Area
- Existing Structure
- Soil Land Use Control Area
- Coordinate Location

N

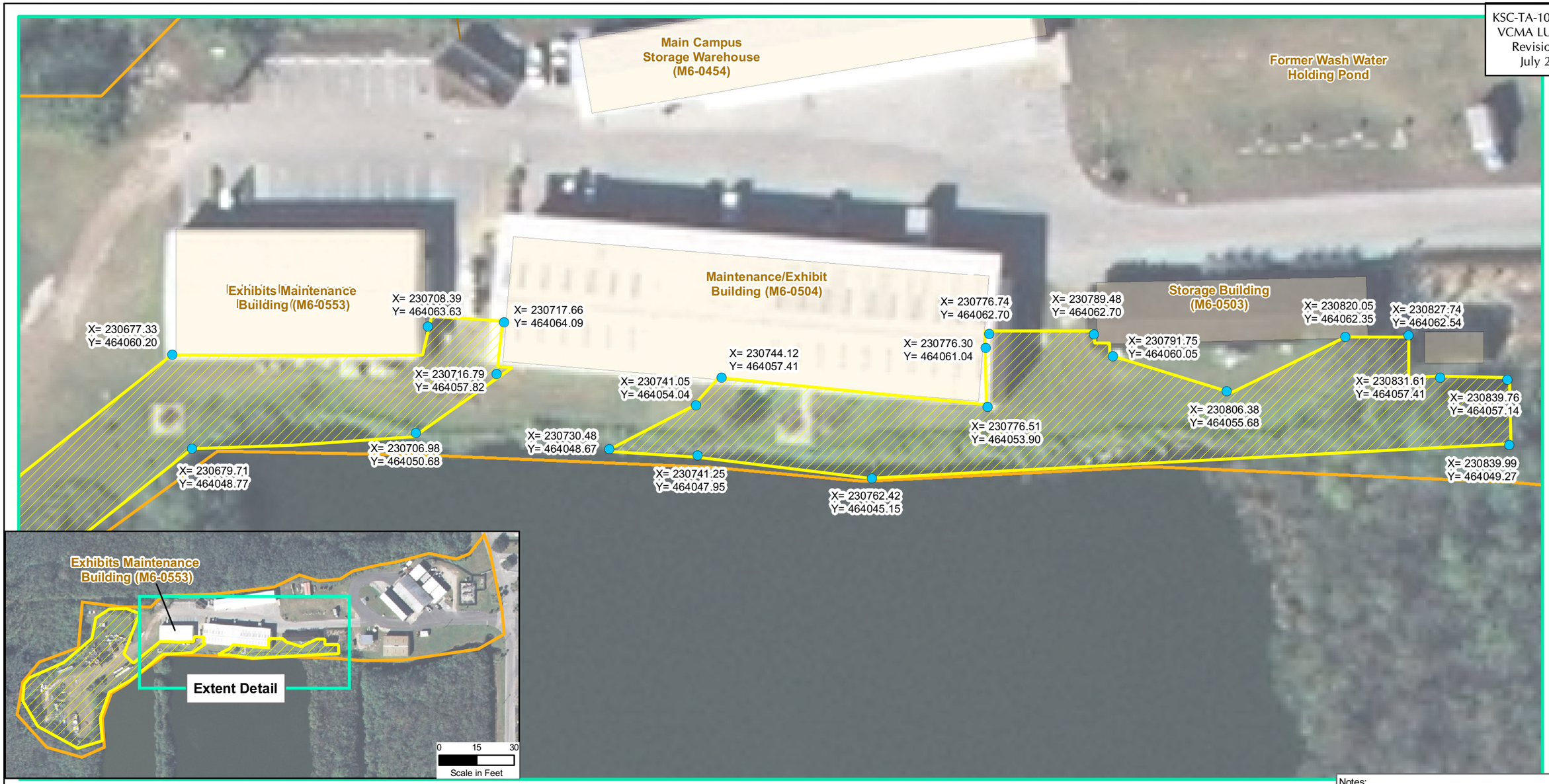
0 25 50
Scale in Feet

Soil Land Use Control Area - West Side
Land Use Control Implementation Plan

Visitor Complex Maintenance Area
NASA Kennedy Space Center, Florida

Figure 3

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Legend

- **Assessment Area**
- **Existing Structure**
- Soil Land Use Control Area
- **Coordinate Location**

N

0 20 40
Scale in Feet

Notes:
Coordinates are in US State Plane Coordinate System, NAD 1983, meters, Florida East.
KSC - Kennedy Space Center
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
VCMA - Visitor Complex Maintenance Area

Soil Land Use Control Area - East Side
Land Use Control Implementation Plan

Visitor Complex Maintenance Area
NASA Kennedy Space Center, Florida

Figure 4

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INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Area South of K7-516
Solid Waste Management Unit 100
CONTAMINANTS: Volatile Organic Compounds in Groundwater
CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Area South of K7-516 (516S) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with 516S, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater at the site and to prevent potential discharge of contaminated groundwater to adjacent surface water bodies that have been designated as Outstanding Florida Water (OFW). Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

During the SWMU Assessment for the Non-Destructive Evaluation Laboratory (NDEL), the parking area for Building K7-516 was identified as Location of Concern (LOC) 12. Soil and shallow groundwater samples were collected as part of Confirmatory Sampling (CS) activities, and all results were less than regulatory criteria. No Further Action was approved for LOC 12 in the May 2004 CS Report. However, more recent investigations at the Components Cleaning Facility (CCF) identified groundwater contaminated with volatile organic compounds (VOCs) within the 516S area.

SITE DESCRIPTION

SWMU 100 is a parking area that was originally constructed in 1968 for KSC personnel working at the CCF. Wastewater from cleaning operations was discharged to ditches from 1964 to 1991. The wastewater from Building K7-516 was discharged to the southern drainage ditch (Figure 1). During the mid-1970s, the southern portion of the parking area was used for miscellaneous storage. From the mid-1990s to present, the area was used by Propellants North to store compressed gas tankers and demineralized water tankers. In 2002 and 2003, the Propellants North breathing air transfer system was located in the southwestern portion of the parking area. No record of spills were identified for the 516S

[1] *This Interim LUCIP summarizes institutional controls regarding the NASA 516S site. For detailed information on the site, consult the 516S administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

area. The primary contaminants at 516S are trichloroethene (TCE) and daughter products.

SITE LOCATION

516S includes a parking area and grassy and forested area located on the southern side of Crawler Way and east of the NDEL (Figure 1). 516S is found in Section 8, Township 22S, Range 37E, as shown on the 7.5-minute Orsino topographic quadrangle map. The groundwater use control area covered by the Interim LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs at concentrations greater than Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels. The past, current, and projected future land use of 516S is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site until cleanup levels are achieved. The current and projected land use of 516S does not include the use of site groundwater; therefore, there is no current or projected exposure risk.

DECISION DOCUMENT

The Kennedy Space Center (KSC) Remediation Team determined that interim institutional controls should be implemented at 516S. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their Resource Conservation and Recovery Act (RCRA) permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and Environmental Protection Agency (EPA), effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating and will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

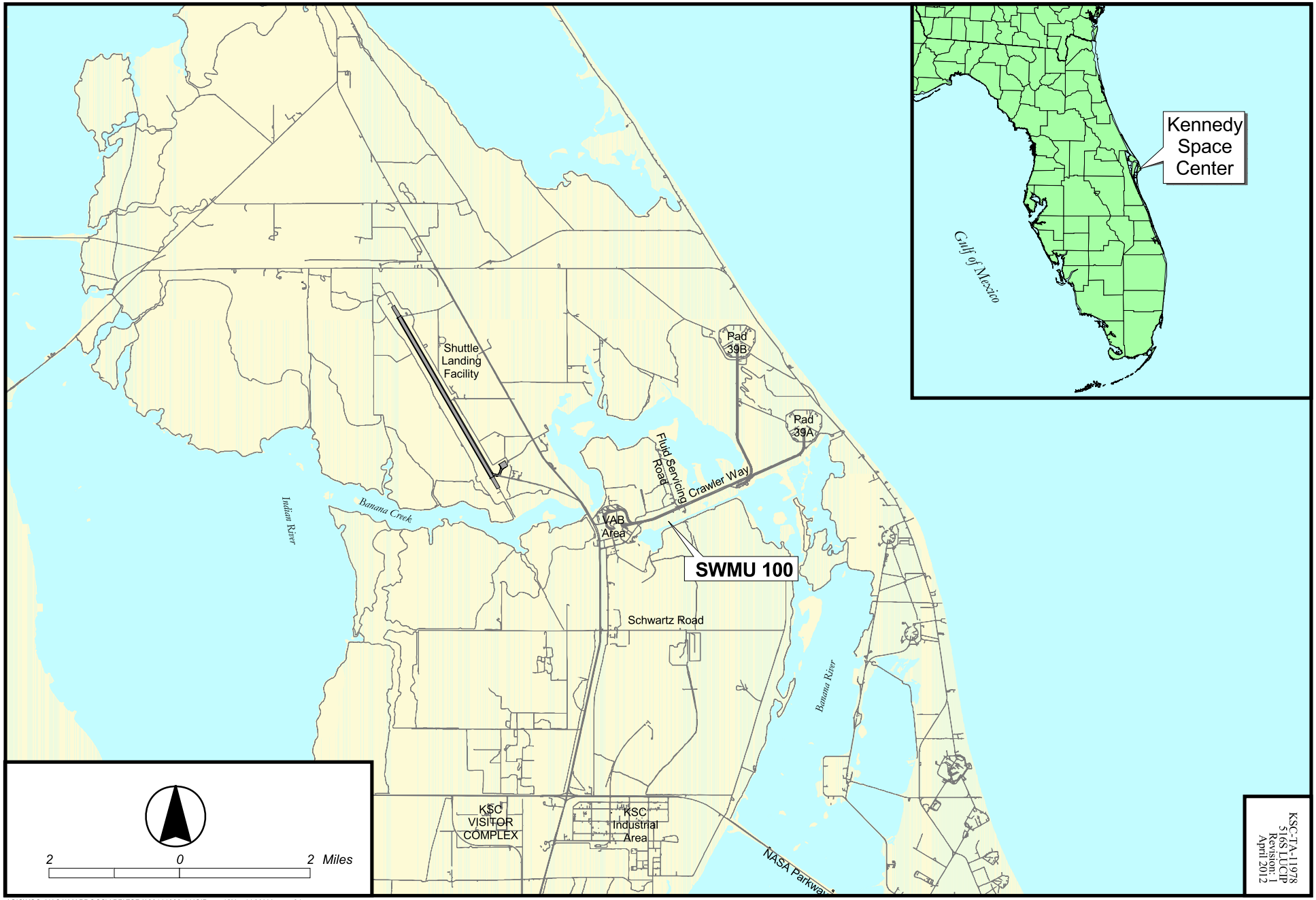
KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this Interim LUCIP.

MAINTENANCE

The Interim LUCIP shall remain in place until a land use change is implemented and the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based on analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.

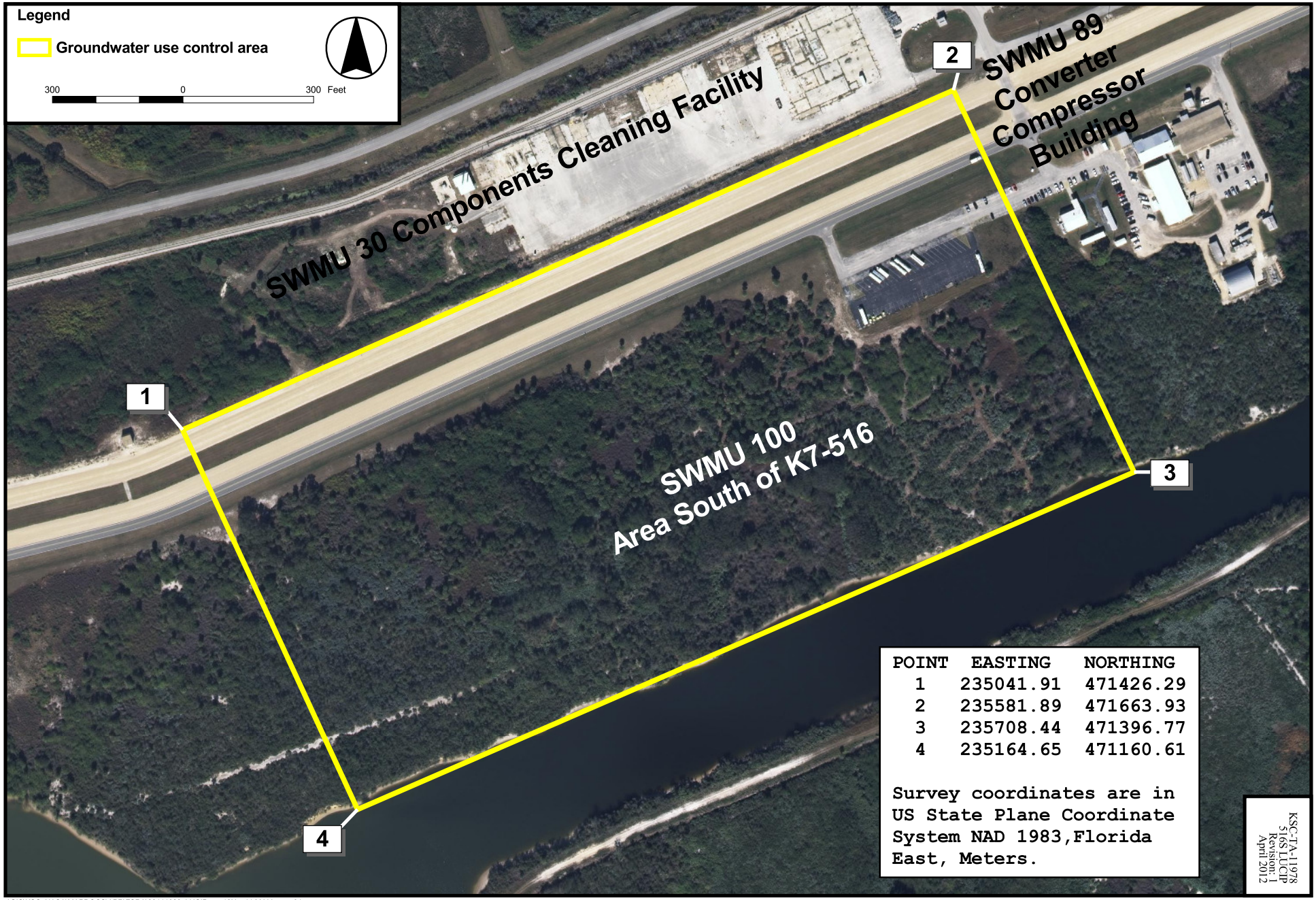
FIGURE 1 LOCATION OF KENNEDY SPACE CENTER AND SWMU 100

SWMU 100 - AREA SOUTH OF K7-516, KENNEDY SPACE CENTER, FLORIDA



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FIGURE 2 GROUNDWATER LAND USE CONTROL AREA
SWMU 100 - AREA SOUTH OF K7-516, KENNEDY SPACE CENTER, FLORIDA



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INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Propellants Support Building Area
Solid Waste Management Unit 102
CONTAMINANTS: Volatile Organic Compounds in Groundwater
CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Propellants Support Building Area (PSBA) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with PSBA, institutional land use controls (LUCs) are necessary to prohibit future use of groundwater at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

The Solid Waste Management Unit (SWMU) Assessment for PSBA identified seven Locations of Concern (LOCs) including areas of known drum storage and potential equipment cleaning operations. Soil and groundwater samples were collected as part of Confirmatory Sampling (CS) activities conducted from October 2007 to April 2008, and all soil results were less than regulatory criteria. The CS Report (CSR) recommended No Further Action (NFA) for all LOCs except LOC 2 due to the presence of volatile organic compounds (VOCs) in groundwater. Florida Department of Environmental Protection (FDEP) approved the CSR in July 2008.

SITE DESCRIPTION

SWMU 102 is located along Fluid Servicing Road north of the Components Cleaning Facility (CCF) and the Converter Compressor Building (CCB), and consists of the Liquid Nitrogen Storage Area (K7-0314) (Figure 1). In 1967, K7-0314 was used for storage of drums that may have contained trichloroethene (TCE) and Freon. In 1996, K7-0314 was outfitted for storage and transfer of Halon and Freon R-21. K7-0314 is currently used for the storage and transfer of Halon, Freon R-21, liquid nitrogen, argon, ammonia, and ethylene glycol. No record of spills were identified for the PSBA area. The primary contaminants at PSBA are TCE and degradation daughter products.

[1] *This Interim LUCIP summarizes institutional controls regarding the NASA PSBA site. For detailed information on the site, consult the PSBA administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

SITE LOCATION

PSBA includes paved areas and undeveloped portions classified as brushland and shrub areas. PSBA is found in Section 8, Township 22S, Range 37E, as shown on the 7.5-minute Orsino topographic quadrangle map. The groundwater use control area covered by this Interim LUCIP is shown on Figure 2. Coordinates of the corners of the LUC area are provided in Figure 2 in the State Plane Coordinate System, North American Datum (NAD) 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs at concentrations greater than FDEP Groundwater Cleanup Target Levels. The past, current, and projected future land use of PSBA is industrial in nature. LUCs are required to prohibit the use of groundwater at the site until cleanup levels are achieved. The current and projected land use of PSBA does not include the use of site groundwater; therefore, there is no current or projected future exposure risk.

DECISION DOCUMENT

The Kennedy Space Center (KSC) Remediation Team determined that interim institutional controls should be implemented at PSBA. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their Resource Conservation and Recovery Act (RCRA) permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between National Aeronautics and Space Administration (NASA), FDEP, and United States Environmental Protection Agency (EPA), effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs for PSBA. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating and will be conducted by KSC's

[2] By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring at PSBA.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

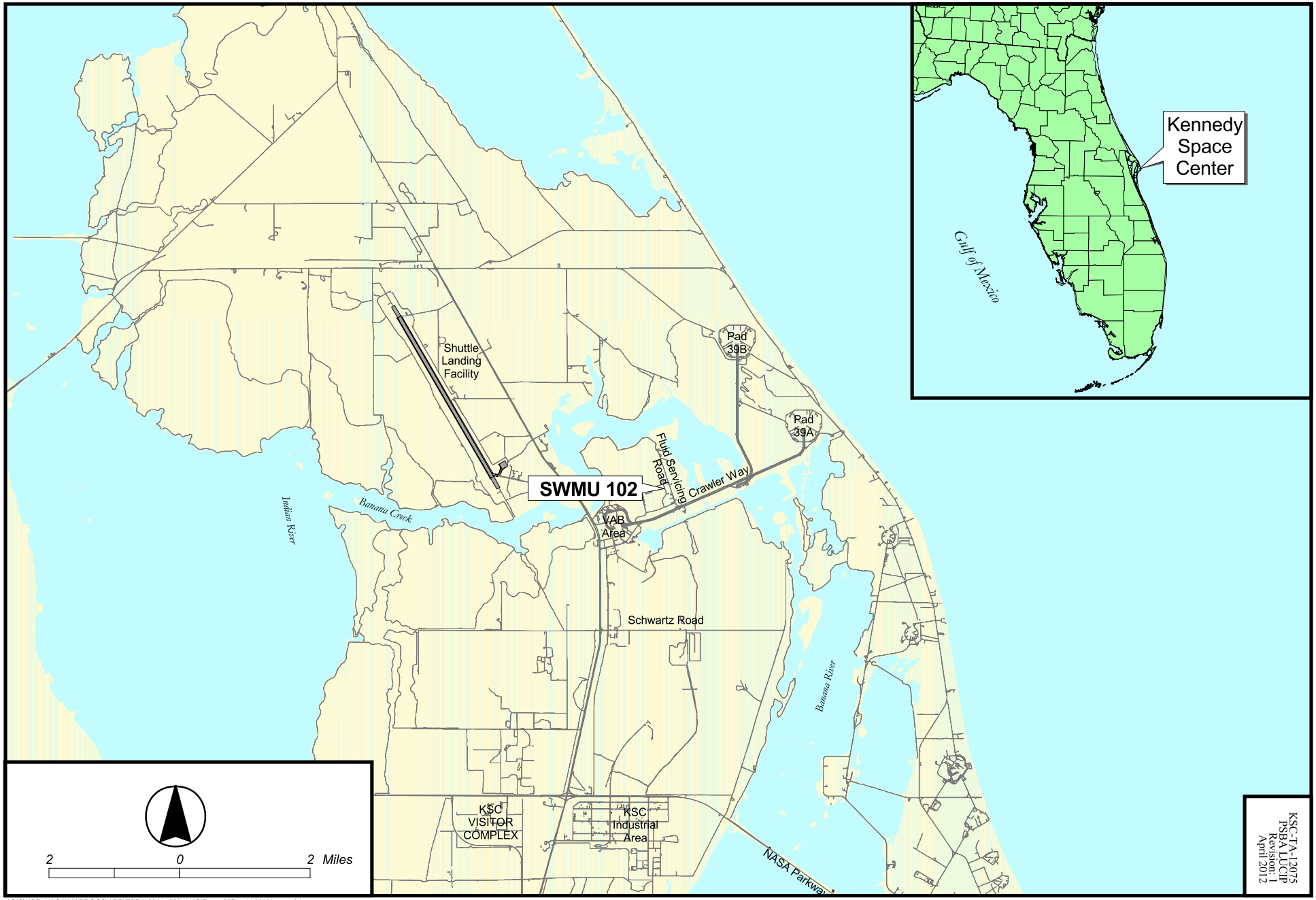
KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this Interim LUCIP.

MAINTENANCE

The Interim LUCIP shall remain in place until a land use change is implemented or the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based on analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.

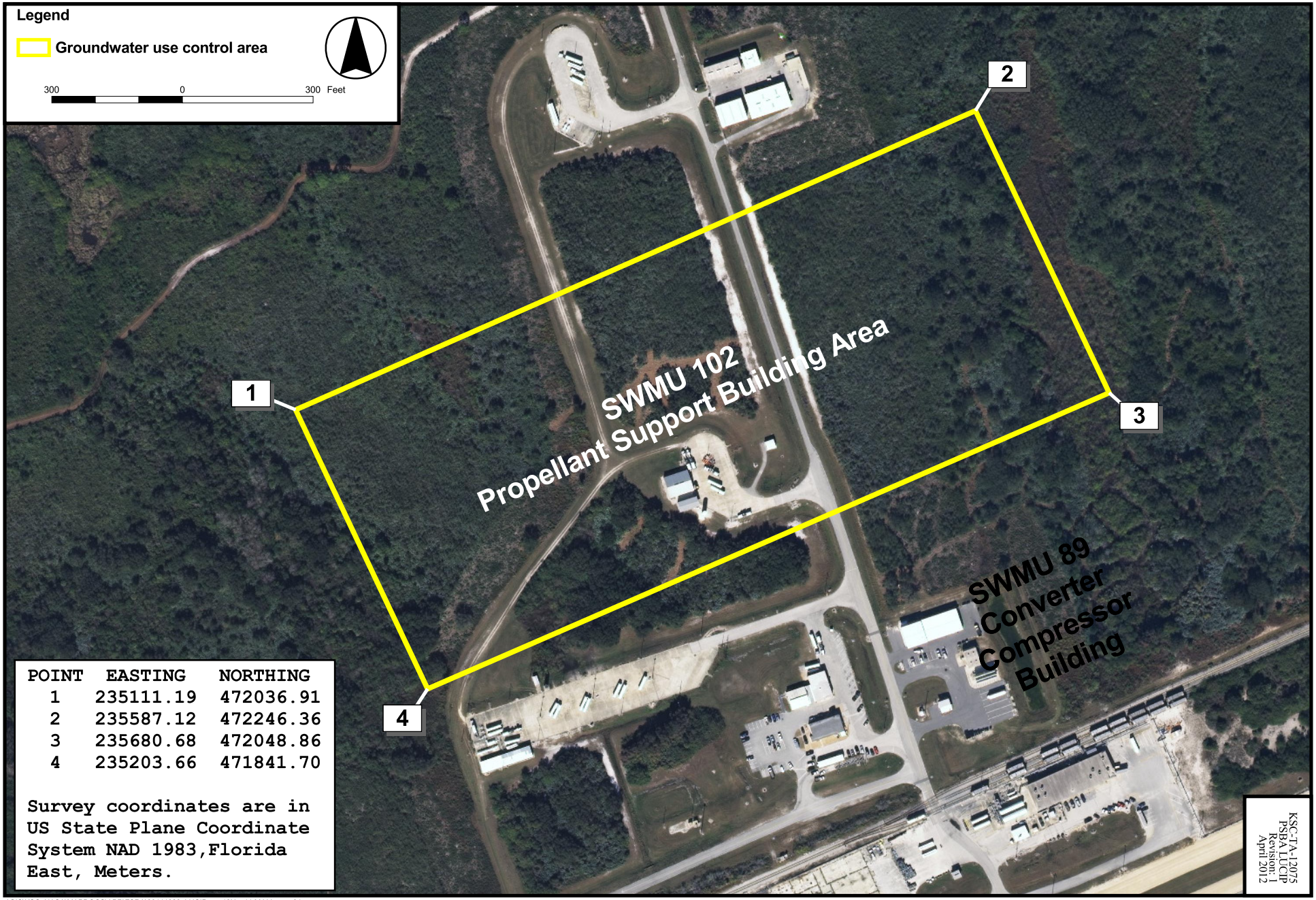
FIGURE 1 LOCATION OF KENNEDY SPACE CENTER AND SWMU 102

SWMU 102 - PROPELLANT SUPPORT BUILDING AREA, KENNEDY SPACE CENTER, FLORIDA



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FIGURE 2 GROUNDWATER LAND USE CONTROL AREA
SWMU 102 - PROPELLANT SUPPORT BUILDING AREA, KENNEDY SPACE CENTER, FLORIDA



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LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	KSC Headquarters Building Area Solid Waste Management Unit 104
CONTAMINANTS:	Polychlorinated biphenyls in soil and concrete
CONTROL:	Prevent contact with soil and concrete

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Kennedy Space Center (KSC) Headquarters Building Area (KHQA; "the Site") of institutional controls that have been implemented at the Site[1]. Although there are no current unacceptable risks to human health or the environment associated with the KHQA, an institutional land use control (LUC) is necessary to prevent human health exposure to soil and concrete affected with polychlorinated biphenyls (PCBs) at the Site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

One chemical of concern (COC; total PCBs) exceeded applicable Florida Department of Environmental Protection (FDEP) Soil Cleanup Target Levels (SCTLs) and Toxic Substance Control Act (TSCA) screening criteria.

SITE DESCRIPTION

The Site currently consists of the KSC Headquarters Building (M6-0399), NASA Training Auditorium (M6-0351), Kennedy Learning Institute (M6-0570), Sewage Lift Station #1C (M7-0451), Helipad #7 (M6-0495A), asphalt parking areas, and mowed and maintained grassy areas. Several transformers are located throughout this area and were evaluated during Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) activities.

SITE LOCATION

The Site is bordered by NASA Parkway to the north, D Avenue SE to the east, 3rd Street SE to the south, and C Avenue SE to the west. The Site is bisected by two east-west streets; 1st Street SE is located between NASA Parkway and the north side of the Headquarters Building and 2nd Street SE is located between the south side of the

[1] *This LUCIP summarizes institutional controls regarding the NASA KHQA. For detailed information on the Site, consult the KHQA administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

Headquarters Building and the asphalt parking area (Figure 1).

The areas covered and the coordinates of the corners of the LUCIP in Location of Concern (LOC) 2D and LOC 2E are shown on Figure 2 and Figure 3, respectively. The coordinates are in the State Plane Coordinate System North American Datum (NAD) 1983, Florida East, meters

SITE CONTAMINATION AND CONTROL

Concentrations of total PCBs present in soil and concrete above applicable SCTLs and TSCA screening criteria are present in the vicinity of LOC 2D and LOC 2E. Activities to encapsulate the concrete in LOC 2E and cap soil in LOC 2D were completed in January and February 2011; therefore, the potential human health risk has been minimized to the extent possible until scheduled maintenance is performed that would allow for access to the affected soils and concrete pad. Additionally, bollards equipped with chains and signs noting the potential human health risk have been installed in these areas.

DECISION DOCUMENT

The KSC Remediation team (KSCRT) determined that institutional controls should be implemented at KHQA. The institutional controls will remain effective until corrective measures can be implemented to remove the PCB-affected soil and concrete.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that the encapsulated concrete has not been affected by Site activities that would permit human health exposure and provide for inspection of the bollards and chains restricting access to these areas.

[2] By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

REPORTING

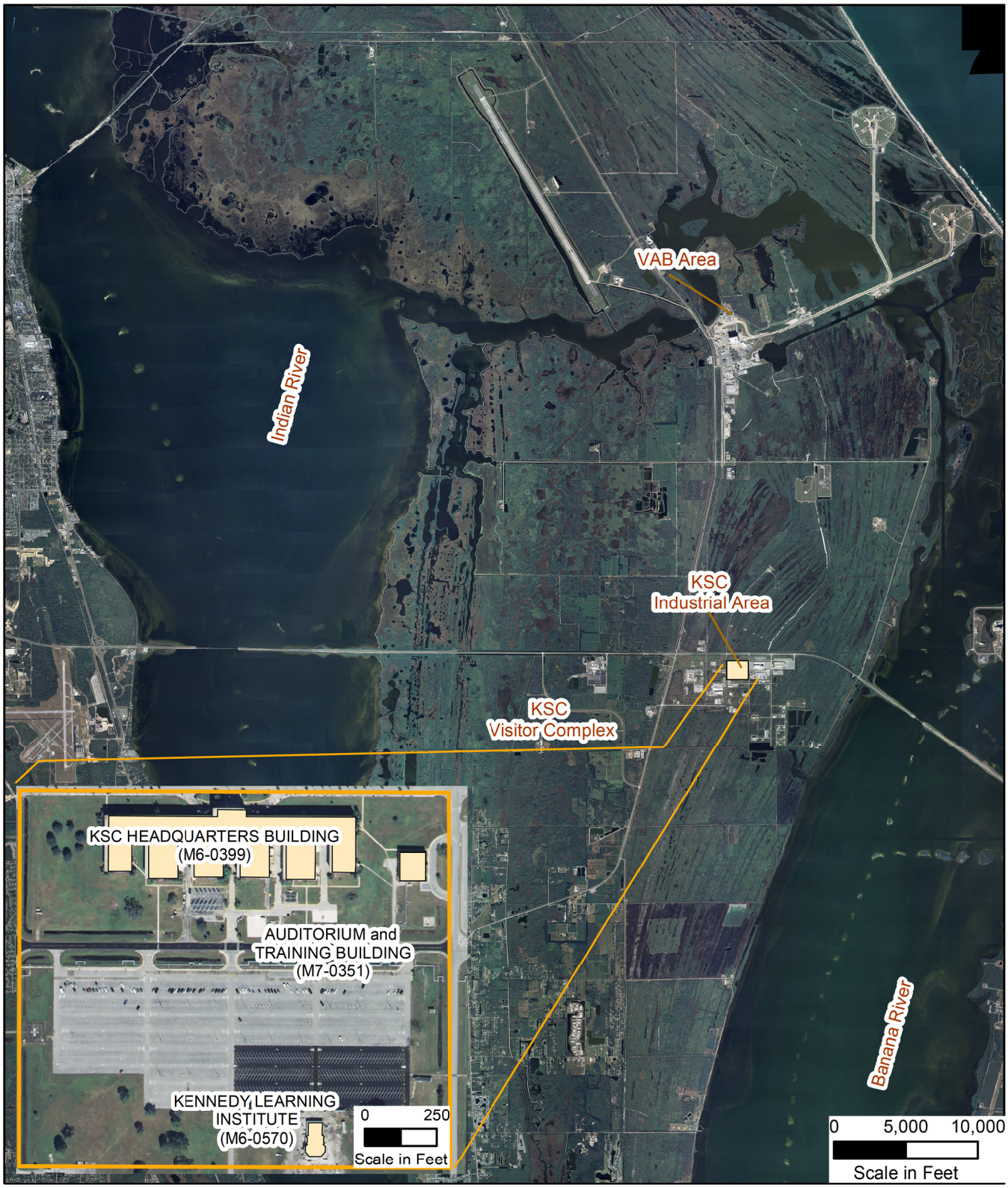
KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until corrective measures are implemented, or until the scenarios managed by the LUCIP are no longer a concern.



Legend

PRL Boundary

Structure

Notes:
KHQA - KSC Headquarters Building Area
KSC - Kennedy Space Center
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration
VAB - Vehicle Assembly Building

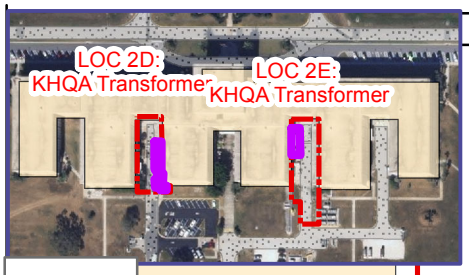
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Site Location Map
LUCIP

KSC Headquarters Building Area
NASA Kennedy Space Center, Florida

Project Number: TL014005.0002

Figure 1



Site Map

LOC 2D: KHQA Transformer

Point	Easting	Northing
1	234129.5717	464335.1369
2	234133.9016	464335.096
3	234133.9424	464314.8355
4	234134.8819	464314.8355
5	234134.9228	464307.1561
6	234137.0877	464307.1153
7	234137.0877	464304.1334
8	234132.9213	464304.1742
9	234132.8396	464305.7673
10	234129.6943	464305.8081
11	234129.6943	464311.1592
12	234132.4311	464313.0791
13	234129.3675	464317.4906

Notes
Coordinates are in State Plane North American Datum (NAD) 1983, Florida East, meters
KHQA - KSC Headquarters Building Area
KSC - Kennedy Space Center
LOC - location of concern
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration

Legend

- Coordinate Point
- LUCIP Area
- LOC
- Concrete
- Asphalt
- Structure
- Bollard
- Curb
- Electric Manhole
- Gravel
- Storm Sewer Manhole
- Electrical Equipment
- Concrete Ramp

0 10 20

Scale in Feet

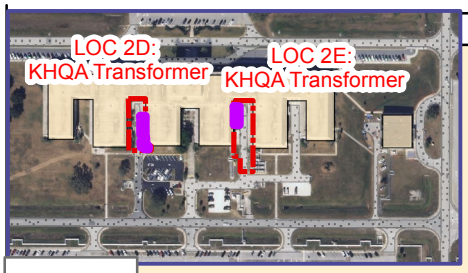
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LUCIP Area - LOC 2D
LUCIP

KSC Headquarters Building Area
NASA Kennedy Space Center, Florida

Project Number: TL014005.0002

Figure 2



Site Map

LOC 2E:
KHQA Transformer

1
2
3
4
5
6

Point	Easting	Northing
1	234216.5794	464343.7159
2	234221.8679	464343.7159
3	234222.0713	464326.6298
4	234218.5456	464326.6298
5	234218.5117	464321.1717
6	234216.5455	464321.2057

Notes
Coordinates are in State Plane North American Datum (NAD) 1983, Florida East, meters
KHQA - KSC Headquarters Building Area
KSC - Kennedy Space Center
LOC - location of concern
LUCIP - Land Use Control Implementation Plan
NASA - National Aeronautics and Space Administration

Legend

- Coordinate Point
- LOC
- LUCIP Area
- Concrete
- Asphalt
- Structure
- Bollard
- Curb
- Electric Manhole
- Gravel
- Storm Sewer Manhole
- Electrical Equipment
- Concrete Ramp

N

0 10 20

Scale in Feet

LUCIP Area - LOC 2E
LUCIP

KSC Headquarters Building Area
NASA Kennedy Space Center, Florida

Project Number: TL014005.0002

Figure 3

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Fire Station #6 Solid Waste Management Unit 106
CONTAMINANTS:	Vinyl Chloride in Groundwater, Polychlorinated Biphenyls in Soil
CONTROL:	Prohibit Groundwater Use, Prevent Exposure to Soil Under Active Transformer

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of Fire Station #6 (FS6; currently known as Fire Station No. 3) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with FS6, institutional land use controls (LUCs) are necessary to prohibit groundwater use at the site and to prevent exposure to soils under the site's active transformer pad. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Affected groundwater and soil were documented during the Confirmation Sampling and Resource Conservation and Recovery Act (RCRA) Facility Investigation activities at FS6. Vinyl chloride concentrations exceeding the Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Level (GCTL) were confirmed to the southeast of the groundwater storage tanks (J7-1387 and J7-1389). Additionally, a spill of transformer oil at the site was documented in 1991, and the soil underneath the active transformer (USS 1054) pad has concentrations of polychlorinated biphenyls (PCBs) above the FDEP Residential-Direct Exposure (R-) Soil Cleanup Target Level (SCTL). The current transformer pad is acting as a cap and preventing exposure to affected soils underneath the pad. Therefore, LUCs are required for groundwater and soil.

SITE DESCRIPTION

FS6 is located at Kennedy Space Center (KSC) and encompasses the facilities and associated structures along Pad B Road and includes 14 numbered structures and several unnumbered support structures. The numbered structures in the immediate LUC area include the following:

- SCAPE (Self-Contained Atmospheric Protective Ensemble) Building (J7-1338);

[1] *This LUCIP summarizes institutional controls regarding the NASA FS6. For detailed information on the site, consult the FS6 administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

- Emergency Response Building (J7-1339);
- Industrial Water Pumping Station (J7-1388);
- Groundwater Storage Tanks (J7-1387 and J7-1389); and
- Hazardous Waste Staging Buildings/ Portables (J7-1388B and J7-1388C).

SITE LOCATION

FS6 is located along Pad B Road in Section 4 of Township 22S, Range 37E, on the United States Geological Survey's 7.5-minute False Cape quadrangle map and encompasses approximately 6 acres (Figure 1). The facility is bordered by the SCAPE Building (J7-1338) and Emergency Response Building (J7-1339) immediately to the north, Pad B Road to the west, and wooded areas to the south and east. The groundwater and soil LUC areas covered by the LUCIP are presented on Figure 2 and Figure 3, respectively. The coordinates of the corners of the LUCs provided on Figure 2 and Figure 3 are in the US State Plane Coordinate System NAD 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

The concentration of vinyl chloride present in groundwater is above the FDEP GCTL, but is less than the FDEP Natural Attenuation Default Concentration. Since vinyl chloride in groundwater exceeds the FDEP GCTL, a LUC prohibiting the use of groundwater is required until the cleanup level is achieved.

The current and projected land use of FS6 does not include the use of site groundwater; therefore, there is no current or projected exposure risk.

The concentrations of PCBs in soil are above the FDEP R-SCTL. The past, current and projected future land use of FS6 is industrial in nature. Therefore, a LUC is required to maintain the integrity of the transformer pad to prevent contact with affected soil.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the site. The SB for this site is available for review by contacting the KSC Environmental Assurance Branch at telephone number 321-867-8402.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and

[2] By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use or integrity issues associated with the transformer pad could result in contact with the affected soil is occurring at the site.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this LUCIP.

MAINTENANCE

They shall remain in place until the concerns managed by the LUCIP are mitigated, or until there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern.

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Launch Complex 39 Observation Gantry (39OG)
Solid Waste Management Unit (SWMU) 107

CONTAMINANTS: Vinyl Chloride in Groundwater
CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Kennedy Space Center (KSC) Launch Complex 39 (LC39) Observation Gantry (39OG; "the Site") of institutional controls that have been implemented at the Site.[1] Although there are no current unacceptable risks to human health or the environment from groundwater associated with the 39OG, an institutional land use control (LUC) is necessary to prevent potential human health exposure to groundwater contaminated by vinyl chloride in the interim until the cleanup objective is attained. The controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Concentrations of vinyl chloride were detected at levels that exceeded the Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Level (GCTL).

SITE DESCRIPTION

The LC39 tour complex was constructed between 1998 and 1999. The area included in the Visitor Center Tour is enclosed by a 6-foot chain-link fence with two powered gates that provide access to the tour bus loop, one security-controlled gate that provides access to employees from the employee parking area located at the northeast section of the facility, and a locked gate behind the LC39 Tour Stop Exhibit Building that provides access to the air conditioning units located in a separate enclosure behind the facility.

The Site is currently developed with six numbered structures: LC39 Observation Gantry Exhibit Building (K7-0140); Guard House (K7-0140A); LC39 Observation Tower (K7-0141); LC39 Tour Stop Concession Building (K7-0142); Security Boathouse (K7-0287); and Marine Patrol Storage Building (K7-0288).

[1] *This Interim LUCIP summarizes institutional controls regarding the NASA 39OG. For detailed information on the Site, consult the 39OG administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-6971*

In addition to the numbered facilities, an unnumbered storage shed is located east of the LC39 Tour Stop Concession Building. Tour buses use the area east of the Security Boathouse as a staging area while waiting for visitors to return to the bus-loading area. The area located northeast of the Observation Gantry is used for vehicle and equipment parking.

SITE LOCATION

39OG is located within Section 9 of Township 22 South, Range 37 East, which is in the Orsino, Florida Quadrangle. The 39OG Area is shown on Figure 1. Coordinates of the corners of the groundwater use control area covered by this Interim LUCIP are provided on Figure 2 in the State Plane Coordinate System (North American Datum 1983 meters, Florida East).

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains vinyl chloride at concentrations greater than FDEP GCTLs. The past, current, and projected future land use of 39OG is industrial in nature. LUCs are required to prohibit the use of groundwater at the site until cleanup levels are achieved. The current and projected land use of 39OG does not include the use of site groundwater; therefore, there is no current or projected future exposure risk. Potential indoor air quality issues shall be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

The KSC Remediation Team determined that institutional controls should be implemented at 39OG. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their Resource Conservation and Recovery Act permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Upon approval of this Interim LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections will be conducted by KSC's Environmental Assurance Branch to confirm that the LUCs specified herein are in

[2] *By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

place and operating. The inspections will verify that no groundwater use is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this Interim LUCIP.

MAINTENANCE

The Interim LUCIP shall remain in place until a land use change is implemented or the concerns managed by the Interim LUCIP are mitigated based on analytical evidence indicating that the scenarios managed by the LUCIP are no longer a concern.

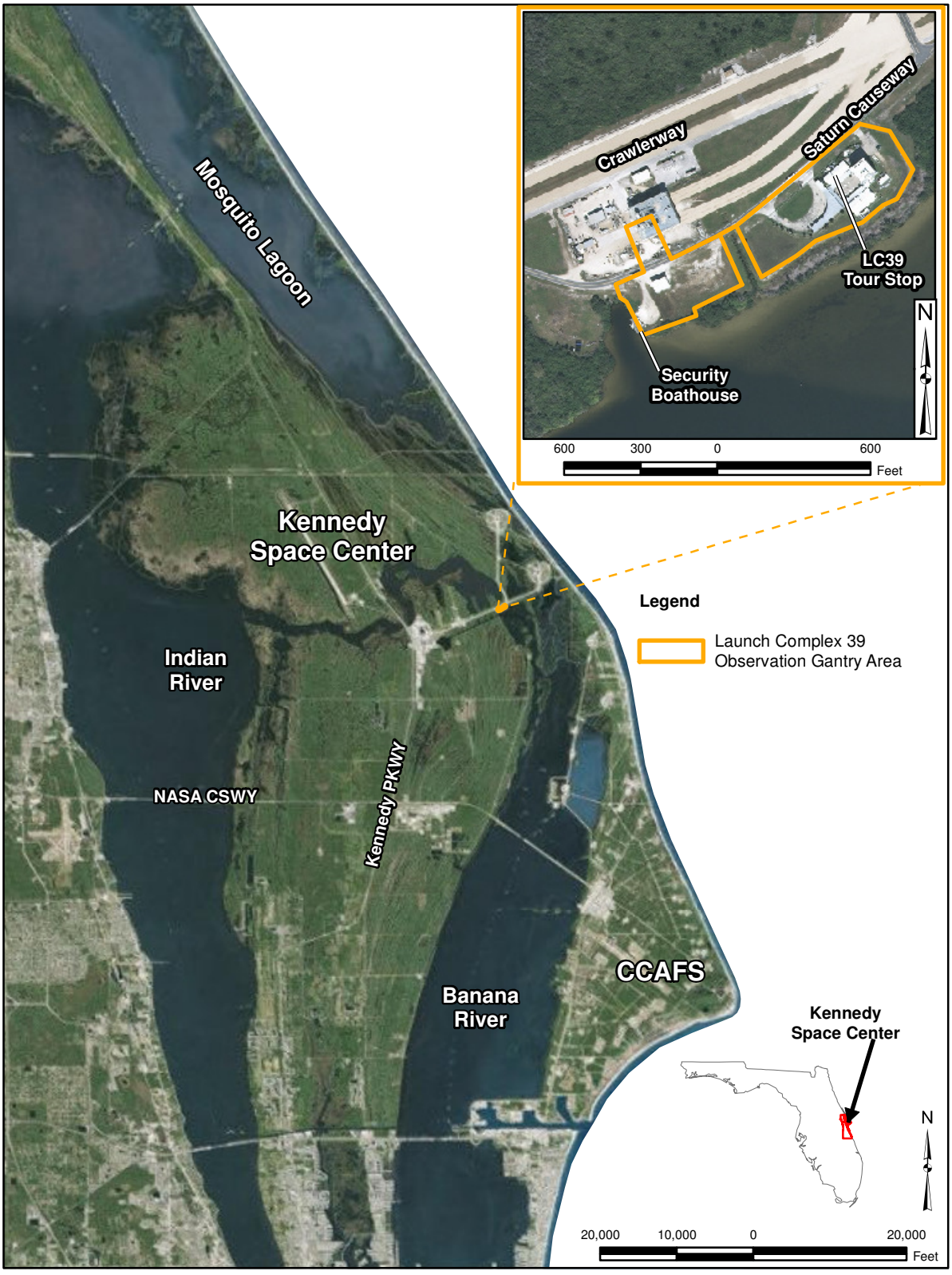
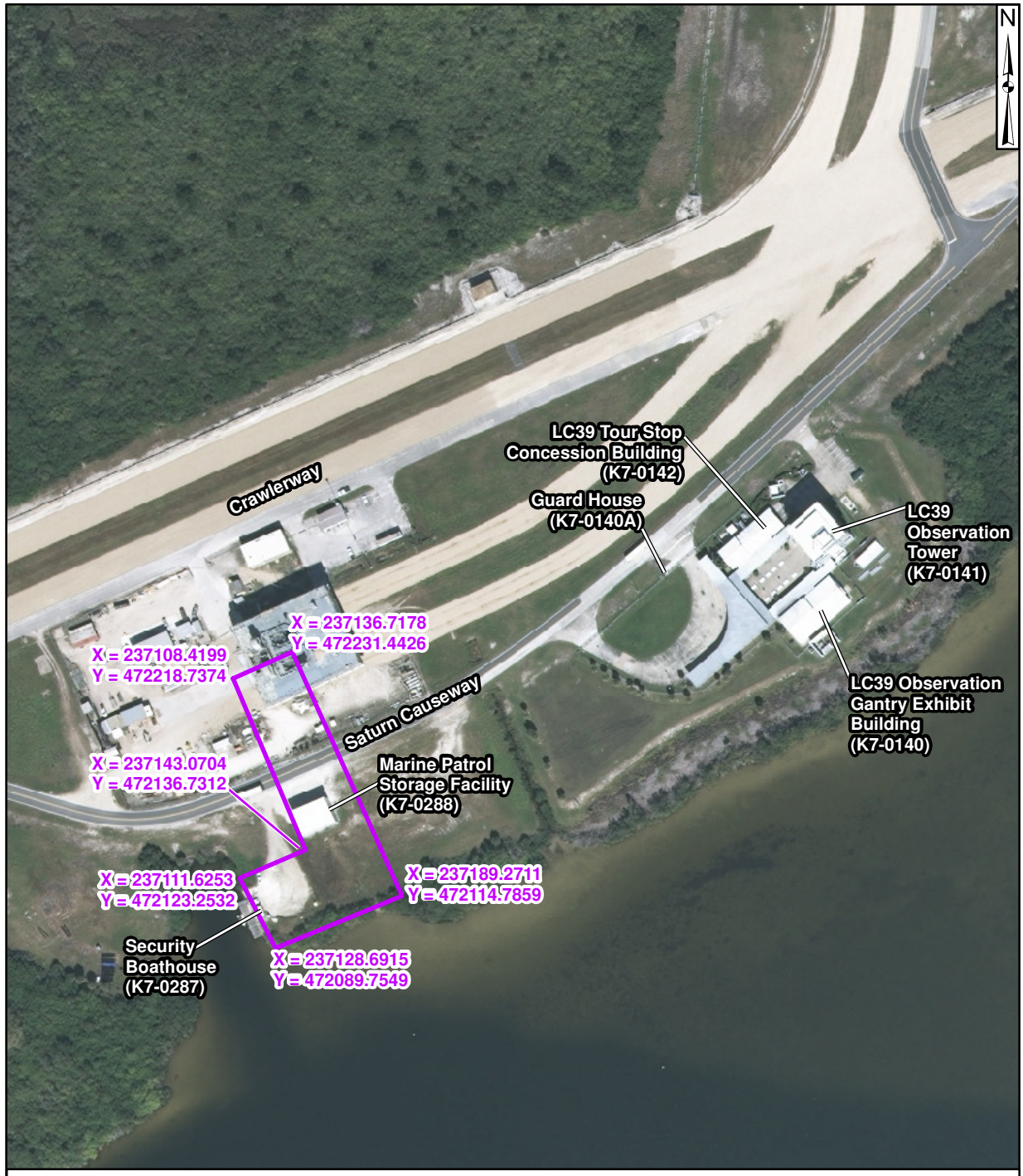


Figure 1
Launch Complex 39 Observation Gantry Area Site Location Map



Path: I:\Titusville-01\DATA\ T:\OGIS\FR2690_VABRA_OGA_soil_excavations\MXDs\20170706_OGA_LUCIP\Figure2_LUCIP.mxd 28 July 2017 MAH

Figure 2
Launch Complex 39 Observation Gantry Area Interim LUCIP Site Plan

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Mission Support Building Area Solid Waste Management Unit 108
CONTAMINANTS:	Vinyl chloride in groundwater
CONTROL:	Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Mission Support Building Area (MSBA) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with the MSBA, an institutional land use control (LUC) is necessary to prohibit groundwater use at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

One chemical of concern (COC; vinyl chloride) exceeded the Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTL). The COC was identified as posing potential human health risk during the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI).

SITE DESCRIPTION

The Site is currently developed with the Back-Up Generator Building (K6-1248) and the Operations Support Building II (OSBII; K6-1249), and Mission Support Building (MSB; K6-1298). The site contains parking areas that are shared by the MSB and OSBII along with a large grass field located east of the OSBII.

SITE LOCATION

The MSBA is located in the Vehicle Assembly Building (VAB) area of Kennedy Space Center (KSC). The facility is bordered by Saturn Causeway to the north; the Press Site to the east; wooded property to the south; and the Former Fire Station #2 (K6-1198), Back-Up Generator Building (K6-1248), and Utility Road to the west (Figure 1). The MSBA is located in Section 18, Township 23S, and Range 37E in the Orsino Quadrangle. The groundwater use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided on Figure 2 in the US State Plane

[1] *This LUCIP summarizes institutional controls regarding the NASA MSBA. For detailed information on the site, consult the MSBA administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

Coordinate System NAD 1983, meters, Florida East.

SITE CONTAMINATION AND CONTROL

Concentrations of vinyl chloride were present in groundwater above the FDEP GCTL but were less than the FDEP Natural Attenuation Default Concentration (NADC). Based on the site assessment and concentrations of vinyl chloride present at the Site, a long-term monitoring (LTM) plan was recommended and approved for the Site. Since groundwater exceeds the FDEP GCTL, LUCs prohibiting the use of groundwater are required until the cleanup level is achieved. The current and projected land use of the MSBA does not include the use of site groundwater; therefore, there is no current or projected exposure risk.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-12112, is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in the Memorandum of Agreement (MOA)[2] between NASA and the FDEP, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring at the site.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this LUCIP.

[2] By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to the FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

MAINTENANCE

The LUCIP shall remain in place until the concerns managed by the LUCIP are mitigated, or until there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the FDEP and implemented by modification of NASA's operating permit.



Notes:
KSC - Kennedy Space Center
LUCIP - Land Use Control Implementation Plan
MSBA - Mission Support Building Area
NASA - National Aeronautics and Space Administration
SWMU - Solid Waste Management Unit
VAB - Vehicle Assembly Building

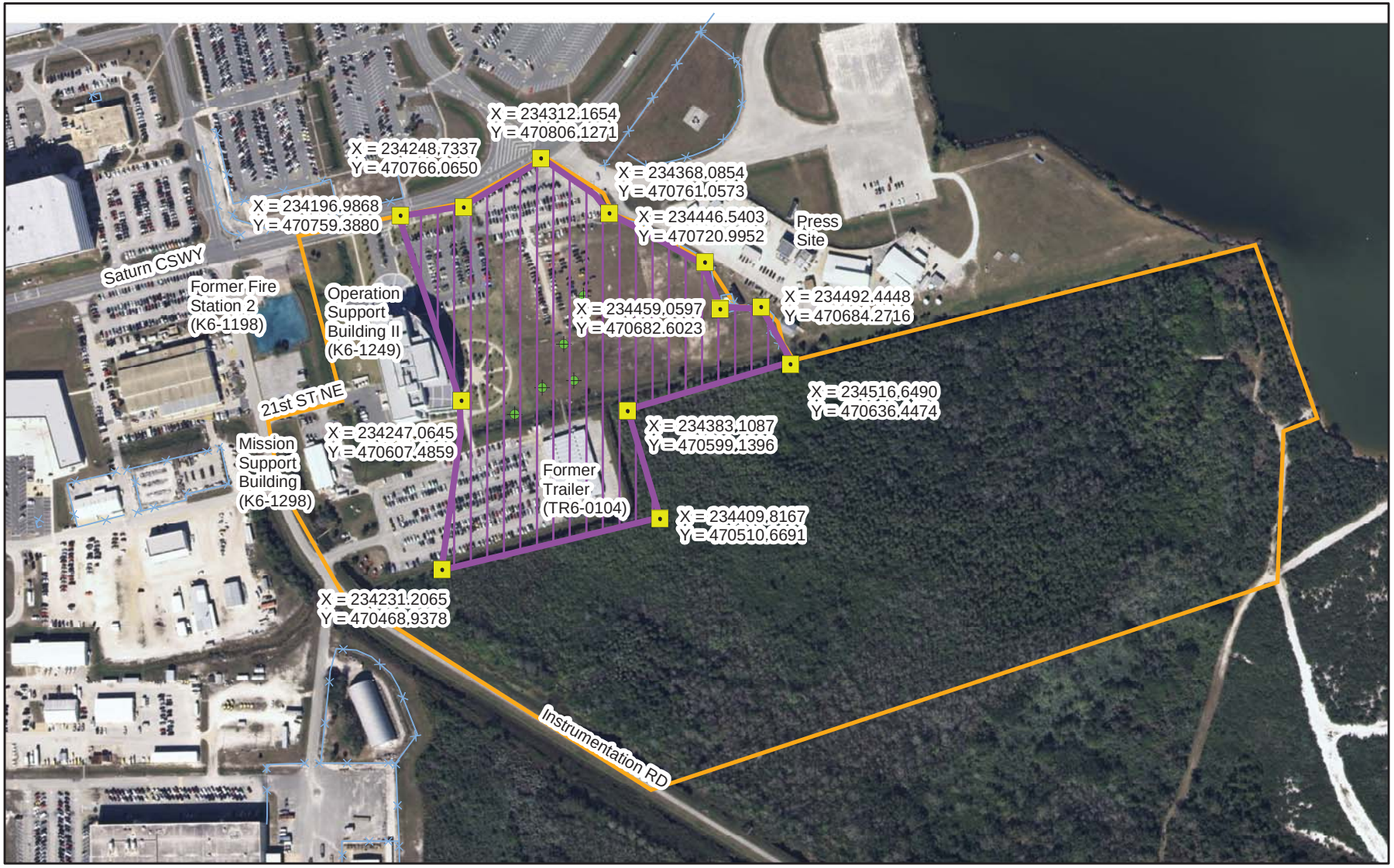
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Site Location Map - SWMU 108
Land Use Control Implementation Plan

Mission Support Building Area
NASA Kennedy Space Center, Florida

Project Number: TL014017.0001

Figure 1



Legend

- Monitoring Well Screened 2 to 12 ft bls
- Fence
- SWMU Boundary
- LUC Area

Notes:
Coordinates are shown in Florida State Plane East, meters
LUC - Land Use Control
MSBA - Mission Support Building Area
NASA - National Aeronautics and Space Administration
SWMU - Solid Waste Management Unit

0 200 400
Scale in Feet

N

Area Under Institutional Controls - SWMU 108
Land Use Control Implementation Plan

Mission Support Building Area
NASA Kennedy Space Center, Florida

Project Number: TL014017.0001

Figure 2

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY:	Launch Complex 39A Operations Support Building Area Solid Waste Management Unit 111
CONTAMINANTS:	Volatile Organic Compounds in Groundwater
CONTROL:	Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Launch Complex 39A Operations Support Building Area (AOSB) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with AOSB, institutional land use controls (LUCs) are necessary to prohibit the use of groundwater at the site and to prevent potential discharge of contaminated groundwater to adjacent surface water bodies that have been designated as Outstanding Florida Water (OFW). Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

During the Solid Waste Management Unit (SWMU) Assessment for the AOSB, nine Locations of Concern (LOCs) were identified and confirmatory sampling (CS) was recommended at all nine locations. Soil and groundwater samples were collected as part of CS activities. Based on the analytical results in the April 2018 CS Report, LOCs 2 through 9 meet the no further action (NFA) conditions for soil in subsection 62-780.680 (1), and LOCs 2 through 6, 8, and 9 meet the NFA conditions for groundwater.

LOC 1 (drainage outfall area) receives discharge from the parking lot of the AOSB. The flumes were designed to remove storm water from the parking lot, which does not have a permitted storm water system. The area was grandfathered in because it was built prior to 1983 and the promulgation of Chapter 62-373.414(12)(a), F.A.C. Additionally, several lines-of-evidence from the Florida Department of Environmental Protection (FDEP) Guidance for Comparing Background and Site Chemical Concentrations in soil indicate that site contaminants are not related because there has been no record of release into the environment at this site, the contaminant exceedances are located only within the confines of the storm water management feature, and the contamination appears to be the result of natural weathering of the site. In consideration of the above items, LOC 1 is not a waste cleanup site under the Resource Conservation and Recovery Act (RCRA) permit and should not have been

[1] *This LUCIP summarizes institutional controls regarding the NASA AOSB site. For detailed information on the site, consult the AOSB administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-6971.*

classified as a LOC. Since this location did not qualify as a waste cleanup site under the RCRA permit, FDEP approved removing LOC 1 as a LOC at AOSB.

Based on volatile organic compound (VOC) exceedances in groundwater at LOC 7 (By-Pass Road Eastern Laydown Area), a RCRA Facility Investigation (RFI) was recommended to delineate groundwater contamination at this location. The primary contaminants at AOSB are trichloroethene, cis-1,2-dichloroethene, and vinyl chloride.

SITE DESCRIPTION

The SWMU Assessment of AOSB (SWMU 111) consisted of facilities and structures along Saturn Causeway, Pad A By-Pass Road, and Samuel C. Phillips Parkway, to include 8 numbered structures. The numbered structures were as follows:

- Pad A Gate House (J8-2008),
- Operations Building No. 1 (J7-2009),
- Sewage Treatment Plan No. 8 (J8-2010),
- Rechlorination building (J8-2059),
- Pad A Operations Support Building (J8-2109)
- Survey Tower (J8-2190),
- Repeater building No. 4 (J8-2204); and
- Guard house (J8-2126).

The SWMU Assessment also included several unnumbered support structures and parking/lay down storage areas associated with site activities to include: five drainage outfall structures, gravel lined drainage area to the northwest of J8-2109), a former drain field at J8-2009, parking and lay down area to the northwest of J8-2109 and west of the crawlerway, former tank storage and temporary maintenance structures to the south of Pad A By-Pass Rd, and a concrete transformer pad to the northeast of Repeater Building 4. Only LOC 7 (By-Pass Road Eastern Laydown Area) was carried forward and included in SWMU 111.

The LOC 7 (By-Pass Road Eastern Laydown Area) formerly served as the eastern maintenance and laydown area to the southeast of Pad A By-Pass Road (Figure 1). It was identified because of the potential releases from tanks stored and activities related to maintenance structures at this location. According to aerials, this location was active between 1968 and 1992.

SITE LOCATION

AOSB encompasses approximately 0.06 square miles located along one side of Pad A By-Pass Road within Section 3, Township 22S, Range 37 E as shown on the U.S. Geological Survey (USGS) 7.5-minute False Cape, Florida topographic quadrangle map. The groundwater use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the State Plane Coordinate System NAD 1983, Florida East, meters.

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs at concentrations greater than FDEP Groundwater Cleanup Target Levels (GCTLs). The past, current, and projected future land use of AOSB is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site until cleanup levels are achieved. The current and projected land use of AOSB does not include the use of site groundwater; therefore, there is no current or projected exposure risk.

DECISION DOCUMENT

The KSCRT determined that interim institutional controls should be implemented at AOSB. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit, and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and Environmental Protection Agency (EPA), effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the RCRA permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating and will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated, or until there is a discovery, based on analytical evidence, that scenarios managed by the LUCIP are no longer a concern.

SITE-SPECIFIC DOCUMENT REFERENCES

Site-specific documentation is available for review by contacting the Environmental Assurance Branch at telephone number (321) 867-6971.

Figure 1. Location of the Kennedy Space Center and SWMU #111
SWMU #111 - Launch Complex 39A Operations Support Building Area

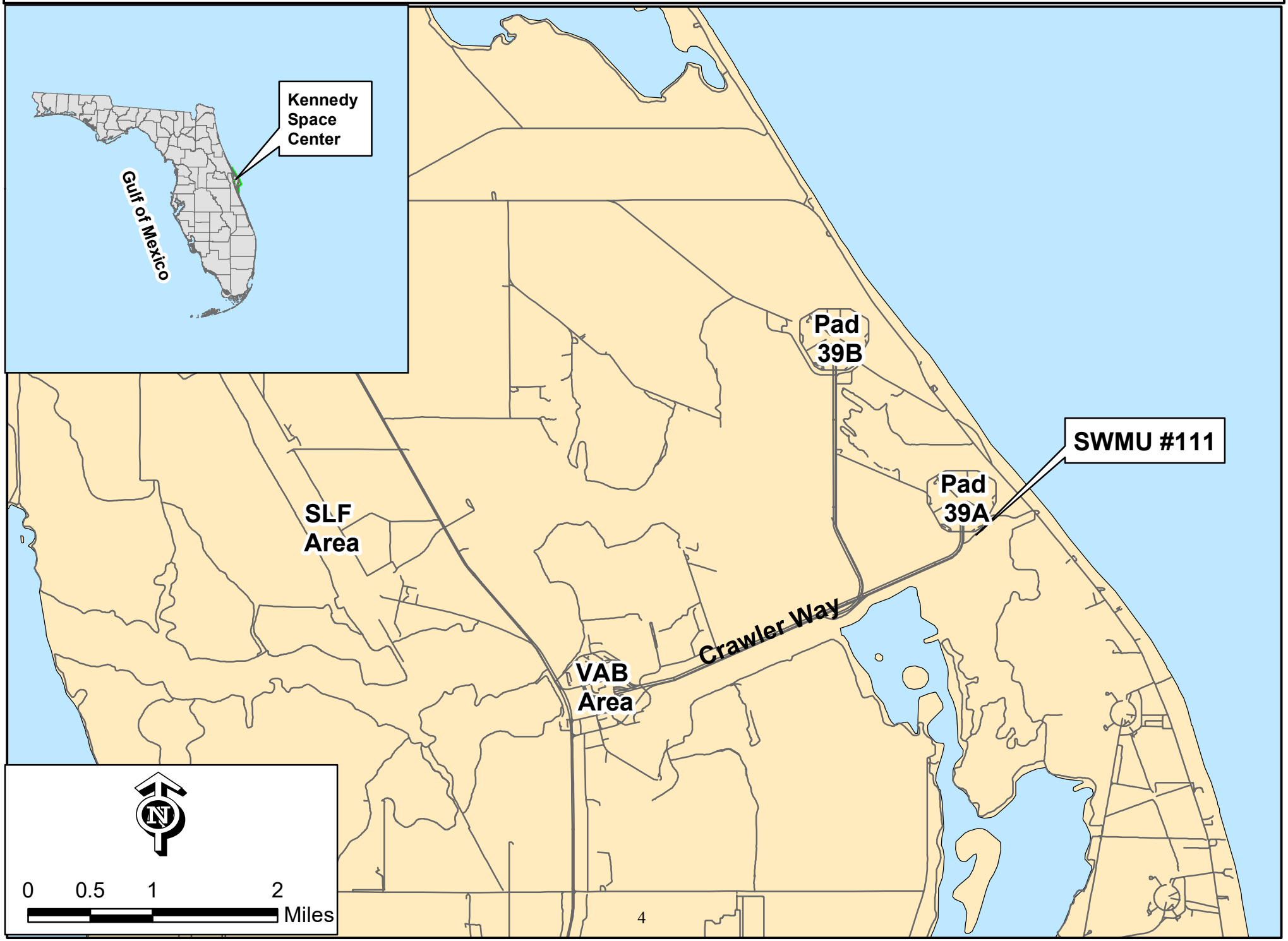
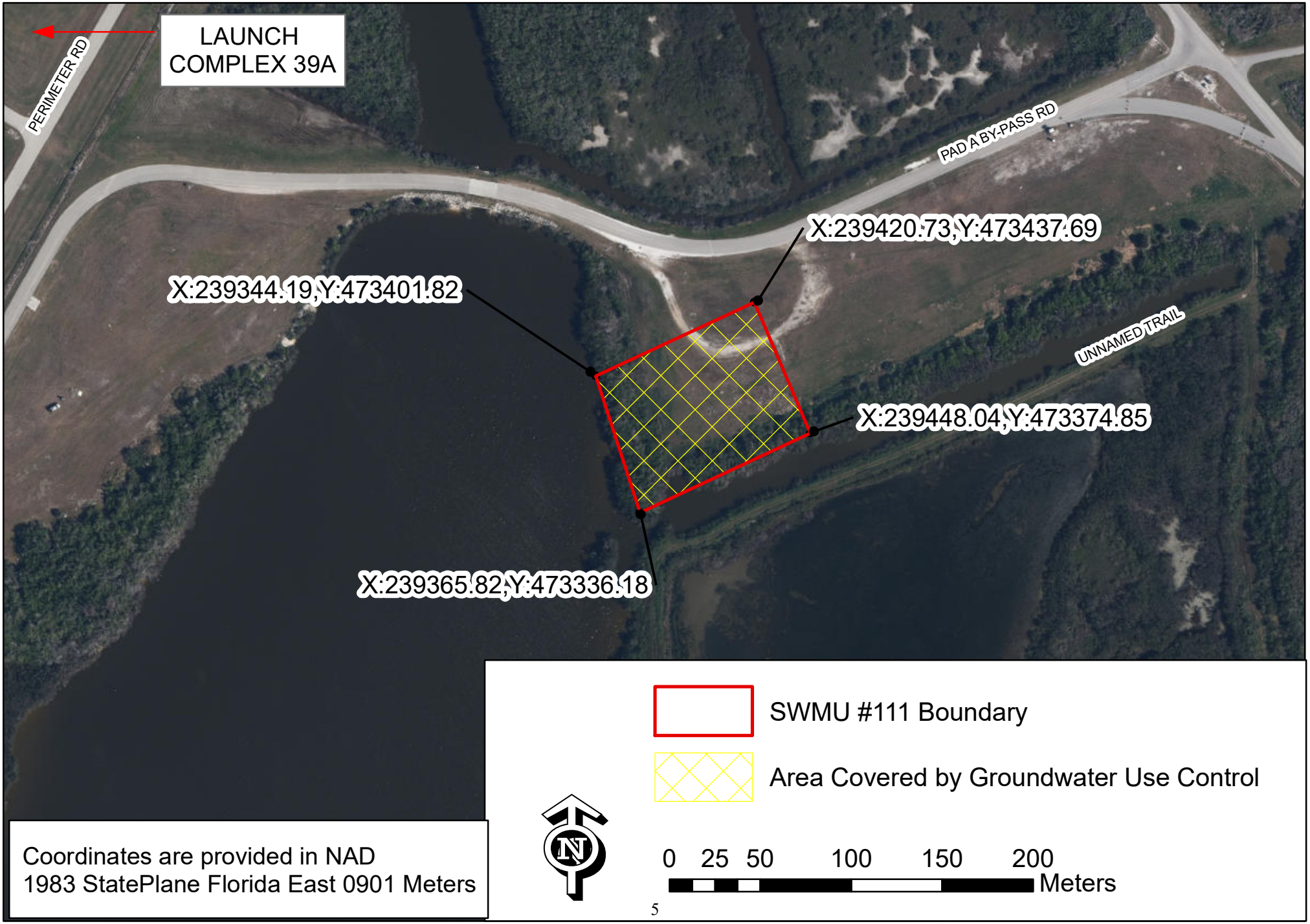


Figure 2. Launch Complex 39 Operations Support Building Area (AOSB) SWMU #111
Area Covered by Groundwater Land Use Controls



INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
CAPE CANAVERAL AIR FORCE STATION
BREVARD COUNTY, FLORIDA

FACILITY:	Launch Complex 34 Solid Waste Management Unit CC054
CONTAMINANTS:	Volatile Organic Compounds (VOCs) and Polychlorinated Biphenyls (PCBs) in Groundwater, and PCBs in Soil and Concrete
CONTROL:	Prohibit Groundwater Use and Residential and Industrial Exposure to Soil and Concrete

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of Launch Complex 34 (LC34) of institutional and engineering controls that have been implemented at the site[1]. Although most areas at LC34 do not pose current unacceptable risks to human health or the environment, areas of soil with contaminant concentrations exceeding Florida Department of Environmental Protection (FDEP) residential, industrial, and leachibility Soil Cleanup Target Levels (SCTLs) and groundwater with contaminant concentrations exceeding FDEP Groundwater Cleanup Target Levels (GCTLs) have been identified. Institutional land use controls (LUCs) are necessary to prohibit groundwater use, and institutional and engineering LUCs are necessary to prohibit residential and industrial exposure to soils and concrete at the site. Controls will include periodic inspection, fence maintenance, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

From 1960 to 1968, during National Aeronautics and Space Administration's (NASA's) Apollo Space Program, the LC34 launch pad was used for launching Saturn rockets. Launch operations included the storage, transport, and use of nitrogen, helium, liquid oxygen, RP-1 fuel, liquid hydrogen, hydrazine, and nitrogen tetroxide. Historical information suggests that rocket engines and other parts were cleaned at the site using solvent degreasers, most notably trichloroethene (TCE). It is speculated that releases of solvents occurred during cleaning operations through both intentional and unintentional discharges to nearby areas. Based on groundwater sampling data, these releases occurred primarily in the immediate vicinity of the Engineering Support Building (ESB). Chlorinated solvents are present in groundwater at trace to high concentrations in dissolved form, and TCE is also present as a dense non-aqueous phase liquid (DNAPL) in the former ESB area. Several investigations were completed at the site under the Resource Conservation and Recovery Act (RCRA) program, and contaminants of concern (COCs) were identified in groundwater at concentrations greater than FDEP GCTLs.

[1] *This Interim LUCIP summarizes institutional and engineering controls regarding the NASA LC34 site. For detailed information on the site, consult the LC34 administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-6971.*

A site-wide soil investigation began in September 2014 to evaluate contaminants in soil resulting from former launch activities. The investigation confirmed the presence of COCs in soil at concentrations greater than FDEP SCTLs, and additional investigations were conducted to determine the extent of contamination.

SITE DESCRIPTION

Solid Waste Management Unit (SWMU) CC054 consists of the LC34 launch pad and associated facilities surrounded by grassy and dense forested areas. Following deactivation of the launch pad in 1968, LC34 has remained largely inactive, although several buildings remained operational. Most operational equipment, including service towers, fuel storage tanks, and piping, was dismantled and the majority of the on-site buildings and structures were abandoned in place. LC34 was declared part of the Man in Space National Historic Landmark in 1984.

A number of site groundwater investigations, engineering studies, and pilot-scale in-situ remedial technology demonstrations have been performed since site investigations initiated in 1993. A hydraulic containment system (HCS) is currently operating in the former ESB area to hydraulically contain and treat the DNAPL source zone and deep high-concentration plume with TCE concentrations greater than 300 micrograms per liter (µg/L). Groundwater extracted from the HCS is treated via air strippers and polished through liquid-phase granular activated carbon, as needed, to meet GCTLs prior to discharge into on-site injection wells and infiltration galleries. Off-gas laden with volatile organic compounds (VOCs) is treated through a catalytic oxidizer and scrubber system to ensure emissions are less than Hazardous Air Pollution (HAP) requirements specified in the KSC Title V Air Permit for Remedial Activities. Outside of the DNAPL source zone, air sparging is used to treat high concentrations of TCE daughter products. The primary groundwater contaminants at LC34 are TCE and degradation daughter products, including cis-1,2-dichloroethene and vinyl chloride. A small area within the VOC plume also contains PCBs in groundwater at concentrations greater than the FDEP GCTL.

Soil interim measures were conducted in 2018-2019 to excavate soils contaminated with PCBs, total recoverable petroleum hydrocarbons (TRPH), and dioxins/furans. All areas were remediated to the FDEP residential SCTL, with the exception of one area where a bank of electrical equipment was previously located near the launch pad. In this area, PCBs remain above the FDEP residential SCTL in soil and concrete; this area is also where PCBs are present in groundwater above the FDEP GCTL. PCBs are the only remaining COC in soil and concrete at the site.

SITE LOCATION

LC34 is located on Cape Canaveral Air Force Station (CCAFS) and is bordered by the Atlantic Ocean to the east (Figure 1). LC34 is found in Section 6, Township 23S, Range 38E, as shown on the 7.5-minute False Cape topographic quadrangle map. The groundwater land use control area covered by this Interim LUCIP is shown on Figure 2. Figure 3 shows the soil excavation areas completed in 2018-2019. All excavation areas were remediated to the FDEP residential SCTL, with the exception of one area near the launch pad where PCBs remain in soil and concrete above the FDEP residential SCTL. The remaining soil and concrete land use control area covered by this Interim LUCIP is shown on Figure 4.

Coordinates of the corners for the groundwater, and soil and concrete LUC areas are provided on Figures 2 and 4 in the State Plane Coordinate System, North American Datum (NAD) 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs and PCBs at concentrations greater than FDEP GCTLs. Soil and concrete in one area at the site has concentrations of PCBs greater than residential, industrial, and leachability SCTLs. The soil LUCs are located beneath a concrete bay where electrical equipment was previously located, and the concrete LUCs are associated with the concrete bay itself and a concrete footer for an adjacent cable tray wall. The soil and concrete was left in-place using a risk-based approach under 40 CFR 761.61(c) *(PCB remediation waste; Risk-based disposal approval)* due to the site's National Historic Landmark status. A fence is being used as an engineering control to prevent exposure to PCBs in soil and concrete in this area (Figure 4). Soils outside of the fenceline were removed or evaluated using a risk-based 95-percent upper confidence level (UCL) approach and are not part of the LUC.

The past, current, and projected future land use of LC34 is industrial in nature. Because concentrations of VOCs and PCBs in groundwater exceed GCTLs, and concentrations of PCBs in soil and concrete exceed residential, industrial, and leachability SCTLs, LUCs are required to prohibit the use of groundwater and to prohibit residential and industrial exposures to soil and concrete until cleanup levels are achieved. The current and projected future use of LC34 does not include the use of site groundwater; therefore, there are no current or projected exposures to contaminants in groundwater. Prior to any construction activities that may occur within the groundwater land use control area, potential exposure issues (i.e., from dewatering) and management of exposed groundwater will be evaluated. Indoor air quality will also be evaluated prior to any construction within the groundwater use control area.

DECISION DOCUMENT

The Kennedy Space Center (KSC) Remediation Team determined that interim institutional and engineering controls should be implemented at LC34 while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional and engineering controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and United States Environmental

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

Protection Agency (EPA), effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office and CCAFS Installation Restoration Program with survey coordinates of the LC34 LUC areas. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use or residential or industrial exposure to soil and concrete is occurring at the site.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this Interim LUCIP.

MAINTENANCE

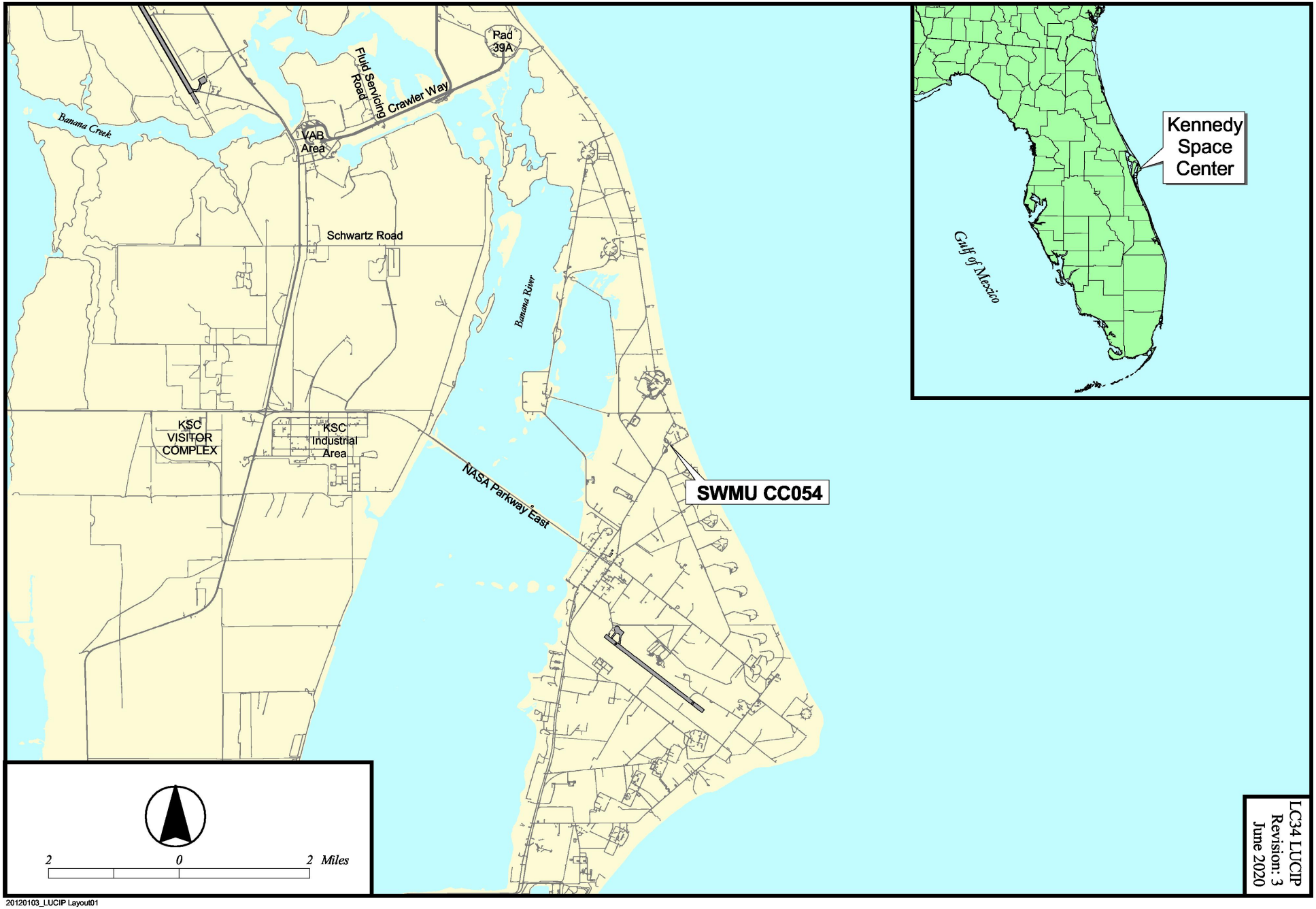
The Interim LUCIP shall remain in place until a land use change is implemented or the concerns managed by the Interim LUCIP are mitigated; or until there is a discovery, based on analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.

SITE-SPECIFIC DOCUMENT REFERENCES

Site-specific documentation is available for review by contacting the Environmental Assurance Branch at telephone number (321) 867-6971.

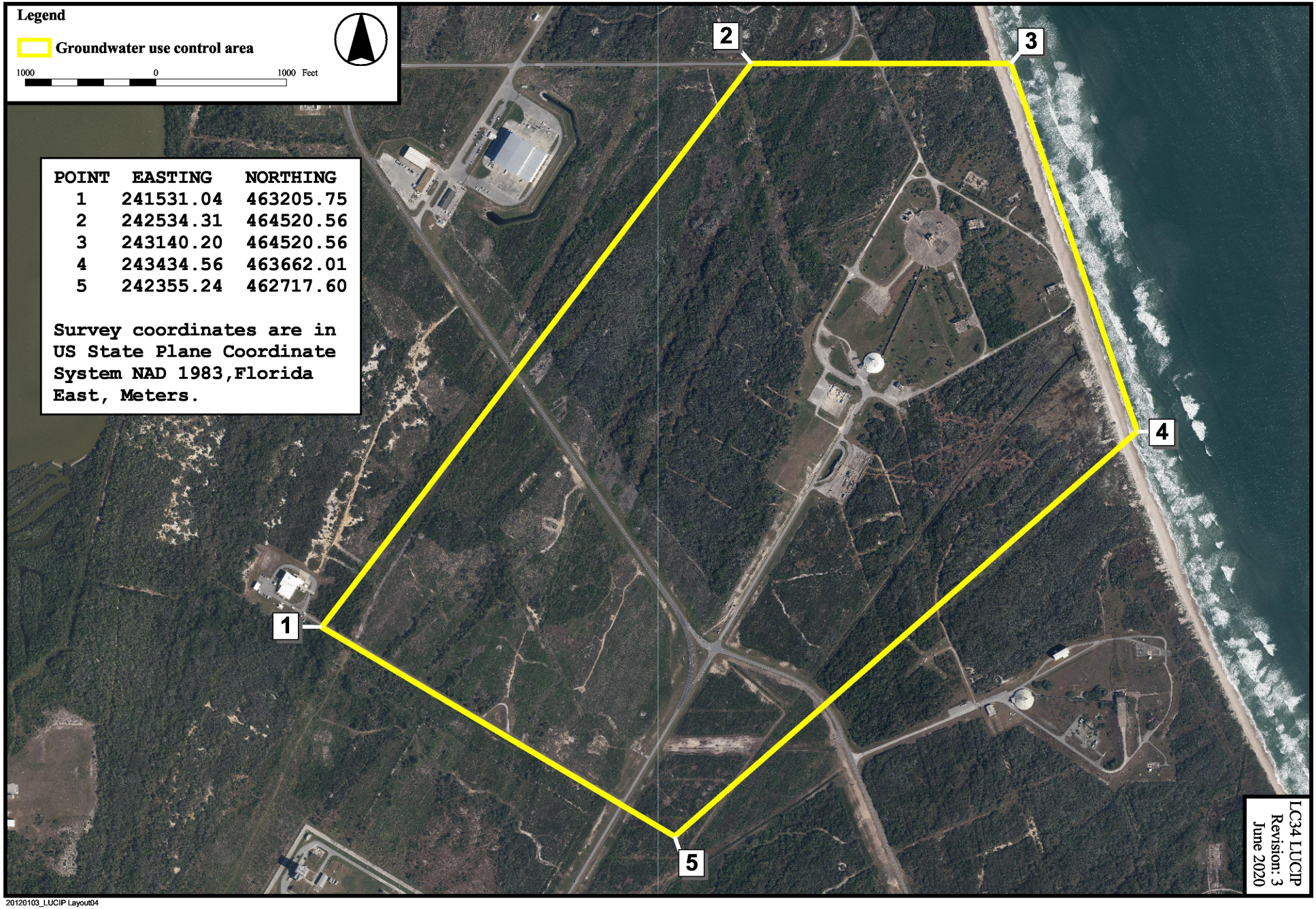
FIGURE 1 LOCATION OF KENNEDY SPACE CENTER AND SWMU CC054

SWMU CC054 - LAUNCH COMPLEX 34, CAPE CANAVERAL AIR FORCE STATION, FLORIDA



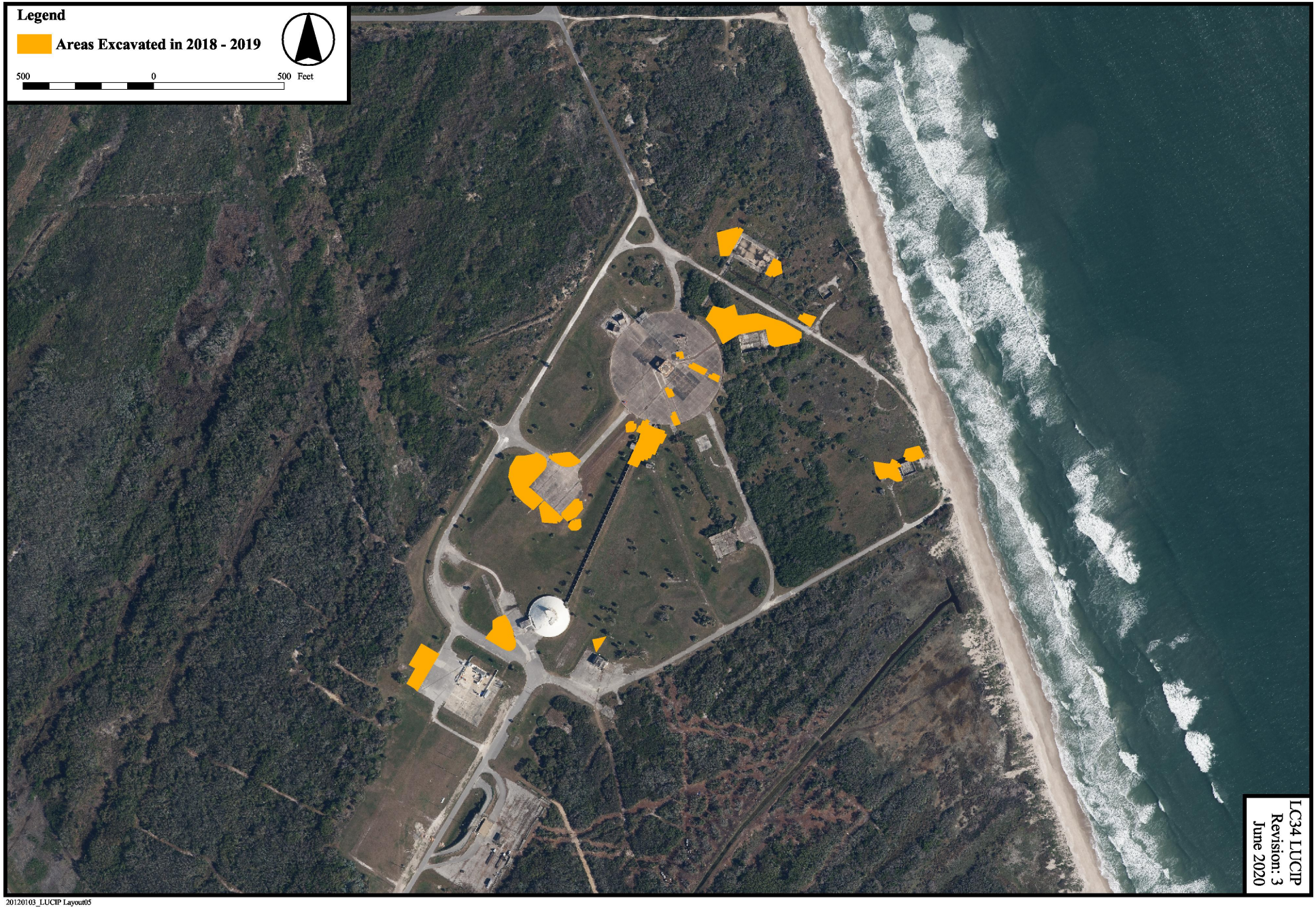
20120103_LUCIP Layout01

FIGURE 2 GROUNDWATER LAND USE CONTROL AREA
SWMU CC054 - LAUNCH COMPLEX 34, CAPE CANAVERAL AIR FORCE STATION, FLORIDA



20120103_LUCIP Layout04

FIGURE 3 AREAS EXCAVATED IN 2018 - 2019
SWMU CC054 - LAUNCH COMPLEX 34, CAPE CANAVERAL AIR FORCE STATION, FLORIDA

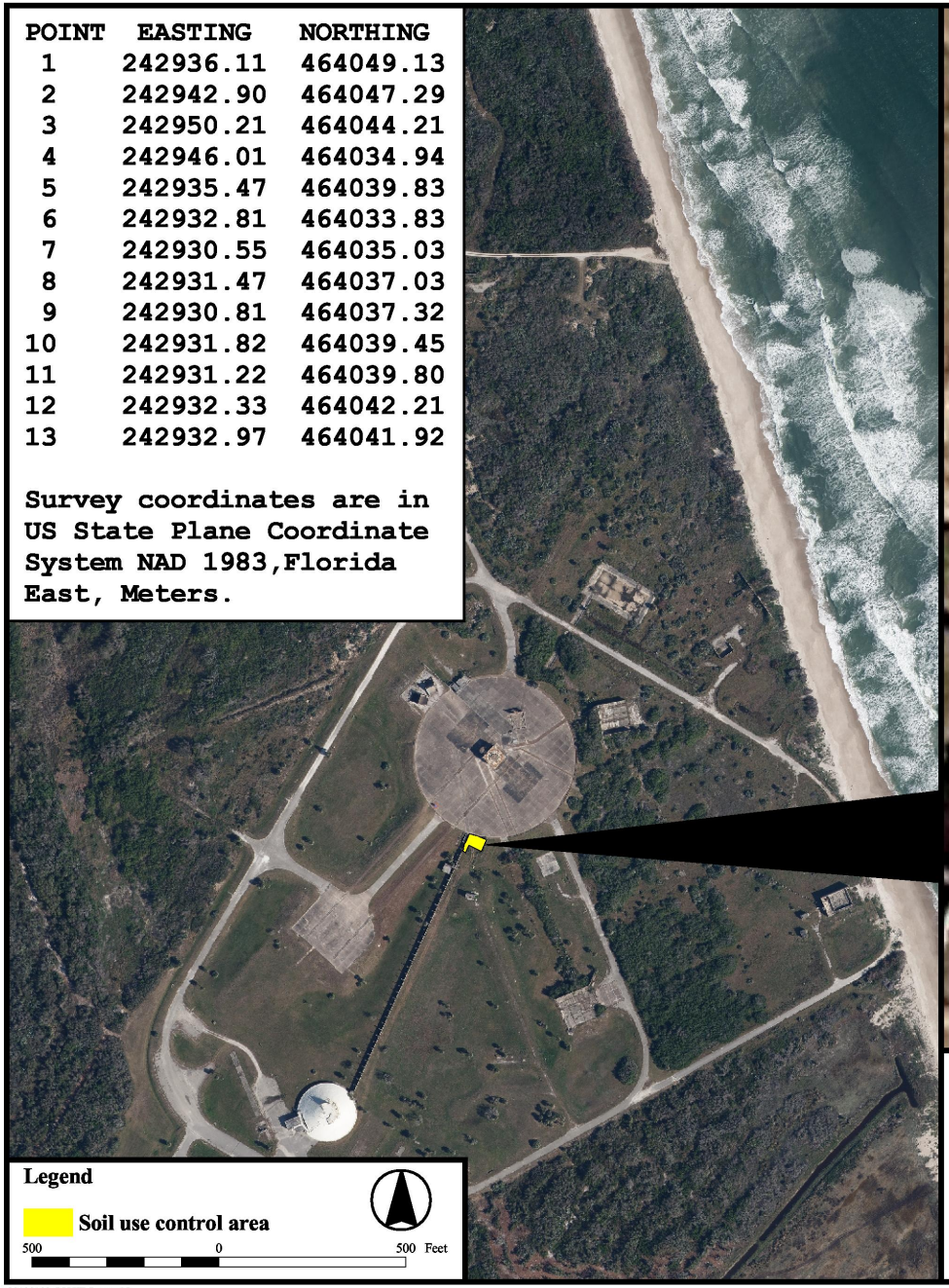


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FIGURE 4 SOIL AND CONCRETE LAND USE CONTROL AREA
SWMU CC054 - LAUNCH COMPLEX 34, CAPE CANAVERAL AIR FORCE STATION, FLORIDA

POINT	EASTING	NORTHING
1	242936.11	464049.13
2	242942.90	464047.29
3	242950.21	464044.21
4	242946.01	464034.94
5	242935.47	464039.83
6	242932.81	464033.83
7	242930.55	464035.03
8	242931.47	464037.03
9	242930.81	464037.32
10	242931.82	464039.45
11	242931.22	464039.80
12	242932.33	464042.21
13	242932.97	464041.92

Survey coordinates are in US State Plane Coordinate System NAD 1983,Florida East, Meters.





Legend

Fence with man gate

Area to be managed by land use controls for contaminated concrete and soils left in place (PCBs > 0.5 mg/kg) and engineering controls (fence).

20 0 20 Feet

LC34 LUCIP
Revision: 3
June 2020

20120103_LUCIP Layout05

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Launch Equipment Shop
Potential Release Location 051
CONTAMINANTS: Polynuclear Aromatic Hydrocarbons and Total Recoverable Petroleum Hydrocarbons in Groundwater
CONTROL: Prohibit Groundwater Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Launch Equipment Shop (LES) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with LES, certain land use controls (LUCs) are necessary to prevent the potential for future risks at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

The Site Assessment Report and Addenda determined that contaminants of concern (COCs) with concentrations exceeding Florida Department of Environmental Protection (FDEP) and United States Environmental Protection Agency (EPA) cleanup target levels include polynuclear aromatic hydrocarbons (PAHs) and total recoverable petroleum hydrocarbons (TRPH) in groundwater.

SITE DESCRIPTION

Potential Release Location (PRL) 051 includes a manufacturing shop for shuttle ground support and facilities. Individual shops within the building include a machine shop, electrical shop, sheet metal shop, and welding shop. The LES building also contains offices for planning and scheduling. The Site Assessment began with the removal of a 4,000-gallon diesel underground storage tank and was limited to the northeastern corner of the facility. Initial tank closure activities conducted in 1996 confirmed the presence of soil and groundwater contamination. Approximately 178 tons of petroleum-contaminated soil were removed and properly disposed of during two source removals in 1996 and 2000. Petroleum-contaminated soils with concentrations greater than SCTLs were left in place to avoid disturbance of underground utilities and to a trailer and shed located at the southern edge of the excavation. A pilot-scale study was conducted between June 2007 and

[1] *This Interim LUCIP summarizes institutional controls regarding the NASA LES site. For detailed information on the site, consult the LES administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

February 2009 to evaluate oxidation of hydrocarbon contamination in soil and groundwater via injection of RegenOx™. A subsequent test was conducted to determine the effectiveness of ozone injections. Based on favorable results, the ozone oxidation system was reconfigured, and operation began in October 2010. Operation will continue until TRPH groundwater concentrations are less than FDEP Groundwater Cleanup Target Levels (GCTLs).

SITE LOCATION

LES includes a parking area and grassy area located southwest of the Vehicle Assembly Building (VAB) area, on the southern side of Saturn Causeway (Figure 1). LES is located in Section 18, Township 22S, Range 37E, as shown on the 7.5-minute Orsino topographic quadrangle map. The groundwater use control area covered by the Interim LUCIP is shown on Figure 2. Coordinates of the corners of the LUC area are provided on Figure 2 in the State Plane Coordinate System, North American Datum (NAD) of 1983, Florida East, meters.

SITE CONTAMINATION AND CONTROL

Concentrations of COCs in groundwater at the site are greater than FDEP GCTLs. The past, current, and projected future land use of LES is industrial in nature. LUCs are therefore required to prohibit the use of groundwater at the site until cleanup levels are achieved. The current and projected land use of LES does not include the use of site groundwater; therefore, there is no current or projected future exposure risk.

DECISION DOCUMENT

The Kennedy Space Center (KSC) Remediation Team determined that interim institutional controls should be implemented at LES. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their Resource Conservation and Recovery Act (RCRA) permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Property transfer (if

[2] By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

implemented in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUC areas. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating and will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no groundwater use is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

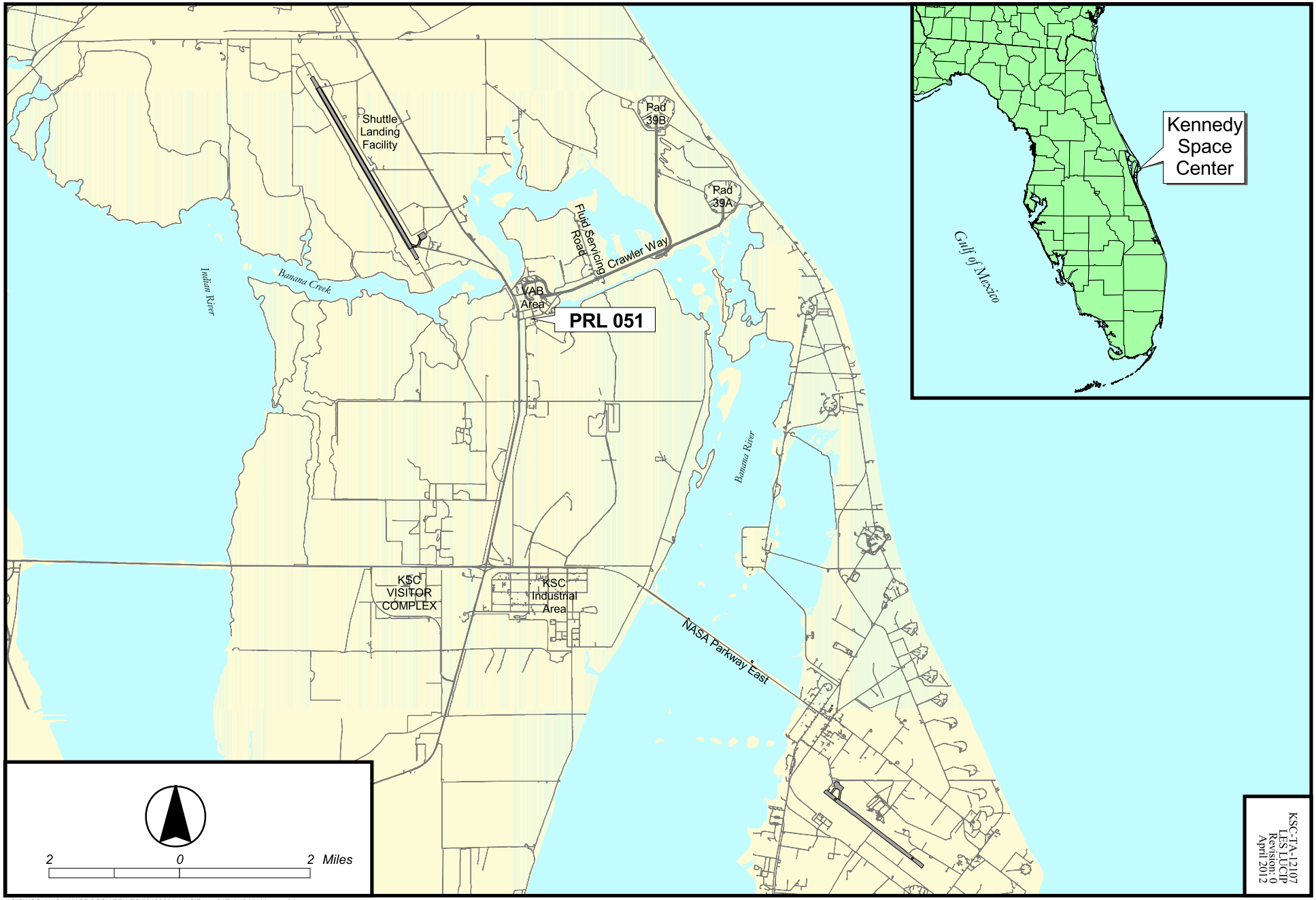
KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this Interim LUCIP.

MAINTENANCE

The Interim LUCIP shall remain in place until a land use change is implemented and the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based on analytical evidence, that scenarios managed by the Interim LUCIP are no longer a concern.

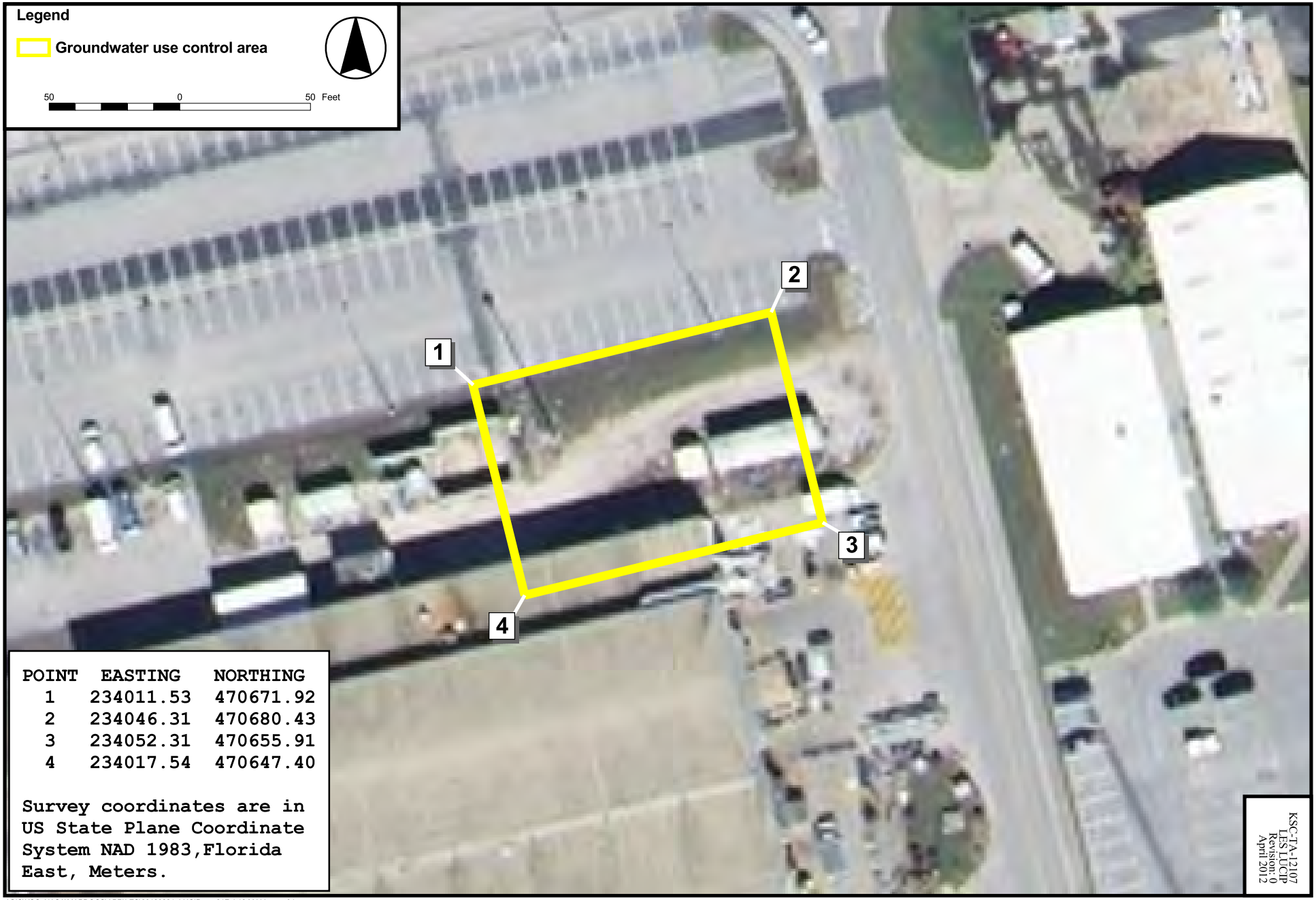
FIGURE 1 LOCATION OF KENNEDY SPACE CENTER AND PRL 051

PRL 051 - LAUNCH EQUIPMENT SHOP, KENNEDY SPACE CENTER, FLORIDA



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FIGURE 2 LAND USE CONTROL AREA
PRL 051 - LAUNCH EQUIPMENT SHOP, KENNEDY SPACE CENTER, FLORIDA



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LAND USE CONTROL IMPLEMENTATION PLAN
KENNEDY SPACE CENTER
CHILD DEVELOPMENT CENTER, PRL 149
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FACILITY: Kennedy Space Center Child Development Center
Potential Release Location 149
CONTAMINANTS: Arsenic
CONTROL: Maintain Existing Pour-in-Place Surfaces and Concrete Sidewalks in Playground Area

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Kennedy Space Center Child Development Center (KCDC) of institutional controls that have been implemented at the site[1]. Although there are no known unacceptable risks to human health or the environment associated with the KCDC site, institutional land use controls (LUCs) are necessary to prevent contact with subsurface soils at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Surface soil impacts from arsenic were documented in the area of the current pour-in-place playground surfaces. Soils below the 0.5 ft excavation were not sampled. A complete exposure pathway does not exist due to the installation of the impervious cover. Therefore, land use controls are needed to ensure that the impervious surfaces within the fenced area of the KCDC remain unaltered.

SITE DESCRIPTION

The KCDC was constructed in 1990 specifically as a child care center for KSC employees. Prior to 1990 the area was undeveloped. The KCDC is a 6,776 square foot single story concrete block building. The building was previously owned by an outside company, Tutor Time-Space Coast, Inc.; however, ownership transferred to NASA in October 1996. The facility is comprised of classrooms, offices, open play areas, staff lounge, lunch room, kitchen, and outside playgrounds. The facility parking lot areas are located to the south and west of the building and include a semi-circular covered driveway, all are paved with concrete. The outside playground areas are located on the northeast side of the building and enclosed with privacy fencing. Within the fenced area, the playground consists of grassy areas with picnic tables, areas sealed with a pour-in-place rubberized surface, and

[1] *This LUCIP summarizes institutional controls regarding the KCDC. For detailed information on the site, consult the KCDC administrative file, which is available for review by contacting the KSC Environmental Program Office at telephone number (321) 867-8411.*

concrete sidewalks. The playground equipment currently consists of modular plastic structures. The site location with inset showing the site layout is shown on Figure 1.

SITE LOCATION

The KCDC is located on Fifth Street, east of Kennedy Parkway South (SR-3), in the southwestern portion of the KSC Industrial Area. The land use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Soil at the site contained arsenic above FDEP's Residential Soil Cleanup Target Level (SCTL). Based on the Solid Waste Management Unit (SWMU) Assessment (SA), three of four identified Locations of Concern (LOCs) were excavated and backfilled and the wooden fence was removed and replaced with recycled-plastic fencing. LUCs were recommended for the fourth LOC, the impervious playground surfaces including the pour-in-place rubberized playground surfaces and concrete sidewalks, to prevent contact with subsurface soils in that area of the KCDC facility.

IMPLEMENTATION

Institutional controls will be implemented by the Kennedy Space Center (KSC) Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between the National Aeronautics and Space Administration (NASA), FDEP, and the Environmental Protection Agency (EPA), effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Program Office will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by

[2] *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

KSC's Environmental Program Office. The inspection will verify that the impervious playground surface is maintained therefore preventing contact with the subsurface soils in this area.

REPORTING

KSC's Environmental Program Office will submit annual reports to the EPA and FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Program Office will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the FDEP and implemented by modification of NASA's operating permit.

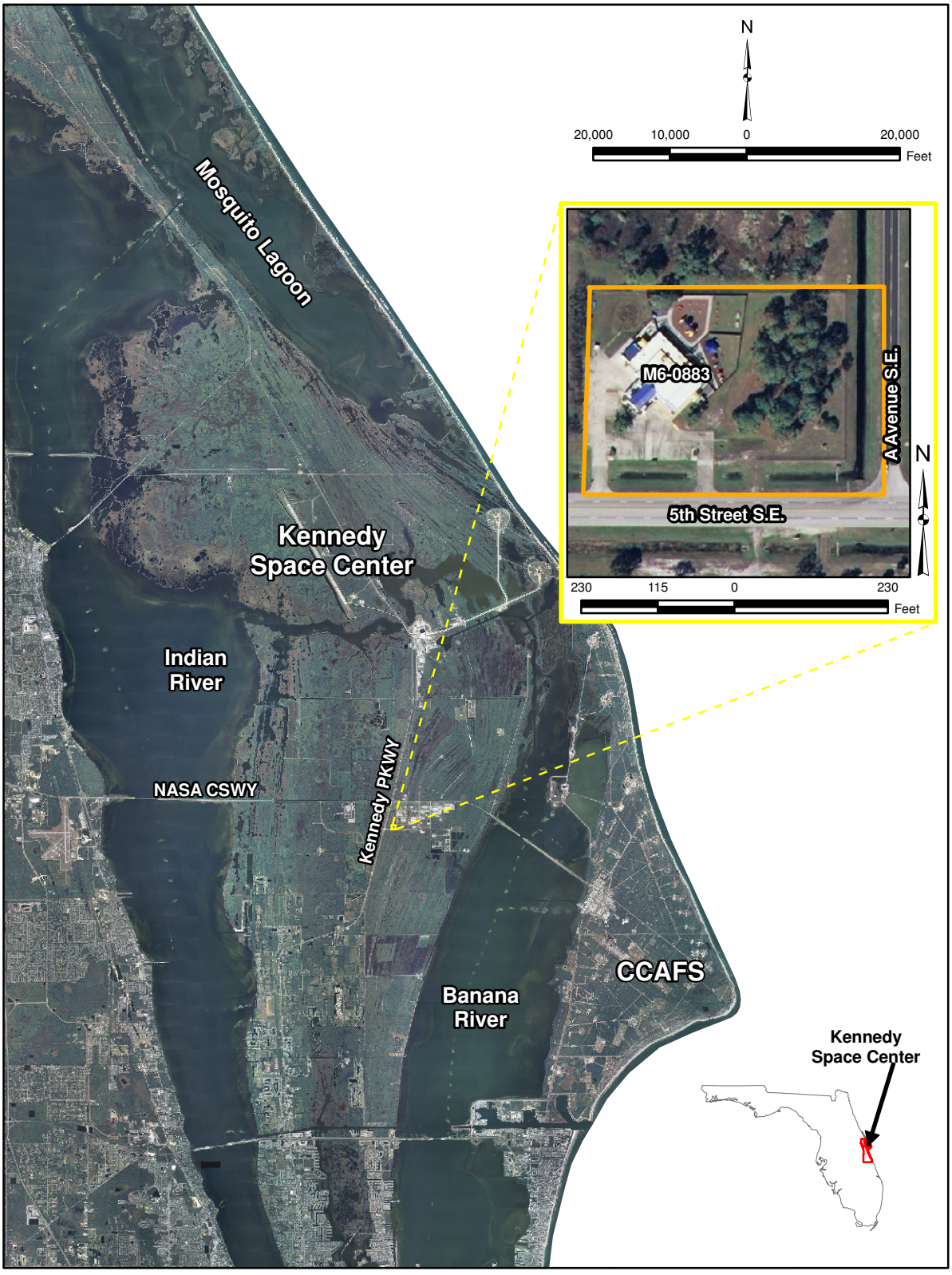


Figure 1
KSC Child Development Center Site Location Map

Titusville-01\DATA\0GIS\FR1216_MXDs\Figure1_LUCIP.mxd

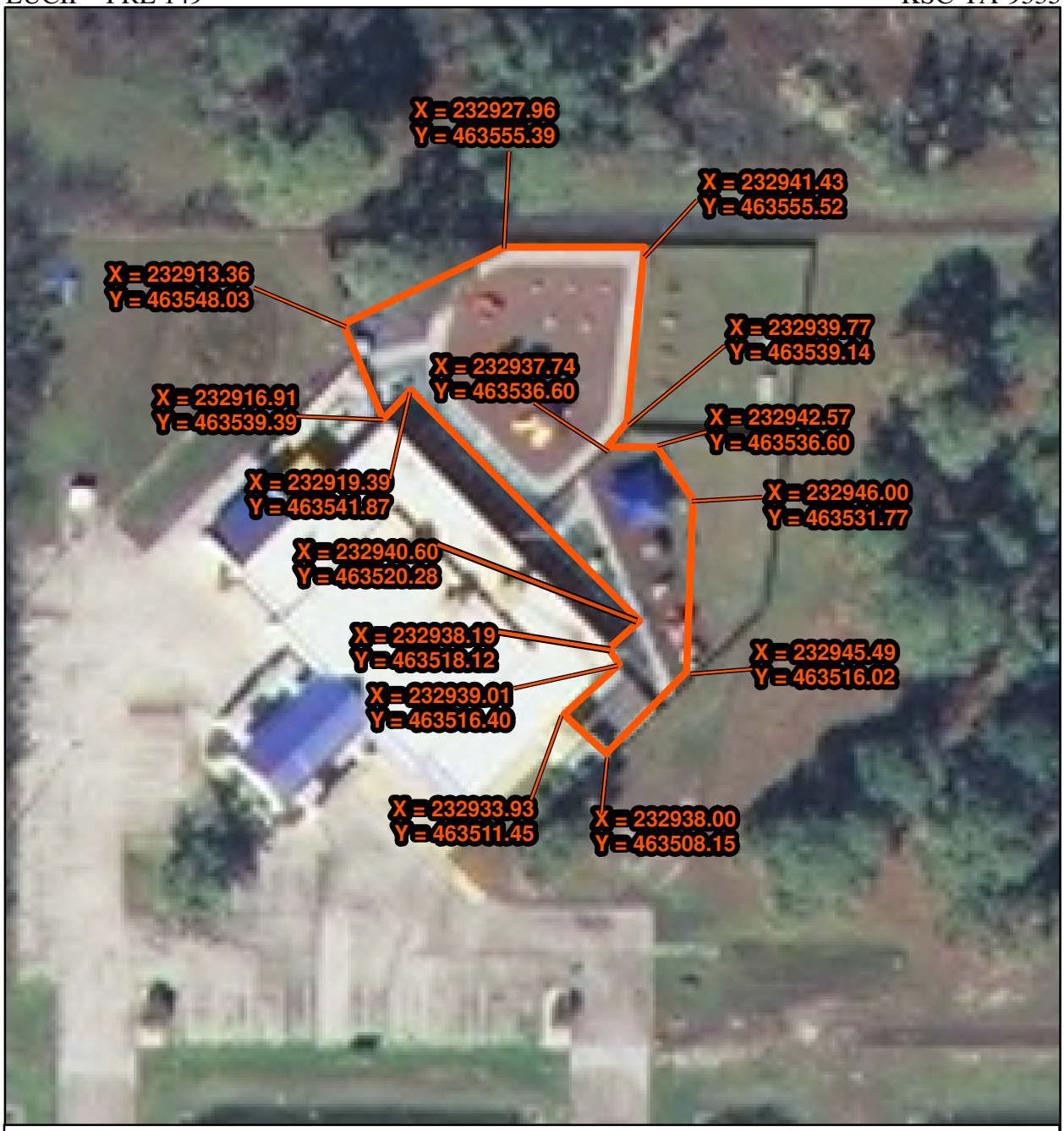


Figure 2
KCDC Land Use Control Area

Legend

Area Covered by LUCIP and Subsurface Soil Controls

N

Note: Survey Coordinates are in US State Plane Coordinate System NAD1983 meters, Florida East.

50 25 0 50
Feet

Titusville-01\data\0GIS\FR1216\MXDs\LUC_Area_Coords.mxd

LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Sewage Treatment Plant 1
Potential Release Location No. 150
CONTAMINANTS: PCBs in Soil
CONTROL: Prohibit Residential Use

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of Sewage Treatment Plant 1 (STP1) of institutional controls that have been implemented at the site[1]. Although there are no current unacceptable risks to human health or the environment associated with STP1, institutional land use controls (LUCs) are necessary to prohibit residential use of the site. Controls will include periodic inspection, condition certification and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Soil sampling was completed as part of a Resource Conservation and Recovery Act (RCRA) Confirmation Sampling (CS). Chemicals of concern identified for human health risk during the CS that exceeded Florida Department of Environmental Protection (FDEP) and Environmental Protection Agency (EPA) cleanup target levels were polychlorinated biphenyls (PCBs) in soil.

SITE DESCRIPTION

STP1 is a NASA-operated facility that has been used for sewage treatment from the 1960s until 2001. Since 2001, the site has been used as a lift station for the Cape Canaveral Air Force Station regional plant. The plant comprises an area of approximately 5 acres and contains an office/laboratory building, lift station, surge tank, chlorine contact chamber, and two clarifiers. A concrete-pad mounted transformer is located near the southeast corner of the office/lab. The facility is mostly unpaved with a vegetated ground surface. The former sludge revetment and polishing pond (approximately) 20 acres and former spray field (approximately 15 acres) are located south of the plant.

SITE LOCATION

STP1 is located west of "C" Avenue, south of 4th Street, and north of 5th Street in the KSC Industrial Area (Figure 1). The site is located within Section 5 of Township 23S, Range 37E which is in the Orsino Quadrangle. The soil use control area covered by the LUCIP is shown on Figure 2. Coordinates of the corners of the LUC are provided in Figure 2 in the US State Plane Coordinate System

1. *This LUCIP summarizes institutional controls regarding STP1. For detailed information on the site, consult the STP1 administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

NAD 1983, meters, Florida East.

SITE CONTAMINATION AND CONTROL

PCBs are present in soil above FDEP's residential soil cleanup target level (SCTL) but are less than FDEP's industrial SCTL. The past, current, and projected future land use of STP1 is industrial in nature. LUCs are therefore required to prohibit residential use/ exposure to soils.

DECISION DOCUMENT

A Statement of Basis (SB) establishes institutional controls as a component of the remedy for the site. The SB for the site, KSC document number KSC-TA-11115, is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Program Office in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and EPA, effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no residential use is occurring.

REPORTING

KSC's Environmental Program Office will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities at KSC that are not compliant with this LUCIP.

MAINTENANCE

The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or until there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the EPA and FDEP and implemented by modification of NASA's operating permit.

2. *By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.*

   Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

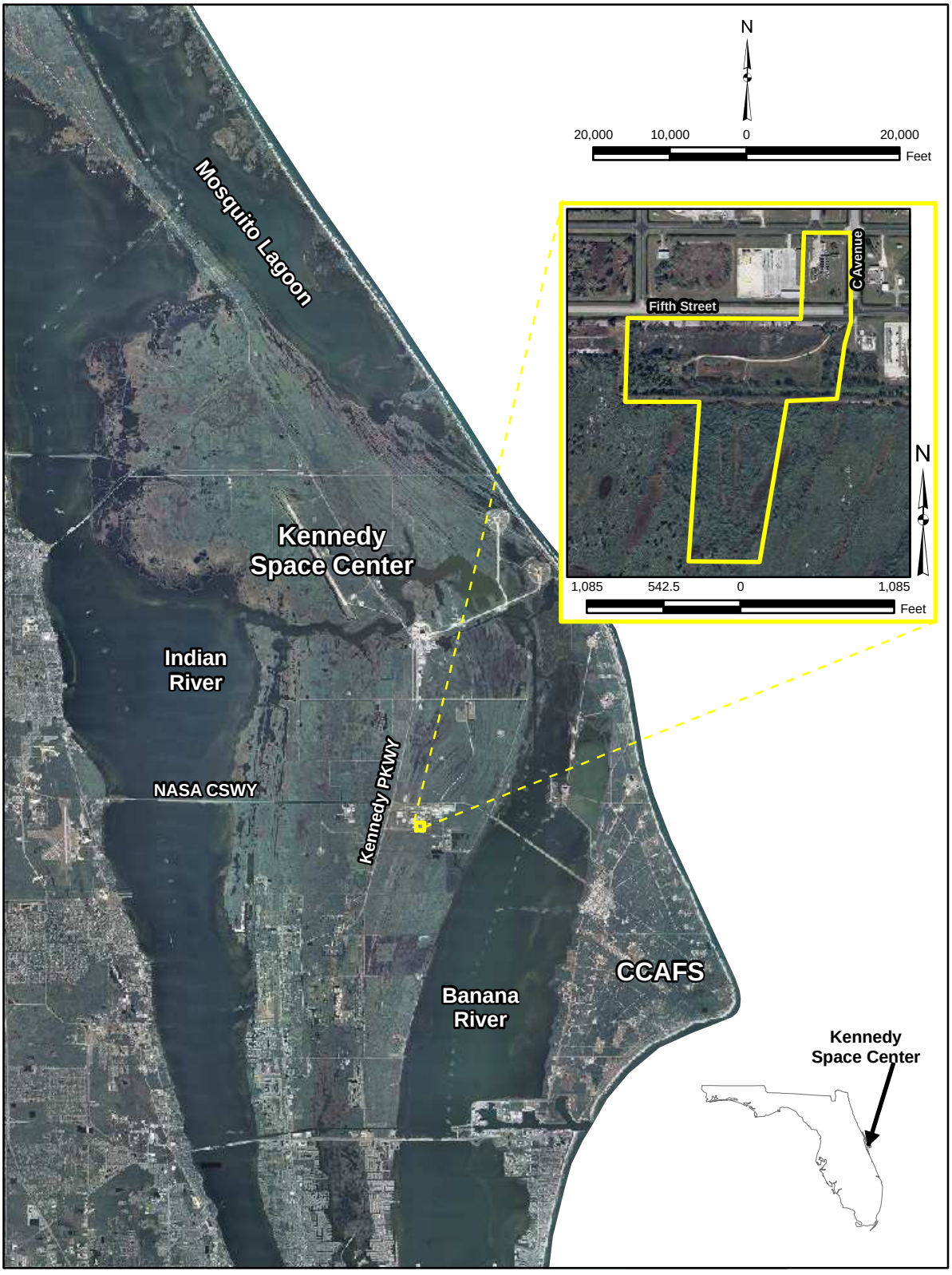


Figure 1
Sewage Treatment Plant #1 Location Map

Titusville-01\data\0GIS\FR1200\MXDs\LUCIP_Figure1.mxd 15 January 2010 MAh

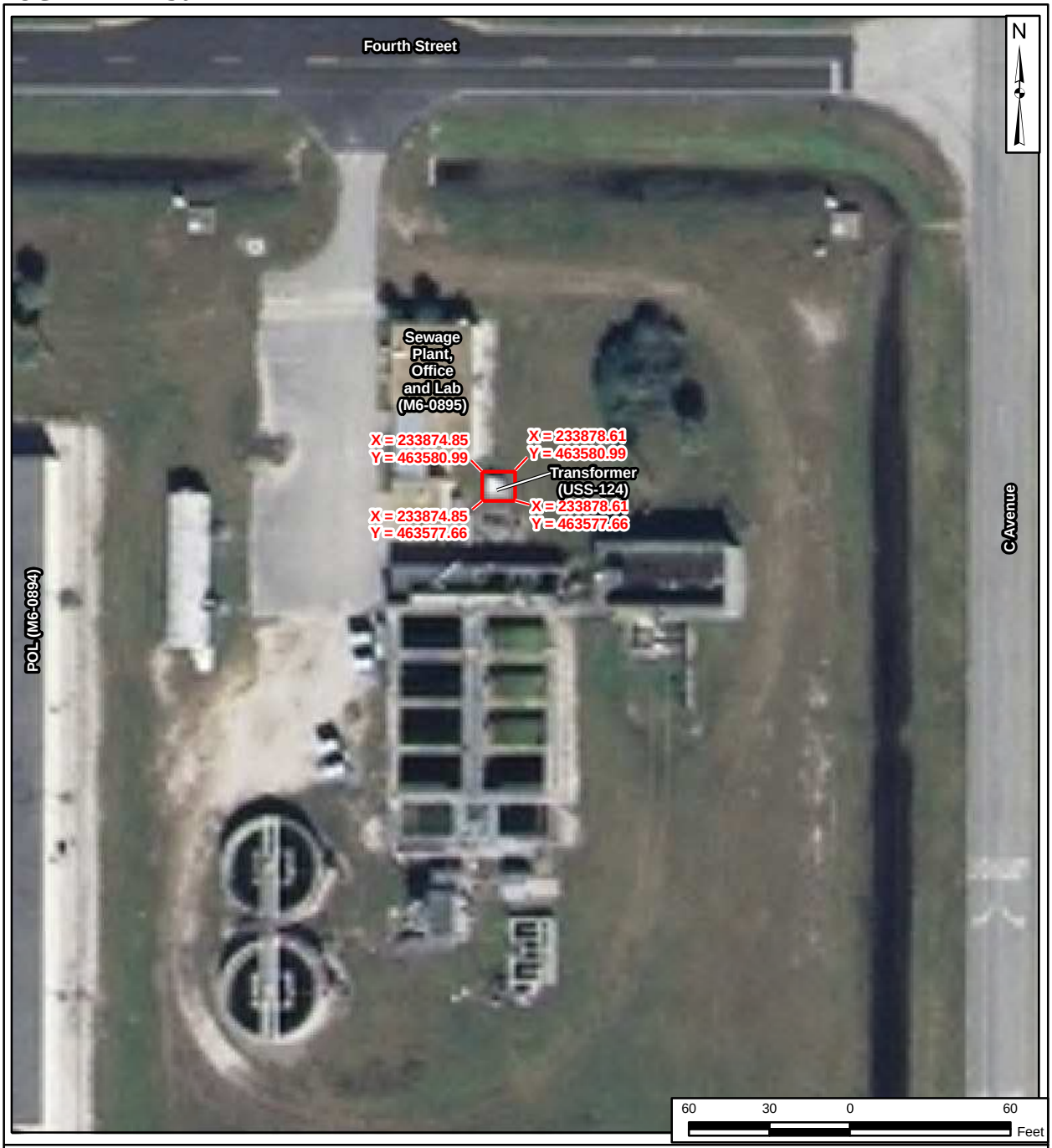


Figure 2
STP1 Transformer Soil Land Use Control Area

Legend

Area Covered by Statement of Basis and Land Use Control Area

Note:
Coordinates are provided in US State Plane NAD 1983, Florida East, Meters.

Titusville-01\DATA\0GIS\FR1200\MXDs\LUCIP_Figure2.mxd 28 January 2010 MAH

LAND USE CONTROL IMPLEMENTATION PLAN

FUEL STORAGE AREA #1 (PRL 157) LOCATED AT CCAFS
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: Fuel Storage Area #1
Potential Release Location 157
CONTAMINANTS: VOCs, SVOCs, and TRPH in Soil and Groundwater
CONTROL: Prohibit Groundwater Use, Prevent Hypothetical Future Residential Exposure to Groundwater, Prevent Non-Industrial Site Uses, and Prevent Uncontrolled Excavation/Disturbance of Soil

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of Fuel Storage Area #1 (FSA1) of institutional controls that have been implemented at the site[1]. Institutional land use controls (LUCs) are necessary to prevent risks associated with current and future industrial exposure and hypothetical future residential exposure to contaminated soil and hypothetical future potable use of groundwater. Specific controls will include prohibiting the use of groundwater from the site, preventing hypothetical future residential exposure to groundwater, restricting future site uses to industrial activities, and preventing uncontrolled excavation or disturbance of soil at the site. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

FSA1 was assessed under Florida's petroleum cleanup program. Concentrations of volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and total recoverable petroleum hydrocarbons (TRPH) in groundwater and TRPH in soil were greater than Petroleum Contamination Site Cleanup Criteria.

SITE DESCRIPTION

FSA1 is part of the larger RP/JP Fuel Handling Facility (SWMU #143) that has been the site of fuel-handling operations since the 1950s. The facility includes a concrete containment area with five 20,000-gallon above-ground storage tanks, a tanker unloading area, Building 1044 (pumphouse) and associated underground storage tank (UST) (Tank 1044-1), a tanker loading area, associated above-ground piping, and an associated asphalt parking area/roadway. Previous leaks at the RP/JP facility included a 3,000-gallon spill in 1989 and a 100-gallon spill in 1991. Tank 1044-1, located west of Building 1044 and northwest of the loading station, was investigated due to a leak detected during maintenance activities in 2006.

SITE LOCATION

FSA1 is a 0.5-acre NASA-operated facility located along the southwestern edge of the Cape Canaveral Air Force Station along the Banana River (Figure 1). The site is located within Section 26 of Township 23S, Range 37E, which is in the Cape Canaveral Quadrangle. The LUC area covered by the LUCIP is shown on Figure 2. Coordinates of the cor-

[1] *This LUCIP summarizes institutional controls regarding the NASA FSA1. For detailed information on the site, consult the FSA1 administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-8402.*

ners of the LUC area are provided on Figure 2 in the State Plane Coordinate System NAD 1983 meters, Florida East.

SITE CONTAMINATION AND CONTROL

Groundwater at the site contains VOCs, SVOCs, and TRPH at concentrations greater than FDEP's Groundwater Cleanup Target Levels, and TRPH concentrations in soil are greater than Soil Cleanup Target Levels. The past, current, and projected future land use of FSA1 is industrial in nature. LUCs are required to prevent use of groundwater, to limit site use to industrial activities, and to prohibit uncontrolled excavation/disturbance of soil. Indoor air quality shall be evaluated prior to any construction within the LUC area.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their RCRA permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between NASA, FDEP, and the United States Environmental Protection Agency (EPA), effective February 23, 2001. Upon approval of this LUCIP, it will be incorporated into the permit by reference. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA. KSC's Environmental Assurance Branch will provide CCAFS's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse for the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the institutional controls specified herein are in place and operating and will be conducted by KSC's Environmental Assurance Branch. The inspections will verify that no residential groundwater use is occurring, that site activities are limited to industrial activities, and that uncontrolled excavation/disturbance of soil has not occurred.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities at FSA1 that are not compliant with this LUCIP.

MAINTENANCE

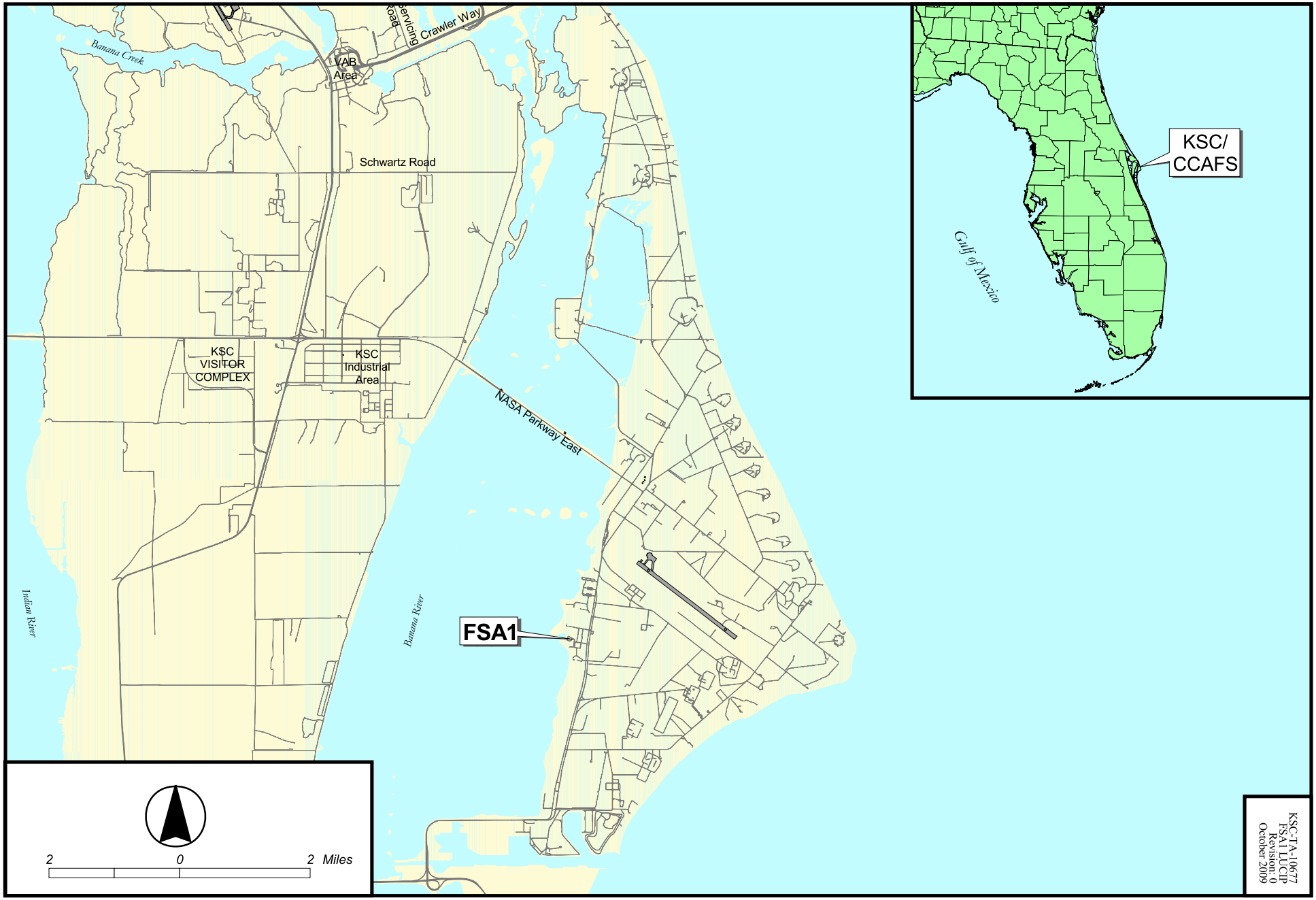
The LUCIP shall remain in place until a land use change is implemented and the concerns managed by the LUCIP are mitigated; or there is a discovery, based upon analytical evidence, that scenarios managed by the LUCIP are no longer a concern. Any change in LUC management must be approved by the FDEP and implemented by modification of NASA's operating permit.

[2] By separate MOA effective February 23, 2001, with the EPA and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

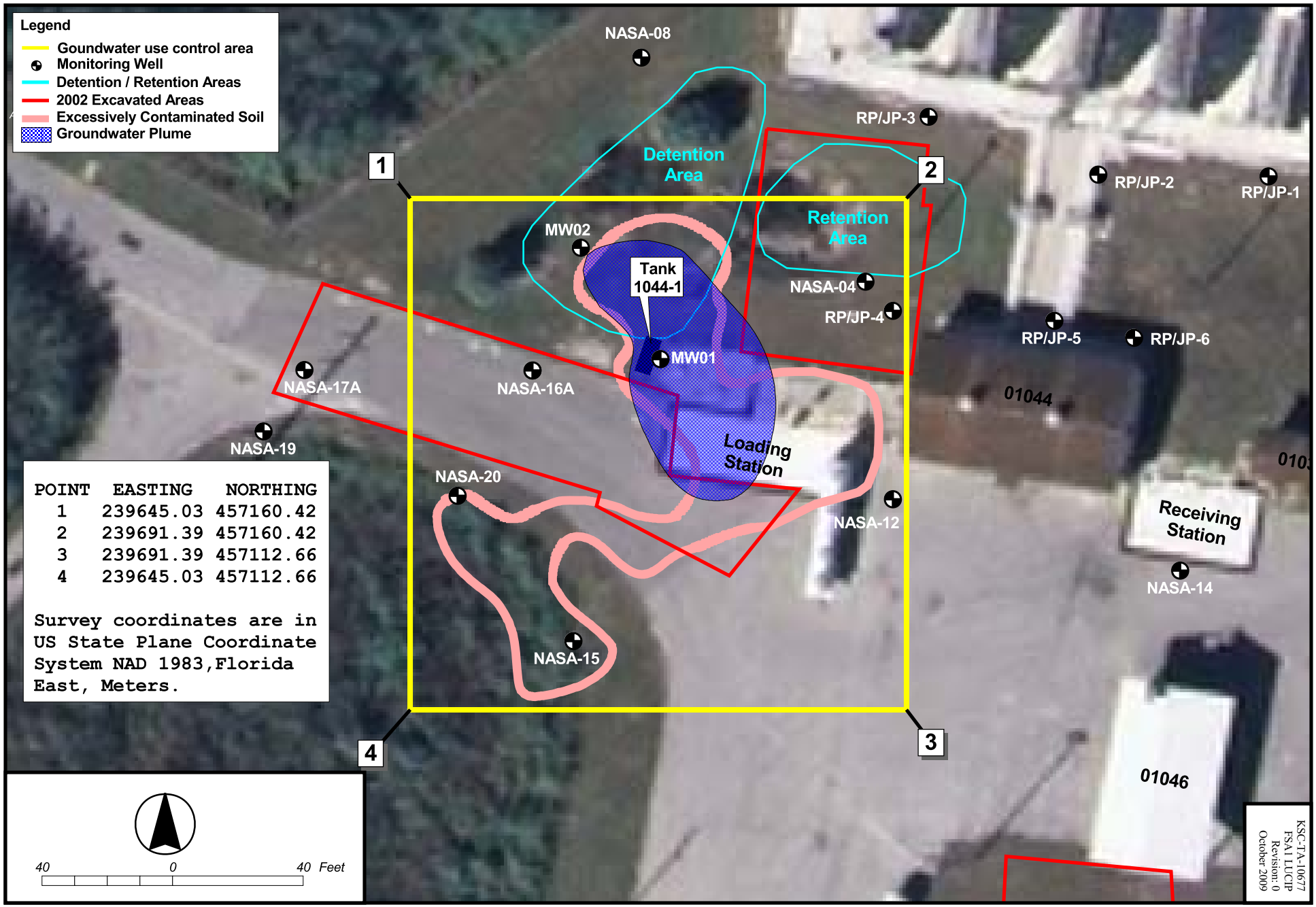
FIGURE 1 LOCATION OF KENNEDY SPACE CENTER AND FUEL STORAGE AREA #1

FUEL STORAGE AREA #1, CAPE CANAVERAL AIR FORCE STATION, FLORIDA



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FIGURE 2 GROUNDWATER LAND USE CONTROL AREA
FUEL STORAGE AREA #1, CAPE CANAVERAL AIR FORCE STATION, FLORIDA



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LUCIP–PRL 228

INTERIM LAND USE CONTROL IMPLEMENTATION PLAN

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
KENNEDY SPACE CENTER
BREVARD COUNTY, FLORIDA

FACILITY: F&W/NPS Support Building and Area, Location of Concern 2
Potential Release Location 228
CONTAMINANTS: Copper in Soil
CONTROL: Prohibit Residential Exposure to Surface Soil

PURPOSE OF LAND USE CONTROL IMPLEMENTATION PLAN

This Interim Land Use Control Implementation Plan (LUCIP) has been prepared to inform current and potential future users of the Kennedy Space Center (KSC) United States Fish and Wildlife/National Park Service Support Buildings and Areas (FWSB) Location of Concern 2 ("the Site") of institutional controls that have been implemented at the Site[1]. Although there are no current unacceptable risks to human health or the environment associated with the Site, institutional land used controls (LUCs) are necessary to prevent human health exposure to soil affected by copper. Controls will include periodic inspection, condition certification, and agency notification.

WHY LAND USE CONTROLS ARE NEEDED

Concentrations of copper were identified in soil at concentrations that exceeded the applicable Florida Department of Environmental Protection (FDEP) Residential Soil Cleanup Target Level (R-SCTL).

SITE DESCRIPTION

The Site is unoccupied and there are no permanent structures. The concrete slab present is suspected to be foundation of a former sheet metal building used for storage (former building number E3-1050A). The area to the northeast of the LUC area is currently managed by United States Fish and Wildlife as a public access boat ramp, known as the Beacon 42 Boat Ramp.

SITE LOCATION

The FWSB Area is located within Sections 13 of Township 20 South, Range 35 East, which is in the Oak Hill, Florida Quadrangle. The Site is shown on Figure 1. Coordinates of the corners of the soil LUC area covered by this Interim LUCIP are provided in Figure 2 in the State Plane Coordinate System, North American Datum of 1983, Florida East, meters.

1. This Interim LUCIP summarizes institutional controls regarding the NASA FWSB Area. For detailed information on the site, consult the FWSB administrative file, which is available for review by contacting the KSC Environmental Assurance Branch at telephone number (321) 867-6971.

SITE CONTAMINATION AND CONTROL

Soil at the Site contains copper at concentrations greater than the FDEP R-SCTL. The past, current, and projected future land use of the FWSB Area is public in nature. LUCs are therefore required to prevent residential contact to copper-impacted soil at the Site.

DECISION DOCUMENT

The KSC Remediation Team determined that interim institutional controls should be implemented at FWSB. The interim institutional controls are temporary while investigation, interim measures, and corrective measures are in progress.

IMPLEMENTATION

Institutional controls will be implemented by the KSC Environmental Assurance Branch in accordance with their Resource Conservation and Recovery Act permit and a Land Use Control Assurance Plan included in a Memorandum of Agreement (MOA)[2] between National Aeronautics and Space Administration and the FDEP, effective February 23, 2001. Property transfer (if conducted in the future) will be conducted in accordance with Section X of the MOA.

KSC's Environmental Assurance Branch will provide KSC's Master Planning Office with survey coordinates of the LUCs. Restrictions will specify limitations on development and reuse of the area for as long as LUCs are necessary to protect human health and the environment.

MONITORING

Quarterly inspections to monitor that the LUCs specified herein are in place and operating will be conducted by KSC's Environmental Assurance Branch. The inspection will verify that no residential exposure to soil is occurring.

REPORTING

KSC's Environmental Assurance Branch will submit annual reports to FDEP certifying retention of the implemented LUCs.

ENFORCEMENT

KSC's Environmental Assurance Branch will be responsible for stopping any activities that are not compliant with this Interim LUCIP.

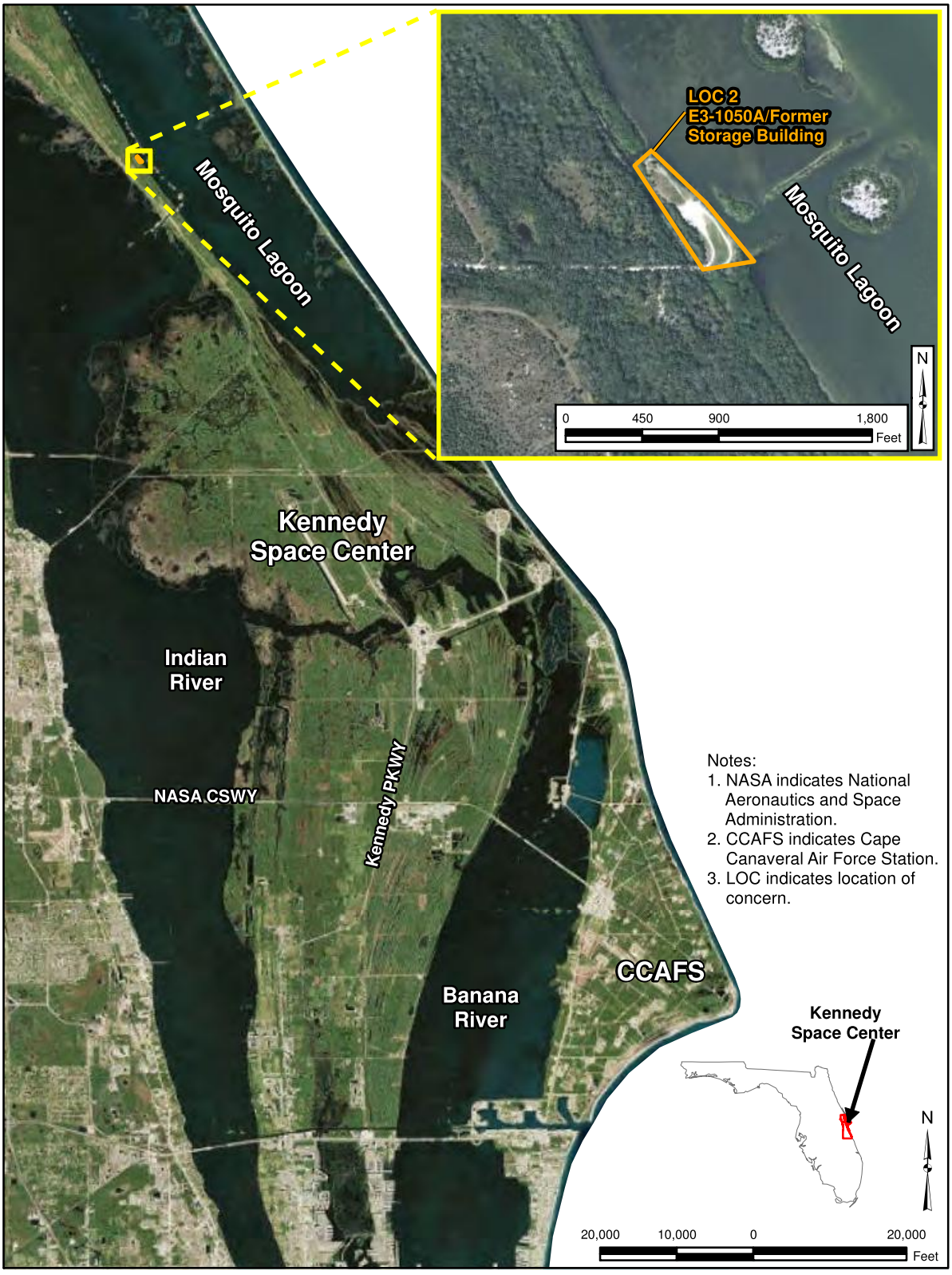
MAINTENANCE

The Interim LUCIP shall remain in place until a land use change is implemented or the concerns managed by the Interim LUCIP are mitigated, or until there is a discovery, based on analytical evidence, that scenarios

2. By separate MOA effective February 23, 2001, with the EPA, and FDEP, KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific LUCs deemed necessary for future protection of human health and the environment. A fundamental premise underlying execution of that agreement was that through the Center's substantial good faith compliance with the procedures called for herein, reasonable assurances would be provided to EPA and FDEP as to the permanency of those remedies which included the use of specific LUCs.

Although the terms and conditions of the MOA are not specifically incorporated or made enforceable herein by reference, it is understood and agreed by NASA KSC, EPA and FDEP that the contemplated permanence of the remedy reflected herein shall be dependent upon the Center's substantial good faith compliance with the specific LUC maintenance commitments reflected herein. Should such compliance not occur or should the MOA be terminated, it is understood that the protectiveness of the remedy concurred in may be reconsidered and that additional measures may need to be taken to adequately ensure necessary future protection of human health and the environment.

managed by the Interim LUCIP are no longer a concern.



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Figure 1
F&W/NPS Support Buildings & Areas Location Map



Figure 2
LUCIP Site Plan

Legend

Soil Land Use Control Area

Approximate Location of Concrete Pad

Notes:
1. LUCIP indicates Landuse Control Implementation Plan.
2. Coordinates are approximate and presented in United State Plane North American Datum of 1983, Florida East, meters.

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ENCLOSURE 4

NEMCON Spill Report for the KSC Child Development Center

September 27, 2023

Mr. Christopher Adkison
National Aeronautics and Space Administration
Christopher.D.Adkison@nasa.gov
Mail Code: SI-E2
Kennedy Space Center, FL 32899

SUBJECT: WO# T202308-45703 Spill Tracking #: S2023030 Kennedy Space Center (KSC), Child Development Center (CDC) (M6-0883) Contamination Investigation and Confirmatory Sampling Results: August 2023 - REVISED

SUMMARY

At the request of the NASA Remediation Office, the NASA Environmental and Medical Contract (NEMCON) Spill Cleanup Team (SCT), responded on July 21, 2023, to the subject site for reconnaissance purposes. The assigned task involved the removal of arsenic-impacted soil, backfill the resultant excavation with certified clean fill, and return the area to the original condition, including grade and sod. Arsenic concentrations above the residential allowance were discovered in soil on the east side of the Child Development Center (CDC) (M6-0883). NASA Environmental Assurance Branch (EAB) requested NEMCON manage this project as a spill cleanup. A deadline for finishing the project no later than August 8, 2023, was stated as a priority in the request.

A small area northeast of the CDC was excavated by NEMCON Sub-Contractor Alpha Omega. The excavation had an average width of 2 feet and an average length of 3 feet with a final depth of 12 inches in order for a sample to be collected from the west wall of what would be the final excavation. The final excavation had an average width of 22 feet and an average length of 109 feet with average depths varying from 6 inches to 12 inches. The excavation boundaries and depths of the final excavation were determined based on pre-excavation soil sampling results provided by NASA.

A second location, northeast of the CDC and west of the area detailed above, was also excavated by NEMCON Sub-Contractor Alpha Omega. The excavation had an average width of 3 feet and an average length of 4 feet with an average depth of 12 inches. The dimensions were determined based on pre-excavation soil sampling results provided by NASA.

The contaminated soil from both excavations was containerized in a roll-off with other soil excavated for the NASA Comprehensive Mitigation and Restoration project which was managed by the NEMCON Spill Cleanup Team.

On August 3, 2023, John Williams, NEMCON ESAM, collected two separate soil confirmatory soil

samples from two different depths from the west wall of the east excavation as requested. Composite soil sample number S2023030-0-6inch was collected from the soil surface to 6 inches below land surface (bls). Composite soil sample number S2023030-6-12inch was collected from 6 inches to 12 inches bls. The soil samples were submitted to the NEMCON contract laboratory under chain of custody documentation for analysis of Arsenic (EPA 6020B). Results of analysis showed that Arsenic concentrations were below the respective Residential Soil Cleanup Target Levels (R-SCTLs) in the two samples collected. The results indicated that no additional soil sampling or excavation would be needed.

Laboratory analytical results for detected analytes in soil samples are summarized in **Table 1**. Photo documentation of the spill site, excavation and sample locations are provided in **Figures 2** through **4**. Field notes and field forms completed during the sampling event are provided in **Appendix A**. Spatial data collection notes for GPS data are provided in **Figure 1**. A copy of the complete laboratory analytical package for the samples collected are provided in **Appendix B**. The contaminated soil disposal manifests are provided in **Appendix C**.

CONCLUSION

Based upon the findings of the August 3, 2023, sampling event, NEMCON ESAM recommends no further sampling or excavation at the specified location. The contaminated soil waste containerized by the NEMCON Spill Cleanup Team and managed for proper disposal.

Should there be any questions regarding the results or the attachments, please contact Sarah Hausman at 867-1928.

For Sarah S. Hausman
Environmental Engineer
NEMCON ESAM

ATTACHMENTS

Table 1: Detected Analytical Results in Soil Samples
Figure 1: Location Map of Excavation and Sample Locations
Figure 2: Photo of Excavation to be Sampled - August 3, 2023
Figure 3: Photo of Excavation Location and Dimensions - August 3, 2023
Figure 4: Photo of Excavation Sample Locations - August 3, 2023

APPENDICES

Appendix A: Field Data, Notes and Spill Cleanup Report
Appendix B: Analytical Laboratory Report
Appendix C: Disposal Manifests

CC

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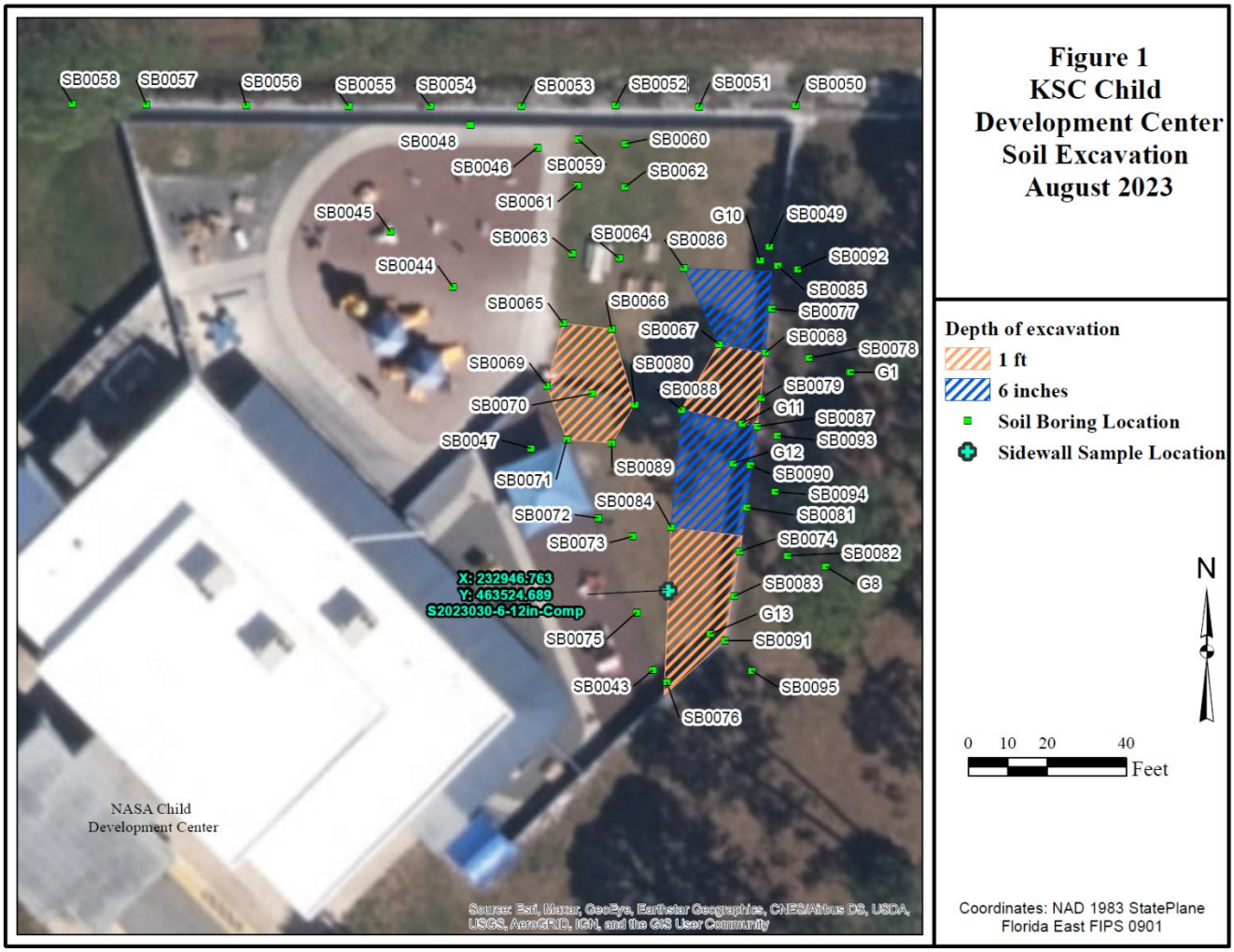
Table 1. Detected Analytical Results in Soil Samples

	Sample ID	S2023030-0-6inch		S2023030-6-12inch		R-SCTL mg/kg	I-SCTL mg/kg	LGW mg/kg
	Sample Date / Time	08/3/2023 13:00		08/3/2023 13:05				
	Sample Depth (bls)	Surface to 6 inches		6 to 12 inches				
Method	Analyte	Result mg/kg	Qual	Result mg/kg	Qual			
EPA 6020B	Arsenic	0.61	I	No Detection		2.1	12	N/A

Notes:

1. Screening Criteria as provided in FDEP Ch. 62-777, FAC, Soil Cleanup Target Levels (SCTL), R-SCTL = Residential, I-SCTL = Industrial, LGW = Groundwater Leachability (4/05)
2. Qual – Qualifier
3. "I" Denotes the parameter was detected at a concentration above the laboratories Method Detection Limit, but below the Reporting Limit.

Figure 1: Location Map of Excavation and Sample Location



Spatial Data Collection Notes:

Datum: North American Datum (NAD) 1983 (2011)

Projection: State Plane Florida East Federal Information Processing Standard (FIPS) 0901 Feet

GPS Data Correction Type: Satellite-based Augmentation System

Figure 2: Photo of Excavation to be Sampled: August 3, 2023



Figure 3: Photo of Excavation Location and Dimensions August 3, 2023

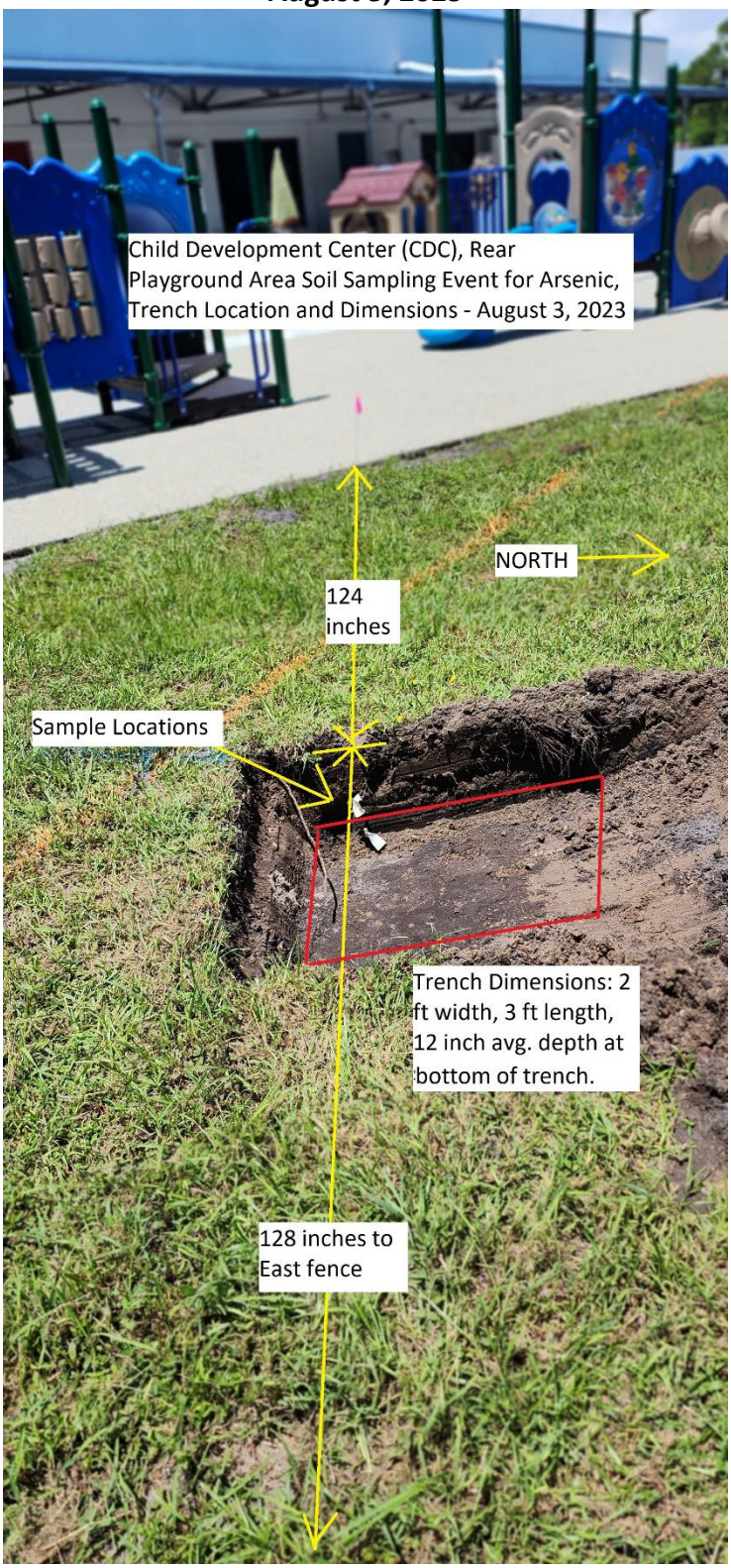


Figure 4: Photo of Excavation Sample Locations: August 3, 2023



Appendix A: Field Data, Notes and Spill Cleanup Report

ESAM FIELD NOTES

Child Development Center (CDC) Soil Sampling

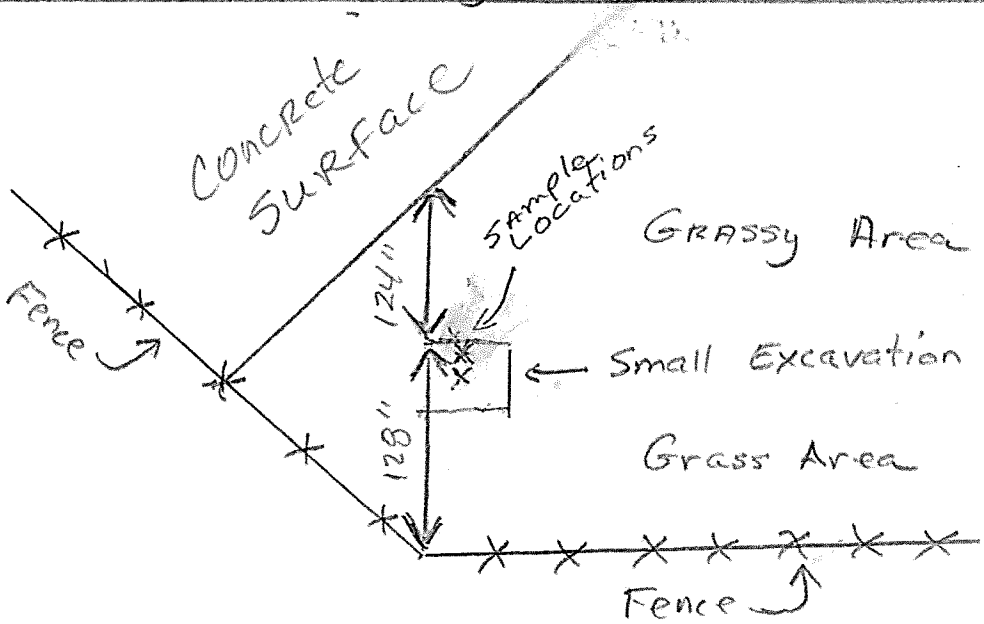
8-3-23

Spill # S2023030

Sample ID	Sample Time	Sample Depth
#S2023030- 0-6 inch	1300	Surface to 6 inches
#S2023030-6-12 inch	1305	6 inches to 12 inches

Each Sample Collected From Soil Sidewall in excavation.

Using; single use scoops, AEC 8 oz Soil jars, (Lot # 2048004), gloves,.



Analysis Requested: Arsenic

NORTH →

MAP NOT TO Scale

Project Name: CDC Special Request Soil Sampling Event	Date: 8/3/23 Page: 1 of 1	Environmental Sampling, Analysis & Monitoring
Task No: T202308-45703	EH Specialist: John Williams Signature: John L Williams	

Waste Management
Post Emergency Spill Cleanup Action Report

Spill Tracking#: S2023030
Spill Location: M6-0883: KSC Child Development Center
Spill Date: 7/21/2023
Responsible Organization: Other (See Cleanup Actions)
Spill Time: 1100
Priority: Non-Emergency
Cleanup Organization and Phone: KSC Waste Management (321) 360-2219

GIS Map X-Coordinate: 28.3110 **GIS Map Y-Coordinate:** -80.3848

Incident Description:
Arsenic concentrations above the residential allowance was discovered in soil on the east side of facility M6-0883. NASA Environmental Assurance Branch (EAB), requested NEMCON manage this project as a spill cleanup.

Material Spilled: Other (See Cleanup Actions) **Spilled Amount:** Other (See Cleanup Actions)

Surface Type: Soil/Sand **Surface Area of Spill:** 100 Ft. 0 In. X 12 Ft. In.

Cleanup Brief:
At the request of the NASA Remediation Office, the NASA Environmental and Medical Contract (NEMCON) Spill Cleanup Team (SCT), responded on 21 July 2023 to the site for reconnaissance purposes. The assigned task involved the removal of arsenic-impacted soil, backfill the resultant excavation with certified clean fill, and return the area to the original condition, including grade and sod.

Note: A deadline for finishing the project no later than 08 August 2023 was stated as a priority in the request.

The SCT mobilized Sub-Contractor Alpha Omega to the site as soon as possible following the necessary planning, permitting and utility locates. On 03 August 2023 the NEMCON SCT commenced work on an excavation guided by a delineation map provided by the NASA Remediation Group Project Manager, Deda Johansen. The map indicated an irregular footprint located on the east side of facility M6-0883 consisting of four discrete shapes. These areas collectively amounted to approximately 1,200 linear ft. of grass and soil be removed.

Note: The timeline for this comprehensive mitigation and restoration effort necessitated a dedicated five-person excavation crew, partial fence removal, timely delivery to the site of heavy equipment machinery, including one track-type excavator, one skid steer, one off-road forklift and four twenty cubic yard waste containers. Additionally, eight pallets of Bahia-mix sod was ordered and delivered to the site. Following the excavation and restoration work, the adjacent field was graded and seeded with the intent of leaving the entire site stabilized and esthetically pleasing.

Note: The work spanned a total of four ten-hour work days to meet the deadline for completion. Work was completed on 08 August 2023.

Note: At the direction of NASA Remediation a midfield confirmatory sample was facilitated by the NEMCON Environmental Sampling Group,(ESAM) on 03 August 2023. No further sampling for this project was requested.

Waste material has been removed from the site and staged near the NASA Treatment Storage and Disposal Facility (TSDF) pending JED Landfill approval as the disposal facility.
E. L. Coyle CHMM

Waste Generated: Four rolloff type containers. (approximately eighty cubic yards of top soil and grass)

Waste Disposition: Transported to KSC Waste Storage Complex for management

Response Time: 0 hours, 10 minutes

Spill Team Leader: Edward Coyle

Appendix B: Analytical Laboratory Report

eurofins | Environment Testing

1 2 3 4 5 6 7 8 9 10 11 12 13 14

ANALYTICAL REPORT

PREPARED FOR

Attn: Ms. Sarah S Hausman
HSG LLC
Logistics Bldg. K6-1547
Room 2504
Kennedy Space Center, Florida 32899

Generated 8/9/2023 7:53:23 AM

JOB DESCRIPTION

Spill Support Sampling for S2023030
SDG NUMBER T202308-45703-3033

JOB NUMBER

670-24474-1

Eurofins Orlando
481 Newburyport Avenue
Altamonte Springs FL 32701

See page two for job notes and contact information.

my EOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing Southeast, LLC Project Manager.

Authorization



Generated
8/9/2023 7:53:23 AM

Authorized for release by
David Camacho, Senior Project Manager
david.camacho@et.eurofinsus.com
(321)282-6400

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Sample Summary

Client: HSG LLC
Project/Site: Spill Support Sampling for S2023030

Job ID: 670-24474-1
SDG: T202308-45703-3033

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
670-24474-1	S2023030-0-6 inch	Solid	08/03/23 01:00	08/04/23 15:50
670-24474-2	S2023030-6-12 inch	Solid	08/03/23 01:05	08/04/23 15:50

Detection Summary

Client: HSG LLC
Project/Site: Spill Support Sampling for S2023030

Job ID: 670-24474-1
SDG: T202308-45703-3033

Client Sample ID: S2023030-0-6 inch — Lab Sample ID: 670-24474-1

Analyte	Result	Qualifier	PQL	MDL	Unit	Dil Fac	D	Method	Prep Type
Arsenic	0.61	I	1.1	0.54	mg/Kg	5	☼	6020B	Total/NA

Client Sample ID: S2023030-6-12 inch — Lab Sample ID: 670-24474-2

No Detections.

This Detection Summary does not include radiochemical test results.

Definitions/Glossary

Client: HSG LLC
Project/Site: Spill Support Sampling for S2023030

Job ID: 670-24474-1
SDG: T202308-45703-3033

Qualifiers

Metals

Qualifier	Qualifier Description
I	The reported value is between the laboratory method detection limit and the laboratory practical quantitation limit.
U	Indicates that the compound was analyzed for but not detected.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent
POS	Positive / Present
PQL	Practical Quantitation Limit
PRES	Presumptive
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Case Narrative

Client: HSG LLC
Project/Site: Spill Support Sampling for S2023030

Job ID: 670-24474-1
SDG: T202308-45703-3033

Job ID: 670-24474-1

Laboratory: Eurofins Orlando

Narrative

Job Narrative
670-24474-1

Receipt

The samples were received on 8/4/2023 3:50 PM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.0°C

Metals

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

General Chemistry

No additional analytical or quality issues were noted, other than those described above or in the Definitions/ Glossary page.

Client Sample Results

Client: HSG LLC
Project/Site: Spill Support Sampling for S2023030

Job ID: 670-24474-1
SDG: T202308-45703-3033

Client Sample ID: S2023030-0-6 inch
Date Collected: 08/03/23 01:00
Date Received: 08/04/23 15:50

Lab Sample ID: 670-24474-1
Matrix: Solid
Percent Solids: 92.7

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.61	I	1.1	0.54	mg/Kg	☼	08/08/23 09:09	08/08/23 13:21	5

Client: HSG LLC
Project/Site: Spill Support Sampling for S2023030

Job ID: 670-24474-1
SDG: T202308-45703-3033

Client Sample ID: S2023030-6-12 inch
Date Collected: 08/03/23 01:05
Date Received: 08/04/23 15:50

Lab Sample ID: 670-24474-2
Matrix: Solid
Percent Solids: 90.3

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.54	U	1.1	0.54	mg/Kg	☼	08/08/23 09:09	08/08/23 13:24	5

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 670-47507/3-A
Matrix: Solid
Analysis Batch: 47622

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 47507

Analyte	MB Result	MB Qualifier	PQL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.10	U	0.20	0.10	mg/Kg		08/08/23 09:09	08/08/23 13:07	1

Lab Sample ID: LCS 670-47507/1-A
Matrix: Solid
Analysis Batch: 47622

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 47507

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic			10.0	9.26		mg/Kg		93	80 - 120		

Lab Sample ID: LCSD 670-47507/2-A
Matrix: Solid
Analysis Batch: 47622

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 47507

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic			10.0	9.18		mg/Kg		92	80 - 120	1	20

Lab Sample ID: 670-24553-B-1-A MS
Matrix: Solid
Analysis Batch: 47622

Client Sample ID: Matrix Spike
Prep Type: Total/NA
Prep Batch: 47507

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Arsenic	1.4		10.1	10.7		mg/Kg	☼	91	75 - 125		

Lab Sample ID: 670-24553-B-1-B MSD
Matrix: Solid
Analysis Batch: 47622

Client Sample ID: Matrix Spike Duplicate
Prep Type: Total/NA
Prep Batch: 47507

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	1.4		10.1	10.5		mg/Kg	☼	90	75 - 125	1	20

QC Association Summary

Client: HSG LLC
Project/Site: Spill Support Sampling for S2023030

Job ID: 670-24474-1
SDG: T202308-45703-3033

Metals

Prep Batch: 47507

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-24474-1	S2023030-0-6 inch	Total/NA	Solid	3050B	
670-24474-2	S2023030-6-12 inch	Total/NA	Solid	3050B	
MB 670-47507/3-A	Method Blank	Total/NA	Solid	3050B	
LCS 670-47507/1-A	Lab Control Sample	Total/NA	Solid	3050B	
LCSD 670-47507/2-A	Lab Control Sample Dup	Total/NA	Solid	3050B	
670-24553-B-1-A MS	Matrix Spike	Total/NA	Solid	3050B	
670-24553-B-1-B MSD	Matrix Spike Duplicate	Total/NA	Solid	3050B	

Analysis Batch: 47622

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-24474-1	S2023030-0-6 inch	Total/NA	Solid	6020B	47507
670-24474-2	S2023030-6-12 inch	Total/NA	Solid	6020B	47507
MB 670-47507/3-A	Method Blank	Total/NA	Solid	6020B	47507
LCS 670-47507/1-A	Lab Control Sample	Total/NA	Solid	6020B	47507
LCSD 670-47507/2-A	Lab Control Sample Dup	Total/NA	Solid	6020B	47507
670-24553-B-1-A MS	Matrix Spike	Total/NA	Solid	6020B	47507
670-24553-B-1-B MSD	Matrix Spike Duplicate	Total/NA	Solid	6020B	47507

General Chemistry

Analysis Batch: 47386

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
670-24474-1	S2023030-0-6 inch	Total/NA	Solid	Moisture	
670-24474-2	S2023030-6-12 inch	Total/NA	Solid	Moisture	
670-24474-1 DU	S2023030-0-6 inch	Total/NA	Solid	Moisture	

Lab Chronicle

Client: HSG LLC
Project/Site: Spill Support Sampling for S2023030

Job ID: 670-24474-1
SDG: T202308-45703-3033

Client Sample ID: S2023030-0-6 inch

Lab Sample ID: 670-24474-1

Date Collected: 08/03/23 01:00
Matrix: Solid
Date Received: 08/04/23 15:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			47386	08/07/23 12:52	JA	EET ORL

Client Sample ID: S2023030-0-6 inch

Lab Sample ID: 670-24474-1

Date Collected: 08/03/23 01:00
Matrix: Solid
Date Received: 08/04/23 15:50
Percent Solids: 92.7

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.501 g	50 mL	47507	08/08/23 09:09	JR	EET ORL
Total/NA	Analysis	6020B		5			47622	08/08/23 13:21	JA	EET ORL

Client Sample ID: S2023030-6-12 inch

Lab Sample ID: 670-24474-2

Date Collected: 08/03/23 01:05
Matrix: Solid
Date Received: 08/04/23 15:50

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Analysis	Moisture		1			47386	08/07/23 12:52	JA	EET ORL

Client Sample ID: S2023030-6-12 inch

Lab Sample ID: 670-24474-2

Date Collected: 08/03/23 01:05
Matrix: Solid
Date Received: 08/04/23 15:50
Percent Solids: 90.3

Prep Type	Batch Type	Batch Method	Run	Dil Factor	Initial Amount	Final Amount	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			0.514 g	50 mL	47507	08/08/23 09:09	JR	EET ORL
Total/NA	Analysis	6020B		5			47622	08/08/23 13:24	JA	EET ORL

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

Accreditation/Certification Summary

Client: HSG LLC
Project/Site: Spill Support Sampling for S2023030

Job ID: 670-24474-1
SDG: T202308-45703-3033

Laboratory: Eurofins Orlando

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Florida	NELAP	E83018	06-30-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Method Summary

Client: HSG LLC
Project/Site: Spill Support Sampling for S2023030

Job ID: 670-24474-1
SDG: T202308-45703-3033

Method	Method Description	Protocol	Laboratory
6020B	Metals (ICP/MS)	SW846	EET ORL
Moisture	Percent Moisture	EPA	EET ORL
3050B	Preparation, Metals	SW846	EET ORL

Protocol References:

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET ORL = Eurofins Orlando, 481 Newburyport Avenue, Altamonte Springs, FL 32701, TEL (407)339-5984

Environmental Sample Chain Of Custody

Kennedy Space Center, Fl 32899

Task Number:T202308-45703-3033

Task Definition:Spill Support Sampling for S2023030

Results Due Date:8/17/2023

Charge String:NCNASA.1013.4060Z.CSO.S2023030

Comment	Custody
Total Container Count: 2 **Total Sample Count: 2** **Container Types:** **2 - 8 oz clear glass jar** **Child Development Center (CDC) Soil Samples**	**Sample** Digitally signed by kemconteam.ksc.nasa.gov Date: 2023.08.03 13:57:46 -04:00 Reason: Sampled by: John Leslie Williams Sample Storage:Cool to 4 Deg. C Signature:John Leslie Williams **Concur** Digitally signed by kemconteam.ksc.nasa.gov Date: 2023.08.03 14:22:09 -04:00 Reason: Concurred by: Sarah S Hausman **Courier** Courier: Date: Time: Signature: **Laboratory** Laboratory:Eurofins ET Date: 8/9/23 Time: 1550 Signature:

670-24474 Chain of Custody

counter 35/3.0 596

Sample Label	Grab/ Comp	Sample Date Time	Volume	Sample Matrix	No. Count	Minutes	EPA 6020B Arsenic
S2023030-0-6inch	Grab	8/3/2023 1:00:00 PM	0 grams	Soil	1		X
S2023030-6-12inch	Grab	8/3/2023 1:05:00 PM	0 grams	Soil	1		X

Login Sample Receipt Checklist

Client: HSG LLC

Job Number: 670-24474-1
SDG Number: T202308-45703-3033

Login Number: 24474
List Number: 1
Creator: Bittle, David W

List Source: Eurofins Orlando

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	N/A	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Appendix C: Disposal Manifests

Follett

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of 1	3. Emergency Response Phone	4. Waste Tracking Number

GENERATOR

5. Generator's Name and Mailing Address: NASA – Kennedy Space Center
John F. Kennedy Space Center, FL 32899

Generator's Site Address (if different than mailing address): KCDC MB-0883
John F Kennedy Space Center, FL

Generator's Phone:

6. Transporter 1 Company Name: Alpha Omega Training and Compliance, Inc. — U.S. EPA ID Number

7. Transporter 2 Company Name — U.S. EPA ID Number

8. Designated Facility Name and Site Address: Waste Connections
1501 Omni Way
St. Cloud, FL 34773
407-891-3720 — U.S. EPA ID Number

Facility's Phone:

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non-RCRA, Non-DOT Regulated Material	01	CM	15	Y	
2.						
3.						
4.						

Waste profile number 23-125 — WCI Customer Alpha Omega Training and Compliance

13. Special Handling Instructions and Additional Information: Contaminated soil
P.O. Box 236727
Cocoa, FL 32923

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: E.L. Coyle — Signature — Month: 8 Day: 4 Year: 23

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Brian Hamilton — Signature — Month: 8 Day: 30 Year: 23

Transporter 2 Printed/Typed Name — Signature — Month Day Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month Day Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name — Signature — Month Day Year

169-BLC-O 5 11977 (Rev. 9/09)

GENERATOR'S/SHIPPER'S INITIAL COPY

JED LANDFILL
WASTE CONNECTIONS OF OSCEOLA
1501 OMNI WAY
ST. CLOUD, FL 34773

Weighed: KAYLA

Deposit: KAYLA

BILL TO: 2740
ALPHA-OMEGA TRAINING AND COMPL
P. O. BOX 236727
COCOA FL 32923

Vehicle ID:
Reference: 23-125
BILLTO: NASA-KENNEDY SPACE CENTER

WO/MEST: 7543-NM#

ROUTE/PO#: NASA-KENNEDY SPACE CENTER

PROFILE#:: 23-125

Origin: BREVARD

DATE IN: 08/21/2023 TIME IN: 14:45:25
DATE OUT: 08/21/2023 TIME OUT: 15:27:31

INBOUND TICKET Number: 01-00336859

SCALE 2 GROSS WT.	65220	LB
SCALE 3 TARE WT.	37520	LB
NET WEIGHT	27700	LB

Qty	Description	Amount
13.350	Contaminated Soil	
1.000	Processing Fee	

2. Page 1 of 1	3. Emergency Response Phone	4. Waste Tracking Number

Generator's Site Address (if different than mailing address)
KSC MG-0883
John F Kennedy Space Center, FL

U.S. EPA ID Number

U.S. EPA ID Number

U.S. EPA ID Number

	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt/Vol.	
	01	CM	15	Y	

Christopher Alpha Omega Training and Co
P.O. Box 236727
Cocoa, FL 32923

ntents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, transport according to applicable international and national governmental regulations.

X

Generator's/Offeror's Printed/Typed Name: E.L. Coyle | Signature | Month 8 | Day 21 | Year 23

INT'L
15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER
16. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name | Signature | Month 8 | Day 21 | Year 23
Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY
17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
17b. Alternate Facility (or Generator) U.S. EPA ID Number
Facility's Phone:
17c. Signature of Alternate Facility (or Generator) Month Day Year
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a
Printed/Typed Name | Signature | Month 8 | Day 21 | Year 23

Runoff (2)

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	1		

GENERATOR

5. Generator's Name and Mailing Address
NASA – Kennedy Space Center
John F. Kennedy Space Center, FL 32899

Generator's Site Address (if different than mailing address)
KCDC M6-0883
John F Kennedy Space Center, FL

Generator's Phone:

6. Transporter 1 Company Name
Alpha Omega Training and Compliance, Inc.

U.S. EPA ID Number

7. Transporter 2 Company Name

U.S. EPA ID Number

8. Designated Facility Name and Site Address
Waste Connections
1501 Omni Way
St. Cloud, FL 34773

U.S. EPA ID Number

Facility's Phone: 407-891-3720

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non-RCRA, Non-DOT Regulated Material	1	CM	15	Y	
2.						
3.						
4.						

Waste profile number 28-125
Contaminated soil

WO/Customer Alpha Omega Training and Compliance
P.O. Box 236727
Cocoa, FL 32923

13. Special Handling Instructions and Additional Information

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name	Signature	Month	Day	Year
Eric Coyle		08	21	23

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:

Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name	Signature	Month	Day	Year
BRIANA HAMILTON		8	21	23
Transporter 2 Printed/Typed Name	Signature	Month	Day	Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)

U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) | Month | Day | Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name	Signature	Month	Day	Year

JED LANDFILL
WASTE CONNECTIONS OF OSCEOLA
1501 OMNI WAY
ST. CLOUD, FL 34773

Weighed: CAREN

Deposit: KAYLA

BILL TO: 2740
ALPHA-OMEGA TRAINING AND COMPL
P. O. BOX 236727
COCOA FL 32923

Vehicle ID:
Reference: 23-125
BILLTO: NASA-KENNEDY SPACE CENTER

WO/MFEST: 7543-NM#

ROUTE/PO#: NASA-KENNEDY SPACE CENTER

PROFILE#:: 23-125

Origin: BREVARD

DATE IN: 08/22/2023 TIME IN: 08:57:02
DATE OUT: 08/22/2023 TIME OUT: 09:26:28

INBOUND TICKET Number: 01-00336982

SCALE 1 GROSS WT.	72080	LB
SCALE 3 TARE WT.	36100	LB
NET WEIGHT	35980	LB

Qty	Description	Amount
17.990	Contaminated Soil	

2. Page 1 of 1	3. Emergency Response Phone	4. Waste Tracking Number

Generator's Site Address (if different than mailing address)
KSC NE-0883
John F Kennedy Space Center, FL

Center
Center, FL 32899
Compliance, Inc
ctions
Bay
34773

U.S. EPA ID Number

U.S. EPA ID Number

U.S. EPA ID Number

1543
1268

	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
d Material	1	CM	15	Y	

Alpha Omega Training and Co
P.O. Box 236727
Cocoa, FL 32923

are that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: E. L. Coyle — Signature — Month: 8 — Day: 21 — Year: 23

INT'L
15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER
16. Transporter Acknowledgment of Receipt of Materials
Transporter 1 Printed/Typed Name: BRIANA HAMILTON — Signature — Month: 8 — Day: 21 — Year: 23
Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY
17. Discrepancy
17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection
Manifest Reference Number:
17b. Alternate Facility (or Generator) — U.S. EPA ID Number
Facility's Phone:
17c. Signature of Alternate Facility (or Generator) — Month — Day — Year
18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a
Printed/Typed Name — Signature — Month — Day — Year

Rolloff #3

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	1		17758 AM 17756

GENERATOR

5. Generator's Name and Mailing Address — Kennedy Space Center
John F. Kennedy Space Center, FL 32899

Generator's Site Address (if different than mailing address)
KSC ME-0883
John F Kennedy Space Center, FL

Generator's Phone:

6. Transporter 1 Company Name: Alpha Omega Training and Compliance, Inc. — U.S. EPA ID Number:

7. Transporter 2 Company Name — U.S. EPA ID Number:

8. Designated Facility Name and Site Address: Waste Connections, 1501 Omni Way, St. Cloud, FL 34773 — U.S. EPA ID Number:

Facility's Phone: 407-891-3720

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non-RCRA, Non-DOT Regulated Material	1	CM	15	Y	
2.						
3.						
4.						

Waste profile number 23-125 — WEI Customer Alpha Omega Training and Compliance

13. Special Handling Instructions and Additional Information
Contaminated soil
P.O. Box 236727
Cocoa, FL 32923
Box # 517307

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name	Signature	Month	Day	Year
MICHAEL J. HOVNANIC		08	23	23

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name	Signature	Month	Day	Year
Briana Hamilton		8	22	23
Transporter 2 Printed/Typed Name	Signature	Month	Day	Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number:

Facility's Phone:

17c. Signature of Alternate Facility (or Generator)	Month	Day	Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name	Signature	Month	Day	Year

GENERATOR'S/SHIPPER'S INITIAL COPY

4

#

JED LANDFILL
WASTE CONNECTIONS OF OSCEOLA
1501 OMNI WAY
ST. CLOUD, FL 34773

Weighed: KAYLA

Deposit: CAREN

BILL TO: 2740
ALPHA-OMEGA TRAINING AND COMPL
P. O. BOX 236727
COCOA FL 32923

Vehicle ID:
Reference: 23-125
BILLTO: NASA-KENNEDY SPACE CENTER

WO/MFEST: 7543-17756

ROUTE/PO#: NASA-KENNEDY SPACE CENTER

PROFILE#:: 23-125

Origin: BREVARD

DATE IN: 08/23/2023 TIME IN: 09:56:35
DATE OUT: 08/23/2023 TIME OUT: 10:39:44

INBOUND TICKET Number: 01-00337213

SCALE 2 GROSS WT.	67100	LB
SCALE 3 TARE WT.	37340	LB
NET WEIGHT	29760	LB

Qty	Description	Amount
14.880	Contaminated Soil	

2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
		17758 17756

Generator's Site Address (if different than mailing address)

U.S. EPA ID Number

U.S. EPA ID Number

U.S. EPA ID Number

10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1	CM	15	Y	

X

14. GENERATOR'S/OFFEROR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: Michael J. Hovanic | Signature | Month: 08 | Day: 23 | Year: 23

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:

Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name | Signature | Month: 8 | Day: 23 | Year: 23

Transporter 2 Printed/Typed Name | Signature | Month | Day | Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) | U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) | Month | Day | Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name | Signature | Month | Day | Year

Ballast #4

NON-HAZARDOUS WASTE MANIFEST

1. Generator ID Number	2. Page 1 of	3. Emergency Response Phone	4. Waste Tracking Number
	1		17757

GENERATOR

5. Generator's Name and Mailing Address
NASA – Kennedy Space Center
John F. Kennedy Space Center, FL 32899
Generator's Phone:

Generator's Site Address (if different than mailing address)
KSC OP-0883
John F Kennedy Space Center, FL

6. Transporter 1 Company Name
Alpha Omega Training and Compliance, Inc.
U.S. EPA ID Number

7. Transporter 2 Company Name
U.S. EPA ID Number

8. Designated Facility Name and Site Address
Waste Connections
1501 Omni Way
St. Cloud, FL 34773
Facility's Phone: 407-891-3720
U.S. EPA ID Number

	9. Waste Shipping Name and Description	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
1.	Non-RCRA, Non-DOT Regulated Material	1	TF	15	Y	
2.						
3.						
4.						

Waste profile number 23-125
WCI Customer Alpha Omega Training and Compliance
P.O. Box 236727
Cocoa, FL 32923

13. Special Handling Instructions and Additional Information
Contaminated soil

14. **GENERATOR'S/OFFEROR'S CERTIFICATION:** I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name	Signature	Month	Day	Year
Michael J. Hovanic		08	22	23

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:
Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name	Signature	Month	Day	Year

Transporter 2 Printed/Typed Name	Signature	Month	Day	Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator)
U.S. EPA ID Number
Facility's Phone:

17c. Signature of Alternate Facility (or Generator)		Month	Day	Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name	Signature	Month	Day	Year

GENERATOR'S/SHIPPER'S INITIAL COPY

3

4

JED LANDFILL
WASTE CONNECTIONS OF OSCEOLA
1501 CENT WAY
ST. CLOUD, FL 34773

Weighed: CAREN

Deposit: KAYLA

BILL TO: 2740
ALPHA-OMEGA TRAINING AND COMPL
P. O. BOX 236727
COCOA FL 32923

Vehicle ID:
Reference: 23-125
BILLTO: NASA-KENNEDY SPACE CENTER

WO/MFEST: 7543-17757

ROUTE/PO#: NASA-KENNEDY SPACE CENTER

PROFILE#:: 23-125

Origin: BREVARD

DATE IN: 08/22/2023 TIME IN: 13:29:50
DATE OUT: 08/22/2023 TIME OUT: 13:50:16

INBOUND TICKET Number: 01-00337059

SCALE 2 GROSS WT.	70920	LB
SCALE 3 TARE WT.	34540	LB
NET WEIGHT	36380	LB

Qty	Description	Amount
18.190	Contaminated Soil	

2. Page 1 of 1	3. Emergency Response Phone	4. Waste Tracking Number 17757

Generator's Site Address (if different than mailing address)

Center — KSC MS-0383 — John F Kennedy Space Center, FL

Center, FL 32899

Compliance, Inc. — U.S. EPA ID Number

U.S. EPA ID Number

U.S. EPA ID Number

...tions ... 34773

	10. Containers No.	10. Containers Type	11. Total Quantity	12. Unit Wt./Vol.	
Material	1	CM	15	Y	

MFI Christopher Alpha Owner Training and Co... — P.O. Box 236727 Cocoa, FL 32923

CT

X ...at the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

Generator's/Offeror's Printed/Typed Name: Michael J. Hovanic — Signature — Month: 08 Day: 22 Year: 23

INT'L

15. International Shipments ☐ Import to U.S. ☐ Export from U.S. Port of entry/exit:

Transporter Signature (for exports only): Date leaving U.S.:

TRANSPORTER

16. Transporter Acknowledgment of Receipt of Materials

Transporter 1 Printed/Typed Name: Brian Hampton — Signature — Month: 08 Day: 22 Year: 23

Transporter 2 Printed/Typed Name — Signature — Month — Day — Year

DESIGNATED FACILITY

17. Discrepancy

17a. Discrepancy Indication Space ☐ Quantity ☐ Type ☐ Residue ☐ Partial Rejection ☐ Full Rejection

Manifest Reference Number:

17b. Alternate Facility (or Generator) — U.S. EPA ID Number

Facility's Phone:

17c. Signature of Alternate Facility (or Generator) — Month — Day — Year

18. Designated Facility Owner or Operator: Certification of receipt of materials covered by the manifest except as noted in Item 17a

Printed/Typed Name — Signature — Month — Day — Year

ENCLOSURE 5

KSCRT Meeting Minutes and Decisions

KSCRT December 2020 Meeting

Meeting Minutes and Decisions

Revision 1 Meeting Minutes for December 10th, 2020

Revision 1 Meeting Minutes for December 10th, 2020

Attendees:

1. Laura Barrett/FDEP
2. Kirk Johnson/FDEP
3. Mike Deliz/NASA
4. Ryan O'Meara/NASA
5. Deda Johansen/NASA
6. Anne Chrest/NASA
7. Natasha Darre/NASA
8. Michelle Moore/NEMCON
9. Mark Speranza/Tetra Tech
10. Mark Jonnet/Tetra Tech
11. Chris Adkison/Tetra Tech
12. Debbie Wilson/Tetra Tech
13. Alex Murphy/Tetra Tech
14. James Lloyd/Tetra Tech
15. Sarah Damphousse/Tetra Tech
16. Andrew Walters/Tetra Tech
17. Chris Neumann/Tetra Tech
18. Jennifer Joyal/AECOM
19. Steve Cobert/AECOM
20. Linnea King/AECOM
21. Richard Smith/HGL
22. Cady Carol/HGL
23. Jason Bublitz/HGL
24. Brad Mitchell/HGL
25. Scott Starr/HGL

2012-M10 Steve Cobert /AECOM

Manhole Dewatering Operations (PRL #204), Area 3 Repeater Building (PRL #210), and Stand-Alone Electrical Equipment LOC 16 (PRL #227b), and 19 (PRL #227c), December 2020

Goal: The purpose of the advance data package (ADP) is to summarize the soil interim measures (IM) at seven locations of concern (LOCs) within three potential release locations (PRLs), review additional soil and groundwater sampling conducted to support recommendations for no further action (NFA) at PRL #227 (LOC 16 and 29), PRL #204 (LOC 7A only), and PRL #210 (LOC 2 and LOC 4), and test consensus on the path forward.

Discussion: AECOM provided a summary of the soil IM locations for each of the sites. FDEP requested clarification on slide 7 of the ADP; was the Stand-alone Electrical Equipment (SAEE), PRL #227, site a polychlorinated biphenyl (PCB) issue? AECOM confirmed that it was. Regarding PRL #204 (Manhole Dewatering Operations), NASA added that previously there was contamination identified with 1200 manholes on center associated with dewatering during maintenance activities. FDEP asked if there were any issues with the water in the manholes? NASA responded that there is Orangeburg pipe (which contains polynuclear aromatic hydrocarbons [PAHs]) located in some of the manholes. FDEP asked if NASA found PAHs associated with Orangeburg in the

manholes, to which NASA confirmed they did in a couple of areas. FDEP inquired if the last two LOCs on slide 7 (Area 3 Repeater Building PRL #210: LOC 2 and LOC 4), also contained PAHs? NASA confirmed with a yes, but explained that AECOM would provide more detail later in the presentation.

PRL #227b (LOC 16) included a soil IM for PCB-contaminated soil to a depth of 0.5' below land surface (bls), completed on March 12, 2020. Previous consensus was reached to install one 2-inch diameter shallow monitoring well (SAEE-MW0002), and perform one groundwater sampling event (with analysis for PCBs by EPA Method SW8082A). The well install location had to be adjusted based on utility infrastructure below ground in this area. The well was installed as close as possible based on these limitations. The results from the groundwater sampling event were below reporting limits of 0.16 and 0.20 µg/L for each PCB congener, which are less than the Florida Groundwater Cleanup Target Level (GCTL) of 0.5 µg/L. FDEP noted that the well location, although not ideal, was the best that could be done.

The Team reached consensus for No Further Action for groundwater and soil at PRL #227b (SAEE) LOC 16 under Risk Management Option Level 1 (RMO-1), Chapter 62-780.680(1) of the Florida Administrative Code (FAC) **(2012-D12).**

FDEP made a note to be specific when requesting NFA for a site. When requesting NFA under RMO-1, please state whether the GCTLs have been met or whether an alternative CTL is being applied based on GCTLs derived from nuisance, organoleptic, or aesthetic considerations. Also, will there be a separate report after the IM report that will address the Site Rehabilitation Completion (SRC) Request? NASA confirmed they would be submitting an SRC report. FDEP asked that NASA please use engineering and professional certifications, as stated in Chapter 62-780.400, that the work is completed and in conformance with 62-780, other applicable rules, and professional standards.

PRL #227c (LOC 29) included a soil IM for PCB-contaminated soil from land surface to a depth of either 0.5' or 4.0' bls, completed on March 12, 2020. The IM removed 6.3 cubic yards of contaminated soil. Sidewall and bottom soil sampling were conducted, and the results were below residential SCTL (R-SCTL) criteria of 0.5 mg/kg.

Previous consensus was reached to install one 2-inch diameter shallow monitoring well (SAEE-MW0003), and perform one groundwater sampling event (analysis for PCBs by EPA Method SW8082A). The results from the groundwater sampling event were below reporting limits of 0.16 and 0.20 µg/L for the individual congeners.

FDEP inquired if the ditch adjacent to this location shown in the photographs was normally full of water? NASA responded that this is the end of the wet season, which is why the ditch is retaining water at this time. FDEP stated there is a low leachability threshold for PCBs to surface water. If we are going for site closure, there could be a concern that the surface water could be ecological habitat. If there is no surface water nearby a site, the NFA decision is easier. NASA stated that this ditch is part of a stormwater conveyance system. HGL stated that a swale with intermittent water should not be considered surface water. FDEP followed up and stated that in the site closure request, ensure we state this is an intermittent ditch and that it is part of a stormwater conveyance system. FDEP has a checklist they go through for SRC Order (SRCO) requests, and one of the boxes to be checked is that surface water is not contaminated. If the water is present year-round, then it is considered surface water. NASA stated that this ditch receives water from all the surrounding roads, and is a stormwater conveyance. FDEP requested that NASA clarify in their request for site closure that this is stormwater conveyance, please.

The Team reached consensus for No Further Action under RMO-1 for groundwater and soil at LOC 29 under PRL #227c (SAEE**) (2012-D13).**

The MHDO PRL #204 (LOC 7A) included a soil IM for lead-contaminated soil from a depth of 0 to 0.5' bls, completed on June 9 and 10, 2020. The IM removed 6 cubic yards of contaminated soil. Previous consensus was reached to collect an additional soil sample(s) 10 to 15 ft west of SB0014 for lead analysis (EPA Method SW6010). On October 21-26, 2020, AECOM used existing coordinates to locate and mark previous soil borings and reestablish excavation boundaries. It was discovered that SB0014 was further south than depicted in historical figures. AECOM expanded soil samples collected to include both west and south side of SB0014. AECOM collected four samples (of which two were held and

ultimately not analyzed) to confirm that excavation was adequate and not leaving any lead contamination out there. Results for the two analyzed samples were below the lead R-SCTL of 400 mg/kg.

FDEP inquired what "R" and "L" stand for? They are used in the figure in red on slide 21. NASA clarified it was the abbreviation to signify residential and leachability exceedances.

The Team reached consensus for No Further Action under RMO-1 for groundwater and soil at LOC 7A under PRL #204 (MHDO) **(2012-D14)**. The next step will be to prepare a SRC Report.

Area 3 Repeater Building (A3RB) PRL #210 LOC 2 included a soil IM for PAH-contaminated soil to a depth to 0.5' bls, completed on June 8, 2020. The IM removed 7.4 cubic yards of contaminated soil. Previous consensus was reached to install one 2-inch diameter shallow monitoring well (A3RB-MW0002), and perform one groundwater sampling event for PAHs (EPA Method SW8270D SIM). The results from the groundwater sampling event were below reporting limits of 0.20, 0.32, or 0.032 µg/L for the individual PAH compounds.

FDEP inquired if this was also related to manhole dewatering operations? AECOM stated it was not. The PAHs at this LOC were tied to a generator.

FDEP inquired on the reporting limits. Are these reporting limit detection limits? Sometimes labs report the Limit of Quantitation and refer to it as the detection limit, which is equal to the Method Detection Limit. Are you using the word detection limit generically? AECOM responded that they were not using the terminology generically. They checked the information real time and reported that the reporting limit provided for A3RB LOC 2 was the laboratory Method Detection Limit.

The Team reached consensus for No Further Action under RMO-1 for groundwater and soil at LOC 2 under PRL #210 (A3RB) **(2012-D15).**

A3RB PRL #210 LOC 4 included a soil IM for soils contaminated by PAHs, copper, and lead to depths of 0.5'- 2.0' bls, completed between June 11-16, 2020. The IM removed a total of 131.6 cubic

yards of contaminated soil. Previous consensus was reached to sample the existing 1-inch diameter shallow monitoring well (MHDO-IW0006S) for lead (EPA Method SW6010). The results from the groundwater sampling event were below the lead GCTL of 15 µg/L.

FDEP inquired on LOC 4, while recent work focused on groundwater at this location, do you have some sampling data for under the slab? NASA responded that the foundation of the building was deeper than the extent of the contamination of the soil and prevented further excavation. FDEP asked this to be stated clearly in the closure request when submitting.

The Team reached consensus for No Further Action under RMO-1 for groundwater and soil at LOC 4 under PRL #210 (A3RB) **(2012-D16).**

Result: Decision item 2012-D12 through D16

December 2020 Decision Items Rev 1		
Decision No.	**Minutes Reference**	**Decision**
2012-D12	2012-M10	Manhole Dewatering Operations (PRL #204), Area 3 Repeater Building (PRL #210), and Stand-Alone Electrical Equipment LOC 16 (PRL #227b), and 19 (PRL #227c), December 2020: The Team reached consensus for No Further Action for groundwater and soil at PRL #227b (SAEE) LOC 16 under Risk Management Option Level 1 (RMO-1), Chapter 62-780.680(1) of the Florida Administrative Code (FAC).
2012-D13	2012-M10	Manhole Dewatering Operations (PRL #204), Area 3 Repeater Building (PRL #210), and Stand-Alone Electrical Equipment LOC 16 (PRL #227b), and 19 (PRL #227c), December 2020: The Team reached consensus for No Further Action under RMO-1 for groundwater and soil at LOC 29 under PRL #227c (SAEE).
2012-D14	2012-M10	Manhole Dewatering Operations (PRL #204), Area 3 Repeater Building (PRL #210), and Stand-Alone Electrical Equipment LOC 16 (PRL #227b), and 19 (PRL #227c), December 2020: The Team reached consensus for No Further Action under RMO-1 for groundwater and soil at LOC 7A under PRL #204 (MHDO).
2012-D15	2012-M10	Manhole Dewatering Operations (PRL #204), Area 3 Repeater Building (PRL #210), and Stand-Alone Electrical Equipment LOC 16 (PRL #227b), and 19 (PRL #227c), December 2020: The Team reached consensus for No Further Action under RMO-1 for groundwater and soil at LOC 2 under PRL #210 (A3RB).
2012-D16	2012-M10	Manhole Dewatering Operations (PRL #204), Area 3 Repeater Building (PRL #210), and Stand-Alone Electrical Equipment LOC 16 (PRL #227b), and 19 (PRL #227c), December 2020: The Team reached consensus for No Further Action under RMO-1 for groundwater and soil at LOC 4 under PRL #210 (A3RB).

KSCRT April 2021 Meeting

Meeting Minutes and Decisions

Revision 1 Meeting Minutes for April 28th & 29th, 2021

Attendees:

1. Bruce Moore/FDEP
2. Mike Deliz/NASA
3. Ryan O'Meara/NASA
4. Deda Johansen/NASA
5. Anne Chrest/NASA
6. Natasha Darre/NASA
7. Dinh Vo/NASA
8. Michelle Moore/NEMCON
9. Mark Speranza/Tetra Tech
10. Mark Jonnet/Tetra Tech
11. Chris Hook/Tetra Tech
12. Chris Johnson/AECOM
13. Josh Lerch/AECOM
14. Howard Fowler/Tetra Tech
15. James Lloyd/Tetra Tech
16. Sarah Damphousse/Tetra Tech
17. Jennifer Joyal/AECOM
18. Linnea King/AECOM
19. Randy Sillan/AECOM
20. Chad Lee/AECOM
21. Richard Smith/HGL
22. Cady Carol/HGL

2104-M05 Howard Fowler/HGL

Stand-Alone Electrical Equipment (PRL #227d) Location of Concern 30, April 2021

Goal: The purpose is to document is to present the results of the 2020 Confirmatory Sampling Results and Recommendations moving forward.

Discussion: Confirmatory sampling was performed at 48 of the 49 Stand-alone Electrical Equipment locations of concern (LOC) in 2019. LOC 30 was not sampled at that time due to operational constraints. In November 2020, ten samples were collected at LOC 30 from 0.5-1.5 feet below land surface (ft bls). The samples were composites of asphalt, road base and soil. Samples were analyzed for polychlorinated PCBs, and no PCBs were detected in any of the ten soil samples. However, there was a delay in shipment and the samples were analyzed out of hold time. While PCBs are very stable and the results are not suspect, NASA elected to confirm the results.

In December 2020, discrete samples of asphalt, road base and soil were collected from six locations adjacent to November 2020 sample locations. The 18 samples were analyzed for PCBs, and there were no detections.

The Team reached consensus for No Further Action (NFA) at LOC 30 for PRL #227d (Stand-Alone Electrical Equipment) under FAC 62-780.680(I) RMO I **(2104-D21).**

Result: Decision item 2104-D21

April 2020 Decision Items Rev 1		Decision
Decision No.	**Minutes Reference**	
2104-D21	2104-M05	Stand-Alone Electrical Equipment (PRL #227d) Location of Concern 30, April 2021: The Team reached consensus for No Further Action (NFA) at LOC 30 for PRL #227d (Stand-Alone Electrical Equipment) under FAC 62-780.680(I) RMO I.

ENCLOSURE 6

KSC PFAS Dewatering Construction Projects

PFAS Dewatering Construction Projects
2023 KSC LUCIP Report
Kennedy Space Center, Florida

SMWU/PRL	Name	KSC Project Control Number (PCN)	Date FDEP Concurrence Received	Dewatering Volume (gal)	Pumping Duration	Dewater Design Details	Effluent Discharge Location	Dewatering Guidance Issued	Post Dewatering Sampling Required	Post Dewatering Sample Date	PFAS Dewatering Assessment Area
SWMU #056	Intersection of Saturn Causeway and Instrumentation Road	**PCN 96968.4** – Water/Wastewater Upgrades Phase 5	14-Aug-2019	1,836,000	3 days	6-inch wellpoint header around the excavation area, connected to a 4-inch Double Diaphragm High Volume Pump. Well points installed to 15 feet bls. 612,000 gal/day.	Discharge dewatering effluent into the open utility trench.	Dewatering effluent will be discharged into the open utility trench, which has overflow into a grassy area. A soil berm will installed around the grassy area to contain the water, allowing water to percolate.	Yes	TBD	KSC Industrial Area
SWMU #093	Citgo Service Station	**PCN 98966.4 & 98966.5** (Safety and Reliability Upgrade, Kennedy Space Center Institutional Power Systems, Phase 4 and Phase 5, Package 1: Replacement of 10 Load Break Switches	30-Sep-2019	180,000	15 days	Pump out manhole MH-19 to support electrical upgrades.	MH-19 effluent will be discharged directly to the ground in the field east of the Citgo Gas Station.	MH-19 effluent will be discharged directly to the ground in the field east of the Citgo Gas Station and allowed to percolate. A watch person with hay bales will be on stand-by should sheet flow approach within 10 feet of adjacent stormwater swales.	Yes	15-Sep-2021	KSC Industrial Area
SWMU #126	Former Central Instrumentation Facility (CIF)	**3288049** - KIAC T0467 Distribution of FS05 in the Industrial Area	18-Jan-2022	4,000-8,000	8-12 hours	Pump out MH-126 to support installation of fiber optic cable	MH-126 effluent will be discharged to ground surface within the former CIF residuals disposal area near the manhole	At Manhole-126 near the former CIF, the results are below FDEP's current provisional groundwater cleanup target levels (GCTLs). A nearby location can be prepared to receive effluent, configured so that the effluent percolates into the ground and does not flow into nearby swales or ditches. FDEP requires that groundwater samples be collected in the percolation location after the dewatering effort is complete. The Remediation Program plans future sampling at the former CIF and therefore we will be able to collect those samples.	Yes	TBD	KSC Industrial Area
SWMU #114	Shuttle Landing Facility (SLF)	**SF0071** - Space Florida, SLF Power and Communications Improvements	28-Jan-2022	37,500,000	75 days	Dewatering pumping rate of 500,000 gal/day.	Effluent discharged to swales east of the newly constructed road and cul-de-sac.	Areas to be dewatered are within the 10 ppt PFOS contour. Dewatering location is north of the SLF concrete apron. Effluent will be discharged to the swales east of the newly constructed road and cul-de-sac. These swales are not connected to the stormwater system. No effluent will be allowed to flow west towards the surface water bodies. Effluent will be sampled and the dewatering system will be inspected daily.	Yes	TBD	SLF Area
SWMU #084	Kennedy Athletic, Recreation, and Social (KARS) Park 1	**PCN 96968.4** – Water/Wastewater Upgrades Phase 5	25-Feb-2022	16,776,000	5 days	Dewatering to replace septic system at KARS Park 1 with gravity sewer lines and a lift station. Dewatering system consists of a 6-inch wellpoint header around the excavation area, connected to a 8-inch Rotary Wellpoint Pump. Well points installed to 17 feet bls. 3,335,200 gal/day.	Dewatering effluent will be discharged to the upland area located west of KARS Park 1.	Effluent will be pumped directly onto adjacent ground in the upland area located west of KARS Park 1 and allowed to percolate. This area is not part of any stormwater system. There is no connection to the Banana River Lagoon and water will percolate into the ground. A watch person with sand bags will be on stand-by should sheet flow begin to pool and threaten to overflow into surface water features. If effluent begins to pool, effluent will be sampled.	Yes	TBD	KARS Park 1 Area
SWMU #126	Former Central Instrumentation Facility	**3293720** - KIAC Install SpaceX Fiber Cable	8-Mar-2022	18,000	8 to 12 hours/each manhole	Pump out Communication Manholes MH-04 and MH-05 to support fiber optic cable installation.	MH-04 and MH-05 effluent discharged to median swale along NASA Causeway.	Manhole MH-04 is located outside the inferred 10 ppt PFOS contour. Conduits connect manholes MH-04 and MH-05. As a result, manhole MH-05 will be pumped down first to mitigate potential contaminant migration. For MH-04 and MH-05 sandbags will be installed around stormwater inlet in the swale, to allow pumped water to percolate.	Yes	TBD	KSC Industrial Area
SWMU #116	Fire Station #1	**3288049** - KIAC T0467 Distribution of FS05 in the Industrial Area	8-Mar-2022	15,000	8 to 12 hours/each manhole	Pump out Communication Manholes MH-37A and MH-37B to support fiber optic cable installation.	MH-37A and MH-37B effluent discharged to swale between Fire Station #1 and Central Supply Warehouse.	Conduits connect manholes MH-37A and MH-37B. Manhole MH-37B had the highest PFAS result. Manhole MH-37B will be pumped first to draw water from manhole MH-37A. The culvert in the swale will be blocked to allow effluent to percolate.	Yes	TBD	KSC Industrial Area
SWMU #045 SWMU #116	Central Heat Plant Fire Station No.1	**3288049** - KIAC T0467 Distribution of FS05 in the Industrial Area	8-Mar-2022	4,000	8 to 12 hours/each manhole	Pump out Communication Manhole MH-37 to support fiber optic cable installation.	MH-37 effluent will be discharged directly to adjacent ground.	Manhole MH-37 is located inside the inferred 10 ppt PFOS contour and outside area with VOCs exceeding NADCs. Effluent will be pumped directly onto adjacent ground and allowed to percolate. A watch person with hay bales will be on stand-by should sheet flow approach within 10 feet of adjacent stormwater swales.	Yes	TBD	KSC Industrial Area
SWMU #014	Base Support Building	**3302770** - KIAC Dig Trench between Manhole #047A and M6-0639	10-May-2022	1,100	8 to 12 hours/each manhole	Pump out Communication Manholes MH-47, MH-47A, and MH-47B to support fiber optic cable installation.	MH-47 and MH-47A effluent will be discharged directly to ground west of manhole MH-47A. MH-47B effluent will be discharged to ground west of Facility M6-0589.	Manholes MH-47, MH-47A, and MH-47B are within the 10 ppt PFOS contour. Effluent from MH-47 and MH-47A will be allowed to percolate on the ground west of manhole MH-47A. A watch person with sand bags will be on stand-by should sheet flow approach within 10 feet of the adjacent stormwater swale. Effluent from MH-47B will be allowed to percolate on the ground west of Facility M6-0589. A watch person with sand bags will be on stand-by should sheet flow approach within 10 feet of the adjacent stormwater swale.	Yes	TBD	KSC Industrial Area
SWMU #014	Base Support Building	**98966.4 & 98966.5** (Safety and Reliability Upgrade, Kennedy Space Center Institutional Power Systems, Phase 4 and Phase 5, Package 1: Replacement of 10 Load Break Switches	12-Jul-2022	1,000	8 to 12 hours/each manhole	Pump out manhole MH-77 to support replacement of an electrical load break switch.	MH-77 effluent will be discharged directly to adjacent ground.	Manhole MH-77 is located inside the inferred 10 ppt PFOS contour. Effluent will be pumped directly onto adjacent ground and allowed to percolate. A watch person with sand bags will be on stand-by should sheet flow approach within 10 feet of the adjacent stormwater swale.	Yes	TBD	KSC Industrial Area

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SWMU #056	Orbital Processing Facility (VAB Area)	**PCN 96968.4** – Water/Wastewater Upgrades Phase 5	13-Oct-2022	6,120,000	2 weeks (10 days)	6-inch wellpoint header around the excavation area, connected to a 4-inch Double Diaphragm High Volume Pump. Well points installed to 10 feet bls. 612,000 gal/day.	Across Crawlerway and discharged into a Retention Pond.	Dewatering effluent will be directed across the Crawlerway and discharged into a Retention Pond. The culvert at the northern edge of the retention pond will be plugged to block flow and ensure effluent is contained and allowed to percolate and infiltrate back into groundwater. Dewatering management also needs to include worker safety measures due to PFOS/PFOA groundwater contamination. Filter methods will be utilized at the discharge end to filter any sediment before being discharged into the retention pond.	Yes	TBD	VAB Area
SWMU #033	Component Cleaning Facility	**EWR162415** - BOSS dewatering in support of SpaceX Project	30-Nov-2022	21,600	8 to 12 hours/each manhole	Pump out manholes P-1, P-4, P-9, P-11, P-14, and P-17 to support the feasibility of expanding Saturn Causeway. 3,600 gal/manhole.	Effluent will be discharged directly to the ground 25 feet south of each manhole.	Effluent will be discharged directly to the ground 25 feet south of each manhole. Sandbags will be used to construct a 1,000 sq. ft. temporary pond at the manholes to allow the pumped water to percolate into the ground. The temporary ponds will be constructed at manholes P-1, P-4, P-9, P-11, and P-14. No controls will be utilized at manhole P-17, since the ground surface at P-17 location does not discharge into any feature that connects to surface water.	Yes	TBD	Saturn Causeway Area
SWMU #105	Former Fire Station #2 and VAB Area North	**3314676** - KIAC Install Fiber Cable between K6-1193 and K6-1096	12-Dec-2022	48,000	2-3 days	Pump out Communication Manholes MH-500, MH-500A, and MH-500B to support fiber optic cable installation.	Effluent will be discharged to adjacent swale located between the parking lot and railroad tracks and on the ground east of the VAB Repeater Building.	Manholes MH-500, MH-500A, and MH-500B are within the 4 ppt PFOS contour. MH-500B will be dewatered before MH-500A to prevent siphoning into MH-500A. Effluent from MW-500B will discharged into the adjacent swale located between the railroad track and parking lot. Estimated 10,000 gallons pumped from MH-500B. Effluent from MW-500A will discharged into the adjacent swale located between the railroad track and parking lot. Estimated 30,000 gallons pumped from MH-500A. Effluent from MW-500 will discharged onto the ground on the east side of the VAB Repeater Building. Estimated 8,000 gallons pumped from MH-500. At MH-500, the pumping rate will be regulated to prevent overflow and allow for percolation. There are no points of discharge to surface water or conveyance to surface water at both effluent discharge locations.	Yes	TBD	VAB Area
SWMU #090	Hypergol Maintenance Facility North	3225647 (KIAC)	1-Feb-2023	15,000	8 to 12 hours/each manhole	Pump out manholes #243 and #244 to support the reconfiguration of a new fiber optic cable. 15,000 gal total 7,500 gal/manhole.	Effluent will be discharged directly to the ground onto the field that parallels G Avenue between manholes #243 and #244.	Manholes #243 and #244 are located along G Avenue in the KSC Industrial Area, south the VOC groundwater plume at HMF North. Manholes are in proximity to areas where PFAS concentrations are at or above the PFAS regional screening levels. Effluent will be discharged directly to the ground onto the field that parallels G Avenue between manholes #243 and #244. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditches.	Yes	TBD	HMF North Area
SMWU #114	SLF Area	SPFL LLF Block 3 ABN&O	17-Feb-2023	27,500,000	80-100 days 250,000-275,000 gal/day	Construction of new Project Comet Facility will include the construction of five retention ponds. Once retention ponds are constructed, dewatering effluent will be pumped into the retention ponds. Any discharges from the ponds will be blocked during construction to allow for percolation. An 8" rotary wellpoint pump will be used.	Effluent will be discharged into retention ponds constructed on-site.	Construction of new Project Comet Facility will include the construction of five retention ponds. Once retention ponds are constructed, dewatering effluent will be pumped into the retention ponds. Any discharges from the ponds will be blocked during construction to allow for percolation. An 8" rotary wellpoint pump will be used. Since discharges will be blocked, all effluent will remain on-site and will be managed through dewatering best management practices.	Yes	TBD	SLF Area
SWMU #056	VAB Area- VAB Utility Annex	WON 10138099 (BOSS)	23-Feb-2023	29,000	6 hours	Pump out manhole #E14 to support inspection and maintenance. 29,000 gal/manhole.	Effluent will be discharged directly to the ground onto the grassy area located approximately 100 ft. south of manhole #E14.	Manhole #E14 is located within the area where PFAS concentrations exceed EPA RSLs. Effluent will be discharged directly to the ground onto the grassy area located approximately 100 ft. south of manhole #E14. A watch person with sand bags will be on stand-by should sheet flow approach within 10 feet of any adjacent stormwater swale. Effluent will not be allowed to reach any surface water and will be retained within the footprint of PFAS-impacted groundwater.	Yes	TBD	VAB Area
SWMU #056	VAB Area	WON 10162961 (BOSS)	3-Mar-2023	21,600	8 to 12 hours/each manhole	Pump out manholes #E6 and #E7 to support inspection and maintenance. 18,000 gal/Manhole E#6 3,600 gal/Manhole #E7	Effluent will be discharged directly to the ground onto unpaved areas located north of the manholes.	Manholes #E6 and #E7 are located within the area where PFAS concentrations exceed EPA RSLs. Effluent will be discharged directly to the ground onto unpaved areas located north of the manholes. Discharge locations have been used for past dewatering efforts and effluent is diverted away from swales and ditches. A berm of gravel and railroad ties will be set-up prior to pumping at Manhole #E6. Effluent will be discharged near the gravel berm. A stormwater lateral line is located beneath the proposed discharge area for Manhole #E7. Wattles or equivalent engineering controls will be positioned to prevent effluent from entering the subsurface line. Effluent will not be allowed to reach any surface water and will be retained within the footprint of PFAS-impacted groundwater.	Yes	TBD	VAB Area

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SWMU #056	VAB Area	WON 10162961 (BOSS)	3-Mar-2023	3,645	8 to 12 hours/each location	Pump out manholes #E25 and #E25A and handholes #ECS-1 and #ECS-2 to support maintenance and to splice a cable. 375 gal/Manhole E#25 3,030 gal/Manhole #E25A 240 gal/handholes	Manhole effluent will be discharged directly to the ground onto grassy areas located adjacent to the manholes. Due to the small volume, handhole effluent will be discharged directly to the ground at the adjacent stormwater swale.	Manholes and handholes are located within the area where PFAS concentrations exceed EPA RSLs. Manhole effluent will be discharged directly to the ground onto grassy areas located adjacent to the manholes. Manhole #E25 effluent will be discharged into the grassy area northwest of the manhole. Manhole #E25A effluent will be discharged into the grassy area south of the manhole. Due to the small volume, handhole effluent will be discharged directly to the ground at the adjacent stormwater swale located north of the handholes. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditches. Effluent will not be allowed to reach any surface water and will be retained within the footprint of PFAS-impacted groundwater.	Yes	TBD	VAB Area
SWMU #033	Component Cleaning Facility	**EWR162415** - BOSS dewatering in support of SpaceX Project	27-Mar-2023	50,400	8 to 12 hours/each manhole	Pump out manholes P-1, P-4, P-5, P-6, P-8, P-9, P-10, P-11, P-12, P-13, P-14, P-15, P-17 and P-18 to support the feasibility of expanding Saturn Causeway. 3,600 gal/manhole.	Effluent will be discharged directly to the ground 25 feet south of each manhole.	Effluent will be discharged directly to the ground 25 feet south of each manhole. Sandbags will be used to construct a 1,000 sq. ft. temporary pond at the manholes to allow the pumped water to percolate into the ground. The temporary ponds will be constructed at manholes P-1, P-4, P-5, P-6, P-8, P-9, P-10, P-11, P-12, P-13, and P-14. No controls will be utilized at manhole P-15 and P-17, since the ground surface at these locations do not discharge into any feature that connects to surface water. Wattles or similar controls will be available at P-18, although the discharge area at P-18 is ample.	Yes	TBD	Saturn Causeway Area
SWMU #08	Launch Complex 39A	WON 10147197 (Rev. A)	6-Apr-2023	14,400	8 to 12 hours/each manhole	Pump out manholes P33, P39, P41a and P44a to support the installation of a new high voltage line from C-5 Electrical Substation to LC-39A. 3,600 gal/manhole.	Effluent will be discharged directly to the ground 25 feet from each manhole.	Effluent will be discharged directly to the ground 25 feet from each manhole. Sandbags or wattles will be used to construct a 1,000 sq. ft. temporary pond at the manholes to allow the pumped water to percolate into the ground. The temporary ponds will be constructed at the manholes. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater.	Yes	TBD	LC-39A Area
SWMU #106	Fire Station #3	WON 10115020 - P48; WON 10115021 - P49; WON 10115035 - P50; WON 10115848 - P51	11-Apr-2023	20,800	8 to 12 hours/each manhole	Pump out manholes P48, P49, P50 and P51 to support on-going work within the area. 5,200 gal/manhole.	Effluent will be discharged directly to the ground 20 feet from each manhole.	Effluent will be discharged directly to the ground 20 feet from each manhole. Sandbags or wattles will be used to construct a 1,000 sq. ft. temporary pond at the manholes to allow the pumped water to percolate into the ground. The temporary ponds will be constructed at the manholes. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	Fire Station #3 Area
SWMU #08	Launch Complex 39A	WON 10102307 - P21, P22, P23; WON 10103810 - P24	27-Apr-2023	20,800	8 to 12 hours/each manhole	Pump out manholes P21, P22, P23 and P24 to support on-going work within the area. 5,200 gal/manhole.	Effluent will be discharged directly to the ground 20 feet from each manhole.	Effluent will be discharged directly to the ground 20 feet from each manhole. Sandbags or wattles will be used to construct a 1,000 sq. ft. temporary pond at the manholes to allow the pumped water to percolate into the ground. The temporary ponds will be constructed at the manholes. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	LC-39A Area
SWMU #41	Components Refurbishment and Chemical Analysis	3330188 (KIAC)	26-May-2023	1,000	1 hour	Pump out manhole #554 to support the installation of a new communication line. 1,000 gal.	Effluent will be discharged directly to the ground 25 feet from the manhole in the grassy area located to the east.	Effluent will be discharged directly to the ground 25 feet from the manhole. Sandbags or wattles will be used to construct a 1,000 sq. ft. temporary pond at the manholes to allow the pumped water to percolate into the ground. The temporary ponds will be constructed at the manholes. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	Contractor's Road Area
SWMU #114	SLF Area	SPFL_LLF_SP 23-0025	26-May-2023	265,305,600	2-4 weeks per location	Stormwater upgrades include the installation of new culverts at seven locations within the SLF Area. Dewatering effluent will be pumped into the upland areas adjacent to the dewatering locations. Wellpoints will be installed 10-15 ft. bls. Two 6" piston wellpoint pumps will be used.	Effluent will be pumped into the upland areas adjacent to the dewatering locations.	Stormwater upgrades include the installation of new culverts at seven locations within the SLF Area. Dewatering volumes vary upon location, but range from 28,425,600 to 47,376,000 gal. Pumping durations vary upon location, but range from 2-4 weeks. Dewatering effluent will be pumped into the upland areas adjacent to the dewatering locations. Since discharge will be to upland areas and allowed to percolate, flows will be diverted by sandbags or other controls to ensure that pumped water does not discharge back into the drainage ditches. All effluent will remain on-site. Temporary ponding may occur. The discharge will be managed through dewatering best management practices. Wellpoints will be installed 10-15 ft. bls. Two 6" piston wellpoint pumps will be used.	Yes	TBD	SLF Area

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SWMU #124	Weather Site #509	PCN 99209 ECM-11.2	26-May-2023	66,528,000	4 weeks	Construction of Solar Site (Solar Site #6) and retention pond. Dewatering effluent will be pumped onto the ground along the southern boundary of site. An earthen ditch plug will be installed in the adjacent stormwater ditch to prevent any discharges to surface water. Two 12" rotary wellpoint pump will be used.	Effluent will be pumped onto the ground in the adjacent wooded areas. An earthen ditch plug will be installed in the adjacent stormwater ditch to prevent any discharges to surface water.	Construction of Solar Site (Solar Site #6) and retention pond. Dewatering effluent will be pumped onto the ground along the southern boundary of site. 4,435,200 gal. per day will be pumped for the first two days. 2,217,600 gal. per day will be pumped after the first couple of days. Pumping duration is expected to last 4 weeks. An earthen ditch plug will be installed in the adjacent stormwater ditch to prevent any discharges to surface water. Two 12" rotary wellpoint pump will be used.	Yes	TBD	Solar Site #6
SWMU #056	VAB Area	3329169 (KIAC)	6-Jun-2023	20,000	2-4 days	Pump out communication manholes 332 through 335 and 416 and 417 to support the installation of a new communication cable. Manholes 332 and 334 = 15,000 gal. Manholes 333, 335, 416, and 417 = 5,000 gal.	Effluent will be discharged directly in grassy areas or blocked ditches near each manhole.	15,000 gallons of water will be pumped from manholes 332 and 334. 5,000 gallons of water will be pumped from manholes 333, 335, 416, and 417. Effluent will be discharged directly in grassy areas or blocked ditches near each manhole. Stormwater outfalls in ditches will be blocked to allow water to infiltrate. Sandbags or wattles will be used to divert any pumped water and allow the pumped water to percolate into the ground. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater.	Yes	TBD	VAB Area
SWMU #056	VAB Area	WON 10147534 - E18a, E18b (BOSS); 3329062 - 421, 421A (KIAC)	6-Jun-2023	10,400	2-4 days	Pump out electrical manholes E18a, E18b, 421, and 421a to support the installation of a new communication cable. Manholes E18a and E18b = 2,200 gal/each. Manhole 421 = 5,000 gal. Manhole 421a = 1,000 gal.	Effluent will be discharged directly in grassy areas near each manhole.	4,400 gallons of water will be pumped from manholes E18a and E18b. 5,000 gallons of water will be pumped from manhole 421. 1,000 gallons of water will be pumped from manhole 421a. Effluent will be discharged directly in grassy areas near each manhole. Sandbags or wattles will be used to divert any pumped water and allow the pumped water to percolate into the ground. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater.	Yes	TBD	VAB Area
SWMU #056	VAB Area		7-Jun-2023	450,000	8 days	Pump out electrical manhole E4 and adjacent open excavations to support the installation of a new duct bank and transformer. Manhole E4 will be pumped for 8 hours/day for 5 days. Excavation areas will be pumped for 3 hours/day for 3 days. Total = 450,000 gal.	Effluent will be discharged directly in dry retention swales east and southwest of Manhole E4.	Pump out electrical manhole E4 and adjacent open excavations to support the installation of a new duct bank and transformer. Manhole E4 will be pumped for 8 hours/day for 5 days. Excavation areas will be pumped for 3 hours/day for 3 days. Total = 450,000 gal. Effluent will be discharged directly in dry retention swales east and southwest of Manhole E4. Sandbags or wattles will be used to divert any pumped water and allow the pumped water to percolate into the ground. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater.	Yes	TBD	VAB Area
SWMU #70	Hypergol Maintenance Facility South	3330907	6-Jun-2023	5,000	1 hour	Pump out manhole #259 to support the installation of a new fiber optic communication line. 5,000 gal.	Effluent will be discharged directly to the ground 25 feet from the manhole, north of the swale that parallels 10th Street.	Effluent will be discharged directly to the ground 25 feet from the manhole, north of the swale that parallels 10th Street. Sandbags or wattles will be used to block the culvert under F Avenue, if needed. Directional drilling will be needed to install the fiber optic line underneath Buck Creek. A pit will be dug to contain drilling fluids and returns associated with the directional drilling. The pit will be isolated from any surface water or stormwater conveyances. Fluids/mud will be allowed to dry in place within PFAS-impacted areas. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater.	Yes	TBD	HMF South and VPF Area
SWMU #056	VAB Area	99584, 99594, 99593, 99593.1, 99593.2	26-Sep-2023	216,000	5 days	Modifications to VAB High Bay 2 will require dewatering. Dewatering effluent will be pumped onto the ground west of VAB High Bay 2. Dewatering depth will be to 7.5 ft. bls. Pumping duration will be 5 days.	Dewatering effluent will be pumped onto the ground west of VAB High Bay 2.	Effluent will be discharged directly in grassy area located west of the VAB High Bay 2. Silt fence or hay bales will be used detain any pumped water and allow the pumped water to percolate into the ground. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater.	Yes	TBD	VAB Area
SWMU #56	VAB Area	WON 10180305	27-Sep-2023	32,400	1.5 - 4 hours	Pump out manholes E23, E24, P2, and P3 (along Saturn Causeway) to support on-going work within the area. 5,400 - 14,400 gal/manhole.	Effluent will be discharged directly to the ground 20 feet from each manhole.	Effluent will be discharged directly to the ground 20 feet from each manhole. Sandbags or wattles will be used to construct a 2,000 sq. ft. temporary pond at the manholes to allow the pumped water to percolate into the ground. The temporary ponds will be constructed at the manholes. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	VAB Area

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PRL #128	KSC Visitor Complex	PCN 99276 (DNPS Water Main Loop)	25-Aug-2023	20,000	2 Days	Installation of new fire main at the KSC Visitor Complex will involve horizontal drilling and dewatering. Two dewatering pumps will be used. 20,000 gal.	Effluent will be discharged north of the chiller plant, located east of the Visitor Complex.	Effluent will be discharged north of the chiller plant, located east of the Visitor Complex. A hose will be used to discharge effluent north of the chiller plant. A trench will be dug east of the discharge location, drill cuttings and fluids will be placed in trench. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or wattles will be used to divert any pumped water and allow the pumped water to percolate into the ground.	Yes	TBD	KSC Visitor Complex
SWMU #10 and #36	GSA Reclamation Yard and GSA Reclamation Yard West	PCN 99276 (DNPS Water Main Loop)	25-Aug-2023	300,000	3 days	Installation of new fire main at along Ransom Road will involve horizontal drilling and dewatering. Diaphragm pump will be used. 100,000 gal. per day	Effluent will be discharged in the dry detention area between the GSA Reclamation Yard and the Administration/Paint Building.	Effluent will be discharged in the dry detention area between the GSA Reclamation Yard and the Administration/Paint Building. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or wattles will be used to divert any pumped water and allow the pumped water to percolate into the ground.	Yes	TBD	GSA Reclamation Yard Area
SWMU #70 and SWMU #77	HMF South and VPF	10182023, 10182021, 10182022, 10184504 (BOSS)	19-Oct-2023	9,000	1.5 - 4 hours	Pump out manholes MH-111 (HMF South) and MH-114 (VPF) to support maintenance of electrical lines. 3,600 - 5,400 gal/manhole.	Effluent will be discharged directly to the ground 20 feet from each manhole.	Effluent will be discharged directly to the ground 20 feet from each manhole. Sandbags or wattles will be used to construct a 2,200 and 2,800 sq. ft. temporary pond at the manholes to allow the pumped water to percolate into the ground. The temporary ponds will be constructed at the manholes. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water pond.	Yes	TBD	HMF South and VPF Area
SWMU #09	Launch Complex 39B	EWR162412 (WON 10186479)	NA	43,200	4 hours/each manhole	Pump out manholes P32B, P34B, and P35B to support electrical work within the area. 14,400 gal/manhole.	Effluent will be discharged directly to the ground 20 feet from each manhole.	Effluent will be discharged directly to the ground 20 feet from each manhole. Sandbags or wattles will be used to construct a 2,000 sq. ft. temporary pond at the manholes to allow the pumped water to percolate into the ground. The temporary ponds will be constructed at the manholes. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	LC-39B Area
SWMU #114	SLF Area	WON 10142011	9-Nov-2023	7,200	2 hours	Pump out manhole #609 to support electrical work within the area. 7,200 gal/manhole.	Effluent will be discharged directly to the ground 25 feet from the manhole.	Effluent will be discharged directly to the ground 25 feet from the manhole. Sandbags or wattles will be used to construct a 1,300 sq. ft. temporary pond at the manhole to allow the pumped water to percolate into the ground. The temporary pond will be constructed at the manhole. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	SLF Area
SWMU #111	LC-39A Operations Support Building Area	EWR162412 (WON10186479)	13-Nov-2023	28,800	4 hours/each manhole	Pump out manholes P20, P25, P26, and P28 to support maintenance of electrical lines along Saturn Causeway. 7,200 gal/manhole.	Effluent will be discharged directly to the ground 25 feet southwest/southeast of each manhole.	Effluent will be discharged directly to the ground 25 feet from the manhole. Sandbags or wattles will be used to construct a 1,000 sq. ft. temporary pond at the manhole to allow the pumped water to percolate into the ground. The temporary pond will be constructed at the manhole. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	LC-39A Area
SWMU #08	Launch Complex 39A	10152955	14-Nov-2023	13,000	5 hours	Pump out manhole #PCV2 to support electrical work within the area. 13,000 gal/manhole.	Effluent will be discharged directly to the ground 25-50 feet from the manhole.	Effluent will be discharged directly to the ground 25-50 feet from the manhole in the grassy area located west of the launch pad. Sandbags or wattles will be used to construct a 2,300 sq. ft. temporary pond at the manhole to allow the pumped water to percolate into the ground. The temporary pond will be constructed near the manhole. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	LC-39A Area
SWMU #56	VAB Area	EWR162412 (WON 10186479) E39 and E49	14-Nov-2023	7,200	2 hours	Pump out manholes #E39 and E49 to support electrical work within the area. 3,600 gal/manhole.	Effluent will be discharged directly to the ground 25 feet from Manhole #E49.	Effluent will be discharged directly to the ground 25 feet from Manhole #E49. Sandbags or wattles will be used to construct a 1,300 sq. ft. temporary pond at the manhole to allow the pumped water to percolate into the ground. The temporary pond will be constructed at the manhole. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes and sample IW0019I for PFAS	TBD	VAB Area

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SWMU #114	SLF Area	EWR 162412, WON 10186479	16-Nov-2023	59,400	11+ hours	Pump out Manholes E51 through E66 to support maintenance of electrical lines within the area. 3,600 gal/manhole (all except Manhole E64). Manhole E64 = 5,400 gallons	For manholes E51-E55 and E62-E66, effluent will be discharged directly to the ground 25-50 feet from the manhole. For manholes E56-E61, effluent will be pumped out using a vacuum truck and discharged in the grassy area south of the Hangar at the SLF Area (north on Manhole E62).	For manholes E51-E55, E62-E63, and E65-E66, effluent will be discharged directly to the ground 25-50 feet from the manhole. Sandbags or wattles will be used to construct a 700 sq. ft. temporary pond at the manhole to allow the pumped water to percolate into the ground. The temporary pond will be constructed at the manhole. For manhole E64, effluent will be discharged directly to the ground 25-50 feet from the manhole. Sandbags or wattles will be used to construct a 1,000 sq. ft. temporary pond at the manhole to allow the pumped water to percolate into the ground. The temporary pond will be constructed at the manhole. For manholes E56-E61, manholes will be pumped out using a vacuum truck. Effluent will be discharged onto the grassy area south of the Hangar at the SLF Area (north on Manhole E62). Sandbags or wattles will be used to construct a 1,200 sq. ft. temporary pond to allow the pumped water to percolate into the ground. Effluent will be allowed to percolate in the temporary ponding area prior to discharging pumped water from another manhole. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	SLF Area
SWMU #56	VAB Area	EWR162412 (WON 10186479) manholes E28 and E41	16-Nov-2023	21,600	6 hours	Pump out manholes #E28-E30 and E41 to support maintenance of electrical lines within the area. 3,600 gal/manhole (all except Manhole #E28). Manhole #E28 = 10,800 gallons.	Effluent will be discharged directly to the ground 25 feet from manholes.	For manholes E29, E30, and E41, effluent will be discharged directly to the ground 25 feet from the manhole. Sandbags or wattles will be used to construct a 700 sq. ft. temporary pond at the manhole to allow the pumped water to percolate into the ground. The temporary pond will be constructed at the manhole. For manhole E28, effluent will be discharged directly to the ground 25 feet from the manhole. Sandbags or wattles will be used to construct a 2,000 sq. ft. temporary pond at the manhole to allow the pumped water to percolate into the ground. The temporary pond will be constructed at the manhole. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	VAB Area
SWMU #56	VAB Area	WON 10162961 (manholes E25, E25A, HH ECS-1, HH ECS-2)	13-Dec-2023	145,800	30.5 hours	Pump out 12 manholes to support maintenance of electrical lines within the area. Manhole volumes range from 1,800 to 72,000 gallons.	Effluent will be discharged directly to the ground 25-50 feet from manholes.	Pump out Manholes E4a, E5, E40, E1, E1b, E6, E25, E25a, HH-ECS1, HH-ECS2, E7, and E15. Effluent will be discharged directly to the ground 25-50 feet from the manhole. Sandbags or wattles will be used to construct a temporary pond at the manhole to allow the pumped water to percolate into the ground. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	VAB Area
SWMU #70 and SWMU #77	HMF South and VPF	WON 10182745 – 111A WON 10182721 – 111B WON 10183581 – 111C WON 10183594 – 112 WON 10184503 – 113	7-Dec-2023	18,000	4 hours/each manhole	Pump out manholes MH-111A, MH-111B, MH-111C, MH-112, and MH-113, to support maintenance of electrical lines within the area. Manhole volumes are 3,600 gallons per manhole.	Effluent will be discharged directly to the ground 25-50 feet from manholes.	Pump out Manholes MH-111A, MH-111B, MH-111C, MH-112, and MH-113. Effluent will be discharged directly to the ground 25-50 feet from the manhole. Sandbags or wattles will be used to construct a temporary pond at the manhole to allow the pumped water to percolate into the ground. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	HMF South and VPF Area
SWMU #08	Launch Complex 39A		NA	7,200	4 hours/each manhole	Pump out manhole P34 to support inspection and maintenance of communications lines. 7,200 gal/manhole.	Effluent will be discharged directly to the ground 25 feet from the manhole.	Pump out Manhole P34. Effluent will be discharged directly to the ground 25-50 feet from the manhole. Sandbags or wattles will be used to construct a temporary pond at the manhole to allow the pumped water to percolate into the ground. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	LC-39A Area
SWMU #114	SLF Area	PCN 98966.4A (REV B)	NA	65,520	6 days	Dewatering around LBS 306, to support upgrading and replacing electrical cables at LBS 306. Well points will be installed around the excavation cable area, connected to a 4-inch pump. Well points installed to 13 feet bls. 390 gal/hr.	Effluent will be discharged directly to the ground in the grassy area west of the LBS 306.	Effluent will be discharged directly to the ground in the grassy area west of LBS 306. The natural grade slopes away from any drainage ditches. Sandbags or wattles will be used to divert any flow from adjacent ditch and will allow the pumped water to percolate into the ground. Effluent management plan will not allow effluent to reach surface water and will retain effluent within the footprint of affected groundwater. Sandbags or an alternate engineering control will be available to allow all pumped water to percolate back into the groundwater and prevent discharge to any surface water ditch.	Yes	TBD	SLF Area

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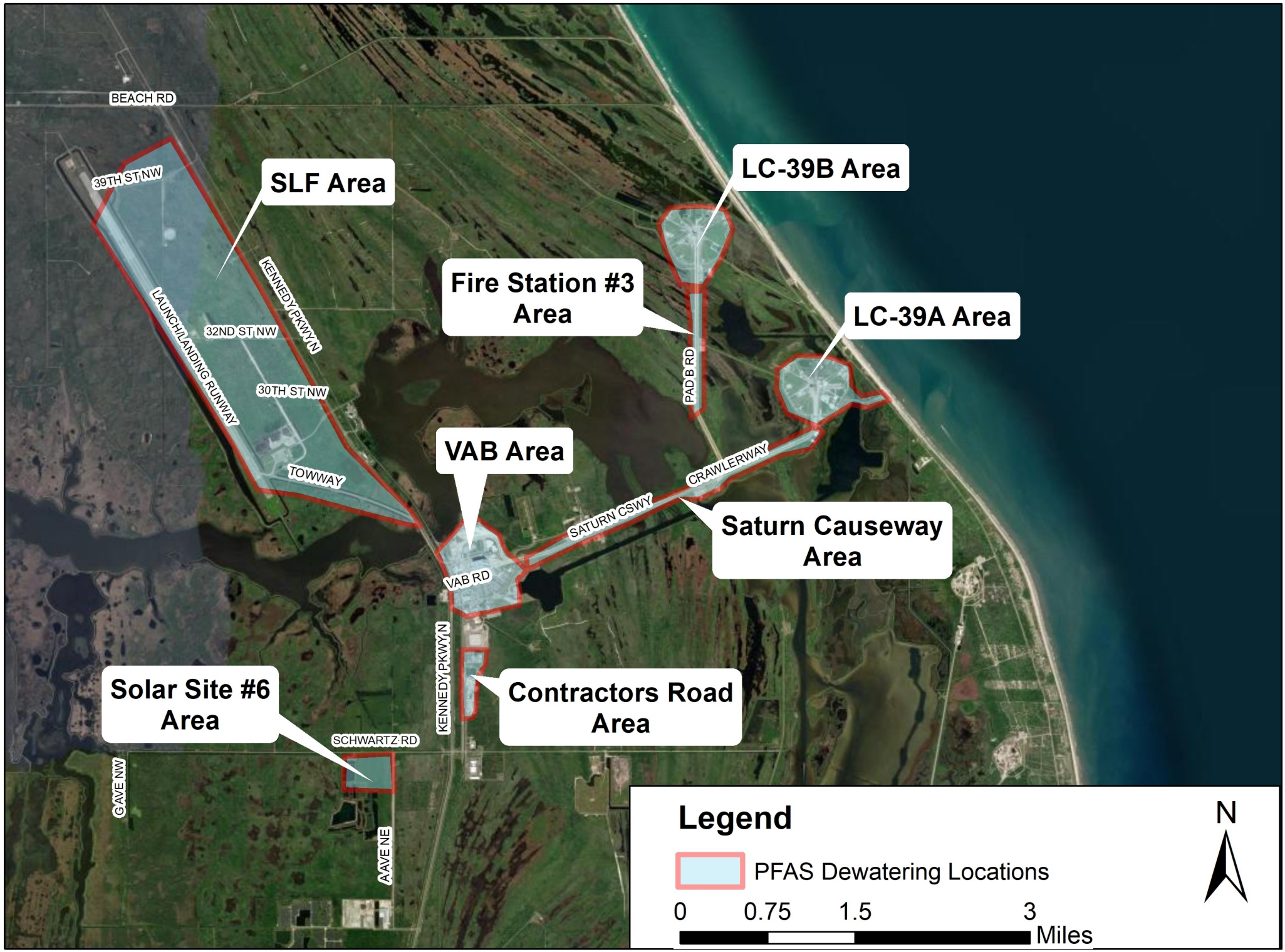
SMWU/PRL	Name	KSC Project Control Number (PCN)	Date FDEP Concurrence Received	Dewatering Volume (gal)	Pumping Duration	Dewater Design Details	Effluent Discharge Location	Dewatering Guidance Issued	Post Dewatering Sampling Required	Post Dewatering Sample Date	PFAS Dewatering Assessment Area

Notes:
BOSS = Base Operations and Spaceport Services Contract
CIF = Central Instrumentation Facility
DNPS = Delaware North Park Services
EPA = US Environmental Protection Agency
FDEP = Florida Department of Environmental Protection
ft. = feet
HMF = Hypergol Maintenance Facility
gal = gallons
GCTL = Groundwater Cleanup Target Level
GSA = General Services Administration
KARS = Kennedy Athletic, Recreation, and Social
KIAC = Kennedy Infrastructure, Applications, and Communications
KSC = Kennedy Space Center
LBS = Load Break Switch
LC = Launch Complex
MH = utility manhole
NA = not applicable due to FDEP dewatering guidance
NADC = Natural Attenuation Default Concentration
PCN = Project Control Number
PFAS = Per- and polyfluoroalkyl substances
PFOA = Perfluorooctanoic acid
PFOS = Perfluorooctanesulfonic acid
ppt = parts per trillion
PRL = Potential Release Location
RSL = Regional Screening Level
SpaceX = Space Exploration Technologies Corporation
SLF = Shuttle Landing Facility
sq. ft. = square feet
SWMU = Solid Waste Management Unit
TBD = To be determined
VAB = Vehicle Assembly Building
VOC = Volatile organic compound
VPF = Vertical Processing Facility
WON = Work Order Number

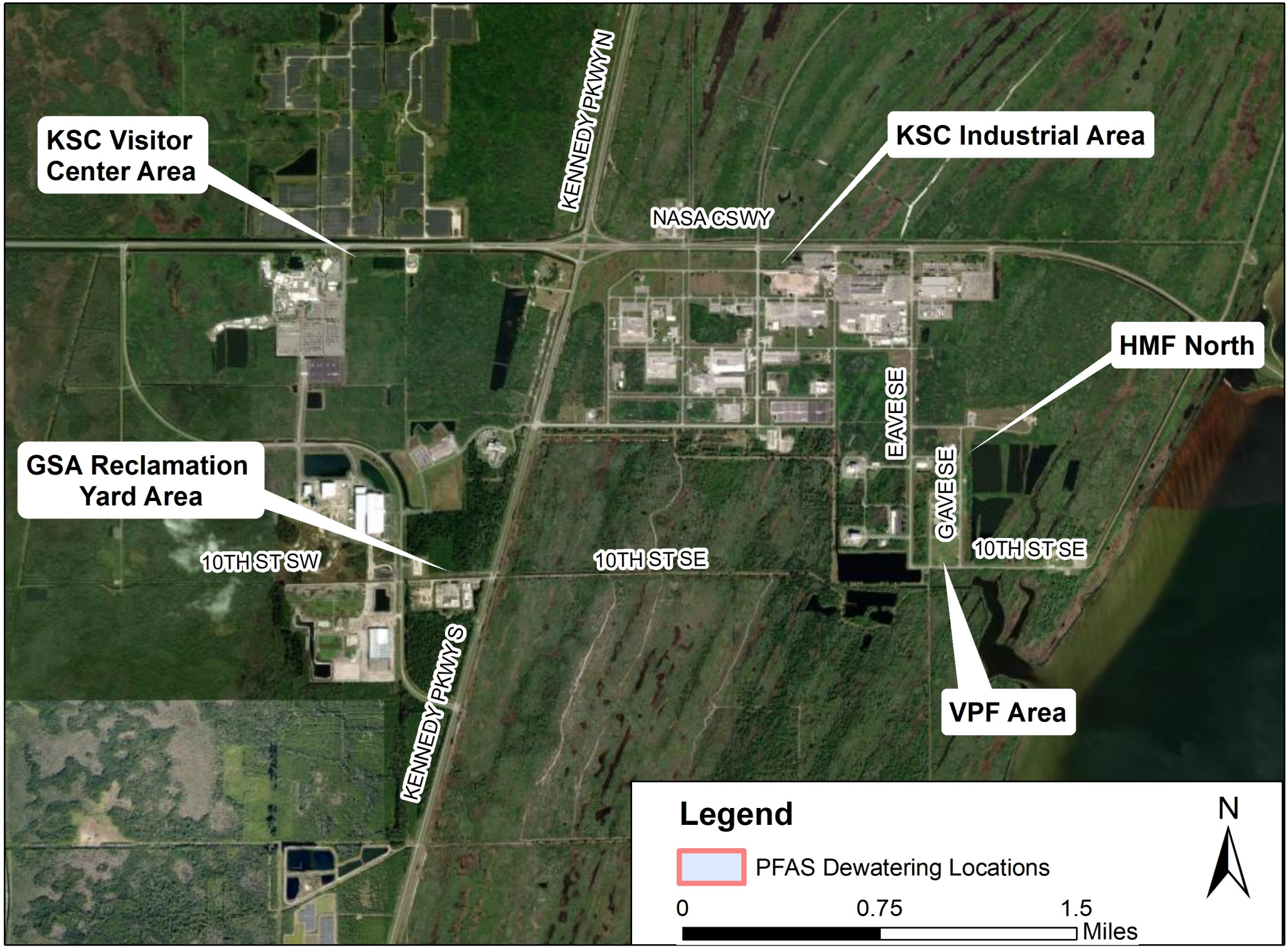
ENCLOSURE 7

KSC PFAS Dewatering Sampling Locations

Northern KSC PFAS Dewatering Locations



Southern KSC PFAS Dewatering Locations



KARS Park 1 PFAS Dewatering Location

