UNNUMBERED OPERATIONAL AREAS (UNOA)
PRL 229
SWMU ASSESSMENT REPORT/
CONFIRMATORY SAMPLING WORK PLAN
(Addendum/Revision 1)
KENNEDY SPACE CENTER, FLORIDA

Prepared for:

National Aeronautics and Space Administration
Kennedy Space Center, Florida

July 2015

Prepared by:

MESC/IHA Environmental Services Branch
Environmental Sampling, Analysis and Monitoring Section
IHA-4300/IHA-022
Kennedy Space Center, Florida 32899
321-867-3609

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Prepared by: _____ _____
Michael P. Hodges Timothy N. Mrdjenovich, P.G., IHA

Approved by: _____
Wilson R. Timmons, Jr., P.G., LEP IHA

July 2015

In accordance with decisions made by the KSC Remediation Team in June 2015, this addendum revises the Locations of Concern (LOCs) and recommendations of the SWMU Assessment Report dated March 2015 and contains a revised Confirmatory Sampling Work Plan as Appendix I. Based upon Decision 1506-D13, that if pentachlorophenol is detected in soil sampling results, sampling for dioxin may be required. Based upon Decision 1506-D14, the East Yard has been added as LOC 2. Five surface soil samples will be collected at LOC 2 and will be analyzed for metals, VOCs, PAHs and pentachlorophenol. Additionally, based on Decisions 1506-D15-16, groundwater samples will also be collected at LOC 2. Due to analysis requirements, a temporary monitoring well will need to be installed to collect the 10 ft bls sample and will be analyzed for metals, VOCs, PAHs and TPH. The 25, 35 and 45 ft bls groundwater samples will be collected using Direct Push Technology (DPT) and analyzed for VOCs. Excerpts of the minutes pertaining to these revisions are attached as Appendix H.

Changes in the attached Work Plan, approved by the Team at the June 2015 Meeting, are as follows:

1- LOC 1 Railroad Tie Disposal Area (RTDA): If pentachlorophenol is detected, sampling for dioxin may be required
2- LOC 2 (East Yard) has been added to the Work Plan: 5 soil samples will be collected and analyzed for VOCs, PAHs and pentachlorophenol. Groundwater samples will be collected from one location. The 10 ft bls sample will require the installation of a temporary monitoring well and will be analyzed for metals, VOCs, PAHs and TPH. The 25, 35 and 45 ft bls samples will be collected utilizing DPT and will be analyzed for VOCs

This SWMU Assessment Report Addendum was prepared in accordance with sound professional practices. The addendum has been reviewed and certified by a Professional Geologist registered in the state of Florida.

Timothy N. Mrdjenovich
Registration # PG-0002880

Appendix H

UNOA SAR
KSC Remediation Team
Minutes and Decisions

1501-M16 Team

Eco Site Visits

Team consensus reached that the RR Tie Disposal Area (PRL 229) area is considered ecological habitat.

Results: Decision item 1501-D83

1501-D83	1501-M16	Unnumbered Operational Areas (PRL 229) - Team consensus reached that the RR Tie Disposal Area (PRL 229) area is considered ecological habitat.

1501-M16 Tim Mrdjenovich/IHA

UNNUMBERED OPERATIONAL AREAS (PRL 229)

Goal: Determine whether each site should or should not be considered ecological habitat.

Discussion: Team viewed aerial photographs for most sites to make determinations on whether or not each site has areas that will or will not be considered ecological habitat.

Team consensus reached that the RR Tie Disposal Area (PRL 229) area is considered ecological habitat. Add pentachlorophenol to analyte list in 1501-D40.

Abandoned Railroad yards, has NASA discussed this? These are a big problem statewide due to Arsenic contamination. As a program NASA doesn't sample adjacent to the rail lines. Sampling is 30 ft from center of rail line. Abandoned rail lines, is something NASA should consider looking at in the future.

Results: Decision items 1501-D40 to D41

1501-D40	1501-M10	UNNUMBERED OPERATIONAL AREAS (PRL 229) - Team consensus reached at LOC 1, East Yard Railroad Tie Disposal Area to collect two surface soil samples for metals, SVOCs, PAHs, TRP, and pentachlorophenol analyses. LOC1 will be screened against human health criteria only.
1501-D41	1501-M10	UNNUMBERED OPERATIONAL AREAS (PRL 229) - Team consensus reached for no further action at the Communications Distribution and Switching Center siding as no locations of concern were discovered during SWMU assessment.

Appendix H
(Continued)

1506-M04 Tim Mrdjenovich/IHA

Unnumbered Operational Area (PRL 229)

Goal: address additional sampling for site.

Discussion: FDEP recommended the assessment of the abandoned rail beds in the east yard after consultation with other FDEP project manager whom evaluate abandoned rail lines. The SAR indicated that rail ties were left in place leading to the potential of buried ties continuing to impact the environment.

At LOC 1 soil samples analyses tables were updated to indicate that if pentachlorophenol is detected sampling for dioxin may be required.

LOC 2 was added to address the concerns regarding the east yard. Five surface soil samples will be collected for metal, VOC, PAH, and pentachlorophenol analyses. If pentachlorophenol is detected sampling for dioxin may be required. One temporary well will be installed to 10 ft for metal, VOC, PAH, and TPH analyses. One DPT location will be sampled from 25, 35, and 45 ft BLS for VOC analyses.

Team consensus reached that if pentachlorophenol is detected in soil sampling results, sampling for dioxin may be required.

Team consensus reached to add LOC 2 (East Yard) and collect five surface soil samples for metal, VOC, PAH, and pentachlorophenol analyses.

Team consensus reached at LOC 2 to install a shallow temporary monitoring well to 10 ft BLS for metal, VOC, PAH, and TPH analyses.

Team consensus reached at LOC 2 to collect samples at one DPT location from 25, 35, and 45 ft BLS for VOC analyses.

Results: Decision items 1506-D13 to D16

Appendix H
(Continued)

1506-D13	1506-M04	Unnumbered Operational Area (PRL 229) - Team consensus reached that if pentachlorophenol is detected in soil sampling results, sampling for dioxin may be required.
1506-D14	1506-M04	Unnumbered Operational Area (PRL 229) - Team consensus reached to add LOC 2 (East Yard) and collect five surface soil samples for metal, VOC, PAH, and pentachlorophenol analyses.
1506-D15	1506-M04	Unnumbered Operational Area (PRL 229) - Team consensus reached at LOC 2 to install a shallow temporary monitoring well to 10 ft BLS for metal, VOC, PAH, and TPH analyses.
1506-D16	1506-M04	Unnumbered Operational Area (PRL 229) - Team consensus reached at LOC 2 to collect one DPT location sampled from 25, 35, and 45 ft BLS for VOC analyses.

Appendix I

UNOA
Confirmatory Sampling Work Plan

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Prepared for:
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Approved by:

Wilson R. Timmons, Jr., P.G., LEP
IHA

July 2015

Site investigation procedures will be conducted in accordance with the approved sampling plan, the site-specific health and safety plan, the Florida Department of Environmental Protection (FDEP) Standard Operating Procedure (SOPs) for Field Activities (December 2008) and the Sampling and Analysis Plan for the RCRA Corrective Action Program at KSC (SAP) Revision 4 (June 2011).

This work plan was prepared in accordance with sound professional practices. The figures, tables and text have been reviewed and certified by a Professional Geologist registered in the State of Florida.

Timothy N. Mrdjenovich, P.G.
Registration # PG-0002880

Figure 1. Location of KSC and the UNOA

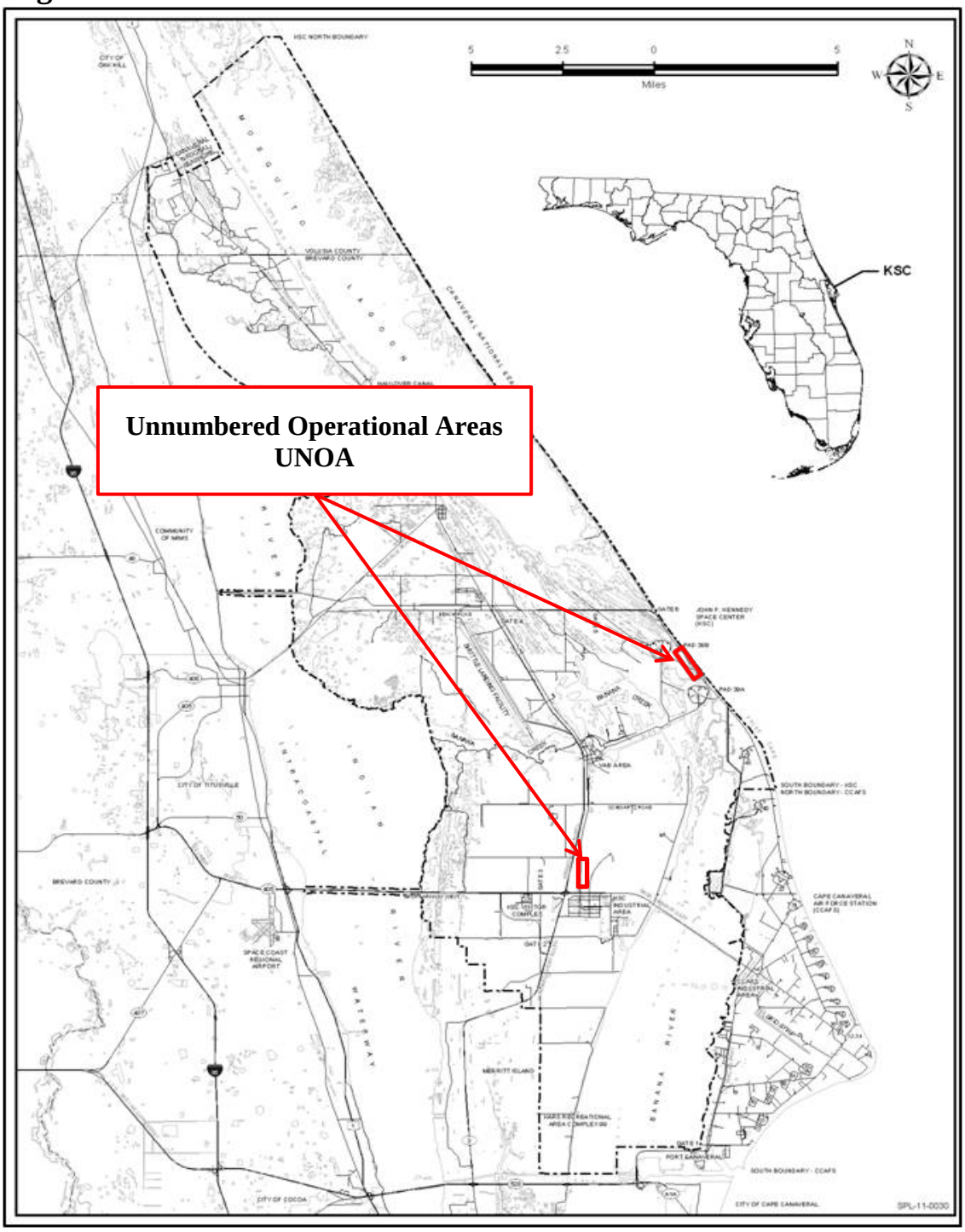

Figure 2. Identified Locations Of Concern (LOCs) at the UNOA

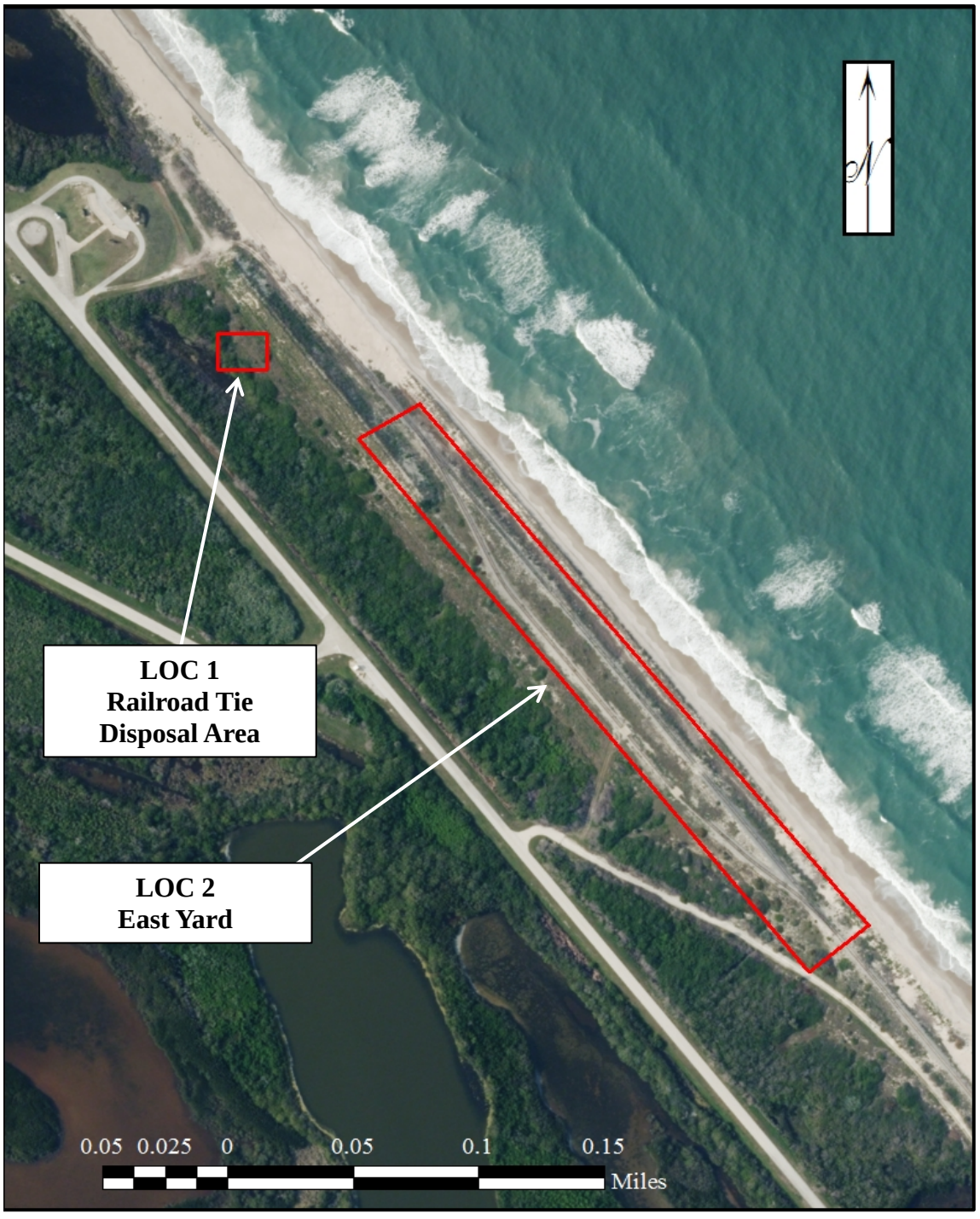

Figure 3. Proposed CS at LOC 1: Railroad Tie Disposal Area (2014 Photo)

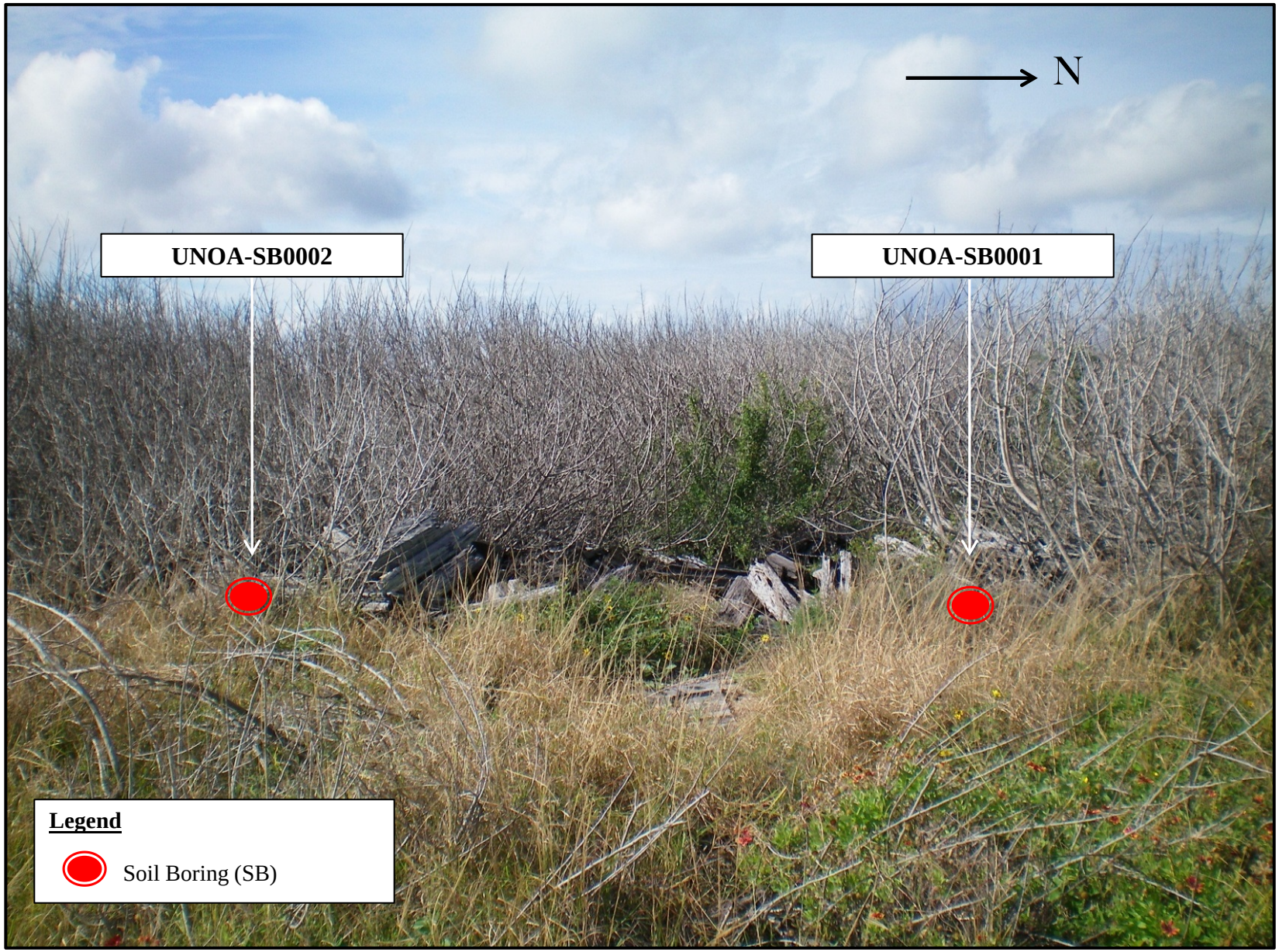

Figure 4. Proposed CS at LOC 2: East Yard (2013 Photo)

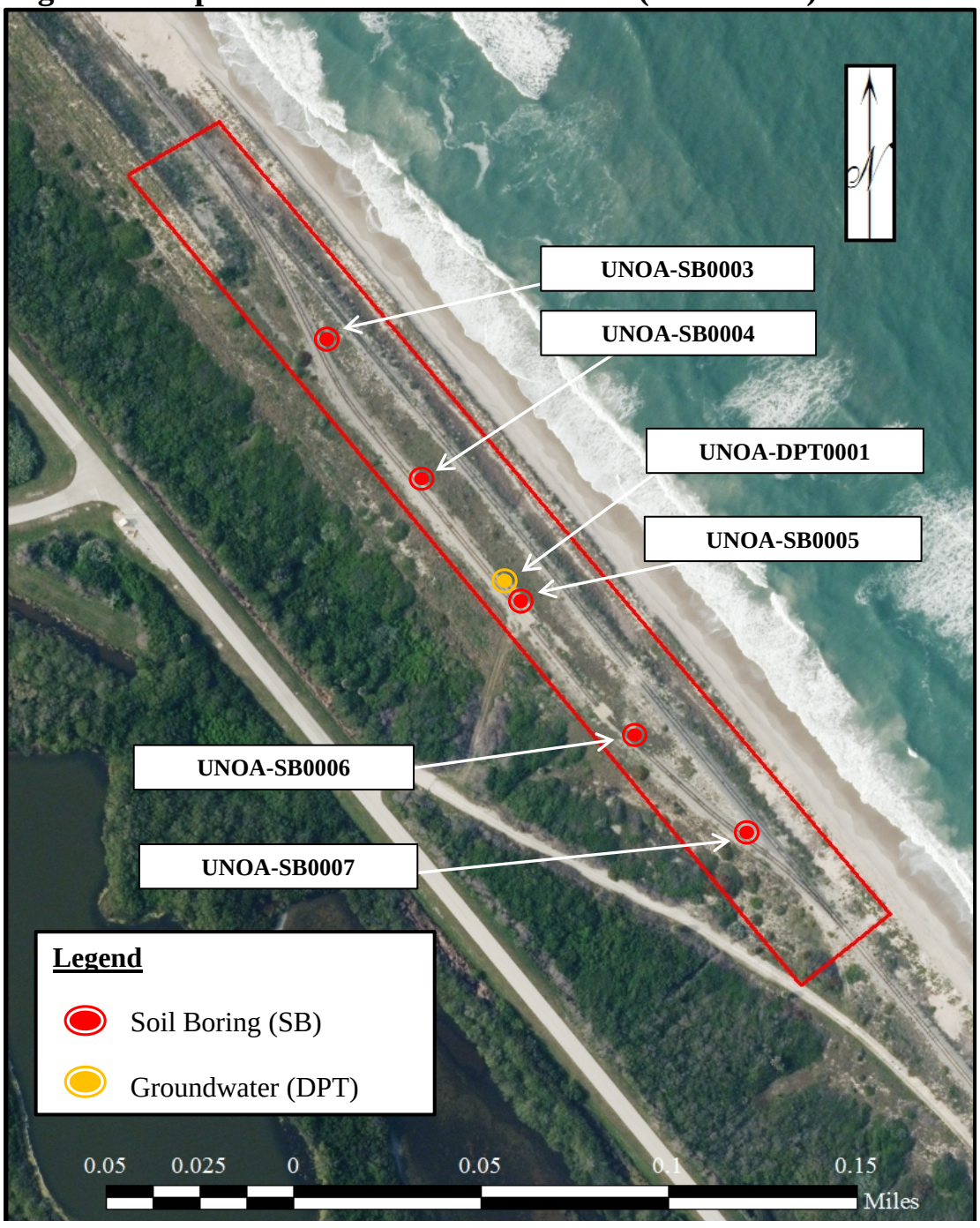

Table 1. UNOA Proposed Confirmatory Sampling Locations, Matrices, Analytes, Rationale & Criteria

Sample Location	Location ID	Sample ID	Matrix	Depth (ft bls)	Analyses	Rationale	Criteria
LOC 1 UNOA Railroad Tie Disposal Area (RTDA)	UNOA-SB0001	UNOA-SB0001-000.5-yyyymmdd	Soil	0-0.5	Metals (7471), VOCs (8260), PAHs (8310), Pentachlorophenol (8270C) and TPH (FL PRO). If Pentachlorophenol is detected, sampling for dioxin may be required	Potential release of metals, solvents and hydrocarbons from railroad ties	Human Health KSC Combined Soil Background Values
	UNOA-SB0002	UNOA-SB0002-000.5-yyyymmdd					
LOC 2 UNOA East Yard	UNOA-SB0003	UNOA-SB0003-000.5-yyyymmdd	Soil	0-0.5	Metals (7471), VOCs (8260), PAHs (8310), Pentachlorophenol (8270C) and TPH (FL PRO). If Pentachlorophenol is detected, sampling for dioxin may be required	Potential release of metals, solvents and hydrocarbons from railroad ties	Human Health KSC Combined Soil Background Values
	UNOA-SB0004	UNOA-SB0004-000.5-yyyymmdd					
	UNOA-SB0005	UNOA-SB0005-000.5-yyyymmdd					
	UNOA-SB0006	UNOA-SB0006-000.5-yyyymmdd					
	UNOA-SB0007	UNOA-SB0007-000.5-yyyymmdd					
	UNOA-DPT0001	UNOA-DPT0001-10.0-yyyymmdd	DPT Groundwater	10	VOCs (8260), PAHs (8270LL), TPH (FLPRO)	Potential release of metals, solvents and hydrocarbons	Human Health KSC G-II Groundwater Background Values
	UNOA-DPT0001	UNOA-DPT0001-25.0-yyyymmdd		25	VOCs (8260)		
	UNOA-DPT0001	UNOA-DPT0001-35.0-yyyymmdd		35			
	UNOA-DPT0001	UNOA-DPT0001-45.0-yyyymmdd		45			

Abbreviations

UNOA - Unnumbered Operational Areas
LOC - Location of Concern
SB - Soil Boring
SVOCs - Semi Volatile Organic Compounds
TPH - Total Petroleum Hydrocarbons
VOCs - Volatile Organic Compounds
SPLP- Synthetic Precipitation Leaching Procedure

Notes

All soil sampling locations, except those associated with energized electrical equipment, will be screened with an OVA to the water table if possible and deeper samples will be collected if warranted
Metals analysis will be performed for the 13 priority pollutant metals and barium.
SPLP will be analyzed only if total concentration of As, Cu, Pb or Zn exceeds Range of Background
SPLP will only be analyzed on the highest detection Range of Background exceedance