

SB-SWMU 039



## STATEMENT OF BASIS

### BUILDING M7-505 TREATMENT TANK SWMU 039 NATIONAL AERONAUTICS AND SPACE ADMINISTRATION KENNEDY SPACE CENTER BREVARD COUNTY, FLORIDA

#### PURPOSE OF STATEMENT OF BASIS

This Statement of Basis (SB) has been developed to inform and give the public an opportunity to comment on a proposed remedy to address contamination at the Building M7-505 Treatment Tank (M7-505) site. Building M7-505 is located in the Kennedy Space Center (KSC) Industrial Area as shown on [Figure 1](#). The KSC Remediation Team (KSCRT) consisting of National Aeronautics and Space Administration (NASA) and Florida Department of Environmental Protection (FDEP) personnel has determined that the proposed remedy is cost effective and protective of human health and the environment. However, prior to implementation of the proposed remedy, the KSCRT would like to give an opportunity for the public to comment on the proposed remedy. At any time during the public comment period, the public may comment as explained in the “How Do You Participate” section of this SB. After the end of the public comment period, the KSCRT will review all comments and issues raised in the comments and determine if there is a need to modify the proposed remedy prior to implementation.

#### WHY IS A REMEDY NEEDED?

The results of the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) and Corrective Measure Implementation (CMI) indicated that three volatile organic compounds (VOCs) were retained as chemicals of concern (COCs)

based on presence in groundwater above FDEP Groundwater Cleanup Target Levels (GCTLs), which could be potentially harmful to human health if water was used for human consumption now or in the future. In addition, polychlorinated biphenyls (PCBs) have been identified in soil adjacent to a transformer exceeding the FDEP Residential Soil Cleanup Target Level (R-SCTL).

#### The Cleanup Remedy

The proposed cleanup remedy for Building M7-505 includes the following components:

- Monitoring the attenuation of groundwater COCs through natural processes following completion of an interim measure.
- Implementation of institutional controls to prohibit residential exposure to site surface soils and prohibit the use of groundwater as a potable water supply.

#### HOW DO YOU PARTICIPATE?

The KSCRT solicits public review and comment on this SB before implementing the proposed remedy. The remedy for Building M7-505 will be incorporated into the Hazardous and Solid Waste Amendments (HSWA) Permit for KSC.

The public comment period for this SB and proposed remedy will begin on the date of publication for notice of availability of the

SB in major local newspapers of general circulation and end 45 days thereafter.

If requested during the comment period, the KSCRT will hold a public meeting to respond to any oral comments or questions regarding the proposed remedy.

To request a hearing or provide comments, contact the following person in writing within the 45-day comment period:

Ms. Rosaly Santos-Ebaugh, P.E.  
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Environmental Assurance Branch  
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Building K6-1547 (Logistics Facility)  
Kennedy Space Center, Florida 32899-0001  
E-mail: Rosaly.J.SantosEbaugh@nasa.gov  
Telephone: (321) 867-8402  
Fax: (321) 867-4446

Mr. John R. Armstrong, P.G.  
FDEP - Waste Cleanup Program  
2600 Blair Stone Road, M.S. 4535  
Tallahassee, FL 32399-2400  
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Telephone: (850) 245-8981  
Fax: (850) 245-8976

## FACILITY DESCRIPTION

NASA established the KSC as the primary launch site for the space program. These operations have involved the use of toxic and hazardous materials. Under the RCRA and applicable HSWA permit (Permit No. 0026028-HO-005) issued by the FDEP, KSC was required to perform an investigation to determine the nature and extent of contamination from Solid Waste Management Unit (SWMU) 039, M7-505 Treatment Tank as shown on [Figure 2](#).

## SITE DESCRIPTION AND HISTORY

Building M7-505 is a NASA-operated facility that was constructed in the early 1960s. The facility includes the M7-505 building, roads, parking lots, and storage areas. Past and current operations at the 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. The waste treatment tank was installed in 1964 and used until 1986, and later removed in 1991. A Site Plan is included as [Figure 2](#).

Investigations conducted at the site include:

- 1990-1991: Groundwater and soil samples were collected and analyzed before the waste treatment tank was removed. Samples were collected and analyzed from the treatment tank and grease interceptor tank, and the sludge and aqueous solution inside the tanks were disposed of properly.
- 1995-1999: RFI activities were conducted to evaluate impacts to site media. Soil, swale soil, surface water, and groundwater samples were collected and various VOCs and polynuclear aromatic hydrocarbons (PAHs) were identified in site media above regulatory criteria. Based on these results, swale soil containing PAHs above regulatory criteria were excavated from the north-south ditch as an interim measure (IM). VOCs in the groundwater were addressed in the Corrective Measures Study (CMS) report.
- 2000: Potential remediation alternatives were evaluated and a CMS report was completed. Based on the CMS report conclusions and decisions made during KSCRT meetings, a combination of air

sparge and soil vapor extraction (AS/SVE), land use controls (LUCs), and natural attenuation with long-term monitoring were selected as the final remedy.

- 2002-2010: An AS/SVE system was installed and operated as a pilot study. The SVE system was shutdown on September 30, 2008. Following completion of additional assessment activities, the KSCRT concluded that the pilot-scale AS system had limited effectiveness in addressing the entire area of affected groundwater, which extended beyond the AS area of influence (AOI) and continued operation would provide minimal reduction in VOC mass. The system was subsequently shut down on November 29, 2010.
- 2010 - 2011: Based on completion of the additional assessment activities, a Remedial Alternatives Evaluation was presented to the KSCRT in March 2011, to review and evaluate alternatives that would remediate the site's affected groundwater. The evaluation included the analysis of five alternatives consisting of air sparge, bioremediation, or monitored natural attenuation of affected groundwater exceeding the FDEP GCTLs and natural attenuation default concentrations (NADCs). Based on the evaluation, the KSCRT selected air sparge of affected groundwater exceeding the NADCs.
- 2011: Based on the KSCRT remedy selection of AS, an IM Work Plan was prepared and presented to the KSCRT in May 2011, which included the approach and design for the remediation of chlorinated VOCs in groundwater. The IM treatment zone was defined by the area with VOC concentrations exceeding the NADCs along the western side of Building M7-505.
- 2012: Between November 7, 2011, and January 10, 2012, an AS system consisting of 21 AS wells and remediation equipment was constructed at the site. Groundwater samples were collected from 24 groundwater performance-monitoring wells and analyzed for VOCs to establish baseline conditions prior to system startup, which occurred between January 9 through 11, 2012. A Construction Completion Report (CCR) summarizing the construction and startup of an AS system that was installed to remediate groundwater at the Building M7-505 Treatment Tank area was submitted in April 2012.
- 2012 - 2013: Following the presentation of the first year of AS system operation to the KSCRT in May 2013, in which the corrective action objective to reduce concentrations below the NADCs was achieved, the KSCRT recommended temporarily shutting the system down to allow expansion of the AS system to remediate trichloroethene affected groundwater exceeding the GCTL beyond the AOI of the AS system. The AS system shutdown on June 5, 2013, and remained off until completion of system expansion.
- 2013: In August 2013, an IM Work Plan Addendum was prepared summarizing the approach and design for the remediation of trichloroethene in groundwater above the GCTL. Based on the approval of the IM Work Plan Addendum, seven additional AS wells and associated piping and appurtenances were constructed between September and December 2013 and the expanded system (including 28 total AS wells) was restarted on December 11, 2013, as documented in the February 2014 Construction Completion Report Addendum.
- 2014 - 2015: The expanded AS system was operated continuously until

September 25, 2015, when NASA elected to shut the system off. As a result of system operation, the concentrations of trichloroethene, cis-1,2-dichloroethene, and vinyl chloride within the AS AOI have been reduced 92, 89, and 85 percent, respectively. In addition, the area of affected groundwater exceeding the GCTLs has been reduced approximately 77 percent.

**WHAT ARE THE REMEDY OBJECTIVES AND LEVELS?**

The remedial action objectives (RAO) are to protect humans from exposure to PCB-affected media that exceeds FDEP R-SCTL and VOC-affected groundwater exceeding FDEP GCTLs by minimizing exposure to the media affected in these areas. Table 1 and Table 2 list the COCs present in groundwater and soil, respectively. The first column lists the chemical name, the second column lists the range of concentrations detected, and the last column presents the FDEP cleanup target level.

**Table 1**

Site-Related COCs	Range of Detections <sup>1</sup> (µg/L)	GCTL <sup>2</sup> (µg/L)
cis-1,2-dichloroethene	ND to 270	70
Trichloroethene	ND to 20	3
Vinyl Chloride	ND to 58	1

**Notes:**

<sup>1</sup> Detections in monitoring wells

<sup>2</sup> Cleanup levels established by Chapter 62-777, FAC. µg/L = microgram per liter;

ND—not detected above laboratory method detection limit

**Table 2**

Site-Related COC	Range of Detections (mg/kg)	R-SCTL <sup>1</sup> (mg/kg)
PCBs	ND to 1,300	0.5

**Notes:**

<sup>1</sup> Cleanup levels established by Chapter 62-777, FAC. mg/kg = milligram per kilogram

ND—not detected above laboratory method detection limit

**REMEDIAL ALTERNATIVES FOR BUILDING M7-505**

Remedial alternatives are different combinations of plans or technologies to restrict access, and to contain or treat contamination to protect human health and the environment. Since the objectives of the IM Work Plan were achieved to remediate affected groundwater to less than the NADCs, the KSCRT has selected land use controls and natural attenuation with long-term monitoring to achieve the RAO.

Land Use Controls and Natural Attenuation with Long-Term Monitoring

Natural processes such as biological degradation, dispersion, advection, and adsorption will reduce COC concentrations to cleanup levels over time. Groundwater will be regularly sampled and analyzed to monitor and document the decrease in contaminant concentrations.

In addition to monitored natural attenuation, institutional controls will be implemented for site groundwater. The institutional controls will maintain the site use and will limit the use of groundwater as a potable water source. In addition, until removal of the PCB-affected soil has been completed adjacent the transformer, institutional

controls will be required to prohibit residential exposure to site surface soil.

NASA and FDEP have entered into a Memorandum of Agreement (MOA), which outlines how institutional controls will be managed at NASA.<sup>1</sup> The MOA requires periodic inspections, condition certification, and agency notification. The area of the site that will be under institutional control is shown as [Figure 3](#).

**EVALUATION OF REMEDY**

The selected remedy was evaluated to determine if it will comply with EPA’s four threshold criteria and five balancing criteria for corrective measures. The four threshold criteria for corrective measures are:

- Overall protection of human health and the environment
- Attain media cleanup standards
- Control the sources of releases
- Comply with standards for management of wastes

The five balancing criteria are:

- Long-term reliability and effectiveness
- Reduction in the toxicity, mobility, or volume of wastes
- Short-term effectiveness
- Implementability
- Cost

Land Use Controls and Natural Attenuation with Long-Term Monitoring meet each of the threshold criteria and were determined to be the most appropriate approach with respect to the balancing criteria.

**WHAT IMPACTS WOULD THE REMEDY HAVE ON THE LOCAL COMMUNITY?**

There would be no impacts to the local community because administrative actions to limit access to the site are consistent with current operating procedures, and the projected future land use of Building M7-505 is industrial in nature.

**WHY DOES THE KSCRT RECOMMEND THIS REMEDY?**

The KSCRT recommends the proposed remedy because it is a cost effective means to remediate/control groundwater in a reasonable amount of time and manage the PCB-affected soil until time it can be safely removed. The long-term monitoring will be used to monitor and document reduction in contamination concentrations to the cleanup goals. The institutional controls will also prevent exposure to soil and groundwater contaminants prior to the cleanup levels being achieved. The proposed remedy meets the four general standards for corrective measures and was determined to be the best overall approach.

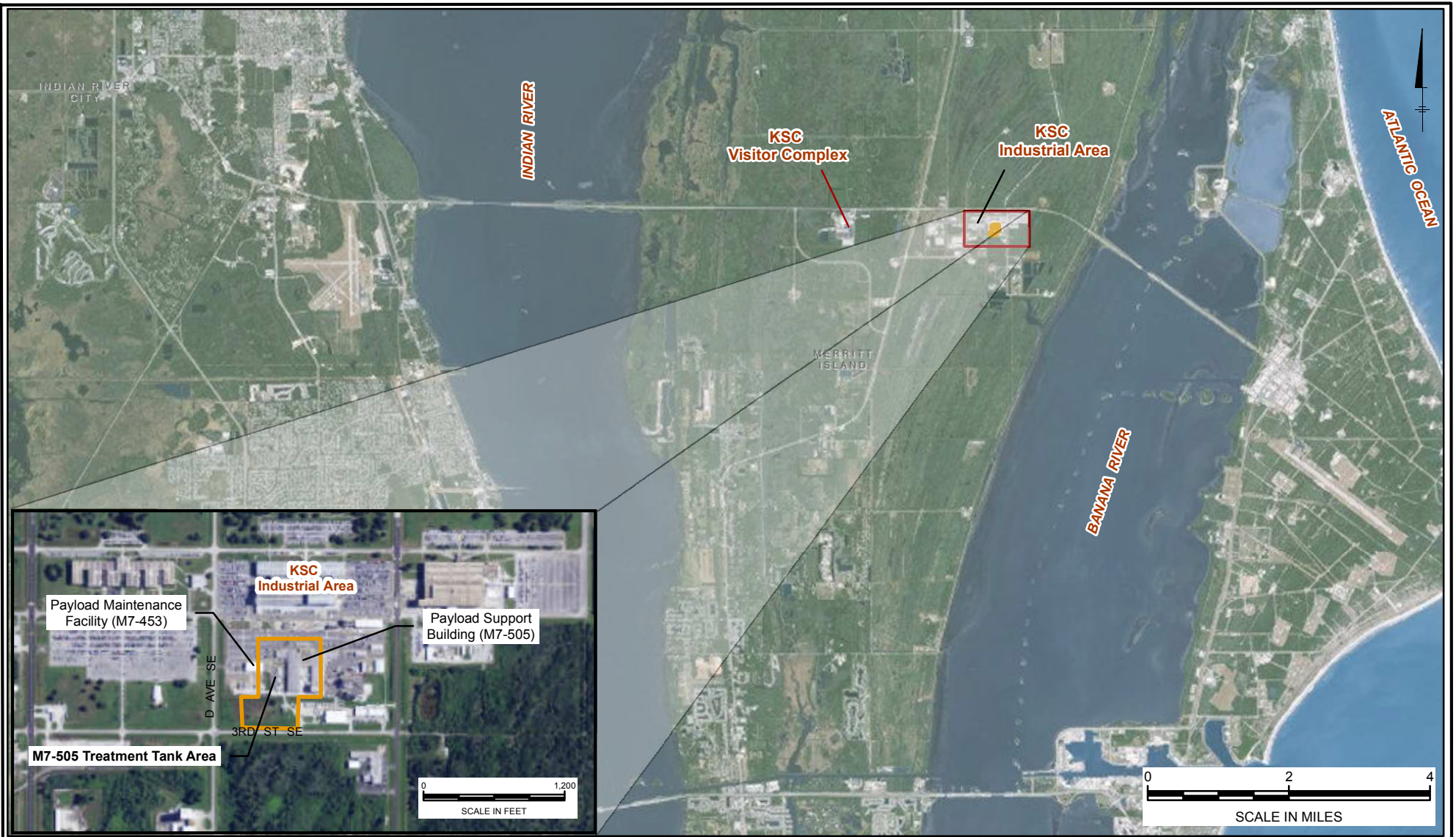
<sup>1</sup> By separate MOA effective February 23, 2001, with the FDEP and KSC, on behalf of NASA, agreed to implement Center-wide, certain periodic site inspections, condition certification, and agency notification procedures designed to ensure the maintenance by Center personnel of any site-specific 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.

**NEXT STEPS**

The KSCRT will review all comments on this SB to determine if the proposed remedy needs modification prior to implementation and prior to incorporating the proposed remedy into KSC's HSWA permit. If the proposed remedy is determined to be appropriate for implementation, then the final remedy will be initiated, and a Land Use Control Implementation Plan will be developed to incorporate the institutional controls at this site.

CITY (KNOXVILLE), DIVISION (ENV/OS), LOCATION (PIC/), PART (S/STAR), TIME (S/STAR), PROJECT (TL014020), PATH (G:\GIS\SWMU\KENNEDYSPACECENTER\RII\A\POCS\201512\M656\STATE\BASIS\SB\M7-505\_SB\_SITE\_LOC.MXD), USER (BALTOI), SERVICE (AYER), CREDITS (SOURCE: ESRI, DIGITALGLOBE, GEOTE, EARTHSTAR, GEOPHOTOS, ONESOURCE), OS, USDA, USGS, AEX, GETMAPPING, AERGRID, IGN, IGH, SWISSSTOP, AND THE GIS USER COMMUNITY



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  
 SWMU - Solid Waste Management Area  
 SB - Statement of Basis

**Site Location Map  
 Statement of Basis**

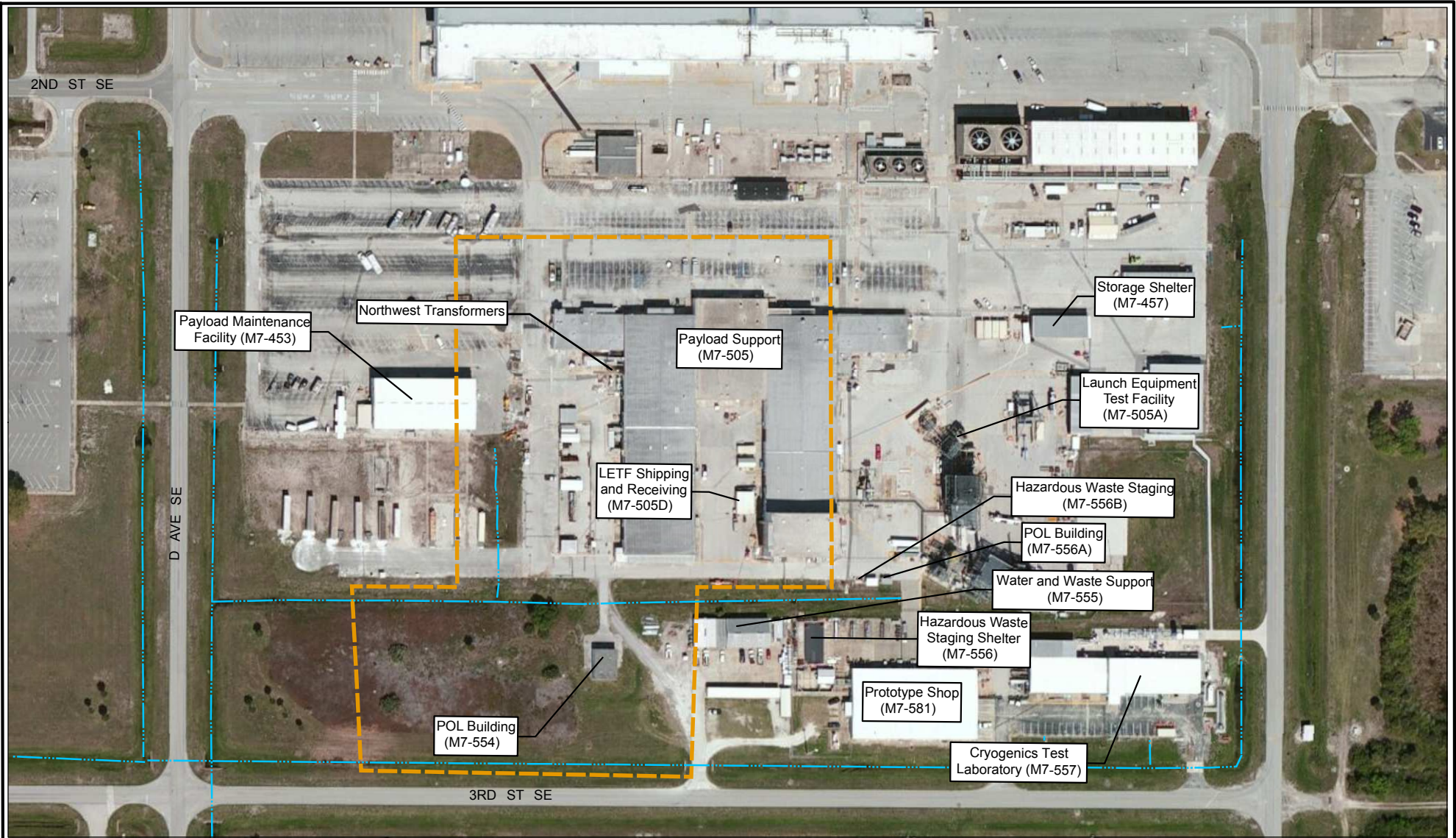
M7-505 Treatment Tank Area  
 NASA Kennedy Space Center, Florida

Project Number: TL014020

**Figure 1**

12/30/2015

CITY (KNOXVILLE), DIVISION (ENV/CS), LOCATION (BALTIMORE), PROJECT (PARIS/STAR), PROJECT (TL014020), PATH (G:\GIS\DATA\KENNEDY\SPACECENTER\RII\MAPDOCS\20151212\M699\STATE\BASIS\SB\M7-505\_S39\_SITE\_PLAN\MXD - USER: BALTIMORE), SERVICE (AERIAL), SOURCE (ESRI), DIGITALGLOBE, GEOTECH (PARTIAL), STAR (GEOGRAPHICS), QUESADA, RUSSELL, USDA, USGS, AEX, GETTING, AERONAUTICS, AND THE GIS USER COMMUNITY

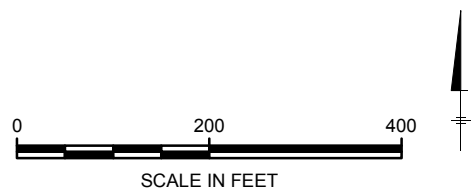


PROJECTION: NAD 1983 StatePlane Florida East FIPS 0901  
 AERIAL SOURCE: ESRI Online Services (NAIP, June 2013).

**LEGEND**

SWMU 039 Boundary

Swale/Ditch



NASA - National Aeronautics and Space Administration  
 KSC - Kennedy Space Center  
 SWMU - Solid Waste Management Area

SB - Statement of Basis  
 POL - Petroleum, Oil, and Lubricants

**Site Plan  
 Statement of Basis**

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

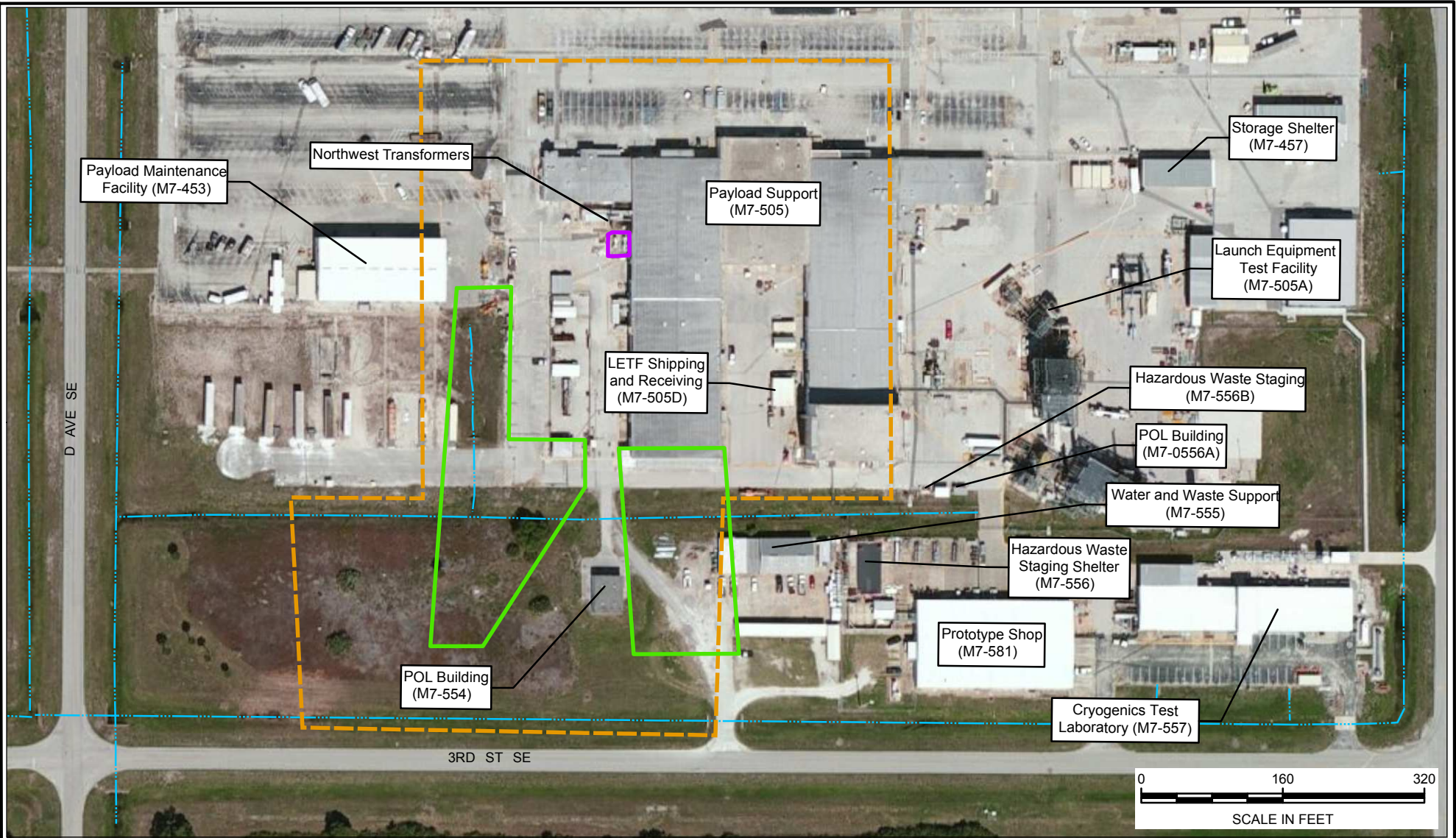
Project Number: TL014020

**Figure 2**

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CITY: KNOXVILLE, DIV: GROUP (ENV/GRS), LD: (BALTIMO), PROJ: (PAV/STARR), TR: (S/STAR), PROJECT: TL014020, PATH: G:\GIS\NASAF\KENNEDY\SPACECENTER\RII\MAPDOCS\201512\M699\STATE\BASIS\SB\M7-505\_S8\_LUC\_AREAS\MXD, USER: BALTIMO, SERVICE: LAYER CREDITS, SOURCE: ESRI, DIGITALGLOBE, GEOTE: PARTHSTAR, GEOGRAPHICS, QINSIARBUS, DS, USDA, USGS, AEX, GETMAPPING, AERODIG, IGN, IGH, SWISSTOP, AND THE GIS USER COMMUNITY



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

- LEGEND**
- SWMU 039 Boundary
  - Swale/Ditch
  - Soil LUCIP Area
  - Groundwater LUCIP Area

NASA - National Aeronautics and Space Administration  
 KSC - Kennedy Space Center  
 SWMU - Solid Waste Management Area

SB - Statement of Basis  
 LUCIP - Land-Use Control Implementation Plan  
 POL - Petroleum, Oil, and Lubricants

## Land Use Control Area Statement of Basis

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

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Project Number: TL014020

**Figure 3**  
12/30/2015