Lockheed Martin Corporation
1600 Tallevast Road, Sarasota, Fl 34243
Telephone 240-687-1813

Electronically Transmitted

October 26, 2017

Ms. Simone Core, P.E.
Remediation Engineer
Florida Department of Environmental Protection
Permitting and Waste Cleanup
13051 N. Telecom Parkway
Temple Terrace, FL 33637-0926

Re: 2017 Remedial Action Status Report
Lockheed Martin Tallevast Site
FDEP Site No. COM_169624/Project No. 238148
Tallevast, Manatee County, Florida

Dear Ms. Core:

Please find enclosed one copy of the 2017 Remedial Action Status Report (RASR) for the referenced site. Per your request, this RASR is being distributed to you in electronic form only. This RASR covers the period of performance from September 1, 2016 through August 31, 2017 and provides a comprehensive summary of system operation and

Lockheed Martin Corporation
Tallevast Site
Remedial Action Status Report
September 2016 through August 2017
Tallevast, Florida

Prepared for:

Lockheed Martin Corporation

Prepared by:

AECOM

October 26, 2017

FDEP Site No. 169624

FDEP Project No. 238148

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Lewis J. Davies, P.E., C.B.C.
Project Director

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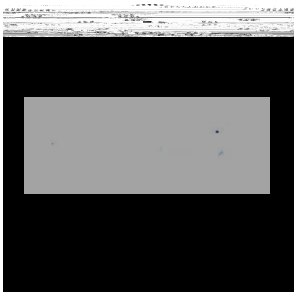
Michael D. McCoy, P.G.
Project Manager

CERTIFICATION

This Remedial Action Status Report for the Remedial Action Plan Addendum Groundwater Recovery and Treatment System at the Lockheed Martin Tallevast Site located at 1600 Tallevast Road, Sarasota, Florida covers the time period of September 1, 2016 through August 31, 2017. This report has been prepared for Lockheed Martin Corporation under the direction of a State of Florida Registered Professional Engineer. The work and professional opinions rendered in this



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Acronyms, Abbreviations, and Units of Measurement

µg/L	micrograms per liter
°C	degrees Celsius
ABC	American Beryllium Company
AECOM	AECOM Technical Services, Inc.
AF	Arcadia Formation
AOP	advanced oxidation process
COC	contaminant(s)(datnv l 0 0 cm 0 g 70.5n)l-32(c1R9Tc 0.301x)l0 0 1j .0MBE0 0 1 2e

Section 1
INTRODUCTION

Lockheed Martin Corporation (Lockheed Martin) presents this annual *Remedial Action Status Report* (RASR) to the Florida Department of Environmental Protection (FDEP). This document provides a comprehensive summary of the remediation and monitoring activities for FDEP Site No. 169624 as described below.

1.1 GENERAL

This RASR describes operation, monitoring and maintenance activities for the *Remedial Action Plan Addendum* (RAPA; ARCADIS, 2009a) Groundwater Recovery and Treatment System (GRTS), at the Lockheed Martin Tallevast Site (also known as the Former American Beryllium Company [ABC] Site) (the Site) located in Tallevast, Manatee County, Florida. The Site consists of both the Facility (also referred to as the "on-Facility" portion of the Site – see Figure 1-1) and the surrounding area (referred to as the "off-Facility" portion of the Site) where groundwater is impacted by contaminants of concern (COC). The RAPA dated July 14, 2009 was approved by

1.3 REPORT ORGANIZATION

This report is organized into seven sections as described below.

Section	Description

received on January 4, 2012, and construction of the GRTS was completed April 2013. The startup of the GRTS occurred on November 18, 2013. The activities described within this RASR have been conducted in accordance with the Consent Order.

2.3 FACILITY DESCRIPTION

This section provides the physical setting of the Site and describes Site hydrologic, geologic, and hydrogeological conditions.

2.3.1 Physical Setting

The Facility is bounded by Tallevast Road to the north; 17th Street Court East to the east; a nine-hole golf course and driving range to the south; and an abandoned industrial property to the west, as shown on Figure 2-1. The treatment building is located in the north-central portion of the Facility property as shown on Figure 2-2. Two concrete driveways provide entry to the Facility from the north off of Tallevast Road. The treatment building is surrounded by a concrete parking area to the east, a concrete driveway to the south, and impermeable asphalt with a permeable artificial turf overlay to the north and to the west. A storm water retention pond is located west of

Sarasota-Bradenton Airport, which drain into Sarasota Bay. Surface water on the easternmost portion of the Facility flows toward the Pearce Canal.

2.3.3 Site Geology and Hydrogeology

In January 1995, the SWFWMD published a report titled *ROMP TR-7 Oneco Monitor Well Site, Manatee County, Florida* (Southwest Florida Water Management District, 1995), which describes the drilling and testing of a well completed to a reported depth of 1,715 feet (ft) below ground surface at a location approximately 2.5 miles north of the Facility in southwestern Manatee County. The nomenclature used in that SWFWMD report to describe subsurface sediments is typically used to describe consolidated carbonate formations in the region and therefore is used for this Site. Local hydrogeologic units and water-bearing zones beneath the site are detailed in Figure 2-4.

2.4 FACILITY OPERATIONS

The following sections summarize the history of Facility operations and RAPA implementation.

2.4.1 History of Facility Operations

From 1962 until 1996, the Facility was owned by Loral Corporation and operated by ABC as an ultra-precision machine parts manufacturing plant in which metals were milled, lathed, and drilled into various components. Some of the components were finished by electroplating, anodizing, and ultrasonic cleaning. Chemicals used and wastes generated at the Facility included oils, fuels, solvents, acids, and metals. Lockheed Martin acquired ownership of the former ABC facility through its 1996 acquisition of Loral Corporation, the parent company of ABC. Historical plant operations were discontinued in late 1996. Lockheed Martin sold the property in 2000 and re-purchased it in June 2009 in order to prepare it for remedial actions.

2.4.2 History of RAPA System Implementation

Construction of the GRTS began in January of 2012, and Manatee County issued a Temporary Certificate of Occupancy on February 1, 2013. Construction reached substantial completion on

April 19, 2013, and Manatee County issued the final Certificate of Occupancy on August 21, 2013 when the Facility civil improvements were completed.

Startup and testing activities began in February 2013 and concluded on November 18, 2013, the date of official system startup. As-built Drawings, which included the soil control plan at the completion of Site civil activities, were submitted to the FDEP on November 14, 2013. The Site is currently in the operations, maintenance, and monitoring (OMM) phase of remedial activities.

fittings and the installation of capacitance sensors in select extraction well vaults capable of detecting water. Once the capacitance sensors detect water, the operator is alerted and the extraction well network is automatically disabled.

Five on-Facility injection wells are contained inside pre-cast concrete vaults. Each vault contains a level sensor, drop pipe, and air release valvTJ .r3(n)1(On)RAloatlach welk icon9(t)-23oatlllevia fa lo

maintain established wetland hydroperiod water levels to minimize wetland health impacts due to drawdown effects of the groundwater extraction system.

A compressed air system operates the pneumatic systems, including double-diaphragm pneumatic pumps and the pneumatic valves. Compressed air is also used to assist in metals oxidation in the primary pretreatment tanks. Displaced air from each of the pre-AOP holding tanks, backwash surge tank, and solids thickening tank vent systems is routed to the vapor phase granular activated carbon (GAC) vessels located in the process area loading dock for passive treatment of volatile organic compounds (VOCs).

Various process instruments are used to monitor key process variables (primarily flow rate, water level, line pressures, pH and temperature). Redundant alarms, switches, and control logic are used to automate the GRTS and prevent system failures such as accidental overfilling of tanks. A programmable logic controller (PLC) provides control and communications between systems, equipment, and instrumentation. The treatment building includes an operations room where operators monitor and control the GRTS.

Section 4

SYSTEM OPERATION, MAINTENANCE, AND MONITORING ACTIVITIES

This section describes activities conducted as part of system OMM. The data and conclusions resulting from these activities are detailed in Sections 5 and 6 of this document.

4.1 SYSTEM OPERATION

The GRTS operated continuously from September 1, 2016, through August 31, 2017, with the exception of pre-planned downtime for required maintenance activities and a limited number of unplanned shutdowns. The extraction wells were in operation during the reporting period, with the exception of extraction well EW-5002 (refer to Section 5.4.1 below).

An OMM log describing key GRTS operations, maintenance activities and downtime events is presented in Table 1. Treatment plant shift daily logs document the key GRTS readings and are presented in Appendix A. System runtime is discussed in Section 5.1, and historical system runtime is presented in Table 2. Monthly extraction well volumes are presented in Table 3.

4.2 WATER TREATMENT PROCESS AND COMPLIANCE MONITORING

The following sections describe water treatment process sampling and laboratory analyses. Data that demonstrate RAPA and regulatory permit compliance are also provided. Water treatment and compliance sampling were conducted in accordance with FDEP Standard Operating Procedures (SOPs) FS 2000 *General Aqueous Sampling*, revision date March 1, 2014 (Florida Department of Environmental Protection, 2014a) and FC 1000 *Cleaning/Decontamination Procedures,* revision date March 1, 2014 (Florida Department of Environmental Protection, 2014b). Table 4 summarizes the monitoring schedule as originally specified in RAPA Table 12-1.

4.2.1 Compliance Sampling

Treatment System POTW effluent compliance samples were collected in accordance with the RAPA and the requirements of Manatee County Discharge Permit #IW-0025s. The Manatee County Discharge Permit, located in Appendix B, was renewed in late 2015 with an effective date of November 9, 2015. The current permit expires November 8, 2018. Compliance sampling dates and analytical results for effluent sampling completed are presented in Table 5. The analytical results of this sampling are described in Section 5.2. The calibration sheet from March 24, 2017, for discharge flow indicator transmitter (FIT) 500 is presented in Appendix C.

TestAmerica Laboratories, Inc. (TestAmerica) located in Tampa, Florida analyzed compliance samples using United States Environmental Protection Agency (USEPA) Method 8260B for VOCs and USEPA Method 8260C with heated purge and selective ion monitoring isotope dilution (SIM/ID) for 1,4-dioxane (1,4-D). Effluent samples were also analyzed for the 12 metals (aluminum, arsenic, beryllium, cadmium, chromium, copper, iron, lead, nickel, zinc, sodium, and molybdenum) specified in the MCUO Discharge Permit by USEPA Method 6010B. Temperature and pH are continuously monitored using treatment plant instrumentation.

4.2.2 GRTS Performance Monitoring Sampling

Performance samples were collected October 11, 2016, from the RO system effluent to monitor discharge to infiltration galleries and injection wells. TestAmerica in Tampa, Florida analyzed these samples using USEPA Method 8260B for VOCs and USEPA Method 8260C with heated purge, and SIM/ID for 1,4-D. Samples were also analyzed for the RO system effluent 10 metals (aluminum, arsenic, beryllium, cadmium, chromium, copper, lead, nickel, zinc, and sodium) by USEPA Method 6020A, total dissolved solids (TDS) by Standard Method 2540C, and for chloride and sulfate by USEPA Method 300.0, as specified in RAPA Table 10-3 (see Table 6), to confirm RO permeate met the lower of either GCTL or surface water quality criteria for discharge to infiltration galleries and adherence to GCTL for discharge to injection wells.

To monitor critical process performance parameters and carbon breakthrough, performance samples are collected at the combined plant influent, AOP feed, AOP effluent, and the primary and secondary carbon vessel discharge points. These samples were analyzed using USEPA Method 8260B for VOCs and USEPA Method 8260C with heated purge, and SIM/ID for 1,4-D. Refer to Table 7 – Analytical Results Process Monitoring and Table 8 – Analytical Results Combined Influent for results from this process sampling. Section 5.2 includes a discussion of the analytical results.

4.2.3 SWFWMD Water Use Permit Compliance

located at the Site. The LTWLM events were conducted September 7 through 9, 2016, December 19 through 21, 2016, March 13 through 15, 2017, and June 5 through 7, 2017. The annual *Long-Term Water Level Monitoring Report* (Tetra Tech, Inc., 2017) is provided in Appendix E.

4.3.4 Wetlands Monitoring Program

In accordance with the July 2009 *Wetlands Monitoring Plan* (WMP; ARCADIS, 2009b) semi-annual wetland manual water-level monitoring events were conducted December 20 through 21, 2016 and June 7 through 8, 2017. Wetland telemetry monitoring systems continued to provide

4.4.3 Biennial Persulfate Compliance Monitoring

As recommended in the FDEP-approved 2016 RASR (AECOM, 2016b), the frequency for persulfate compliance monitoring was decreased to biennial following the August 2016 sampling event. Monitoring wells and/or parameters have been eliminated from persulfate compliance monitoring as concentrations have decreased below baseline or GCTLs for two or more consecutive events. In order to confirm the results from the August 2016 sampling event, monitoring well MW-39 was sampled in February 2017 for USEPA Method SM2540C for TDS and USEPA Method 6010B for Aluminum. Section 5.4.3 includes a discussion of the analytical results provided in Table 15. The next persulfate compliance monitoring event will take place in

Section 5

SYSTEM OPERATION, MAINTENANCE, AND MONITORING RESULTS

This section provides results from system operation, treatment and compliance, water level, effectiveness and persulfate, and wetlands monitoring. The section also includes a summary of waste management activities.

5.1 SYSTEM OPERATION

The total volume of groundwater pumped from the extraction system for the reporting period was approximately 73,556,700 gallons, resulting in a total of 299,673,200 gallons of groundwater extracted and treated since initial system startup in November 2013. A monthly summary of groundwater volumes that were extracted, treated and discharged is presented in

Table 16b – Averaged Monthly Plant Influent Total Contaminant of Concern (COC) Concentration	
Month	**Influent Total COC Average Concentrations (micrograms per liter [µg/L])**
September 2016	107
October 2016	123
November 2016	108
December 2016	105
January 2017	105
February 2017	100
March 2017	102
April 2017	103
May 2017	117
June 2017	77
July 2017	97
August 2017	97

The permit requirements prescribed in the Manatee County Discharge Permit #IW-0025S were met. Refer to Appendix B for a copy of the Discharge Permit. Appendix B also includes the required Manatee County Industrial Pretreatment Program Certification Statement. There were no laboratory analytical quality control issues that adversely affected data usability, as documented in the Data Validation Reports. Analytical results for the treated effluent samples indicate that COC and metals concentrations in the treated effluent were below limits set forth in the Discharge Permit. Treatment efficiencies for VOCs and 1,4-D removal were 100% and 100%, respectively, averaged over the reporting period.

Presented below (Table 16c) are the Discharge Permit limits and recorded values for pH, temperature, and daily discharge flow.

Table 16c - Manatee County Discharge Permit Compliance Limits

Monitored Parameter	Discharge Permit Limits	Publicly Owned Treatment Works (POTW) Discharge Recorded Values
pH Range	5 to 11.5 standard units (SU)	5.5 to 9.54 SU
Maximum Temperature	104 Degrees Fahrenheit	102.5 Degrees Fahrenheit
Maximum Daily POTW Effluent Flow	432,000 Gallons	239,600 Gallons
Average Daily POTW Effluent Flow	Report Only	190,800 Gallons

Table 16d - Manatee County Discharge Permit Compliance – Continued			
Reporting Period	**Minimum POTW Discharge pH**	**Maximum POTW Discharge pH**	**Maximum POTW Discharge Temp (º Fahrenheit)**
December 2016	6.3	7.8	100.3
January 2017	6.25	7.57	97.7
February 2017	6.23	7.45	97.4
March 2017	6.03	8.93	97.6
April 2017	6.35	7.63	96.8
May 2017	6.25	7.43	96.7
June 2017	6.15	7.44	99
July 2017	6.13	9.21	99.5
August 2017	5.52	9.54	102.5

The total volume of treated groundwater discharged to the POTW is recorded automatically by the PLC. These data, including maximum and average daily flows and water reuse conveyed to the infiltration galleries, injection wells, and the Facility irrigation system, are archived in the reporting software database and are presented below (Table 16e).

Table 16e – SWFWMD Effluent Flow Totals				
SWFWMD DID	**DID 97**	**DID 97**	**DID 97**	**DID 96***
Month	**Maximum Daily POTW Effluent Flow in Gallons**	**Average Daily POTW Effluent Flow in Gallons**	**Monthly Total POTW Effluent Flow in Gallons**	**Monthly Total Water Reuse in Gallons**
September 2016	236,400	182,900	5,486,000	213,400
October 2016	239,600	190,800	5,913,600	352,100
November 2016	208,200	188,600	5,657,800	976,700
December 2016	202,400	169,700	4,921,900	1,090,200
January 2017	204,000	154,100	4,776,900	993,400
February 2017	196,500	177,900	4,980,500	1,002,400
March 2017	203,100	178,500	5,532,200	1,280,700

Table 16e – SWFWMD Effluent Flow Totals – Continued				
SWFWMD DID	**DID 97**	**DID 97**	**DID 97**	**DID 96***
Month	**Maximum Daily POTW Effluent Flow in Gallons**	**Average Daily POTW Effluent Flow in Gallons**	**Monthly Total POTW Effluent Flow in Gallons**	**Monthly Total Water Reuse in Gallons**
April 2017	196,900	166,400	4,990,800	1,543,600
May 2017	159,000	129,500	4,013,800	1,683,300
June 2017	212,900	169,300	5,077,500	945,500
July 2017	219,000	162,800	5,048,300	1,086,500
August 2017	237,000	164,900	5,111,300	878,300

*Water reuse calculated using Plant influent total flow minus POTW effluent total flow

Table 9 provides additional information on volumes of groundwater extracted((ateET 70s34 0.479(t.85 g

the continuous monitoring of wells near the edges of the Site provided information on the extent of GRTS effects for each water-bearing zone, which demonstrates that RAOs are being met.

5.4 GROUNDWATER QUALITY MONITORING RESULTS

Groundwater COC at the Site include 1,4-D; tetrachloroethene (PCE); trichloroethene (TCE); cis-1,2-dichloroethene (cis-1,2-DCE); 1,1-dichloroethene (1,1-DCE), 1,1-DCA; and VC and the applicable FDEP cleanup criteria are listed below.

COC	Groundwater Cleanup Target Level (GCTL) (µg/L) (62-777 F.A.C.)
1,4-D	3.2
TCE	3
PCE	3
cis-1,2-DCE	70
1,1-DCE	7
1,1-DCA	70
VC	1

5.4.1 Extraction Well Monitoring

Groundwater quality data for vertical and horizontal extraction wells are provided in Table 12. The results from the August 2017 sampling event indicated that COC concentrations in the USAS extraction wells have been generally declining since November 2013. Generally stable to decreasing COC concentrations in the LSAS were observed from November 2013 to August 2017. In the AF Gravels, laboratory analytical data indicated generally decreasing COC concentrations since November 2013. Two extraction wells are screened in the S&P Sands (EW-5001 and EW-5002). The results from the August 2017 sampling event indicated that COC concentrations in the S&P Sands extraction wells have generally increased since 2013 but have been generally stable to decreasing since February 2016. As discussed in Section 4.1 above and in the Response to Comments 2016 Remedial Action Status Report (AECOM, 2017b), Lockheed Martin evaluated the groundwater data and made the determination to keep extraction well EW-5002 off given the stable to decreasing COC trends observed at that well since the August 2016

extraction well sampling event and the extensive capture present in the Salt & Pepper (S&P)

- On November 8, 2016, MW-20 was abandoned in accordance with the FDEP *Monitoring Well Design and Construction Guidance Manual* (Florida Department of Environmental

Table 16g - Average COC Concentrations in the USAS in 2016 and 2017			
COC	**Concentration (August 2016) (µg/L)**	**Concentration (August 2017) (µg/L)**	**Percent Change (USAS)**
PCE	11.0	4.6	-58.0

primarily attributed to an increase in the concentration of cis-1,2-DCE in MW-41, which increased from 100 µg/L to 230 µg/L.

Table 16h - Average COC Concentrations in the Lower Shallow Aquifer System (LSAS) in 2016 and 2017

COC	Concentration (August 2016) (µg/L)	Concentration (August 2017) (µg/L)	Percent Change (LSAS)
1,4-D	29.6	19.0	-35.9
TCE	95.9	86.6	-9.7
PCE	5.1	3.5	-30.2
cis-1,2-DCE	15.2	20.0	32.1
1,1-DCE	10.1	5.5	-45.9
1,1-DCA	5.8	3.8	-35.0
VC	0.1	0	-26.8

The composite COC distribution is presented in Figure 5-16 along with the estimated LSAS capture zone. The area of COC concentrations exceeding GCTLs in the LSAS identified in August 2017 was 88 acres compared to 92 acres in August 2016. Application of the *Mann-Kendall* statistical method (Mann-Kendall, 2003) to 1,4-D data at well MW-101 (see Section 4.4.2) resulted in an increasing trend for 1,4-D at that well, with a 98.1% confidence factor. Appendix K includes VOC Concentration versus Time Charts for a group of selected LSAS monitoring wells (MW-41, MW-77, MW-81, MW-86R, MW-87, MW-98, MW-101, and PZ-LSAS-4).

5.4.4.3 COC Distribution in the AF Gravels

The distributions of 1,4-D, TCE, PCE, cis-1,2-DCE, 1,1-DCE, 1,1-DCA, and VC in the monitoring wells and private wells within the in the AF Gravels are shown on Figures 5-17 through 5-23, respectively. Average concentrations for each COC using the laboratory analytical data from the August 2016 and August 2017 sampling events are summarized below in Table 16i. While average total COC concentrations generally decreased from the August 2016

sampling event, the average concentration of 1,4-D slightly increased. Observations for the AF Gravels are summarized below.

Table 16i- Average COC Concentrations in the AF Gravels in 2016 and 2017			
COC	**Concentration (August 2016) (µg/L)**	**Concentration (August 2017) (µg/L)**	**Percent Change (AF Gravels)**
1,4-D			

Table 16j - Average COC Concentrations in the S&P Sands in 2016 and 2017			
COC	**Concentration (August 2016) (µg/L)**	**Concentration (August 2017) (µg/L)**	**Percent Change (S&P Sands)**
1,4-D	5.4	3.7	-32.3
TCE	2.3	1.2	-49.1
PCE	0.0	0.0	0.0
cis-1,2-DCE	3.5	1.6	-54.7
1,1-DCE	1.3	0.3	-76.8
1,1-DCA	0.4	0.5	22.4

5.4.4.7 Additional Volatile Organic Compounds

In addition to the COC described above, data from laboratory analyses were reviewed to determine if concentrations of additional reported compounds from groundwater samples were detected or exceeded GCTL limits. Concentrations of additional volatile compounds were either not detected or detected below their respective GCTLs.

5.5 CONTAMINANTS OF CONCERN MASS REMOVAL

The mass of COC (PCE, TCE, cis-1,2-DCE, VC, 1,4-D, 1,1-DCA, and 1,1-DCE) removed during this one-year reporting period is estimated to be approximately 64 pounds, based on the average combined influent COC concentrations and volume of extraction for each month. The mass is calculated using the average of two (if available) groundwater combined influent sample results per month (presented in Table 8) and the monthly combined influent flow totals, which

5.7 WASTE MANAGEMENT

Approximately 66,000 pounds of non-hazardous dewatered filter cake solids were removed and transported to the Clark Environmental disposal facility in Mulberry, Florida during the reporting period. Solids are removed through primary settling tanks, ultra-filters, and media filter backwashing, and subsequently pumped to the solids thickening tank, settled, and then dewatered through the operation of the filter press. Transportation and disposal of the dewatered solids is contracted through Southern Waste Services, Inc. See Appendix L for waste characterization laboratory analytical results of the dewatered solids and disposal facility waste acceptance letters. See Appendix M for the dewatered solids non-hazardous waste manifests.

The GAC system primarily provides a polishing step for the removal of 1,1-DCA. The GAC becomes saturated with organic compounds and requires periodic replacement. During each GAC replacement event, approximately 10,000 pounds of non-hazardous spent carbon is removed, stored in lined and covered dumpsters, and transported to a landfill for disposal. Carbon change-out events were conducted in October 2016, March 2017, and July 2017. During these events, Adler Tank removed and transported approximately 40,000 pounds (dry weight) of spent carbon to the Waste Management landfill in Okeechobee, Florida for disposal. See Appendix L for the spent carbon waste characterization laboratory analytical results and landfill waste acceptance letters. See Appendix M for spent carbon non-hazardous waste manifests.

The filter cake material and waste GAC are disposed at Lockheed Martin-approved, permitted and licensed facilities in accordance with applicable environmental laws and regulations.

- The GRTS was successful in meeting the MCUO Discharge Permit criteria.
- The conditions of the SWFWMD WUP for extraction volumes and monthly reporting were achieved.
- The RO effluent concentrations discharged to the infiltration galleries and on-Facility injection wells met discharge criteria, defined as the lower of either the GCTL or Surface Water Quality Standards for constituents detailed in RAPA Table 10-3.
- The GRTS removed approximately 64 pounds of COC mass.
- Approximately 66,000 pounds of non-hazardous dewatered filter cake solids and 40,000 pounds of non-hazardous spent GAC were removed and transported for disposal to approved facilities.

Lockheed Martin will continue to operate the GRTS through the next operational reporting period. The operation will include the following actions:

- Meet the RAOs during the next reporting period
- Extract groundwater for treatment and discharge per the Consent Orders, the 2009 RAPA, the 2012 FDEP RAPA Approval Order, and the approved OMM Manual
- Continue scheduled compliance sampling
- Discharge to infiltration galleries as needed to maintain water levels in wetland areas
- Discharge to on-Facility injection wells to perform focused flushing of areas with highest historical COC concentrations
- Meet MCUO discharge permit and WUP requirements

6.2 GROUNDWATER LEVEL MONITORING

Based on the data presented in this report, Lockheed Martin provides the following conclusions for the groundwater level monitoring program:

- Groundwater level monitoring indicated the GRTS system continued to maintain adequate hydraulic control of the Site COC in the USAS, LSAS, AF Gravels, and S&P Sands from September 2016 to August 2017, as discussed in Section 5.3.2.

- By design, the GRTS system did not influence the Lower AF Sands.

- The LTWLM program continued to monitor the effects of the GRTS system and off-Site pumping influences and generally confirmed the description of hydraulic gradients detailed in Section 5.3.2.

Based on the data presented above, Lockheed Martin recommends continuing the current water level monitoring program as depicted on Table 18, and the LTWLM program.

6.3 EXTRACTION WELL SAMPLING

Based on the data presented in this report, Lockheed Martin provides the following summary of the extraction well sampling program:

- The GRTS system continued to extract and treat the groundwater COC plume. Generally, the COC concentrations in the groundwater extracted from the USAS, LSAS and AF Gravels are stable to decreasing, as indicated by the results discussed in Section 5.4.1.

- EW-2103 flow rates were regulated to maintain TW-6 water levels.

- Groundwater in the S&P Sands with COC concentrations in excess of GCTLs was well within the S&P capture zone; therefore EW-5002 remained off during the period of performance, with the exception of periodic operation to maintain well function.

Lockheed Martin recommends continuing semi-annual extraction well sampling aligned with the effectiveness monitoring to occur in February and August 2018. Future operation of extraction well EW-5002 will continue to be evaluated in an effort to achieve RAOs.

6.4 EFFECTIVENESS MONITORING

Based on the data presented in Section 5.4.4, Lockheed Martin provides the following conclusions for the effectiveness monitoring program:

- Analytical results indicate average COC concentrations are generally decreasing in the USAS, LSAS, AF Gravels, and S&P Sands groundwater since August 2016, indicating a reduction in in-situ COC mass. An exception to this is the slight increase in average concentrations of daughter products in the LSAS (cis-1,2-DCE) and S&P Sands (1,1-DCA). Analytical data indicate that biotic or abiotic processes appear to be occurring based on the increased observation of daughter products associated with reductive
  .

- Analytical results indicated that groundwater concentrations of target parameters in monitoring well MW-39 were below GCTLs for two consecutive sampling events.

Lockheed Martin recommends the following for the biennial persulfate monitoring program:

12. Florida Department of Environmental Protection, 2014c. Standard Operating Procedure *FS 2200 Groundwater Sampling*, March 1.

13.