SECTION J

SOLID WASTE MANAGEMENT UNITS (SWMUs)

This section provides detailed information on the -10- solid waste management units (SWMUs) identified at this facility. The locations of the SWMUs are provided on **Figure J-1**. Detailed descriptions of the SWMUs and the results of prior sampling are provided in subsections J-1 and J-2. Future planned corrective action is described in Section J-3 and Section E. Figures, tables, and other supporting data are provided in the labeled appendices for added clarity.

J-1 Information Requirements For SWMUs (40 CFR 270.14(d)(1)

Eight SWMUs were originally identified at the site during a Georgia Environmental Protection Division (EPD) inspection conducted in June 1988. A description of SWMUs 1-8 was provided in an August 1988 RCRA Facility Assessment (RFA) report. SWMUs 1-8 are described as follows:

1. *PROCESS TANK FIELD AREA (including Creosote Truck Unloading Area)*
2. *TREATING ROOM UNDER ROOF*
3. *SOIL AREAS BETWEEN THE CONCRETE PAD UNDER #0 TREATING CYLINDER AND THE CONCRETE FOUNDATIONS UNDER #1 CYLINDER*
4. *RAILROAD TRACK "KICKBACK" DRIPPAGE AREA*
5. *OLD CREOSOTE STORAGE TANK*
6. *COOLING WATER POND*
7. *FOUNDATION RETAINING WALL UNDER #1 CYLINDER*
8. *OIL SHED*

SWMU #9 (Old Goldfish Pond) and #10 (Stream and Culvert Area) were later added to the list in 1991 and 1998, respectively. SWMU #11 (closed HWMU surface impoundment in 1989) was added to the list in 2010. An historical overview of SWMU areas followed by a detailed evaluation of each SWMU is provided in subsections J-1a and J-1b, respectively.

J-1a Historical Overview of SWMU Areas

Prior to the early 1990s, wood treating operations occurred on compacted soil areas without a roof cover. Surface run-off and chemical wastes associated with treatment operations (SWMUs 1-4 and 6 and 7) was drained into the surface impoundment (HWMU-SWMU #11) prior to the start of closure in 1986. After closure of the surface impoundment (SWMU #11 in 1989), a concrete retaining wall was installed to create a diked area to hold any runoff from the adjacent process and tank field areas. In 1993, the entire process area and tank field area was upgraded by adding a roof, reinforced concrete pads, and a double lined sump and drip pan to capture and recycle wastewater and treatment chemicals. The wastewater treatment system was also upgraded to include an ICB feed tank, two wastewater treatment tanks, and a filter press and feed tank.

A RCRA Facility Investigation (RFI) Work Plan was submitted in early 1991 to address SWMUs 1-8. Soil samples were collected from selected SWMUs as described in the Work Plan in July 1991 prior to renovation of the treating area. In 1991, SWMU #9 (the Old Goldfish Pond) was identified by EPD as an additional SWMU after receiving information from Southern Wood Piedmont (SWP), the adjoining property owner. Later in 1998, EPD personnel performed an inspection of the intermittent stream on the WCM property and notified WCM that the stream from the culvert discharge to the point at which it exits onto SWP property, would be classified as SWMU #10. Both SWMUs #9 and #10 (Stream and Culvert Area) were added to the SWMU list in the 1998 permit. Further details are provided in the labeled appendix referenced as Information Requirements for SWMUs from Part L of the 1988 Part B Permit Application.

In July 2002, additional soil samples were collected following closure of the cooling pond (SWMU #6). In September 2002, a follow-up RFI Work Plan was submitted to address SWMUs #9-10. In September 2004, EPD personnel collected soil and sediment samples from selected locations in SWMUs #9 and 10. A discussion of sample results is provided in Section J-2.

The history and current status of each SWMU is described in more detail in J-1b.

J-1b SWMU Descriptions

The location, unit type/description, dimensions, duration of operation, waste or chemical substance stored, and a description of interim corrective action performed is provided for each SWMU in the following underlined sections. The wood treating process area and details of corrective action activities performed at SWMU #6 is described for the Exhibits 1A-D and 2 below, provided in the labeled appendix:

- **Exhibit 1A** shows the cooling tank excavation areas #1-8 for SWMU 6;
- **Exhibit 1B** shows SWMU 6 cooling tank excavation areas #1, 4, and 5;
- **Exhibit 1C** shows SWMU 6 cooling tank excavation areas #2 and 3 and the soil sampling areas for sites B and D;
- **Exhibit 1D** shows SWMU 6 cooling tank excavation areas for #6-8 and the soil sampling areas for sites A and C; and
- **Exhibit 2** shows SWMU 6 areas of fill, caps, and concrete slabs.

SWMU #1: PROCESS TANK FIELD AREA INCLUDING CREOSOTE TRUCK UNLOADING AREA

Location: SWMU #1 is located on the west side of the wood treating process area as shown on **Figure J-1**.

Unit Type/Description: SWMU #1 was classified by EPD due to visual observations of soil staining around the ASTs and tank truck unloading area. The tank field consists of three (3) above ground storage tanks (ASTs) containing wood treatment chemicals which have been in use since the 1930s. Two (2) of the tanks have a capacity of approximately

50,000 gallons and the third approximately 10,000 gallons. Prior to closure of the adjacent HWMU, the tank field area was diked on the west and south sides by a treated wood retaining wall backfilled with red clay. The east side was bounded by the treating room wall. The ASTs rested on steel reinforced concrete foundations. A drainage trench in the tank field ran south to north along the edge of the treating room wall and discharged by gravity feed at the northeast end of the tank field into the former impoundment.

Dimensions: The tank field area is triangular shaped and approximately 100 feet long by 45 feet wide at the north end, covering an area of approximately 3,500 ft^2. The ASTs are mounted on four (4) foot deep concrete pad foundations originally with bare soil between the foundation pads. A treated wood retaining wall was previously located on the west side of the tank field.

Duration of Operation: The SWMU #1 tank field has been in operation since the 1930s. In November 1991, visually impacted soils around the ASTs were removed and a reinforced concrete slab was placed around the concrete pad foundations. During this time, concrete retaining walls were also poured for secondary containment and wastewater storage tanks were installed. Surface cracks in the concrete were repaired in October 2003 and epoxy sealant applied to the concrete walls and slab. At present, the tank field contains five (5) ASTs including a pentachlorophenol (PCP) work tank, an ICB feed tank, two (2) wastewater treatment tanks, a filter press, and a filter press feed tank (see **Figure J-1**).

Waste or Chemical Substance Stored: Chemical substances and wastes historically managed in the area include creosote, PCP, diesel fuel, and K001 wastewater treatment sludge.

Interim Corrective Action: Corrective action was performed on the tank field land area from October 23, 1991 through December 13, 1991. The location of the tank field excavation area is shown on Figure J-1 (enlarged area) as SWMU #1 along the west side of the treating room area. In October 1991, the entire triangular tank field area less 740 square feet containing three concrete tank bases (two - 20 ft diameter and one - 12 ft diameter) was excavated to visually clean soil at a minimum of one foot deep in the southern end and three feet deep in the areas around the three concrete tank bases in the middle and north end of the tank field. The excavated area consisted of approximately 2,760 square feet (or 184 cubic yards) of visually impacted soils from the tank field SWMU #1. Soil was transported by licensed carriers to a permitted hazardous waste disposal facility. This work was performed to remove a potential source for deeper subsurface soil or groundwater impact. The excavated areas were backfilled with compacted granular aggregate base/gravel and were capped with a six-inch reinforced concrete slab.

SWMU #2: TREATING ROOM UNDER ROOF

Location: The location of the SWMU #2 is adjacent to treating cylinder #1 on the west side under the treating room roof, as shown on **Figure J-1**.

Unit Type/Description: SWMU #2 was identified by Georgia EPD on June 30, 1988 during a site inspection. The rear half (north end) of the treating room floor was previously bare soil/compacted clay and showed evidence of spills/leaks of PCP and creosote from pumps and valves in the treating room.

Dimensions: The treating room soil floor area was rectangular in shape measuring approximately 30 feet width by 38 feet in length (1,054 ft^2). The southern end of the treating room contained a concrete slab floor measuring approximately 150 ft^2.

Duration of Operation: The unit was operated from 1929 until excavation of visually impacted soils was performed and a reinforced concrete slab was constructed in July 1993. A roof was installed over the entire treating area in October 1993. The treating room has been used since 1993 as the equipment and pump operating location for the wood treating cylinders.

Waste or Chemical Substance Stored: Chemical substances and wastes historically managed in the treating room were creosote, PCP, and diesel fuel.

Interim Corrective Action: Corrective action was performed on the Treating Room Under Roof SWMU #2 from July 2, 1993 through July 9, 1993. The location of the treating room soil floor excavation is shown on Figure J-1 (enlarged area) as SWMU #2, the area west of the center treating cylinder #1. In July 1993, the entire 30 ft by 38 ft rear soil portion of the treating room floor was excavated to visually clean soil a minimum of one (1) foot deep with deeper excavation of two (2) feet in the rear northwest corner. The excavated area consisted of approximately 1,140 square feet (or 46 cubic yards) of visually impacted soils from the treating room floor area SWMU #2. Soil was transported by licensed carriers to a permitted hazardous waste disposal facility. This work was performed to remove a potential source of impact to deeper subsurface soils or groundwater. The excavated areas were backfilled with compacted granular aggregate base/gravel and were capped with a six-inch reinforced concrete slab.

<u>SWMU #3:</u> SOIL AREAS BETWEEN THE CONCRETE PAD UNDER #0 TREATING CYLINDER AND THE CONCRETE FOUNDATIONS UNDER #1 CYLINDER

Location: The location of SWMU #3 is bounded on the south side by the concrete wall of the cooling pond tank, on the east side by the concrete foundation slab under the #0 treating cylinder, on the north side by the concrete retaining wall of the closed surface impoundment, and on the west side by the concrete foundations under the #1 treating cylinder (**Figure J-1**).

Unit Type/Description: SWMU #3 was identified by Georgia EPD on June 30, 1988 during a site inspection. The soil floor of this area showed visual evidence of spills/leaks of wood preserving chemicals and wastewater.

Dimensions: The area between the treating cylinders was rectangular six (6) feet wide by 50 feet long and the area behind the treating cylinders to the surface impoundment retaining wall was 15 feet wide by 75 feet long. Total area is approximately 1,425 ft^2.

Duration of Operation: The unit was operated with a bare soil/compacted clay floor from 1938 when the #1 treating cylinder was installed until visually impacted soils were excavated in July 1991 and a six-inch reinforced concrete slab was installed along with a double lined sump. The sump was installed to remove surface water draining from processing areas and direct the fluids to the plant process water treatment and recycling reuse system. The concrete area between the treating cylinders has been used as secondary containment since 1991.

Waste or Chemical Substance Stored: The chemical products and wastes that were managed in the areas adjacent to the wood treating cylinders were creosote, PCP, diesel fuel, and K001 from wood preserving wastewater.

Interim Corrective Action: Corrective action was performed on the soil areas between #0 and #1 Treating Cylinders at SWMU #3 during the first two weeks of July 1991. The location of the soil areas excavated between #0 and #1 treating cylinders and behind the treating room to the concrete retaining wall of the south end of the closed surface impoundment are shown as Figure J-1 (enlarged area) as SWMU #3. Contaminated soil was initially excavated four feet deep from the 300 square feet of soil between #0 and #1 treating cylinder during the closure of the facility surface impoundment. Contaminated soil was initially excavated eight feet from the 1,125 square feet of soil area behind and to the north of the treating cylinders and behind and to the north of the treating room during the closure of the facility surface impoundment. The excavated areas were filled and compacted with “clean” red clay from an offsite source. In July 1991, the top one foot of red clay was excavated from the entire 1,425 square foot area of SWMU #3 to remove any surface contamination prior to adding compacted granite granular aggregate base followed by six inches of reinforced concrete slab over the entire area. In October 1993, a roof was added over the entire treating area. The final excavated area was 1,425 square feet (or 60 cubic yards) of visually impacted soils from the SWMU #3 area between the treating cylinders to the closed surface impoundment retaining wall. Soil was transported by licensed carriers to a permitted hazardous waste disposal facility. This work was performed to remove a potential source for deeper subsurface soil or groundwater impact.

SWMU #4: RAILROAD TRACK “KICKBACK” DRIPPAGE AREA

Location: The location of the railroad track “kickback” drippage area is immediately south of wood treating cylinders #0 and #1. The location is shown on **Figure J-1**.

Unit Type/Description: SWMU #4 was identified by Georgia EPD on June 30, 1988 during a site inspection. The railroad track area is where the treated wood was allowed to cool at which time wood treating chemicals were historically allowed to drip onto the ground surface.

Dimensions: The eastern drip track extends out approximately 220 feet south from treating cylinder #0; while, the western track extends approximately 100 feet to the south. The total area of this SWMU is approximately 2,800 ft^2.

Duration of Operation: The drip track in front of treating cylinder #0 was operated from the 1930's until visually impacted soils were excavated in March 1992. After excavation, a double steel lined drip containment pan was installed in May 1992 under the railroad tracks to satisfy Subpart W requirements. The drip track in front of treating cylinder #1 was operated from 1929 until visually impacted soils were excavated in July 2006. After excavation, a similar drip containment pad was installed under the tracks. These track areas have been operated as Subpart W drip pads since the stated construction dates.

Waste or Chemical Substance Stored: The wastes historically managed in the rail track kickback drippage area consisted of creosote, PCP, and No. 2 fuel oil.

Interim Corrective Action: Corrective action was performed on cylinder #0 railroad track and bypass track "kickback" drippage area in March 1992. Corrective action was performed on cylinder #1 railroad track "kickback" drippage area in July 2006. The location of #0 railroad drip track area is a rail track that connects into #0 treating cylinder and runs south 240 feet past the bypass storage drip track, then 240 feet to the east of #0 drip track, shown on Figure J-1 as SWMU #4. The location of #1 railroad drip track area is the rail track that connects into #1 treating cylinder and south 200 feet as shown on Figure J-1 as SWMU #4. The #0 drip track and bypass storage track areas had the tracks removed and were excavated in March 1992. The excavations were 12 feet wide, a total of 480 feet long, and 1.5 feet deep to visually clean soil. The surface area was approximately 5,760 square feet (or 322 cubic yards) of visually impacted soil from #0 drip track SWMU #4. The #1 trip track had the tracks removed and was excavated in July 2006. The excavation was 12 feet wide, 200 feet long and approximately 1.5 feet deep to visually clean soil. The surface area was approximately 2,400 square feet (or 120 cubic yards) of visually impacted soils from #1 drip track SWMU #4. Soil was transported by licensed carriers to a permitted waste disposal facility. The excavated areas were filled with compacted granular aggregate base, cement supports for steel drip pans, and granite stone between railroad ties. Subpart W steel drip track pans were installed in front of #0 cylinder between March 1992 and July 1992. Subpart W steel drip track pans were installed in front of cylinder #1 between April 2006 and June 2006. New rail ties and rail tracks were installed on the approaches and bypass track.

SWMU #5: OLD CREOSOTE STORAGE TANK

Location: SWMU #5 was previously located on the north end of the former impoundment near the present location of MW-5R (**Figure J-1**).

Unit Type/Description: The old creosote storage tank (SWMU #5) was identified by Georgia EPD on June 30, 1988 during a site inspection. In 1980, the old creosote storage tank was taken out of service from its former location in the south end of the tank field (SWMU #1). Prior to moving the tank, the process lines were disconnected, and the tank

was steam cleaned to remove liquid creosote. In 1982, the empty tank containing approximately eight inches of solid dirt, wood waste, and solid creosote tank bottoms was moved by crane to the northern most end of the surface impoundment for dismantling and scrap reduction. Although no signs of visual leakage were observed on the ground surface, since the top and sides of the tank had been cut, the EPD inspector assumed that a creosote release may have occurred after relocating the tank.

Dimensions: The tank was approximately 35,000 gallons in capacity and 18 feet in length. The tank and surrounding soil area for SWMU #5 is estimated at approximately 255 ft^2.

Duration of Operation: The empty tank unit was located at the north end of the site surface impoundment from 1982 until 1988 when it was properly cleaned and removed. Since 1989, the area where the tank was located was cleaned and the adjacent area was treated and capped as part of the surface impoundment (HWMU) closure.

Waste or Chemical Substance Stored: The wastes that were managed in the old creosote tank were solid creosote tank bottoms.

Interim Corrective Action: Corrective action was performed on the old empty creosote storage tank, SWMU #5, in September 1988 and the soil under the tank was disposed of during the closure of the surface impoundment/HWMU in 1989. The location of the old empty creosote tank from 1982 until 1988 was adjacent to the facility surface impoundment on the northeast corner of the berm. Rainwater and solid bottoms remained enclosed in the tank until the fall of 1988 when approximately 400 gallons of rainwater was pumped into the surface impoundment treating cells. Approximately 1,000 pounds of F032 solids were excavated out of the tank bottom and placed in the plant hazardous waste roll-off. The steel tank was then cut into pieces and moved to the treatment area where the pieces were pressure washed in the concrete door sump area. The clean metal scraps were transported to a steel recycling facility. There was no visibly stained soil under the empty tank. The soil under the old tank was pushed with a bulldozer into the lined closed impoundment cell and solidified with quick lime (approximately 15 cubic yards) prior to final capping of the impoundment.

<u>SWMU #6:</u> COOLING WATER POND

Location: The location of the SWMU #6 is adjacent to the east side of wood treating cylinder #1, continuing under the south end of treating cylinder #0, and terminating on the east side at the wall of the old plant wash house (see **Figure J-1**).

Unit Type/Description: The cooling water pond previously consisted of a large rectangular enclosed reinforced concrete tank. During an EPD inspection conducted on June 30, 1988, strong evidence of surface impact around the perimeter of the pond was noted. In addition, soils surrounding the concrete cooling tank have also indicated soil impact from contact with cooling water spray nozzles used for the plant vacuum system. Surface water from the unit previously flowed into the surface water impoundment prior to closure.

Dimensions: The cooling water tank was 25 feet wide and 45 feet long covering an approximate area of 1,125 ft^2. Areas adjacent to the cooling water tank to the east and west of treating cylinder #0 totaled another 375 ft^2.

Duration of Operation: The unit was operated from the 1930's until the installation of a new vacuum pump system in November 1998 that utilized a heat exchanger with a non-contact city water cooling tower. Prior to closure of the cooling water tank, the contaminated K001 wastewater was pumped to the plant wastewater treatment system and the bottom sediment sludge was removed and placed in the plant hazardous waste roll-off box. The concrete walls and floor of the cooling tank were triple pressure washed and inspected for any signs of leaks or deterioration. No leaks or deterioration were observed. The walls and floor of the cooling tank were then sealed with Penaseal®. Impacted soils were excavated around the concrete cooling tank and replaced with a crushed granite aggregate base. The portion of the tank area under the treating plant roof was capped with a reinforced concrete slab and side retaining walls. The portion remaining outside and east of the roofed area extending to the old wash house wall was capped with clean compacted clay and a 60-millimeter PVC liner cap. SWMU #6 clean-up and capping was completed in August 2002. Since 2002, the concrete slab and retaining walled area under the roof has been used as secondary containment for the process area. The area filled and capped outside has been left vacant.

Waste or Chemical Substance Stored: The wastes that were managed in the cooling pond area were K001 wastewater treatment sludge.

Interim Corrective Action: Corrective action was performed on the cooling water pond, SWMU #6, and surrounding area from November 1996 through September 2002. The location of the cooling pond excavation area is (1) the soil area adjacent to the cooling pond on the south side starting at the washhouse on the east and extending under treating cylinder #0 to the concrete wall under treating cylinder #1 on the west side, and (2) the soil area adjacent to the cooling pond on the north side starting at the wash house on the east and extending to the concrete foundation slab under treating cylinder #0 on the west side. Locations are shown on Figure J-1 as SWMU #6. There were eight (8) excavation areas surrounding the cooling water pond on the south, east and north with dimensions as shown in the Appendix J Exhibits. Excavations ranged from two feet deep in front of the cylinders between the drip tracks and under the front of #0 treating cylinder to four feet and six feet deep on the southeastern edge of the cooling water pond to 3.5 feet deep on the northern edge of the cooling water pond. From November 1996 through September 2002, approximately 165 cubic yards of visually impacted soils were excavated in stages from the cooling water tank area. Soil was transported off-site to a permitted hazardous waste disposal facility. This work was performed to remove a potential source for deeper subsurface soil or groundwater impact.

SWMU #7: FOUNDATION RETAINING WALL UNDER #1 CYLINDER

Location: The location of the SWMU #7 is under the south end of the treating room under a portion of treating cylinder #1 (**Figure J-1**).

Unit Type/Description: SWMU #7 was identified by EPD on June 30, 1988 during a site inspection. The unit consists of a concrete enclosure with structural foundations under the front end of treating cylinder #1. At the time of the EPD inspection, surface runoff was observed in the southwest corner that posed a concern for possible subsurface impact if leaks occurred through cracks in the enclosure.

Dimensions: The concrete enclosure is 10 feet deep, 10 feet wide, and 12 feet long covering 120 ft^2. The concrete slab adjacent to the southwest corner that was subsequently repaired is approximately 30 ft^2.

Duration of Operation: The unit was installed in the 1930's as part of the heavy concrete structural foundation support for the #1 treating cylinder. Sometime in the later years the concrete pad adjacent to the top of the foundation had become damaged allowing surface water to collect after rain events. In 1991, the water was pumped from the foundation enclosure and the concrete floor and walls were pressure washed and checked for cracks leading to the subsurface. No leakage into the surrounding soil was observed at that time. In order to eliminate any future leakage, a 30 ft^2 section of the damaged area was removed and re-poured. In addition, the roof was later installed over the treating area covering -90- percent of the foundation area. The small amount of occasional rainwater that does enter the foundation area is pumped to the plant wastewater treatment system.

Waste or Chemical Substance Stored: The wastes that potentially could have entered the structural foundation area were creosote, PCP, and diesel fuel diluted from surface water.

Interim Corrective Action: No subsurface impact was observed during inspection of the foundation; therefore, soil removal was not performed at this SWMU. Corrective action performed included the replacement of a section of cracked concrete deck and berm to eliminate a future source of leakage into the subsurface soil and groundwater.

SWMU #8: OIL SHED

Location: SWMU #8 was formerly located on the south end of the Storage Room/Boiler Room building south of the treatment area, as shown on **Figure J-1**.

Unit Type/Description: SWMU #8 was identified by EPD on June 30, 1988 during a site inspection. At the time of the inspection, the shed contained 55-gallon drums of motor oil and hydraulic oil for the plant equipment. Around the drums, dirt and sawdust was observed that contained dripped oil from the drums. The shed had a roof and walls and therefore no surface runoff was observed.

Dimensions: The oil shed was eight feet long by eight wide covering 64 ft^2. The shed had a roof, four (4) walls, two (2) doors, and a solid wooden floor.

Duration of Operation: The unit was operated from the 1950's storing new motor oil and hydraulic oil for plant equipment until it was demolished in 1996. After demolition, the oil-

soaked dirt, flooring, and subsurface soils to a depth of 1-foot were removed and placed in the plant hazardous waste roll-off box. The area has remained vacant since the shed was removed.

Waste or Chemical Substance Stored: The chemicals/wastes that were managed in the unit were new motor oil and hydraulic oil.

Interim Corrective Action: In 1996, approximately three (3) cubic yards of surficial dirt and subsurface soils, possibly impacted, were excavated and placed in the hazardous waste roll-off box maintained on-site. The hazardous waste roll-off was removed after filling, prior to the 90-day holding requirement, and transported off-site to a permitted hazardous waste disposal facility. This work was performed to remove a potential source for deeper subsurface soil or groundwater impact.

SWMU #9: OLD GOLDFISH POND

Location: The location of the SWMU #9 is on the western boundary of the property directly north and behind the main office, as shown on **Figure J-1** and **Figure B-1**.

Unit Type/Description: SWMU #9 was identified by Georgia EPD in 1991 after being notified by the adjacent landowner, SWP that a possible old hazardous waste disposal unit existed on both properties. Investigation of the area revealed an old earthen bermed area that had been reportedly constructed in 1928 as a rainwater goldfish pond behind the company office. The pond was utilized as a lunch/recreation area for WCM employees. In the 1950s, the berm was reportedly breached and the pond drained. Creosote staining or other visual or olfactory indicators of impact were not observed in the surface water drainage or sediments formerly associated with the pond. According to WCM personnel, the goldfish pond was never utilized for waste disposal.

Dimensions: The goldfish pond full water area was crescent shaped and approximately 250 feet long and 75 feet wide at the middle of the arch covering approximately 16,000 ft^2. Approximately 4,000 ft^2 of the goldfish pond was previously located on the abutting SWP property. The empty bottom flat soil area of the goldfish pond was approximately 150 feet long and 50 feet wide covering approximately 7,500 ft^2.

Duration of Operation: The unit operated as a recreational goldfish pond from approximately 1928 until the mid-1950's when the berm was breached. The pond was never rebuilt.

Waste or Chemical Substance Stored: There is no visual soil evidence that creosote or other wood treatment chemical wastes were ever stored in the unit. Until the mid-1950's when the northwestern berm that contained the goldfish pond surface water was breached, the pond supported a recreational goldfish population. Currently there is plentiful bottom and berm vegetation growing throughout the old goldfish pond land area which would not be indicative of pond soils being saturated and stained with wood preserving chemicals from storage. Monitoring wells MW-12 and MW-12A located at the

bottom of the old goldfish pond have indicated the presence of low to moderate concentrations of VOCs and SVOCs in the groundwater; however, these constituents appear to have resulted from down-gradient migration of dissolved contaminants from the closed HWMU or the SWMU #10 culvert. Concentrations in these wells, along with soil sample data collected in the vicinity, are not elevated as would be expected if the pond had been utilized as a hazardous waste disposal unit. Non detect to trace concentrations of VOCs were also detected in nearby SWP wells, MW-52, 52A, and 52B in further support of these observations. Wastes that could migrate into the pond through surface water/rainwater run-off or possibly groundwater base flow would include dissolved constituents associated with creosote, PCP, and No. 2 fuel oil or diesel.

Interim Corrective Action: Soil and groundwater samples were collected in and around this unit during 2017-2019 Phase 4 assessments. Additional details regarding these investigations are included in Section J.2. No other corrective action has been performed at this unit.

SWMU #10: STREAM AND CULVERT AREA

Location: SWMU #10 consists of the exposed portion of the intermittent stream located on the northwest portion of the property. The stream originated at the drainage end of a City of East Point 36-inch diameter storm water drainage pipe, immediately adjacent to the scales and east of the main office building. The stream flows to the northwest onto the adjacent SWP property (**Figure J-1**).

Unit Type/Description: SWMU #10 was assigned by EPD personnel in 1998 during a site inspection with SWP. The intermittent stream experiences some dry weather flow from the 36-inch city storm drainpipe. The majority of the stream flow is during rain events.

Dimensions: The intermittent stream flows north from the culvert opening prior to curving northwest to flow behind the office and off-site. The stream and side banks occupy an area of approximately 8,000 ft^2.

Duration of Operation: The intermittent stream has existed in this area since the 1920s prior to WCM's purchase and development of the property. When WCM purchased the property in 1925, the city storm sewer discharged into a low area approximately 30 feet east of the present location of MW-11. In the mid 1950's, the 36-inch storm water pipe was extended by the City of East Point approximately 300 feet northwest to its present location at the mouth of the intermittent stream. The sewer pipe was extended by constructing a brick manhole structure to connect the end of the original pipe outflow to a new galvanized corrugated steel pipe. The pipe excavation up to the stream head was subsequently filled over time to allow use of the area for plant inventory storage. The intermittent stream drains to the northwest and eventually connects to an unnamed tributary of South Utoy Creek.

Waste or Chemical Substance Stored: Potential sources of impact include surface runoff from on-site, non-point source discharges associated with run-off from adjacent

properties, and groundwater base flow that may discharge into the stream bed. Waste discharges from on-site sources may include dissolved constituents associated with creosote, PCP, and No. 2 fuel oil (diesel).

Interim Corrective Action: Surface soil and sediment samples were collected from this unit during 2014-2018 Phase 4 assessments. Additional details regarding these investigations are included in Section J.2. No other corrective action has been performed at this unit.

SWMU #11: CLOSED HWMU SURFACE IMPOUNDMENT

Location: SWMU #11 is located on the northwest side of the wood treating process area as shown on **Figure J-1**.

Unit Type/Description: SWMU #11 was classified by EPD due to the HWMU permitted closure of the facility surface impoundment in 1989 as a disposal cell with wastes left in place. From 1927 until 1985 the facility utilized SWMU #11, an unlined earthen impoundment, for the treatment of wood preserving process water containing creosote, PCP, and site contaminated storm water. K001 sludge waste settled in the bottom and on the side walls of the surface impoundment. Separated wastewater was treated and sent to the POTW. (See Section I-1 Closure Plan for a summary of the Closure Plan.)

Dimensions: The closed surface is seven sided with an approximate length of 150 feet to the northwest of the treating area concrete retaining wall and 120 feet wide from the east to the west. The unit is 15 feet deep and the top capped area is 0.352 acres. The hazardous waste cell contains 750 cubic yards of K001 waste.

Duration of Operation: SWMU #11 was operated as a wood preserving wastewater treatment surface impoundment from 1927 until 1985. From 1986 until 1989 the unit was in the process of closure. The unit has been capped and fenced since 1989 and has been maintained under permitted Post Closure Care since 1989.

Waste or Chemical Substance Stored: Chemical substances and wastes historically managed in the surface impoundment were K001 wastewater treatment sludge containing creosote, PCP, and No. 2 fuel oil.

Interim Corrective Action: In November 1985 the surface impoundment ceased being used for wood treating wastewater treatment and closure of the unit was started under an EPD approved Closure Plan finalized in June 1986. Initially, surface impoundment waters and sludge were segregated within one end of the surface impoundment. A poly-lined aerated treatment cell and poly-lined aerated polishing cell were constructed in the cleaned-out end of the impoundment. Impacted water and sludge from the impoundment were pumped into these biological oxidation detoxification cells for treatment. Treatment of contaminates continued until 1989 when the final closure was completed by treating the remaining water prior to discharge to the POTW and filter pressing all remaining sludge. The filter press cake and sludge were mixed with quick lime to encapsulate the

residuals left in the waste cell. The waste was left on top of a compacted red clay bottom and side liner and was covered on top with compacted red clay, a 20-mil polyethylene synthetic impervious liner, two feet of topsoil, and Bermuda grass cover. The unit was fenced with restricted access in accordance with permit requirements. A post closure care plan was approved by EPD. An extensive groundwater monitoring well network and one groundwater pumping well have been installed, sampled, and utilized during the Post Closure Care period (see Section I-1 for Closure Plan summary).

J-2 Information Pertaining to Releases (40 CFR 270.14(d)(2))

Confirmed releases have not been reported at any of the identified SWMU locations. Visual observations made by EPD or WCM personnel have indicated the presence of surface staining from wood treatment chemicals and/or the potential for impact to subsurface soils or groundwater based on historical activities. Soil samples have been collected at each of the SWMUs, with the exception of SWMU #3, 5, and 7, to evaluate the presence of regulated constituents in the soil. Sampling events are described below in chronological order.

July 1991 Sampling Event

On July 17-19, 1991, a total of 18 soil samples were collected for laboratory analysis from 10 separate locations by WCM personnel. The samples were collected from accessible subsurface soils around SWMU #s 1, 2, 4, and 8. All samples were collected prior to excavation and renovation of the SWMU areas. Background samples (B-3) were also collected at 1 inch and 12 inches adjacent to MW-1. The sampling plan followed required the collection of an initial sample from approximately 1 inch below ground surface, in a presumed “worst case” location. If visual or olfactory indicators identified possible impact from regulated substances, a subsequent sample was collected at a depth of 12 inches.

The soil samples were collected using a dedicated stainless-steel scoop for each location. Disposable gloves were worn and changed between sample locations to lessen the potential for cross-contamination. All samples were submitted to an analytical laboratory for testing for volatile organics (VOCs), semi-volatile organics (SVOCs), and metals using the EPA Toxicity Characteristic and Leaching Procedure (TCLP), EPA Method 1311, as described in the September 1991 RFI Work Plan. TCLP analysis was performed to evaluate if the waste had hazardous characteristics and to determine disposal requirements. Due to the construction schedule, sample collection was performed prior to EPD review and approval. A later review by EPD indicated that TCLP results would not be acceptable and required standard soils analyses using the appropriate EPA methods for SWMU #6 and any future SWMU sampling.

A review of **Table J-1a** and **Figures J-2** and **J-3** indicates that non-detect or low-level concentrations were generally observed for the TCLP constituents reported. None of the TCLP levels were exceeded as shown on the table indicating that the samples did not exhibit hazardous characteristics.

A review of **Table J-1b** indicates that the theoretical concentrations would exceed laboratory reporting limits or background concentrations for several SVOCs and toluene. PCP concentrations exceeding the standard were reported for samples collected in each of the SWMU areas. All of the sample locations indicated a decline in concentration at 12 inches, with the exception of the A-3 location collected at SWMU #2. Naphthalene exceeded the standard in sample G-9 (1 inch depth) only with a theoretical concentration of 76.0 mg/kg. During soil excavation, impacted soils were removed below the 12-inch depth in the SWMU areas, thereby eliminating a source for future subsurface soil or groundwater impact.

July 2002 SWMU #6 Sampling Event

In July 2002, four soil samples were collected by WCM personnel from the cooling pond area following excavation around the sides of the concrete tank. The samples were collected at depths ranging from 42 to 72 inches after visual and olfactory indicators suggested that "clean" soils were encountered at depth. Samples were collected using dedicated stainless-steel scoops. The samples were submitted for analysis of VOCs, SVOCs, metals, and dioxins by a local laboratory. The results are provided in **Tables J-2a** and **J-2b** and **Figures J-2** and **J-3**.

A review of **Table J-2a** indicates that VOCs were not detected above laboratory reporting levels with the exception of tri-methylbenzenes. Detections above background concentrations were limited to low to moderate concentrations of benzo(a)pyrene (4 mg/kg in Site B sample), benzo(b)fluoranthene (8-13 mg/kg in three samples), and PCP (6-41 mg/kg) detected in all four samples. The dioxin results displayed in **Table J-2b** indicated detections in each of the samples. Results were reported in nanograms per kilogram. Background samples were not collected for dioxin analysis and subsequent comparison.

September 2004 SWMU # 9 and 10 Sampling Event

In September 2004, the EPD conducted sampling around the Old Goldfish Pond (SWMU #9) and the Stream and Culvert Area (SWMU #10). A total of six (6) soil samples were collected at depths of approximately one (1) inch in the locations shown on **Figures J-2** and **J-3**. The samples were analyzed by the EPD laboratory for SVOCs, metals, and diesel range organics (DRO). The data is summarized on **Table J-3**.

A review of the findings indicates trace/low level detections of SVOCs in all of the samples except SC-10-2, collected on the north side of the stream bank, approximately 25 feet northwest of the MW-12 well cluster. Constituents exceeding background concentrations in this sample include benzo(a)anthracene (detected at 78 mg/kg), benzo(a)pyrene (detected at 24 mg/kg), benzo(b)fluoranthene (detected at 39 mg/kg), benzo(k)fluoranthene (detected at 32 mg/kg), and phenanthrene (detected at 190 mg/kg). For metals, background concentrations for arsenic were exceeded in all of the samples with concentrations ranging from 8.4 to 14 mg/kg. DRO was also detected in concentrations ranging from 60 to 2,800 mg/kg in four of the samples. DRO analytical

results represent a group of compounds and are used more as a screening tool rather than a compound specific indicator of regulated constituents.

2011-2012 Phase 1 and 2 Investigations (SWMUs 1, 4, 6, and 8)

In 2011, Envirorisk conducted investigations of SWMUs 1, 4, 6, and 8 as part of the 2011 Revised Corrective Action Plan (RCAP) implementation. Phase 1 was initiated in October 2011 and included the installation of 12 temporary wells (TW-1 through TW-12) to depths of approximately 32-34 ft-bgs. The temporary wells were located to the north, east, and west of the HWMU fenced area (refer to **Figure J-4A**). The Phase 1 investigation scope and findings were reported in the March 2012 Phase 1 Progress Report. The primary focus of this investigation was to fill data gaps regarding the extent of non-aqueous phase liquid (NAPL), impacted soils, and dissolved VOC/SVOCs requiring corrective action. The results indicated an expanded area of NAPL was detected in TW-3, TW-6, TW-10, TW-11, and TW-12, down-gradient or cross-gradient of the POC wells. VOCs/SVOCs were detected in shallow fill soils and deeper saturated soil zones above and below the water table. Additional NAPL delineation was recommended for completion in conjunction with Phase 2 investigations. The first Phase 2 Progress Report was submitted in October 2012 and recommended additional delineation. The Georgia EPD responded in a December 18, 2012 comment letter approving the additional delineation.

The Phase 2 investigation scope and findings were reported in October 2012 and March 2013 Phase 2 Progress Reports. The July 2012 investigation included installation of 13 soil borings (sampling IDs start with “SWMU”) and collection of soil samples from multiple depths ranging from 1-28 feet for analysis of SVOCs, VOCs, and metals. In November 2012, a follow up investigation was performed, and 7 additional soil borings were advanced in SWMUs 1, 4, and 6 (sampling IDs also start with “SWMU”). Soil samples were analyzed for SVOCs and VOCs and three (3) samples were analyzed for dioxins. In addition, four (4) temporary wells were installed (SB/TW-25, SB/TW-26, SB/TW-28, and SWMU1-3B) in SWMU areas. Groundwater samples from the 4 temporary wells were analyzed for SVOCs, VOCs, and two (2) wells were sampled for dioxins. Soil analytical results for VOCs, SVOCs, metals, and dioxins are tabulated on **Tables J-4A** to **J-4D**. The horizontal extent of detected constituents is depicted on **Figures J-4B** to **J-4G**. Analytical reports associated with these investigations and others are included with electronic versions of Progress Reports saved on a USB drive. A discussion of sampling results is provided below.

The following eight (8) VOCs were detected in the SWMU areas (SWMU sample IDs and SB/TW-25, SB/TW-26, and SB/TW-28) in at least one interval during the July and/or November 2012 sampling events: 1,2,4-Trimethylbenzene, 1,3,5-Trimethylbenzene, acetone, benzene, ethylbenzene, styrene, toluene, and total xylenes (**Table J-4A**). A review of **Figure J-4B** indicates that VOC impacted soils were detected around SWMU #1 (process tank field area including creosote truck unloading area), SWMU 4 (railroad track “kickback” drippage area), and SWMU #6 (cooling water pond). VOC impacted soils were not detected at SWMU #8 (oil shed).

Figure J-4B indicates the presence of four VOC plumes covering approximately 4,919 ft^2 at the SWMU areas. This equates to an approximate volume of VOC impacted soils of 98,380 cubic feet, or 3,644 cubic yards. A review of the figure indicates that total VOC concentrations were relatively low, ranging from non-detect to a high of 40.2 mg/kg detected in sample SWMU 6-3 @ 7-8 ft-bgs, located on the north end of SWMU #6.

The following 20 SVOCs were detected in the SWMU areas in at least one interval during the July and/or November 2012 sampling events: 2,3,4,6-Tetrachlorophenol, 2,4-Dimethylphenol, 2-Methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, carbazole, chrysene, dibenzofuran, fluoranthene, fluorene, indeno(1,2,3-cd)pyrene, naphthalene, pentachlorophenol, phenanthrene, and pyrene. Soil analytical results for SVOCs are tabulated on **Table J-4B**. A review of **Figure J-4C** illustrating SVOCs in SWMU area soils (collected from 1-28 ft-bgs) indicates the presence of 4 SVOC plumes covering approximately 7,721 sf. This equates to an approximate volume of SVOC impacted soils of 154,420 cubic feet, or 5,719 cubic yards. SVOC concentrations are approximately one to two orders of magnitude higher than VOC concentrations. Total SVOCs were highest in sample SWMU 6-3 @ 7-8 ft-bgs with a total SVOC concentration of 16,382.3 mg/kg, located on the north end of SWMU #6.

The following nine (9) metals were detected in the temporary monitoring well borings and/or the SWMU soil samples (in at least one interval) during the July and/or November 2012 sampling events: arsenic, barium, chromium, cobalt, copper, lead, nickel, vanadium, and zinc. A source of metals has not been identified at the facility and detections have historically been attributed to naturally occurring mineral sources or fill materials. Soil analytical results for metals are tabulated on **Table J-4C**. Due to the sporadic occurrence of metals detections, plume maps were not generated.

Soil samples for dioxins were collected from SWMUs 1, 4, and 6 during the November 2012 event at depths ranging from 11-21 ft-bgs. No dioxins were detected above reporting limits. Sampling results are tabulated on **Table J-4D**. In addition, groundwater samples were collected from five (5) temporary wells in November 2012 for analysis of VOCs and SVOCs. A total of seven (7) VOCs and 19 SVOCs were detected. Groundwater analytical results for VOCs and SVOCs are depicted on **Table J-4E**.

In addition, maps depicting the horizontal extent of VOCs in fill soils from 3-16 ft-bgs were prepared to include sample results from locations surrounding the HWMU (**Figure J-4D**), VOCs in saturated soils from 16-36 ft-bgs (**Figure J-4E**), SVOCs in fill soils from 3-16 ft-bgs (**Figure J-4F**), and SVOCs in saturated soils from 16-36 ft-bgs (**Figure J-4G**). These maps were prepared using 2011 Phase 1 soil data combined with the Phase 2 soil data to better illustrate the extent of regulated constituents around the HWMU and/or selected SWMU areas. Additionally, the evaluation of saturated soils was also performed in combination with well locations containing measured NAPL (POC wells) to characterize areas above and below the water table which affects source mass calculations for remedial decision making. Since the saturated soil samples were collected either below

the water table or in capillary fringe, this data consists of a combination of separate phase sources including soil, groundwater, and NAPL.

A review of **Figure J-4D** (illustrating VOC concentrations in fill soils from 3-16 ft-bgs) indicates the presence of three (3) contoured plumes with an estimated total area of approximately 1,913 sf. Note that contouring was performed based on an assumption of lateral continuity in heterogeneous fill soils, which were observed to contain "pockets" of NAPL, and therefore contoured boundaries should be considered conservative. Most of the impacted fill soils contained discrete pockets of wood and organic debris with creosote and/or diesel-like staining and odor (see boring logs). Based on this understanding, volumetric calculations of VOC impacted fill soils were not performed. Total VOC concentrations were low, with the highest concentration detected in TW-19 @ 15-16 ft-bgs, located southeast of the HWMU, with a concentration of approximately 4.6 mg/kg. The horizontal extent of VOCs in fill soils has been approximately delineated by non-detect to low level concentrations in all directions except the south due to inaccessible areas of the Treatment/Preserving Facility.

A review of **Figure J-4E** illustrating VOCs in saturated soils (16-36 ft-bgs) indicates the presence of one VOC plume in the area surrounding the impoundment covering approximately 40,274 sf. This equates to an approximate volume of VOC impacted soils of 805,480 cubic feet, or 29,833 cubic yards. The POC wells (MW-5R, MW-6R, and MW-11) were selectively included in the contouring. In addition, the area under the impoundment (which was previously remediated to a depth of 15 ft-bgs) was also assumed to contain VOC constituents in saturated soils to provide a conservative estimate. A review of **Figure J-4E** indicates that total VOC concentrations were relatively low (ranging from 1-6 mg/kg) except for SB-22 and TW-11, as would be expected based on the low levels of dissolved VOCs detected at the site. Total VOCs were highest in TW-11 @ 30-31 ft-bgs with a total VOC concentration of approximately 58.0 mg/kg, and in SB-22 @ 19-20 ft-bgs with a total VOC concentration of 38.8 mg/kg, both located on the southeast side of the HWMU. Both locations were also observed to contain NAPL during the July 2012 event.

The horizontal extent of VOCs in saturated soils has been approximately delineated by TW-2/TW-23 to the east, low concentrations in TW-26/TW-28 to the southeast, TW-1/TW-5/TW-12/TW-14 to the north, and TW-17 to the west and by low concentrations in TW-8 and TW-9. The extent of VOCs in saturated soils has been approximately delineated in all directions except the south due to inaccessible areas of the Treatment/Preserving Facility.

A review of **Figure J-4F** (illustrating SVOC concentrations in fill soils from 3-16 ft-bgs) indicates concentrations one to two orders of magnitude higher than VOC concentrations. The figure indicates the presence of four (4) contoured plumes with an estimated total area of approximately 29,836 sf. Note that contouring was performed based on an assumption of lateral continuity in heterogeneous fill soils, which were observed to contain "pockets" of NAPL, and therefore contoured boundaries should be considered

conservative. Most of the impacted fill soils contained discrete pockets of wood and organic debris with creosote and/or diesel-like staining and odor.

Based on this understanding, volumetric calculations of SVOC impacted fill soils were not performed. The highest SVOC concentration was detected in TW-9 @ 9.5 ft-bgs, located west of the HWMU, with a concentration of 9,670 mg/kg. High concentrations were also detected in TW-19 @ 15-16 ft-bgs, located southeast of the HWMU, with a concentration of 5,261.4 mg/kg. A larger contoured area is displayed on the east side of the HWMU and includes TW-2, TW-3, TW-4, TW-11, TW-19, TW-20, SB-22, and TW-23. This larger contoured area is now defined by TW-23 to the east (deeper sample), TW-24/TW-25 to the southeast, and TW-1/TW-5 to the north. The smaller contoured areas have not been fully delineated. Delineation to the south was limited due to inaccessible areas of the Treatment/Preserving Facility.

The review of **Figure J-4G** illustrating SVOCs in saturated soils (16-36 ft-bgs) indicates the presence of two (2) contoured plumes with an estimated total area of approximately 64,346 sf. This equates to an approximate volume of saturated SVOC impacted soils of 1,286,920 cubic feet, or 47,664 cubic yards. Please note that these estimates are conservative and assumes regulated constituents extend across the entire HWMU. The highest SVOC concentration detected was at TW-11 @ 30-31 ft-bgs, located southeast of the HWMU, with a concentration of 14,600 mg/kg. The larger plume has been approximately delineated by TW-9/TW-17 to the west, TW-12 to the north/northwest, TW-1 to the northeast, and TW-2/TW-23 to the east. Sampling locations east/southeast of the HWMU show a continuous plume extending into SWMU #6.

January-April 2013 Phase 3 Investigation

Phase 3 corrective action investigations were conducted at WCM from January – April 2013 and detailed in the September 2013 Phase 3 Progress Report. Phase 3 is the third of eight corrective action phases, as detailed in the 2011 RCAP. Phase 3 was specifically designed to delineate dissolved VOCs and SVOCs in saprolitic soils and bedrock and complete vertical delineation. In addition to completion of Phase 3 activities, background sampling of soils for dioxins and furans was conducted.

Subsurface soils were observed during the advancement of MW-5A to a depth of 46 ft-bgs and MW-7B2 to a depth of 73.5 ft-bgs prior to installation of an outer casing. A review of both boring logs indicates the presence of fill soils to depths of 28 ft-bgs in MW-7B2 and 32 ft-bgs in MW-5A followed by sandy silts/silty sands with varying amounts of clay and evidence of foliation indicative of saprolite. The soils appeared generally consistent with previous evaluations. At MW-5A, “creosote-like” product zones were encountered from 22-23 ft-bgs and “pockets” of product were noted from 23-31 ft-bgs in fill materials. PID hits were observed in MW-5A throughout. For MW-7B2, PID hits and noticeable odors were trace or not observed (from 0-73.5’).

Soil sampling for metals was conducted during July 2012 Phase 2 implementation and results were reported in the Phase 2 Progress Report/Revised Phase 2 Progress Report.

Per EPD's request in the comments provided on July 10, 2013, results were compared to calculated background concentrations. Site background concentrations for metals were calculated by taking two times the arithmetic mean of the three background samples (SB/BK-1, SB/BK-3, and SB/BK-4 at 1 foot on 2-28-13). In cases where the background concentration was below the laboratory detection limit, the detection limit was utilized in the calculation. Based on a comparison to the calculated values, background concentrations were exceeded for all metals in at least one sample collected. Barium and zinc concentrations exceeded background concentrations most frequently. A comparison of concentrations in fill versus saprolitic (native) soils indicates about half of the exceedances were in fill soils versus half in saprolitic soils. In general, metal concentrations tended to be higher in the deeper saprolitic soils, indicating naturally occurring metals are present in the parent bedrock. Zinc concentrations were notably higher in shallow fill soils collected around SWMU #1. The source of the zinc in these fill soils may be galvanized metal debris or similar debris products located in the area(s) sampled. The source of these higher concentrations around SWMU #1 is unknown.

Barium concentrations exceeded background concentrations more than the other metals, so Envirorisk analyzed the sampling results in detail to determine any relevant trends. Approximately half of the exceedances were in fill material, and half were in saprolitic soils. In addition, soil samples with creosote pockets and/or odor did not exceed background concentrations more often than non-impacted soils. Based on these observations, there does not appear to be any clear pattern of barium concentrations between fill and native soils, or soils impacted with creosote.

Envirorisk further evaluated metal detections at the site by averaging concentrations by the following four (4) categories: fill with no odor/septic odor, fill with creosote odor and/or staining, saprolite above the water table (0-16 ft-bgs), and saprolite below the water table (16 ft-bgs and deeper). Soil samples collected from intervals containing charcoal, coal, and/or ash were excluded from the averaging (SWMU 1-2, SWMU 1-3, SWMU 4-3, and SWMU 4-4). Analytical results indicated concentrations of arsenic and barium slightly exceeded background concentrations in saprolitic soils; however, did not exceed the range for Piedmont soils. Chromium slightly exceeded background concentrations in fill soils only. Cobalt exceeded the calculated background concentration in saprolite below the water table only due to the elevated levels in one sample collected from TW-16. The cobalt concentration in this sample was 753 mg/kg. TW-16 did not contain high concentrations of other metals tested and since the source of this detection is unknown, the result appears to be an anomaly. When this sample is removed from the calculation, the average cobalt concentration for deeper saprolite soils is 16.2 mg/kg, below the background concentration. Zinc exceeded background concentrations in all soils except shallow saprolite. Concentrations of copper, lead, nickel, and vanadium did not exceed background concentrations in any soil type. In general, there does not appear to be a significant difference in regulated metal concentrations between native and fill soils.

Based on an evaluation of the soil data, it was concluded the source of metals at the site was likely attributed to native minerals resulting from in-place weathering of the underlying metamorphic bedrock. There is no clear indication that metal concentrations are higher

in fill and/or creosote impacted soils when compared to native saprolite samples. Therefore, metal detections at the site were attributed to background, naturally occurring sources and not site contaminants. Additional assessment of the extent and distribution of metals at this site was not recommended. Soil analytical results for metals are summarized on **Table J-5A**.

Dioxins were collected at a depth of one foot from SB/BK-1, SB/BK-3, and SB/BK-4 in presumed "clean" locations for analysis using EPA Method 8290. Prior samples were run by EPA Method 8280, which has a higher detection limit. Sampling results indicated detections of Hexa CDD/CDF, Hepa CDD/CDF, Penta CDF, OCDF, and OCDD. Soil analytical results for dioxins are summarized on **Table J-5B**.

Phase 3 implementation also included the collection of groundwater samples from the two newly installed wells, MW-5A and MW-7B2. Discrete "grab" samples were also collected from the original borehole in MW-7B2 at 84-85', and then from two intervals (148-150' and 173-175') during well installation for analysis of VOCs and SVOCs. Following development of both wells, groundwater samples were collected for VOCs, SVOCs, and metals. Based on a review of data, site contaminants appear to be located to a minimum depth of 175'. The groundwater sample collected from MW-7B2 after the well was set at a depth of 200 ft-bgs (195-200' sampling interval) was below laboratory detection limits. Groundwater analytical results are summarized on **Table J-5C**.

November 2016 – August 2017 Supplemental Phase 3 Investigation

Based on an August 23, 2016 meeting with EPD, additional bedrock delineation was requested to evaluate VOC/SVOC distribution and hydraulic pathways in deeper fractured rock. Prior investigations performed around the MW-7 well cluster suggested that these pathways included fracture zones from 85 to 175 ft-bgs, and possibly deeper, prior to termination at 195 ft-bgs. On October 17, 2016, Envirorisk submitted a Supplemental Work Plan/Corrective Action Cost Estimate detailing the proposed field work associated with additional bedrock delineation (Supplemental Phase 3). Supplemental Phase 3 activities were initiated in November 2016 and included horizontal and vertical bedrock delineation through the installation of monitoring wells MW-8A, MW-8B, MW-8B2 (adjacent to MW-8), and MW-3B (adjacent to MW-3 and MW-3A). (An outer casing for planned bedrock monitoring well MW-5B was installed but the well was not completed.) The details of the investigation were provided in the April 2021 Supplemental Phase 3 Progress Report.

Subsurface soils were observed during the advancement of MW-3B to a depth of 62.5 ft-bgs, MW-8A and MW-8B to depths of approximately 50 ft-bgs, and MW-5B to a depth of 46 ft-bgs prior to installation of an outer casing. At MW-3B, MW-8A, and MW-8B, fill soils were observed to depths of approximately 25-30 ft-bgs, followed by micaceous sandy-silt/silty-sand saprolite derived from an apparent mica schist parent rock. The soils appeared generally consistent with previous evaluations. At MW-5B and MW-5A, silty, sandy fill soils extended to approximately 32 ft-bgs where native saprolite was observed. Apparent "creosote-like" product zones (NAPL) were encountered from 22-23 ft-bgs and

NAPL pockets were noted from 24-31 ft-bgs in fill materials, including a black saturated zone at 27-28 ft-bgs. Based on field observations and PID/olfactory indications, the more impacted saturated soils appeared to extend to depths of approximately 35 ft-bgs. At MW-3B, odors were minimal or not observed with no detectable PID hits (from 0-62.5 ft-bgs).

In order to evaluate VOC and SVOC impact in deeper saturated soils, two (2) soil samples were collected at MW-8A and MW-5B at depths of 50 ft-bgs and 46 ft-bgs, respectively. Soil samples, identified as MW-8A-50' and MW-5B-46', were submitted for laboratory analysis of site-specific VOCs and SVOCs. Based on the analytical results, none of the site-specific VOCs were detected above the laboratory reporting limit in either of the two (2) soil samples. The following SVOCs were detected above the laboratory reporting limit in soil samples MW-8A-50' and MW-5B-46':

- MW-8A-50' – Naphthalene (0.73 mg/kg).

- MW-5B-46' – 2-Methylnaphthalene (5.3 mg/kg), Acenaphthene (6.7 mg/kg), Anthracene (4.1 mg/kg), Benz(a)anthracene (2.0 mg/kg), Benzo(a)pyrene (0.80 mg/kg), Benzo(b)fluoranthene (1.8 mg/kg), Carbazole (2.8 mg/kg), Chrysene (2.0 mg/kg), Dibenzofuran (5.4 mg/kg), Fluoranthene (8.5 mg/kg), Fluorene (7.5 mg/kg), Naphthalene (8.6 mg/kg), Phenanthrene (18 mg/kg), and Pyrene (6.6 mg/kg).

While the detections in MW-5B-46' do not suggest the presence of NAPL at this depth interval, these concentrations indicate a source of SVOCs for continued matrix diffusion into the groundwater. The December 2016 soil analytical data is summarized on **Table J-5D.**

Supplemental Phase 3 implementation included the collection of groundwater samples from the top of bedrock (intermediate) monitoring well MW-8A and deep bedrock monitoring wells, MW-3B and MW-8B. At the deep bedrock monitoring wells, discrete "grab" samples were collected from the depth intervals for analysis of SVOCs only. The groundwater sample collected from MW-8A was analyzed for VOCs and SVOCs. Analytical data collected from MW-7B2 during January – April 2013 Phase 3 activities has also been provided for ease of reference. Groundwater analytical data for VOCs and SVOCs from the supplemental sampling is provided in **Tables J-5E** and **J-5F**.

The following summarizes VOCs and SVOCs detected above the laboratory reporting limits in the groundwater depth intervals sampled:

MW-7B2

- MW-7B2– 84-85 ft-bgs: Below laboratory reporting limits for all analyzed VOCs and SVOCs.

- MW-7B2–148-150 ft-bgs: Acetone ((88 micrograms per liter (µg/L)), Naphthalene (45 µg/L), and Pentachlorophenol (64 µg/L).

- MW-7B2–173-175 ft-bgs: 2,3,4,6-Tetrachlorophenol (120 µg/L), 2,4-Dimethylphenol (11 µg/L), 2-Methylnaphthalene (100 µg/L), 3,4-Methylphenol (17 µg/L), Acenaphthene (21 µg/L), Carbazole (22 µg/L), Dibenzofuran (18 µg/L), Fluorene (11 µg/L), Naphthalene (840 µg/L), Pentachlorophenol (1,100 µg/L), Benzene (2.3 µg/L), Toluene (8.0 µg/L), Ethylbenzene (3.2 µg/L), Total Xylenes (10.9 µg/L), Styrene (xx µg/L), 1,3,5-Trimethylbenzene (2.2 µg/L), and 1,2,4-Trimethylbenzene (5.7 µg/L).

- MW-7B2–195-200 ft-bgs:- Below laboratory reporting limits for all analyzed VOCs and SVOCs.

MW-8A

- MW-8A: 2,4,6-Trichlorophenol (21.2 µg/L), Acenaphthene (273 µg/L), Anthracene (12.3 µg/L), Carbazole (270 µg/L), Dibenzofuran (205 µg/L), 2,4-Dimethylphenol (11.0 µg/L), Fluorene (160 µg/L), 2-Methylnaphthalene (582 µg/L), Naphthalene (4,110 µg/L), Pentachlorophenol (23.6 µg/L), Phenanthrene (153 µg/L), Benzene (2.2 µg/L), 1,2-Dichloroethane (16.2 µg/L), 1,1-Dichloroethene (1.4 µg/L), Ethylbenzene (9.2 µg/L), Tetrachloroethene (7.1 µg/L), Toluene (5.6 µg/L), Trichloroethene (2.1 µg/L), 1,2,4-Trimethylbenzene (33.9 µg/L), 1,3,5-Trimethylbenzene (14.1 µg/L), m,p-Xylene (18.3 µg/L), and o-Xylene (9.4 µg/L).

MW-3B

- MW-3B–65-70 ft-bgs: 2,3,4,6-Tetrachlorophenol (220 µg/L), 2-Methylnaphthalene (130 µg/L), Acenaphthene (51 µg/L), Carbazole (68 µg/L), Dibenzofuran (44 µg/L), Fluorene (25 µg/L), Naphthalene (1,400 µg/L), and Pentachlorophenol (1,400 µg/L).

- MW-3B–80-85 ft-bgs: 2,3,4,6-Tetrachlorophenol (370 µg/L), 2,4-Dimethylphenol (17 µg/L), 2-Methylnaphthalene (200 µg/L), 2-Methylphenol (16 µg/L), 3,4-Methylphenol (22 µg/L), Acenaphthene (75 µg/L), Carbazole (140 µg/L), Dibenzofuran (63 µg/L), Fluorene (31 µg/L), Naphthalene (3,300 µg/L), Pentachlorophenol (2,600 µg/L), and Phenanthrene (14 µg/L).

- MW-3B–85-90 ft-bgs: 2,3,4,6-Tetrachlorophenol (430 µg/L), 2,4-Dimethylphenol (30 µg/L), 2-Methylnaphthalene (180 µg/L), 2-Methylphenol (21 µg/L), 3,4-Methylphenol (27 µg/L), Acenaphthene (71 µg/L), Carbazole (160 µg/L), Dibenzofuran (54 µg/L), Fluorene (29 µg/L), Naphthalene (3,100 µg/L), Pentachlorophenol (2,700 µg/L), and Phenanthrene (12 µg/L).

- MW-3B–90-95 ft-bgs: 2,3,4,6-Tetrachlorophenol (770 µg/L), 2,4-Dimethylphenol (110 µg/L), 2-Methylnaphthalene (280 µg/L), 2-Methylphenol (59 µg/L), 3,4-Methylphenol (100 µg/L), Acenaphthene (170 µg/L), Acenaphthylene (14 µg/L), Carbazole (200 µg/L), Dibenzofuran (87 µg/L), Fluorene (81 µg/L), Naphthalene (4,800 µg/L), Pentachlorophenol (4,900 µg/L), and Phenanthrene (23 µg/L).

- MW-3B–110-115 ft-bgs: 2,3,4,6-Tetrachlorophenol (690 µg/L), 2,4-Dimethylphenol (24 µg/L), 2-Methylnaphthalene (210 µg/L), 2-Methylphenol (18 µg/L), 3,4-Methylphenol (33 µg/L), Acenaphthene (79 µg/L), Carbazole (140 µg/L), Dibenzofuran (74 µg/L), Fluorene (32 µg/L), Naphthalene (4,000 µg/L), Pentachlorophenol (3,200 µg/L), and Phenanthrene (13 µg/L).

- MW-3B–118.5-123.5 ft-bgs: 2,3,4,6-Tetrachlorophenol (990 µg/L), 2,4-Dimethylphenol (120 µg/L), 2-Methylnaphthalene (260 µg/L), 2-Methylphenol (66 µg/L), 3,4-Methylphenol (120 µg/L), Acenaphthene (180 µg/L), Acenaphthylene (12 µg/L), Carbazole (260 µg/L), Dibenzofuran (97 µg/L), Fluorene (92 µg/L), Naphthalene (5,600 µg/L), Pentachlorophenol (5,100 µg/L), and Phenanthrene (28 µg/L).

- MW-3B–175-180 ft-bgs: 2,3,4,6-Tetrachlorophenol (640 µg/L), 2,4,6-Trichlorophenol (18 µg/L), 2,4-Dimethylphenol (110 µg/L), 2-Methylnaphthalene (170 µg/L), 2-Methylphenol (51 µg/L), 3,4-Methylphenol (92 µg/L), Acenaphthene (180 µg/L), Acenaphthylene (16 µg/L), Carbazole (180 µg/L), Dibenzofuran (92 µg/L), Fluorene (84 µg/L), Naphthalene (4,400 µg/L), Pentachlorophenol (3,900 µg/L), and Phenanthrene (27 µg/L).

MW-8B

- MW-8B–53-58 ft-bgs: 2,3,4,6-Tetrachlorophenol (490 µg/L), 2,4-Dimethylphenol (460 µg/L) 2-Methylnaphthalene (1,200 µg/L), 2-Methylphenol (54 µg/L), 3,4-Methylphenol (72 µg/L), Acenaphthene (620 µg/L), Acenaphthylene (22 µg/L), Anthracene (42 µg/L), Carbazole (660 µg/L), Dibenzofuran (420 µg/L), Fluoranthene (49 µg/L), Fluorene (320 µg/L), Naphthalene (14,000 µg/L), Pentachlorophenol (3,800 µg/L), Phenanthrene (380 µg/L), and Pyrene (26 µg/L).

- MW-8B–61-66 ft-bgs: 2,3,4,6-Tetrachlorophenol (380 µg/L), 2,4-Dimethylphenol (190 µg/L), 2-Methylnaphthalene (1,300 µg/L), 2-Methylphenol (55 µg/L), 3,4-Methylphenol (64 µg/L), Acenaphthene (650 µg/L), Acenaphthylene (26 µg/L), Anthracene (55 µg/L), Benz(a)anthracene (18 µg/L), Carbazole (450 µg/L), Chrysene (16 µg/L), Dibenzofuran (410 µg/L), Fluoranthene (140 µg/L), Fluorene (360 µg/L), Naphthalene (14,000 µg/L), Pentachlorophenol (4,000 µg/L), Phenanthrene (550 µg/L), and Pyrene (80 µg/L).

- MW-8B–66-71 ft-bgs: 2,3,4,6-Tetrachlorophenol (330 µg/L), 2,4-Dimethylphenol (170 µg/L), 2-Methylnaphthalene (1,100 µg/L), 2-Methylphenol (52 µg/L), 3,4-Methylphenol (58 µg/L), Acenaphthene (540 µg/L), Acenaphthylene (27 µg/L), Anthracene (51 µg/L), Benz(a)anthracene (15 µg/L), Carbazole (380 µg/L), Chrysene (14 µg/L), Dibenzofuran (330 µg/L), Fluoranthene (120 µg/L), Fluorene (290 µg/L), Naphthalene (12,000 µg/L), Pentachlorophenol (3,400 µg/L), Phenanthrene (430 µg/L), and Pyrene (70 µg/L).

- MW-8B–71-76 ft-bgs: 2,3,4,6-Tetrachlorophenol (180 µg/L), 2,4-Dimethylphenol (92 µg/L), 2-Methylnaphthalene (410 µg/L), 2-Methylphenol (23 µg/L), 3,4-Methylphenol (30 µg/L), Acenaphthene (230 µg/L), Anthracene (17 µg/L), Carbazole (200 µg/L), Dibenzofuran (130 µg/L), Fluoranthene (21 µg/L), Fluorene (1100 µg/L), Naphthalene (4,300 µg/L), Pentachlorophenol (1,300 µg/L), Phenanthrene (120 µg/L), and Pyrene (11 µg/L).

- MW-8B–91-96 ft-bgs: 2,3,4,6-Tetrachlorophenol (590 µg/L), 2,4-Dimethylphenol (230 µg/L), 2-Methylnaphthalene (1,100 µg/L), 2-Methylphenol (60 µg/L), 3,4-Methylphenol (95 µg/L), Acenaphthene (600 µg/L), Acenaphthylene (23 µg/L), Anthracene (67 µg/L), Benz(a)anthracene (25 µg/L), Benzo(b)fluoranthene (10 µg/L), Carbazole (420 µg/L), Chrysene (24 µg/L), Dibenzofuran (400 µg/L), Fluoranthene (180 µg/L), Fluorene (370 µg/L), Naphthalene (11,000 µg/L), Pentachlorophenol (5,300 µg/L), Phenanthrene (620 µg/L), and Pyrene (110 µg/L).

- MW-8B–148-153 ft-bgs: 2,3,4,6-Tetrachlorophenol (620 µg/L), 2,4-Dimethylphenol (200 µg/L), 2-Methylnaphthalene (920 µg/L), 2-Methylphenol (45 µg/L), 3,4-Methylphenol (69 µg/L), Acenaphthene (420 µg/L), Acenaphthylene (20 µg/L), Anthracene (17 µg/L), Carbazole (310 µg/L), Dibenzofuran (200 µg/L), Fluoranthene (21 µg/L), Fluorene (160 µg/L), Naphthalene (11,000 µg/L), Pentachlorophenol (4,900 µg/L), Phenanthrene (130 µg/L), and Pyrene (11 µg/L).

Based on the analytical data, target SVOCs and some VOCs were detected in all the fracture zones sampled extending to 175 ft-bgs at MW-3B and 153 ft-bgs at MW-7B2. Historically, groundwater samples collected from MW-7B2 at a depth of 200 ft-bgs (screened 195-200 ft-bgs) have not detected target constituents above laboratory detection limits. Water-bearing fracture zones were not encountered in MW-3B at 200 ft-bgs (or below 180 ft-bgs). Utilizing analytical data collected during 2013 Phase 3 and 2017-2018 Supplemental Phase 3, the vertical extent of contamination is illustrated on geologic cross-sections A-A', B-B', and C-C'. A cross-section location map is provided as **Figure J-5A** followed by the vertical extent of SVOCs (**Figures J-5B**, **J-5C**, **and J-5D**). MW-8A, MW-8B, and MW-8B2 installed during the 2016-2017 Phase 3 supplemental investigation was added to geologic cross-sections A-A'. Likewise, MW-3B, also installed during the 2016-2017 Phase 3 supplemental investigation was added to C-C'. Vertical extent cross-sections with the most recent April 2023 analytical data are included in Section E.

A review of **Figures J-5B-5D** for SVOCs indicates that the vertical extent of the dissolved SVOC plume in the shallow saprolite-PWR zone extends into the partially weathered schist saprolite-PWR at MW-7A and MW-8A, and then vertically into the fractured bedrock at MW-7B, MW-8B, and MW-8B2. At the MW-7 well cluster, SVOCs are vertically delineated by MW-7B2 (non-detect for all SVOCs). The vertical extent of dissolved VOCs and SVOCs at the MW-3, MW-8, and MW-12 well clusters has not been vertically delineated based on the extent of drilling/rock coring performed thus far. Additional vertical assessment will be required to determine the extent of target VOCs/SVOCs in the bedrock.

2014-2019 Phase 4 Investigations (SWMUs 9 and 10)

From 2014-2019 Envirorisk conducted investigations of SWMUs #9 and #10 as part of RCAP implementation that was reported in multiple Phase 4 Progress Reports. Phase 4 activities included delineation of soil, sediment, surface water, and groundwater as well as collection of storm water samples and sediment from outfalls associated with the Facility's stormwater plan. A brief synopsis of work completed is as follows:

- *March 2014 Phase 4 Progress Letter Report* – Detailed March 2014 Phase 4 sediment and surface water sampling results (SWMU #9);
- *January 2015 Letter Progress Report* – Detailed January 2015 Phase 4 sediment and surface water sampling results (SWMU #9);
- *September 2016 Phase 4 Progress Report* – Detailed September 2015 – February 2016 Phase 4 soil and groundwater sampling of temporary wells along the stream (SWMU #9) and July 2016 soil sampling along the storm drain (SWMU #10);
- *November 2017 Supplemental Phase 4 Progress Report* – Detailed April 2017 Phase 4 surface water and sediment sampling within the stream (SWMU #9) and June-July 2017 Phase 4 stormwater and sediment sampling across the site.
- *July 2019 Supplemental Phase 4 Progress Report* – Detailed November 2018 aquatic resource delineation survey, November 2018 surface water and sediment sampling of the stream and stormwater across the site, March 2019 installation of 17 temporary wells and soil sampling, and April 2019 groundwater sampling of the temporary wells installed in March 2019.

SWMUs 9 and 10 Sediment Sampling Results

Multiple sediment sampling events were performed at SWMU 9 and 10 between 2014 and 2018. Samples were analyzed for VOCs, SVOCs, and metals and sampling results were compared to Screening Values taken from EPA's "Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft" dated 2015 for comparison purposes only*. (Please note that clean-up standards are currently set to background because a risk assessment has not been completed.)* During the most recent event in November 2018, the highest total SVOC concentration was 47.2 mg/kg at SED-6, located on the northern end of SWMU #10. No VOCs were detected during the November 2018 sampling event. No VOCs were historically detected in the sediment samples other than a trace of acetone (0.24 mg/kg) in SED-6 during the January 2015 event and 1,2,4-Trimethylbenzene (0.0094 mg/kg) in SED-5 during the April 2017 event. In November 2018, total metals ranged from 2,245.53 mg/kg in SED-5 to 5,252.72 mg/kg in SED-7. Aluminum accounted for most of the metal detections in SED-7 (4,690 mg/kg) in November 2018. Aluminum is naturally occurring in Piedmont rich soils due to the breakdown of feldspars and other aluminosilicate bearing minerals, and detections were below the applicable screening value (see paragraph below). Metal detections do not appear to be significantly lower in down-stream samples, which likely indicates contribution from natural sources versus outfall drainage. Sediment sampling results are provided on **Table J-6**. **Figures J-6A**, **J-6B**, and **J-6C** display sampling results for VOCs, SVOCs, and metals, respectively, for the November 2018 event.

SWMUs 9 and 10 Temporary Well Soil Sampling Results

A total of 33 temporary wells (TW-1 to TW-33) were installed around SWMUs #9 and #10 between 2015 and 2019. Soil samples were collected from depths of 0-15 feet and analyzed for VOCs, SVOCs, and metals. September 2015, March 2017, and February-March 2019 sampling results are tabulated on **Tables J-7A**, **J-7B**, and **J-7C**, respectively. **Table J-7D** displays dioxin sampling results for the March 2019 event.

The September 2015 soil analytical results for temporary monitoring wells TW-12 to TW-19 indicated the highest total SVOC concentration was 1,902.9 mg/kg detected in TW-17 at 2 ft-bgs. Soil samples collected from deeper depths of 5-7 ft-bgs contained trace or no SVOCs. No VOCs were detected in the soil samples collected during installation of the temporary monitoring wells in September 2015. During the 2015 sampling event, SVOCs were detected at concentrations exceeding laboratory reporting limits in all locations except TW-13, TW-15, and TW-18. The soil sampling results for 2015 for temporary wells along with sediment sampling results for 2014-2015 are depicted on **Figure J-7A**. Temporary well groundwater results and surface water results for the same/similar dates is depicted on **Figure J-7B**.

In March 2017, SVOCs were detected at concentrations exceeding laboratory reporting limits at five (5) of the nine (9) soil sample locations. The highest total SVOC concentration was 451.8 mg/kg in TMW-9 at 0-1 ft-bgs. Elevated total SVOC concentrations were also observed in 0-1 ft-bgs soil samples collected southeast of TMW-9 in TWM-10 (213.7 mg/kg) and TWM-11 (104.62 mg/kg). The highest total SVOC concentration in a sample collected beneath the surface (2 ft-bgs and deeper) was 62.77 mg/kg in TMW-1 at 2 ft-bgs. Soil samples collected at depths of 3 ft-bgs and deeper contained trace or no SVOCs. Other than acetone, no VOCs were detected in any of the temporary well soil samples. Soil samples from the temporary monitoring wells were also analyzed for total metals, with detections consistent throughout all the samples, suggesting naturally occurring sources. Total metals in samples collected from 0-1 ft-bgs ranged from 12,001.5 mg/kg in TMW-4 to 32,321.74 mg/kg in TMW-8. Total metals in samples collected from 2-9 ft-bgs ranged from 5,463.3 mg/kg in TMW-13 at 2 ft-bgs to 26,492.61 ft-bgs in TMW-8 at 9 ft-bgs.

In order to further evaluate possible contaminant flow pathways, pentachlorophenol (PCP) was evaluated using the March 2017 soil data. Based on the location of the detections and the shallow depth of collection, the PCP detections were attributed to ongoing stormwater discharge impacts at the intermittent creek and surrounding flood plain impacts. The sampling results for 2017 are summarized on **Table J-7B** and depicted on **Figures J-7C**, **J-7D**, and **J-7E**.

In February and March 2019, the highest total SVOC concentration detected in surface soil (0 to 1 ft-bgs) was 46.02 mg/kg in TMW-25 at 1 ft-bgs. The highest total SVOC concentration in a sample collected beneath the surface (2 ft-bgs and deeper) was 1,529.4 mg/kg in TMW-25 at 5 ft-bgs. Trace VOCs were also detected in TMW-22 (0-1 ft-bgs), TMW-33 (5 ft-bgs), and TMW-25 (5 ft-bgs).

Dioxins were analyzed in soil sample TMW-25-5 ft-bgs and the following dioxin/furan compounds were detected: total TCDF [140 nanograms per kilogram (ng/kg)], total TCDD (85 ng/kg), total PeCDF (1,100 ng/kg), total PeCDD (270 ng/kg), total HxCDF (7,900 ng/kg), total HxCDD (7,200 ng/kg), total HpCDF (66,000 ng/kg), total HpCDD (36,000 ng/kg), OCDF (50,000 ng/kg), and OCDD (130,000 ng/kg).

Metal concentrations were consistent throughout the site at all depths, and concentrations were generally not higher in shallow soils, near SWMUs, or in locations where groundwater samples contained regulated constituents indicative of site operations. Total metals in samples collected from 0-1 ft-bgs ranged from 10,702.87 mg/kg in TMW-28 to 22,812.2 mg/kg in TMW-22. Total metals in samples collected from 2 ft-bgs and deeper ranged from 4,785.2 mg/kg in TMW-33 at 5 ft-bgs to 30,635.13 mg/kg in TMW-27 at 4 ft-bgs. The sampling results for 2019 are displayed on **Table J-7C** to **J-7D**. The February - March 2019 temporary monitoring well surficial (0 to 2 ft-bgs) soil analytical results for VOCs, SVOCs, and total metals are depicted on **Figures J-7F**, **J-7G**, **and J-7H**, respectively. The February – March 2019 subsurface (2 ft-bgs or deeper) soil analytical results for VOCs, SVOCs, and total metals are depicted on **Figures J-7I**, **J-7J**, **and J-7K**, respectively.

SWMU 9 Surface Water Sampling Results

Between 2014-2018, Envirorisk collected surface water samples around SWMU-9 at six locations (SW-5 to SW-10). Samples were analyzed for VOCs, SVOCs, and metals. In March 2014, January 2015, and April 2017 surface water analytical results generally indicated SVOC concentrations to be higher up-stream at the drain outfall (up-stream of SW-5). Historically, the highest total SVOC concentration was 2,503 µg/L at SW-5 in January 2015.

The April 2017 total SVOC concentration at SW-5 was 1,471 µg/L, a decline of approximately 1,000 µg/L from January 2015. During the surface water sampling event in November 2018, total SVOC concentration at SW-5 was 502 µg/L, a decline of approximately 500 µg/L from April 2017. Similarly, declines in total SVOC concentrations were observed at surface water locations (SW-6, SW-7, and SW-10) in November 2018 when compared to data collected in March 2014, January 2015, and April 2017. For example, total SVOC concentrations at SW-6 in January 2015 and April 2017 was 1,367 µg/L and 538 µg/L, respectively. In April 2017, total SVOCs concentration was 106 µg/L in SW-6. Conversely, surface water sample locations SW-8 and SW-9, which were non-detect for SVOCs in April 2017, contained concentrations of 55 µg/L and 52 µg/L, respectively, in November 2018.

VOC concentrations in March 2014, January 2015, April 2017, and November 2018 were relatively low, as expected, due to the lack of a known VOC source on site. However, as observed with SVOC concentrations, VOC concentrations appear to be higher up-stream nearer to the drain outfall. In November 2018, no VOC concentrations were detected above laboratory reporting limits except for SW-5 (5.6 µg/L) with declines in total VOC concentrations observed in each of the sample locations. Concentrations were lower in

November 2018 when compared to March 2014, January 2015, and April 2017 results, presumably due to the diluting effects of surface runoff since the sampling event was conducted during a rain event.

The highest total metal concentration in April 2017 was 8.92 mg/L in SW-8, with 8.8 mg/L of the total consisting of aluminum. Similarly, in November 2018, the highest total metals concentration was 13.3 mg/L in SW-8, with 12.8 mg/L of the total consisting of aluminum. Metal concentrations were consistent throughout all the surface water samples collected, indicative of naturally occurring conditions.

Surface water sampling results were compared to screening values in EPA's "Region 4 Ecological Risk Assessment Supplemental Guidance Interim Draft" dated 2015 for comparison purposes only*. (Please note that clean-up standards are currently set to background).* No VOCs exceeded the screening values during any of the past surface water sampling events. During the November 2018 sampling event, several SVOCs exceeded applicable screening value in multiple sampling locations. Aluminum was the only metal exceeding its screening value at locations SW-5, SW-6, SW-7, SW-8, SW-9, and SW-10; however, these detections are attributed to naturally occurring conditions. The surface water analytical results are provided in **Table J-8**. Surface water analytical results for VOCs, SVOCs, and total metals for the November 2018 sampling event are depicted on **Figures J-8A**, **J-8B**, **and J-8C**, respectively.

SWMU 9 Temporary Well Sampling Results

Based on a review of the temporary monitoring wells installed September 2015, total SVOC concentrations were highest in TW-13 (372 µg/L in January 2016) and TW-17 (342 µg/L in September 2015). TW-13 was located on the northeastern edge of SWMU #9 and TW-17 was located northwest of SWMU #9 adjacent to the stream, just north of SW/SED-10. On March 27-29, 2017, groundwater samples were collected from 16 temporary monitoring wells (TMW-1 to TMW-16). Based on the March 2017 analytical results, the highest total SVOC concentrations was observed in TMW-9 (1,591 µg/L). The location of TMW-9 was approximately 50 feet northwest of TW-17, within a low-lying area adjacent to the stream. Elevated total SVOC concentrations were also observed in TMW-3 (1,553 µg/L), TMW-7 (864 µg/L), and TMW-11 (697 µg/L).

On April 18-23, 2019, groundwater samples were collected from 17 temporary monitoring wells (TMW-17 to TMW-33). Based on the April 2019 analytical results, the highest total SVOC concentrations was observed in TMW-21 (2,385 µg/L). TMW-21 is located north and up-gradient of the stream, and approximately 50 feet northwest of the scales. Elevated total SVOC concentrations were also observed in TMW-25 (1,075 µg/L) and TMW-29 (198 µg/L).

In March 2017 and April 2019, VOC (chlorinated) concentrations were relatively low, as expected, due to the lack of a known source on site. In April 2019, the highest total VOCs detected was 196.7 µg/L in TMW-21. Total VOCs were also detected in TMW-25 (18.9 µg/L), TMW-31 (3.1 µg/L), and TMW-32 (2.9 µg/L). Tetrachloroethene was detected in

TMW-21 at a concentration of 4.4 µg/L. Tetrachloroethene was not detected in any of the remaining temporary monitoring wells. Based on the detections in up-gradient temporary monitoring well TMW-21, the VOC source appears to be originating from groundwater base flow. Chlorinated VOCs detected at this facility have historically been attributed to an unidentified off-site source(s).

In April 2019, total metal concentrations were generally consistent throughout all groundwater samples collected, indicative of naturally occurring conditions, with barium present in all samples collected. Total lead was detected at elevated concentrations in MW-21 (0.115 mg/L). However, due to elevated turbidity readings observed during purging activities, dissolved metals were also analyzed (lab-filtered) with concentrations below laboratory reporting limits. Total cadmium was detected in TMW-33 (0.00836 mg/L), just exceeding the Maximum Contaminant Limit (MCL) of 0.005 mg/L. Elevated aluminum concentrations were detected in TMW-21 (42.7 mg/L) and TMW-33 (30.3 mg/L), significantly higher than in the other temporary monitoring wells. These concentrations are slightly lower than detected in TMW-12 (119 mg/L) during the March 2017 investigation. TMW-12 and TMW-33 are the furthest down-gradient temporary monitoring wells, while MW-21 is the furthest up-gradient.

Groundwater sampling results were compared to the EPA's June 2017 RSLs/MCLs for comparison purposes only*. (Please note that clean-up standards are currently set to background).* During September 2015, January 2016, March 2017, and April 2019 sampling events, VOCs including 1,2-Dichloroethane, benzene, and tetrachloroethene exceeded the MCLs. In March 2017, PCP exceeded the MCL of 1.0 µg/L in TMW-3 (220 µg/L) and TMW-4 (110 µg/L). In April 2019, PCP exceeded the MCL of 1.0 µg/L at in TMW-21 (270 µg/L).

In March 2017, lead was detected above the MCL of 0.015 mg/L in TMW-13 (0.0196 mg/L). In April 2019, Cadmium was detected at a concentration above the MCL of 0.005 mg/L in TMW-33 (0.00836 mg/L). Total lead was detected above the MCL of 0.015 mg/L in TMW-21 (0.115 mg/L), however dissolved metals concentrations were below laboratory reporting limits. Note that metals sampling was not performed in 2015 or 2016. Exceedances are highlighted red on **Tables J-9A** through **J-9C**.

The temporary monitoring well groundwater analytical results for samples collected September 2015 and January 2016 are tabulated in **Table J-9A**. The March 2017 groundwater analytical results are tabulated in **Table J-9B**. The April 2019 groundwater analytical results are tabulated in **Table J-9C**. Groundwater analytical results for VOCs, SVOCs, and total metals for April 2019 are depicted on **Figures J-9A**, **9B**, **and 9C**, respectively.

April – July 2017 Impoundment Investigation (HWMU)

On April 6, 13, and 14, 2017, Envirorisk conducted a subsurface investigation within the impoundment to determine if the wood preserving area, which includes SWMUs 1, 2, 3, 4, 6, and 7 is contributing to down-gradient NAPL detections. The impoundment

investigation included the installation of three (3) temporary monitoring wells (TW-1, TW-2, and TW-3) on the south end of the former impoundment. The TWs were later converted to permanent monitoring wells HWMU-1, HWMU-2, and HWMU-3, respectively, as shown on **Figure J-10**. The wells were installed using a combination of direct push technology and hollow stem auger (HSA) drilling to a depth of approximately 35 ft-bgs. Soil logging was performed on April 6, 2017 to provide continuous cores for field examination of fill versus native soils as well as contaminant screening and analysis. Soils were screened using a photoionization detector (PID) and field NAPL test kits. A total of two soil samples were collected from each well location (for a total of six) for analysis of VOCs and SVOCs. Soil sample designations and depths are provided below:

- HWMU-TW-1-16', HWMU-TW-1-24', HWMU-TW-2-(5-6'), HWMU-TW-2-24', HWMU-TW-3-4', and HWMU-TW-3-29'

Based on the analytical results, soil impacts were observed in each of the temporary well locations with highest concentrations of VOCs and SVOCs observed in the deeper soil samples (collected at the soil-groundwater interface). Soil analytical results are summarized in **Table J-10A**.

Product gauging events were conducted on April 14, 2017, May 17, 2017, and July 6, 2017. The measurements collected for each of these gauging events are provided below in feet. No NAPL was detected in HWMU-TW-1, the eastern most well. HWMU-TW-2 contained over seven (7) feet of NAPL (LNAPL) during the July event (thickest measurement). Historic groundwater elevations and LNAPL thickness are summarized in **Table J-10B**.

April 14, 2017

Monitoring Well	Depth to Free Product*	Depth to Groundwater*	Thickness
HWMU-TW-1	N/A	21.85	N/A
HWMU-TW-2	21.49	21.50	sheen/0.01
HWMU-TW-3	N/A	21.93	N/A

May 17, 2017

Monitoring Well	Depth to Free Product*	Depth to Groundwater*	Thickness
HWMU-TW-1	N/A	21.80	N/A
HWMU-TW-2	24.00	27.40	3.40
HWMU-TW-3	21.90	22.30	0.40

July 6, 2017

Monitoring Well	Depth to Free Product*	Depth to Groundwater*	Thickness
HWMU-TW-1	N/A	21.35	N/A
HWMU-TW-2	23.31	30.80	7.49
HWMU-TW-3	21.46	21.66	0.20

* in feet below ground surface (ft-bgs)

Following the July 6, 2017 gauging events, groundwater and NAPL samples were collected from HWMU-TW-1 and HWMU-TW-2, respectively. Groundwater samples from TW-1 were submitted for VOC/SVOC analysis, while NAPL collected from TW-2 was submitted for Diesel Range Organics (DRO), Oil Range Organics (ORO), and SVOC analysis. Due to the insufficient amount of free product detected in TW-3, NAPL samples were not collected for laboratory analysis. Based on the analytical results, nine (9) VOCs (Acetone, Benzene, Toluene, Ethylbenzene, m,p-Xylene, o-Xylene, Styrene, 1,3,5-Trimethylbenzene, and 1,2,4-Trimethylbenzene) were detected in TW-1. These VOCs have also been historically detected in the existing, downgradient POC monitoring wells (MW-5R, MW-6R, and MW-11) at similar concentrations. Likewise, SVOC constituents associated with creosote (2,4-Dimethylphenol, 2-Methylphenol, and 3,4-Methylphenol) were detected in TW-1 and have also been historically detected in the existing impoundment monitoring wells. The groundwater analytical results are summarized in **Table J-10C** and depicted on **Figure J-10**.

From 2017 to 2023, NAPL measurements collected from HWMU monitoring wells indicated a defined NAPL (specifically LNAPL) separation observed at HWMU-2 and HWMU-3. From 2017 to 2023, LNAPL thicknesses in monitoring well HWMU-2 ranged from 8.15 feet (April 2018) to 5.24 feet (March 2019). At HWMU-3, LNAPL thicknesses ranged from 9.85 feet (April 2023) to 4.12 feet (April 2018), with an increase in thickness observed each year measured. Historically, LNAPL has not been detected in HWMU-1, the easternmost well.

Interim Corrective Measures

In July 2018, Envirorisk completed an Interim Corrective Measures Work Plan to address impacted stormwater/run-off impacts detected during Phase 4 investigations at various outfalls and off-site surface water migration at SWMU #10. The work plan was implemented in March 2021. Stormwater, groundwater, and surface water sample results were detailed in Interim Measures Monitoring Report #1, dated August 2, 2021. A second sampling event was conducted in December 2021 with sample results detailed in Interim Measures (IM) Monitoring Report #2, dated June 30, 2022. Details of these events are provided below.

August 2021 Interim Measures Monitoring Report #1

In March 2021, quarterly IM corrective measures and assessment activities included re-grading of the western property boundary locations and treated inventory relocation, gauging of monitoring wells MW-3, MW-3A, MW-3B, MW-4, MW-7, MW-7A, MW-8, MW-8A, and MW-9 to monitor the effects of the proposed deep trenching on groundwater, collection of stormwater samples: PB-1, PB-2, PB-4, Outfall-1, Outfall-2, Outfall-3, Outfall-4, and Outfall-5 for laboratory analysis of VOCs, SVOCs, and RCRA Metals, and collection of surface water sample SW-9 and groundwater sample TMW-25 for laboratory analysis of site-specific VOCs, SVOCs, and Metals. Overall, stormwater and surface water sample concentrations in March 2021 were slightly higher than prior Phase 4 results. In surface water sample SW-9, 2,3,4,6-Tetrachlorophenol was detected for the

first time. In groundwater sample TMW-25, total SVOC concentrations were less than detected in 2019. However, SVOCs previously not detected (2,3,4,6-Tetrachlorophenol and PCP) were detected in March 2021. As 2,3,4,6-Tetrachlorophenol and PCP were the only SVOCs detected in the outfall and property boundary samples, it was suspected that the new detections of these SVOCs in surface water and groundwater may be associated with stormwater flow during rain events. The March 2021 interim measures sample locations and analytical results are depicted on **Figure J-11**.

June 2022 Interim Measures Monitoring Report #2

In December 2021, quarterly IM corrective measures and assessment activities included gauging of monitoring wells MW-3, MW-3A, MW-3B, MW-4, MW-7, MW-7A, MW-8, MW-8A, and MW-9 to monitor the effects of the proposed deep trenching on groundwater. Stormwater samples PB-1, PB-2, PB-4, Outfall-1, Outfall-2, Outfall-3, Outfall-4, and Outfall-5 were collected for laboratory analysis of VOCs, SVOCs, and Metals (PB-4 was not analyzed for metals). Surface water sample SW-9 and groundwater sample TMW-25 were also collected for laboratory analysis of site-specific VOCs, SVOCs, and Metals. A review of the December 2021 data indicates VOCs, SVOCs, and metals concentrations were lower than detected in March 2021. At the property boundary locations, 2,3,4,6-Tetrachlorophenol and PCP were the only SVOCs detected above laboratory reporting limits. In December 2021, 2,3,4,6-Tetrachlorophenol and PCP were detected at each of the sample locations except for Outfall-2. The only other SVOCs detected were 2,4-Dimethylphenol, 2-Methylnaphthalene, 3,4-Methylphenol, Acenaphthene, Dibenzofuran, Fluoranthene, Fluorene, Naphthalene, and Phenanthrene in Outfall-2. A review of historic elevations indicates the December 2021 elevations are in range with elevations observed in November 2018. Likewise, SVOCs historically associated with groundwater, were observed at Outfall-2 in November 2018 and December 2021. This suggests that as groundwater elevations decline and dissolved constituents become less saturated, impacts at Outfall-2 are more indicative of groundwater baseflow than stormwater runoff.

Surface water analytical results from SW-9 indicated no detections of 2,3,4,6-Tetrachlorophenol and PCP. Since these SVOCs were detected in most outfall and property boundary samples, this indicates that runoff originating from the property boundary and outfall areas had less impact to surface water concentrations in December 2021. In addition, Acenaphthene, Fluorene, Naphthalene, and Phenanthrene have also been detected in Outfall-2 and groundwater sample TMW-25. Based on these results, it appears surface water impacts observed in December 2021 originated from groundwater baseflow rather than stormwater runoff from the property boundary and outfall areas. Stormwater results at Outfall-3 indicated an increase in 2,3,4,6-Tetrachlorophenol and PCP concentrations in December 2021. The December 2021 interim measures sample locations and analytical results are depicted on **Figure J-12**.

J-3 Future Actions Planned (40 CFR 270.14(d)(2)(3))

Interim Measures sampling events will continue to be performed on a semi-annual or annual frequency as needed to continue evaluation of SWMU #10 conditions. The

sampling events will include stormwater locations Outfall-1, Outfall-2, Outfall-3, Outfall-4, and Outfall-5, PB-1, and PB-2; surface water location SW-9; and groundwater at TMW-25. (Note: These samples may be collected apart from a storm event). One of the Interim Measures sampling events will coincide with annual monitoring well sampling conducted in March as part of the Permit requirements. During the annual sampling event, sampling of historic sediment and surface water locations will be conducted, including at a minimum, SED/SW-5, SED/SW-6, SED/SW-7, SED/SW-8, SED/SW-9, and SED/SW-10), in conjunction with groundwater sampling.

Future groundwater corrective action will include the expansion of the existing groundwater extraction system following the completion of additional vertical bedrock delineation and hydraulic aquifer testing. The expanded groundwater extraction system will be intended to provide site-wide corrective action. Additional and supplemental corrective action will target impacted soils in the vadose zone or deeper areas associated with the HWMU or SWMUs. Treatment options may include limited bulk soil removal above the water table or remedial treatments utilizing in-situ chemical oxidation (ISCO), surfactant injection and extraction, ex-situ/in-situ soil oxidant blending, or In-situ stabilization and solidification (ISS). Further details are provided in the revised RCAP and in Section E.