

STATE OF MISSOURI
DEPARTMENT OF NATURAL RESOURCES



**MISSOURI HAZARDOUS WASTE MANAGEMENT FACILITY
PART I PERMIT**

PERMIT NUMBER: MOD007129406

PERMITTEE

Facility Owner and Operator: Greenfield Environmental Multistate Trust LLC
Trustee of the Multistate Environmental Response Trust
11 Flagg Street Unit No. 1
Cambridge, MA 02138

FACILITY LOCATION

2800 West High Street
Springfield, MO 65803
Greene County
North Latitude – 37°14'17"
West Longitude – 93°20'00"

FACILITY DESCRIPTION

The site is a former wood treating facility, located on about 68 acres in the northwest part of Springfield, Missouri. This facility was originally located in a rural area. The City of Springfield expanded over the years, with businesses and residential neighborhoods appearing around the facility. The facility currently is bordered by industrial, residential, and rural areas. None of the facility property is within the 100-year floodplain of any local streams. The facility location is shown in Figure 1.

In 1907, American Creosote Corporation built and began operating a wood treating facility on the property. Kerr-McGee Corporation purchased the facility in 1964, and it became part of Moss American Corporation, a wholly-owned subsidiary of Kerr-McGee Corporation. In 1974, Moss American became the Forest Products Division of Kerr-McGee Chemical Corporation, another wholly-owned subsidiary of Kerr-McGee Corporation. Kerr-McGee continued operating the wood treating facility until December 2003.

Both American Creosote and Kerr-McGee pressure-treated railroad cross-ties, switch ties, bridge timbers, and lumber, which they sold for commercial use. Both companies used a 70 percent creosote and 30 percent coal-tar solution as the wood preservative. Creosote is a mixture of several residual oils, aromatic hydrocarbons, and tars resulting from carbonizing bituminous coal. The preservative was shipped to the facility by railcar and unloaded into one of four bulk storage tanks in the tank farm area. Untreated “green” lumber was shipped to the facility by either railcar or truck.

While operating, the facility was divided into an untreated wood storage area, a process area, and a “black tie” storage area. Green lumber was sorted, cut to length and air dried for 8 to 12 months in the untreated wood storage area. Dried (seasoned) wood was loaded onto a tram cart and placed in one of two large high temperature, high pressure cylinders called retorts. The retort was sealed, filled with the preservative and then pressure was applied to force the preservative into the wood (modified “empty cell” process). The pressure was released when the desired amount of creosote had been injected into the wood. A vacuum was then applied to remove the excess preservative from the retort and recycle it back to the work tank. The tram cart was removed from the retort and held on a drip track to allow for any creosote drippage (“kick-back”) from the treated wood. The drippage was collected and recycled back to the production process. The treated wood was then either loaded directly onto a railcar or truck for shipping or stored in the “black tie” storage area.

Process wastewater was produced as part of the facility operations. The major sources of wastewater were the cooling water from the treatment process and steam condensate from cleaning the retorts. The steam condensate contained some residual preservative from the retorts. American Creosote built a wastewater treatment system on the facility property, which consisted of an oil/water separator and a 2.5-acre lagoon. The original lagoon was built in 1908, and located near the southeast corner of the property. The wastewater was processed through the oil/water separator, where the oil was skimmed from the top of the wastewater and pumped into a holding tank to be recycled back to the production process. The wastewater effluent was discharged to the lagoon to let the remaining creosote sludge settle out of the wastewater. If not heated, creosote can thicken and turn into sludge. The wastewater effluent was then recycled back to the production process.

Around 1960, American Creosote expanded the lagoon system and built a 0.3-acre lagoon just north of the original lagoon. This lagoon (Lagoon 2) was a sedimentation lagoon, operated in series with the original lagoon. Wastewater effluent from the original lagoon flowed by gravity into Lagoon 2. Wastewater effluent from Lagoon 2 was either recycled back to the production process as cooling water or discharged to a small tertiary pond. It is presumed any overflow from the tertiary pond became part of the surrounding surface water drainage.

In early 1972, Vich Spring, a former spring located northeast of the facility, began discharging a dense black substance after moderate to heavy rainfall. The U.S. Environmental Protection Agency (EPA) sampled both Vich Spring and water and sediment from the Kerr-McGee lagoons. Cresol, a component of creosote, was confirmed in samples from both locations. No corrective measures were taken because the creosote source, and how the creosote traveled from the facility to the spring, were not established and there were no applicable federal laws that regulated hazardous waste management in existence at that time.

In 1973, Kerr-McGee closed the original lagoon and replaced it with a 0.9-acre (800,000-gallon) aeration lagoon (Lagoon 1), located just east of the original lagoon and south of Lagoon 2. The lagoon closure included pumping the wastewater to the other lagoons and mixing the bottom sediment sludge with straw and sawdust. The bottom sediment sludge and most of the visibly contaminated soil were removed from the original lagoon area and stored on facility property in an above ground-diked area. The excavated area was backfilled with un-impacted soil from the property.

In 1976, Kerr-McGee redesigned and expanded Lagoon 2 to approximately 0.6 acres (500,000 gallons) and installed new liners in Lagoons 1 and 2. Kerr-McGee also built a new 1-acre (650,000-gallon) lagoon (Lagoon 3) north of Lagoon 2. Lagoon 3 was operated in series with the two other lagoons. Wastewater from the oil/water separator was pumped to Lagoon 1, where organics were removed through aeration. The treated wastewater effluent flowed by gravity into Lagoon 2 through a concrete flume. Wastewater effluent from Lagoon 2 was either recycled back to the production process as cooling water or discharged to Lagoon 3. Lagoon 3 also collected storm water runoff from the facility. The combined wastewater in Lagoon 3 was discharged to the City of Springfield sewer and publicly owned treatment works under a wastewater pre-treatment discharge permit with the City of Springfield.

In 1976, Kerr-McGee encountered continuously wet spots in the basin floor of Lagoon 3 during its construction. In order to lower the local water table, water was pumped from a trench excavated to bedrock just north of Lagoon 2. Kerr-McGee contacted EPA after oil was discovered seeping into the trench below ground level. Kerr-McGee extended the trench to 300 feet long and pumped the water out daily to a creosote reclamation tank. The oil-water

mixture was processed through the oil/water separator. The water was discharged to Lagoon 1 and the oil was recycled back into the plant process. The trench was changed to a recovery trench and a pre-cast concrete manhole was installed so the oil-water mixture could still be removed.

In 1976, Congress passed the Resource Conservation and Recovery Act (RCRA), which is the federal law governing hazardous waste management. EPA conducted a groundwater contamination abatement investigation at the facility to evaluate the oil in the trench and determine if there was a connection between Vich Spring and releases originating on the facility property. Sample results showed aromatic hydrocarbons and coal tar derivatives in Vich Spring. The investigation concluded the oil was coming from leaks in the bottom of Lagoon 2. Kerr-McGee redesigned Lagoon 2 and installed new liners in Lagoons 1 and 2. The bottom sediment sludge, which contained a large amount of oil, was mixed with straw and stored in the northwest corner of the facility property in an above ground-diked area (i.e., the future land farm area).

In 1979, Kerr-McGee submitted an operational plan to the Missouri Department of Natural Resources for an experimental land treatment unit to treat creosote-contaminated soil through biological land farming. The Department approved the plan to treat the bottom sediment sludge from the original lagoon in a one-acre land farm in the northwest corner of the facility property. The land farm was divided into three experimental plots, which were routinely disked and sampled. One plot was a background plot, where no waste was disposed. The two remaining plots evaluated various application rates of both waste and nutrients. Kerr-McGee applied the sludge yearly from 1979 to 1981.

In 1981, EPA determined the lagoons were hazardous waste management units regulated under the federal RCRA. Sediment sludge produced from treating wastewaters from creosote wood preserving processes was/is classified as a listed hazardous waste (K001). This waste had collected and was being “stored” in the bottom of Kerr-McGee’s lagoons. Kerr-McGee decided to change their production process and close the lagoons. Kerr-McGee installed a groundwater monitoring system and began a groundwater quality assessment, as required by the federal RCRA regulations.

In 1984, Kerr McGee’s Groundwater Quality Assessment Plan results indicated there was a black, oily substance in some of the monitoring wells, related to past facility operations. According to the Hazardous and Solid Waste Amendments that Congress passed in 1984, all hazardous waste treatment, storage and disposal facilities are required to investigate and clean up releases of hazardous waste and hazardous constituents to the environment at their facility resulting from present and past hazardous waste handling practices.

In October 1984, the Department issued an Order to Abate Violations, Order No. HW-84-015, requiring Kerr-McGee to develop a multi-phase groundwater assessment program. The Department approved Kerr-McGee's program in April 1985, which included installing monitoring wells and excavating two inspection trenches. In June 1985, Kerr-McGee installed a 200-foot long inspection trench between Lagoons 2 and 3, which revealed an irregular bedrock surface with creosote oil collecting in low areas. In October 1985, Kerr-McGee installed a 400-foot long inspection trench north of Lagoon 3 that wrapped inside the northeast corner of the facility property boundary.

In 1986, Kerr McGee's Groundwater Corrective Action: Groundwater Quality Assessment Report indicated there were two groundwater contamination plumes: one in the shallow groundwater under the lagoons and the second in a deeper groundwater zone under the process area. The inspection trench north of Lagoon 3 was changed to a recovery trench to catch the contaminated groundwater. All collected groundwater was pumped back to the production process through the oil/water separator, treated and discharged to the City of Springfield sewer system.

Under RCRA, the three wastewater lagoons were designated as interim status hazardous waste management storage units. In February 1985, Kerr-McGee submitted a closure plan to the Department for the three lagoons, which the Department approved in 1986. Active closure of the lagoons began in 1987, and included pumping the wastewater back to the production process through the oil/water separator, treating and discharging to the City of Springfield sewer system. The bottom sediment sludge was processed through a creosote recovery system, which resulted in about 17,000 gallons of creosote recycled back to the production process. Non-recoverable creosote sludge, contaminated soil, and piping were removed and disposed off-site at a permitted hazardous waste disposal facility. The excavated lagoons were backfilled with clean soil and covered with clay caps, topsoil, and vegetation.

In 1987, Kerr-McGee installed a new cooling tower to replace using the lagoon system for cooling water. Kerr-McGee also upgraded the oil/water separators and storm water collection system, which replaced Lagoon 3. With the upgraded oil/water separators, Kerr-McGee was able to remove enough preservative from the wastewater so they were allowed to discharge the wastewater directly to the City of Springfield sewer system.

On October 18, 1987, Kerr-McGee entered into a RCRA 3008(a) Consent Order with EPA, Docket No. 87-H-0004, in response to previous groundwater assessments and investigation results and the potential for contaminants to move to the northeast, beyond the facility property boundaries. The Order specified actions to define the nature, migration rate, and extent of contamination.

On November 17, 1988, Kerr-McGee entered into a 3008(h) Corrective Action Order on Consent with EPA, Docket No. 7-88-H-0019, because Missouri had not yet received final EPA authorization to carry out its corrective action program in lieu of the federal RCRA corrective action program. This Order specified that Kerr-McGee undertake a program to design, build, and operate corrective action technologies to clean up contaminated groundwater originating at the facility. As part of this program, Kerr-McGee was to submit a report about current conditions and activities at the facility.

In 1988, Kerr-McGee also made several changes to their production process, designed to eliminate potential impacts to the environment. Kerr-McGee installed a concrete containment system in the tank farm area and replaced the drip track with an 18-inch thick, reinforced concrete drip pad. Kick-back drippage collected on the pad was routed to the production process oil/water separators to recover the excess preservative. As part of the tank farm changes and drip pad installation, all pipes were brought above ground and a concrete floor was installed within the existing concrete dikes (walls) to contain any major spills. A new overhead tank car unloading station was also installed to eliminate the potential for catastrophic spills associated with unloading a tank car from the bottom. A Deed Notice, dated September 28, 1988, and recorded with the Greene County Recorder of Deeds on Sept. 30, 1988, was placed in the property chain-of-title in order to inform potential future buyers of the property that the former lagoon area was used to manage hazardous waste.

In September 1989, the Department accepted Kerr-McGee's closure certification for the lagoons. The land farm was designated as a RCRA interim status hazardous waste treatment unit, and due to the creosote in the land farm not completely breaking down to non-hazardous levels, Kerr-McGee submitted a closure plan for the land farm to the Department in July 1989, which the Department approved in September 1989. Closure included grading the plots within the 12-inch dikes surrounding the land farm and covering with vegetation.

In 1989, Kerr-McGee submitted a Description of Current Conditions Report to EPA as required by the above-referenced Orders. The report presented all environmental sampling and investigations, interim measures, and unit closures conducted up to that point. As also required by the Orders, Kerr-McGee performed a RCRA Facility Investigation (RFI) to define the extent of any contamination both on and off the facility property. On behalf of Kerr-McGee, James L. Grant and Associates Incorporated submitted a RFI Report to EPA in July 1992. The sample results showed soil and groundwater on the facility property and groundwater in some off-property areas were contaminated with creosote constituents. The report identified the contaminant sources as the process area, storage tank area, drip track, the original lagoon, and the area where sludge from the original lagoon was temporarily stored after closure. At that time, the shallow groundwater contamination plume extended northeast and south, off the facility

property. The deeper groundwater contamination plume did not extend off the facility property. Contaminated sediments in the Clifton drainage, between Clifton Street and Kearney Avenue, were thought to be partly related to past facility operations. Based on these results, the investigation concluded there was enough data to begin evaluating possible corrective action, or cleanup, activities.

At EPA's request, Kerr-McGee performed a Corrective Measures Study (CMS) to identify and evaluate possible remedial alternatives for the soil and groundwater contamination. During this time, Kerr-McGee also performed interim measures to reduce or prevent unacceptable risks to human health and the environment. An interim measure is an action taken to temporarily control the contamination source or path the contamination could take from the source to humans, animals, or the environment, via air, soil, water, and food. Interim measures are typically implemented while a facility evaluates possible corrective measures to be taken as a final remedy. As interim measures, Kerr-McGee changed the surface water drainage pattern near the closed lagoons, removed contaminated soil from the production process areas, and installed groundwater extraction wells in the production process area and along the northern edge of the original lagoon to capture contaminated groundwater for on-site treatment.

A Deed Notice, dated February 23, 1990, and recorded with the Greene County Recorder of Deeds on March 9, 1990, was placed in the property chain-of-title in order to inform potential future buyers of the property that the former land farm area was used to manage hazardous waste. The Department accepted Kerr-McGee's closure certification for the land farm in March 1991. Because hazardous waste remained in place after closing the former lagoon and land farm areas, these areas are required to go through a period of post-closure care. As part of the post-closure care, the facility is required to operate and maintain a groundwater monitoring and remediation system, as well as inspect and maintain the covers over the closed lagoons and land farm.

In July 1993, James L. Grant and Associates Incorporated, on behalf of Kerr-McGee, submitted a CMS Report to EPA. The report included Kerr-McGee's proposed final remedy along with other remedial alternatives. EPA, in coordination with the Department, selected the best remedy given known facility-specific environmental conditions at that time. EPA prepared a Statement of Basis that summarized the remedial alternatives and EPA's basis of support for the proposed final remedy. In August 2002, after the opportunity for public comment, EPA, in coordination with the Department, approved the proposed final remedy and issued a final remedy decision. In addition to the interim measures already put in place, the approved final remedy included continued groundwater and surface water monitoring, contaminated groundwater collection and treatment, and property activity and use limitations. In September 2002, the Department and EPA included the approved final remedy, along with the post-closure requirements for the closed

lagoons and land farm, in Kerr-McGee's hazardous waste permits. These permits replaced the earlier EPA Orders. Kerr-McGee was required to sample the groundwater twice a year as part of their groundwater-monitoring program. This monitoring program was used to make sure the extent of groundwater contamination and the migration rate remained defined, in addition to determining whether the approved final remedy was effective.

Active wood treating operations at the facility stopped in December 2003. Contaminated groundwater and free product (creosote) recovered from the wells and trenches continued to be processed through the oil/water separator, treated, and discharged to the City of Springfield sewer system. Recovered creosote was recycled back to the production process until production operations at the facility stopped in 2003. Thereafter, recovered preservative was stored on-site in a holding tank and then shipped off property for reuse in wood treating operations at other locations. Kerr-McGee decommissioned the wood preparation and treatment equipment in 2004. All buildings related to the wood treating operations were demolished, with the exception of the maintenance building, large groundwater storage tank, and administrative office.

In late 2004, after a heavy rainfall, the City of Springfield notified the Department that possible creosote-like material was coming from Woodlawn Spring, a newly formed spring to the west of the former Vich Spring and next to the Golden Hills residential subdivision, located north of the facility. During a site visit in January 2005, the Department, City of Springfield, and Kerr-McGee staff observed a surface water sheen with organic odor coming from a seep on the bank of a drainage ditch in the Golden Hills subdivision. At the Department's request, Kerr-McGee investigated the subdivision's storm water detention basin, a nearby pasture area, and sampled yards in the residential area. On behalf of Kerr-McGee, ENSR Corporation submitted the Woodlawn Spring Study Area Investigation Report to the Department and EPA in March 2006, with revisions in 2007. All sample results from residential yards near Woodlawn Spring indicated there were no health concerns. Chemical fingerprinting of the Woodlawn Spring discharge indicated a mix of contaminants (weathered creosote, oil tar, and residual oil), which appeared to be coming from multiple sources. Areas where weathered creosote was found in sediment were either underground or enclosed by a fence. Although not part of the facility, the area enclosed by fencing was purchased by Tronox to restrict access to the area. Tronox is the successor to Kerr-McGee as described below. Periodic monitoring of Woodlawn Spring continued per recommendations in the Woodlawn Spring Study Area Investigation Report and at the request of the Department. Oil tar in the pasture area and residual oil contamination in Vich Spring sediment were determined to be from a source(s) other than the facility.

In the early 2000s, Kerr-McGee began an internal corporate restructuring through which its oil and gas business was separated from its chemical business and legacy (environmental and tort) liabilities. Unable to sell the liability-laden chemical business following the restructuring,

Kerr-McGee decided to separate its chemical business from its oil and gas business through a multi-step transaction, involving both an initial public offering of Tronox Incorporated (Tronox) stock in 2005 and Kerr-McGee's spin-off of Tronox in 2006. As part of the spin-off, Kerr-McGee transferred the Springfield facility to Tronox.

In January 2009, burdened by legacy (especially environmental) liabilities, Tronox filed for Chapter 11 bankruptcy protection. Under a 2011 global bankruptcy settlement agreement, Tronox resolved its environmental liabilities with the United States, multiple state and local governments, and the Navajo Nation relating to numerous contaminated sites around the country, including the Springfield facility. The settlement provided \$270 million of upfront cash funding and 88 percent of Tronox's interest in a fraudulent conveyance case (described below) to the governments and bankruptcy-created trusts for cleanup costs incurred or to be incurred at these sites. The Multistate Environmental Response Trust (Multistate Trust) was one such trust created by the settlement, to address the vast majority of Tronox's owned, but non-operating properties. As part of the Tronox bankruptcy settlement, Tronox provided facility-specific funding and transferred all its rights, title, and interest with respect to the Springfield facility to the Multistate Trust.

On February 14, 2011, Greenfield Environmental Multistate Trust, LLC, not individually but solely in its representative capacity, was appointed as Trustee of the Multistate Trust by the bankruptcy court. As Trustee, they are to, among other things and using available funds, own, carry out administrative and property management functions, manage, and/or fund implementation of future environmental activities approved by its governmental beneficiaries, and (if possible) facilitate reuse of hundreds of former Tronox/Kerr-McGee sites in 31 states, including the Springfield facility. The Multistate Trust reports directly to its two beneficiaries – the United States and the State of Missouri, represented by EPA and the Department, respectively – regarding the Springfield facility. For the first several years after its creation, the Multistate Trust continued operating the groundwater recovery system and performing the required post-closure care and corrective action activities at the Springfield facility with limited funds initially provided by the Tronox bankruptcy settlement.

During this time, a litigation trust, created through the Tronox bankruptcy settlement, pursued a fraudulent conveyance case initiated by Tronox during its bankruptcy proceedings. The fraudulent conveyance case was filed against Kerr-McGee and related companies that were subsidiaries of Anadarko Petroleum Corporation (Anadarko) to recover, among other things, response costs for environmental cleanups at numerous sites around the country. The plaintiffs alleged that the defendants fraudulently transferred valuable assets out of the entity that became Tronox, imposed Kerr-McGee's legacy liabilities on Tronox, and left Tronox with insufficient funds to pay the liabilities that Tronox owed to governmental environmental and tort claimants.

In December 2013, the bankruptcy court ruled in the plaintiffs' favor in the fraudulent conveyance lawsuit. In 2014, the parties reached an agreement to resolve the lawsuit, which was approved by a federal district court in late 2014. After the deadline for any appeals from the district court's decision passed in early 2015, without any appeal being filed, the fraudulent conveyance settlement agreement went into effect. Pursuant to that settlement, Anadarko paid \$5.15 billion (plus interest) to the litigation trust, so the settlement proceeds could be distributed to the litigation trust's environmental and tort beneficiaries. For example, additional funds became available for the Multistate Trust to maintain and enhance the previously implemented final remedy, complete additional corrective action investigation work, and position the Springfield facility for redevelopment. Under the Tronox bankruptcy agreements, segregated funds maintained by the Multistate Trust for the Springfield facility can only be expended pursuant to Department-approved budgets, provided that the Multistate Trust can pay ongoing and recurring expenses approved in a prior year's budget pending the Department's approval of a proposed budget.

The Multistate Trust currently is performing a Remedial Action Optimization (RAO) investigation to update its and the Department's understanding of environmental conditions, including the extent of residual contamination, and determine what, if any, additional measures are needed beyond the previously implemented interim measures as part of a proposed final remedy to protect human health and the environment. The Multistate Trust updated the groundwater recovery system by installing a new line from the northeast corner of the facility to the on-facility groundwater treatment plant and completed Phase 1 of the RAO investigation in 2016. The Multistate Trust installed additional groundwater monitoring wells and sampled those wells in 2016, 2017, 2018, and 2019. The current groundwater-monitoring network consists of 75 active monitoring wells and piezometers installed in three separate flow zones (Upper, Secondary, and Tertiary). Forty-eight wells are on-facility and 27 are off-facility; also, additional well installations are planned to meet the requirements of this Permit. Additionally, monitoring of Woodlawn Spring continues to be performed by the Multistate Trust at the request of the Department, as appropriate. Recent work conducted by the Permittee shows that off-facility shallow groundwater continues to be contaminated (see Figure 5-B) with facility-related chemicals at levels that could potentially result in vapor intrusion into nearby structures. Vapor intrusion refers to the vapors liberated from contaminated soil or groundwater, moving through the air spaces between the soil particles in the subsurface and entering homes or other buildings through foundation cracks, sumps, or drainage systems. This process is similar to the way naturally occurring radon gas can enter a home.

In December 2016, the Multistate Trust began a vapor intrusion investigation. Soil vapor, groundwater, and sewer gas samples were collected both on and off the facility property. In 2017 and 2018, the Permittee performed multiple indoor air, outdoor air, and residential

sub-slab/crawl space sampling and analysis events in the vicinity of the facility with emphasis on selected residences northeast of the facility. Naphthalene, the main chemical of concern in air that could be related to contamination at the facility, was found above the action level in indoor air in most homes that were sampled. However, the sampling results from below the foundation of homes and in crawl spaces indicated that vapor intrusion into these homes was not occurring from the subsurface. Naphthalene was detected above risk-based screening levels in the ambient outdoor air and appeared to be a likely source of the naphthalene levels in the indoor air. Elevated benzene, toluene, ethylbenzene, xylene, and naphthalene levels were also found in certain sewer gas samples in the same neighborhood. The concentrations in sewer gas sampled at the facility were much lower than what was found in the sewer lines downstream of the facility, where other sources could discharge into the City of Springfield sewer system. Additional vapor intrusion, soil, seep, and groundwater related investigations will continue under the requirements of this Permit to ensure appropriate protection of human health and the environment related to releases at the Springfield facility.

PERMITTED ACTIVITY

This Permit requires post-closure care for the four closed hazardous waste management units: Impoundment (lagoon) 1, Impoundment (lagoon) 2, Impoundment (lagoon) 3, and the experimental land farm. This Permit addresses continuing implementation of corrective action requirements, including facility-wide groundwater monitoring/remediation and off-facility monitoring to address releases to the environment at or from the facility. This Permit contains requirements that address further investigation of on- and off-facility soil and groundwater contamination and vapor intrusion issues. This Permit also contains contingent corrective action activities to address any newly identified releases to the environment from previously or newly identified Solid Waste Management Units and Areas of Concern, as necessary and appropriate.

EFFECTIVE DATES OF PERMIT: January 30, 2020 to January 29, 2030

January 30, 2020
Date


Chris Nagel, Director
WASTE MANAGEMENT PROGRAM

TABLE OF CONTENTS

	<u>Page</u>
INTRODUCTION	14
DEFINITIONS.....	17
SCHEDULE OF COMPLIANCE	19
SUBMITTAL OF REQUIRED INFORMATION	20
STANDARD PERMIT CONDITIONS.....	20
GENERAL PERMIT CONDITIONS.....	21
SPECIAL PERMIT CONDITIONS	23
I. Post-Closure.....	23
II. Groundwater Monitoring and Corrective Action Program.....	26
III. Surface Water Monitoring Program.....	42
IV. Identification of SWMUs and AOCs.....	43
V. Notification Requirements for, and Assessment of, Newly Identified SWMU(s) and AOCs	44
VI. Notification Requirements for, and Assessment of, Newly Identified Releases from Previously Identified SWMUs and AOCs	46
VII. Interim/Stabilization Measures	48
VIII. RCRA Facility Investigation (RFI) Work Plan	49
IX. RCRA Facility Investigation (RFI) Report.....	51
X. Corrective Measures Study (CMS) Work Plan.....	53
XI. Corrective Measures Study (CMS) Report	55
XII. Updated Final Remedy Approval	57
XIII. Construction Completion Report	59
XIV. Long-Term Operation, Maintenance, and Monitoring Plan	59
XV. Certification of Completion of Corrective Measures.....	61
XVI. Environmental Covenant	62
XVII. Permit and Property Transfers	63
XVIII. Cost Estimates and Financial Assurance	64
XIX. Supplemental Information	66
XX. Planned Activities	66

XXI. Contingent Activities 67

FACILITY SUBMISSION SUMMARY 67

FIGURES

Figure 1 - Facility Location and Topography Map..... 73

Figure 2 - Historical Operations Features including Solid Waste Management
Units (SWMUs) and Areas of Concern (AOCs)..... 74

Figure 3 - Well Location Map - South..... 75

Figure 4 - Well Location Map - North..... 76

Figure 5A - 2018 Water Elevation Contour Map – Upper Flow Zone 77

Figure 5B - Extent of Contamination – Upper Flow Zone 78

Figure 6A - 2018 Water Elevation Contour Map – Secondary Flow Zone 79

Figure 6B - Extent of Contamination – Secondary Flow Zone 80

Figure 7 - 2018 Water Elevation Contour Map – Tertiary Flow Zone 81

TABLES

Table 1 - Groundwater Protection Standards 28

Table 2 - Groundwater Corrective Action Monitoring, 38

Table 3 - Summary of the Planned Submittals Required by this Permit 67

Table 4 - Summary of the Contingent Submittals Specified in this Permit..... 69

INTRODUCTION

After public notice, according to Code of State Regulations 10 CSR 25-8.124, and review of the Multistate Trust's Hazardous Waste Permit Application (hereafter referred to as the Permit Application), the Missouri Department of Natural Resources (hereafter referred to as the Department) determined the Permit Application conforms to the provisions of the Solid Waste Disposal Act, as amended by the RCRA, the Missouri Hazardous Waste Management Law Sections 260.350 through 260.433, Revised Statutes of Missouri (RSMo), et seq., and all standards, rules, and regulations adopted under these acts. The federal regulations, promulgated by the U.S. Environmental Protection Agency (hereafter referred to as EPA), are codified and to be codified in Title 40 of the Code of Federal Regulations. State rules and regulations promulgated under the Missouri Hazardous Waste Management Law are published in the Code of State Regulations, Title 10, Division 25 (10 CSR 25).

Pursuant to Section 260.375.13, RSMo, and the Solid Waste Disposal Act, the Department hereby approves the Permit Application and issues this Missouri Hazardous Waste Management Facility Part I Permit (hereafter referred to as the Permit), Permit Number MOD007129406, to the Multistate Trust, as the facility owner and operator (hereafter referred to as the Permittee) for post-closure care and corrective action activities, as described in the Permit Application and this Permit. This Permit also includes "contingent" corrective action requirements that may be triggered, if necessary, for Solid Waste Management Units and Areas of Concern, pursuant to the state-equivalent requirements of the federal Hazardous and Solid Waste Amendments of 1984 (HSWA) to RCRA, as administered and enforced by the Department. The Department is issuing this Permit under state authority.

On July 6, 1999, Missouri received final authorization for revisions to its hazardous waste management program, including the corrective action portion of the HSWA Codification Rule (July 15, 1985, 50 FR 28702), which had been previously adopted by the state. Thus, the corrective action requirements implemented by Missouri, in lieu of EPA, are incorporated into this Permit and are under state authority.

All citations to federal regulations throughout this Permit are for the sake of convenient reference. The federal regulations are incorporated by reference in 10 CSR 25. Applicable regulations are found in 10 CSR 25-3, 25-4, 25-5, 25-6, 25-7, and 25-8; and 40 C.F.R. Parts 260 through 264, 266, 268, and 270, as specified in this Permit. In instances where state regulations are more stringent, the appropriate state reference is given and shall apply.

Any appeals of this Permit, or specific permit conditions based on state authority, shall be filed according to 10 CSR 25-8.124(2). Any parties adversely affected or aggrieved by this decision may be entitled to pursue an appeal before the Administrative Hearing Commission (AHC). To

appeal, the party shall file a petition with the AHC within 30 calendar days after the date this Permit was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, then it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC. Contact information for the AHC can be found online at ahc.mo.gov, or by calling 573-751-2422. The Department also requests that a copy of any appeal request be provided to the Missouri Department of Natural Resources, Waste Management Program Director, P.O. Box 176, Jefferson City, MO 65102-0176.

The provisions of this Permit are severable. If any provision of this Permit, or the application of any provision of this Permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby.

This Permit is for hazardous waste post-closure and corrective action activities and is issued only to the Permittee named above. This Permit is issued for a period of ten years and expires at midnight on January 29, 2030. This Permit is subject to review and modification by the Department, according to Section 260.395.12, RSMo., and 40 C.F.R. § 270.41. According to 40 C.F.R. § 270.51, if the Permittee submits a timely and complete application for a new permit and the Department, through no fault of the Permittee, is unable to issue a new permit on or before the expiration of this Permit, the conditions of this Permit will continue in force until the effective date or denial of a new permit.

All Permit Application information shall be available to the public, unless the Permittee requests nondisclosure in writing, as described in Section 260.430, RSMo and 10 CSR 25-7.270(2)(B)2. This Permit and accompanying materials are available for public review at the Department's office in Jefferson City, Missouri.

The following shall collectively be referred to as the "Approved Permit Application":

- Missouri Hazardous Waste Management Facility Part I Permit Application for the Former Tronox/Kerr-McGee Facility, dated July 2, 2019.

The "Consolidated Permit Application" is defined as the Approved Permit Application, any changes resulting from the public comment period, and all additional documents required to be submitted under the Schedule of Compliance contained in this Permit. The Permittee shall maintain a copy of all documents outlined above with the Consolidated Permit Application at the facility or with the local facility representative.

Section 260.395.12, RSMo, and 40 C.F.R. § 270.32(b)(2), require each permit issued under that section to contain terms and conditions as the Department determines necessary to protect human health and the environment. Ongoing post-closure care and corrective action activities at this hazardous waste facility and any future corrective action activities that are required shall be according to the provisions of this Permit; the Missouri Hazardous Waste Management Law and the rules and regulations promulgated thereunder as effective on the date of this Permit; all final engineering plans, petitions, specifications, and procedures submitted to the Department during the Permit Application review process, which are included in the Approved Permit Application; and any other conditions, changes, or additions to the engineering plans, specifications, and procedures as specified in this Permit. The Consolidated Permit Application, which includes the Approved Permit Application, is therefore incorporated by this reference into the conditions of this Permit. All conditions specified in this Permit supersede any conflicting information in the Consolidated Permit Application. Where conflicts arise between documents, the latest revision shall be effective.

According to 40 C.F.R. Part 270 Subpart D, any inaccuracies found in information submitted by the Permittee may be grounds for terminating, revoking and reissuing, or modifying this Permit, and for potential enforcement action. The Permittee shall inform the Department of any deviation from, or changes in, the information in the application, which would affect the Permittee's ability to comply with the applicable regulations or permit conditions. When the Department receives any information, such as inspection results, information from the Permittee, or requests from the Permittee, it may decide whether cause exists to modify, revoke and reissue, or terminate this Permit. All such changes to this Permit shall be handled according to the requirements of 10 CSR 25-8.124 and 40 C.F.R. Part 270 Subpart D.

40 C.F.R. § 264.101(a) requires all owners or operators of facilities seeking a permit for treating, storing, or disposing hazardous waste, to institute corrective action as necessary to protect human health and the environment from all releases of hazardous wastes or hazardous constituents from any Solid Waste Management Unit, regardless of the time at which waste was placed in such unit. 40 C.F.R. § 264.101(b), requires that permits issued under the Missouri Hazardous Waste Management Law contain a schedule of compliance for corrective action (where corrective action cannot be completed before permit issuance) and assurances of financial responsibility for completing such corrective action. 40 C.F.R. § 264.101(c), requires corrective action to be taken by the facility owner or operator beyond the facility property boundary, where necessary to protect human health and the environment, unless the owner or operator demonstrates that, despite the owner or operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such actions. 40 C.F.R. § 264.101(c) further stipulates that the owner or operator is not relieved of any responsibility to cleanup a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such

releases shall be determined on a case-by-case basis. In addition, assurances of financial responsibility for completing such corrective action shall be provided.

Section 260.395.12, RSMo, and 40 C.F.R. § 270.32(b)(2), require that each permit issued under that section contain terms and conditions as the Department determines necessary to protect human health and the environment. The Permittee is required to comply with all applicable environmental laws and regulations enforced by the Department. These environmental laws and regulations are administered by the Air Pollution Control Program, Environmental Remediation Program, Land Reclamation Program, Missouri Geological Survey, Waste Management Program, and Water Protection Program. Failure to comply with these environmental laws and regulations may, in certain circumstances, result in suspending or revoking this Permit and may subject the permit holder to civil and criminal liability.

DEFINITIONS

For purposes of this Permit, terms used herein shall have the same meaning as those in RCRA and 40 C.F.R. Parts 260, 261, 264, 266, 268, and 270, and 10 CSR 25, unless this Permit specifically provides otherwise. Where terms are not defined in RCRA, the regulations, this Permit, or EPA guidance or publications, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

“Alternate Concentration Limit (ACL)” means a Department-approved maximum concentration limit or risk-based threshold for a hazardous constituent, facility-related contaminant, or combination thereof, in the groundwater that will not pose a unacceptable current and/or potential future risk to human health or the environment, as long as that concentration limit or risk-based threshold is not exceeded at the point of compliance.

“Approved Permit Application” means the original Permit Application and all subsequent revisions or addenda to the Permit Application, and any completeness and technical information submitted as referenced in the introduction of this Permit.

“Area of Concern (AOC)” means any area where an actual or potential release of hazardous wastes or hazardous constituents that is not from a Solid Waste Management Unit, has occurred or is occurring and is determined by the Department to pose an unacceptable current and/or potential future risk to human health or the environment. Investigation and/or remediation of AOCs may be required pursuant to Section 260.395, RSMo and 40 C.F.R. § 270.32(b)(2).

“Consolidated Permit Application” means the Approved Permit Application, any changes resulting from the public comment period, and all additional documents required to be submitted under the Schedule of Compliance contained in this Permit.

“Corrective Action” means the investigation and remediation of hazardous wastes and hazardous constituents from any past and present release(s), including contamination that may have migrated beyond the boundaries of the permitted property.

“Director” means the Director of the Missouri Department of Natural Resources or authorized delegate.

“Facility” means:

- (1) All contiguous land and structures, other appurtenances, and improvements on the land used for treating, storing, or disposing hazardous waste; and
- (2) All contiguous property under the control of the owner or operator, for the purpose of implementing corrective action under 40 C.F.R. § 264.101, and as specified in this Permit.

“Hazardous constituent” means any chemical compound listed in 40 C.F.R. Part 261, Appendix VIII.

“Hazardous waste” means any waste, or combination of wastes, as defined by or listed in 10 CSR 25-4, incorporating 40 C.F.R. Part 261, may cause or significantly contribute to an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness or which may pose a threat to the health of humans or other living organisms because of its quantity, concentration, physical, chemical, or infectious characteristics.

“Interim/Stabilization Measures (ISMs)” means near-term action(s) to control or abate actual and potential threats to human health or the environment related to releases at the facility, or to prevent or minimize the further spread of contamination while long-term remedies are pursued.

“Point of Compliance” is where the Permittee monitors groundwater quality to demonstrate progress towards and achievement of the GPS maximum concentration limits (or approved ACLs) specified in Table 1.

“Release” means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing hazardous wastes or hazardous constituents

into the environment. This includes the abandoning or discarding barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents.

“Solid Waste Management Unit (SWMU)” means any discernible unit at which solid wastes have been placed at any time, irrespective of whether the unit was intended for managing solid or hazardous waste. Such units include any area at a facility at which solid wastes have been routinely and systematically released.

SCHEDULE OF COMPLIANCE

- I. Within 60 calendar days after the effective date of this Permit, the Permittee shall:
 - A. Submit to the Department two copies and one searchable electronic copy of the Consolidated Permit Application, incorporating any changes resulting from comments on the draft Permit, as defined in the Introduction of this Permit.
 - B. Submit to the Department a certification signed by the Permittee that the Permittee has read this Permit in its entirety and understands all Permit conditions contained herein.
 - C. Submit to the Department, to the attention of the Waste Management Program, a check or money order payable to “State of Missouri” for any outstanding engineering review costs.
 - D. Submit to the Department, to the attention of the Waste Management Program, a check or money order payable to “State of Missouri” for \$1,000 for each year this Permit is to be in effect beyond the first year. This Permit is effective for 10 years. Since the Permittee submitted a \$1,000 deposit with the Permit Application and paid a \$1,000 permit continuation fee for the current year, the remaining balance to be submitted by the Permittee is calculated as:

$$\text{Remaining balance} = \$9,000.00 - ((\$1,000.00 \div 365 \text{ days}) \times N_d)$$

where N_d equals the number of calendar days from the expiration date of the continued permit (which coincides with the anniversary date of the original permit issuance) to the date of permit reissuance. An invoice based on the foregoing formula is included with this Permit.

- II. Within 90 calendar days after the effective date of this Permit, the Permittee shall submit to the Department for review and approval, a revised Sampling and Analysis Plan, to incorporate all groundwater-monitoring conditions outlined in this Permit and any new conditions at the facility, as required in Special Permit Condition II.D.7.
- III. The Permittee shall comply with the schedule for planned activities specified in this Permit, as summarized in Table 3.
- IV. The Permittee shall comply, as necessary, with the schedule for contingent activities specified in this Permit, as summarized in Table 4.

SUBMITTAL OF REQUIRED INFORMATION

- I. Unless otherwise requested by the Department, the Permittee shall submit two paper copies and one searchable electronic copy of all reports, documents, and plans/specifications required under this Permit to:

Chief, Engineering Section
Missouri Department of Natural Resources
Waste Management Program
P.O. Box 176
Jefferson City, MO 65102-0176

- II. If the Permittee requires additional time to submit a scheduled document or perform other activities required by this Permit, the Permittee shall submit a written extension request to the Department in accordance with General Permit Condition IV.

STANDARD PERMIT CONDITIONS

The Permittee shall comply with the requirements applicable to this facility as set forth in the Missouri Hazardous Waste Management Law and all corresponding standards, rules, and regulations adopted under this Law, Section 260.350 through 260.433, RSMo, et seq.; 10 CSR 25-8; 40 C.F.R. Part 264 Subpart H, and 40 C.F.R. §§ 264.101; 270.10, 270.30, 270.40, 270.42, and 270.51.

- I. Application for Permit Reissuance [40 C.F.R. § 270.32(b)(2)]

According to 40 C.F.R. § 270.10(h)(1), the Permittee may submit a permit renewal application to the Department at least 180 calendar days before the expiration date of this Permit, unless the Director allows a later date. However, in order not to

jeopardize timely reissuance, the Permittee shall submit a permit renewal application to the Department at least 24 months before the expiration date of this Permit, unless the Department allows a later date pursuant to General Permit Condition IV.

GENERAL PERMIT CONDITIONS

The Permittee shall comply with the applicable requirements described in 40 C.F.R. Part 264 Subparts B, C, D, E, F, G, H, AA, BB, and CC; 40 C.F.R. Part 268; 40 C.F.R. Part 270, and the following.

I. Notification of an Emergency Situation [Section 260.505.4, RSMo]

The Permittee shall, at the earliest practical moment upon discovery of an emergency involving the hazardous waste or hazardous constituents under the Permittee's control, implement the facility contingency plan, including notifying the Department's emergency response hotline at 573-634-2436 and the National Response Center at 800-424-8802.

Within 15 calendar days of the incident occurrence, the Permittee shall submit a written report to the Department providing details. The content of the written report shall conform to 40 C.F.R. § 264.56(i), and be provided to the addressee listed in "Submittal of Required Information" provision of this Permit.

II. Reporting Requirements [40 C.F.R. § 270.30(l)(9)]

If applicable, a biennial report shall be submitted to the Department by March 1 during even numbered calendar years, covering facility activities as required by 40 C.F.R. § 264.75.

III. Review and Approval Procedures

A. Following submission of any plan or report required by this Permit (excluding the Annual Groundwater Corrective Action Reports, unless proposed actions to address corrective action program inadequacies are contained therein; and Corrective Measures Implementation Report) and any Certification of Completion of Construction of Final Remedy, the Department shall review and either approve or provide written comments on the plan or report. If the Department does not approve the plan or report, the Department shall notify

the Permittee, in writing, of the plan's or report's deficiencies and specify a due date for submitting a revised plan, report, or associated activity schedule.

- B. If the Department does not approve the revised plan, report, or associated activity schedule, the Department may modify the plan, report, or schedule and notify the Permittee, in writing, of the modifications. The plan, report, or schedule, as modified by the Department, shall be the approved plan, report, or schedule.
- C. If the Permittee disagrees with any Department-initiated plan, report, or schedule modifications, and a mutually acceptable resolution of such modifications cannot be informally reached, the Permittee may file an appeal of the Department-initiated modifications according to Sections 260.395.11 and 621.250, RSMo.
- D. Annual post-closure and corrective action cost estimates, budgets, and budget amendments shall be reviewed and approved by the Department, according to the procedures described in Special Permit Condition XVIII.

IV. Document and Activity Extension Requests

- A. If the Permittee requires additional time to submit a scheduled document or perform other activities required by this Permit, the Permittee shall submit a written extension request to the Department. Hard copy letter or e-mail are acceptable. The Department shall receive the extension request at least 15 calendar days before the scheduled document due date or activity completion date. The Permittee's extension request shall specify the amount of additional time needed to submit the scheduled document or complete the scheduled activity and shall be accompanied by the Permittee's justification for the extension.
- B. The Department shall review and approve the extension request according to the procedures described in General Permit Condition III.
- C. If the Department does not approve the extension request, the Department may modify the request and notify the Permittee of the modification. The extension request, as modified by the Department, shall be the approved schedule.

SPECIAL PERMIT CONDITIONS

I. Post-Closure [40 C.F.R. Part 264 Subpart G]

The Permittee shall comply with all applicable requirements of 40 C.F.R. Part 264 Subpart G, and all provisions of this Permit for the three closed surface impoundments (lagoons), and the land farm.

A. Post-Closure Care and Use of Property [40 C.F.R. § 264.117]

1. According to 40 C.F.R. § 264.117(a)(1), post-closure care begins after the acceptance of the closure certification of the hazardous waste management units and continues for 30 years after that date, unless modified according to 40 C.F.R. § 264.117(a)(2) or otherwise specified by the Department. The Department accepted the certification of closure for the three surface impoundments on September 7, 1989. The original post-closure care period for the three surface impoundments was scheduled to end on September 6, 2019, but was extended as explained below.

The land farm closure report was submitted in March 1990. This report was reviewed and deficiencies noted in a March 6, 1991, comment letter from the Department to KMCLLC-FPD. KMCLLC-FPD responded, and the Department accepted the certification of closure for the land farm on March 26, 1991. The post-closure care period for the land farm is scheduled to end on March 25, 2021.

2. At a minimum, post-closure care for the closed impoundments and land farm shall be extended until such time as the groundwater protection standard maximum concentration limits contained in Table 1, or approved alternate concentration limits, as applicable, are met for a period of three consecutive years under the groundwater monitoring and corrective action conditions described in Special Permit Condition II., or as determined to be necessary by the Department. Post-closure care during this period shall consist of maintenance, monitoring, financial assurance, and reporting according to the approved post-closure care plan and 40 C.F.R. Part 264 Subparts F, G, H, and N.

3. Post-closure use of the property shall be restricted by the Permittee to prevent disturbing the integrity of the final cover on the closed surface impoundments and land farm, prevent damage to the monitoring systems, and provide for continued implementation of institutional and engineering controls. The Department may approve a use of the property that disturbs the integrity of the surface impoundments or land farm final covers if necessary for the proposed property use and will not increase the potential hazards to human health or the environment, or if it is necessary to reduce a threat to human health or the environment.
 4. The Permittee may submit a request to the Department to shorten the post-closure care period. Justification for shortening the post-closure care period shall accompany any such request. The Department may approve the request if it determines that a shortened post-closure care period is sufficient to protect human health and the environment. Approval to shorten the post-closure care period shall be according to the applicable permit modification procedures in 40 C.F.R. Part 270, 10 CSR 25-7, and 10 CSR 25-8.124.
- B. Post-Closure Plan and Amendments [40 C.F.R. § 264.118]
1. Post-closure care shall be conducted according to the post-closure care plan included in the Approved Permit Application and all conditions of this Permit.
 2. The post-closure care plan may be amended at any time during the post-closure care period. Amendments are subject to the applicable permit modification requirements of 40 C.F.R. Part 270 Subpart D and 10 CSR 25-8.124. Written requests for amendments shall be submitted at least 60 calendar days before the proposed change in post-closure requirements, or not later than 60 calendar days after the occurrence of an unexpected event, that has affected the post-closure care requirements.

The Department may request modification of the post-closure care plan if changes in operations on the property affect the approved post-closure care plan. The Permittee shall submit a modified post-closure care plan no later than 60 calendar days after receiving

the Department's request. Any modifications requested by the Department are subject to the applicable permit modification requirements of 40 C.F.R. Part 270 Subpart D and 10 CSR 25-8.124.

3. During the post-closure care period, the Permittee shall make the approved post-closure care plan available for inspection by the Department as required by 40 C.F.R. § 264.118(c).

C. Future Removal of Hazardous Wastes [40 C.F.R. § 264.119(c)]

Except as required to facilitate Department-approved corrective actions, including continued operation of the contaminated groundwater and product recovery and treatment system, if the Permittee wishes to remove hazardous wastes, hazardous waste residues, contaminated soils, or contaminated sludge from within the boundaries of the closed surface impoundments or land farm, the Permittee shall request a modification of this Permit, according to the applicable requirements in 40 C.F.R. Part 270 Subpart D and 10 CSR 25-8.124. The modification request shall include a demonstration that the proposed action will not increase potential hazards to human health or the environment, or the action is necessary to reduce threats to human health or the environment, according to 40 C.F.R. § 264.117(c). By removing contaminants, the Permittee may become a hazardous waste generator and shall manage any removed material according to all applicable laws, regulations, and ordinances.

D. Certification of Completion of Post-Closure Care [40 C.F.R. § 264.120]

No later than 60 calendar days after completion of the post-closure care period(s) (including any necessary extensions), the Permittee shall submit to the Department, by registered mail, a certification that the post-closure care period(s) was completed in accordance with the approved Post-Closure Care Plan. Based on the Department's original closure certification acceptance dates, the certification would have been due by November 6, 2019, for the three surface impoundments, and May 25, 2021, for the land farm, except that post-closure care has been extended for the surface impoundments and land farm until such time as the groundwater protection standard MCLs contained in Table 1, or approved ACLs, as applicable, are met for a period of three consecutive years under the groundwater monitoring and corrective action conditions described in Special Permit Condition II., or as determined to be

necessary by the Department. The post-closure completion certification shall be signed by the Permittee and a professional engineer registered in the state of Missouri and shall include documentation supporting the certification.

II. Groundwater Monitoring and Corrective Action Program [40 C.F.R. §§ 264.90 - 264.101]

A. Groundwater Protection Standards (GPS), Hazardous Constituents, and Concentration Limits [40 C.F.R. §§ 264.92, 264.93, and 264.94].

The GPS establishes the maximum concentration limits for hazardous and contaminant indicator constituents in the groundwater at the point of compliance during the compliance period. The groundwater monitoring constituents, maximum concentration limits, and required analytical detection limits specified in Table 1 constitute the GPS for all releases to groundwater attributable to the facility. The groundwater monitoring constituents listed in Table 1 have been detected in the groundwater beneath the facility property and are reasonably expected to be in or derived from chemicals previously managed at the facility while in operation.

1. The maximum concentration limits for the GPS groundwater monitoring constituents listed on Table 1 are based on protecting human health and the environment. These limits were derived from a hierarchy of sources as explained by the footnotes to Table 1.
2. The GPS maximum concentration limit for some groundwater monitoring constituents is below the lowest, reasonably achievable detection limit due to limitations in current analytical technology. In these cases, the GPS maximum concentration limit has been set at the corresponding GPS required detection limit.
3. The GPS required detection limit shall not exceed the GPS maximum concentration limit unless the required detection limit cannot be achieved due to matrix interferences or other reasonable analytical limitations. As long as appropriate supporting documentation is provided, affected samples and associated chemical analyses will be exempted from meeting the required detection limit. However, inability to meet the required detection limit does not in any way

relieve the Permittee from complying with the GPS maximum concentration limits.

4. The Department reserves the right, based on future advances in analytical technology, to modify this Permit to require the Permittee to achieve analytical detection limits for the groundwater monitoring constituents covered by Special Permit Condition II.A.2., which allows for adequate comparison with appropriate health- or environmental protection-based concentration limit(s).
5. The Permittee may make a demonstration to the Department, at any time during the term of this Permit, for establishing ACLs in lieu of the GPS maximum concentration limits specified herein. Any such demonstration shall ensure that any and all ACLs proposed in lieu of the GPS maximum concentration limits are protective of human health and the environment, according to the requirements of 40 C.F.R. § 264.94(b). In proposing an ACL(s), the Permittee shall consider and formally address the factors listed in 40 C.F.R. §§ 264.94(b)(1) and 264.94(b)(2). Any ACL(s) approved by the Department shall require a Permit modification according to 40 C.F.R. § 270.42.
6. The Permittee shall propose modification of the GPS to include any additional hazardous constituent(s) (40 C.F.R. Part 261, Appendix VIII.) identified in the groundwater during future sampling and analysis, if such constituents may be attributed to releases from operations at the facility and/or the degradation of facility-related hazardous constituents known to be present in the groundwater. The 40 C.F.R. Part 264, Appendix IX., groundwater sampling and analysis requirements contained in Special Permit Condition II.E.5. shall be used as the basis for determining if adding hazardous groundwater monitoring constituents to the GPS is necessary.
7. Any addition of hazardous groundwater monitoring constituents to the GPS as a result of the above determination shall require a Class 1 Permit Modification With Prior Director Approval. Any other changes to the GPS list of hazardous groundwater monitoring constituents shall require a permit modification, according to 40 C.F.R. § 270.42.

Table 1 - Groundwater Protection Standards

Groundwater Monitoring Constituent	CAS#	Maximum Concentration Limit (µg/l)	Required Detection Limit (µg/l)*
Acenaphthene	83-32-9	1200 (b)	0.10
Acenaphthylene	208-96-8	Not available (e)	0.10
Anthracene	120-12-7	9600 (b)	0.10
Benzene	71-43-2	5 (a, b)	0.20
Benzo(a)anthracene	56-55-3	0.10 (b, d)	0.10
Benzo(b)fluoranthene	205-99-2	0.10 (b, d)	0.10
Benzo(k)fluoranthene	207-08-9	0.10 (b, d)	0.10
Benzo(a)pyrene	50-32-8	0.10 (a, b, d)	0.10
2-Chlorophenol	95-57-8	0.5 (b, d)	0.50
Carbazole	86-74-8	Not available (e)	0.50
Chrysene	218-01-9	0.10 (b, d)	0.10
Dibenz(a,h)anthracene	53-70-3	0.10 (b, d)	0.10
Dibenzofuran	132-64-9	7.9 (c)	0.50
2,4-Dimethylphenol	105-67-9	540 (b)	3.0
2,4-Dinitrophenol	51-28-5	70 (b)	14
Ethylbenzene	100-41-4	700 (b)	0.20
Fluoranthene	206-44-0	300 (b)	0.10
Fluorene	86-73-7	1300 (b)	0.10
Indeno(1,2,3-cd)pyrene	193-39-5	0.10 (b, d)	0.10
2-Methylnaphthalene	91-57-6	36 (c)	0.10
Naphthalene	91-20-3	20 (b**)	0.10
Phenanthrene	85-01-8	Not available (e)	0.10
Phenol	108-95-2	300 (b)	0.50
Pyrene	129-00-0	960 (b)	0.10
Toluene	108-88-3	1,000 (a)	0.2
Xylenes	1330-20-7	10,000 (a, b)	0.2

* The lower of the Practical Quantitation Limits (PQLs) contained in the latest version of the EPA document entitled, Test Methods for Evaluating Solid Waste - Physical/Chemical Methods (SW-846), or method specific detection limits routinely achieved by the Permittee's laboratory.

- (a) Denotes limits derived from state (10 CSR 60-4, dated August 31, 2018) and federal public drinking water regulations.
- (b) Denotes limits derived from Missouri Water Quality Standards (10 CSR 20-7.031, dated March 31, 2018) for protecting groundwater. **Health advisory concentration.
- (c) Denotes limits derived from risk-based concentration values for tap water as contained in the EPA Regional Screening Level Tables, dated November 2019 (IELCR = 1×10^{-6} , HI=1).

- (d) Health and/or environmental-based levels are lower than the ability of current analytical technology to routinely attain detection limits at or below such levels. These constituents and their health- and/or environmental-based criteria are listed below.

Groundwater Monitoring Constituent	CAS#	Maximum Concentration Limit (µg/l)	Source
Benzo(a)anthracene	56-55-3	0.0044	(b)
Benzo(b)fluoranthene	205-99-2	0.0044	(b)
Benzo(k)fluoranthene	207-08-9	0.0044	(b)
2-Chlorophenol	95-57-8	0.1	(b)
Chrysene	218-01-9	0.0044	(b)
Dibenzo(a,h)anthracene	53-70-3	0.0044	(b)
Indeno(1,2,3-cd)pyrene	193-39-5	0.0044	(b)

- (e) Denotes a chemical that is not a hazardous constituent as defined in the Definitions section of this Permit, but is a groundwater monitoring constituent defined in 40 C.F.R. Part 264 Appendix IX. and/or is a chemical compound that is a plume indicator.

B. Point of Compliance [40 C.F.R. §§ 264.95 and 264.101]

The point of compliance is where the Permittee monitors groundwater quality to demonstrate progress towards and achievement of the GPS maximum concentration limits (or approved ACLs) specified in Table 1. Due to the commingling of facility groundwater contamination related to the closed regulated units and former wood treating process/treated wood storage areas, the point of compliance for the facility is defined as “throughout the plume.” Using the “throughout the plume” point of compliance approach for the final clean up goals specified in Table 1 is consistent with the Department’s overarching goal of protecting human health and the environment by attempting to return “usable” groundwater to its maximum beneficial use and helps to ensure that operation and maintenance, including monitoring, continue for as long as necessary to ensure protection of human health and the environment.

Groundwater contamination throughout the plume that exceeds the GPS maximum concentration limits in Table 1, or approved ACLs, shall be subject to corrective action pursuant to 40 C.F.R. §§ 264.100 and 264.101.

C. Compliance Period [40 C.F.R. § 264.96]

The compliance period for the closed surface impoundments is equal to the active life of these former hazardous waste management units, which is 24

years. The compliance period began on the effective date of the original facility Permit, issued September 25, 2002. The compliance period is therefore currently scheduled to end on September 24, 2026.

If the GPS maximum concentration limits, or approved ACLs, are being exceeded at the end of the compliance period at any point within the groundwater contamination plume, the Permittee's groundwater corrective action program shall continue until the Permittee demonstrates these limits have not been exceeded within the plume for a period of three consecutive years.

D. General Groundwater Monitoring Requirements [40 C.F.R. § 264.97]

The Permittee shall comply with those requirements of 40 C.F.R. § 264.97 applicable to monitoring programs conducted, according to 40 C.F.R. §§ 264.100 and 264.101, and the following additional requirements.

1. The Permittee's groundwater monitoring systems shall be designed, installed, operated, and maintained during the compliance period in a manner, which ensures:
 - a. Detection and/or delineation of the horizontal and vertical extent of groundwater contamination throughout the groundwater contaminant plume, including beyond the facility property boundaries;
 - b. Determination of representative concentrations of hazardous constituents and contaminant plume indicator parameters in the groundwater; and
 - c. The Permittee's ability to determine the effectiveness of the groundwater corrective action activities in terms of contaminant removal, destruction, and/or containment.
2. The number, location, and depth of the Permittee's monitoring wells shall be sufficient to define the horizontal and vertical extent of groundwater contamination beneath the Permittee's property and beyond the facility property boundaries. If, at any time during the compliance period, the Permittee or the Department determines the

existing monitoring system fails to define the horizontal and vertical extent of groundwater contamination, the Permittee shall submit, within 30 calendar days of such determination by the Permittee or written notification by the Department, a proposed plan for installing additional monitoring wells to define such extent.

3. The addition of new monitoring wells may require a Class 2 Permit Modification, according to 40 C.F.R. § 270.42(b). Procedures cited in the most current Department-approved version of the groundwater Sampling and Analysis Plan (SAP) shall be followed in the sampling and analysis of groundwater from any new wells required under this Permit.

When the Department determines the Permittee has adequately redefined the horizontal and/or vertical extent of groundwater contamination, the wells defining such extent shall be incorporated into, and be designated for continued monitoring in, the Permittee's SAP. The Department shall notify the Permittee, in writing, when it makes this determination. Within 60 calendar days of receiving this notification, the Permittee shall consult the Department regarding the need for SAP modification to incorporate the new wells. If SAP modification is required, the timeframe for such modification will be established via discussion with the Department. If agreeable to the Department, the Permittee may elect to submit an annual SAP modification to incorporate any needed changes in lieu of a modification for each individual change.

4. Any new groundwater monitoring well(s) installed by the Permittee to meet the requirements of this Permit shall be designed and constructed according to the requirements of 40 C.F.R. § 264.97, the Monitoring Well Construction Code of the Missouri Well Construction Rules (10 CSR 23-1 through 10 CSR 23-4), and/or Department-approved well-specific plans and specifications.
 - a. The Permittee shall submit to the Department's Missouri Geological Survey (MGS) and Waste Management Program (WMP), a copy of the well certification report form and resulting certification acceptance required by 256.614 RSMo, for any new monitoring well(s) installed pursuant to this

Permit. This information shall be reported as part of the Annual Groundwater and Corrective Action Reports, required by Special Permit Condition II.F.

- b. Any change in the number of wells being monitored may require a Class 2 Permit Modification, according to 40 C.F.R. § 270.42(b). The Permittee shall consult the Department regarding the need for a permit modification and, if required, the Permittee may elect to submit an annual permit modification request to incorporate changes in the number of monitoring wells in lieu of a modification for each individual change.
5. Plugging and abandonment of any groundwater monitoring well(s) operated by the Permittee pursuant to the requirements of this Permit shall meet the requirements of 10 CSR 23-4.080.
 - a. The Permittee shall submit to MGS and WMP, a copy of the well registration report form and resulting registration acceptance required by 10 CSR 23-4.080, for any monitoring wells plugged pursuant to this Permit. This information shall be reported as part of the Annual Groundwater and Corrective Action Reports required by Special Permit Condition II.F.
 - b. Within 60 calendar days of MGS's registration acceptance, the Permittee shall consult the Department regarding the need for SAP modification to remove the plugged wells. If SAP modification is required, the timeframe for such modification will be established via discussion with the Department. If agreeable to the Department, the Permittee may elect to submit an annual SAP modification to incorporate any needed changes in lieu of a modification for each individual change.
 - c. Any change in the number of wells being monitored may require a Class 2 permit modification in accordance with 40 C.F.R. § 270.42(b). The Permittee shall consult the Department regarding the need for a permit modification and, if required, the Permittee may elect to submit an annual modification to incorporate changes in the number of

monitoring wells in lieu of a modification for each individual change.

6. The Permittee shall contact the Department at least five working days before conducting any fieldwork associated with constructing or modifying the groundwater monitoring system required by this Permit. The Department shall then have the option to observe any portion of the system's construction or modification. This notification requirement applies to major work such as new wells, retrofitting existing wells, or abandoning wells. This notification requirement does not apply to minor well repairs, maintenance, or modification.
7. The Permittee shall submit for the Department's review and approval an updated SAP for the facility within 90 calendar days of the effective date of this Permit. The updated SAP shall address the requirements of this Permit and the updated final remedy. The Department shall review and approve updated SAPs, according to the procedures described in General Permit Condition III.

All SAP procedures and techniques used in groundwater sampling, analysis, and measurement of groundwater-related parameters shall be designed to meet the requirements of 40 C.F.R. Part 264 Subpart F and this Permit. The Permittee's sampling, analysis, and measurement protocols shall ensure the representative nature of all analysis and measurement results.

8. A monitoring well inspection and maintenance program shall be implemented for the duration of the compliance period. This program shall be designed to ensure the structural integrity of all monitoring well installations. The Permittee's revised SAP shall address the details of this program in accordance with the following requirements.
 - a. Surface well integrity inspections shall be performed at the time of each sampling event and shall be documented on an inspection log sheet. Surface integrity evaluations for each monitoring well shall include a visual inspection of the outer protective casing, inner casing riser, surface well seal, well cap, and locking mechanism to document any damage or deterioration. The ground surface in the immediate vicinity of

each monitoring well and the annular space between the outer protective casing and casing riser shall be inspected for visible anomalies (e.g., collection or ponding of water, ground subsidence, etc.).

- b. Subsurface well integrity inspections shall be performed every three years in all wells, according to the provisions contained in the Permittee's SAP, and shall be documented on a well inspection log sheet. Subsurface well integrity inspections may consist of a combination of elements, including total well depth measurements, groundwater turbidity measurements, in situ hydraulic conductivity tests, casing caliper logs, down-hole television camera surveys, and/or other methods capable of verifying the subsurface integrity of the well casing and screen.
- c. The Permittee's SAP shall specify performing a wellbore siltation evaluation every three years to assess down-well siltation and well screen occlusion in all monitoring wells. This requirement is designed to ensure the representative nature of the Permittee's groundwater sample analysis and field measurement results through minimizing sampling and measurement interferences (e.g., turbidity, excessive well screen occlusion, etc.).

The Permittee's SAP shall specify a well redevelopment trigger criterion based on a percentage of well screen occlusion and the potential of such occlusion to compromise the representative nature of the Permittee's groundwater sample analysis and field measurement results. Wells demonstrating well screen occlusion equal to or in excess of the redevelopment trigger criterion shall be redeveloped to remove wellbore siltation prior to the next scheduled sampling event.

- d. Monitoring well repairs shall be undertaken within 30 calendar days of identifying any surface or subsurface well integrity problem. If adverse weather or site conditions preclude the Permittee from gaining access to and/or repairing impacted monitoring wells within the above-noted periods, then the Permittee shall take action as soon as practicable. Written

justification for any delay, completed well inspection log sheets, a narrative description of any well repairs, and before and after photographic documentation (in the case of visible surface well repairs) shall be provided to the Department as part of the Annual Groundwater Corrective Action Reports required by Special Permit Condition II.F.

E. Corrective Action Program [40 C.F.R. §§ 264.100 and 264.101]

Historical releases to groundwater from the closed regulated units and other former operational areas are subject to the corrective action requirements of 40 C.F.R. Part 264 Subpart F and this Permit.

1. The Permittee's corrective action program shall consist of groundwater and surface water monitoring in accordance with Special Permit Conditions II. and III. The corrective action program shall address any groundwater contamination that has migrated beyond the facility property boundaries. Integration of the corrective action-monitoring program for the closed regulated units with the facility-wide program is required due to:
 - a. The need for continued operation of the recovery wells and trenches in order to maintain control of the contaminated groundwater plume to prevent any additional off-property migration, to recover any remaining mobile creosote, and to further reduce the concentration of facility-related contaminants in the groundwater.
 - b. The inability to differentiate groundwater contamination related to releases from the closed surface impoundments versus that related to nearby SWMUs/AOCs that are subject to corrective action according to 40 C.F.R. § 264.101.
 - c. The desirability of implementing a holistic, facility-wide approach to groundwater investigation, monitoring, and remediation given the foregoing circumstances.

2. The Permittee shall perform groundwater sampling/analysis and field measurement of groundwater-related parameters, according to the schedule presented in Table 2.
 - a. Sampling and analysis according to this schedule shall begin during the next regularly scheduled sampling event following approval of the revised SAP required by Special Permit Condition II.D.7. Given the potential lag time between the effective date of this Permit and approval of the revised SAP required by Special Permit Condition II.D.7., the Permittee shall continue sampling and analysis according to the latest Department-approved version of the SAP, until such time as the revised SAP is approved.
 - b. Sampling and analysis of groundwater from any new wells shall be performed no later than the next regularly scheduled sampling event following their installation.
 - c. Installing new wells to maintain continued knowledge of the extent of groundwater contamination during the compliance period may be necessary to meet the requirements of 40 C.F.R. Part 264 Subpart F and this Permit. New wells may be subject to the monitoring requirements contained in Table 2 and a permit modification as outlined in Special Permit Condition II.D.3.
 - d. New monitoring wells installed following issuance of this Permit that are used for delineating the extent of groundwater contamination shall be subject to sampling and analysis at a frequency and for a period of time that is sufficient to establish contaminant trends in these wells.
3. Only single sample analyses (as opposed to replicates) are required for the parameters listed in Table 2, with the exception of duplicate samples taken for Quality Assurance/Quality Control (QA/QC) purposes.
4. Field parameter values measured and reported by the Permittee shall be representative of stabilized well conditions.

- a. Down well measurement of Non-Aqueous Phase Liquid thickness, static water level and total well depth shall be taken prior to well purging.
 - b. Specific conductance, pH, and temperature measurements reported to the Department shall be those taken immediately following well purging, according to the approved SAP.
 - c. Additional field parameter measurements, such as those taken to verify the adequacy of well purging, shall be recorded in the field logbook.
5. The Permittee shall sample and analyze groundwater every five years, as specified in Table 2, from three historically contaminated wells for all parameters contained in 40 C.F.R. Part 264, Appendix IX, except for metals, pesticides, herbicides, and dioxins.
 - a. The wells sampled to meet this requirement shall be left to the discretion of the Permittee. The specific wells to be sampled shall represent one well containing low levels of dissolved phase contamination, one well containing moderate levels of dissolved phase contamination, and one well containing free phase contamination, if present. The sample to be analyzed from the free phase contaminated well shall be the groundwater (aqueous phase) obtained from this well, not the non-aqueous phase liquid.
 - b. This sampling and analysis is required to determine if additional hazardous constituents (40 C.F.R. Part 261, Appendix VIII) and/or contamination indicator parameters are present in the groundwater that may be attributable to a release at the facility and/or degradation of currently known facility-related groundwater monitoring constituents.
 - c. If hazardous constituents and/or groundwater contamination indicator parameters are identified that are not currently specified in the GPS, the Permittee may resample and analyze the groundwater, according to 40 C.F.R. § 264.99(g). If the Permittee's groundwater reanalysis confirms the presence of

additional hazardous constituents or groundwater contamination indicator parameters that are reasonably related to facility releases, then the Permittee shall propose a Class 1 Permit Modification With Prior Director Approval, according to 40 C.F.R. § 270.42(a)(2), to add the confirmed hazardous constituents and/or groundwater contamination indicator parameters to the GPS in Table 1 and the monitoring program specified in Table 2.

Table 2 - Groundwater Corrective Action Monitoring, Sampling, Analysis, and Parameter Measurement Schedule

Parameter	Type*	Required Detection Limit (µg/l)	Frequency
Appendix IX (1)	HC/GWMP	PQLs per SW-846**	Every 5 years
Semi-volatiles (2)	HC/GWMP	Per Table 1	*** (see note)
Benzene, Ethylbenzene, Toluene, Xylene (3)	HC/GWMP	Per Table 1	*** (see note)
NAPL Thickness	FM	Not Applicable	**** (see note)
pH	FM	Not Applicable	*** (see note)
Specific Conductance	FM	Not Applicable	*** (see note)
Static Groundwater Elevation (4)	FM	Not Applicable	**** (see note)
Temperature	FM	Not Applicable	*** (see note)
Total Well Depth	FM	Not Applicable	****Annually

- (1) 40 C.F.R. Part 264 Appendix IX scan on three historically contaminated wells.
- (2) EPA SW-846 Method 8270D or equivalent.
- (3) EPA SW-846 Method 8260C or equivalent.
- (4) Potentiometric measurements shall be obtained at the time of each regularly scheduled sampling event for all monitoring wells, including those that are not scheduled for sampling.
- * HC/GWMP = Hazardous Constituent/Groundwater Monitoring Parameter, FM = Field Measurement
- ** Per the current EPA SW-846 method at the time of analysis.
- *** New wells shall be sampled per Special Permit Condition II.E.2.
- **** NAPL detection and thickness measurements shall be made at the time of sampling (prior to well purging) and prior to removal of NAPL from any well. Static groundwater elevations and total well depth measurements shall be made prior to well purging.

F. Groundwater and Corrective Action Reporting

The Permittee shall submit Annual Groundwater and Corrective Action Reports to the Department, for the preceding calendar year (i.e., January

through December). The Permittee's Annual Groundwater and Corrective Action Reports shall be submitted by March 1 of each calendar year for the preceding calendar year. These annual reports shall continue to be submitted annually until such time as the Permittee's groundwater and corrective action activities are complete.

Each March 1 report shall be called the Annual Groundwater and Corrective Action Report and shall be a comprehensive evaluation of the facility-wide groundwater-monitoring program for the preceding calendar year and shall include, but not be limited to, the following information for the time period being reported:

1. A narrative discussion of the nature and evolution of the Permittee's facility-wide groundwater monitoring program and conclusions concerning the overall adequacy of the program as related to its intended purpose. Any conclusions concerning inadequacies in the Permittee's groundwater monitoring program shall be accompanied by a general discussion of proposed measures to address these inadequacies. However, specific details concerning any proposed measures to address inadequacies should be further developed outside the scope of these reports and/or as otherwise specified in this Permit.
2. Groundwater analysis results, field parameter measurement results, copies of field sampling and well inspection log sheets, well repair documentation, QA/QC data, statistical analysis of groundwater data, field investigation results, volume(s) of groundwater and mobile product recovered/treated, and other relevant corrective action related information.
3. The Permittee's Annual Groundwater and Corrective Action Reports shall comprehensively address all technical requirements of 40 C.F.R. Part 264 Subpart F and this Permit. The Permittee shall summarize relevant groundwater monitoring information and shall present this information in the form of narrative discussions, groundwater flow calculations, and/or diagrammatic illustrations (e.g., tabular groundwater and statistical data summaries, hydrogeologic and potentiometric contour maps/cross-sections, chemical parameter trend graphs, calculated rate(s) of contaminant migration, contaminant isoconcentration maps/cross-sections, fence/isometric diagrams,

groundwater plume stability analyses, groundwater flow nets, etc.), as appropriate.

4. The Permittee's Annual Groundwater and Corrective Action Reports shall evaluate the effectiveness of the groundwater and corrective action program, including, but not limited to, the following:
 - a. The direction and rate of migration of contaminated groundwater in impacted groundwater bearing zones and potential effects on any corrective action measures being designed or implemented at the facility for removal, containment or control of the groundwater contaminant plume(s);
 - b. The horizontal and vertical extent and concentrations of hazardous constituents/groundwater monitoring parameters (Table 1) in groundwater throughout the contaminant plume(s) as evaluated from the data obtained through the Permittee's groundwater monitoring program;
 - c. Any surface and/or subsurface well integrity problems and their potential or actual influence on the groundwater data or efficiency of the groundwater corrective action program;
 - d. The quantity of free product and contaminated groundwater extracted from the subsurface. This information should be reported as a total amount and/or per well or extraction location, and shall be used in conjunction with dissolved phase contaminant concentration information to estimate quantities of contaminants removed;
 - e. The conclusions and summary, including statistical evaluation, of analytical results from any surface water monitoring conducted during the reporting period; and
 - f. Information related to extraction of contaminated groundwater, installing/operating the on-site groundwater treatment system, and discharging treated groundwater to the Springfield sewer system, including the following:

- (1) Groundwater extraction rates, volumes, and pressures to determine if plugging of the well screens and/or the surrounding geologic strata is occurring;
 - (2) Concentrations of the groundwater monitoring parameters (Table 1) in the groundwater treatment system influent and treated effluent to demonstrate adequate removal of contaminants is being achieved by the groundwater treatment system, and whether the levels of treatment meet all applicable federal, state, and local requirements; and
 - (3) Any groundwater treatment system operation and maintenance problems in terms of their potential or actual influence on effluent monitoring and contaminant removal efficiency.
5. The Permittee shall include in the Annual Groundwater and Corrective Action Reports detailed boring logs for new exploratory borings, detailed “as-built” monitoring well diagrams for any new monitoring wells installed during the corresponding reporting period and the monitoring well-related information specified in Special Permit Conditions II.D.3., and 4.

Each Annual Groundwater and Corrective Action Report shall also include a progress-reporting component that discusses the following information for the time-period being reported:

- a. A description of the work completed;
- b. Summaries of all findings, including summaries of laboratory data;
- c. Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems;
- d. Projected work for the next reporting period; and

- e. Any instances of non-compliance with the corrective action requirements of this Permit not required to be reported elsewhere in this Permit.

III. Surface Water Monitoring Program

- A. The Permittee previously implemented a surface water-monitoring program in accordance with its previous MHWMF Part I Permit. The following requirements shall apply throughout the post-closure care period or until such time as the Permittee makes a successful demonstration for exemption from these requirements.
 - 1. The Permittee's surface water monitoring program shall be incorporated directly into and be submitted as part of the revised SAP required by Special Permit Condition II.D.7.
 - 2. The Permittee's surface water sampling and analysis methods for organic chemical indicator parameters and hazardous constituents shall be consistent with those specified in this Permit for groundwater and the Permittee's State Operating Permit No. MO 0117331.
 - 3. Upon Department approval of the revised SAP incorporating the surface water-monitoring program, the Permittee shall implement the surface water sampling and analysis as specified in the approved revised SAP and this Permit.
 - 4. Reporting and analysis of data/information collected as part of the surface water-monitoring program shall be included in the Annual Groundwater and Corrective Action Reports required by Special Permit Condition II.F. Analysis of the surface water data shall be part of the comprehensive evaluation included in the Annual Groundwater and Corrective Action Report.
- B. The Permittee may, at any time during the term of this Permit, make a demonstration to the Department for cessation of surface water monitoring. This demonstration shall be certified by a geologist or professional engineer registered in the State of Missouri. Any such demonstration shall address the elements of 40 C.F.R. § 264.94(b) as applied to potentially affected surface water bodies. Departmental approval of the Permittee's surface water

monitoring cessation demonstration may require a permit modification, according to 40 C.F.R. § 270.42.

IV. Identification of SWMUs and AOCs [40 C.F.R. § 264.101]

- A. On October 18, 1987, the EPA and KMCLLC-FPD finalized a RCRA 3008(a) Consent Order that required a Groundwater Assessment Plan (GAP). The GAP was approved by EPA on October 4, 1988. Subsequent to finalizing the work prescribed in the RCRA 3008(a) Consent Order, EPA issued a 3008(h) Consent Order in May 1988. The RCRA 3008(h) Consent Order No. 7-88-H-0019 was finalized between EPA and KMCLLC-FPD on November 17, 1988. The Consent Order required KMCLLC-FPD undertake a program to design, construct, and operate applicable corrective action technologies to remediate groundwater impacts originating from the facility. The program consisted of two phases: the performance of a RFI, and a CMS. The contaminants found at the facility included wastewater, and wastewater sludge, containing K001 hazardous waste constituents, as well as hazardous constituents from creosote wood preservative, gasoline, and diesel fuel.
- B. Historical contamination source areas present at the facility include three closed Hazardous Waste Management Units (HWMUs; surface impoundments), the production process area, the pre-RCRA original cell, the historic black-tie storage area, and the former land farm. The general location of the SWMUs is illustrated on Figure 2. For the purpose of environmental monitoring and remediation, they are grouped as follows:

HWMUs – Closed surface impoundments

1. Closed Impoundment 1- Aeration Basin,
2. Closed Impoundment 2 - Sedimentation/Process Water Cooling Basin,
3. Closed Impoundment 3 - Stormwater Basin.

SWMU I – Production process area including:

1. Production process oil/water separator,
2. Fuel storage area,
3. Creosote storage tanks and tail water sump,
4. Drip track,

5. Process tank contained in a concrete vault,
6. Boiler house and oil tanks

SWMU II – Pre-RCRA cell area. This was operated prior to KMCLLC-FPD ownership of the facility, and was closed in 1973 when new Impoundment 1 was constructed.

SWMU III – Black-tie storage area (historical).

SWMU IV – Closed land farm area. In 1979, KMCLLC-FPD established an experimental land treatment unit (land farm) to treat waste during the closure of a wastewater impoundment. Creosote sludge was applied to the land farm from 1979 to 1981. The closed land farm is a former interim status hazardous waste management unit that closed with waste in place. No cap was installed over this area at the time to allow for soil tillage to further biodegrade the creosote-based contaminants. Analytical results for land farm samples collected by the Department on November 29, 2000, indicated that the land farm soil at that time contained concentrations of creosote constituents that exceeded protective levels for industrial land use.

V. Notification Requirements for, and Assessment of, Newly Identified SWMU(s) and AOCs

- A. The Permittee shall notify the Department, in writing, no later than 15 calendar days after discovery of any SWMU(s) or AOC(s) identified subsequent to the issuance of this Permit.
- B. The Department may require a SWMU/AOC Assessment Work Plan for conducting an investigation of the newly identified SWMU(s) or AOC(s). Within 60 calendar days after receiving the Department's written request for a SWMU/AOC Assessment Work Plan, the Permittee shall submit a SWMU/AOC Assessment Work Plan to the Department for review and approval. The SWMU/AOC Assessment Work Plan shall include a discussion of past waste management practices at the unit, as well as a sampling and analysis program for groundwater, land surface and subsurface strata, surface water and/or air, as necessary, to determine whether a release of hazardous waste, including hazardous constituents from such unit(s) has occurred, or is occurring. The sampling and analysis program shall be capable of yielding

representative samples and shall include monitoring parameters sufficient to assess the release of hazardous waste and/or hazardous constituents from the newly identified SWMU(s) or AOC(s) to the environment. The SWMU/AOC Assessment Work Plan shall specify any data to be collected to provide for a complete SWMU/AOC Assessment Report, as specified below. The SWMU/AOC Assessment Work Plan shall contain a schedule for conducting the work specified therein.

- C. The Department shall review and approve the SWMU/AOC Assessment Work Plan according to the procedures set forth in General Permit Condition III. The Permittee shall implement the Department-approved plan according to the schedule contained therein.

- D. The Permittee shall submit a SWMU/AOC Assessment Report to the Department, according to the schedule specified in the approved SWMU/AOC Assessment Work Plan. The SWMU/AOC Assessment Report shall present and discuss the information obtained from implementing the approved SWMU/AOC Assessment Work Plan. At a minimum, the SWMU/AOC Assessment Report shall provide the following information for each newly identified SWMU or AOC:
 - 1. The location of the newly identified SWMU or AOC in relation to other SWMU(s) and AOC(s);
 - 2. The type and function of the SWMU or AOC;
 - 3. The general dimensions, capacities, and structural description of the SWMU or AOC;
 - 4. The period during which the SWMU or AOC was operated;
 - 5. The physical and chemical properties of all wastes that have been or are being managed at the SWMU or AOC, to the extent available;
 - 6. The results of any sampling and analysis conducted;
 - 7. Past and present operating practices;
 - 8. Previous uses of area occupied by the SWMU or AOC;

9. Amounts of waste handled; and
 10. Drainage areas and/or drainage patterns near the SWMU or AOC.
- E. The Department shall review and approve any required SWMU/AOC Assessment Report according to the procedures set forth in General Permit Condition III. Based on the findings of this report, the Department shall determine the need for further investigations, including ISMs, an RFI, or a CMS, at specific unit(s) identified in the SWMU/AOC Assessment Report.
- F. If the Department determines additional investigations are needed, the Department may require the Permittee to prepare and submit to the Department for approval, a work plan(s) for such investigations. Any work plan for additional investigations shall contain a schedule for conducting the work specified therein. The Department shall review and approve any work plan according to the procedures set forth in the General Permit Condition III. The Permittee shall implement the approved work plan, according to the schedule contained therein.

VI. Notification Requirements for, and Assessment of, Newly Identified Releases from Previously Identified SWMUs and AOCs

- A. The Permittee shall notify the Department, in writing, no later than 15 calendar days after discovery, of any newly identified release(s) of hazardous waste, including hazardous constituents, from previously identified SWMU(s) or AOC(s) discovered during the course of groundwater monitoring, field investigation, environmental auditing, or other activities undertaken after issuance of this Permit.
- B. The Department may require a Newly Identified Release Work Plan for conducting an investigation of the newly identified release(s). Within 60 calendar days after receiving the Department's written notice requiring a Newly Identified Release Work Plan, the Permittee shall submit a Newly Identified Release Work Plan to the Department for review and approval. The Newly Identified Release Work Plan shall include a discussion of the hazardous waste/chemical management practices related to the release(s); a sampling and analysis program for groundwater, land surface and subsurface strata, surface water and/or air, as necessary, to determine whether the release poses a threat to human health or the environment. The sampling and analysis

program shall be capable of yielding representative samples and shall include monitoring parameters sufficient to assess the release of hazardous waste and/or hazardous constituents to the environment. The Newly Identified Release Work Plan shall contain a schedule for conducting the work contained therein and shall specify any data to be collected to provide for a complete Newly Identified Release Report, as specified below.

- C. The Department shall review and approve the Newly Identified Release Work Plan according to the procedures set forth in General Permit Condition III. Upon approval thereof by the Department, the Permittee shall implement the approved plan according to the schedule contained therein.
- D. The Permittee shall submit a Newly Identified Release Report to the Department, according to the schedule specified in the approved Newly Identified Release Work Plan. The Newly Identified Release Report shall present and discuss the information obtained during implementing the approved Newly Identified Release Work Plan. At a minimum, the report shall provide the following information for each newly identified release:
 - 1. The location of the newly identified release in relation to any other SWMU(s) and AOC(s);
 - 2. The general dimensions of the release;
 - 3. The period during which the release is suspected to have occurred;
 - 4. The physical and chemical properties of all wastes that comprise the release;
 - 5. The results of any sampling and analyses conducted;
 - 6. Past and present operating practices near and at the location of the release;
 - 7. Previous uses of the area(s) occupied near and at the location of the release;
 - 8. Amounts of waste handled near and at the location of the release; and

9. Drainage areas and/or discharge patterns near and at the location of the release.
- E. The Department shall review and approve the Newly Identified Release Report according to the procedures set forth in General Permit Condition III. Based on the findings of the report and any other available information, the Department will determine the need for additional investigation, including ISMs, an RFI, or a CMS.

VII. Interim/Stabilization Measures

- A. If the Permittee becomes aware of a situation that may require ISMs to protect human health and the environment, the Permittee shall notify the Department within 24 hours of the time the Permittee becomes aware of the situation.
- B. If, during the course of any activities initiated under this Permit, the Permittee or Department determines a release or potential release of hazardous waste, including hazardous constituents, poses a threat to human health or the environment, the Department may require ISMs to slow or stop the further spread of contamination until final corrective action measures can be implemented. The Department shall determine, in coordination with the Permittee, the specific action(s) that shall be taken to implement ISMs, including potential permit modifications, and the schedule for implementing the ISM requirements. The Department shall inform the Permittee, in writing, of decisions regarding the action(s). This requirement shall not preclude the Permittee from responding to an emergency situation without direction from the Department.
- C. If, at any time, the Permittee determines or should have known that the ISM program is not effectively limiting or stopping the further spread of contamination, the Permittee shall notify the Department, in writing (e-mail is acceptable), no later than 10 calendar days after such a determination is made. The Department may require the ISM program be revised to make it effective in limiting or stopping the spread of contamination, or that final corrective action measures are required to remediate the contaminated media.
- D. In cases where releases or potential releases present minimal human health and environmental exposure concerns, or the proposed remedial solution is relatively uncomplicated, the Permittee may propose ISMs to the Department

for review and approval according to the procedures set forth in General Permit Condition III. These ISMs shall be consistent with, and may supplement and/or satisfy the requirements for, a final remedy(s) in specific areas. Proposed ISMs which the Department determines to be significant (e.g., those which are anticipated to comprise a substantial portion of a final remedy) may be subject to public review and comment prior to final Department approval.

VIII. RCRA Facility Investigation (RFI) Work Plan

- A. KMCLLC-FPD submitted an RFI Work Plan pursuant to the requirements of the EPA 3008(h) Consent Order. EPA approved the RFI Work Plan on December 5, 1989. The RFI objectives were to supplement and verify existing information, characterize the contaminant sources, and identify any potential receptors to facility releases. Implementing the approved RFI Work Plan began on January 29, 1990.
- B. Following transfer of the previous MHWMF Part I Permit to the Multistate Trust (the current Permittee) in 2011, additional investigations were implemented under various work plans approved by the Department. These investigations were conducted to update knowledge regarding the nature and extent of historical releases to the environment at/from the facility, with the primary focus on off-property groundwater, and potential residential indoor air impacts from vapor intrusion. In addition, several related activities have been conducted by the Permittee, in coordination with the Department, to evaluate the efficacy of the existing final remedy and, as necessary, propose changes and additions to update and optimize the final remedy.
- C. If the Department determines that further investigations are needed for newly identified SWMUs or AOCs or newly identified releases from previously identified SWMUs or AOCs, pursuant to Special Permit Conditions V. or VI., the Department shall notify the Permittee, in writing, of this decision. The Department may require the Permittee to prepare and submit an additional RFI Work Plan or equivalent for such investigations. If an RFI Work Plan is required, the Permittee shall submit it according to the time frame specified in the Department's written notice. The RFI Work Plan shall contain provisions, which are designed to meet the following objectives:

1. Full characterization of the nature, vertical and horizontal extent, and rate of migration of releases of hazardous waste and hazardous constituents from a newly identified SWMUs and AOCs, or groups of SWMUs and AOCs, or newly identified release(s) at the facility and the actual or potential receptors of such releases; and
 2. Collection of any other pertinent data, which may be used to substantiate future corrective action decisions.
- D. The content of the RFI Work Plan shall be appropriate for facility-specific conditions and shall be consistent with and address all applicable investigation elements described in the EPA document entitled, RCRA Facility Investigation (RFI) Guidance, EPA 530/SW-89-031, May 1989, or the most recent version. Any required RFI activities shall also be conducted using the approaches contained in the EPA document entitled, Resource Conservation and Recovery Act Facilities Investigation Remedy Selection Track (RCRA FIRST): A Toolbox for Corrective Action, May 20, 2016. At a minimum, the RFI Work Plan shall detail all proposed activities and procedures to be conducted at the facility, including a description of current conditions; the schedule for implementing and completing such investigations and for submitting reports (including the final RFI Report); the qualifications of personnel performing or directing the investigations, including contractor personnel; and the overall management of the RFI activities.
- E. The RFI Work Plan shall include a Quality Assurance Project Plan (QAPP). The QAPP shall present the policies, organization, objectives, functional activities, and specific quality assurance and quality control activities designed to achieve the data quality goals of the RFI. It shall include the RFI objectives; sampling procedures; analytical methods; field and laboratory quality control samples; chain-of-custody procedures; and data review, validation, and reporting procedures. The Permittee shall follow the EPA document entitled, EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5, March 2001, (reissued May 2006) or the most recent version.
- F. The Permittee shall prepare and maintain a Health and Safety Plan during the project that assures the RFI activities are conducted in a manner that is protective of human health and the environment.

- G. Due to the complexity of defining the extent of contamination, the Permittee may be required or choose to use a phased approach that requires submitting supplemental RFI Work Plans.
- H. The Department shall review and approve the RFI Work Plan(s) according to the procedures set forth in General Permit Condition III. The Permittee shall implement the approved plan(s), according to the schedule contained therein.

IX. RCRA Facility Investigation (RFI) Report

- A. KMCLLC-FPD submitted an RFI Final Report on July 1, 1992, which EPA approved August 21, 1992, pursuant to the requirements of the EPA 3008(h) Consent Order.
- B. Following transfer of the previous MHWMF Part I Permit to the Multistate Trust (the current Permittee) in 2011, additional investigations were implemented by the Permittee, pursuant to various work plans approved by the Department. The results of these investigations were included in various RFI-equivalent reports. These reports contained information that updated knowledge regarding the nature and extent of historical releases to the environment at/from the facility, with a primary focus on off-property groundwater and potential residential indoor air impacts from vapor intrusion. Additional reports were submitted by the Permittee that evaluated the efficacy of the original final remedy and, as necessary, proposed changes and additions to update and optimize the final remedy. These reports were reviewed and approved by the Department.
- C. The Permittee shall submit any additional RFI Report or equivalent required by this Permit to the Department, according to the schedule contained in the corresponding approved RFI Work Plan. The RFI Report shall present all information gathered under the approved RFI Work Plan, along with a brief facility description and map showing the property boundary and all SWMUs and AOCs. The information presented in the RFI Report shall be presented in a form consistent with Section 5 of the EPA document entitled, RCRA Facility Investigation Guidance; EPA 530/SW-89-031, May 1989, or the most recent version.
- D. The RFI Report shall provide an interpretation of the RFI information gathered, supported with adequate documentation; to enable the Department

to determine whether additional ISMs or corrective measures may be necessary. The RFI Report shall describe the procedures, methods, and results of all investigations of SWMUs and AOCs and associated releases, including, but not limited to, the following, as appropriate:

1. Characterization of the nature, concentration(s), horizontal and vertical extent, and direction/rate of movement of releases from SWMUs and AOCs at the facility;
2. Characterization of the environmental setting of the facility, including:
 - a. Hydrogeological conditions;
 - b. Climatological conditions;
 - c. Soil and bedrock characteristics;
 - d. Surface water and sediment quality; and
 - e. Air quality and meteorological conditions.
3. Characterization of SWMUs and AOCs from which releases have been or may be occurring, including unit and waste characteristics;
4. Descriptions of human and environmental receptors and associated risks to the receptors which are, may have been, or, based on site-specific circumstances, could be exposed to release(s) from SWMUs and AOCs;
5. Assessment of potential risks to the human and environmental receptors exposed to release(s) from SWMUs and AOCs (e.g., a Focused or Baseline Risk Assessment);
6. Extrapolations of future contaminant movement, including description of contaminant fate and transport mechanisms, and pathways for human and environmental exposure;
7. Laboratory, bench-scale, pilot-scale, and/or appropriate tests or studies to determine the feasibility or effectiveness of treatment technologies

or other technologies that may be appropriate in implementing remedies at the facility;

8. Statistical analyses to aid in the interpretation of data;
 9. Results of any ISMs previously implemented;
 10. Revision of the groundwater-monitoring program from the time of RFI approval until such time as this Permit is modified to implement an updated final remedy. This plan shall specify the wells to be monitored, the frequency of monitoring, and the analytical parameters. Groundwater monitoring shall be conducted in accordance with Special Permit Condition II.; and
 11. Evaluation of data quality that could affect the nature and scope of a CMS Work Plan or evaluation of corrective measure alternatives thereunder (e.g., identifying any potential bias in the RFI data and documenting its precision, accuracy, representativeness, completeness, comparability, validation, etc.).
- E. The Department shall review and approve the RFI Report or equivalent according to the procedures set forth in General Permit Condition III. After review of the RFI Report or equivalent, if the Department determines the objectives of the RFI have not been met, the Department may require additional investigation. Upon approval of the RFI Report or equivalent, the Department shall advise the Permittee as to the next step in the corrective action process, which may include submitting a CMS Work Plan pursuant to Special Permit Condition X.

X. Corrective Measures Study (CMS) Work Plan

- A. KMCLLC-FPD prepared and submitted a CMS Work Plan to EPA on November 25, 1992, which EPA approved on March 26, 1993. On November 8, 1993, EPA provided comments on a CMS Report that was submitted on July 19, 1993, and requested revisions and additional soil assessment in the Pre-RCRA surface impoundment. KMCLLC-FPD submitted a written response to EPA's comments and a work plan to address the additional data collection. The soil assessment was conducted in April 1994, and the resulting report, "Soil Characterization and Source

Potential of the Pre-RCRA Cell,” was submitted by KMCLLC-FPD on November 10, 1994.

- B. If the Department determines that a release(s) of hazardous waste or hazardous constituents from newly or previously identified SWMUs or AOCs pursuant to Special Permit Conditions V. or VI. may present a threat to human health or the environment, the Department may require the Permittee to prepare and submit an additional CMS Work Plan or equivalent. The Department shall notify the Permittee, in writing, of this decision. This notice shall identify the hazardous constituent(s) of concern and may specify remedial alternatives to be evaluated by the Permittee during the CMS.
- C. As part of the CMS, the Department may require the Permittee to identify and evaluate one or more specific potential remedies for removing, containing, or treating hazardous waste and hazardous constituents in contaminated media, based on the objectives established for the corrective action. These remedies may include a specific technology or combination of technologies that, in the Department's judgment, may be capable of achieving standards for protecting human health and the environment.
- D. The Permittee shall submit a CMS Work Plan or equivalent to the Department, according to the time frame specified in the Department's written notice requiring a CMS. The CMS Work Plan or equivalent shall be consistent with guidance contained in the EPA document entitled, RCRA Corrective Action Plan (Final), May 1994, OSWER Directive 9902.3-2A, May 1994, or the most recent version. Any required CMS activities shall be conducted using the approaches contained in the EPA document entitled, Resource Conservation and Recovery Act Facilities Investigation Remedy Selection Track (RCRA FIRST): A Toolbox for Corrective Action, May 20, 2016. At a minimum, any CMS Work Plan or equivalent required by this Permit shall include an implementation schedule and shall provide the following information, as appropriate:
 - 1. A description of the general approach to investigating and evaluating potential remedies;
 - 2. A definition of the specific objectives of the study;
 - 3. A description of the remedies which will be studied;

4. A description of those potential remedies which were initially considered, but were dropped from further consideration, including the rationale for elimination;
 5. The specific plans for evaluating remedies to ensure compliance with remedy standards;
 6. The schedules for conducting the study and submitting a CMS Report;
 7. The proposed format for the presenting information; and
 8. Laboratory, bench-scale, pilot-scale, and/or appropriate tests or studies to determine the feasibility or effectiveness of treatment technologies or other technologies that may be appropriate in implementing remedies at the facility.
- E. The Department will review and approve any CMS Work Plan or equivalent required by this Permit according to the procedures set forth in General Permit Condition III. The Permittee shall implement the approved plan according to the schedule contained therein.

XI. Corrective Measures Study (CMS) Report

- A. KMCLLC-FPD prepared and submitted a draft CMS Report on July 19, 1993, to EPA and the Department. EPA provided comments on November 8, 1993, and requested revisions including additional soil assessment in the Pre-RCRA surface impoundment. The soil evaluation of the Pre-RCRA surface impoundment was conducted in April 1994, and the results were reported in "Soil Characterization and Source Potential of the Pre-RCRA Cell," submitted November 19, 1994. A revised CMS Report was submitted to EPA by KMCLLC-FPD on January 4, 1995, and was approved on March 31, 1995. The land farm was not addressed in the approved revised CMS Report but was evaluated later according to the original MHWMF Part I Permit issued by the Department in September 2002.
- B. Since taking over ownership and operational control of the facility in 2011, the Permittee's RAO investigation and evaluation efforts may result in the identification and proposal of revised/additional corrective measures to update the previous final remedy. As RAO Reports and related documents are

completed, they will be submitted to the Department for review and approval according to the procedures set forth in General Permit Condition III. As applicable, this CMS-equivalent information will be used to support approval and implementation of an updated final remedy in accordance with Special Permit Condition XII.

- C. If the Department determines any additional CMS Report or equivalent is necessary to address a release(s) of hazardous waste or hazardous constituents from newly or previously identified SWMUs or AOCs pursuant to Special Permit Conditions V. or VI., or the performance of any long-term final remedy established pursuant to Special Permit Condition XII., the Permittee shall submit a CMS Report or equivalent to the Department, according to the schedule contained in the approved CMS Work Plan.

The CMS Report or equivalent shall present all information gathered under the approved CMS Work Plan or equivalent and shall be consistent with guidance contained in the EPA document entitled, RCRA Corrective Action Plan (Final), May 1994, OSWER Directive 9902.3-2A, or the most recent version. The CMS Report or equivalent shall summarize the results of the investigations for each remedy studied and any bench-scale or pilot tests conducted. The CMS Report or equivalent shall include, but not be limited to, the following information:

1. Evaluation of performance, reliability, ease of implementation, and potential impacts of each remedy studied, including safety impacts, cross media impacts, and control of exposure to any residual contamination;
2. Assessment of the effectiveness of each remedy in achieving adequate control of sources and cleanup of the hazardous waste or hazardous constituents released from the SWMU(s) and AOC(s);
3. Assessment of the time required to begin and complete each remedy;
4. Estimation of the costs of implementing each remedy;
5. Recommendation of a preferred remedy and rationale for the proposed selection; and

6. Assessment of institutional requirements, such as state or local permit requirements, implementing a facility-specific environmental covenant containing property activity and use restrictions, or other environmental or public health requirements, which may substantially affect implementing the remedy.
- D. The CMS Report or equivalent shall contain adequate information to support the Department in the remedy approval decision-making process.
- E. The Department shall review and approve the CMS Report or equivalent according to the procedures set forth in General Permit Condition III. Upon approval thereof, the Department will approve an updated final remedy, as specified in Special Permit Condition XII.

XII. Updated Final Remedy Approval

- A. Following the approval of the CMS Report or equivalent (e.g., compendia of RAO-related reports), the Department shall prepare a Statement of Basis, in coordination with the Permittee, summarizing the corrective measures alternatives that were evaluated by the Permittee, including justification for the proposed updated final remedy identified by the Permittee in the CMS Report or equivalent.
- B. Following preparation of the Statement of Basis, a Class 3 permit modification shall be initiated according to 40 C.F.R. § 270.42(c) or a Department-initiated permit modification according to 40 C.F.R. § 270.41, as applicable, to facilitate public review and comment on the Statement of Basis and proposed updated final remedy including the Department's basis of support for approval of the updated final remedy, and the Permittee's implementation of the approved updated final remedy.
- C. Upon completion of the public participation activities associated with the permit modification to implement the proposed updated final remedy, the Department will approve a final remedy that shall:
 1. Be protective of human health and the environment;
 2. Control and/or eliminate the source(s) of contaminants so as to reduce or eliminate, to the maximum extent practicable, further contaminant

releases, exposures, or migration that might pose a threat to human health and the environment; and

3. Meet all applicable federal, state, and local laws and regulations.

D. The previously implemented final remedy at the facility consists of the following:

1. Removing contaminated soils from the three surface impoundments that were operated as hazardous waste management units, and from the Pre-RCRA surface impoundment. Contaminated soils were replaced with clean fill and a clay cap with vegetated cover was placed over the former surface impoundments during closure.
2. Installing and operating four groundwater interceptor trenches, and additional contaminated groundwater/creosote recovery wells between 1985 and 1996. These trenches and wells remove contaminated groundwater and mobile creosote for treatment and provide hydraulic control of the groundwater contaminant plume to prevent additional off-property migration.
3. Installing and operating a contaminated groundwater and mobile creosote recovery and treatment system that reclaims creosote from the recovery trenches and wells. The treatment process includes primary and secondary oil/water separation with the addition of chemical flocculants to break down emulsified oil/water mixtures. Five recovery wells and a trench were installed in 1985 along the northeast property boundary to prevent contaminated groundwater related to releases from the former impoundments from migrating off-property. The first recovery well (RW-14) was installed in July 1991, with additional recovery wells added in August 1995. In 2018, approximately 400 gallons of mobile creosote, and 9.3 million gallons of contaminated groundwater were extracted and treated by the system.
4. Implementing institutional controls, including restrictions regarding the former capped surface impoundments and land farm recorded in the property chain-of-title; and property activity and use limitations contained in the Department's 2002 MHWMF Part I Permit that are continued via Special Permit Condition XIV. of this Permit.

5. Implementing engineering controls, including maintaining facility security/fencing; inspection, maintenance, and mowing of capped areas; on-site personnel presence; and continued groundwater and creosote recovery, treatment, monitoring and reporting.

XIII. Construction Completion Report

KMCLLC (as the original Permittee) submitted a Construction Completion Report (CCR) to the Department dated February 20, 2003, to document construction of the previously implemented final remedy for the facility as described in Special Permit Condition XII. The Department reviewed and approved the CCR on October 10, 2003, as supplemented by additional information acknowledged in the March 26, 2004, Long-Term Operation, Maintenance, and Monitoring Plan approval referenced below.

If, and when, an updated final remedy is implemented, the Permittee shall submit a CCR for the updated final remedy within 90 calendar days of completion of any required construction. The CCR shall summarize all additional ISMs, as-built plans and corrective measures comprising the updated final remedy that were implemented subsequent to the Department's approval of the original CCR referenced above. This includes details on trenches, extraction wells, associated piping, any treatment process to recover contaminants or product, containment devices, sumps, implementation of engineering and/or institutional controls, and other measures that are part of the updated final remedy.

XIV. Long-Term Operation, Maintenance, and Monitoring Plan

KMCLLC (as the original Permittee) submitted a Long-Term Operation, Maintenance, and Monitoring Plan (LTOM&M Plan) to the Department dated February 20, 2003. The Department reviewed and commented on the LTOM&M Plan in October 2003. KMCLLC submitted a revised LTOM&M Plan dated December 15, 2003, in response to the Department's comments. The revised LTOM&M Plan was approved by the Department on March 26, 2004.

Within 60 calendar days of the Department's approval of the updated final remedy, the Permittee shall submit an updated LTOM&M Plan that addresses the following:

- A. Implementation and maintenance of engineering and/or institutional controls to prevent unacceptable human and environmental exposures to residual facility-related contamination on the permitted property, and residential areas

to the north of the facility property including the off-property Woodlawn Spring water collection basin located adjacent to the Golden Hills Subdivision. The facility property shall not be used in any manner that would interfere with, or adversely affect, the integrity or protectiveness of the updated final remedy. The referenced controls shall include, but not be limited to, the following:

1. Public access to the facility property, and the Woodlawn Spring water collection basin, shall be prevented by appropriate means, such as fences, appropriate signage, and other security measures.
 2. Any future construction or maintenance activities involving excavating any contaminated soil shall comply with applicable Occupational Safety and Health Administration requirements regarding appropriate worker exposure protection and shall provide for managing and disposing contaminated soil according to applicable federal, state, and local regulations.
 3. Buildings, caps, structures, and pavement that currently cover contaminated soil on the facility property shall not be removed or altered unless the Permittee has provided for alternative corrective measures to protect human health and the environment, and has prior Department approval.
 4. Groundwater from contaminated water bearing zones beneath the facility property shall not be used as a drinking water or domestic use water supply.
 5. Unless prior Department approval is obtained, the areas with institutional controls may not be used for any purpose other than adult workers performing non-residential construction and maintenance activities consistent with the exposure assumptions in the approved CMS or equivalent and updated final remedy.
- B. Contingent provisions to supplement and/or continue appropriate engineering and institutional controls via executing an Environmental Covenant pursuant to the Missouri Environmental Covenant Act (Sections 260.1000 through 260.1039, RSMo) in the event of a permit transfer and/or the conveyance of

any interest in real property that is currently part of the facility, including but not limited to, fee interests, leasehold interests, and mortgage interests.

- C. The Permittee shall evaluate every five years, the availability and viability of innovative treatment technologies and their potential application to areas with substantial residual contaminant concentrations in groundwater with the objective of meeting the GPS. These evaluations shall be included every fifth year as part of the March 1 Annual Groundwater and Corrective Action Reports required by Special Permit Condition II.F.
- D. The operation and maintenance procedures for all elements/components of the updated final remedy, including the replacement schedule for equipment and installed components. All monitoring to be performed to determine effectiveness of the final remedy in meeting the GPS in Table 1.

The Department shall review and approve the LTOM&M Plan according to the procedures set forth in General Permit Condition III. Once the updated LTOM&M Plan is approved, any additional changes, updates, or revisions of the approved LTOM&M Plan shall be submitted to the Department for review and approval, according to General Permit Condition III.

XV. Certification of Completion of Corrective Measures

- A. When the Permittee believes all corrective measures required by this Permit are complete and all applicable clean-up standards have been met (e.g., the GPS specified in Table 1, or approved ACLs), the Permittee shall submit a Corrective Measures Completion (CMC) Report to the Department. The CMC Report shall contain a summary of corrective measures activities conducted at the facility and a description of the long-term operation and maintenance and monitoring programs associated with the corrective measures.

To verify completion of corrective measures for groundwater, the Permittee shall demonstrate in the CMC Report that groundwater contaminant levels have not exceeded the GPS maximum concentration limits contained in Table 1 (or approved ACLs) throughout the plume of groundwater contamination for a period of three consecutive years.

The Department shall review and approve the CMC Report according to the procedures set forth in General Permit Condition III.

- B. Elements of the current and any updated final remedy may require extended time periods to complete. Until such time as the Permittee submits a CMC Report, the Permittee shall summarize remedy implementation progress and provide data obtained during remedy implementation in the Annual Groundwater and Corrective Action Reports required by Special Permit Condition II.F. Any short-term completion of corrective action activities (e.g., ISMs) shall also be summarized in the Annual Groundwater and Corrective Action Reports.
- C. Within 60 calendar days of the Department's approval of the CMC Report documenting completion of all corrective action pursuant to Special Permit Condition XV., the Permittee shall submit to the Department, by registered mail, a written certification stating that the final remedy has been completed as approved by the Department. The certification shall be signed by the Permittee and a professional engineer registered in Missouri.

XVI. Environmental Covenant [Sections 260.1000 through 260.1039, RSMo]

- A. The institutional (property activity and use limitations) and engineering controls specified in Special Permit Condition XIV., and LTOM&M Plan, shall remain effective for the life of this Permit, including the term of any reissued Permit(s), unless this Permit is revised via the Department's approval of an appropriate permit modification pursuant to 40 C.F.R. §§ 270.41 or 270.42.
- B. At least 120 calendar days before submitting a CMC Report or proposed removal of all or a portion of the permitted property from the jurisdiction of this Permit, the Permittee shall contact the Department to discuss the need for executing an Environmental Covenant to continue any then-applicable institutional (property activity and use limitations) and/or engineering controls specified in Special Permit Condition XIV., and LTOM&M Plan.
- C. If an Environmental Covenant is determined to be necessary, the Department will provide the Permittee with the most current standard template version of the Environmental Covenant to facilitate the Permittee's drafting of a property-specific Environmental Covenant. The Permittee shall then prepare and submit to the Department a draft Environmental Covenant using the supplied template in conformance with the Missouri Environmental Covenants Act, Sections 260.1000 through 260.1039, RSMo. The Department

will review and conditionally approve the Permittee's draft Environmental Covenant according to the procedures set forth in General Permit Condition III.

Prior to final execution and recording of the Environmental Covenant, the conditionally approved draft Environmental Covenant will be subject to public review and comment as part of any permit modification request by the Permittee or Department-initiated permit modification proposing termination of this Permit based on the completion of corrective action and/or proposed removal of property from the jurisdiction of this Permit.

- D. Within 60 calendar days after the Department's response to public comments, if any, and final decision regarding the proposed action(s), the Permittee shall execute and record, in coordination with the Department and according to state law, the approved Environmental Covenant with the Greene County Recorder's Office in the chain-of-title for the facility property, or on some other instrument which is normally examined during title search, that will, in perpetuity, notify any potential purchaser of the then-current environmental conditions and activity and use limitations on the property.
- E. Within 30 calendar days after recording the executed Environmental Covenant, the Permittee shall provide a statement to the Department certifying the executed Environmental Covenant has been recorded at the Greene County Recorder's Office. A copy of the recorded information with the Recorder's notarized stamp and book/page or other information identifying the location of the notation in the County's records shall accompany the Permittee's certification statement.

XVII. Permit and Property Transfers [40 C.F.R. § 270.40]

Prior to conveyance of this Permit or any property at the facility, or transfer of custody or control of any real property, that is currently under control of the Permittee, the Department may require modification or revocation and reissuance of this Permit to change the name of the Permittee and incorporate such other requirements as necessary to continue the engineering and institutional controls, as well as ongoing remediation and corrective action activities.

The Permittee and the Department shall follow the permit transfer requirements outlined in 40 C.F.R. § 270.40. In addition, the Permittee shall provide a copy of this

Permit to any potential new owner/leaseholder at least 120 calendar days before the date of the proposed property transfer or lease.

XVIII. Cost Estimates and Financial Assurance

Tronox's environmental liabilities at the Springfield facility were resolved pursuant to a 2011 bankruptcy settlement that, in part, involved creating five environmental response trusts and a litigation trust. On February 14, 2011, Tronox transferred the Springfield facility into the then newly created Multistate Trust and simultaneously provided funding to Greenfield Environmental Multistate Trust LLC (the current Permittee, as Trustee of the Multistate Trust) for future cleanup work and other administrative costs associated with the Springfield facility. Funding provided at that time was based solely on the Tronox bankruptcy settlement amounts, as any additional proceeds from the then-pending Anadarko litigation were not yet available. The initial funding amount allocated to the Springfield facility as a result of the bankruptcy was \$2,025,323. These funds were projected to provide for an estimated five years of operation, maintenance, monitoring and reporting of existing activities (with no new initiatives) under the Department's original 2002 MHWMF Part I Permit, which this Permit replaces.

The Anadarko litigation was ultimately settled before the above-referenced initial bankruptcy settlement funding ran out. This resulted in additional funds being transferred into the Multistate Trust for activities at the Springfield facility. From February 2015 to June 2016, seven separate distributions from the Anadarko litigation trust, totaling \$22,657,150.70, were placed in the Multistate Trust for activities at and around the Springfield facility. When added to the previous Tronox bankruptcy recovery, the total amount recovered for activities at and around the Springfield facility was \$24,682,473.70. The Multistate Trust is charged with performing Environmental Actions to responsibly manage the impacts of contamination at and around the Springfield facility only to the extent that funds are available.

Beyond the noted bankruptcy and litigation amounts, the Permittee receives quarterly rent from a lumber company that owns property west of the facility and that leases a portion of the permitted property for bulk untreated wood storage pursuant to a lease arrangement that Tronox transferred to the Multistate Trust as part of the 2011 bankruptcy settlement. This lease arrangement currently generates \$62,000 annually (excluding prorated real estate tax amounts reimbursed by the tenant), which is placed in the Multistate Trust for activities at and around the Springfield facility. Periodic "waterfall" distributions to the Multistate Trust are also made as unneeded property is

sold from the Springfield and various other Multistate Trust facilities. Income derived from investing the Multistate Trust-maintained assets is also periodically placed in the Multistate Trust.

In order to provide for the full and final completion of the post-closure and corrective action activities required by this Permit, the Permittee shall establish and maintain financial assurance for the benefit of the Department in an amount at least equal to the projected future post-closure care and corrective action costs.

- A. The Department acknowledges that the Multistate Trust is an acceptable form of financial assurance for post-closure care and corrective action. As a Trust Fund, the Multistate Trust is compliant with the requirements of 40 C.F.R. §§ 264.101, 264.145, and 264.151, in that it is:
1. Established for the benefit of the Department;
 2. Administered by a trustee who has the authority to act as a trustee under federal or state law and whose trust operations are regulated and examined by a federal or state agency; and
 3. Acceptable in all respects to the Department.
- B. The trust agreement provides that the trustee shall make payments from the fund, as the Department shall direct in writing, as described below:
1. To reimburse the Permittee for expenditures made by the Permittee for post-closure care and corrective action activities performed according to this Permit; and
 2. To facilitate payment by the trustee to third parties conducting post-closure care and corrective action activities required by this Permit.
- C. On or before January 1 of each calendar year, the Permittee shall submit an estimate of the projected costs for the upcoming calendar year to conduct post-closure care and corrective action activities at the facility. This cost estimate shall be itemized in sufficient detail across the range of planned activities, so as to facilitate the Department's review of all technical and administrative elements. The Department will review and approve the annual

cost estimate according to General Permit Condition III. If the cost estimate requires modification, the Department shall notify the Permittee, in writing, of the estimate's deficiencies and specify a due date for submitting a revised cost estimate for further evaluation and final written approval.

- D. Any proposed amendments or changes to the approved annual budget amounts shall be submitted to the Department at the appropriate time for review and approval, according to General Permit Condition III.
- E. Annually, by June 1 of each calendar year, the Permittee shall submit a trust accounting to the Department detailing the assets and liabilities at the end of the preceding calendar year for the Springfield facility. This accounting shall itemize the deductions from and additions to the net trust assets. This accounting shall also include a comparison of the amount approved by the Department for the preceding calendar year (including any mid-year amendments) versus actual expenditures during the calendar year.
- F. If, at any time, the Permittee wishes to change the form or terms of financial assurance from the current Trust Fund arrangement, the Permittee may submit a written proposal to the Department to do so. Any such proposal/change shall necessitate modifying this Permit according to 40 C.F.R. § 270.42.

XIX. Supplemental Information

All raw data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Permit shall be maintained by the Permittee during the term of this Permit, including the term of any reissued Permits. Copies of other reports (e.g., inspection reports), information, or data not routinely reported pursuant to the requirements of this Permit shall be made available to the Department upon written request.

XX. Planned Activities

The Permittee shall comply with the schedule for planned groundwater monitoring, surface water monitoring, corrective action, and other activities specified in this Permit, as summarized in Table 3.

XXI. Contingent Activities

The Permittee shall comply, as necessary, with the schedule for contingent corrective action and other activities as specified in this Permit, as summarized in Table 4.

FACILITY SUBMISSION SUMMARY

Table 3 - Summary of the Planned Submittals Required by this Permit

Planned Submittal	Due Date*	Permit Condition
Submit two copies and one searchable electronic copy of the Consolidated Permit Application.	Within 60 calendar days after effective date of this Permit.	Schedule of Compliance I.A.
Submit a signed certification that the Permittee has read and understands all Permit conditions contained herein.	Within 60 calendar days after effective date of this Permit.	Schedule of Compliance I.B.
Submit a check or money order to the Department's Waste Management Program payable to the State of Missouri, for any outstanding engineering review costs.	Within 60 calendar days after effective date of this Permit.	Schedule of Compliance I.C.
Submit a check or money order to the Department's Waste Management Program, payable to the State of Missouri, for \$1,000 for each year this Permit is to be in effect beyond the first year.	Within 60 calendar days after effective date of this Permit.	Schedule of Compliance I.D.
Permit Renewal Application	At least 24 months before expiration date of this Permit.	Standard Permit Condition I.
Revise and resubmit the Groundwater SAP	Within 90 calendar days after effective date of Department's approval of the updated final remedy.	Special Permit Condition II.D.7.
Annual Groundwater and Corrective Action Reports	By March 1 of each calendar year.	Special Permit Condition II.F.

Planned Submittal	Due Date*	Permit Condition
Surface Water Monitoring Program's incorporation into Groundwater SAP.	Within 60 calendar days after effective date of Department's approval of the updated final remedy.	Special Permit Condition III.A.1.
Remedial Action Optimization Reports and related documents in support of updated final remedy.	As completed.	Special Permit Condition XI.B.
Construction Completion Report for updated final remedy.	Within 90 calendar days after completing construction of all updated final remedy elements.	Special Permit Condition XIII.
Long-Term Operation, Maintenance, and Monitoring Plan.	Within 60 calendar days after Department approval of an updated final remedy.	Special Permit Condition XIV.
Annual post-closure and corrective action cost-estimate for upcoming year.	On or before January 1 of each calendar year.	Special Permit Condition XVIII.C.
Annual accounting of previous year's expenditures, remaining trust balance, and comparison with approved budget.	By June 1 of each calendar year.	Special Permit Condition XVIII.E.

*Extensions may be requested and approved by the Department for cause without modifying this Permit.

Table 4 - Summary of the Contingent Submittals Specified in this Permit

Contingent Submittal	Due Date	Permit Condition
Notification of an Emergency Situation	At earliest practical moment upon discovery.	General Permit Condition I.
Written Report of an Emergency Situation	Within 15 calendar days after incident occurrence.	General Permit Condition I.
Biennial Report (if applicable)	By March 1 of each even numbered calendar years.	General Permit Condition II.
Document and Activity Extension Requests	At least 15 calendar days before scheduled document due date or activity completion date.	General Permit Condition IV.
Post-Closure Plan Amendment	At least 60 calendar days before proposed change or not later than 60 calendar days after occurrence of an unexpected event.	Special Permit Condition I.B.
Certification of Completion of Post-Closure Care	No later than 60 calendar days after completing post-closure care period(s), including any necessary extension(s).	Special Permit Condition I.D.
Alternate Concentration Limit Demonstration	At any time during the term of this Permit.	Special Permit Condition II.A.5.
Plan for installation of new monitoring wells to determine contamination extent	Within 30 calendar days after determination by the Permittee or written notification by the Department.	Special Permit Condition II.D.2.
Groundwater SAP update discussion with the Department regarding revisions to include new wells	Within 60 calendar days of the Department's written notification that contamination extent has been defined.	Special Permit Condition II.D.3.
Groundwater SAP update discussion with the Department regarding revisions to remove plugged and abandoned wells	Within 60 calendar days after MGS' registration acceptance.	Special Permit Condition II.D.5.

Contingent Submittal	Due Date	Permit Condition
Notification of field work associated with constructing or modifying the groundwater monitoring system	At least 5 working days before conducting work.	Special Permit Condition II.D.6.
Perform monitoring well repairs	Within 30 calendar days, or as soon as practicable, following identification of any surface or subsurface well integrity problem.	Special Permit Condition II.D.8.
Surface water monitoring cessation demonstration	At any time during the post-closure care period.	Special Permit Condition III.B.
Notification of new SWMU/AOC	Within 15 calendar days after discovery.	Special Permit Condition V.A.
Newly identified SWMU/AOC Assessment Work Plan	With 60 calendar days after Department's notification that a SWMU/AOC Work Plan is required.	Special Permit Condition V.B.
SWMU/AOC Assessment Report	According to the schedule in the approved SWMU/AOC Work Plan.	Special Permit Condition V.D.
Notification of newly identified release from previously identified SWMU/AOC	Within 15 calendar days of after discovery.	Special Permit Condition VI.A.
Newly identified release(s) from previously identified SWMU/AOC Assessment Work Plan	With 60 calendar days after Department's notification that a SWMU/AOC Work Plan is required.	Special Permit Condition VI.B.
SWMU/AOC Assessment Report	According to the schedule in the approved SWMU/AOC Work Plan.	Special Permit Condition VI.D.
Notification of potential need for Interim/Stabilization Measures (ISMs)	Within 24 hours of discovery of a situation that may require ISMs.	Special Permit Condition VII.A.
Submission of proposed Interim/Stabilization Measures (ISMs)	As specified in Department's written notification that ISMs are needed.	Special Permit Condition VII.B.
Notification that ISMs are not effective	Within 10 calendar days after determination by Permittee.	Special Permit Condition VII.C.

Contingent Submittal	Due Date	Permit Condition
RFI Work Plan or equivalent	As specified in Department's written notification that an RFI Work Plan is required.	Special Permit Condition VIII.C.
RFI Report or equivalent	According to the schedule in the approved RFI Work Plan.	Special Permit Condition IX.C.
CMS Work Plan or equivalent	As specified in Department's written notification that a CMS Work Plan is required.	Special Permit Condition X.D.
CMS Report or equivalent	According to the schedule in the approved CMS Work Plan.	Special Permit Condition XI.C.
Corrective Measures Completion (CMC) Report	When the Permittee believes that all corrective measures have been completed.	Special Permit Condition XV.A.
Certification of Completion of Corrective Measures	Within 60 calendar days after Departmental approval of the CMC Report.	Special Permit Condition XV.C.
Environmental Covenant discussion with Department	At least 120 calendar days before submitting a CMC Report or proposed removal of all or a portion of the permitted property from the jurisdiction of this Permit.	Special Permit Condition XVI.B.
Draft Environmental Covenant	Per discussion with the Department.	Special Permit Condition XVI.C.
Execute and Record Final Environmental Covenant	Within 60 calendar days after Department's final decision regarding the proposed action(s).	Special Permit Condition XVI.D.
Certification of Environmental Covenant Recording	Within 30 calendar days after recording at the Greene County Recorder's Office.	Special Permit Condition XVI.E.

Contingent Submittal	Due Date	Permit Condition
Copy of this Permit to any new potential owner or leaseholder	At least 120 calendar days before the date of the proposed property transfer or lease.	Special Permit Condition XVII.
Proposed amendments or changes to the approved annual budget	As needed.	Special Permit Condition XVIII.D.
Change in the form or terms of financial assurance from the current Trust Fund arrangement	As needed.	Special Permit Condition XVIII.F.

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Missouri Hazardous Waste Management Facility Permit - Part I
MOD007129406
Page 73

Figure 1 - Facility Location and Topography Map

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Please see hard copy or separate electronic file online at

<https://dnr.mo.gov/env/hwp/permits/mod007129406/20181108-figure1.pdf>

Figure 2 - Historical Operations Features including Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)

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<https://dnr.mo.gov/env/hwp/permits/mod007129406/20191031-figure2.pdf>

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Missouri Hazardous Waste Management Facility Permit - Part I
MOD007129406
Page 75

Figure 3 - Well Location Map - South

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<https://dnr.mo.gov/env/hwp/permits/mod007129406/20190916-figure3.pdf>

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Missouri Hazardous Waste Management Facility Permit - Part I
MOD007129406
Page 76

Figure 4 - Well Location Map - North

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<https://dnr.mo.gov/env/hwp/permits/mod007129406/20190917-figure4.pdf>

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Missouri Hazardous Waste Management Facility Permit - Part I
MOD007129406
Page 77

Figure 5A - 2018 Water Elevation Contour Map – Upper Flow Zone

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<https://dnr.mo.gov/env/hwp/permits/mod007129406/20190917-figure5a.pdf>

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Missouri Hazardous Waste Management Facility Permit - Part I
MOD007129406
Page 78

Figure 5B - Extent of Contamination – Upper Flow Zone

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Missouri Hazardous Waste Management Facility Permit - Part I
MOD007129406
Page 79

Figure 6A - 2018 Water Elevation Contour Map – Secondary Flow Zone

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<https://dnr.mo.gov/env/hwp/permits/mod007129406/20190625-figure6a.pdf>

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Missouri Hazardous Waste Management Facility Permit - Part I
MOD007129406
Page 80

Figure 6B - Extent of Contamination – Secondary Flow Zone

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<https://dnr.mo.gov/env/hwp/permits/mod007129406/20190918-figure6b.pdf>

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Missouri Hazardous Waste Management Facility Permit - Part I
MOD007129406
Page 81

Figure 7 - 2018 Water Elevation Contour Map – Tertiary Flow Zone

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<https://dnr.mo.gov/env/hwp/permits/mod007129406/20190625-figure7.pdf>