

SOLID WASTE MANAGEMENT UNITS and AREAS OF CONCERN

This enclosure describes the Solid Waste Management Units (SWMUs) and Areas Of Concern (AOCs) in Sunflower's Environmental Restoration Program

SAAP-001 (SWMU 1) Classification Yard

The Classification Yard is comprised of ~64 acres along the railroad switchyard in the northeastern portion of SFAAP. Incoming raw materials were sorted in this area for diversion to the appropriate receiving facility within SFAAP. The area operated from 1942-1991. Rail operations in the area stopped in 2001. This area produced no hazardous wastes; however, as a result of handling incoming raw materials which may be classified as hazardous, the area had the potential for contamination. Although no spills were reported, the Classification Yard was identified as an area of potential contamination in the 1980 Installation Assessment because of the materials handled and the length of time the area has been in use. A RFI was submitted and indicated no contamination above industrial land use standards. KDHE requested additional groundwater data downgradient of this site. Surface soil sampling was conducted at the bare spots and other locations to characterize the areas. Approximately 7500 cy of contaminated soil will be removed and disposed of off-site. Confirmatory samples will be taken and a closure report will be completed. Finalize the no further action closure report.

SAAP-002 (SWMU 2) River Water Treatment Plant Lagoons

The River Water Treatment Plant (RWTP) (~19 acres), located in the northern portion of SFAAP near the Kansas River, was constructed and started operations in 1943. Water from the Kansas River was treated by lime addition, sedimentation, carbon filtration and chlorination. Sludge from the RWTP was partially used to construct two unlined lagoons south of the plant (upper lagoon 1,269,000 ft³, lower lagoon 1,952,000 ft³). Wastes from the RWTP were collected in the lagoons (USAEHA, 1978). Water treatment operations at the RWTP ceased in 1971, thus eliminating the effluent of sludge from the RWTP into the lagoons. In the late 1970s, because of the start up of NQ production, the lagoons received about 200,000 gallons per day of discharge from the NQ Area. This included wastewater from tank T784 (SWMU 44) which stored non-contact cooling water, steam condensate, cooling tower blowdown, and ammonia stripper discharge from the NQ production process. The RWTP was leased to a private firm for commercial aquaculture purposes (terminated in Sep 2001). Both lagoons support a variety of aquatic life. Beaver, muskrat, turtles, sunfish and bass, along with aquatic vascular plants and summer algal blooms are commonly observed. Initial RFI results indicated the need for additional GW and sediment sampling. Additional RFI data indicated elevated levels of arsenic in deep subsurface soils and the bedrock interface. Remove accumulated sludge and backfill/regrade (12,500 cy). Revise risk assessment to incorporate arsenic-related concerns. This site was included in an installation-wide stream study. Long-term monitoring and pond closure report will follow.

SAAP-003 (SWMU 3) Main Sewage Treatment Plant Drying Beds

The main Sewage Treatment Plant (STP) is located on ~10 acres in the northeastern portion of SFAAP. Operations began in 1943. The STP stopped receiving human waste in 2002. The plant treated sanitary wastewater from the installation. Following treatment, water from the plant was discharged into Kill Creek. During the 1950s and 1960s, solids (sludge) from the STP were placed in drying beds east of the Imhoff tank. The digester was last emptied in 1974. Wastewater from various production facilities and laboratories, including a photographic laboratory, processed at the plant may have contained hazardous constituents. According to a 1974 report, no chlorination was provided. This site consists of the drying beds east of the Imhoff Tank. No significant contamination was found during the initial RFI activities; however, further soil investigation was conducted to fully delineate the site. The RFI is expected to be final in late FY05. Sediment removal (~500 cy) with off-site disposal is required.

SAAP-004 (SWMU 4) Pond A And Sludge Disposal Area

Pond A (~2.5 acres) is an unlined pond located in the north central portion of SFAAP encompassing ~86,200 ft². Pond A was constructed in the 1940s and received wastewater from NC production during periods 1943-1960 and 1965-1971, and water discharged from the NQ Pilot Plant from 1980-1984. Pond A was used for the sedimentation of solids and equalization of wastewater from the NC area prior to lime treatment and subsequent discharge to Pond B (SWMU 6). In addition, Pond A received wastes from many other areas of SFAAP, including the NQ Pilot Plant. The pond now functions as part of the natural drainage system receiving storm sewer outfall from various parts of SFAAP, including drainage from the Industrial Wastewater Treatment Facility Area. An unknown quantity of sludge dredged from Pond A was landfilled at the Sludge Disposal Area, located north of, and adjacent to, the pond. Initial RFI (March 2000) results indicated elevated levels of nitrocellulose. All underground piping that is associated with the neutralization basin will be handled under SAAP-005. Install bedrock well to ensure no contamination has reached a lower aquifer. Investigate sediment and surface water contamination in ditch between Ponds A and B. Approximately 4,000 cy of soil may be removed. A pond closure plan will be developed and the pond will be closed. LTM is not anticipated due to insolubility of NC.

SAAP-005 (SWMU 5) Acid Sewage Disposal Plant

The Acid Sewage Disposal Plant is located on ~1 acre on the southeast edge of Pond A. It was constructed in 1943 to treat the acidic wastewater flowing into Pond A from the NC area and had two periods of operation: 1943-1960 and 1965-1971. The pH of Pond A effluent was adjusted in the neutralization unit before draining into Pond B (SWMU 6). Neutralized wastes and unsettled flocculent were discharged to an open drainage ditch leading to Pond B. During a visual inspection in 1990, a white sludge identified as "pebble lime" was piled up along the southeast edge of the plant. Initial RFI data indicates elevated levels of nitrocellulose in soil. The underground piping and the initial portion of the connecting ditch to Pond B will be remediated under this site. Further investigation (neutralization basins) and a Corrective Measures Study will be completed. Approximately 5,000 cy of soil will be removed.

SAAP-006 (SWMU 6) Pond B And Sludge Disposal Area

SAAP-006 (~38 acres) is located in the east-central portion of SFAAP, downstream of Pond A. Pond B is an unlined impoundment situated upon limestone bedrock with a surface area of ~9 acres and a capacity of ~2.2 million ft³ (16.5 million gal). The pond was constructed in the 1940s for sedimentation of solids from the neutralized wastewater discharged from the Acid Sewage Disposal Plant (SWMU 5). Unknown quantities of sludge were occasionally dredged from pond B and landfilled west of the pond. Pond B discharges into Kill Creek. The pond supports a variety of aquatic life. Large fish were observed in the pond during a site visit in 2002. Initial RFI results indicated elevated levels of manganese in groundwater. Drain and dredge the pond. Stabilize and dispose of sludge from the pond and associated disposal areas as special waste. Additional investigation, including installing monitoring wells, is planned. Approximately 42,000 cy of soil will be removed, treated and disposed of off-site. A pond closure plan will be developed. Five years of LTM will be conducted.

SAAP-007 (SWMU 7) North Acid Area- Chromate Area

The North Acid Area is located in the north-central portion of SFAAP. The North Acid Area manufactured ammonium nitrate liquor from 1947 to 1948 and was dismantled in 1958. The North Acid Area contains 3 SWMUs: the Chromate Area (SAAP-007), the Chromate Concentration Pond (SAAP-008) and the Wastewater Treatment Lagoon (SAAP-009). The Chromate Area consists of ~0.5 acre within the North Acid Area. The Chromate Area is the location of the former cooling water treatment unit, including a cooling tower in which chromium-contaminated wastewater was reportedly generated through the use of corrosion inhibitors on the tower. Chromate liquid may have been disposed of in

pipes subsequently left buried in the area and the potential is present for heavy metal contamination. When the site was dismantled in 1958, the 2 wastewater collection basins were left in place. In 1982 and 1983, chromium-contaminated water was removed from the basins. Water continues to accumulate in the basins. A geophysical survey was conducted and several subsurface anomalies were identified, potentially indicating buried process pipelines. Initial RFI activities indicate the need for additional soil and surface water delineation due to heavy metal and PAH contamination. Initial sample data were found to be unreliable; therefore, the site must be re-sampled. Additional RFI activities will be performed to complete nature and extent determination and to confirm source areas. Approximately 7,200 gal of liquid waste will be removed and disposed of off-site as hazwaste. The removal action will include excavation of debris (subsurface anomalies). Approximately 550 cy of soil will be excavated, treated, and disposed off-site. Any existing surface water in the basins will be removed. Five years of LTM will be conducted.

SAAP-008 (SWMU 8) North Acid Area- Chromate Concentration Pond

The North Acid Area is located in the north-central portion of SFAAP. The North Acid Area manufactured ammonium nitrate liquor from 1947 to 1948 and was dismantled in 1958. The North Acid Area contains 3 SWMUs: the Chromate Area (SAAP-007), the Chromate Concentration Pond (SAAP-008) and the Wastewater Treatment Lagoon (SAAP-009). The Chromate Concentration Pond is known to have been located within the North Acid Area, but because the pond has been drained, its location remains uncertain. Reportedly, chromate was used as a corrosion inhibitor on the cooling towers at the Nitrogen Fixation Plant. Chromate salts from the neutralization process used to treat chromium sludge were reportedly stored in drums located in the magazine area. These salts proved non-hazardous and SFAAP received state approval to dispose of the salts in an on-site landfill. The risk assessment found that the primary risk drivers were hexavalent chromium in surface water and PAHs in surface soil. Initial sample data were found to be unreliable, therefore, the site must be re-sampled. Additional RFI activities will be performed. Approximately 3,600 gal of liquid waste will be removed and disposed of off-site as hazwaste. Approximately 550 cy of soil will be excavated, treated, and disposed off-site. Five years of LTM will be conducted.

SAAP-009 (SWMU 9) North Acid Area- Wastewater Treatment Lagoon

The North Acid Area is located in the north-central portion of SFAAP. The North Acid Area manufactured ammonium nitrate liquor from 1947 to 1948 and was dismantled in 1958. The North Acid Area contains 3 SWMUs: the Chromate Area (SAAP-007), the Chromate Concentration Pond (SAAP-008) and the Wastewater Treatment Lagoon (SAAP-009). Wastewater treatment practices for the North Acid Area were not documented. It is believed the processes practiced were similar to the traditional wastewater treatment operations practiced in the South Acid Area. This treatment involved lime addition to the wastewater, followed by discharge to a holding pond or lagoon. The South Acid Area produced calcium sulfate sludges. Similar sludges are believed to have been produced in the North Acid Area. In addition, there is a possibility that chromate-contaminated water may have been released as waste to this lagoon. The risk assessment found that primary risk drivers were hexavalent chromium in surface water and PAHs in surface soil. Initial sample data were found to be unreliable; therefore, the site must be re-sampled. Additional RFI activities will be performed. Approximately 7,200 gal of liquid waste will be removed and disposed of off-site as hazwaste. Approximately 550 cy of soil will be excavated, treated, and disposed off-site. Five years of LTM will be conducted.

SAAP-010 (SWMU 10) F-Line Area Ditches

The F-Line Area is located in the east-central portion of SFAAP. This site consisted of sumps, troughs, pipes and other conveyances and ditches used for the management of wastewater from operations in the F-Line Area. F-Line included a blender house where explosive propellant was received and blended with lead salicylate; rolled into sheets; slit and wound into carpet rolls; and extruded by large hydraulic

presses into solid propellant grains. Any propellant that was on the floor was washed into the drain with the wastewater. Most of the effluents were then discharged, via unlined ditches, to settling ponds and eventually to Spoon and Kill Creeks; however, one group of the ditches discharged directly to a field adjacent to Spoon Creek. The F-line ditches were located on the east side of the F-Line press houses. Occasionally, propellant solids settled in these ditches before reaching the ponds. The ditches were used periodically from the early 1950s to 1971. Several ditches served as discharge points for runoff from storm drains along the streets in the area. The draft RFI indicates nitroglycerin in soil at concentrations that exceed EPA's target risk range for carcinogenic risk. Lead was found at concentrations exceeding EPA and KDHE guidance values. The Statement of Basis has been completed and recommended soil remediation by excavation, stabilization and disposal. A surface soil (~24,000 cy) removal was completed in 2001. In 2001, the size of this site was expanded by ~25 acres to a total area of ~128 acres and includes 56 additional building foundations. Approximately 10 acres around the building foundations will require additional investigation. AOC-6 is being handled under this site. Completed site investigation of 10 additional acres of the site in FY04. Soil removal is expected to be complete by March 2005, and report is expected to be completed by the end of FY05. Five years of LTM will be conducted.

SAAP-011 (SWMU 11) F- Line Area Settling Ponds

The F-Line Area (~5 acres total) is located in the east central portion of SFAAP. Wastewater from the F-Line production facilities drained into ditches, which, for the most part, led to the six F-Line Area Settling Ponds (1A, 1B, 2A, 2B, 3A, and 3B) and two Blender Ponds (4A and 4B). The six Settling Ponds were unlined earthen ponds equipped with stand pipes to permit settling of solids and decantation of water. The northernmost Settling Ponds (3A and 3B) were constructed in 1943 and abandoned in 1971. The remaining ponds were operational from 1943 to 1969. These ponds were used to settle propellant solids from wastewater generated during production of propellants. The ponds were also part of the natural drainage system, ultimately discharging into Spoon and Kill Creeks. During past operations, SFAAP occasionally removed the propellant solids which had accumulated in the ponds and burned them at the burning grounds. The pond sediments were contaminated with uncolloided propellant with lead salts, phthalates and NC from the manufacturing process. The RFI indicated nitroglycerine in soil at concentrations that exceed EPA's target risk range for carcinogenic risk. Lead was also found at concentrations exceeding EPA and KDHE guidance values. A surface soil (4,500 cy) removal was completed in 2001. Four years of LTM will be conducted.

SAAP-012 (SWMU 12) Pyott's Pond And Sludge Disposal Area

Pyott's Pond and Sludge Disposal Area (~12 acres) is located in the east-central portion of SFAAP. Pyott's Pond is an unlined, earthen impoundment with a surface area of ~1.7 acres and a capacity of ~697,000 ft³ /5.2 million gal. The pond was constructed in 1968 to aide in pollution control. In the past it has received drainage from the South Acid Area, the F-Line Paste Area, the NC Area, the Solvent Area and the NG Area, as well as non-contact cooling water, boiler blowdown and some process water from the South Acid Area. Neutralization of water entering the pond resulted in an accumulation of calcium sulfate sludge, which was periodically dredged and landfilled adjacent to the pond to the north and south. The pond was used primarily for flow control and emergency containment for acid manufacturing. Effluent from the pond drains northeast to Kill Creek, and was monitored by NPDES Outfall 004. The pond supports an active aquatic ecosystem. PCBs were detected in two pond sediment samples. Initial RFI results indicated elevated levels of mercury and Nitroguanidine in the surface water. Groundwater contained Nitroguanidine, and sediments contained elevated levels of PAHs and nitrocellulose. Additional RFI activities will be performed to fully define the extent of contamination to characterize the sludge in the pond. A risk assessment revision will require additional surface water and groundwater sampling. A pond closure plan will be developed and the pond will be closed. Approximately 7,000 cy of sediment and soil will be removed, treated and disposed of off-site. Five years of LTM will be conducted.

SAAP-013 (SWMU 13) South Acid Area LWTP Evaporative Lagoons

The South Acid Area LWTP Evaporative Lagoons (32 acres) are located in the east-central portion of SFAAP. The Liquid Waste Treatment Plant (LWTP) consists of 5 aboveground tanks: 3 for treating wastewater, 1 for slurring lime, and 1 for feeding wastewater to be treated. In addition, there were 4 unlined, earthen cells used as Evaporative Lagoons associated with the LWTP. Use of the LWTP and lagoons began in 1979. Volumes of waste treated at the LWTP varied with the need of production operations. The plant treated up to 1.5 million gallons of corrosive wastewater each month. In the summer of 1986, the lagoons were reportedly nearing their effective capacity, and the wastewater from the lagoons was being applied to land within the plant boundaries. Land application of wastewater had been performed in many areas of SFAAP, including the open areas in the western and southern portions of the NQ production area. In a letter dated March 11, 1996, KDHE approved a schedule of work for remediation of the lagoon sludge and dismantlement of the lagoons. This action partially fulfilled KDHE requirements for lagoon closure. This work was completed in August 1999. Additional requirements to complete closure of the lagoons include groundwater monitoring at selected sites downgradient of the lagoons for a period of not less than five years, and submittal of a final work plan for closure activities consistent with KDHE's pond closure/sampling verification plan. The Army is currently determining the lateral extent of the plume. Ten years of LTM will be conducted.

SAAP-014 (SWMU 14) Rocket Static Test Area

The Rocket Static Test Area is located in the east-central portion of SFAAP. It encompasses ~7 acres in the northeastern portion of the Proving Ground area. The site includes 4 firing platforms. Two outdoor firing platforms are located immediately north of each of the two Proving Ground buildings. The Proving Ground was used to conduct proof and surveillance tests of manufactured powder and propellants common to cannon and rocket artillery. Tests were conducted between 1965 and 1971. Phase I and II RFI sampling indicated lead, nitroglycerine, propellants, and phthalates in surface soil above action levels. Lead and nitroglycerine were found in the groundwater above action levels. Completed sediment and surface water sampling in FY04. Remedial activities will consist of soil excavation, treatment and off-site disposal of ~200 cy of soil. Five years of LTM will be conducted.

SAAP-015 (SWMU 15) Waste Storage Magazines

The Waste Storage Magazines (57 acres) are located in the southeast portion of SFAAP, and are also known as the J-Magazine Area Buildings. The buildings included in this SWMU are J-117, J-118, J-119, J-120, J-121, J-122, J-124, J-127, and J-128. All magazines used natural lighting to preclude accidental detonation of explosives, are secured with locking doors, and have concrete floors with secondary containment. Materials designated to be stored in each magazine included production waste from propellant manufacturing, spent solvents, and other explosive and hazardous waste. During a site inspection in 1990, rust colored stains were noted on the concrete loading pad at J-127. Initial sample data were found to be unreliable; therefore, the site must be re-sampled. A RFI will be performed. The site buildings are currently undergoing RCRA closure (Section I of the Part B Permit).

SAAP-016 (SWMU 16) Temporary Waste Storage Magazines

Most of the Temporary Waste Storage Magazines (79 acres) are located in the southwest-central portion of SFAAP. This includes the B-Area Storage Buildings B-14, B-16, B-20, B-21 and B-22. Also included in this SWMU is Building 181-2 which is located in the central portion of SFAAP. Building 181-2 is an inactive 12 x 15 ft metal structure that was used to store spent degreasing solvents. The building has a concrete floor and is surrounded by an earthen dike. The solvents which were stored in 181-2 were transferred in 1984 to Building J-125, where temporary spill containment was provided. When the upgrading of J-124 was complete, the solvents were then transferred from J-125 to J-124. Over time, 181-2 contained ~550 gallons of spent degreasing solvents. During a site visit in 1990, no signs of past

releases were evident. It was noted, however, that the earthen dike for spill containment for building 181-2 was "inadequate." Initial sample data were found to be unreliable; therefore, the site must be re-sampled. A RFI will be performed. The site buildings are currently undergoing RCRA closure (interim status).

SAAP-017 (SWMU 17) G-Line Area Ditches

The G-Line Area Ditches (~284 acres) are located in the south central portion of SFAAP. It was a solvent propellant area. G-Line operated from 1943-1948, and 1953-1960. It was reported that during the 1940s, the G-line NC wringers overflowed, and NC fines had been observed along drainage ditches from the area leading to Kill Creek. It is likely that G-Line Area ditches received the same types of materials and followed the same historical wastewater treatment practices as the F-Line Area. The G-Line area is situated close to the basin divide between flow westward to Captain Creek and flow eastward to Spoon and Kill Creeks. Consequently, it is possible for contamination to migrate in either direction depending on the location of the source of contamination in the G-Line area. In addition, it has been reported that NC spills occurred in the area, and NC wastes were observed in the ditches in the area. It is possible that small amounts of propellant solids containing lead salts may have settled in these ditches. Initial sample data were found to be unreliable, therefore, the site must be re-sampled. A RFI will be performed. A soil removal of ~11,000 cy may be required. Soil will be disposed of off-site. Five years of LTM will be conducted.

SAAP-018 (SWMU 18) Old/New Sanitary Landfills

The entire Landfill Area encompasses ~50 acres located about 1 mile west of the NG Area near the central-western border of SFAAP. However, only 31 acres make up the Old/New Sanitary Landfills. The landfills employed a trench-type operation. Several types of landfills are included in the Landfill Area: the sanitary landfill (31 acres); the asbestos landfill (1 acre) and the ash landfill (19 acres, SAAP-019). This Landfill Area began operation in 1943. Prior to the designation of the New Sanitary Landfill in 1967, refuse of all types was buried at a site just south of the new landfill. No records from the Old Landfill were available. SFAAP no longer uses the New Sanitary Landfill; currently, waste is disposed off-site. Although there was no hazardous waste placed in either landfill, there is one area reported to have received containers of a lead compound east of the landfill, and 2 areas with known asbestos waste near the Sanitary Landfill. The RFI report states that the primary concerns at SFAAP-018 and 019 are the constituents detected in groundwater (sulfide; cis-1,3-dichloropropene and ammonia nitrogen) and dioxins/furans in the shallow soil. Institutional controls have been implemented (fencing) to control site access. An IRA for erosion control was completed. Shallow groundwater flowing through a sand lens within the site complicates remedial action. Additional RFI activities are being performed in FY05 to delineate the lateral extent of the disposal cells, and groundwater characterization. To reduce groundwater flow through the site, remedial action activities will include construction of a landfill cap and a French drain or other feature. Thirty years of LTM will be required. The abandonment of all installation wells will be funded under this site.

SAAP-019 (SWMU 19) Ash Landfill

There are two, unlined ash landfills. SAAP-019 (~19 acres) is located north of the Sanitary Landfill, in the central-western portion of SFAAP. The area of SAAP-019 adjacent to SAAP-018 will be addressed under SAAP-018. The other landfill is located southeast of Power House #1 (~1 acre). It has been reported that these landfills were used prior to 1966. The ash landfills contain unknown quantities of fly ash from the ash-sludge system and coal fines from the coal pile. Fly ash sometimes contains heavy metals. The area of SAAP-019 adjacent to SAAP-018 will be addressed under SAAP-018. In the area southeast of Power House #1, ~1,000 cy of material will be excavated and disposed of off-site.

SAAP-020 (SWMU 20) Ash Lagoon And Sludge Disposal Area

The Ash Lagoons and Sludge Disposal Area are located on 15 acres in the north-central portion of SFAAP. There are four Ash Lagoons, all are 15 feet deep. Lagoon 165-1 is 103,600 ft², Lagoon 165-2 is 118,900 ft², Lagoon 165-3 is 95,000 ft², Lagoon 165-4 is 10,000 ft². These lagoons began operation in 1979 to collect fly ash and bottom ash from the boiler house (Power House #1) via an ash-sludge system. The ash wastes (which may contain heavy metals) were allowed to settle out in the lagoons and the slightly alkaline wastewater was filtered and recycled back to the boiler house. Lagoons 165-1, 165-2, and 165-3 were periodically dredged and the sludge was landfilled in the Ash Landfill (SWMU 19). The lagoons are located just south of Pond A; however, discharge most likely flowed in the direction of the topographic slope to Pond B, located 2,000 feet east of the lagoons. Reports from site visits in 1987 and 1990 both indicated that the embankments of the lagoons appeared to be in good condition. The lagoons are reportedly unlined; however, logs from a 1992 site visit indicated one lagoon appeared to have a liner. Unlined lagoons present a pathway for constituents to migrate into the groundwater. Initial sample data were found to be unreliable, therefore, the site was re-sampled. The RFI Addendum was completed in February 2005. Ash from the lagoons will be excavated and disposed (55,000 cy) and the lagoons will be clean closed.

SAAP-021 (SWMU 21) Contaminated Materials Burning Ground

The Contaminated Materials Burning Ground consists of ~10 acres located in the west central portion of SFAAP. The site was brought into operation in 1943 to decontaminate scrap metal (which was later salvaged) and to burn other combustible material that had been contaminated with explosives or propellants. Prior to 1970, burning of contaminated materials occurred in two open trenches. However, in about 1970, two unlined 30 x 300 ft pads were installed where the trenches were located. The pads were separated by an earthen berm. Contaminated material accumulated at the site until the pad was full, which generally took ~1-2 months. Burning was initiated using diesel fuel, waste oils, and scrap wood (including telephone poles). SFAAP randomly sampled the remainder of the residue for TCLP metals (leachable), and upon negative results disposed the ash in the sanitary landfill. After one pad was burned, the other pad began receiving materials for the next burn. During a site visit in 1990, burn areas were observed away from the main burn pads. Also located on the site was an open top tank, ~8 ft in diameter, which was used to burn waste solvent. Adjacent to the tank was an elevated platform which appeared to have been used as an unloading dock for liquids to be emptied into the tank. At the time of a 2001 site visit, the tank contained water. Groundwater and surface water runoff from the burn area flow northwest to Captain Creek or the adjacent Oxbow Lake. Phase I & II RFI results indicated the presence of dioxins, metals, solvents, and petroleum hydrocarbons in soil. Petroleum hydrocarbons and volatile organic compounds were detected in groundwater and surface water. Additional sampling was completed in spring 2003. An ex-situ bioremediation pilot test for TPH, VOC and PAHs in groundwater was conducted FY04. Approximately 5,000 cy of POL-contaminated soil was excavated and bioremediated in FY04 (from Area D). The CMS was completed in November 2004. No contamination was detected at Area C. Remedial action will consist of excavation and disposal of ~8,000 cy of wastes (Areas E and F). An additional 2,400 cy is anticipated from Area A & B (assumes funding for completion in FY05). Five years of LTM will be conducted.

SAAP-022 (SWMU 22) Old Explosive Waste Burning Ground

The Old Explosive Waste Burning Ground (30 acres) is located north of the Contaminated Materials Burning Ground (SWMU 21) in the west central portion of SFAAP. In this area, waste explosives including NG slums (i.e., NG mixed with sawdust for stabilization) and various propellant formulations from the sumps, filters, and drains in the production areas were disposed by open burning on designated pads. The site was in operation from 1943 to 1980. SAAP-022 includes ~7 acres of 5 burning pads, and a NG slums burning area. During a Groundwater Contamination Survey in 1987, the USAEHA reported that the site was a grass covered field showing no signs of vegetative stress. RFI and CMS activities are complete. Lead and NG were detected in surface soil above action levels. In

FY05, ~39,000 cy of contaminated soil were excavated and disposed off-site in accordance with CMS recommendations. One round of groundwater sampling was conducted, and there were no contaminants detected above action levels. LTM is not required. The RA report is expected to be complete in late FY05.

SAAP-023 (SWMU 23) New Explosive Waste Burning Ground

The New Explosive Waste Burning Ground (17 acres) had been in operation since 1980 when it replaced the Old Explosive Waste Burning Ground (SWMU 22). It is located in the southwest portion of SFAAP and consists of a diked earthen pad measuring 130 x 340 ft. A maximum of 5,000 lbs of explosives may be burned on this pad at one time, and smaller quantities may be detonated. Waste NQ, GN, explosives, and propellants of various formulation have been burned and/or detonated at this site. Releases to the soil were reportedly evident, as indicated by stained soils observed at the time of a site visit conducted in 1990. This unit is currently listed on SFAAP's RCRA Part A Application; and the Subpart and Part B Application. Physical remediation is complete and the final report was submitted to the EPA and KDHE in 2000. Final clean closure acceptance by regulatory agencies was received in 2000. No further action is needed at this site. The wells will be closed under SAAP-018.

SAAP-024 (SWMU 24) Nitroglycerine And Paste Mix Area

The NG and Paste Mix Areas (149 acres) are located in the central portion of SFAAP. NG manufacturing in this area began prior to the end of World War II and continued until 1971. Two operating lines provided nitrated glycerine for use in the paste area. There were several recorded instances where NG spilled onto the soil in the NG area. The amount of NG spilled ranged from 1-2 lbs to a 1,200 lbs spill in August of 1944. This site drains into Pyott's Pond. The buildings have been removed. Field observations in 1985 indicated the main ditch contained between ten and fifteen inches of stagnant water, with grass present throughout most of the length. Investigation activities identified 11 sumps as possible explosive hazards. The sumps have been fenced to limit access. Remote sampling of the 11 sumps and ditches in FY04 indicated that NG concentrations are well below explosive levels and therefore no Explosive Safety Submission is required. Elevated levels of lead in soil and surface water were detected, probably resulting from drainage from the paste area. This site also includes the piping from the 11 Nitrator buildings to their respective sumps, and the areas immediately around the buildings, due to documented spills. This site also includes potential residual contamination in the paste mixing area. Additional RFI investigations will be performed to fully define the extent of contamination around the paste mix buildings, Nitrator, rest houses, and sumps. Remedial activities will include excavation, treatment (blending) and hauling ~15,000 cy of materials to an off-site disposal facility. Five years of LTM will be conducted.

SAAP-025 (SWMU 25) Nitrocellulose Area Ditches

The NC Area Ditches (4,100 linear feet) are located in the north central portion of SFAAP. This site consists of the ditches leading from the NC Area to Pond A. NC is prepared by the reaction of cotton linters (cellulose) and a mixture of nitric and sulfuric acids. NC was produced during two periods, 1943 through 1960, and 1965 through 1971. Nitrocellulose was detected in the ditch sediments during initial RFI activities. Initial sample data were found to be unreliable, therefore the site must be re-sampled. Currently, the site is being re-sampled. Additional RFI activities will be performed to fully define the extent of contamination in FY04-FY05. Remedial activities will include excavation, treatment and disposal of ~1,500 cy (2,500 linear feet of ditch soil) of contaminated sediment. Five year of LTM will be conducted.

SAAP-026 (SWMU 26) Single Base Propellant Area, Waste Water Settling Sumps

The Single Base Propellant Area (501 acres) consists of a series of buildings in the north-central portion of SFAAP. Single base propellant for small arms, cannon, and rockets was produced in this area during the periods of 1943-1948, 1951-1960, and 1965-1971. Solvents (acetone, alcohol, ether) were used in the Single Base Propellant process. There were four different types of production buildings in this area numbered 1600, 1650, 1700 and 1725 series. There were wastewater sumps adjacent to each of the 1600 and 1650 series buildings, which were designed to settle out solids from the building's wastewater. Flow equalization tanks were located adjacent to each of the 1700 and 1725 series buildings. Each of these tanks was covered by an open wooden grate. Wastewater from the sumps and tanks was discharged to a collection sewer, which eventually discharged to open ditches. These ditches discharged west into Captain Creek. The three southeast buildings' wastewater drained east and eventually discharge into Pond A. At the time of the USAEHA study in 1985, all the sumps contained standing water, soil, and pieces of rotted wood from the baffles, all of which appeared to have partially decayed. The buildings in this area were undergoing removal via demolition and burning in 1990. At the time of the 1992 site visit, some of the buildings which fed the sumps had already been removed. Remediation will consist of soil removal from impacted areas outside the building foundations and drainage areas. Initial samples were found to be unreliable; therefore, the site must be re-sampled. Additional RFI sampling activities will be performed to fully define the extent of contamination around building foundations and ditches. Visual inspections will be conducted in areas not sampled. Remedial activities will include excavation and disposal of ~2,400 cy of contaminated soil around the building foundations. Confirmatory sampling for metals, phthalates, and NC will be conducted at 50-foot intervals in ditches and one sample per building sump. Five years of LTM will be conducted.

SAAP-027 (SWMU 27) NQ Area SAC & LWTP Evaporative Lagoons

The NQ LWTP Evaporative Lagoons Area (10 acres) are located in the northwest portion of SFAAP. The Sulfuric Acid Concentrator (SAC) Liquid Waste Treatment Plant (LWTP) went into operation in 1984. It consisted of a 45,000-gal tank for distillate and a 17,000-gal tank for other corrosives. It received corrosive distillate from the SAC and some corrosive wastewater from the NQ production processes. Lime neutralizers were added to the acidic wastewater, which then flowed into the two Evaporative Lagoons located south of the LWTP. The wastewater transfer line from the LWTP to the evaporative lagoons had documented releases. The lagoons were constructed in 1984. At the time of the 1987 investigation, the lining of the lagoons appeared damaged. Observations of higher soil moisture and occasional small amounts of water at the base of the berm on the west side of the southern lagoon indicated releases were occurring. The lining was replaced. It was reported that when the liner was replaced in one of the lagoons, the breaks in the old liner indicated that release to the underlying soil did occur. In 1996, the lagoons were remediated and dismantled under an agreement with KDHE, constituting partial fulfillment of requirements for lagoon closure. The lagoons have been capped and final grading and seeding was designed for minimal surface water infiltration and erosion. Confirmation soil samples were collected in FY02 along the LWTP transfer line. In FY04, LWTP transfer line was excavated and disposed. Ten years of LTM will be conducted.

SAAP-028 (SWMU 28) Waste Calcium Carbide Treatment Area

This site is a state regulated unit and was closed outside of the ER,A program. No further action is planned under the IRP.

SAAP-029 (SWMU 29) Industrial Wastewater Lagoons

This site is a state regulated unit and was closed outside of the ER,A program. No further action is planned under the IRP.

SAAP-030 (SWMU 30) Pesticide Handling Area

The Pesticide Handling Area (20 acres) is located in the north central portion of SFAAP, with a new building erected a short distance from the old structure that it replaced. The old facility and its surrounding area were reportedly cleaned of pesticide residues. The new facility met USAEHA's Criteria for Design of a Pest Control Shop, Pesticide Storage and Mixing Facility. It has been in operation since 1984. The facility contains four sumps, one in each area: the pesticide storage room, the herbicide storage room, the inside mixing room and the outside mixing area. All liquid within the sumps is recycled into formulations, and there is no discharge from the sumps. No spills or releases have been recorded for this site. During a Preliminary Review site visit to the Pesticide Handling Area in 1990, an aqua-blue stain was evident at the outside sump and outside the pesticide building. It was identified as a dibromide solution which is sprayed in areas where herbicides/pesticides are used. Any contamination is assumed to have resulted from operations at the former area. It was also noted that stressed vegetation was observed leading from the shop and following a newly constructed road; however, SFAAP personnel indicated an underground steam line in the area may have impacted the vegetation. Initial samples were found to be unreliable; therefore, the site must be re-sampled. Additional RFI activities will be performed to fully define the extent of contamination. Potential remedial activities may include excavation and disposal of ~1,500 cy of pesticide-contaminated materials to an off-site facility. Confirmatory sampling will be performed.

SAAP-031 (SWMU 31) Contaminated Waste Processor/ Evaporative Lagoon

The Contaminated Waste Processor (CWP) and Evaporative Lagoon (8 acres total) are located in the central portion of SFAAP close to its western border. The CWP is an incinerator measuring ~40 x 60 ft. The CWP was designed to incinerate materials contaminated or suspected of being contaminated with explosives, and to decontaminate (flash) explosive-contaminated metal prior to salvage. Because the CWP could only handle materials with residual amounts of explosives, the waste materials to be incinerated were checked to insure they did not contain pockets of explosives. Waste residuals from the CWP were also analyzed for EP Toxicity. If results indicated the waste was hazardous it was treated/disposed off-site at a hazardous waste treatment facility. Otherwise it was landfilled on-site. The CWP operated between 1982 and 1996. Three existing monitoring wells have been in place around the lagoon since 1981. There is a potential for trace concentrations of explosives and propellant compounds such as NG, DNT, and soluble lead to be present after incineration. While these would not be explosion or fire hazards, they may be soluble and could potentially contaminate groundwater. Initial RFI results indicated the presence of phthalates in the soil samples. No contamination has been found in the groundwater. Additional RFI activities will be performed to fully define the extent of contamination. A remedial action including excavation, treatment, and disposal of ~800 cy of contaminated soil will be performed. Confirmatory sampling will be conducted. The lagoon will be closed in accordance with KDHE Non-hazardous Industrial Wastewater Lagoon Closure requirements.

SAAP-032 (SWMU 32) Lead Decontamination And Recovery Unit

The Lead Decontamination and Recovery Unit (0.7 acres) is located on the central portion of SFAAP near the western border. The facility borders the Captain Creek flood plain. Surface drainage is toward a southwest drainage ditch which subsequently drains west near the Old Explosive Waste Burning Ground (SWMU 22) to Captain Creek. Some runoff also eventually drains into an oxbow lake near Captain Creek. The site consists of a small building and melting rack within a paved area, and encompasses approximately one half acre. The Recovery Unit was in operation from 1943 to 1970. Contaminated lead recovered from routine maintenance activities in the acid, NG, and propellant manufacturing buildings was placed on a rack and suspended over a tank. An overhead heater melted the lead, which then dropped into the tank. The lead was drained into molds and made available for salvage. Lead solids have been observed scattered throughout the site. Lead is the primary constituent of concern at this site. It is somewhat soluble under acidic conditions. RFI results indicated lead in soil above action levels. An underground storage tank (UST) was removed from this site under the UST

program. Fuel oil contaminated soil associated with the UST was addressed under this site. The CMS was completed and the lead contaminated soil (803cy) was excavated, treated and disposed off-site in FY02. One round of groundwater sampling was conducted in December 2004 (under SAAP-022); no contaminants were found above action levels. UST soil removal has been completed and the site has been closed. No further action is planned for this site.

SAAP-033 (SWMU 33) Paste Area Half Tanks And Ditches

The Paste Area is located in the central portion of SFAAP just northeast of the NG Area. The Half Tanks in this area received wastewater from wash down of propellant processing equipment and buildings in the Paste Area, and possibly from buildings in the NG Area as well. They were used between the mid 1960s and 1971. The tanks discharged into 2 unlined settling ponds, then to Pyott's Pond. There are 2 steel Half Tanks (area totaling 1 acre) located up gradient from each of the settling ponds and are designated Half Tank 33/34 and 33/35. The 33/34 tanks are located southeast of the Paste Area between the Five Corners Settling Ponds and the Paste Sump, and the 33/35 tanks are located northwest of the Paste Area near the NG Settling Ponds. According to a survey, the settling ponds were abandoned and in disrepair. As a result, unidentified quantities of NC and NG were known to be in and around the lagoons. Reportedly, overflowing of the metal flumes and half tanks occurred. There was no secondary containment. The IRA occurred in FY02 and consisted of removal and decontamination of the Half Tanks, removal of ~60 cy of impacted soils from the Half Tanks and ~700 cy of contaminated soil from drainage ditches extending from each tanks to its stream discharge point. Confirmation samples were collected to verify that remaining soils met KDHE requirements. The ditches extending from the Half Tanks, up gradient to the source area, will be remediated as part of the SWMU 24 cleanup. Four years of LTM will be conducted.

SAAP-034 (SWMU 34) Five Corners Settling Ponds

The Five Corners Settling Ponds (0.4 acres) are located in the central portion of SFAAP, immediately south of the Paste Area and immediately east of the NG Area. There were 2 earthen, unlined ponds (5A, 5B), each ~40 ft in diameter. The ponds were used periodically from the early 1950s to 1971. There are no containment berms surrounding these ponds. The Settling Ponds received NG wastewater resulting from the wash down of equipment and buildings and from sprinkler trips. RFI results indicated the presence of lead, nitroglycerin, nitrocellulose, and SVOCs in soil. The IRA occurred in FY02 and consisted of removal of 900 cy of contaminated soil and re-grading. This site will be closed.

SAAP-035 (SWMU 35) Nitroglycerin Area Settling Ponds

The NG Area Settling Ponds (0.4 acres) were located in the central portion of SFAAP, at the northeastern edge of the NG Area just north of the Paste Area. The 2 ponds (6A, 6B) were used periodically from the early 1950s to 1971 to receive wastewater resulting from the wash down of equipment and buildings, and from sprinkler trips. The propellant solids and sludge which settled in the ponds were occasionally removed during production and burned at the burning grounds. These ponds were investigated in 1985 and designated as Pond 6A (the southern pond) and Pond 6B (the northern pond). During site visits in both 1985 and 1987, Pond 6A was reported to contain approximately 16 inches of standing water, while Pond 6B was dry. Both ponds contained ~12-18 inches of sediment which appeared to be soil. RFI results indicated the presence of lead, nitroglycerin, nitrocellulose, and SVOCs in soil. The IRA occurred in FY02 and consisted of removal of 1,300 cy of contaminated soil and re-grading. Four years of LTM will be conducted. Replace one groundwater well.

SAAP-036 (SWMU 36) N-Line Area

The N-Line (301 acres) is located in the south central portion of SFAAP. Production occurred in this area during three periods of operation: 1943 through 1946; 1951 through 1960; and 1965 through 1971. In this area the final machining and inspection of extruded and cut propellant grains occurred. Off-spec materials and trimmings were sent to a grinding mill and then back to the F-Line Area for re-blending. Wastewater originated primarily from floor and equipment washing and flowed through floor drains into unlined ditches which lead to a small tributary of Spoon Creek. There were ~20 eastwardly trending ditches and 2 concrete settling sumps. During several site visits in the late 1980s, the ditches were reportedly well vegetated, except those which received storm water. Propellant solids containing NG and lead salts settled in these ditches. The propellant formulations stored in this area were single or double base and were generally reactive. The N-Line was known as the solvent-less propellant area along with the F-Line. The RFI report states that risks due to the ingestion of groundwater by residential receptors exist. The RFI recommended CMS and removal action. Propellant and lead contaminated soil was identified during the RFI. Lead and nitroglycerin were found in groundwater. In 2001, this site was increased in size. This additional area will need to be investigated. The two Tunnel Dryers (SAAP-043) within this SWMU boundary will be investigated and cleaned up under this site. Additional RFI activities will be performed to determine extent of contamination. Remedial activities will include excavation and disposal off-site of ~16,000 cy of contaminated soil. Waste propellant will be removed from the two sumps and confirmatory sampling will be conducted. Contaminated soil includes ~1,000 cy from a leaking UST containing POL products.

SAAP-037 (SWMU 37) Sandblast Areas

Sandblasting occurred in several locations (totaling ~3 acres) during various periods of operation. From ~1964 to 1969, an area east of the former Maintenance Office Building 245-3 was used for sandblasting. Between 1980 and 1984, an area west of the Paint and Sign Shop Building 504 was used. Additionally, documents indicate an area south of the Equipment Storage Building 566-1 was used. It is believed this area was used prior to 1980, but records of this use were not available. Sandblasting was used to prepare equipment such as motors, pumps, pipes, trailers and heavy equipment for painting and preservation. The bulk of the sand recovered was disposed in the sanitary landfill; however, residual sand was left on the ground in these areas. In addition, sand was not contained during the sandblasting operations and was therefore able to migrate through the air. The primary concerns at these sites are paint wastes and their constituents, especially metals such as lead, chromium, and cadmium. Initial samples were found to be unreliable; therefore, the site must be re-sampled. Additional sampling will be completed. The project will proceed with excavation, treatment and disposal off-site of 3,000 cy of contaminated soil.

SAAP-038 (SWMU 38) Oil Water Separator

The Oil Water Separator (0.5 acres) was located in the north central portion of SFAAP. It began operation in 1971 to service the auto maintenance shop located in Building 542. A majority of the flow to the separator was derived from the floor drain in the car wash bay. Additional wastewater sources include rainwater and condensate from steam radiators used to heat the building. Although no oil or grease was reportedly dumped into the drains leading to the separator, a small quantity of sludge collected in the tank. Sludge was removed from the tank in 1987 and tested for TCLP prior to transfer to the Sanitary Landfill (SWMU 18). This was the first recorded removal of sludge. During a site visit in 1990, the integrity of the tank was questioned because there was influent to the separator, but the tank did not appear to be filling. Oil stains and bare ground were noted under and downgradient of the half tank. It was also indicated that there was visual evidence of potential release to the surface water and soil. Initial samples were found to be unreliable; therefore, the site was re-sampled in January 2004. Complete the RI report in FY05. Excavation and off-site disposal of 500 cy of contaminated soil may be needed.

SAAP-039 (SWMU 39) South Acid Area Ditches

The South Acid Area Ditches (11 acres) is located in the east central portion of SFAAP. Two primary drainage ditches originate near the Calcium Cyanamide Disposal Area (SWMU 40). A third influent ditch from the NG and Paste Mix Areas joins the west ditch. All three ditches discharge into Pyott's Pond. During a site visit in 1990, the surface water observed in the east ditch was tinted orange; a white precipitate was observed along both ditches. Reportedly the orange color was caused by the neutralization of acidic ferrous sulfate and sulfuric acid with hydrated lime. The sediment was reported to contain ferrous sulfate and calcium sulfate. Wastes handled at this site include sulfuric and nitric acids, and wastes from the SAC LWTP which may have contained NQ. Initial samples were found to be unreliable; therefore, the site must be re-sampled. A large portion of the re-sampling effort has been completed. No contamination requiring remedial action has been found. A limited soil removal may be needed.

SAAP-040 (SWMU 40) Calcium Cyanamide Disposal Area

The Calcium Cyanamide Disposal Area (2 acres) is located in the east central portion of SFAAP. Waste from the operation of the NQ pilot plant was disposed of in a natural ravine at this site. Calcium Cyanamide was generated for wet guanidine nitrate (GN) production and delivered to the NQ pilot plant from the main NQ Area. Whenever the carbide content was too high for acceptance at the pilot plant, the calcium Cyanamide was taken to the Calcium Cyanamide Disposal Area. The calcium Cyanamide sludge was disposed of in this area for only a 3-month period in 1982. The waste material, consisting of calcium Cyanamide and fluorspar, was later covered to form a landfill, and enclosed by a barbed-wire fence. The fenced-in area comprises approximately one acre; however, less than half of the area was actually used for disposal of the calcium Cyanamide waste. The 200' X 60' disposal area is located in the northeastern portion of the landfill, an area which is now a grassy plateau which slopes downward ~15 ft. An evaporation pond is located in the southwest portion of the landfill. White and black stains were observed along the edges of the pond during site visits in 1989 and 1990. There is some concern that the surface water runoff from this site drains to Pyott's Pond via the South Acid Area Drainage Ditch discussed in the previous section (SWMU 39). Initial samples were found to be unreliable; therefore, the site must be re-sampled for SVOCs, VOCs, metals, sulfates and cyanide. Additional RFI activities will be conducted to determine the extent of contamination. Approximately 5,000 cy of waste will be removed from the disposal area.

SAAP-041 (SWMU 41) Calcium Carbonate Cake Landfill

The Calcium Carbonate Cake (CCC) Landfill (2 acres) is located in the west central portion of SFAAP. It measures ~350 x 315 ft and was operated from May 1986 to June 1988. Between May 1988 and December 1991, the CCC was provided to farmers rather than landfilled. This practice was discontinued in December 1991. Initially, containerized CCC was disposed of at this site, but later uncontainerized CCC was deposited. The source of CCC was NQ production. CCC is a byproduct of GN manufacturing. GN is an intermediate product of NQ. A leachate collection system was installed in the CCC Landfill at the time of construction. The leachate in the collection system tank is monitored. During a site visit in 1990, it was noted that the landfill cap was cracked, vegetative cover was sparse, and erosional features had developed. In 1998, the landfill cap was repaired and graded to minimize erosion. Also, new ground cover was established. All work was inspected and accepted by KDHE representatives. Per KDHE's requirement, additional wells were installed in FY02. Thirty years of LTM will be conducted. The cap is maintained with non-IRP funds.

SAAP-042 (SWMU 42) Temporary Sanitary Landfill

The Temporary Sanitary Landfill (3 acres) is located in the west central portion of SFAAP, adjacent to the CCC Landfill discussed in the previous section (SWMU 41). It was used to manage non-hazardous

solid waste consisting of general trash and sanitary waste. CCC was initially landfilled in the first cell; however, that practice was discontinued. During the site visit in 1992, it appeared that the landfill consisted of three cells. The cap is maintained with non-IRP funds. Groundwater monitoring will be addressed under SAAP-041.

SAAP-043 (SWMU 43) Tunnel Dryers (CCC Storage)

There are a total of six Tunnel Dryers (8 acres); all were used for temporary storage of CCC. Four of the dryers are located in the west central portion of SFAAP. The 2 remaining dryers are located in the southern portion of SFAAP and will be handled under SAAP-036. The dryers began operation in 1986. Each dryer measures ~125 x 18 ft, with 6 ft high walls, and each has a leachate collection system. CCC was a byproduct of the GN step of the NQ production process. The CCC was loaded into dump trucks via conveyor in the NQ area and transported to the tunnel dryers. The CCC was dumped into the dryer and arranged using a front-end loader. The product was ultimately offloaded from the tunnel dryers by vendors. The tunnel dryers are not enclosed. During a site visit in 1990, it was observed that CCC had been tracked beyond the walls of the tunnel dryers by the trucks loading and unloading at the site. Initial groundwater samples were found to be unreliable; therefore, the site must be re-sampled. The extent of soil contamination has not been determined. Additional RFI activities will include sampling of soil and groundwater. Five new wells will be installed and monitored for five years.

SAAP-044 (SWMU 44) Tank T784

Tank T784 (1 acre) is located in the northwest corner of the NQ area in the northwest portion of SFAAP. Limited production began in the NQ Area in 1981. Tank T784, also known as Structure 9049, is a vertical steel above ground wastewater collection tank which held cooling tower blowdown water, NQ crystallizer condensate, GN evaporator condensate, and non-contact cooling water. A pipe discharged the wastewater from T784 into the River Water Treatment Plant (RWTP) Lagoons (SWMU 2), via an underground transfer line. This pipe follows the north plant boundary before turning directly north towards the lagoons. Several releases have occurred as a result of breaks in the RWTP Lagoon transfer line. Tank overflows have also occurred. There are no spill containment structures for the tank. Initial samples were found to be unreliable; therefore, the site was re-sampled. The RFI report was finalized in March 2005. No further action is needed.

SAAP-045 (SWMU 45) Building 9040 (Calcium Cyanamide Conveyors & Storage Unit)

Building 9040 (2 acres) is the wet GN building. It is located in the central part of the NQ Area in the northwestern portion of SFAAP. The NQ Area began limited production in 1981. Calcium Cyanamide was produced in Building 9004 and transferred via belt conveyor to Building 9040 for use in the GN process. The belt conveyor, which lead to storage bins located on the east side of Building 9040, is enclosed in an elevated, sheet metal galley way. There are four 175-ton storage bins. Calcium Cyanamide was released at the bins because of problems with the screw conveyors used to transport material from Building 9004. A concrete pad was constructed in a small portion of the area under the storage bins; however, the pad was too small to effectively contain the spillage, especially in windy conditions. Bare spots were observed in areas near the storage bins. A drainage divide is located in the NQ Area running east of Building 9040. It separates the Captain Creek drainage area from the area drained by unnamed creeks flowing northward toward the Kansas River. Initial samples (1995) were found to be unreliable; therefore, the site was re-sampled in 2003. The preliminary results indicate that the nitrate plume is not leaving SFAAP. Additional RFI activities included a hydrologic assessment and collection of geotechnical and geochemical data to facilitate a technology evaluation of potential remedies to address nitrate-contaminated groundwater. A RFI Addendum, which included the Risk Assessment, was completed in FY05. It is anticipated to recommend LTM only. Ten years of LTM will be conducted.

SAAP-046 (SWMU 46) Decontamination Oven

The Decontamination Oven (2-acre site) is located in the northeast portion of SFAAP. The oven was constructed in 1970 and was used to decontaminate oversized equipment/materials contaminated with trace explosives. There were no secondary containment features at this site (PRC, 1990). Only trace explosives were treated in this area. It may have been possible for volatile contaminants to be released via the exhaust fan during heating. Lead may have been released from the equipment and vehicles decontaminated at this site. Initial samples were found to be un-reliable, therefore the site must be re-sampled. Additional soil samples will be taken. It is expected that ~400 cy of contaminated soil will be excavated and disposed off-site.

SAAP-047 (SWMU 47) Nitroguanidine Production Area Sumps

The NQ manufacturing facilities are located in the northwest corner of SFAAP. Construction of these facilities began in the late 1970s with limited production during 1981. In August 1984, the plant began bulk production of NQ, and ceased bulk production in August 1992. There are 25 sumps (0.7 acres) in the NQ Area. Each of the production buildings had dedicated sumps outside the buildings which received wastewater generated by operations in the NQ Area. The wastewater resulted from equipment washdowns, spills, runoff, and non-contact operations, such as cooling water and steam condensate. The wastewater may have been acidic and may potentially have contained contaminants such as NQ and GN, as well as raw process materials or intermediates of the NQ process. RFI results indicate elevated levels of nitrates in groundwater and the soil around the sumps of Bldg 9040. Elevated levels of sodium were also detected. A RFI and focused CMS will be completed to confirm contaminant characteristics and evaluate potential remediation options. Remediate all of the 25 sumps (14,800 cy removal and landfarm). 2,500 cy of concrete debris will be disposed of as solid waste. Five years of LTM will be conducted.

SAAP-048 (SWMU 48) Nitroguanidine Support Area

The NQ Support Area (6 acres) is located in the north central portion of SFAAP in Buildings 2000 and 2012. The equipment included dryer bays, aboveground storage tanks, and half tanks. This was the location of the pilot-scale production plant known as the NQ Support Equipment (NSE) facility. The NSE facility was constructed during 1977-1980 and was operated periodically as a partial prove-out from May 1979 to June 1984. In August 1984, the main NQ plant began production. The majority of the pilot plant was demolished sometime following shut down; however, Buildings 2000 and 2012 are still present. This site was the location of the former nitrocellulose production facility, used from 1942-1971. RFI results indicate the presence of elevated levels of nitrates, NQ, GN and sulfates in soil and groundwater. The Army is currently determining lateral extent of the plume. Seven years of LTM will be conducted.

SAAP-049 (SWMU 49) Road Just Southeast Of The Sanitary Landfill

The road just southeast of the Sanitary Landfill is located on ~6 acres near the central western border of SFAAP. Along the road located just east of the Sanitary Landfill (SAAP-018) is a steep slope, which, upon inspection, revealed the presence of drums, construction rubble and other refuse apparently, underlying the road. It appears the road may have been built over the landfill or may be comprised of fill from the landfill to construct the road base. A geophysical survey indicated the presence of subsurface anomalies south of SAAP-018 that may include metal objects. During investigation of SAAP-018, track excavator was used to delineate extent of waste disposal area. No waste was detected. No further action is anticipated at this site.

SAAP-050 (SWMU 50) Disposal Site East Of The Classification Yard

SAAP-50 consists of two areas. The first area (50 north) is an abandoned dump site (6.5 acres) that was discovered just inside the eastern boundary of SFAAP near Kill Creek. The second area (50 south) consists of another abandoned dump site (3.2 acres) immediately adjacent to the other area. The debris scattered about both sites includes shingles, drums and metal slag. An interim removal was accomplished in FY97. Additional debris was removed and rip-rap was placed over select areas to stabilize the bank in 2000. In FY04, limited debris removal and cover stabilization was conducted on an exposed disposal area on the north disposal site. Thirty years of cover maintenance will continue.

SAAP-051 (SWMU 51) New Reclamation Yard

The New Reclamation Yard is located on ~8 acres in the north central portion of SFAAP and includes the Battery Handling Area. The yard was used to stage scrap materials and excess equipment. Scrap was decontaminated to 5X standards prior to sale or reclamation. In the battery handling area, battery parts were observed on the ground. Wastes typically associated with batteries include acids and metals, particularly mercury, lead and/or cadmium, depending upon the type of battery. Initial samples collected in the battery handling area were found to be unreliable; therefore, the site must be re-sampled. As a result of the EBS, this site was expanded from just the Battery Handling Area to include the entire Reclamation Yard. Additional samples were collected to characterize the entire Reclamation Yard. The RFI report will be finalized and a CMS will be completed. Approximately 3,200 cy of metals-contaminated soil will be excavated, treated and disposed. Confirmatory sampling will be conducted.

SAAP-052 (SWMU 52) Paint Bay Building 542

Building 542 (0.4 acres) is located in the north central portion of SFAAP. A paint bay, located within the building, was used to repaint vehicles. Fumes and overspray were vented through the side of the building where stressed vegetation has been observed. Wastes typically associated with paint bays include volatile organics and metals such as chromium, cadmium and lead. Initial samples were found to be unreliable; therefore the site was re-sampled in 2003. The preliminary results indicated no contamination above regulatory levels for unrestricted use. A closure certificate will be completed.

SAAP-053 (SWMU 53) Burn And Debris Area North Of STP

The Burn and Debris Area North of STP (Sewage Treatment Plant) is located on ~5 acre in the northeast portion of SFAAP. A sequence of aerial photographs taken of SFAAP beginning in 1941 and ending in 1991 show the old Burn and Debris Area. An inspection was done on September 18, 1997. A wood pile is still there, but the road is covered over with vegetation. The debris begins around the fence line near the main road by the sewage treatment plant. It is comprised of construction debris including heavy duty concrete rubble, rusted out 55-gallon steel drums, glass rubble, broken insulators, pipe debris, wood scraps, telephone poles, wire fencing, concrete pipe pieces, iron scraps and asbestos materials. The debris covers ~1 acre and extends from the fence line, following the creek until reaching the open area where a quarry existed. Debris is on both sides of the creek and in the creek bed itself. RFI funded in FY04. Complete the RFI in FY05. A CMS will be conducted. Soil/debris removal and treatment (~500 cy) may be needed. Five years of LTM will be conducted.

SAAP-054 (SWMU 54) Fluorescent Tube Wells

SAAP-054 is three Fluorescent Tube Wells (totaling less than 1 acre). One well is located in the northwestern portion of SFAAP, east of the NQ production area. A second well is located in the northeastern portion of SFAAP, southeast of building 211. The third well is located in the east central

portion of SFAAP, south of the Ballistics Area. The sites consist of hand dug water wells that were part of old pre-SFAAP homesteads. One of the wells is five feet in diameter, about twelve feet deep and lined with concrete. This well was used as a fluorescent tube disposal pit. It is uncertain when this occurred, but is suspected to have taken place prior to 1976. The well was uncovered and full of water. Fluorescent tubes contain mercury. An additional two wells were identified as being used for fluorescent tube disposal. The broken fluorescent tubes and contaminated soil were removed from all three wells. This site includes the well identified in the Environmental Baseline Survey (EBS) prepared for the Army by Aguirre Engineers, dated October 1998, as being located in Parcel 1-7(4)HR. All three wells were closed in accordance with KDHE well abandonment requirements in 1994 (TIM). Install monitoring wells and sample to verify that the contents of the three wells did not have an adverse impact to groundwater.

SAAP-055 (SWMU 55) Old Administrative Buildings

The Old Administrative Buildings are located in the northeast portion of SFAAP. SWMU 55 is soil with potential lead-based paint contamination next to the Old Administration Buildings. This SWMU is located in Parcel 1-1(1) shown in the EBS. Lead-based paint removal is not ER,A-eligible. Lead contamination will be addressed if the buildings are demolished by the future land owner. In FY05, non-ER,A funds may provide for a site characterization.

SAAP-056 (SWMU 56) Well South Of Facility 211

The Well South of Facility 211 is located in the northeast portion of SFAAP. SWMU 56 is the area of nitrate/nitrite contamination in the area south of Facility 211. Contamination has been documented in a monitoring well south of this facility. This SWMU is located in Parcel 1-25(7)HR(P) shown in the EBS. Groundwater and soils were sampled by USACHPPM in March 2003. None of the soil results exceeded EPA Region IX PRGs. No contamination was detected in the groundwater. USACHPPM's March 2003 RRSE Report recommended no further action at this site. However, KDHE wrote letter recommending the Army conduct additional sampling, specifically two years of semi-annual groundwater monitoring for nitrates. SI phase will be re-opened to take additional samples.

SAAP-057 (SWMU 57) Chemical Preparation House

The Chemical Preparation House (Facility 507-2) is located in the north central portion of SFAAP. Chemicals may have been disposed on the ground outside of this building. This SWMU is located in Parcel 1-27(7)HR(P) as shown in the EBS. Soil samples were collected by USACHPPM in March 2003. None of the samples exceeded background levels. USACHPPM's March 2003 RRSE Report recommended no further action at this site. However, KDHE wrote letter recommending the Army conduct additional soil and groundwater sampling. The SI phase will be re-opened to take additional samples.

SAAP-058 (SWMU 58) Combined Shops Area

The Combined Shops Area (24 acres) is located in the north central portion of the plant, and was used for maintenance activities and repairs. There are a total of 30 facilities in the area. The facilities include: three offices, the fuel oil unloading station, storage and distribution center, 12 storehouses, and nine shops. There was a Tram Repair Shop that was converted into a Heating Plant (Formerly Facility 522, Currently Facility 154-5). Several facilities in the Shop Area are visibly stained. This site is located in Parcel 1-28(7)HR(P) shown in the EBS. Groundwater and soils were sampled by USACHPPM in March 2003. PCE results in the groundwater exceeded the EPA Region IX PRGs. PCE, PAHs, lead, arsenic and manganese results from soil exceeded the EPA Region IX PRGs. Perform RFI to define areas

requiring excavation of contaminated soil. CMS will be completed. Excavate, treat, and dispose of 400 cy of contaminated soil. Three years of LTM will be conducted after soil removal.

SAAP-059 (SWMU 59) Laundry Facility

The Laundry Facility (Facility 4562) is located in the north central portion of the plant. This facility was used to launder worker clothing to remove process wastes and propellant contamination. The Laundry Shop was a single story facility with a concrete floor containing several sumps and drains. There were two fuel oil tanks located outside of the facility. This SWMU is located in Parcel 1-30(7)HR(P) shown in the EBS. Soil sampling was conducted by USACHPPM in March 2003. All results of the soil sampling were below EPA Region IX PRGs. However, KDHE wrote letter recommending the Army conduct additional soil and groundwater sampling. SI phase will be re-opened to take additional samples.

SAAP-060 (SWMU 60) Old Photographic Laboratory

The Old Photographic Laboratory (3 acre site) is in the southeast corner of the Old Administration Building No. 2 (Facility 214), which is located in the northeast portion of SFAAP. Wastes from the laboratory were commonly dumped into the sink, which discharged directly to soils behind the facility. Cleanup inside the building was handled outside of ER,A. This site is located in Parcel 1-31(7)HR(P). Soil was sampled by USACHPPM in March 2003. SVOCs and arsenic results exceeded the EPA Region IX PRGs. Finalize RFI Addendum in FY05. CMS will be completed. Excavate, treat, and dispose of 75 cy of contaminated soil from outside of the building.

SAAP-061 (SWMU 61) Environmental Laboratory (Facility 232)

The Environmental Laboratory (Facility 232) is located in the north central portion of the plant. The Environmental Laboratory was built in 1982 and contains sumps and drains. Past waste disposal practices are not documented. This SWMU is located in Parcel 1-32(7)HR(P) shown in the EBS. This was an active lab until Jan 2003. It is not ER,A eligible. Sampling (non-ER,A funded) inside and around building indicated no contamination above action levels. Therefore no further action is expected.

SAAP-062 (SWMU 62) Transformer Storage Warehouse (Facility 566-5)

The Transformer Storage Warehouse (Facility 566-5) is located in the north central portion of the plant. At the time of the EBS, this facility stored 149 replacement transformers. All of these transformers were removed off-site in FY03. Based on visual inspections, several stains were observed on the concrete floor, and some of the transformers stored in the facility were observed to be leaking. The facility is considered a potential area of concern. All of the transformers stored were tested for PCB content and were below 50 ppm; however, labels were lacking on most of the transformers. It was impossible to determine if all the stains noted were caused by the transformers stored at that time or by transformers previously stored at the facility. Cleanup and disposal of the transformers and building was administered outside the authority of ER,A. This SWMU is located in Parcel 1-34(7)HR(P)/PR(P) shown in the EBS. This site was remediated in 2004 (Non-ER,A funds) and no further action is expected.

SAAP-063 (SWMU 63) Water Towers

The Water Towers (7 acres total) are located throughout the plant. There are 8 water towers consisting of the north towers #'s 1, 2, 3 and 4 and the south towers #'s 5, 6, 7 and 8. The surface soil surrounding the Water Towers are contaminated with lead, originating from lead-based paint. The towers were painted several times before 1978, and sandblasted each time before they were repainted. Documentation was available to confirm that no measures were taken to contain the removed paint during or after sandblasting operations. Soil samples were collected by USACHPPM in March 2003. Arsenic and lead results exceeded EPA Region IX PRGs. Two other water towers located in the NC

Production Area will be remediated under SAAP-116 (AOC 16). Perform RFI to define areas requiring excavation of contaminated soil. Excavate, treat, and dispose of ~5,000 cy of contaminated soil.

SAAP-064 (SWMU 64) Paper Burning Ground

The Paper Burning Ground (3 acres) is located in the east central portion of the plant. A trench was observed on aerial photographs encompassing 200 X 30 feet. Contaminants may have extended to a depth of 5 feet below ground surface. This SWMU is located in Parcel 1-38(7)HR(P) shown in the EBS. Soil samples were collected by USACHPPM in March 2003. Arsenic results in soil exceeded the EPA Region IX PRGs. The soil results were used to estimate the potential levels of compounds in groundwater. Arsenic, chromium and lead are estimated for groundwater as exceeding the EPA Region IX PRGs. Perform RFI to define areas requiring excavation of contaminated soil. One well will be installed as part of the RFI. Excavate and dispose of ~1,600 cy of contaminated soil. Five years of LTM will be conducted.

SAAP-065 (SWMU 65) Tank Farm

The Tank Farm site (~22 acres) is located in the north central portion of the plant, Parcel 8-2(7)HR(P) as shown in the EBS. The tank farm received and processed recycled solvents which included alcohol, ether, and acetone. Numerous releases have been documented from within the Tank Farm. Although the tanks were removed, the foundations and saddles remain. This site has not been used since the 1960s. Groundwater and soil samples were collected by USACHPPM in March 2003. Arsenic and lead results for groundwater exceeded the EPA Region IX PRGs. Arsenic and benzo(a)pyrene results for soil exceeded the EPA Region IX PRGs. Perform RFI to define areas requiring excavation of contaminated soil. Excavate and dispose of 4,100 cy of contaminated soil. Five years of LTM will be conducted.

SAAP-066 (SWMU 66) Installation-Wide Stream Study

In Feb 2000, EPA ordered SFAAP to conduct stream monitoring. This site will be designated for sampling the installation-wide streams of Captain (10,861 linear feet), Hanson (6,900 linear feet), Kill (9,097 linear feet), and Spoon (18,506 linear feet) Creeks. Initial stream surface water and sediment sampling was conducted under SAAP-014, except for Hanson Creek, which was conducted under SAAP-002. Phase I of the stream sampling was completed in 2003. Phase I included sediment and surface sampling. Sediment sample contaminants above KDHE RSK residential soil to groundwater pathway values were arsenic, nitrocellulose and TPH-DRO. Surface water sample contaminants above KDHE RSK residential groundwater pathway values were manganese, dieldrin, di-n-octyl phthalate and lead. Phase II is completed, which included surface water sampling only. Phase III includes surface water sampling to characterize changes over time. This sampling is planned for FY05. The RFI will be completed. ~75 cy soil removal may be needed.

SAAP-067 (SWMU 67) South Acid Area

The South Acid Area (26 acres) is located in the east central portion of SFAAP, and consists of tanks, troughs, pipes and other conveyances. The plant manufactured nitric and sulfuric acids. This area was used from 1942 to 1980. This site includes the areas identified as AOC 7-Former Truck Maintenance Shop in South Acid Area, AOC 8-Former Fuel Oil Storage Tank in South Acid Area, and AOC 9-Oil and Paint House in South Acid Area. The ditches from the South Acid Area to Pyott's Pond are included in SAAP-039. Groundwater and soil samples were collected by USACHPPM in March 2003. None of the groundwater results exceeded EPA Region IX residential PRGs. Benzo(a)pyrene, lead and arsenic results in soil exceeded the EPA Region IX PRG. Perform RFI to define areas requiring excavation of contaminated soil. Excavate, treat, and dispose of ~15,600 cy of contaminated soil. Five years of LTM will be conducted.

SAAP-101 (AOC 1) Monitoring Well West Of Old Admin Area

The Monitoring Well West (32 acre site) of the Old Administration Area is located in the northeast portion of SFAAP. AOC 1 is the area of nitrate/nitrite groundwater contamination west of the Old Administration Area. Contamination has been documented in a monitoring well in this area. This AOC is located in Parcel 1-26(7)HR(P) shown in the EBS. The Army funded sampling in 2003 for nitrates in groundwater and found detections right at the action level. Currently, the source of the nitrates is unknown. Three years of LTM will be conducted.

SAAP-102 (AOC 2) Main Electrical Switch Yard

The Main Electrical Switch Yard (Facility 154-4) is located in the center of the plant. Based on interviews with former employees, a transformer fire resulting from a lightning strike occurred around 1945. The majority of the transformers (assumed to contain PCBs based on the time period) were said to have been destroyed by the fire. This site was active until 2003. This AOC is located in Parcel 1-29(7)HR(P) shown in the EBS. The transformers were removed in 2003. This site was remediated in 2004 with non-ER,A funds. Therefore, no further action is expected.

SAAP-103 (AOC 3) New Photographic Laboratory

The new Photographic Laboratory (Facility 227-18) (0.2 acres) is located in the north central portion of the plant and operated between 1990 and 1998. Based upon interviews, a common waste disposal practice in the photography laboratories was to dispose of the wastes in the sinks. The location of the sink drain outfall has not been identified. Because this facility was active after 1986, it is not eligible for remedial action under ER,A. This AOC is located in Parcel 1-33(7)HR(P) shown in the EBS. In 2004, this site was investigated with non-ER,A funds. No contaminants were found above action levels. No further action is anticipated at this site.

SAAP-104 (AOC 4) Disposal Area Southeast Of STP

The Disposal Area (0.3 acres) Southwest of the STP (Sewage Treatment Plant) is located in the northeast portion of SFAAP. This AOC is the area southwest of the STP where several trenches were noted on historical aerial photographs. This area may have been the Mess Hall Landfill. This AOC is located in Parcel 1-37(7)HR(P) shown in the EBS. Sampling by USACHPPM in March 2003 identified arsenic in the subsurface soil and surface soil as exceeding EPA Region IX PRG screening levels. However, the detections were below background levels. USACHPPM's March 2003 RRSE Report recommends no further action at this site. However, KDHE wrote letter recommending the Army conduct additional soil and groundwater sampling. The SI phase will be re-opened in AEDB-R in spring 2005. Additional soil and groundwater samples will be taken. Back hoe trenching will be conducted for two days.

SAAP-105 (AOC 5) Cannon Range Tunnels (Facility 303)

The Cannon Range Tunnels are located in the eastern portion of SFAAP. The Army fired 2.75 inch inert rockets into these tunnels at this site. During the 1998 EBS site investigation of the Cannon Range Tunnels (Facility 303), it was noted that 32, 55-gallon drums were stored within the southern tunnel. It was later determined that these drums contained investigation-derived waste. Iron piping material, commonly used for explosive reactivity testing, was observed in the drums. The greatest potential for surface soil contamination was anticipated to be along the firing line leading from the platforms to the tunnels and within the tunnels. During a 1988 RI field program conducted at the Cannon Range, six

surface soil samples were collected downrange of the firing line and a composite sample was collected from each tunnel. Samples were analyzed for priority pollutant metals, explosives, and TCLP. Analytical results indicate that explosives and metals were present in the soil at low levels. This AOC is located in Parcel 2-11(7)HR(P) shown in the EBS. All drums located in the Cannon Range Tunnels were moved to a central storage area for future disposal or if clean were disposed off-site. During USACHPPM's March 2003 RRSE sampling, arsenic was the only compound exceeding the EPA Region IX PRG value, but below background level. USACHPPM's March 2003 RRSE Report recommends no further action at this site. However, KDHE wrote letter recommending the Army conduct additional soil samples.

SAAP-106 (AOC 6) 35 Process Facilities Within F-Line Area

Thirty-five process facilities (89 acres) located to the west of the Press Housed in the F-Line Area, in the east central portion of the plant. AOC 6 is located in Parcel 2-18(7)HR(P) shown in the EBS. This parcel has been delineated to include each of the following facilities D120-7, F120-4, F120-8, 181-3, 563, 5815-1, 5815-2, 5815-3, 5816-2, 5822, 5823, 5837, 5850, 5861, 7803-1, 7803-2, 7803-3, 7803-4, 7814, 7815-1, 7816-1, 7816-2, 7816-3, 7826, 7827, 7828, 7832, 7866, 7868-1, 7868-2, 7868-3, 7868-4, 7871-2, 7897, and 7898. This site was handled under SAAP-010.

SAAP-107 (AOC 7) Former Truck Maintenance Shop in South Acid Area

SAAP-107 consists of the area where a methylene chloride release was detected in the South Acid next to the Former Truck Maintenance Shop. This AOC is located in Parcel 3-4(3)HR shown in the EBS. SAAP-107 is consolidated under SAAP-067.

SAAP-108 (AOC 8) Former Fuel Oil Storage Tank in South Acid Area

SAAP-108 consists of the area where a chloroform release was detected in the South Acid next to the Former Fuel Oil Storage Tank. This AOC is located in Parcel 3-5(3)HR shown in the EBS. SAAP-108 is consolidated under SAAP-067.

SAAP-109 (AOC 9) Oil and Paint House in South Acid Area

SAAP-109 consists of the area where a methylene chloride release was detected in the South Acid next to the Oil and Paint House. This AOC is located in Parcel 3-6(3)HR shown in the EBS. SAAP-109 is consolidated under SAAP-067.

SAAP-110 (AOC 10) Storage Magazines Not Part Of SWMUs 15 & 16

The 80 storage magazines (~541 acres) not included in SAAPs (SWMUs) 15 and 16, are on the southern end of the plant. These magazines were used to store processed powder and propellants. This AOC is located in Parcel 4-1(1) shown in the EBS. During USACHPPM's 2003 RRSE sampling event, arsenic was the only compound to exceed its respective Region IX PRG value, but was below background level. Pesticide residues (assumed to be from proper application) below the floors exceed residential risk levels. Additional samples will be taken to better delineate the contamination levels.

SAAP-111 (AOC 11) Forced Air Dryers And Rest, Screen And Can Pack Houses

SAAP-111 consists of over 50 buildings designated as Forced Air Dryers, Rest Houses, Screen Houses, and Can Pack Houses in Parcel 5-10(7)HR shown in the EBS. Located in the west section of the plant, this area processed both solvent propellant. This site was sampled by USACHPPM in 2003 for SVOCs,

nitrites, and heavy metals. Arsenic was the only compound to exceed the EPA Region IX PRG value and local background. USACHPPM's March 2003 RRSE Report recommends no further action for this site. However, KDHE wrote letter recommending the Army conduct additional soil and groundwater samples. The SI phase will be re-opened in AEDB-R in spring 2005. Additional soil samples will be taken.

SAAP-112 (AOC 12) Paste Air Dry Facilities

SAAP-112 consists of the former Paste Air Dry facilities in Parcel 5-13(7)HR(P) shown in the EBS. Located in the center of the facility, this site consists of 16 buildings (36 acres) used as paste drying facilities that were part of the N-line operations. All of the buildings have been burnt with only foundations remaining. The RRSE sampling conducted by USACHPPM in March 2003 analyzed for metals, SVOCs, NC, and NG. Arsenic and lead exceeded the EPA Region IX PRG value. Additional samples will be taken to better delineate the contamination.

SAAP-113 (AOC 13) General Warehouses (8037 Series)

The 8037 series warehouses consist of eight large warehouses that have been listed as containing such items as unused NQ drums (pre-NQ packaging) storage, acid plant parts and supplies, and 3X contaminated equipment interim storage. The 8037 series warehouses are located in Parcel 5-14(7)HR(P) shown in the EBS. The parcel delineation includes the warehouse buildings and adjacent railroad/loading dock areas. In FY04 & FY05, an investigation and cleanup of this site was conducted with non-ER,A funds.

SAAP-114 (AOC 14) Robert's Lake

Robert's Lake (12 acres) is located south of the Old Sanitary Landfill and west (downgradient) of the G-line ditches. Robert's Lake current and future use is for recreation. This AOC is located in Parcel 6-7(7)HR(P) shown in the EBS. This site was sampled by AEHA in 1994 and was sampled for SVOCs, metals and explosives. Arsenic and lead were the only compounds in surface water to exceed EPA Region IX PRGs. Arsenic in sediment exceeded EPA Region IX PRGs. CHPPM performed a Relative Risk Site Evaluation using the 1994 data and recommended further action on this site. Perform an RFI to delineate sediments requiring excavation. CMS will be completed. Excavate and dispose of ~17,000 cy of contaminated sediment. Restore pond by fixing the dam once excavation is complete.

SAAP-115 (AOC 15) Hazardous Analysis Testing Lab

The Hazardous Analysis Testing Laboratory (1 acre) is located in the north central portion of the plant. This area consists of an indoor firing range which has piles of sand containing expended small-caliber test projectiles. The sand piles are situated just outside a door on the south side of the building and a door on the north side of the building. Both sand piles measure 60 X 30 feet. This AOC is located in Parcel 7-2(5)HR shown in the EBS. During 2003, the site was sampled by USACHPPM. Lead and arsenic in soil were the only contaminants to exceed Region IX PRGs. Complete Interim Removal Action of 77 cy of soil. Excavate, treat, and dispose of soil on-site. Perform confirmation sampling and restoration of area.

SAAP-116 (AOC 16) NC Production Lines

The former Nitrocellulose (NC) production lines (107 acres) were located in the north central portion of the plant. Each production line is approximately 10 acres in size and contains 10 or more buildings. The majority of the buildings have been burnt and all that remains are the concrete foundations. The NC

Production Lines produced NC during the periods of 1943-1960, and 1965-1971. Nitrocellulose and other hazardous constituents were released to the soil and potentially the groundwater in the proximity of the production facilities. This AOC is located in Parcel 8-2(7)HR(P) shown in the EBS. During 2003, the site was sampled by USACHPPM. Arsenic, lead and SVOCs were detected in soil above the EPA Region IX PRGs. Complete RFI to verify quantities outside of foundations. Perform remedial design for soil removal and disposal. Perform remedial action to excavate and dispose of ~13,880 cy of soil off-site. Sample and restore excavated area.

SAAP-117 (AOC 17) NQ Production Facilities

SAAP-117 includes all buildings which have been identified as being potentially contaminated with explosives located in Parcel 9-5(6)HR shown in the EBS. The NQ Production Facilities are located in the northwest portion of SFAAP. Based a review of the documents, visual inspections and interviews, there is evidence that NQ and GN contamination was observed leaching out of walls and floors during the 1998 EBS visual inspection. During 2003, the site was sampled by USACHPPM for NQ and nitrates/nitrites with no detections above EPA Region IX PRG values. CHPPM's March 2003 RRSE Report recommends no further action at this site. Once the buildings are demolished, if contamination is found it will be addressed under SAAP-047. However, KDHE wrote letter recommending the Army conduct additional soil samples. The SI phase will be re-opened in AEDB-R in spring 2005. Additional soil samples will be taken.

SAAP-118 (AOC 18) Trench Disposal Area A3

SAAP-118 is the Trench Disposal Area (34 acres) identified as A3 in 1948 aerial photographs from disturbed ground west of SAAP-001, the Classification Yard located in the northeast portion of SFAAP. The Army obligated funds to conduct site characterization sampling in 2003 as follow-up work to SAAP-001 characterization and RFI completion. Lead was detected above regulatory levels. The RI/FS/RD/RA will be added to AEDB-R. Perform an RFI to delineate soil requiring excavation. Excavate, treat, and dispose of ~40 cy of contaminated soil. Restore area once excavation is complete.

SAAP-119 (AOC 19) Trench Disposal Area A4

SAAP-119 (0.6 acres) is the Disposal Site identified as A4 in 1948 aerial photographs from disturbed ground on the southwest end of SAAP001, the Classification Yard located in the northeast portion of SFAAP. The Army obligated funds to conduct site characterization sampling in 2003 as follow-up work to SAAP-001 characterization and RFI completion. There were no contaminants detected above regulatory limits. Therefore, the Army recommended no further action at this site. However, KDHE wrote letter recommending the Army conduct additional soil and groundwater samples, and conduct trenching with backhoe to verify that no disposal of waste occurred in historic trenches. The SI phase will be re-opened in spring 2005, and additional soil samples will be taken. Backhoe trenching will be conducted for one day.

SAAP-120 (AOC 20) Trench Disposal Area A5

SAAP-120 (0.5 acres) is the Disposal Pit identified as A5 in 1948 aerial photographs from disturbed ground east of SAAP-001, the Classification Yard located in the northeast portion of SFAAP. The Army obligated funds to conduct site characterization sampling in 2003 as follow-up work to SAAP-001 characterization and RFI completion. There were no contaminants detected above regulatory limits. Therefore, the Army recommended no further action at this site. However, KDHE wrote letter recommending the Army conduct additional soil and groundwater samples, and conduct trenching with backhoe to verify that no disposal of waste occurred in historic trenches. The SI phase will be re-

opened in spring 2005, and additional soil samples will be taken. Backhoe trenching will be conducted for one day.

SAAP-121 (AOC 21) Trench Disposal Area A6

SAAP-121 (0.1 acres) is the Disposal Trench identified as A6 in 1948 aerial photographs from disturbed ground south of SAAP-001, the Classification Yard located in the northeast portion of SFAAP. The Army obligated funds to conduct site characterization sampling in 2003 as follow-up work to SAAP-001 characterization and RFI completion. There were no contaminants detected above regulatory limits. Therefore, the Army recommended no further action at this site. However, KDHE wrote letter recommending the Army conduct additional soil and groundwater samples, and conduct trenching with backhoe to verify that no disposal of waste occurred in historic trenches. The SI phase will be re-opened in spring 2005, and additional soil samples will be taken. Backhoe trenching will be conducted for one day.

SAAP-122 (AOC 22) Old Reclamation Yard

The Old Reclamation Yard (13 acres) is located in the northeast portion of the plant. Disturbed ground in a fenced area south of the classification area was observed in 1948 aerial photographs (A8). A site walk was conducted in February 2003. The following was observed: metal debris, stressed vegetation and bare spots. Soil samples were collected by USACHPPM and analyzed for SVOCs, VOCs, total metals, and PCBs with six compounds exceeding their respective Region IX PRG values, including PCBs, SVOCs and metals. Finalize the RFI report. CMS will be completed. Excavate, treat and dispose of ~6,500 cy (8,125 cy after 25% fluff factor) of contaminated soil. 125 cy will be disposed of as hazardous waste. 8,000 cy will be stabilized. 200 cy of debris will disposed of as solid waste.

SAAP-123 (AOC 23) Cleanup Under Explosives Foundations

This site involves the investigation and cleanup underneath explosive buildings' foundations. This site includes SAAP-010, 014, 017, 024, 026, 031, 036, 043, 047, 048, 065, 067, 111, 112, 116, with an approximate total square feet of 2,254,113 of concrete. The explosive foundations will be removed and any soil containing greater than 10% explosives will be decontaminated using non-ER,A funds. After explosive decontamination is completed, ER,A funds will pay for investigation and cleanup of any potentially contaminated soil. Removal of 20,871 cy of soil is planned. Assumes 25% of square footage under foundations requires removal with off-site disposal. Assumes one foot depth for excavation for cubic yards. If LTM is required, then it will be funded under the appropriate site (see sites listed above).

SAAP-124 (AOC 24) Cleanup Under Explosives Sewers

This site involves the investigation and cleanup underneath explosive sewer lines. This site includes SAAP-007, 008, 009, 010, 017, 024, 026, 036, 067, 116, with an approximate total linear feet of 163,141 of explosive sewer lines. The explosive sewer lines will be removed and any soil containing greater than 10% explosives will be decontaminated using non-ER,A funds. After explosive decontamination is completed, ER,A funds will pay for investigation and cleanup of any potentially contaminated soil. Removal and off-site disposal of 13,114 cy of soil is planned. Investigation assumes one sample every one hundred feet. If LTM is required, then it will be funded under the appropriate site (see sites listed above).