STATE OF MISSOURI
Matt Blunt, Governor • Doyle Childers, Director
DEPARTMENT OF NATURAL RESOURCES
www.dnr.mo.gov

**MISSOURI HAZARDOUS WASTE MANAGEMENT FACILITY PERMIT**
**PART I**
**PERMIT NUMBER: MOD077887909**

## PERMITTEE

### FACILITY OWNER/OPERATOR

Expert Management, Incorporated
3078 County Road 180
Joplin, MO 64802

### FACILITY LOCATION

3078 County Road 180
Joplin, MO 64802
T28N, R32W Jasper County
North Latitude - 37°06'42"
West Longitude - 94°22'51"

## FACILITY DESCRIPTION

Portion of the property used for industrial purposes.

Expert Management, Incorporated (EMI), formerly ICI Explosives USA, Incorporated (ICI), is the owner of property where its predecessors operated a chemicals and explosives manufacturing facility on approximately 600 to 700 acres of their approximate 1745 acre tract of land 6.5 miles northeast of Joplin in Jasper County, Missouri. The 1000 to 1100 acres of land that was utilized as "buffer" land (a common practice in the explosives industry) generally appears, based on historical photography and sampling data, to not have been impacted by past operations. Sampling of any questionable areas within this buffer and survey requirements to determine the actual acres comprising the "facility" for purposes of corrective action pursuant to this permit are included in the Schedule of Compliance. The facility manufactured industrial grade ammonium nitrate, weak nitric acid, ammonium nitrate-based emulsion explosives, TNT, blasting agents and other chemicals in support of the explosives industry.

History of ownership.

The Joplin facility was constructed in 1901 by E.I. Dupont de NeMours & Company, (Dupont) Incorporated. In 1912, DuPont divested portions of its explosives operations and the Joplin plant became part of the newly formed Atlas Powder Company. In 1961, the company incorporated under the name Atlas Chemical Industries. In the early 1970's, ICI acquired Atlas Chemical Industries. ICI then divested the Atlas Powder explosives operations in 1973. Atlas Powder

Company became a wholly-owned subsidiary of the Tyler Corporation from approximately mid-1973 until May 1990, when it was re-acquired by ICI. Several operations ceased between May 1990 and January 2000. ICI sold the bulk of its business and assets (exclusive of the real property) in February 2000 to Joplin Manufacturing, Incorporated (JMI), which continued to manufacture emulsion explosives until September 2001. ICI changed its name to EMI in December 2001. JMI ceased operations at the facility and their lease of the real property on January 31, 2002. There are no current manufacturing operations at the facility. EMI retains responsibility for post-closure care, corrective action, site clean-up, and monitoring related to the soil and groundwater. Some of the facility is in the Grove Creek 100-year floodplain. Adjoining property is being used for agricultural, forest, commercial, industrial, and residential purposes.

The EMI facility has five former hazardous waste management units. These include a former impoundment (Atlas Pond), a former burning ground, a former drum storage building, former acid mud treatment area, and former emulsion waste treatment sump. The impoundment and burning ground were closed with waste in place. Groundwater contamination resulting from the operation of these units is subject to remediation under the post-closure care portion of this Permit.

On December 21, 1989, Atlas Powder Company and United States Environmental Protection Agency (USEPA) entered into a Corrective Action Administrative Order on Consent, EPA Docket Number VII-90-H-0014, pursuant to the authority of Section 3008(h) of the Resource Conservation and Recovery Act (RCRA). The Consent Order initially listed 29 areas where wastes were managed at the facility. Some areas contain several Solid Waste Management Units (SWMUs). Since the signing of the Consent Order, additional areas have been identified and evaluated during the RCRA Facility Investigation (RFI). During the RFI work, about 52 SWMUs were evaluated for potential soil and/or groundwater contamination. Many of these SWMUs were grouped together due to their geographic proximity and contamination type. EMI has further delineated a more comprehensive list of SWMUs, Areas of Concern, and areas of interest that includes 126 specific areas included in Table V of this Permit.

All interim status regulated hazardous waste management units have gone through the closure process, and the Missouri Department of Natural Resources has received the certification of closure. The Department has accepted the certification on the impoundment and the burning ground which were closed with waste in place. The acid mud treatment areas closed clean. The drum storage building and the emulsion waste treatment sump had contaminants in the soil above background levels. A risk based closure was done, including a risk assessment on both units, and deed notations were made on the property for the drum storage building and the emulsion waste treatment sump. The Department has accepted the certification on the drum storage building and the emulsion waste treatment sump.

## PERMITTED ACTIVITY

This Permit requires post-closure care of two hazardous waste management units: the impoundment and the burning ground. It also addresses the continuing implementation of corrective action requirements, including site-wide groundwater monitoring and remediation to address releases from other SWMUs and Areas of Concern.

EFFECTIVE DATES OF PERMIT: 2-15-05 to 2-15-2015

2/15/05
Date

Daniel R. Schuette, Interim Division Director
Air and Land Protection Division

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INTRODUCTION

After public notice, according to 10 CSR 25-8.124, and review of the ICI Explosives USA, Incorporated (now EMI), Resource Conservation and Recovery Act Part B Application, the Missouri Department of Natural Resources (hereafter referred to as the Department) has determined that the application substantially conforms with the provisions of the Missouri Hazardous Waste Management Law (and all standards, rules, and regulations adopted under this act), Section 260.350, et seq., RSMo. Pursuant to Section 260.375 (13), RSMo, the Department hereby approves the application and issues Permit Number MOD077887909 to EMI, as the facility owner (hereafter referred to as the Permittee) for the operation of the hazardous waste management facility and post-closure care as set forth in the application. This Permit also addresses corrective action requirements for SWMUs, Areas of Concern and Corrective Action Sites (CASs). Applicable regulations are found in 40 CFR Parts 124, 260 through 264, 268, and 270, and in 10 CSR 25-7 as specified in this Permit. Part I of this Permit is issued under state authority, and Part II is issued under federal authority. Part I shall remain in effect even if Part II is terminated or has expired.

The Permit application that was submitted by the Permittee and received by the Department on November 6, 1985, along with subsequent submittals, replacements, and revisions received on May 7, 1986, November 8, 1988, April, 21, 1999, July 1, 1999, June 15, 2000, and November 20, 2002, will hereafter be referred to as the "approved Permit application." The approved Permit application, along with all of the additional documents to be submitted under Schedule of Compliance Item I., are defined as the "consolidated Permit application."

Post-closure operation of this hazardous waste management facility and corrective action shall be in accordance with the provisions of this Permit, the Missouri Hazardous Waste Management Law (Sections 260.350 et. seq, RSMo), the rules and regulations promulgated thereunder Code of State Regulations, Title 10, Division 25 (10 CSR 25) as effective on the date of this Permit, the approved Permit application which is incorporated by this reference into the conditions of this Permit, and any other conditions, changes, or additions to the engineering plans, specifications and operating procedures as specified in this Permit. The conditions specified in this Permit supersede any conflicting information in the approved Permit application. Where conflicts arise between Permit applications, the latest revision shall control.

Any inaccuracies found in information submitted may be grounds for the termination, revocation and reissuance, or modification of this Permit in accordance with 40 CFR Part 270 Subpart D, incorporated by reference in 10 CSR 25-7.270(1) and modified in 10 CSR 25-7.270(2)(D), and

for potential enforcement action. The Permittee shall inform the Department of any deviation from, or changes in, the information in the application, which would affect the Permittee's ability to comply with the applicable regulations or Permit conditions.

When the Department receives any information (such as inspection results, information from the Permittee, or requests from the Permittee), it may decide whether cause exists to modify, revoke and reissue, or terminate a facility's Permit. All such changes to the Permit will be in accordance with 10 CSR 25-7.270(2)(D), 10 CSR 25-8, and 40 CFR Part 270 Subpart D, incorporated by reference in 10 CSR 25-7.270(1).

The Permittee shall comply with all applicable environmental laws and regulations enforced by the Department. These environmental laws and regulations are administered by the Air Pollution Control Program, the Hazardous Waste Program, the Land Reclamation Program, the Public Drinking Water Program, the Solid Waste Management Program, and the Water Protection Program. Failure to comply with these environmental laws, in certain circumstances, result in the suspension or revocation of this Permit and may subject the Permit holder to civil and criminal liability.

This Permit for post-closure and corrective action activities is issued only to the Permittee named above. This Permit is issued for a period of ten years and expires at midnight on February 15, 2015. This Permit is subject to review and modification by the Department in accordance with Section 260.395.12, RSMo.

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

All citations to federal regulations throughout this Permit are for the sake of convenient reference. The federal regulations are adopted by reference in 10 CSR 25. In the instances where state regulations are more stringent, the appropriate state reference is given and shall apply.

Any appeals of the issuance or denial of the Permit or specific Permit conditions based on state authority shall be filed in accordance with Section 260.395.11, RSMo. The appeal must be filed with the Missouri Hazardous Waste Management Commission within 30 days from the date of this Permit. The Missouri Supreme Court has ruled that corporations and associations may only proceed in legal matters through attorneys licensed to practice in Missouri. *Reed v. Labor and Industrial Relations Commission,* 789 S.W.2d 19 (Mo banc 1990). The Court held that a pleading, filed by a non-attorney on behalf of a corporation or association is null and void, and

therefore, such pleading will not be accepted by the Hazardous Waste Management Commission. Individuals and partnerships are not required to have an attorney and may represent themselves in front of the Commission.

40 CFR 264.101(a), as incorporated by reference in 10 CSR 25-7.264(1), requires all owners or operators of facilities seeking a Permit for the treatment, storage, or disposal of hazardous waste to institute corrective action as necessary to protect human health and the environment for all releases of hazardous waste or hazardous constituents from any SWMU, regardless of the time at which waste was placed in such unit.

40 CFR 264.101(b), as incorporated by reference in 10 CSR 25-7.264(1), requires that Permits issued under the Hazardous Waste Management Law contain a schedule of compliance for corrective action (where corrective action cannot be completed prior to Permit issuance) and assurances of financial responsibility for completing such corrective action.

40 CFR 264.101(c), as incorporated by reference in 10 CSR 25-7.264(1), requires that corrective action be taken by the facility owner or operator beyond the facility property boundary, where necessary to protect human health and the environment, unless the owner or operator demonstrates that, despite the owner/operator's best efforts, the owner or operator was unable to obtain the necessary permission to undertake such action. Further, 40 CFR 264.101(c), as incorporated by reference in 10 CSR 25-7.264(1), stipulates that the owner/operator is not relieved of any responsibility to clean up a release that has migrated beyond the facility boundary where off-site access is denied. On-site measures to address such releases will be determined on a case-by-case basis. In addition, assurances of financial responsibility for completing such corrective action must be provided.

40 CFR 270.32(b)(2), as incorporated by reference in 10 CSR 25-7.270(1), and Section 260.395.12, RSMo, requires that each Permit issued under that section contain terms and conditions as the Department determines necessary to protect human health and the environment.

On July 6, 1999, Missouri received final authorization for revisions to its hazardous waste management program, including the corrective action portion of the hazardous and solid waste amendments of 1984 (HSWA) Codification Rule (July 15, 1985, 50 FR 28702) which had been previously adopted by the state. Thus, the corrective action requirements implemented by the state in lieu of United States Environmental Protection Agency (USEPA) are incorporated into Part I of this Permit and are under state authority. Authority for other HSWA requirements for which the state is not authorized is retained by USEPA and appears in Part II of the Permit.

DEFINITIONS

For purposes of this Permit, terms used herein shall have the same meaning as those in the law and 40 CFR Parts 124, 260, 261, 264, 268, and 270, and Section 260.360, RSMo, unless this Permit specifically provides otherwise. Where terms are not defined in the law, the regulations, the Permit, or USEPA guidance or publications, the meaning associated with such terms shall be defined by a standard dictionary reference or the generally accepted scientific or industrial meaning of the term.

"Area of Concern (AOC)," or "Area of Interest," means any area where an actual or potential release of hazardous waste or hazardous constituents which is not from a SWMU and is determined by the Department to pose a current or potential threat to human health or the environment. Investigation and/or remediation of AOCs may be required pursuant to Section 260.395, RSMo, and 40 CFR 270.32(b)(2), as incorporated by reference in 10 CSR 25-7.270(1).

"Buffer land" means parcels of land purchased over the history of the facility to provide separation and distance of the production/manufacturing areas of the facility from neighboring landowners, a common practice in the explosives industry. These areas are mostly in agriculture, timber, and residential use. Buffer areas which are removed from the jurisdiction of this Permit pursuant to the definition of "facility" are required to have historical and/or sampling data that indicates there is no evidence that any historical activity resulted in contamination of environmental media above levels of potential regulatory concern.

"Corrective Action Site (CAS)" means collectively AOCs and SWMUs which will be dispositioned via the Corrective Action process under this Permit.

"Deep aquifer" means the deep portion of the saturated groundwater system, as distinct from the shallower portion. The deep aquifer is located below the Northview Shale layer. Where present, the Northview Shale layer establishes a hydraulic barrier and separates the deep and shallow aquifers. The deep aquifer is typically at depths greater than 150 feet, and investigations to date have not indicated any contamination of the deep aquifer from the facility's current or historical activities. Institutional controls and water use restrictions apply to the contaminated upper/ shallow aquifer at the facility.

"Director" means the Director of the Missouri Department of Natural Resources.

"Facility" means:

> All contiguous land, and structures, other appurtenances and improvements on the land, used for treating storing or disposing hazardous waste; and
>
> All contiguous property under the control of the owner/operator, for the purpose of implementing corrective action under 40 CFR 264.101, as incorporated by reference in 10 CSR 25-7.264(1) and as specified in Special Permit Conditions I. through XXIV. of this Permit. Buffer land areas that were not impacted by the facility operation, and have no known soil or groundwater contamination, will be surveyed and identified as a separate tract(s). These buffer areas are subject to the requirements of this Permit, including General Permit Condition V., until such time as the activities specified in Special Permit Condition XXI.,C. have been satisfactorily completed.

"Hazardous constituent" means any chemical compound listed in 40 CFR Part 261 Appendix VIII. as incorporated in 10 CSR 25-4.261.

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

"Industrial uses" are those which result only in exposure of adult workers in industrial, construction, and maintenance activities consistent with the exposure assumptions to be used in development of a risk assessment(s) at the facility.

"Institutional Controls" (ICs) are non-engineered instruments such as administrative and/or legal measures taken to limit or prohibit certain activities which may interfere with the integrity of a remedial action that minimizes the potential for human exposure to contamination at a site. Some examples include easements, covenants, well drilling prohibitions, zoning restrictions, and special building permit requirements. Physical barriers such as fences that restrict access are considered engineering controls rather than ICs.

"Land Use Restrictions" or "activity use limitation" means limitations on allowable activities and use of the real property to those that do not interfere with the integrity and effectiveness of a remedial action or final remedy put in place to be protective of human health and the environment in connection with the current and anticipated future uses of the property.

"Nonresidential" means any real property on which commercial, industrial, manufacturing or any other activity is done to further the development, manufacturing, or distribution of goods and services, intermediate and final products, including but not limited to administration of business activities, research and development, warehousing, shipping, transport, manufacturing, stockpiling of raw materials, storage, repair and maintenance, of commercial machinery and equipment, and solid waste management. This term shall not include schools, nursing homes, day care centers, hospitals, houses, apartments, condominiums, or any other residential style facilities. This term may include "non-intrusive" recreation areas and activities, such as hunting lands, wildlife sanctuaries, golf courses, race tracks, etc.

"Release" means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of hazardous wastes (including hazardous constituents) into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous wastes or hazardous constituents).

"Residential" means any real property or portion thereof which is designed for the housing of human beings and does not meet the definition of nonresidential property. This term may include schools, nursing homes, day care centers, hospitals, houses, apartments, condominiums or any other residential style facilities. This term may include "intrusive" recreation areas and activities such as fishing, play lots, swimming, etc.

"Shallow Aquifer" means the shallow portion of the saturated groundwater system, as distinct from the deeper portion of the groundwater system. The shallow aquifer is located above the Northview Shale layer. Where present, the Northview Shale layer establishes a hydraulic barrier and separates the shallow and deep aquifers. The shallow aquifer is typically at depths less than 150 feet. ICS and water use restrictions apply to the shallow aquifer as it has been affected by releases from historic facility operations.

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

"Stabilization" means actions to control or abate threats to human health and/or the environment from releases at RCRA facilities and/or to prevent or minimize the further spread of contamination while long-term remedies are pursued.

SCHEDULE OF COMPLIANCE

I. Within 60 days after the effective date of Permit issuance, the Permittee shall:

A. Submit two copies of the consolidated Permit application to the Department.

B. Submit a certification signed by the Permittee that the Permittee has read this Permit in its entirety and understands all Permit conditions contained herein.

C. Submit a check or money order to the Department's Hazardous Waste Program payable to the State of Missouri for any outstanding engineering review costs.

D. Submit a check or money order to the Department's Hazardous Waste Program payable to the State of Missouri for $1,000 for each year the Permit is to be in effect beyond the first year. This Permit is effective for ten years. Since the Permittee has submitted a check for $1,000 with the Permit application, the remaining balance to be submitted by the Permittee is $9,000 for this ten-year Permit.

II. Within 90 days after the effective date of Permit issuance, the Permittee shall revise and submit the Groundwater Sampling and Analysis Plan, including the Surface Water Monitoring Program.

III. Within 180 days after the effective date of Permit issuance, the Permittee shall:

A. Submit an archaeological survey and an historic architectural survey for the facility, and the buffer land, as per General Permit Condition V.

B. Submit a long-term soil and groundwater plan addressing containment, removal of hot spots, and institutional controls site-wide approach as referenced in Special Permit Condition XIV. CMI Workplan, Part B, C, D, and G.

IV. The Permittee shall comply with the schedule for the planned corrective action activities as specified in this Permit and as summarized in Table IV.

V. The Permittee shall comply, as necessary, with the schedule(s) for contingent corrective action activities as specified in the Special Permit Conditions Section of this Permit and as summarized in Table IV.

STANDARD PERMIT CONDITION

I. The Permittee shall comply with the requirements set forth in the Missouri Hazardous Waste Management Law (and all standards, rules, and regulations adopted under this law), Section 260.350, et seq., 40 CFR Part 264 Subpart F, 40 CFR 270.30, 40 CFR 270.40, 40 CFR 270.42, and 40 CFR 270.51 as incorporated and modified in 10 CSR 25-7 and 10 CSR 25-8.

GENERAL PERMIT CONDITIONS

I. General Requirements

The Permittee shall comply with the requirements set forth in 40 CFR Part 264 Subpart B-General Facility Standards, 40 CFR Part 264 Subpart C-Preparedness and Prevention, 40 CFR Part 264 Subpart D-Contingency Plan and Emergency Procedures, and 40 CFR Part 270 as incorporated in 10 CSR 25-7 and 10 CSR 25-8.

II. Preparedness and Prevention [40 CFR Part 264 Subpart C]

The Permittee shall comply with the Contingency/Emergency Plan revised April 15, 2004, in order to fulfill the requirements of 40 CFR Part 264 Subpart C. The Contingency/Emergency Plan shall be included in the consolidated Permit Application required in the Schedule of Compliance.

III. Contingency Plan and Emergency Procedures [40 CFR Part 264 Subpart D]

The Permittee's Contingency Plan and Emergency Procedures shall comply with the Contingency/Emergency Plan revised April 15, 2004, and all conditions of this Permit.

A. Copies of the Contingency Plan [40 CFR 264.53]. A copy of the approved Contingency Plan and all revisions of this plan shall be kept with the local site representative and/or at the facility, and the Contingency Plan and all revisions must be submitted to all local police departments, fire departments, hospitals, and state and local emergency response teams or organizations that may be called to provide emergency services.

IV. Notification of an Emergency Situation (Chapter 260.505.4, RSMo

The Permittee shall at the earliest practical moment upon discovery of an emergency involving the hazardous waste under their control, notify the Department's emergency response hotline at (573) 634-2436 and the National Response Center (800) 424-8802.

V. Considerations under Federal Law [40 CFR 270.3 (b)]

40 CFR 270.3 (b) requires that a Permittee mitigate project impacts on eligible sites. Section 106 of the National Historic Preservation Act (16 U.S.C. Section 470, et seq., as amended) and the Advisory Council on Historic Preservation's regulation 36 CFR Part 800, require identification and evaluation of cultural resources. The State Historic Preservation Office (HPO) staff has determined that the site is eligible for inclusion in the National Register of Historic Places under Criteria A and C, Military, Industry, and Engineering, as an early to mid 20th century explosives production industrial complex with major contributions to World War II. Site development was extensive where manufacturing occurred, and significant undisturbed archaeological sites are unlikely in that portion of the facility. Given this, an historic and prehistoric archaeological survey is required for those portions of the facility that can be documented as relatively undisturbed. This includes high potential areas such as creek valleys, terraces, and secondary streams. Bluff lines should be inspected for caves and/or rock shelters. This requirement applies to the "buffer areas" described above under the definition of facility. Future corrective action activity may involve ground disturbing activities which may have an adverse effect on buildings, structures, or objects that could contribute to a National Register of Historic Places eligible district. The Permittee shall pursue development of a Memorandum of Agreement among, at a minimum, Expert Management, Incorporated (EMI), the Department, the United States Environmental Protection Agency, and the Advisory Council on Historic Preservation. This agreement and a schedule for work to be performed shall be submitted within 180 days of the effective date of this Permit. Stipulations shall include, but not be limited to, the following:

A. Identification of historic and prehistoric archaeological sites. The survey may be conducted in phases, but should eventually include all those areas that are determined to be relatively undisturbed property within the boundaries of the facility. The survey must establish eligibility for inclusion in the National Register of Historic Places, and recommendations for preservation in place, data recovery, and alternatives in the event of contamination of eligible sites.

B. The historic documentation formerly submitted indicates that records do exist and will provide a basis for a more detailed recordation report on the history of the establishment of the facility and its development and subsequent changes in ownership and function. This report must include historical photographs, site maps, business or corporate papers, and other sources, as appropriate, and should establish the age and use of all buildings, structures, and objects within the boundaries of the facility.

C. All work should be performed by individuals meeting the Professional Qualifications set out in 36 CFR Part 61 Appendix A.

The HPO staff has also determined that the closure of the facility and environmental remediation will have an adverse effect on the historic fabric of the Atlas Powder Company. Therefore, the USEPA and EMI should forward the necessary adequate documentation (36 CFR Part 800.11{e}) to the Executive Director, Advisory Council on Historic Preservation, The Old Post Office Building, 1100 Pennsylvania Avenue NW, #809, Washington, DC 20004. Pending receipt of the Council's decision on whether it will participate in consultation, no action shall be taken which would foreclose Council consideration of alternatives to avoid or satisfactorily mitigate any adverse effect on the property in question.

VI. Reporting Requirements [40 CFR 270.30 (l) (9)]

A biennial report shall be submitted covering facility activities by March 1 during even numbered calendar years, as required by 40 CFR 264.75.

SPECIAL PERMIT CONDITIONS

I. Miscellaneous Units [40 CFR Part 264 Subpart X]

The Permittee shall comply with the 40 CFR Subpart X requirements for the composting operation if a Research, Development, and Demonstration (RD&D) Permit either has not been issued, or has been issued, is not renewed, and the Permittee elects to continue using composting for treating contaminated soil. The composting operation is a hazardous waste management unit and meets the requirements of 40 CFR 264.600 through 40 CFR 264.603 and 10 CSR 25-7.264 (2)(X). All requirements of 40 CFR Part 264 Subparts C, D, G, and H shall also be met as appropriate. This section does not apply if the Department issues an RD&D Permit. Should the Permittee want to increase the quantity of soil and/or compost pile material above the amount allowed in the RD&D Permit, a Class III Permit modification shall be required as per 40 CFR 270.42, and the compost operation shall become a regulated "miscellaneous unit" under 40 CFR Part 264 Subpart X.

II. Post-Closure [40 CFR Part 264 Subpart G]

The Permittee shall comply with all applicable requirements of 40 CFR Part 264 Subpart G, as incorporated by reference in 10 CSR 25-7.264(1), and all provisions of this Permit.

A. Post-Closure Care [40 CFR 264.117]

Post-closure care of the hazardous waste management units shall begin after completion of closure and continue for 30 years after that date unless otherwise specified by the Department. This facility, therefore, has a post-closure care period which shall last at least until March 29, 2029. Post-closure care shall be extended, at a minimum, until such time as the groundwater protection standard maximum concentration limits or alternate concentration limits, as applicable, are met for a period of three consecutive years under the groundwater monitoring and corrective action program described in the Special Permit Conditions section of this Permit. Care during this period must consist of maintenance, monitoring, and reporting in accordance with 40 CFR Part 264 Subparts F and N, as incorporated by reference in 10 CSR 25-7.264.

The Permittee may submit a request to the Department to shorten the post-closure care period. Adequate justification for shortening the post-closure care period must accompany any such request. If the Department finds that a shorter post-

closure care period is sufficient to protect human health and the environment, shortening of the post-closure care period will be handled in accordance with the applicable Permit modification procedures under 40 CFR parts 124 and 270.

Post-closure use of the property shall be restricted by the Permittee to prevent disturbance of the integrity of the final cover on the former surface impoundment and the former burning ground, and to prevent damage to the monitoring systems. The Department may approve a use of the property that disturbs the integrity of the final cover if it is necessary for the proposed use of the property and will not increase the potential hazard to human health or the environment, or if it is necessary to reduce a threat to human health or the environment.

B. Post-Closure Plan and Amendments [40 CFR 264.118]

Post-closure care shall be in accordance with the plan contained in Section 1 of the approved Permit application and all conditions of this Permit. The Post-closure Care Plan may be amended at any time during the post-closure care period. The Permittee must submit a written request to the Department for a Permit modification to authorize a change in the approved Post-closure Care Plan. Amendments are subject to the applicable Permit modification requirements of 40 CFR Part 270 Subpart D, 10 CSR 25-7.270(2)(D), and 10 CSR 25-8. Written requests for amendments must be submitted at least 60 days prior to the proposed change in site operations, or not later than 60 days after an unexpected event that has affected the plan. The Department may request modifications to the plan if changes in site operations affect the approved plan. The Permittee must submit the modified plan no later than 60 days after a Departmental request for modification of the plan. Any modifications requested by the Department will be approved, disapproved, or modified in accordance with the procedures in 40 CFR Parts 124 and 270 and 10 CSR 25-8.

C. Future Removal of Hazardous Wastes [40 CFR 264.119(c)]

If the Permittee wishes to remove hazardous wastes, hazardous waste residues, contaminated soils or contaminated sludge from beneath the former regulated units, the Permittee must request a modification to this Permit in accordance with the applicable requirements in 40 CFR Parts 124 and 270. The request for a modification must include a demonstration that the action will not increase the potential hazard to human health or the environment, or the action is necessary to reduce the threat to human health or the environment. In addition, a demonstration must be made indicating that the action will satisfy the criteria of

40 CFR 264.117(c). By removing contaminants, the Permittee may become a generator of hazardous waste and must manage any removed material in accordance with all applicable state and federal laws and regulations.

D. Certification of Completion of Post-Closure Care [40 CFR 264.120]

No later than 60 days after completion of the post-closure care period, the Permittee shall submit to the Department, by certified mail, a certification that the post-closure care period has been completed in accordance with the approved Post-Closure Care Plan. For this Permit, the post-closure care certification is due by May 28, 2029, unless otherwise amended. The certification must be signed by the Permittee and an independent professional engineer registered in the state of Missouri, and documentation supporting the certification must be furnished to the Department prior to the Permittee's release from the financial assurance requirements for post-closure care under 40 CFR 264.145(i).

III. Groundwater Monitoring and Corrective Action Program - Former Burning Ground [40 CFR 264.90 - 264.100

A. Groundwater Protection Standard, Hazardous Constituents, and Concentration Limits [40 CFR 264.92, 264.93, and 264.94]

The Groundwater Protection Standard (GPS) establishes the maximum concentration limits for hazardous constituents in the groundwater at and beyond the point of compliance during the compliance period. The hazardous constituents, maximum concentration limits, and maximum analytical detection limits specified in Table I of this Permit constitute the GPS for the Permittee's closed burning ground, SWMUs/AOCs and CAS(s). The hazardous constituents listed in Table I have been detected in the groundwater beneath and beyond the subject units and are reasonably expected to be in or derived from wastes managed at the facility.

1. The maximum concentration limits for the GPS hazardous constituents listed on Table I are based on protection of human health and the environment and were derived from several different sources as explained by the footnotes to Table I. The Permittee may propose site-specific risk-based concentrations for groundwater protection pursuant to SPC III.A.5., below.

2. The GPS maximum concentration limit for some hazardous constituents is

below the lowest, reasonably achievable detection limit (due to limitations in current analytical technology) for particular hazardous constituents. In these cases, the GPS maximum concentration limit has been set at the corresponding GPS maximum detection limit.

3. The allowable GPS maximum detection limit shall never be greater than the GPS maximum concentration limit. If the GPS maximum detection limit for specific GPS parameters cannot be achieved due to matrix interferences or other reasonable analytical limitations (provided that appropriate supporting documentation is provided), the affected sample and associated chemical analyses will be exempted from this requirement. Such an exemption does not; however, in any way relieve the Permittee from complying with the GPS maximum concentration limits.

4. The Department reserves the right, based on future advances in analytical technology, to modify this Permit to require the Permittee to achieve analytical detection limits for the hazardous constituents covered by Special Permit Condition III.A.2. that allows for an adequate comparison with appropriate health- or environmental protection-based concentration limit(s).

5. The Permittee may make a demonstration to the Department, at any time during the term of this Permit, for establishment of Alternate Concentration Limits (ACLs) in lieu of the GPS maximum concentration limits contained herein. Any such demonstration shall ensure that any and all ACLs proposed in lieu of the GPS maximum concentration limits are protective of human health and the environment in accordance with the requirements of 40 CFR 264.94(b). In proposing an ACL(s), the Permittee shall consider and formally address the factors listed in 40 CFR 264.94(b)(1) and (2). Any ACLs approved by the Department will require a Permit modification in accordance with 40 CFR 270.42.

6. The Permittee shall propose modifications of the GPS to include any additional hazardous constituent(s) (40 CFR Part 261 Appendix VIII.) in the groundwater which is/are identified during future sampling and analysis, if such constituents may be attributed to past operation of the regulated unit(s) and/or the degradation of hazardous constituents known to be present in the groundwater. The Permittee shall use Appendix IX. (40 CFR Part 264) groundwater sampling and analysis requirements contained in Special Permit Condition III.E.6. as the basis for determining if the addition of hazardous constituents to the GPS is necessary. Note that dioxins and furans are not included in the Appendix IX. sampling required in Special Permit Condition III.E.6.

Any addition of hazardous constituents to the GPS as a result of the above determination requires a Class 1 Permit modification with prior Director approval. Any other changes to the GPS list of hazardous constituents require a permit modification in accordance with 40 CFR 270.42.

B. Point of Compliance [40 CFR 264.95]

The point of compliance is the location at and beyond which the GPS must be achieved. The point of compliance is defined as a vertical surface that, at the limit of the waste management area, extends perpendicularly downward into the uppermost aquifer underlying the regulated units. This definition is based upon the nature of the contaminants managed at the former regulated units and the existing data from the current sampling and monitoring at the site that shows contaminants in groundwater in a direction(s) other than that dictated by the direction(s) of local groundwater flow. In the case of the burning ground, Wells MW-100 (formerly BG-1) and MW-103 (formerly BG-7) represent a line of wells on the leading edge of the contaminated groundwater plume. Groundwater contamination at and beyond the point of compliance that exceeds the GPS maximum concentration limits shall be subject to corrective action pursuant to 40 CFR 264.100. See Figure 2.

The point of compliance for other SWMUs/AOCs and CAS(s) will be added in the future by modifying this Permit as the corrective action process proceeds and a final remedy is proposed and selected to address these areas.

C. Compliance Period [40 CFR 264.96]

The compliance period for the burning ground shall be equal to the active life of the former waste management area, which is 22 years. If the GPS or other applicable Department approved maximum concentration limits are being exceeded at the end of the compliance period at or beyond the point of compliance, the Permittee's groundwater corrective action program shall continue until the Permittee demonstrates that these limits have not been exceeded at and beyond the point of compliance for a period of three consecutive years.

D. General Groundwater Monitoring Requirements [40 CFR 264.97]

The Permittee shall comply with that portion of 40 CFR 264.97 applicable to monitoring programs conducted in accordance with 40 CFR 264.100 and the following additional requirements:

1. The Permittee's groundwater monitoring systems shall be designed, installed, operated, and maintained during the compliance period in a manner which ensures:

    a. Detection and/or delineation of the horizontal and vertical extent of groundwater contamination at and beyond the point of compliance (including beyond the facility property boundary);

    b. Determination of representative concentrations of hazardous constituents and/or contaminant plume indicator parameters in the groundwater; and

    c. The Permittee's ability to determine the effectiveness of any groundwater corrective action activities in terms of contaminant removal, destruction, and/or containment.

2. The number, location, and depth of the Permittee's monitoring wells shall be sufficient to define the horizontal and vertical extent of groundwater contamination beneath the Permittee's property and beyond the facility property boundary. If, at any time during the compliance period, the Permittee or the Department determines that the existing monitoring system fails to define the horizontal and vertical extent of groundwater contamination, the Permittee shall submit, within 45 days of such determination by the Permittee or written notification by the Department, a proposal for the installation of additional monitoring wells to define such extent.

    If any new monitoring wells are installed, the Permittee shall submit a Class 2 permit modification in accordance with 40 CFR 270.42. The Permittee shall follow the procedures cited in ICI's Groundwater Quality Assessment Plan dated October 1998, approved by the Department in a November 6, 1998, letter, and found in Appendix H of the approved Permit application in the sampling and analysis of samples from any new wells installed under this Permit.

    At such time as the Department determines that the Permittee has adequately redefined the horizontal and/or vertical extent of groundwater contamination, the wells defining such extent shall be incorporated into and designated for continued monitoring in the Permittee's Sampling and

Analysis Plan (SAP). The Department will notify the Permittee in writing when it makes the determination. Within 45 days of this notification, the Permittee shall submit appropriate SAP revisions to the Department's Hazardous Waste Program (HWP).

3. The Permittee shall design and construct any new groundwater monitoring well(s) to meet the requirements of this Permit including 40 CFR 264.97, 10 CSR 23-Chapter 4, Monitoring Well Construction Code of the Missouri Well Construction Rules and/or well-specific plans and specifications approved by the Department.

   a. In addition to the reporting required by the Department's Geologic Survey and Resource Assessment Division (GSRAD), the Permittee shall submit a copy of the well certification report form and the resulting certification acceptance required by 10 CSR 23-4.020 for any new monitoring wells installed pursuant to this Permit. The Permittee shall report this information as part of the Annual or Semi-Annual Groundwater Corrective Action Reports required by Special Permit Condition III.F.

   b. Any change in the number of wells being monitored shall require a Class 2 Permit modification in accordance with 40 CFR 270.42. The Permittee may elect to submit an annual modification to incorporate changes in the number of monitoring wells in lieu of a modification for each individual change.

4. Plugging and abandonment of any groundwater monitoring well(s) operated by the Permittee pursuant to the requirements of this Permit shall meet the requirements of 10 CSR 23-4.080.

a. In addition to the reporting required by the Department's GSRAD, the Permittee shall submit a copy of the well registration report form and resulting registration acceptance required by 10 CSR 23-4.080 for any monitoring wells plugged pursuant to this
Permit. This information shall be reported as part of the Goundwater Corrective Action Reports required by Special Permit Condition III.F.

b. At such time as the Department's GSRAD has accepted the Permittee's well registration, the plugged wells shall be removed from the Permittee's Groundwater SAP. Within 30 days of the registration acceptance, the Permittee shall submit appropriate SAP revisions to the Department.

c. Any change in the number of wells being monitored shall require a Class 2 Permit modification in accordance with 40 CFR 270.42. The Permittee may elect to submit an annual modification to incorporate changes in the number of monitoring wells in lieu of a modification for each individual change.

5. The Permittee shall contact the Department at least five working days prior to conducting any field work associated with the construction or modification of the groundwater monitoring system required by this Permit. The Department will then have the option of observing any portion of the system's construction or modification. This notification requirement applies to major work such as new wells, retrofitting of existing wells, or abandonment of wells. It does not apply to minor repairs, maintenance, or modification.

6. The Permittee shall revise the SAP contained in the approved Permit application to reflect the requirements contained in this Permit. Within 90 days of the effective date of this Permit, the Permittee shall submit the revised SAP to the Department for approval. The Permittee shall design all SAP procedures and techniques used in groundwater sampling, analysis, and measurement of groundwater-related parameters to meet the requirements of 40 CFR Part 264 Subpart F, as incorporated by reference in 10 CSR 25-7.264(1), and this Permit. The Permittee's sampling, analysis, and measurement protocols shall ensure the representative nature of all analysis and measurement results.

7. The Permittee shall implement a monitoring well inspection and maintenance program for the duration of the compliance period. The Permittee shall design this program to ensure the structural integrity of all monitoring well installations during the compliance period. The Permittee's revised SAP shall address the details of this program in accordance with the following requirements.

   a. The Permittee shall perform surface well integrity inspections at the time of each sampling event and shall document these inspections on an inspection log sheet. Surface integrity evaluations for each monitoring well shall include a visual inspection of the outer protective casing, inner casing riser, surface well seal, well cap, and locking mechanism to document any damage or deterioration. The ground surface in the immediate vicinity of each monitoring well and the annular space between the outer protective casing and casing riser shall be inspected for visible anomalies (e.g., collection or ponding of water, ground subsidence, etc.).

   b. The Permittee shall perform subsurface well integrity inspections annually on the wells in accordance with the provisions contained in the Permittee's SAP and shall document these inspections on a well inspection log sheet, with all wells being evaluated once every three years. Subsurface well integrity inspections may consist of a combination of elements, including total well depth measurements, groundwater turbidity measurements, in-situ hydraulic conductivity tests, casing caliper logs, down-hole television camera surveys, and/or other methods capable of verifying the subsurface integrity of the well casing and screen.

   c. The Permittee's SAP shall specify performance of an annual wellbore siltation evaluation to assess downwell siltation and well screen occlusion in the monitoring wells. The Permittee shall design this evaluation to ensure the representative nature of the Permittee's groundwater sample analysis and field measurement results through minimization of sampling and measurement interferences (e.g., turbidity, excessive well screen occlusion, etc.). The Permittee's SAP shall specify a well redevelopment trigger criterion based on a percentage of well screen occlusion and the potential of such occlusion to compromise the representative

nature of the Permittee's groundwater sample analysis and field measurement results. The Permittee shall re-develop wells demonstrating well screen occlusion equal to or in excess of the selected criterion prior to the next scheduled sampling event for that well.

d. The Permittee shall undertake monitoring well repairs within 30 days of identification of any surface or subsurface well integrity problem. If adverse weather or site conditions preclude the Permittee from gaining access to and/or repairing flood-impacted monitoring wells within the above-noted periods, then the Permittee shall take appropriate action as soon as practicable. The Permittee shall provide written justification for any delay, completed well inspection log sheets, a narrative description of any well repairs, and before and after photographic documentation (in the case of visible surface well repairs) to the Department as part of the Semi-Annual Groundwater Corrective Action Reports required by Special Permit Condition III.F.

E. Corrective Action Program [40 CFR 264.100]

The former burning ground and Atlas Pond are subject to the corrective action program requirements of 40 CFR 264.100, as incorporated by reference in 10 CSR 25-7.264(1) and this Permit, until such time as these requirements have been satisfied.

1. The Permittee's corrective action program for the regulated units shall consist of groundwater and surface water monitoring in accordance with Special Permit Conditions III. and IV. The Pemittee shall perform further site investigation, evaluation, and/or implementation of remedial alternatives to address site-wide groundwater contamination in accordance with Special Permit Conditions VI. through XVI. if determined to be necessary by the Department. The corrective action program shall include measures to address any groundwater contamination that has migrated off-site. Substantial integration of the site-wide monitoring program and the corrective action monitoring program for the closed regulated units is required due to:

a. The need for a complete understanding of site-wide groundwater flow to adequately support decisions regarding evaluation and/or

implementation of groundwater remedial alternatives;

b. The inability to differentiate groundwater contamination related to releases from the closed burning ground and former surface impoundment from that groundwater contamination which is potentially related to nearby SWMUs, AOCs and/or CASs, which are subject to corrective action in accordance with 40 CFR 264.101; and

c. The interest of implementing a holistic, site-wide approach to groundwater investigation, monitoring, and remediation given the foregoing circumstances.

2. The Permittee shall perform groundwater sampling/analysis and field measurement of groundwater-related parameters according to the schedule presented in Table II.

a. Sampling and analysis in accordance with this schedule shall begin during the next regularly scheduled sampling event following approval of the revised SAP required by Special Permit Condition III.D.6. Given the potential lag time between the effective date of this Permit and approval of the revised SAP required by Special Permit Condition III.D.6., the Permittee shall continue sampling and analysis in accordance with the groundwater section contained within the Permittee's approved Permit application, the Department's letter on the Phase II RFI Supplement dated March 7, 2002, and as outlined in this Permit until such time as the revised SAP is approved.

b. The Permittee shall sample the wells monitored to ensure adequate delineation of the horizontal and vertical extent of groundwater contamination (hereafter referred to as perimeter wells) and shall analyze the samples on an annual basis in accordance with Table II following approval of the revised SAP as required by Special Permit Condition III.D.6., provided that the horizontal and vertical extent of groundwater contamination remains adequately defined. Any new perimeter wells installed to redefine the extent of groundwater contamination, shall be sampled and the samples analyzed on a quarterly basis in accordance with Special Permit Condition III.E.2.e.

c. The Permittee shall specify the perimeter wells to be monitored in the Permittee's revised SAP, required by Special Permit III.D.6.

d. The Permittee may need to install additional perimeter wells during the compliance period to meet the requirements of 40 CFR Part 264 Subpart F, as incorporated by reference in 10 CSR 25-7.264(1), and this Permit. If any such wells are installed, they shall be subject to the monitoring requirements contained in Table II.

e. Following the issuance of this Permit, installation of new monitoring wells used for the purpose of delineation of the extent of groundwater contamination shall be subject to quarterly sampling and analysis for a period of time which is sufficient to establish contaminant trends in such wells. Thereafter, the monitoring frequency may be modified to reflect a long-term monitoring strategy and usage of such wells.

f. Any changes to the list of perimeter wells established in the Permittee's revised SAP require a permit modification in accordance with 40 CFR 270.42, which must be approved in writing by the Department. The Permittee may elect to submit an annual modification to incorporate changes in the number of monitoring wells in lieu of a modification for each individual change. Within 45 days of receipt of the Department's approval, the Permittee shall submit additional SAP revisions to incorporate the approved changes.

3. The Permittee shall sample the wells monitored to assess the effectiveness of the Permittee's corrective action program (hereafter referred to as effectiveness wells) and analyze the samples on an annual basis in accordance with Table II.

a. The Permittee shall specify the effectiveness wells to be monitored in the Permittee's revised SAP. Submittal of a revised SAP is required by Special Permit Condition III.D.6.

b. The Permittee may need to install additional effectiveness wells during the compliance period to meet the requirements of 40 CFR Part 264 Subpart F, as incorporated by reference in 10 CSR 25-7.264(1), and this Permit. If any such wells are installed, they shall be subject to the monitoring requirements contained in Table II.

c. Any future changes to the list of effectiveness wells established in the Permittee's revised SAP shall require a permit modification in accordance with 40 CFR 270.42, which must be approved in writing by the Department. The Permittee may elect to submit an annual modification in lieu of a modification for each individual change. Within 45 days of receipt of Department approval, the Permittee shall submit additional SAP revisions to incorporate the approved changes.

4. The Permittee need only perform single sample analyses (as opposed to replicates) for the parameters listed in Table II, with the exception of duplicate samples taken for Quality Assurance/Quality Control (QA/QC) purposes.

5. The field parameter values the Permittee measures and reports shall be representative of stabilized well conditions.

a. The Permittee shall take downwell measurement of static water level and total well depth prior to well purging.

b. The Permittee shall take the specific conductance, pH and temperature measurements reported to the Department immediately following well purging in accordance with the approved SAP.

c. Additional field parameter measurements such as those taken to verify the adequacy of well purging shall be recorded in the field logbook.

6. Every five years, as per Table II, the Permittee shall sample and analyze groundwater from three historically contaminated wells for all parameters contained in Appendix IX. of 40 CFR Part 264, excluding polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans.

   a. The Permittee may select the wells sampled to meet this requirement; however, the Permittee shall select one well containing low levels of metals, perchlorate, and explosives contamination; one well containing moderate levels of contamination; and one well demonstrating the presence of high levels of contamination, as appropriate.

   b. This sampling and analysis is required to determine if additional hazardous constituents (40 CFR Part 261 Appendix VIII.) and/or contamination indicator parameters are present in the groundwater which may be attributable to a release(s) from the closed burning ground, SWMUs, AOCs, or CASs, and/or degradation of currently known hazardous constituents.

   c. If hazardous constituents and/or contamination indicator parameters are identified in the groundwater that are not currently specified in the GPS, the Permittee may resample the groundwater in accordance with 40 CFR 264.99(g). If the Permittee's subsequent groundwater analyses confirm the presence of additional hazardous constituents or contamination indicator parameters, then the Permittee shall propose a Class 1 Permit modification with prior Director approval to add the confirmed hazardous constituents or contamination indicator parameters to the GPS (Table I) and the monitoring program specified in Table II contamination indicator parameters may also be incorporated into the monitoring program but will not necessarily have a corresponding maximum concentration limit (i.e., may be a monitoring requirement

F. Groundwater-Related Reporting Requirements

The Permittee shall submit to the Department, on a semi-annual basis for the preceding calendar half-year (i.e., January through June and July through December), Groundwater Corrective Action Reports. The Permittee shall submit these Groundwater Corrective Action Reports to the Department by March 1 and

September 1 of each calendar year for the preceeding calendar half-year. These Groundwater Corrective Action Reports shall include all raw analytical data from the Permittee's groundwater sampling events, groundwater analysis results, field parameter measurement results, copies of field sampling and well inspection log sheets, well repair documentation, QA/QC data, statistical analysis of groundwater data, field investigation results, volume of groundwater extracted, and other relevant groundwater-related information, as appropriate. These reports shall also discuss any exceedances of the Groundwater Protection Standard and effluent limits in the State Operating Permit. The September 1st Groundwater Corrective Action Reports need only contain the information outlined in this paragraph.

In addition to the information outlined above, the Permittee's March 1st Groundwater Corrective Action Reports shall contain a comprehensive evaluation, as described below, of the facility-wide groundwater monitoring program for the preceding calendar year (i.e., January through December).

1. The March 1st Groundwater Corrective Action Reports shall contain a narrative discussion of the nature and evolution of the Permittee's facility-wide groundwater monitoring program as well as conclusions concerning the overall adequacy of the program as related to its intended purpose, including discussion of any groundwater-related interim measures or stabilization actions taken in the preceding calendar year. Any conclusions concerning inadequacies in the Permittee's groundwater monitoring program shall be accompanied by a discussion of proposed remedies. The Permittee shall develop specific details concerning any proposed remedies outside of the scope of these reports and/or as otherwise specified in this Permit.

2. The Permittee's March 1st Groundwater Corrective Action Reports shall comprehensively address all of the technical requirements of 40 CFR Part 264 Subpart F and this Permit. The Permittee shall summarize relevant groundwater monitoring information and shall present this information in the form of narrative discussions, groundwater flow calculations, and/or diagrammatic illustrations (e.g., tabular groundwater

and statistical data summaries, hydrogeologic and potentiometric contour maps/cross-sections, chemical parameter trend graphs, calculated rate(s) of contaminant migration, contaminant isoconcentration maps/cross-sections,
fence/isometric diagrams, groundwater flow nets, etc.), as appropriate.

3. The Permittee's March 1st Groundwater Corrective Action Reports shall evaluate the effectiveness of the groundwater corrective action program, including, but not limited to, the following:

   a. The rate and direction of groundwater movement in underlying aquifers and potential effects on any corrective action measures being designed or implemented at the facility for removal, containment or control of the groundwater contaminant plume(s);

   b. The horizontal and vertical extent and concentrations of hazardous constituents (Table I) in groundwater throughout the contaminant plume(s) as evaluated from the data obtained through the Permittee's groundwater monitoring program;

   c. Any surface and/or subsurface well integrity problems and their potential or actual influence on the groundwater data or efficacy of the groundwater corrective action program;

   d. The estimated quantity/mass of contaminants remaining in the groundwater and the quantity/mass of groundwater contaminants removed/treated by the constructed wetlands and any other activities that are part of the groundwater corrective action program. The Permittee shall report this information as a total amount and, as appropriate, per well or extraction location. The Permittee shall also evaluate contaminant concentration information and indicators of natural attenuation in selected wells as a means to estimate the quantity/mass of contaminants potentially being addressed by natural attenuation processes;

   e. The conclusions and summary, including statistical evaluation, of analytical results from surface water monitoring conducted during the reporting period; and

f. Information related to flow of groundwater, installation, and operation of any on-site groundwater treatment, wetlands, permeable barrier walls, or other remediation methods, and discharge of treated or untreated groundwater to surface water including the following:

(1) If any corrective action measures or pilot studies involve pumping groundwater, extraction rates, volumes and pressures to determine if plugging of the well screens and/or the surrounding geologic strata is occurring;

(2) Concentrations of the groundwater monitoring parameters (Table I) in the wetlands, groundwater treatment system, or other corrective measures system influent and treated effluent to determine if substantial removal of contaminants is being achieved by the system, and whether the levels of treatment meet all applicable federal, state, and local requirements; and

(3) Any groundwater corrective measure operation and maintenance problems in terms of their potential or actual influence on effluent monitoring and treatment or removal efficiency.

4. The Permittee shall submit to the Department, in the March 1st Groundwater Corrective Action Reports, detailed boring logs for new exploratory borings and/or detailed as-built monitoring well diagrams for any new monitoring wells installed during the corresponding reporting period and the monitoring well-related information specified in Special Permit Conditions III.D.3. and 4.

IV. Surface Water Monitoring Program [10 CSR 25-7.264(2)(F)4.]

A. The Permittee shall implement a surface water monitoring program in accordance with the requirements of 10 CSR 25-7.264(2)(F)(4) throughout the post-closure care period or until such time as the Permittee makes a successful demonstration for an exemption from these requirements.

1. The Permittee's surface water monitoring program shall be incorporated

directly into and be submitted as part of the revised SAP required by Special Permit Condition III.D.6.

2. The Permittee's surface water sampling and analysis methods for chemical indicator parameters and hazardous constituents shall be consistent with those specified in Table II for groundwater.

3. The Permittee's surface water monitoring program shall use the parameters described in Section 7.4, Surface Water Evaluation of Volume 1 of the Phase II RFI Supplement dated January 2001. The Permittee shall add perchlorate and pesticides found at the facility to this list of parameters. The Permittee shall sample locations SW-1 through SW-13, which are shown on sheet SW-Surface of Volume II b of the RFI Phase II Report Amendment. The Permittee may propose changes in the Surface Water Monitoring Program in the SAP that is due within 90 days of the effective date of this Permit. After the Department approves such changes, the Permittee may implement them.

4. The Permittee shall conduct the surface water monitoring program concurrently with the annual groundwater sampling event performed under this Permit once the revised SAP has been approved.

5. Reporting of data/information collected as part of the surface water monitoring program shall be sufficient to ensure that the requirements of 10 CSR 25-7.264(2)(F)(4) are met, and shall be included in the Groundwater Corrective Action Reports required by Special Permit Condition III.F. The Permittee shall complete an analysis of the data/information as part of the comprehensive evaluation that is required in the March 1st Groundwater Corrective Action Report.

B. The Permittee may, at any time during the post-closure care period, make a demonstration to the Department for a surface water monitoring exemption. This demonstration shall be certified by an independent geologist or professional engineer registered in the state of Missouri, as described in 10 CSR 25-7.264(2)(F)4. A successful demonstration for such an exemption

must, at a minimum, adequately address the elements of 40 CFR 264.94(b), as applied to potentially affected surface water bodies. If the Department approves the Permittee's surface water monitoring exemption, the Permittee shall submit a Permit modification in accordance with 40 CFR 270.42.

V. Identification of Solid Waste Management Units (SWMUs), Areas of Concern (AOCs), and Corrective Action Sites (CASs)

A. On December 21, 1989, Atlas Powder Company and the USEPA entered into an Administrative Order on Consent (hereafter referred to as the Consent Order), Docket No. VII-90-H-0014, pursuant to the authority of Section 3008 (h) of RCRA, Part IV. The Findings of Fact in the Consent Order listed 29 areas of waste management activity. Additional investigations done to date for the RFI have identified a total of 52 SWMUs. Many of these SWMUs have been grouped together due to their geographic proximity and contamination type. The general location of the individual SWMUs is illustrated on Figure 1.

B. The following SWMUs were investigated during the Phase I/II RFI:

SWMU C: Old Container Storage Area

SWMU H-2: Scrap Metal Storage Area

SWMU J: Acid Recovery Facility

SWMU L: Nitroglycerin Spill Site

SWMU M-1: Old DNT Drum Storage Site (Bldg. 3)

SWMU M-2: Old DNT Drum Storage Site (West Area)

SWMU N: Old TNT Treatment Facility and Pipeline

SWMU O: Old Petron Leaching Tanks

SWMU Q: Dump Site by Burning Ground

SWMU R: Old Dissolved Air Facility

SWMU S: Old Burning Ground and Landfill

SWMU T: Old TNT Settling Ponds

SWMU U: Chemical Pond

SWMU V: Storm Water Pond

SWMU W: Old Chemical Pond

SWMU X: Old Copper Pond

SWMU Y: Burning Ground

SWMU Z: Spent Catalyst Storage Area

SWMU AA: Biological Pond
SWMU BB-2: Scrubbers, East Area

SWMU BB-3: Old Atlas Dump Site

SWMU BB-4: North Disposal Site

SWMU BB-5: Northern Property Boundary (Grace Area Maintenance Building and Pesticide Storage Building.)

SWMU BB-6: Area West of Hwy AA and North of No-Name Creek

SWMU BB-7: Emergency Holding Pond and Borrow Area Pit

SWMU BB-8: North and South Ponds

SWMU CC-1: Nitrogen Section Ditch

SWMU CC-2: Cooling Tower Ditch

SWMU CC-3: Acid Area Ditch

SWMU CC-4: Pool Ditch

SWMU CC-5: Powderline Ditch

SWMU DD: Facility Maintenance Shops, Three Areas

SWMU EE: Powderline Buildings

SWMU TNT: Old TNT Production Areas

C. The following SWMUs were identified in the Consent Order, but did not require additional investigation during the RFI, based on information gathered in the RCRA Facility Assessment (RFA) or because of satisfactory implementation of interim measures to address releases at these SWMUs. This determination was based on screening levels used at that time; however, once site specific soil clean-up levels are developed by the Permittee, further investigation and/or remediation at these SWMUs, while unlikely, could be required:

SWMU A: Old Permitted Landfill

SWMU B: Rail Car Wash and Pond

SWMU D: Emulsion Waste Treatment Facility

SWMU E: Atlas Pond

SWMU F-1: AOP Acid Tank Area

SWMU F-2: Mixed Acid Tank Area

SWMU F-3: OV Acid Tank Area

SWMU F-4: TC Acid Tank Area

SWMU F-5: Biazzi Acid Tank Area

SWMU G: Northern Old Dump Site

SWMU H-1: Scrap Metal Storage Area

SWMU I: Old Nitric Acid Production Residue

SWMU K: Old Change House Lagoon

SWMU M: Old DNT Drum Storage Site (East and Tank Area)

SWMU P: Ammonium Nitrate Pit and Tank

SWMU BB-1: Fluoride Ponds and Phosphoric Acid Plant

D. In the event any new information becomes available indicating human health and the environment may be unacceptably impacted, the Department may require the Permittee to reevaluate any of the aforementioned SWMUs and any newly identified SWMUs/AOCs or CASs and/or any release(s) from previously identified SWMUs/AOCs or CASs, including off-site release(s), as specified in Special Permit Conditions VI. and VII.

The Permittee shall notify the Department prior to any future construction or excavation activities that disturb existing contamination at any SWMUs/AOCs or CASs subject to institutional controls. Future construction, excavation activities, or land use changes may necessitate further evaluation of site conditions at SWMUs/AOCs or CASs with residual levels of contamination above corresponding regulatory thresholds or Department approved site-specific clean-up levels at that time.

E. Corrective Action Site Inventory

The term Corrective Action Site (CAS), as proposed by the Permittee, includes SWMUs and Areas of Concern (AOCs) under the Corrective Action Program (CAP). During the course of corrective action process at this facility, there have been instances where Solid Waste Management Units (SWMUs) were not clearly identified and/or described. The SWMU designations listed in subsection B and C of Special Permit Condition V. were previously used in the RFI Report. Following completion of the RFI, the Permittee proposed logical groupings of certain SWMUs using the concept of Corrective Action Sites (CASs) with the intent of better organizing impacted areas and facilitating evaluation of potential corrective measures at each CAS. The creation of CASs did not result in the elimination of any SWMUs or AOCs, areas were simply combined into logical groupings for the purpose of remedy evaluation. The CAS Inventory, shown in

Table V., defines each unit more clearly and provides more detail on its history. The Permittee may update the CAS Inventory annually in the Annual Groundwater Corrective Action Report.

VI. Notification Requirements for and Assessment of Newly-Identified SWMU(s) and Areas of Concern (AOCs)

A. The Permittee shall notify the Department and EPA in writing of any SWMU(s) or AOC(s), identified subsequent to the issuance of this Permit no later than 15 calendar days after discovery, or after discovery should have been made.

B. The Department may require a SWMU/AOC Assessment Work Plan for conducting an investigation of the newly-identified SWMU(s) or AOC(s). Within 45 calendar days after receipt of the Department's request for a SWMU/AOC Assessment Work Plan, the Permittee shall submit a SWMU/AOC Assessment Work Plan which shall include a discussion of past waste management practices at the unit, as well as a sampling and analysis program for groundwater, land, surface, and subsurface strata, surface water and/or air, as necessary to determine whether a release of hazardous waste, including hazardous constituents from such unit(s), has occurred, or is occurring. The Permittee shall design a sampling and analysis program that is capable of yielding representative samples and that includes monitoring parameters sufficient to assess the release of hazardous waste and/or hazardous constituents from the newly-identified SWMU(s)/AOC(s) to the environment. The Permittee shall specify any data to be collected to provide for a complete SWMU/AOC Assessment Report, as specified below in a SWMU/AOC Assessment Work Plan.

C. The Department will review the SWMU/AOC Assessment Work Plan in accordance with the procedures set forth in Special Permit Condition XXI., Review and Approval Procedures. The Permittee shall initiate implementation of the plan according to the schedule contained therein, after it is approved by the Department, and shall complete implementation in accordance with the schedule contained in the approved plan.

D. The Permittee shall submit a SWMU/AOC Assessment Report to the Department and USEPA according to the schedule specified in the approved SWMU/AOC Assessment Work Plan. The SWMU/AOC Assessment Report shall present and discuss the information obtained from implementation of the approved

SWMU/AOC Assessment Work Plan. At a minimum, the SWMU/AOC Assessment Report shall provide the following information for each newly-identified SWMU/AOC:

1. The location of the newly-identified SWMU/AOC in relation to other SWMU(s)/AOC(s);

2. The type and function of the unit;

3. The general dimensions, capacities, and structural description of the unit;

4. The period during which the unit was operated;

5. The physical and chemical properties of all wastes that have been or are being managed at the SWMU/AOC, to the extent available;

6. The results of any sampling and analysis conducted;

7. Past and present operating practices;

8. Previous uses of area occupied by the SWMU/AOC;

9. Amounts of waste handled; and

10. Drainage areas and/or drainage patterns near the SWMU(s)/AOC(s).

The Department will review the SWMU/AOC Assessment Report in accordance with the procedures set forth in the Review and Approval Procedures, Special Permit Condition XXI. Based on the findings of this report, the Department will determine the need for further investigations, including stabilization, a RCRA Facility Investigation (RFI) and/or a Corrective Measures Study (CMS), at specific unit(s) identified in the SWMU/AOC Assessment Report.

If the Department determines that additional investigations are needed, the Department may require the Permittee to prepare and submit for approval a Work Plan for such investigations. The Department will review this Work Plan for additional investigations in accordance with the procedures set forth in the Review and Approval Procedures, Special Permit Condition XXI. The Permittee shall complete implementation in accordance with the schedule contained in the approved plan.

VII. Notification Requirements for and Assessment of Newly-Identified Releases from Previously-Identified SWMUs and AOCs

A. The Permittee shall notify the Department and EPA in writing, no later than

15 days after discovery, or after discovery should have been made, of any newly-identified release(s) of hazardous waste, including hazardous constituents, from previously-identified SWMUs and AOCs discovered during the course of groundwater monitoring, field investigation, environmental auditing, or other activities undertaken after issuance of this Permit.

B. The Department may require a Newly-Identified Release Work Plan for conducting an investigation of the new-identified release(s). Within 60 days after receipt of notice that the Department requires a Newly-Identified Release Work Plan, the Permittee shall submit a Newly-Identified Release Work Plan which shall include a discussion of the waste/chemical management practices related to the release; a sampling and analysis program for groundwater, land surface and subsurface strata, surface water or air, as necessary to determine whether the release poses a threat to human health or the environment; and a proposed Newly-Identified Release Work Plan. The Permittee shall design the sampling and analysis program such that it is capable of yielding representative samples and includes monitoring parameters sufficient to assess the release of hazardous waste and/or hazardous constituents to the environment. The Newly-Identified Release Work Plan shall identify any data to be collected to provide for a complete Newly-Identified Release Report, as specified below.

C. The Department will review the Newly-Identified Release Work Plan in accordance with the procedures set forth in the Review and Approval Procedures, Special Permit Condition XXI. Upon approval thereof by the Department, the Permittee shall initiate implementation of the plan within 60 days of Departmental approval and shall complete implementation in accordance with the schedule contained in the plan.

D. The Permittee shall submit a Newly-Identified Release Report to the Department and USEPA according to the schedule specified in the approved Newly-Identified Release Work Plan. The Newly-Identified Release Report shall present and discuss the information obtained during implementation of the approved Newly-Identified Release Work Plan. At a minimum, the report shall provide the following information for each newly-identified release:

1. The location of the newly-identified release in relation to any other SWMU(s)/AOC(s);

2. The general dimensions of the release;

3. The period during which the release is suspected to have occurred;

4. The physical and chemical properties of all wastes that comprise the release;

5. The results of any sampling and analyses conducted;

6. Past and present operating practices near and at the location of the release;

7. Previous uses of the area(s) occupied near and at the location of the release;

8. Amounts of waste handled near and at the location of the release; and

9. Drainage areas and/or discharge patterns near and at the location of the release.

E. The Department will review the Newly-Identified Release Report in accordance with the procedures set forth in Special Permit Condition XXI., Review and Approval Procedures. Based on the findings of the report and any other available information, the Department will determine the need for further investigation, including stabilization, an RFI, and/or a CMS.

## VIII. Interim/Stabilization Measures

To date, four interim measures investigations/actions have been implemented at the site. An Interim Measures Investigation was conducted in 1990 to evaluate the presence of hazardous constituents at 15 areas of the facility. A second Interim Measures investigation was conducted in 1992 and 1993 at the location of the incinerator (Note: this is a separate area that has its own permit and is not part of the EMI property). A third Interim Measure resulted in the removal of sediment from the AN Clay Pit, Chemical Pond, Stormwater Pond, and Biological Pond between November 1993 and February 1994. The fourth Interim Measure investigation was conducted in 1994 on the Powderline, the Nitroglycerin Spill Site, and the Spent Acid Recycling Facility.

A. If the Permittee becomes aware of a situation that may require additional interim/stabilization measures (ISMs) to protect human health and the environment, the Permittee shall notify the Department and USEPA within 24 hours of the time the Permittee becomes aware, or should have become aware, of the situation.

B. If during the course of any activities initiated under this Permit, the Permittee or the Department determines that a release or potential release of hazardous waste, including hazardous constituents, poses a threat to human health or the environment, the Department may require ISMs to slow or stop the further spread of contamination until final corrective action measures can be implemented. The Department will determine the specific action(s) that shall be taken to implement ISMs, including potential Permit modifications, and the schedule for implementing the stabilization requirements and will inform the Permittee of decisions regarding the action(s) in writing. This requirement shall not preclude the Permittee from responding to an emergency situation without direction of the Department.

C. If, at any time, the Permittee determines or should have known that the stabilization program is not effectively limiting or stopping the further spread of contamination, the Permittee shall notify the Department and EPA in writing no later than ten days after such a determination is made. The Department may require that the stabilization program be revised to make it effective in limiting or stopping the spread of contamination, or that final corrective action measures are required to remediate the contaminated media.

D. In cases where releases present minimal exposure concerns and/or the remedial solution is straightforward, the Permittee may propose ISMs for review and approval by the Department. These ISMs shall be consistent with, and may supplement and/or satisfy the requirements for, a final remedy(s) in specific areas.

IX. <u>RCRA Facility Investigation (RFI) Work Plan</u>

A. Atlas Powder completed the RCRA Facility Assessment (RFA) for the Atlas facility in April, 1988. Subsequent to completion of the RFA, EPA and Atlas Powder Company executed a Corrective Action Administrative Order on Consent, EPA Docket Number VII-90-H-0014, pursuant to the authority of Section 3008(h)

of RCRA on December 21, 1989. Pursuant to the requirements of the Consent Order, Atlas Powder Company submitted an RFI Work Plan, which USEPA approved on April 23, 1993.

B. If the Department determines that further investigations are needed for newly and/or previously identified SWMUs/AOCs pursuant to Special Permit Conditions VI. and VII., the Department will notify the Permittee of this determination in writing. The Department may require the Permittee to prepare and submit an RFI Work Plan for such investigations. If an RFI Work Plan is required, the Permittee shall submit it within 90 days of receipt of the notice. The RFI Work Plan shall contain provisions that shall meet the following objectives:

1. Full characterization of the nature, vertical and horizontal extent, and rate of migration of releases of hazardous waste and/or hazardous constituents from newly identified SWMUs/AOCs or groups of SWMUs/AOCs or newly identified release(s) at the facility and the actual or potential receptors of such releases; and

2. Collection of any other pertinent data which may be utilized to substantiate future corrective action decisions.

C. The content of the RFI Work Plan shall be appropriate for site-specific conditions and shall be consistent with and address all applicable investigation elements described in the most recent version of the RCRA Facility Investigation Guidance EPA 530/ SW-89-031. At a minimum, the Permittee shall detail in the RFI Work Plan all proposed activities and procedures to be conducted at the facility, a description of current conditions, the schedule for implementing and completing such investigations, and for submission of reports (including the final RFI Report), the qualifications of personnel performing or directing the investigations, including contractor personnel, and the overall management of the RFI.

D. The RFI Work Plan shall include a Quality Assurance Project Plan (QAPP). The QAPP shall present the policies, organization, objectives, functional activities, and specific quality assurance and quality control activities designed to achieve the data quality goals of the RFI. It shall include the RFI objectives, sampling procedures, analytical methods, field and laboratory quality control samples, chain-of-custody procedures and data review, validation, and reporting procedures.

E. The Permittee shall prepare and maintain a health and safety plan during the project that assures the RFI activities are conducted in a manner that is protective of human health and the environment.

F. Due to the complexity of defining the extent of contamination, the Department may require the Permittee to use a phased, approach which requires the submittal of supplemental RFI Work Plans.

The Department will review the RFI Work Plan(s) in accordance with the procedures set forth in Special Permit Condition XXI., Review and Approval Procedures. The Permittee shall complete implementation in accordance with the schedules contained in the approved plan(s).

X. RCRA Facility Investigation (RFI) Report

The RFI has been conducted in three phases. The Permittee conducted Phase I of the RFI in 1993-1994 and focused on characterizing the nature and extent of hazardous constituents in site soils and establishing a hydrogeologic conceptual model for the site. EPA provided comments on the RFI Phase I Investigation Report that was submitted April 1994, which resulted in revisions to the Phase I Report that also functioned as the RFI Phase II Work Plan. The Permittee performed Phase II in 1995-1996 and further characterized site soils and groundwater. In response to the Department's comments in April 1999, the Permittee conducted additional soils investigation and four quarters of groundwater sampling to supplement the RFI. The Department received an amendment to the RFI Phase II Supplement in January 22, 2001, which included the quarterly monitoring data collected through calendar year 2000 plus an updated assessment of the facility hydrogeology. The Department commented on the Final Phase II RFI Supplemental Report in a March 7, 2002, letter, listing items that had to be addressed prior to approval of the RFI. The Permittee responded to the Department's comments in correspondence dated May 31, 2002. USEPA in coordination with the Department, approved the site-wide RFI in a letter to the Permittee dated August 15, 2002.

A. The Permittee shall submit any additional RFI Report required by this Permit to the Department and USEPA in accordance with the schedule contained in the corresponding approved RFI Work Plan. The RFI Report shall present all information gathered under the approved RFI Work Plan along with a brief facility description and map showing the property boundary and all SWMUs/AOCs and CAS(s). The Permittee shall present the information in the

RFI Report in a form that is consistent with Section 5 of the most recent version of the EPA publication entitled, RCRA Facility Investigation Guidance; EPA 530/SW-89-031.

B. The Permittee's RFI Report shall provide an interpretation of the RFI information gathered, supported with adequate documentation, to enable the Department to determine whether additional stabilization and/or corrective measures may be necessary. The RFI Report shall describe the procedures, methods, and results of all investigations of SWMUs/AOCs and CAS(s) and associated releases, including, but not limited to, the following, as appropriate:

1. Characterization of the nature, concentration(s), horizontal and vertical extent, and direction/rate of movement of releases from SWMUs/AOCs and CAS(s) at the facility;

2. Characterization of the environmental setting of the facility, including:

   a. Hydrogeological conditions;

   b. Climatological conditions;

   c. Soil and bedrock characteristics;

   d. Surface water and sediment quality; and

   e. Air quality and meteorological condition

3. Characterization of SWMUs/AOCs and CAS(s) from which releases have been or may be occurring, including unit and waste characteristics;

4. Descriptions of human and environmental receptors and associated risks to the receptors, which are, may have been, or, based on site-specific circumstances, could be exposed to release(s) from SWMUs/AOCs and CAS(s);

5. Assessment of potential risks to the human and environmental receptors (e.g., Baseline Risk Assessment) exposed to release(s) from SWMUs/AOCs and CAS(s);

6. Extrapolations of future contaminant movement, including a description of

contaminant fate and transport mechanisms and pathways for human and environmental exposure;

7. Laboratory, bench-scale, pilot-scale and/or appropriate tests or studies to determine the feasibility or effectiveness of treatment technologies or other technologies that may be appropriate in implementing remedies at the facility;

8. Statistical analyses to aid in the interpretation of data;

9. Results of any stabilization measures previously implemented;

10. A plan for groundwater monitoring from the time of RFI approval until such time as this Permit is modified to implement a final remedy. This plan shall specify the wells to be monitored, the frequency of monitoring, and the analytical parameters. Groundwater monitoring shall be conducted in accordance with Special Permit Condition III.E; and

11. Evaluation of data quality that may affect the nature and scope of a Corrective Measures Study Work Plan as well as the evaluation of corrective measure alternatives thereunder (e.g., identification of any potential bias in the RFI data, and documentation of its precision, accuracy, representativeness, completeness, compariability, validation, etc.).

C. The Department will review the RFI Report in accordance with the procedures set forth in Review and Approval Procedures, Special Permit Condition XXI. After review of the RFI Report, if the Department determines that the objectives of the RFI have not been met, the Department may require additional investigation. Upon approval of the RFI Report by the Department, the Department shall advise the Permittee as to the next step in the corrective action process, which may include submittal of a CMS Work Plan pursuant to Special Permit Condition XI.

XI. Corrective Measures Study (CMS) Work Plan

A. The Permittee submitted a CMS Work Plan strategy for the facility to the Department and USEPA on December 12, 2002. The RFI findings at the facility were compiled by quadrants (Figure 3) to make the data and information more manageable. The current CMS strategy proposes performing a risk assessment for each quadrant to determine exposure risks associated with that quadrant. The risk assessment(s) will be submitted and reviewed/approved as per Special Permit

Condition XXI. A CMS Work Plan shall be submitted within 90 days of approval of the risk assessment for each of the four quadrants. Should the Department approved risk assessment indicate that no unacceptable risks to human health and the environment exist, the Department will not require a CMS Work Plan for that quadrant as long as cumulative risk across multiple quadrants has been evaluated by the Permittee and has been shown to be accceptable. The Permittee submitted the risk assessment for the Nitrogen Section (North) Ditch Valley quadrant in October 2002. The Department, with the assistance of an USEPA contract risk assessor and the Missouri Department of Health and Senior Services (MDHSS) responded with a comment letter in December 2003. Human health and environmental risks related to contaminated surface water and groundwater need to be addressed. Rather than assessing these risks on a quadrant by quadrant basis, the Permittee may elect to address these risks on a "facility wide" basis. Upon approval of the risk assessment for a particular quadrant, the Permittee shall have 90 days to complete and submit the risk assessment on the next quadrant.

B. If the Department determines that a release(s) of hazardous waste and/or hazardous constituents from newly and/or previously-identified SWMUs/AOCs pursuant to Special Permit Conditions VI. and VII. has occurred, the Department may require the Permittee to prepare and submit a CMS Work Plan and will notify the Permittee in writing of this decision. This notice will identify the hazardous constituent(s) of concern and may specify remedial alternatives to be evaluated by the Permittee during the CMS.

C. The Department may require the Permittee to identify and evaluate, as part of the CMS, one or more specific potential remedies for removal, containment, and treatment of hazardous waste, including hazardous constituents in contaminated media based on the objectives established for the corrective action. These remedies may include a specific technology or combination of technologies that, in the Department's judgment, are protective of human health and the environment.

D. The Permittee shall submit a CMS Work Plan to the Department and EPA within 90 days of notification of the requirement to conduct a CMS. The CMS Work Plan shall be consistent with guidance contained in the EPA document entitled:

RCRA Corrective Action Plan (Final), May 1994, OSWER Directive 9902.3-2A. At a minimum, the CMS Work Plan and any other CMS Work Plan required by this Permit shall provide the following information as appropriate:

1. A description of the general approach to investigating and evaluating potential remedies;

2. A definition of the specific objectives of the study;

3. A description of the remedies that will be studied;

4. A description of those potential remedies that were preliminarily considered, but were dropped from further consideration, including the rationale for elimination;

5. The specific plans for evaluating remedies to ensure compliance with remedy standards;

6. The schedules for conducting the study and submitting a CMS Report;

7. The proposed format for the presentation of information; and

8. Laboratory, bench-scale, pilot-scale, and/or appropriate tests or studies to determine the feasibility or effectiveness of treatment technologies or other technologies that may be appropriate in implementing remedies at the facility.

E. The Department will review any CMS Work Plan required by this Permit in accordance with the procedures set forth in Review and Approval Procedures, Special Permit Condition XXI. The Permittee shall complete implementation in accordance with the schedule contained in the approved plan.

XII. Corrective Measures Study (CMS) Report

A. The Permittee shall submit a CMS Report to the Department and the USEPA according to the schedule contained in the approved CMS Work Plan. The CMS Report shall present all information gathered under the approved CMS Work Plan and shall be consistent with guidance contained in the USEPA document entitled, RCRA Corrective Action Plan (Final), May 1994, OSWER Directive 9902.3-2A.

The CMS report shall summarize the results of the investigations for each remedy studied and of any bench-scale or pilot tests conducted. The CMS reports shall include, but not be limited to, the following information:

1. Evaluation of performance, reliability, ease of implementation, and potential impacts of each remedy studied, including safety impacts, cross media impacts, and control of exposure to any residual contamination;

2. Assessment of the effectiveness of each remedy in achieving adequate control of sources and clean-up of the hazardous waste or hazardous constituents released from the SWMU(s)/AOC(s) and/or CAS(s);

3. Assessment of the time required to begin and complete each remedy;

4. An estimate of the costs of implementing each remedy;

5. Recommendation of a remedy and rationale for selection; and

6. Assessment of institutional requirements, such as state or local permitting requirements, or other environmental or public health requirements which may substantially affect implementation of the remedy.

B. The CMS report shall contain adequate information to support the Department in the remedy approval decision-making process.

C. The Department will review the CMS report in accordance with the procedures set forth in Review and Approval Procedures, Special Permit Condition XXI. Upon approval thereof by the Department, the Department will approve a final remedy as specified in Special Permit Condition XIII.

XIII. Final Remedy Approval

Following the approval of the CMS Final Report or equivalent, the Department will prepare a Statement of Basis (SB) summarizing the corrective measures alternatives that were evaluated by the Permittee, including justification for the Permittee's proposed final remedy.

Following preparation of the SB by the Department, the Permittee and/or the Department will initiate a Permit modification pursuant to 40 CFR 270.41 or 270.42(c), as applicable, to implement the proposed final remedy.

Upon completion of the public participation activities associated with the Permit modification to implement the proposed final remedy, the Department will approve a final remedy that will: 1) be protective of human health and the environment; 2) control, stabilize, and/or eliminate the source(s) of contaminants so as to reduce or eliminate, to the maximum extent practicable, further contaminant releases, exposures or migration that might pose a threat to human health and the environment; and 3) meet all applicable federal, state, and local laws and regulations.

XIV. Corrective Measures Implementation (CMI) Work Plan

A. Within 90 calendar days of approval of a final remedy covering specific SWMUs/AOCs and/or CAS(s), the Permittee shall submit a CMI Work Plan to the Department and USEPA to provide the information pertaining to the design and implementation of the corrective measure(s) in the approved final remedy. The Permittee may propose a schedule for submitting the CMI Work Plan in its CMS report, basing it upon the final remedy approval.

The CMI Work Plan shall outline the objectives of the corrective measures and shall contain a description of the design, construction, operation, monitoring, quality assurance, and maintenance requirements; an amended cost estimate to more accurately define costs for design, construction, and monitoring; a detailed schedule for design, construction, and monitoring; and management procedures for hazardous wastes and/or hazardous constituents recovered as a result of implementing the corrective measures. The CMI Work Plan shall provide for submission of deliverables for remedy implementation consistent with all applicable components of the CMI as specified in the document entitled, RCRA Corrective Action Plan (Final), May 1994, OSWER Directive 9902.3-2A. The CMI elements shall be consistent with the objectives specified in the approved CMS report.

1. Many SWMUs/AOCs and/or CAS(s) at the site may require further corrective action for soil contamination. Specific SWMUs/AOCs and/or CAS(s) will be identified for such action once site specific clean-up levels are determined and approved by the Department. The approved corrective measures may, in part, consist of institutional controls and land use restrictions. Any future construction or maintenance activities that

involve excavation or disturbance of contaminated soils that are in areas covered by institutional controls, shall come under the Excavated Soil Management Procedures discussed in Special Permit Condition XXI.B., or if not related to maintenance of utilities, the Permittee shall submit a work plan to the Department for its review and approval prior to disturbance of contaminated soils that are in areas covered by institutional controls.

B. Within 120 days of Department approval of a final remedy covering specific SWMUs/AOCs and/or CAS(s), that includes institutional controls, the Permittee shall submit a plan for the implementation of the institutional controls. The institutional controls will insure that any real property at the facility shall not be used in any manner that would interfere with or adversely affect the integrity or protectiveness of the corrective action measures to be implemented. The institutional controls will include, but not be limited to, the following land use restrictions:

1. Public access to all contaminated soil shall be prevented by appropriate means such as fences and other security measures.

2. Any future construction or maintenance activities involving excavation of contaminated soil shall include internal Permittee controls consistent with Occupational Safety and Health Administration (OSHA) requirements regarding appropriate worker exposure protection and shall provide for the management of the soil according to federal, state, and local regulations.

3. Buildings, structures, and pavement that currently cover contaminated soil shall not be removed or altered unless the Permittee has provided for alternative corrective measures to protect human health and the environment, and has the prior approval of the Department. An exception to this is repair and maintenance of utilities provided for by the Excavated Soil Management Procedures found in Special Permit Condition XXI.B. Alterations that are subject to this provision are limited to those that result in exposing presently covered soils.

4. Groundwater from the shallow aquifer beneath the facility, shall not be used as a water supply for any purpose. Water from the deep aquifer may be used with the following stipulations: 1) water withdrawn shall be monitored by the entity taking the water from the aquifer or the Permittee, for constituents listed in Table I of this Permit, and 2) water elevations in the shallow aquifer shall be monitored by the Permittee to determine if

draw down in the deep aquifer is having any influence on the upper aquifer. Permit modification may be needed to accommodate these stipulations.

5. Unless approved in writing by the Department, the institutional controls shall provide that real property comprising the facility may not be used for any purpose other than industrial use. Industrial uses are those that result only in exposure of adult workers in industrial, construction, and maintenance activities consistent with the exposure assumptions used in the site-wide risk assessment.

C. The institutional control implementation plan shall provide for the incorporation of the land use restrictions and conditions listed in Special Permit Condition XIV.B., above, into the facility's security and internal land use permitting system.

D. The institutional control implementation plan shall also provide for the continuation of appropriate institutional controls in the event of a permit transfer, a transfer of custody, or the conveyance of any interest in real property that is currently part of the facility, including, but not limited to, fee interests, leasehold interests, and mortgage interests. The plan shall provide for an access easement and restrictive covenants to be filed and recorded in the Recorder's Office of Jasper County, State of Missouri, and to be written to run with the land and be enforceable under Missouri law.

1. The Permittee will submit to the Department for approval, proposed drafts of the access easement, and restrictive covenants, and propose a schedule for the filing and recording of each.

2. The easements and restrictive covenants shall be drafted so as to retain or grant the access easement rights and the right to enforce the land use restriction on behalf of the Permittee and its representatives and to the state of Missouri and its representatives. The state of Missouri may opt to be a grantee of the easements and restrictive covenants.

3. The easements shall be free and clear of all prior liens and encumbrances, except as approved by the Department.

4. The restrictive covenant shall include, but not be limited to the restrictions and conditions stated in Special Permit Condition XIV.B. above, and any others necessary to implement, ensure non-interference with, or ensure the

protectiveness of the corrective measures provided for in this Permit.

5. The access easement shall include a grant of a right of access to the real property for the purpose of conducting any activity related to the corrective measures provided for in this Permit. This shall include, but not be limited to the following activities:

   a. Monitoring the work.

   b. Verification of data or information submitted to the Department and USEPA.

   c. Conducting investigations relating to contamination at, near, or migrating from the facility.

   d. Obtaining samples.

   e. Assessing the need for, planning, or implementing additional response actions at the facility.

   f. Implementing work pursuant to conditions set forth in a final remedy, the Consent Order, or this Permit.

   g. Inspecting and copying records, operating logs, contracts, or other documents maintained or generated by the Permittee or its agents.

   h. Assessing EMI's compliance with this Permit.

   i. Determining whether any property at the site is being used in a manner that is prohibited or restricted.

E. The Department will review and approve the CMI Work Plan in accordance with the procedures set forth in Special Permit Condition XXI., Review and Approval Procedures. The Permittee shall complete implementation in accordance with the schedules contained in the approved plan.

F. The Permittee shall monitor any passive final remedy (such as a permeable barrier wall or wetlands) for effectiveness in groundwater treatment, for the contaminants listed in Table I. Within 60 days of completion of installation of any passive final remedy, the Permittee shall submit a separate passive remedy operation and

maintenance (O&M) plan for Department review and approval. The Permittee shall operate any passive remedy until the Permittee demonstrates that the remedy is not effective in meeting the GPS , or the objectives of the remedy have been met.

G. The Permittee shall address the hot spots within the plume. The Permittee shall continue to investigate innovative treatment technologies with respect to their application to areas of high contaminant concentrations in groundwater with the objective of meeting the GPS and/or other regulations on clean-up. These efforts shall be reported annually as part of the March 1 Groundwater Corrective Action Report, required in Special Permit Condition III.F.

XV. Corrective Measures Implementation (CMI) Report and Certification of Completion of Corrective Measures

A. Within 90 calendar days of completion of all corrective measures implementation activities, the Permittee shall submit a Corrective Measures Implementation (CMI) Report to the Department and USEPA. The CMI Report shall contain a summary of corrective measures activities conducted at the facility; a detailed description of any long-term operation and maintenance and/or monitoring program associated with the corrective measures.

To verify completion of corrective measures at the SWMUs/AOCs and/or CAS(s), the Permittee shall demonstrate in the CMI Report that groundwater and contaminant levels do not exceed GPS maximum concentration limits specified on Table I, or alternate concentration limits or risk-based levels that have been approved by the Department. The Permittee's groundwater corrective action program for the SWMUs/AOCs and/or CAS(s) shall continue until the Permittee demonstrates that these limits have not been exceeded for a period of three consecutive years at and beyond the point of compliance. All other contaminated media (soil, sediment, etc.) must meet current clean-up standards or site specific levels approved by the Department.

The Department will review and approve the CMI Report in accordance with the procedures set forth in Special Permit Condition XXI., Review and Approval Procedures.

B. Where remediation is projected to occur over a long period of time (i.e., is not complete at the time of site-wide construction completion), the Permittee shall submit a Corrective Measures Construction Completion Report within 90 days of completion of final remedy construction, to document construction of the site-wide final remedy. The Department will not formally approve the Corrective Measures Construction Completion Report, but will acknowledge receipt and provide comments as needed.

For SWMUs/AOCs and/or CAS(S) requiring extended time periods to implement the remedy, the Permittee shall summarize the progress of the remedy implementation and provide data obtained during remedy implementation in the Groundwater Corrective Action Reports required by Special Permit Condition III.F. The Permittee shall also summarize any short-term completion of corrective action activities (interim measures) at individual SWMUs/AOCs and/or CAS(s) in the Groundwater Corrective Action Reports required by Special Permit Condition III.F.

C. Within 60 calendar days of the Department approval of the CMI Report documenting completion of all corrective action pursuant to Special Permit Condition XV., the Permittee shall submit to the Department and USEPA, by certified mail, a written certification stating that the approved final remedy has been completed in accordance with the approved CMS Report and CMI Work Plan. The certification shall be signed by the Permittee and an independent professional engineer registered in the state of Missouri.

XVI. Institutional Controls and Activity Use Limitations

A. Within 120 calendar days of the effective date of this Permit, the Permittee shall submit to the Department for approval, a draft notice that the Permittee will file with the Recorder of Deeds for Jasper County, Missouri, that contains two figures or maps drawn to scale, illustrating the approximate boundaries of each SWMU/AOC and/or CAS for which levels of contamination in the subsurface soils and/or groundwater exceed background concentrations and/or other regulatory clean-up guidance criteria/standards. One figure shall illustrate the soil contamination, and the other shall illustrate the groundwater contamination. Type, location, and concentrations of hazardous waste and/or hazardous

constituents shall be noted on the figures. Both figures shall indicate the general location and area of each SWMU/AOC and/or CAS with respect to identifiable landmarks and permanently surveyed benchmarks or Global Positioning System (GPS) coordinates. The Department will review and approve the draft notice in accordance with Special Permit Condition XXI.

B. Within 60 calendar days of the Department's approval of the draft notices described in Special Permit Condition XVI.A. above, the Permittee shall:

1. Record, in accordance with state law, a notation and/or restrictive covenant in the chain of title to the facility property, or on some other instrument which is normally examined during title search, that will in perpetuity notify any potential purchaser of the property:

a. that the land has been used to manage hazardous waste and/or hazardous constituents; and

b. of the record of type, location, and concentration of hazardous wastes and/or hazardous constituents remaining in the subsurface soils and/or groundwater as noted above.

C. Within 60 calendar days of the Permittee's recording the Department approved notice(s)/restrictions, the Permittee shall submit a notarized statement to the Department certifying that the notation and/or restriction specified in paragraph B.1 of this section has been recorded with the local zoning authority or the authority with jurisdiction over local land use, including a copy of the document in which the notation/restriction has been placed.

D. At least 60 days prior to conveyance, or transfer of custody or control, of any real property at the facility located within areas subject to corrective action or institutional controls under this Permit, the Permittee shall submit and record an access easement, and a restrictive covenant with the Recorder of Deeds for Jasper County, Missouri. Refer to Special Permit Condition XIV., CMI Work Plan, Part D.

The restrictive covenant shall grant the right to enforce the land use restrictions listed in Special Permit Condition XIV., CMI Work Plan, Part D., and those

requirements that are otherwise necessary to implement, ensure non-interference with, or ensure the protectiveness of the corrective action measures provided for in the CMI Work Plan, the final remedy, or this Permit.

E. The Permittee shall continue to investigate innovative technologies to address soils with high contamination as it pertains to corrective action to ensure protection of human health and the environment. The Department may require the Permittee to implement additional remedies when appropriate. Prior to conveyance of any property at the Permittee's facility, or transfer of custody or control of any real property at the Permittee's facility, the Department may modify or revoke and re-issue this Permit to change the name of the Permittee and incorporate such other requirements as necessary to continue the institutional controls, as well as ongoing remediation and corrective action.

F. The Permittee may, as a result of ongoing remediation efforts or future implementation of innovative technologies reduce the concentration of the contaminants to the GPS, an approved groundwater ACL, and/or levels in soil to concentrations which are suitable for something other than industrial land use. Should this occur, the Permittee may propose appropriate revisions to any deed notation and/or restrictive covenant as a class 2 permit modification. Once the Class 2 permit modification has been finalized, the Permittee may record the revised notation or restriction in the property chain of title to supersede any previous notation or restriction on use.

XVII. Transfers of Ownership or Operational Control

Prior to conveyance of any property at the facility, or transfer of custody or control of any real property that is currently under the control of the Permittee, the Department may modify or revoke and re-issue this Permit to change the name of the Permittee and incorporate such other requirements as are necessary to continue the engineering and institutional controls, as well as ongoing remediation and corrective action. The Permittee shall provide to the Department and any potential new owner/lease holder, at least 30 days prior to the property transfer or lease execution, an updated version of the two figures required by Special Permit Condition XVI. illustrating the remaining levels of soil and groundwater contamination. The revised figures shall be based on the most recent sampling data for soil and groundwater, and shall in no case be over one year old. If the clean-up goals have been achieved prior to the transfer, the confirmation data that supports this shall also be provided to the Department and any potential new owner/lease holder.

XVIII. Funding and Financial Assurance for Corrective Action

A. Within 60 days of the effective date of this Permit, the Permittee shall amend its financial assurance with EPA Region VII, in the amount of $1,484,900.00 for Corrective Action Administrative Order on Consent, EPA Docket Number VII-90-H-0014 by adding the Department to the same obligation. Within **60** days of EPA Region VII terminating the Corrective Action Administrative Order on Consent, EPA Docket Number VII-90-H-0014 the Permittee shall remove EPA Region VII from the obligation and leave the obligation solely to the Department pursuant to this Permit.

Within 60 days of updating financial assurance estimates for ongoing activities and implementation of approved final remedies at the facility, the Permittee will adjust the financial assurance from the above-referenced $1,484,900.00 base amount. The Permittee shall submit revised cost estimates to the Department for review and approval pursuant to Special Permit Condition XXI prior to implementing any changes in financial assurance amounts or instruments. As with the site characterization and risk assessment activities, revised costs estimates and financial assurance may be addressed by quadrant. As requirements for specific areas or quadrants are satisfied, cost estimates and financial assurance amounts can be adjusted by the Permittee via submission of revised corrective action cost estimates to the Department for review and approval. These estimates shall be itemized, giving the number of wells being sampled, laboratory analysis, operation and maintenance costs for any ongoing corrective actions, and other associated costs not already covered by other specific post-closure financial assurance requirements for the former regulated units.

At the time of this permit issuance, the following financial assurances are in place:

(a) To the Department, in the amount of $382,628.00 for closure costs of the RD&D composting operation

(b) To the Department, in the amount of $676,646.00 for post closure care of the Former Burning Grounds Closure, CAS Y.

(c) To EPA Region VII, in the amount of $1,484,900.00 for Corrective Action Administrative Order on Consent, EPA Docket Number VII-90-H-0014.

The effective financial assurance requirements for corrective action shall be consistent with and/or substantially equivalent to that specified in either final 40 CFR Part 264 Subpart S corrective action regulations or 40 CFR Part 264 Subpart H, as incorporated by reference in 10 CSR 25-7.264.

B. Within 60 days after the Department's approval of any new or revised corrective action cost estimates, the Permittee shall submit the updated financial assurance.

C. Within 90 days after this Permit has been modified to include any new or additional remedies, the Permittee shall provide updated financial assurance to demonstrate an adjustment of funds sufficient to support all corrective action activities required under this Permit. The updated financial assurance shall be based on ongoing remedies at the facility, and on the cost estimates contained in the CMS Reports or equivalent for any additional remedies.

D. Annually, the Permittee shall adjust the corrective action cost estimate to account for inflation in accordance with 40 CFR 264.142(b) and any other changes in the costs associated with implementation, operation, maintenance and monitoring of the approved final remedy. This updated cost estimate shall be submitted within 60 days prior to the anniversary date of the initial updated financial assurance required by Special Permit Condition XVIII. B.

XIX. Quarterly Progress Reports

A. The Permittee shall submit to the Department and USEPA signed quarterly progress reports summarizing all permitted corrective action activities undertaken during each calendar quarter. Each quarterly progress report shall be due within 60 days following the last day of each reporting period (i.e., March 1, June 1, September 1, and December 1). Those quarterly progress reports falling on March 1 and September 1 may be combined with the Groundwater Corrective Action Reports required by Special Permit Condition III.F.

The first quarterly progress report shall be due within 60 days of the end of the calendar quarter in which this Permit becomes effective. The Permittee shall continue to submit the quarterly progress reports until such time as the Permittee's corrective action activities are complete. The quarterly progress reports shall include the following information for the time period covered by the report:

1. A description of the work completed;
2. Summaries of all findings, including summaries of laboratory data;

3. Summaries of all problems or potential problems encountered during the reporting period and actions taken to rectify problems;

4. Projected work for the next reporting period; and

5. Any instances of noncompliance with the corrective action requirements of this Permit not required to be reported elsewhere in this Permit.

B. Detailed technical information shall be submitted as part of the Groundwater Corrective Action Reports required by Special Permit Condition III.F. and/or other reports (i.e., IM, RFI, CMS, etc.) required by this Permit. This detailed information need not be reproduced as part of the Permittee's quarterly progress reports.

C. The Permittee shall make copies of other reports (e.g., inspection reports), information or data available to the Department and USEPA upon request.

XX. Supplemental Data

All raw data, such as laboratory reports, drilling logs, bench-scale or pilot-scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Permit shall be maintained by the Permittee during the term of this Permit, including the term of any reissued Permits.

XXI. Review and Approval Procedures

A. Following submission of any plan or report pertaining to corrective action activities (excluding the Groundwater Corrective Action Reports, quarterly progress reports, and Corrective Measures Construction Completion Reports), the Department will review and either approve or disapprove the plan or report in writing.

If the Department does not approve the plan or report, the Department will notify the Permittee in writing of the deficiencies in the plan or report and specify a due date for submittal of a revised plan or report.

If the Department does not approve the revised plan or report, the Department may modify the plan or report and notify the Permittee of the modifications. The plan or report as modified by the Department shall be the approved plan or report.

If the Permittee disagrees with any Department-initiated plan or report modifications, and a mutually acceptable resolution of such modifications can not be informally reached, the Permittee may file any appeal of the Department-initiated modifications in accordance with Section 260.395.11, RSMo, and 10 CSR 25-8.

B. To facilitate the Permitee's repair and maintenance of utilities on-site that may be in a contaminated area, the Permittee shall follow the Excavated Soil Management Procedures, subject to the following conditions:

1. Pre-excavation soil sampling/analysis shall be done along the area of repair/excavation prior to submitting the request to the Department for approval.

2. A plan view map showing the location(s) and depth(s) of the necessary repair, location(s) and depth(s) of any pre-excavation samples, and the location(s) of any known hazardous waste (regulated) units or SWMUs/AOCs and/or CAS(s) and/or releases from such units that could be impacted by the proposed excavation/construction activities and any information relevant to disturbance of areas with known contamination, shall be submitted with the request to the Department. This map and the sample results shall be legible and clear.

3. The Departmental approval shall be followed for each individual utility project, and is not a blanket approval for management of excavated soils associated with other activities. The Permittee shall consult the Department if the Permittee has any questions as to whether certain activities are covered by the Department’s approval.

4. The Permittee's pre-excavation soil sampling/analysis and subsequent excavation activities could lead to discovery of additional SWMUs/AOC's, CAS(s) and/or releases from such areas. Any newly-identified SWMUs/AOCs or CAS(s) and/or newly-identified releases from known

SWMUs/AOCs or CAS(s) discovered must be reported to the Department and USEPA in accordance with Special Permit Conditions VI. and VII. as applicable.

5. When contaminated soil is approved for backfill into an excavation, the Permittee shall place a clean layer of soil at grade on top of the soil that is backfilled. The clean soil layer shall be a minimum of four inches thick and be free of contamination above background levels (i.e., below the method detection limits for VOCs, explosives, and perchlorate). For areas that have Department approved site specific clean up levels that pose no unacceptable risk to human health and the environment, concentrations shall be less than the site specific numbers in the top four inches of soil. Any contaminated soil which is not used as backfill must be managed and disposed of in accordance with all applicable local, state, and federal laws and regulations. In the event any excavated material is shown to be hazardous waste, land disposal restrictions in 40 CFR Part 268 must be met prior to placing material back in/on the ground (unless placement is for stockpiling, prior to transportation off-site).

6. The Permittee shall submit Excavated Soil Management requests to the Department at least 15 working days prior to performing the work. When possible, the Permittee should group requests together and consolidated them.

7. The Department will notify the Permittee by telephone and/or email if the request is approved. The Permittee shall then confirm the Department's approval by letter within seven working days of the verbal or e-mail approval.

C. Removing buffer land from the jurisdiction of this Permit shall be done as follows. Areas that the Permittee proposes to remove that include a SWMU/AOC and/or CAS shall require sufficient data to demonstrate that the area has not been impacted by facility activities. If existing data is not available, incomplete, or does not cover all suspected constituents of concern for an area, the Permittee shall submit a sampling plan for Department approval. Once the Department approves the sampling plan, the Permittee shall proceed with the sampling and report the findings to the Department. The Department is currently reviewing data submitted by EMI on CASs G, TT-4, and ZZ for removal from this Permit. When the Department determines that the areas are not impacted above levels of regulatory concern, determines that the requirements of General Permit Conditon

V. are met, and approves the legal survey describing the "buffer land," it will send an approval letter to the Permittee documenting the basis for removal of the buffer land from the jurisdiction of this Permit. Following this approval, the "buffer land" legal survey and the Department's approval letter shall be recorded in the property chain of title at the Jasper County Recorders office. Proof of filing for the survey plat and associated approval letter shall be submitted to the Department by the Permittee within 30 days of recording at the Jasper County Recorders Office.

XXII. Planned Activities

A. The Permittee shall comply with the schedule for the planned activities other than groundwater monitoring, surface water monitoring, and corrective action as specified in this Permit and as summarized on Table III attached hereto.

B. The Permittee shall comply with the schedule for planned groundwater monitoring, surface water monitoring, and corrective action activities as specified in this Permit and as summarized on Table IV. attached hereto and by this reference incorporated herein.

XXIII. Contingent Activities

A. The Permittee shall comply, as necessary, with the schedule(s) for contingent activities as specified in the Standard and General Permit Conditions of this Permit.

B. The Permittee shall comply, as necessary, with the schedule(s) for contingent corrective action activities as specified in the Special Permit Conditions of this Permit.

XXIV. Submittal of Required Information

A. The Permittee shall submit three copies of all reports, documents, or plans/specifications required under the terms of this Permit to:

Chief, Permits Section
Missouri Department of Natural Resources
Hazardous Waste Program
1738 East Elm (lower level)
P.O. Box 176
Jefferson City, MO 65102-0176

B. The Permittee shall submit two copies of all reports, documents, or plans/specifications required under the terms of this Permit to:

Chief, RCRA Corrective Action & Permits Branch
United States Environmental Protection Agency Region VII
Air, RCRA and Toxics Division
901 North 5th Street
Kansas City, KS 66101

**Table I**
**Groundwater Protection Standard**

| Hazardous Constituent | Maximum Concentration Limit (ug/l) | Maximum Detection Limit (ug/l)* (d) |
|---|---|---|
| 1,3,5-trinitrobenzene | 1100 (c) | 0.26 |
| 1,3-dinitrobenzene | 1 (a) | 0.11 |
| 2,4,6-trinitrotoluene | 2 (a) | 0.11 |
| 2,4-dinitrotoluene | 0.05 (a) | 0.02 |
| 2,6-dinitrotoluene | 0.31 (a), (f) | 0.31 |
| Arsenic | 50 (a), (b) | 35.0 |
| Barium | 2000 (a), (b) | 0.87 |
| Cadmium | 5 (a) | 2.3 |
| Chromium | 100 (a), (b) | 4.7 |
| Lead | 15 (a), (b) | 1.0 |
| Mercury | 2 (a), (b) | 0.2 |
| Aldrin | 0.04 (b), (f) | 0.04 |
| Chlordane | 2 (a), (b) | 1.8 |
| Lindane | 0.2 (b) | 0.2 |
| Dieldrin | 0.02 (b), (f) | 0.02 |
| Benzo(a)anthracene | 10.0 (a), (b), (f) | 10.0 |
| Benzo(a)pyrene | 10.0 (a), (b), (f) | 10.0 |
| Benzo(b)fluoranthene | 10.0 (a), (f) | 10.0 |
| Indeno(1,2,3-cd)pyrene | 10.0 (a), (b), (f) | 10.0 |
| Nitrobenzene | 17.0 (a), (b) | 10.0 |
| Tetrachloroethene | 5.0 (a), (b) | 0.14 |
| Trichloroethene | 5.0 (a), (b) | 0.19 |
| Perchlorate | 18.0 (e) | 0.53 |
| Ammonia | 210 (c) | 5.0 |
| Nitrate | 10,000 (b) | 13.0 |
| Chloride | 250,000 (b) | 15.0 |
| Fluoride | 4,000 (b) | 5.0 |
| White Phosphorus | 0.73 (a), (c) | 0.01 |
| Sulfate | 250,000 (b) | 206.0 |
| HMX | 400 (a) | 13.0 |
| RDX | 2 (a) | 0.84 |

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

(a) Denotes Groundwater Target Concentrations taken from Missouri Department of Natural Resources Clean-up Levels for Missouri (CALM) effective September 1, 2001.

(b) Denotes limits derived from Missouri Water Quality Standards (10 CSR 20-7.031) for protection of groundwater dated October 31, 1999.

(c) Denotes limits derived from risk-based concentration values for tap water as contained on the EPA Region III Risk-Based Concentration Table dated September 25, 2001.

(d) The Department reserves the right, based on future advances in analytical technology, to modify this Permit to require the Permittee to achieve analytical detection limits for the hazardous constituents covered by Special Permit Condition III.A., which allows for adequate comparison with appropriate health- and/or environmental protection-based concentration limit(s).

(e) Denotes limits derived from risk-based concentration values for tap water as contained on USEPA Region IX Preliminary Remediation Goals updated November 22, 2000.

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

| Constituent | MCL (ug/L) | Source |
|---|---|---|
| Aldrin | 0.00013 | (b) |
| Dieldrin | 0.00014 | (b) |
| 2,6-dinitrotoluene | 0.05 | (a) |
| Benzo(a)anthracene | 0.0044 | (a), (b) |
| Benzo(a)pyrene | 0.2 | (a), (b) |
| Benzo(b)fluoranthene | 0.0044 | (a) |
| Indeno(1,2,3-cd)pyrene | 0.0044 | (a), (b) |

**Groundwater Corrective Action Monitoring,
Sampling, Analysis, and Parameter Measurement Schedule**

| Parameters | Type* | Maximum Detection Limit (ug/l) | Frequency |
|---|---|---|---|
| Appendix IX (1) | HC | PQLs per SW-846** | Every 5 years |
| Volatiles/Semi-Volatiles (2) | HC | Per Table 1 | *** (see note) |
| Metals (3) | HC | Per Table 1 | *** (see note) |
| Explosives (4) | HC | Per Table 1 | *** (see note) |
| Pesticides (5) | HC | Per Table 1 | *** (see note) |
| Perchlorate | HC | Per Table 1 | **** (see note) |
| PH | FM | Not Applicable | *** (see note) |
| Specific Conductance | FM | Not Applicable | *** (see note) |
| Static Groundwater Elevation (6) | FM | Not applicable | ***** (see note) |
| Temperature | FM | Not Applicable | *** (see note) |
| Total Well Depth | FM | Not Applicable | *****Annually |

(1) Appendix IX. (40 CFR Part 264) scan on three wells only.
(2) EPA SW-846 Method 8260/8270 or equivalent.
(3) EPA SW-846 Method 6000 series or equivalent.
(4) EPA SW-846 Method 8330 or equivalent.
(5) EPA SW-846 Method 8081A or equivalent.
(6) Potentiometric measurements shall be obtained at the time of each regularly scheduled sampling event from all monitoring wells at the facility, including those which are not being sampled regularly.

* HC = Hazardous Constituent FM = Field Measurement
** The EPA approved SW-846 version at the time of sampling.
*** Annual for wells that were identified in Table 4-1 proposed by the Permittee on July 11, 2003, for Groundwater and Surface Water Monitoring. This proposal was approved by the Department in a July 25, 2003, letter to EMI. Changes proposed by EMI to this group of wells must be approved by the Department, or incorporated into the new SAP required by Special Permit Condition III.D.6. New wells shall be sampled quarterly as per Special Permit Condition III.E.2.e.

**** Perchlorate levels are guidelines until such time that the USEPA establishes values protective to human health and the environment.

***** Static groundwater elevations and total well depth measurements shall be made prior to well purging.

**Table III**
**Summary of Submittal Requirements Per the Schedule of Compliance and General Permit Conditions of this Permit**

| SUBMITTAL REQUIREMENTS | DUE DATE | PAGE NO. |
|---|---|---|
| Archaeological Survey and Historic Architectural Survey | Within 180 calendar days of effective date of Permit | Page 11 |
| Certification that Permittee has read and understands this Permit. | Within 60 calendar days of effective date of Permit | Page 11 |
| Submit two copies of the entire approved consolidated Permit application to the Department. | Within 60 calendar days of effective date of Permit. | Page 11 |
| Submit a check or money order to the Department's Hazardous Waste Program payable to the State of Missouri for any outstanding engineering costs. | Within 60 calendar days of effective date of Permit. | Page 11 |
| Check or money order for $9,000 and all outstanding engineering review costs. | Within 60 calendar days of effective date of Permit | Page 11 |

**Table IV**
**Summary of Submittal Requirements Per the Special Conditions of this Permit**

| SUBMITTAL REQUIREMENTS | DUE DATE | SPECIAL CONDITION |
|---|---|---|
| Revise and resubmit the Groundwater SAP. | Within 90 calendar days of the effective date of this Permit. | III.(D)(6) |
| Annual/Semi-Annual Groundwater Corrective Action Reports | By March 1 and September 1 of each calendar year. | III.(F) |
| Surface Water Monitoring Program incorporated into revised Groundwater SAP. | Within 90 calendar days of the effective date of this Permit. | IV. |
| RFI Work Plan | Within 90 calendar days of notice by the Department that an RFI Work Plan is required. | IX. |
| RFI Report | According to the schedule in the approved RFI Work Plan. | X. |
| Submit a risk assessment for additional quadrants of the facility. | Within 90 calendar days of Department approval of the previous risk assessment. | XI. |
| CMS Work Plan | Within 90 calendar days of notice by the Department that a CMS is required. | XI. |
| CMS Report | According to the schedule in the approved CMS Work Plan. | XII. |
| CMI Work Plan | Within 90 calendar days of the effective date of Permit modification to include an approved final remedy. | XIV. |
| Long term site-wide soil and groundwater plan addressing containment, hot spots, and institutional controls | Within 180 calendar days of the effective date of this Permit. | XIV. Parts B, C, D, and G |

| SUBMITTAL REQUIREMENTS | DUE DATE | SPECIAL CONDITION |
|---|---|---|
| CM Implementation | According to schedule in approved CMI Work Plan | XIV.E |
| Corrective Measures Implementation (CMI) Report | Within 90 calendar days of all corrective measures implementation activities. | XV.A. |
| Corrective Measures Construction Completion Report | Within 90 days of completion of final remedy construction | XV.B. |
| Certification of Completion of Corrective Measures | Within 60 calendar days of Department approval of the CMI Report. | XV.C. |
| Deed Notation and/or Deed Restriction Requirements | Submit draft notices within 60 calendar days of the effective date of this Permit; record notices and/or restrictions within 60 days of Department approval; and provide notarized certification within 60 days of recording. | XVI. |
| Funding and Financial Assurance for Corrective Action | Within 60 calendar days of the effective date of this Permit, the Permittee shall amend the financial assurance for corrective action. | XVIII.A &B |
| Annual Update of Financial Assurance | On or before each anniversary of the effective date of this Permit. | XVIII.D |
| Financial Assurance for New or Additional Remedies | Within 90 calendar days of a Permit modification for any new or additional remedies. | XVIII.C |
| Quarterly Progress Reports | By March 1, June 1, September 1, and December 1 of each calendar year. | XIX. |

| SUBMITTAL REQUIREMENTS | DUE DATE | SPECIAL CONDITION |
|---|---|---|
| Sampling Plan and/or additional sampling required for removal of buffer land from Permit | Within 75 days of receipt of Department's request for additional information. | XXI. C |

**Table V**
**Corrective Action Sites (CAS(s)) Listing**

| CAS ID | CAS Name | North | East | Description or Historic Usage | Previous ID | Classification of site | Source of Listing |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| A | Former Trash Landfill | 12900 | 11100 | Unlined landfill containing plastic and paper bags from the Shell-house and Box Factory. Permitted by Jasper County 8/71 followed by trial operation shortly thereafter. Determined economically unfeasible to operate after trial operation of 8 days. Material hauled off site. | AOC a | AOI | 1989 CO |
| B | Former Rail Car Washout Facility and Pond Area | 10600 | 10800 | Area where rail cars containing ammonium nitrate, urea, grain, and cement were washed (rinsed) prior to being loaded. During operation, water flowed south into an unlined pond with an estimated capacity of 100,000 gallons. After being allowed to settle, the pond level was lowered by gravity flow to the then "Pool Ditch" (today known as the Central-Wetland Ditch) which flowed to Grove Creek at the time. MDNR's Water Program shutdown the use of this pond via NPDES Permit changes. The pond was drained and filled with cement and local borrow soil in August 1987. This is one of the suspected sources of nitrate migrating to groundwater. | AOC b | AOC | 1989 CO |
| C | Former Container Storage Area | 11960 | 10870 | Used to store drums of RCRA regulated wastes, such as paint thinner, acid putty, and waste oil. The drums were set one high on pallets or on the ground along a fence. There was no containment. Transformers may also have been stored in this location. | SWMU C | SWMU | 1989 CO, Phase I/II RFI |
| D | Former Emulsion Solution Evaporation Facility CLOSED USING RISK BASED CLOSURE | 9460 | 12850 | Consisted of a stainless steel compartmentalized tank in a concrete containment where emulsion manufacturing equipment and storage tanks were washed. Before November 1985, the organic phase was burned and remaining liquid drained via a ditch to Atlas Pond (CAS-E). After November 1985, a surfactant was added to the wastes and heated for evaporative purposes. The remaining concentrate was burned at the Burning Ground (CAS-Y). This unit also replaced CAS-R, the DAF from the LDEP. | AOC d | SWMU | 1989 CO |
| E | Former Settling (Atlas) Pond CLOSED WITH WASTE IN PLACE | 9750 | 12900 | An unlined impoundment used to collect wastewaters from the Emulsion Waste Treatment Facility (CAS-E) and discharge from acid tanks (D002). During its operation, the pond received inflow via the South Wetlands Ditch (fka Acid Ditch) which drained the former acid production area. The acidic solutions were neutralized in the pond. Upon closure, the sediments were left in place and backfilled over with local borrow soils. | AOC e | SWMU | 1989 CO |
| F-1 | Former (Blazzi) Acid Salts Area CLEAN CLOSED | 9500 to 9400 | 12500 to 12700 | One of five (5) separate areas where mixtures of nitric and sulfuric acid were stored in carbon steel tanks. The resulting salts referred to as "mud" from the placement of the acid in the carbon steel tanks, was periodically flushed and discharged to the ground in an area covered with soda ash. The neutralized solution was allowed to enter the South-Wetland Ditch system which flowed to Grove Creek at the time. | AOC f | SWMU | 1989 CO |
| F-2 | Former (Tower Concentrator) Acid Salts Area CLEAN CLOSED | 8800 | 10,800 | One of five (5) separate areas where mixtures of nitric and sulfuric acid were stored in carbon steel tanks. The resulting salts referred to as "mud" from the placement of the acid in the carbon steel tanks, was periodically flushed and discharged to the ground in an area covered with soda ash. The neutralized solution was allowed to enter the South-Wetland Ditch system which flowed to Grove Creek at the time. | AOC f | SWMU | 1989 CO |

| CAS ID | CAS Name | North | East | Description or Historic Usage | Previous ID | Classification of site | Source of Listing |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| F-3 | Former (Mixed Acid) Acid Salts Area CLEAN CLOSED | 9200 | 11,400 | One of five (5) separate areas where mixtures of nitric and sulfuric acid were stored in carbon steel tanks. The resulting salts referred to as "mud" from the placement of the acid in the carbon steel tanks, was periodically flushed and discharged to the ground in an area covered with soda ash. The neutralized solution was allowed to enter the South-Wetland Ditch system which flowed to Grove Creek at the time. | AOC f | SWMU | 1989 CO |
| F-4 | Former (Oil of Vitriol ) Acid Salts Area CLEAN CLOSED | 8700 | 11,200 | One of five (5) separate areas where mixtures of nitric and sulfuric acid were stored in carbon steel tanks. The resulting salts referred to as "mud" from the placement of the acid in the carbon steel tanks, was periodically flushed and discharged to the ground in an area covered with soda ash. The neutralized solution was allowed to enter the South-Wetland Ditch system which flowed to Grove Creek at the time. | AOC f | SWMU | 1989 CO |
| F-5 | Former (Nitric Acid Plant) Acid Salts Area (aka AOP) CLEAN CLOSED | 9100 | 10800 | One of five (5) separate areas where mixtures of nitric and sulfuric acid were stored in carbon steel tanks. The resulting salts referred to as "mud" from the placement of the acid in the carbon steel tanks, was periodically flushed and discharged to the ground in an area covered with soda ash. The neutralized solution was allowed to enter the South-Wetland Ditch system which flowed to Grove Creek at the time. | AOC f | SWMU | 1989 CO |
| G | Former (Brush) Dump Site | 16400 | 13000 | Approximate one-acre used for placement of brush and tree stumps. Heavily overgrown. | AOC g | AOI | 1989 CO |
| H-1 | Former Salvage Storage Area (South) | 8650 | 11000 | Area used for storage of decontaminated salvage, metal equipment, tanks, etc., pending final disposition (reuse, sale, etc.) The RFA concerns were for potential impact to soil from residual explosives or cleaning solvents which is highly unlikely and/or deminimus. | AOC h | AOC | 1989 CO. Permittee refined identity. |
| H-2 | Former Salvage Storage Area (North) | 11750 | 11100 | Area used for storage of decontaminated salvage, metal equipment, tanks, etc., pending final disposition (reuse, sale, etc.) The RFA concerns were for potential impact to soil from residual explosives or cleaning solvents which is highly unlikely and/or deminimus. The staging areas of these residues is thought to be the same as the Acid Mud Treatment Areas (CAS-F-1, CAS-F-2, CAS-F-3, CAS-F-4, and CAS-F-5). | AOC h | AOC | 1989 CO, Phase I/II RFI. Permittee refined identity. |
| I-1 | Former Nitric Acid Production Area from early 1900's til ? (fka Retort) | TBD | TBD | Area used for storage of decontaminated salvage, metal equipment, tanks, etc., pending final disposition (reuse, sale, etc.) The RFA concerns were for potential impact to soil from residual explosives or cleaning solvents which is highly unlikely and/or deminimus. The staging areas of these residues is thought to be the same as the Acid Mud Treatment Areas (CAS-F-1, CAS-F-2, CAS-F-3, CAS-F-4, and CAS-F-5). | AOC i | AOC | 1989 CO. Permittee refined identity. |
| I-2 | Former Nitric Acid Production Area from ??? Until 1984 | TBD | TBD | Area used for storage of decontaminated salvage, metal equipment, tanks, etc., pending final disposition (reuse, sale, etc.) The RFA concerns were for potential impact to soil from residual explosives or cleaning solvents which is highly unlikely and/or deminimus. The staging areas of these residues is thought to be the same as the Acid Mud Treatment Areas (CAS-F-1, CAS-F-2, CAS-F-3, CAS-F-4, and CAS-F-5). | AOC i | AOC | 1989 CO. Permittee refined identity. |
| I-3 | Former Nitric Acid Production Area from 1956 til ???? | TBD | TBD | Area where corrosive sodium sulfite was generated during the production of nitric acid. | AOC i | AOC | 1989 CO. Permittee refined identity. |

| CAS ID | CAS Name | North | East | Description or Historic Usage | Previous ID | Classification of site | Source of Listing |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| J | Former Acid Reclamation Facility (RR 209) | 8700 | 10900 | Area formerly consisting of a distillation column and associated tankage used for the storage and reclamation of spent mixed acid produced as a by product of NG production. The mixed acid was transported from the Biazzi via an overhead pipeline. NG and EGDN may have been present in the spent mixed acid feedstock's, but would have been destroyed during reclamation. Acid putty containing lead oxide may have been used as a caulking agent for piping joints and tanks. The facility, operated under a MDNR Class R1Permit, accepted spent acid from off-site to be reclaimed. The reclaimed acid was sold for reuse. | SWMU J | SWMU | 1989 CO, Phase I/II RFI. Permittee refined identity. |
| K | Former Evaporation Pond & Spray Application Field | 10800 | 11000 | An MDNR ( MSOP#0002453) permitted land application system where "gray water" from the powder line laundry and change house was evaporated and/or sprayed on to the grass. Replaced Outfall #006. Closed as a permitted outfall (#012) with MDNR Water Program in 2003. | AOC k | AOI | 1989 CO |
| L | Historic Nitroglycerin Spill Location | 10000 | 13340 | Area where it was reported a 449 pound mixture of NG and EGDN was spilled on August 23, 1965. The spill occurred when a cart carrying the mixture along an elevated walkway struck a guard rail and fell to the ground below. An estimated 339 pounds were spilled. 110 pounds were recovered and open burned leaving 229 pounds which penetrated the surface and was reported destroyed in place using a solution of sodium sulfide, acetone & denatured alcohol to break down the nitrate bonds. Both NG and EGDN are extremely biodegradable. | SWMU L | SWMU | 1989 CO, Phase I/II RFI |
| M-1 (a) | Former DNT Liquefaction Process Area | 9800 | 9800 | DNT, a raw material, was shipped to the Atlas Powder Co. facility in 55 gallon drums and stored on a horizontally drum rack, adjacent to former building 3. The DNT was liquefied in a steam heated water bath in the building, for transfer into smaller containers and subsequent transport to various explosives manufacturing areas within the facility. Aerial photographs indicate former building 3 was at this location sometime between 1959 and 1966 until 1995 when it was removed. The process apparently stopped sometime prior to 1975. One of the explosives manufacturing processes utilizing DNT was Petron Production where returned TNT from the United States Government was reclaimed for use in commercial explosives. DNT also went into Nitrocarbonitrate (N.C.N.) a commercial, relatively low-sensitive explosive made up of DNT, a solid carbon carrier as fuel, and ammonium nitrate. Drums were "completely" emptied, and as much DNT as possible was put into the production process, as it was a valuable commodity. It is historically reported, drums were steam cleaned on the rack to the | SWMU M-1 | SWMU | 1989 CO, Phase I/II RFI |

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| M-1 (b) | **Former South DNT Drum Storage Area** | 9800 | 11400 to 12000 | This area was the predecessor location to the CAS-M-1 (a) Former DNT Liquefaction Process Area because Building 3 was located in this area as early as 1912 (unconfirmed) prior to being relocated as noted above. Accurate details of this historic time frame are difficult to come by, however aerial photographs indicate this facility was very active just prior to and around World War II when the United States Government directed the production of TNT and some other production processes at this facility. DNT unpacking operations occurred here, and subsequently the emptied drums were also stored in this vicinity until they were crushed and scrapped, then removed from the property. Some drums were stored here as late as 1981, but we do not suspect these contained DNT; it is suspected the drum storage activity in this location was vestigial to WWII activities and the DNT drums were removed shortly after the war. It is unknown what specifically the later empty drums may have containe prior to being emptied. This area was regraded extensively after the drum were removed in 1981. | SWMU M-1 | SWMU | 1989 CO, Phase I/II RFI |
| M-2 (a) | **Former Central DNT Drum Storage Area** | 11350 | 11200 | Used to store empty DNT drums. In 1979 an EPA investigation concluded they were not polluting the environment. | SWMU M-2 | SWMU | 1989 CO, Phase I/II RFI |
| M-2(b) | **Former North DNT Drum Storage Area** | 11200 | 12000 | Used to store empty DNT drums. In 1979 an EPA investigation concluded they were not polluting the environment. | SWMU M-2 | SWMU | 1989 CO, Phase I/II RFI |
| N-1 | **Former Red & Yellow Water Evaporation Facility** | 9000 | 11900 | A 2-story building (429), where red & yellow water from the manufacture of TNT during WWII was neutralized with caustic, evaporated, and incinerated. The water was diluted before entering the pipeline and neutralized once at this facility by adding dry caustic. Where the resultant Ash was dispositioned is unknown. | SWMU N | SWMU | 1989 CO, Phase I/II RFI |
| N-2 | **Red & Yellow Water Pipeline** | 9000 to12400 | 10100 to 12600 | Wooden 3, and 4-inch diameter pipeline which conveyed red and yellow water from the three former TNT Production Lines to the former Red & Yellow Water Evaporation Facility. Red water contained sodium sulfite to remove undesirable TNT isomers and byproducts. Yellow water was a wash water used to remove acids and TNT isomers. Both were diluted prior to entering the pipeline. | SWMU N | SWMU | 1989 CO, Phase I/II RFI |

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| O | Former Petron Reclamation Leach Tanks | 12040 | 11600 | The Petron Leaching Tanks were used to reclaim the contents of Petron A, and Petron Primer canisters. The canisters contained an explosive composed of DNT, ammonium nitrate, sodium nitrate, TNT, and Alcaid Oil (a high flash point petroleum hydrocarbon) mixture. The process involved removing the bulk contents from canisters for reclamation into commercial products then punching holes in the canisters and placing them in a water bath to leach the residual explosives. The leached Petron solution was drained to settling ponds in the area and then to the North-Wetland Ditch which at the time was known as the Cooling Tower Ditch and it drained to Grove Creek then. The canisters and debris from this process were open burned at the Burning Grounds. Building 356 operated as a settling tank building for wash water used in the TNT graining process prior to being converted into this Petron reclamation activity. | SWMU O | SWMU | 1989 CO, Phase I/II RFI |
| P | Former Ammonium Nitrate "Clay Pit" or "Clay Tank" | 10780 | 10370 | The Former Ammonium Nitrate "Clay Pit", or "Clay Tank", dependant on the time, was located in the AN Production Area between buildings 940 and 943. A "clay" coating, from the AN Production Facility, was flushed into this tank, initially, where it settled and the effluent flowed via a ditch to the Chemical Pond (CAS-U). At a undetermined time, the tank was abandoned and the flow only went into the ditch for settling. The clay when removed from, the tank or ditch, was sold as fertilizer. The pit was less than 50 sf. About 1980 the process changed, the pit was filled in and the tank removed. There is concern this may have been a source of AN to groundwater. | AOC p | AOI | 1989 CO |
| Q | Former North Dump Site | 15200 | 12000 | Dump site for disposal of construction/demolition debris, and trash generated from other parts of the facility. Observed material (as described in AOC) consisted primarily of empty bottles, cans, drums, and possibly petron canisters. The North Ditch runs through this area. | SWMU Q | SWMU | 1989 CO, Phase I/II RFI |
| R | Former Dissolved Air Flotation (DAF) Facility | 11600 | 13950 | The Former Dissolved Air Flotation (DAF) Facility consisted of a TENCO waste water treatment system Model CF48 designed for the removal of suspended aluminum particles and oil from wash waters at the Water Gel Explosives Production Line. The DAF was installed in 1977 and operated about one year. The extracted wastes, a oily aluminum hydroxide/ammonia/nitrate slurry, were burned at the Burning Grounds. The waste water, with residuals of the same, was discharged to Grove Creek under a NPDES Permit. | SWMU R | SWMU | 1989 CO, Phase I/II RFI |
| S-1 | Former South Burning Ground | 7450 | 10250 | Used for burning of construction debris and explosive contaminated materials, although exact nature of materials burned is unknown. Two "bays", the North Burning Bay and Burning Bay, were buddled against the rock formation and had earthen barricades. These are thought to have been the primary burning areas, though it appears there may have also been occasional "surface burning" in the central portion of former Site S area. These "surface burning" areas would not have been used for explosives, but probably trash. | SWMU S | SWMU | 1989 CO, Phase I/II RFI |
| S-2 | Former South Dump Site | 7450 | 10250 | Associated with CAS-S-1, this area, or areas, was/were used for disposal of ash generated from CAS-S-2. It appears some of this ash was placed separately while others may have been placed with the rubble noted in CAS-S-3 to fill in low lying wet areas. | SWMU S | SWMU | 1989 CO, Phase I/II RFI |

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| S-3 | **Former Rubble Area** | 7450 | 10250 | Associated with CAS-S-1 and CAS-S-2 in the time frame of usage. Construction debris and rubble were placed in low lying portions of this area, apparently with the intent of filling in "swampy" or wet ground. | NA | AOI | NA |
| T | **Former TNT Settling Ponds Area** | 12750 | 10650 | A series of ten earthen ponds, each slightly lower in elevation than the preceding, to facilitate gravity flow of water and settling of solids were constructed prior to 1939. TNT Production Line #1 starting in 1939, discharged "Red Water" and "Yellow Water" to these ponds. The effluent discharged to Grove Creek via the North Ditch (fka Nitrogen Section Ditch) CAS-CC-1. In 1940 when the #2 and #3 TNT Production Lines were constructed, the Red and Yellow Water Pipeline (CAS-N-2) and Red and Yellow Water Evaporation System (CAS-N-1) were also built to receive their waste waters. Upon completion, TNT Production Line #1 waste water was also, then routed to these facilities. After this rerouting, the ponds were allowed to dry, the berms of the ponds were breached, the settled material (sediment) removed and burned, and the berms then pushed in to fill in the ponds. After use of the ponds ceased, the former Chemical Pond #1(CAS-W) was excavated and constructed in the general location of the former #1 TNT Settling Pond. The Supplemental RI also indicates the pond were capped with native borrow material. | SWMU T | SWMU | 1989 CO, Phase I/II RFI |
| U | **Former Chemical Pond #2 (aka Waste Water Pond)** | 11650 | 10300 | Stored up to 500,000 gallons of waste water from the former Ammonia, Urea, and Ammonium Nitrate Production facilities. The pond was lined with asphalt sheet at construction but deteriorated. The pond was drained in June 1989 by breaching the berm. Stormwater from the surrounding area collected in the pond after draining and overflow went to the North Ditch. | SWMU U | SWMU | 1989 CO, Phase I/II RFI |
| V | **Former Storm Water Pond (aka Fire Water Pond)** | 11800 to 12100 | 10200 to 10400 | Constructed to contain stormwater from the Ammonia, Urea, and Ammonium Nitrate plant area for use as emergency fire water. Occasionally received siphoned water from the adjacent Chemical Pond (CAS-U). Asphalt sheet lined but deteriorated. Breached and drained in 1988. | SWMU V | SWMU | 1989 CO, Phase I/II RFI |
| W | **Former Chemical Pond #1** | 12300 | 10900 | An unlined pond which received wastewater from the Ammonia and Urea Plants in a preceding capacity to Chemical Pond #2. Discharged to the North Ditch. In 1985, water was pumped to Chemical Pond #2 (CAS-U) and this pond was filled and graded. Historical aerial photos indicate the pond was constructed in the general location of the former TNT settling ponds (No. 1 and 2) (CAS-T) | SWMU W | SWMU | 1989 CO, Phase I/II RFI |

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| X | **Former Copper Pond** | 12300 | 10500 | Unlined impoundment used to collect stormwater and spills impacted with copper ammonium acetate. This water was discharged to the Former Chemical Pond (AOC U). Liquid contents pumped to the Former Storm Pond (AOC V) in November 1990. | SWMU X | SWMU | 1989 CO, Phase I/II RFI |
| Y | **Former Burning Ground** CLOSED WITH WASTE IN PLACE | 14850 | 11650 | Used for thermal destruction of off-specification and explosive contaminated material. Consisted of five (5) bays separated by earthen berms constructed of native clay. Material was ignited with diesel fuel on the ground. Following a burn, ash was stored in a waste pile in this area until it was taken to Joplin Sanitary Landfill as a non-hazardous (?) waste. Contaminated rubbish burned at adjacent area (outside bays). | SWMU Y | SWMU | 1989 CO, Phase I/II RFI |
| Z | **Former Spent Catalyst Area** | 12000 | 10700 | Earthen pad used to store spent catalyst in drums and piles after being used in the ammonia production process. Materials removed pre-AOC. | SWMU Z | SWMU | 1989 CO, Phase I/II RFI |
| AA | **Former Biological Pond** | 12450 | 10250 | A bentonite lined pond designed and constructed for the biological degradation of ammonia in the effluent from the Nitrogen Section of the facility. This was aided by aeration. Discharges went to Grove Creek via the North Ditch (fka Nitrogen Section Ditch) under NPDES permitted Outfall 004. Designed to treat 925,000 gpd (338 million gallon per year) from the Storm Water Pond. Effluent appears to have contained ammonia, urea, ammonium nitrate and copper ammonium acetate. Other constituents may have been present are mono ethanol amine (MEA) and chromium which were used in a algal inhibitor from the cooling tower. EP Toxic metals and pesticides have been analyzed for in the sediments, but not found. Chromium has been present in effluent at low concentrations when operating. | SWMU AA | SWMU | 1989 CO, Phase I/II RFI |
| BB-1(a) | **Former W. R. Grace Company Fluoride Pond #1** | 8100 | 9600 | Unknown activities by W. R. Grace Company. Appears to have been an unlined lagoon. | AOC bb | AOC | Permittee Listed |
| BB-1(b) | **Former W. R. Grace Company Fluoride Pond #2** | 8050 | 9800 | Unknown activities by W. R. Grace Company. Appears to have been an unlined lagoon. | AOC bb | AOC | Permittee Listed |
| BB-1© | **Former W. R. Grace Company Phosphoric Acid Plant** | 8100 | 9700 | Presumed to be Phosphoric Acid production by W. R. Grace Company. Consisted of above ground tankage, piping and pumps. | AOC bb | AOC | Permittee Listed |

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| BB-2(a) | Former W. R. Grace Company Scrubber Area | 8200 | 10000 | Consisted of two (2) concrete pads with 6-inch curbs installed in 1987. Prior to 1987, spills of scrubber water containing trace mono-ammonium phosphate, ammonium sulfate, and potash were reportedly discharged to the ground. Post 1987, scrubber water spills were collected and transferred via piping to the Former W. R. Grace Company South Pond. | SWMU BB-2 | SWMU | 1989 CO, Phase I/II RFI |
| BB-2(b) | Former W. R. Grace Company Hopper Cleaner Area | 8100 | 10000 | Area was used to clean fertilizer products from hoppers and trucks | NA | AOC | Permittee Listed |
| BB-2(c) | Former W. R. Grace Company Ammonium Sulfate Plant | 8100 | 10050 | Used for the production of ammonium sulfate from sulfuric acid and anhydrous ammonia. There were no records found indicating waste generation, handling, or disposal activities. | NA | AOC | Permittee Listed |
| BB-2(d) | Former W. R. Grace Company Sulfuric Acid Plant | 8000 to 8600 | 10100 to 10500 | Area used for the production of Sulfuric Acid. Non-contact cooling and wastewater potentially containing chromium (as a scale inhibitor) were passed through the Former W. R. Grace Company North Pond before discharging to Grove Creek. | NA | AOC | Permittee Listed |
| BB-2(e) | W. R. Grace Company French Drains | 8000 to 8600 | 10100 to 10500 | Six French Drains were installed prior to construction of the Former W. R. Grace Company Sulfuric Acid Plant in 1954. The drains were installed outside the perimeter of the proposed excavation construction area to provide dewatering to approximately 10-12 feet below grade. The excavated area was filled with rock. The excavated area inside the perimeter french drains was filled with compacted clay for the construction of the Sulfuric Acid Plant. | NA | AOC | Permittee Listed |
| BB-3 | Former W. R. Grace Company Dump Site (aka Old Atlas Dump Site) | 7800 | 10200 to 10700 | Prior to construction of the Former W. R. Grace Company Sulfuric Acid Plant and the Former W. R. Grace Company South Pond, it appears Atlas Powder may have used this area to dispose of mostly construction waste and possibly as a burning area for explosives material prior to the operation of the Former Burning Ground and Landfill (Site S). W. R. Grace and Company subsequently filled the bulk of this area with debris and industrial wastes. | SWMU BB-3 | SWMU | 1989 CO, Phase I/II RFI |
| BB-4 | Former W. R. Grace Company North Disposal Area | 8000 to 8200 | 10200 to 10700 | Site history suggests this area was used for the disposal of solid phase sulfur. Spent catalyst which was allegedly buried here was never identified. The area is on the floodplain of Grove Creek. | SWMU BB-4 | SWMU | 1989 CO, Phase I/II RFI |
| BB-5(a) | Former W. R. Grace Company Pesticide Storage Building | 10050 | 8950 | Used for the storage, re-packaging and distribution of pesticides by the W. R. Grace Company. | SWMU BB-5 | SWMU | 1989 CO, Phase I/II RFI |
| BB-5(b) | Former W. R. Grace Company Maintenance Building | 8800 | 10200 | Used for the day-to-day maintenance and upkeep of vehicles used at the Former W. R. Grace Company fertilizer facility. | SWMU BB-5 | AOC | 1989 CO, Phase I/II RFI |

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| BB-5(c) | Former W. R. Grace Company Vehicle Cleaning Area | 8700 | 10200 | Concrete slab used for vehicle cleaning. The slab had a five-inch high curb around its perimeter and sloped to the middle toward a central floor drain which discharged to a sump/temporary holding tank. Structures in place as of 1/01. | SWMU BB-5 | AOC | 1989 CO, Phase I/II RFI |
| BB-5(d) | Former W. R. Grace Company Fuel Storage Tanks | 8600 | 10200 | Location of an underground gasoline storage tank (identity unknown) and above ground diesel fuel storage tank. No visible signs of leakage observed when removed There is some confusion about the identity of the tanks. The UST is thought to be #12 but this has been identified as a containing diesel not gasoline. | SWMU BB-5 | AOC | 1989 CO, Phase I/II RFI |
| BB-6(a) | Former W. R. Grace Company Quality Control Laboratory Septic Tank & Drainage Field South of Bulding 736 | 9050 | 9750 | QC tests performed here on Grace products. Test chemicals and fertilizer products (pesticides - ?) were reportedly discharged to a drain which led to a septic tank and leach field south of the facility. Liquids ran through a clay pipe to the 10 ft by 10 ft square by 5 ft deep concrete sump. The clay pipe was in tact and the sump was filled with gravel. A 3-foot wide ditch ran south then southwest from the septic tank toward No-Name Creek. | SWMU BB-6 | SWMU | 1989 CO, Phase I/II RFI |
| BB-6(b) | Former W. R. Grace Company Cooling Tower | 8400 | 9500 | Provided cooling water to the Former W. R. Grace Company Phosphoric Acid Plant. Mechanical equipment removed and basin demolished pre-2001. A sump was located in the south corner of the 40 ft by 25 ft concrete basin foundation. | NA | AOI | Permittee Listed |
| BB-6(c) | Former W. R. Grace Company Truck Scale | 9250 | 9750 | Scale pit where vehicles were weighed. | NA | AOC | Permittee Listed |
| BB-7(a) | Former W. R. Grace Company Emergency Holding Pond | 7600 to 8200 | 9400 to 9900 | Used by W. R. Grace Company for storage of superphosphate scrubber water from construction in 1953 until mid 1950's, then used for emergency storage of gypsum slurry until 1968. The basin was reportedly constructed with an earthen bottom and compacted clay berms. A portion of the slurry was removed in the mid 1960's by W. R. Grace Company. The pond was filled and covered with its own berm material (clay) in 1989 by W. R. Grace Company. | NA | SWMU | January 2001 - Final RFI Phase II Supplement |
| BB-7(b) | Former W. R. Grace Company Borrow Area | 7950 | 8900 | An excavation in the hillside on the south side of the railroad tracks west of AA Highway. Several small debris piles consisting of dirt, rocks, broken concrete, wood, scrap building and process materials, household trash, scrap metal and burned wood were observed. | NA | AOC | January 2001 - Final RFI Phase II Supplement |
| BB-8(a) | Former W. R. Grace Company North Pond | 8100 | 10500 | Constructed in 1979 for receiving & holding non-contact cooling water from the Former W. R. Grace Company Sulfuric Acid Plant. The pond is enclosed with berms constructed of earthen material. Overflow from the Former W. R. Grace Company North Pond flowed to Grove Creek under Atlas NPDES permit MO-0002543 as Outfall 008. The Pond is no longer in service but may collect precipitation. | NA | AOC | January 2001 - Final RFI Phase II Supplement |

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| BH-8(b) | Former W. R. Grace Company South Pond | 7900 | 10500 | Constructed in 1954 for use as a temporary holding pond in a recirculation system for scrubber water. The pond was enclosed with an 8-ft high earthen dike constructed of clayey soils. The depth of the water in the former pond fluctuated, but may have been up to 7 ft deep in the center. Process water with elevated nutrient levels was discharged into the pond via underground drains. The sources of water included the scrubber systems as the former Single -Superphosphate Plant, the former Fertilizer Granulation Plant, and overflow from the former Sulfuric Acid Plant cooling towers. The water and solids, plus two inches of soil from the bottom of the former South Pond were removed between August and November 1988 when the pond was taken out of service. The material was used as fertilizer off-site; the drain system was plugged and is no longer usable. | NA | AOC | January 2001 - Final RFI Phase II Supplement |
| CC-1-(a) | South-Wetlands Ditch | 9000 to 10200 | 11500 to 13100 | Formerly known as the Acid Area Ditch, drained the watershed from the Former Powerhouse and Former W. R. Grace Company and Atlas Chemicals Acid Production Areas North to Grove Creek. This ditch was diverted in late 2003 into the Constructed Wetlands System to permit biological treatment of flow versus direct discharge to Grove Creek. Just before the discharge point to Grove Creek (Former Outfall 003), this ditch combined with the Central-Wetlands Ditch (fka Pool Ditch); also diverted to the Constructed Wetlands System in late 2003. As of 2004, with the exception of flows initiated by precipitation events, all flow originates from the relief of shallow groundwater to surface. | AOC cc | AOC | 1989 CO, Phase I/II RFI |
| CC-1-(b) | Central-Wetlands Ditch | 10000 to 11600 | 10600 to 12200 | Formerly known as the Pool Ditch, drained the watershed from the Former Ammonium Nitrate, Ammonia, Urea, production areas East to Grove Creek. This ditch was diverted in late 2003 into the Constructed Wetlands System to permit biological treatment of flow versus direct discharge to Grove Creek. As of 2004, with the exception of flows initiated by precipitation events, all flow originates from the relief of shallow groundwater to surface. | AOC cc | AOC | 1989 CO, Phase I/II RFI |
| CC-2 | North Ditch | 12000 to 15800 | 9800 to 13100 | Formerly known as the Nitrogen Section Ditch. Drains the watershed from part of the Former Ammonium Nitrate, Ammonia, Urea, production areas and Former TNT Production Lines North to Grove Creek. Historically this ditch is a loosing stream and requires a large saturating flow to experience flow from one to the other. | AOC cc | AOC | 1989 CO, Phase I/II RFI |
| CC-3 | Constructed Wetlands System | 10200 to 13000 | 12200 to 13500 | Formerly known as the Powderline Ditch. Constructed in the central portion of the facility, primarily to address elevated levels of nitrate in stormwater runoff originating around the Former Ammonium Nitrate Production facility. This system is being used to treat nitrate-based constituents found in flow being fed to it from the three ditches feeding it prior to discharge to Grove Creek via MSOP Outfall 002. As of 2004, with the exception of flows initiated by precipitation events, all flow originates from the relief of shallow groundwater to surface. | AOC cc | AOC | 1989 CO, Phase I/II RFI |
| CC-4 | North-Wetlands Ditch | 11900 to 12100 | 11000 to 12800 | Formerly known as the Cooling Tower Ditch. Drains the watershed from part of the Former Ammonium Nitrate, Ammonia, Urea, production areas and Former TNT Production Lines East to the Constructed Wetlands System. This ditch discharged to Grove Creek without treatment prior to the construction of the wetlands. As of 2004, with the exception of flows initiated by precipitation events, all flow originates from the relief of shallow groundwater to surface. | AOC cc | AOC | 1989 CO, Phase I/II RFI |
| DD (a) | Former Powderline Maintenance Shop and Wash Rack Location Building 382 | 11300 | 12600 | Erroneously identified in the RFA as building 448. Building 448 was used for non-chemical storage only where building 382 was used for maintenance activities supporting the Former Powderline and it had a septic system. | AOC dd | AOC | 1989 CO, Phase I/II RFI |

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| DD (b) | Former Acid Area Maintenance Complex | 9200 | 11200 | Former Garage and Wash area, buildings 138 & 719 Former Labor & Combined Maintenance Shop, building 42 Former Welding, Lead & Tin Shop buildings 138, 719, and 454 All supported maintenance activities in the Acid production areas of W. R. Grace Company and Atlas Chemicals. | AOC dd | AOC | 1989 CO, Phase I/II RFI |
| DD © | Former Nitrogen Section Maintenance & Engineering Complex | 11200 | 10200 | Former Maintenance Shops, buildings 903, 916, 917, and 918. Maintenance activities in support of the Ammonia Nitrate, Urea, and Ammonia production activities. | AOC dd | AOC | 1989 CO, Phase I/II RFI |
| EE-1 (a) | Former #1 Talley Mix House, Building 242 | 10250 | 13000 | Mixing activities, used to manufacture nitroglycerine based explosives (dynamite and gels). | NA | SWMU | Permittee Listed |
| EE-1 (b) | Former #1 Talley DNT Storage, Building 245* | 10200 | 12950 | DNT storage used to manufacture nitroglycerine based explosives (dynamite and gels). | NA | SWMU | Sampling 4/22/03 |
| EE-2 (a) | Former #2 Talley Mix House, Building 246* | 10150 | 13400 | Mixing activities, used to manufacture nitroglycerine based explosives (dynamite and gels). | NA | SWMU | Permittee Listed |
| EE-2 (b) | Former #2 Talley DNT Storage, Building 247* | 10100 | 13400 | DNT storage used to manufacture nitroglycerine based explosives (dynamite and gels). | NA | SWMU | Permittee Listed |
| FF-1 (a-1) | Former TNT Production Line 1, Mono-Nitration Area | 11200 | 11600 | Part of Former TNT Production Line #1. Nitrating Area. 310 - MONO,, 311, 312, 313, 316, 319, 320, 321, 322, 324, 325, 326, 327, and 357 305, | site ddd | SWMU | January 2001 - Final RFI Phase II Supplement |
| FF-1 (a-2) | Former TNT Production Line 1, Bi & Tri - Nitration Area | 11800 | 10500 | Part of Former TNT Production Line #1. 312 BI & TRI | site ddd | SWMU | January 2001 - Final RFI Phase II Supplement |
| FF-1 (b) | Former TNT Production Line 1, Grainer Area | 11550 | 12050 | Part of Former TNT Production Line #1. 317 | site ddd | SWMU | Permittee Listed |
| FF-1 (c) | Former TNT Production Line 1, Wash Area | 11750 | 11800 | Part of Former TNT Production Line #1. Wash Area314 | site ddd | SWMU | Permittee Listed |
| FF-2 (a) | Former TNT Production Line 2, Nitration Area | 11050 | 12400 | Part of Former TNT Production Line #2. Nitrating Area. | site eee | SWMU | January 2001 - Final RFI Phase II Supplement |
| FF-2 (b) | Former TNT Production Line 2, Grainer Area | 11300 | 12300 | Part of Former TNT Production Line #2. Grainer Area (aka Old Petron Leaching Tank, CAS-O) | site eee | SWMU | Permittee Listed |
| FF-2 © | Former TNT Production Line 2, Wash Area | 10950 | 12300 | Part of Former TNT Production Line #2. Wash Area | site eee | SWMU | Permittee Listed |

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| FF-3 (a) | Former TNT Production Line 3, Nitration Area | 11750 | 10800 | Part of Former TNT Production Line #3. Nitrating Area. | NA | SWMU | January 2001 - Final RFI Phase II Supplement |
| FF-3 (b) | Former TNT Production Line 3, Grainer Area | 12500 | 10950 | Part of Former TNT Production Line #3. Grainer Area | NA | SWMU | Permittee Listed |
| FF-3 (c) | Former TNT Production Line 3, Wash Area | 11950 | 10900 | Part of Former TNT Production Line #3. Wash Area | NA | SWMU | Permittee Listed |
| GG (a) | Former Ammonium Nitrate Slurry Recirculation Sump | 10900 | 10400 | Former containment where a slurry of ammonium nitrate was recycled back through the production process. It is reported this containment may have been breached and released the ammonium nitrate slurry to ground. | site aaa | AOC | Permittee Listed |
| GG (b) | Former Ammonium Nitrate Warehouse Floor | 10500 to 10600 | 10100 to 10400 | Former Ammonium Nitrate Warehouse stored the ammonium product in large quantities for the life of the AN Production area. The floor has shown evidence of degradation and is breached in several locations. | site bbb | AOC | Permittee Listed |
| HH | Former Nitrocabonitrate Building (aka Dope House) | 10400 | 10300 | Former building 55 was used as a "doping" operation where DNT was blended into various products. The bricks of this structure were saturated with DNT. | na | SWMU | Permittee Listed |
| II | Former Small Diameter Emulsion Plant Complex | 9400 | 12900 | This cluster of structures was used originally as a nitration facility during the production of dynamite and other gel products. Later it was converted to produce small diameter emulsion products. Sodium Perchlorate was one of the chemicals used at this location but it was used in relatively large quantities as an oxidizer which enhanced the energy level of the products produced here. Apparently there have been releases of sodium perchlorate over its history of usage. | part of EE | AOC | Permittee Listed |
| JJ | Former Large Diameter Emulsion Plant Complex | 11500 | 13900 | This cluster of structures was built for the production of emulsion based explosives and used primarily to produce large diameter emulsion , packaged products. It is not believed sodium perchlorate was prevalent in the facility. | part of EE | AOC | Permittee Listed |
| KK | Former Laboratory Structures | 9200 | 11050 | Constructed to provide operational quality assurance testing services, evolved into an environmental testing lab as well. | na | AOC | Permittee Listed |
| LL | Former Powerhouse Complex | 8900 | 11500 | Built to provide steam and compressed air to the production facilities. Before its removal it also was the central control station for the plant water system, and electrical distribution. | na | AOC | Permittee Listed |

| CAS ID | CAS Name | North | East | Description or Historic Usage | Previous ID | Classification of site | Source of Listing |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| MM | Impacted Shallow Groundwater and Surface Water Property Wide | Facility Wide | Facility Wide | All shallow groundwater which originates from precipitation events and migrates to surface and stream relief points. This would include the ditch collection system (Corrective Action Sites CC-1(a), CC-1(b), CC2, CC-3and CC-4) No-name creek and Grove Creeks which flow through the property and are impacted by the migration of constituents from shallow groundwater. | none | SWMU | Permittee Listed |
| NN | Former Test Detonation Complex | 7800 | 10700 | Testing services were provided here for operational quality assurance purposes. The testing consumed any explosives tested. | none | AOI | Permittee Listed |
| OO | Former Ammonia Receiving Area | 10600 to 11300 | 10800 to 11000 | This area consisted of (3) ammonia spheres, tankage, piping systems, and railroad with off loading and storage facilities. | none | AOC | Permittee Listed |
| PP | Former Aqua Ammonia Plant | 10800 to 11300 | 10550 to 10800 | Tankage, piping, loading and storage facilities for the production of liquid ammonia. | none | AOC | Permittee Listed |
| QQ | Former Urea Production | 11300 to 11600 | 10600 to 11000 | Tankage, piping, loading and storage facilities for the production of Urea. | none | AOC | Permittee Listed |
| RR | Former Drum Storage Building CLOSED USING RISK BASED CLOSURE | 11600 | 10800 | Also known as the Memtek Building. In recent years this contained building was used as a Hazardous Waste Storage Facility where drummed wastes were accumulated until off site disposal could be arranges at permitted TSDF's. This structure was used for other Ammonia Production support purposes prior to be using used to store waste. | none | SWMU | Permittee Listed |
| SS | Former Ammonia Production | 11600 to 12000 | 10400 to 10800 | Structures used in the manufacture and compression of ammonia gas. This area also overlays the Southwest end of Former TNT Production Line #3. | none | AOC | Permittee Listed |
| TT-1 | Former South ANFO Blending (Ammonia Nitrate & Fuel Oil) | 12400 | 12500 | One of several Ammonia Nitrate Fuel Oil blending facilities to evolve on the property. AN was transferred via railcar, offloaded in a bin and conveyor and blended with Fuel Oil to make a slurry of explosive. | none | AOC | Permittee Listed |
| TT-2 | Former North ANFO Blending (Ammonia Nitrate & Fuel Oil) | 12800 | 12700 | One of several Ammonia Nitrate Fuel Oil blending facilities to evolve on the property. AN was transferred via railcar, offloaded in a bin and conveyor and blended with Fuel Oil to make a slurry of explosive. | none | AOC | Permittee Listed |
| TT-3 | Former Cast Primer Building (fka ANFO Bagging) | 12550 | 12600 | One of several Ammonia Nitrate Fuel Oil facilities to evolve on the property. ANFO was bagged at this location, it evolved into the packaging of Power-AN, an emulsion and ANFO blend which was packaged into sausage like casings. A brief (4/89 to 8/89) time was used casting the Pentolite primers. (Pentolite is a pourable mixture of TNT and PETN (pentaerythritol tetranitrate) used in shaped charges and boosters.) | none | AOC | Permittee Listed |

# Corrective Action Sites Listing
## "White Pages"



| CAS ID | CAS Name | North | East | Description or Historic Usage | Previous ID | Classification of site | Source of Listing |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| TT-4 | Former ANFO Distribution Site | 17200 | 11800 | One of several Ammonia Nitrate Fuel Oil facilities to evolve on the property. ANFO was shipped out in bulk and in bags from this location. This was the newest of these types of facilities. All chemicals were fully contained and managed in doors. There were no spills in this location. | none | AOI | Permittee Listed |
| UU | Former Soda Dry Operations | 8950 | 10500 | Sodium Nitrate off-loading from railcars, un-packaging , "drying" and re-packaging for usage elsewhere on the plant. One of the users of this sodium nitrate was the "Dope House" (CAS-HH). (At times some of this material came from Chile.) This was a fairly clean operation being confined to the interior of the structures. | none | AOC | Permittee Listed |
| VV | *Not used* | | | | | | |
| WW | Former Grained Ammonium Nitrate Plant (GANP) | 9500 | 11600 | Used to manufacture Ammonium Nitrate via the STENGEL process where ammonia and nitric acid are reacted in the presence of a titanium catalyst to produce either a flaked or grained AN product. This was the predecessor technology to the prilling tower. | none | AOC | Permittee Listed |
| XX | Former Shell House | 10400 | 12000 | Location where paper and cardboard tubes were assembled. Some were waxed. These tubes were used as casings for various explosives product. | none | AOC | Permittee Listed |
| YY | Former Kinepak Complex | 12000 | 10700 | Production of a two component explosives package. One component contained Nitro methane and the other contained a matrix of Ammonium Nitrate and glass Microspheres. One of the structures, building 930, had previously been used as Ammonia Control Room when ammonia was produced, another structure, building 934, was a warehouse. | none | AOC | Permittee Listed |
| ZZ | Former Trailer Shop | 16500 | 10100 | Maintenance & Repair primarily of trailers, but may have included some light mechanical maintenance of trucks. | none | AOI | Permittee Listed |
| *AAA* | *Former Magazines* | *12900 to 16500* | *12000 to 14000* | ***Magazines will be listed individually with a CAS ID of CAS-AAA*. EMI will continue to list these specific CAS's in this inventory as resources or need permits.*** | none | AOC | Permittee Listed |
| | | | | | | | |
| UST-1 | Former UST#1 gasoline | 9400 | 11050 | 3,000 gal. steel, removed 12/11/1989 | NA | AOC | Permittee Listed |
| UST-2 | Former UST#2 gasoline | 11300 | 10400 | 2,000 gal steel, removed12/18/1989 | NA | AOC | Permittee Listed |
| UST-3 | Former UST#3 gasoline | 9400 | 11030 | 1,000 gal. steel, removed 7/2003 | NA | AOC | Permittee Listed |
| UST-4 | Former UST#4 LDEP-DAF Emulsion wash water | 11600 | 13950 | removed | NA | AOC | Permittee Listed |
| UST-5 | Former UST#5 SD Waster Water Sump | 9400 | 12800 | 7500 gal. concrete, removed | NA | AOC | Permittee Listed |
| UST-6 | Former UST#6 gasoline | 11500 | 11100 | 40 gal. steel, removed 7/2003 | NA | AOC | Permittee Listed |
| UST-7 | Former UST#7 diesel | 7300 | 7300 | 1500 gal. steel, removed | NA | AOC | Permittee Listed |
| UST-8 | Former UST#8 ammonia solution | 11600 | 10800 | 600 gal. SS, removed | NA | AOC | Permittee Listed |
| UST-9 | Former UST#9 urea solution | 11600 | 10800 | 1200 gal. steel, removed | NA | AOC | Permittee Listed |
| UST-10 | Former UST#10 Urea & AN Solution | 10600 | 10400 | 10, 000 gal ??, removed | NA | AOC | Permittee Listed |

**Expert Management Inc.**
**MOD077887909**

**Corrective Action Sites Listing**
**"White Pages"**

**4/22/2004**

| CAS ID | CAS Name | North | East | Description or Historic Usage | Previous ID | Classification of site | Source of Listing |
|---|---|---|---|---|---|---|---|
| | | | | | | | |
| UST-11 | **Former UST#11 gasoline** | TBD | TBD | 4,000 gal. steel, removed | NA | AOC | Permittee Listed |
| UST-12 | **Former UST#12 diesel** | 8700 | 10200 | 2,000 gal. steel, removed, W. R. Grace | NA | AOC | Permittee Listed |
| UST-13 | **Former UST#13 nitric acid** | 8900 | 10700 | 560 gal.. 304 SS, removed | NA | AOC | Permittee Listed |
| UST-14 | **Former UST#14 nitric acid** | 8800 | 10900 | 200 gal. 304 SS, removed | NA | AOC | Permittee Listed |
| UST-15 | **Former UST#15 anhydrous ammonia** | 9000 to 11300 | 10500 to 11000 | Partially above and below grade piping from the former ammonia receiving area (former spheres) to former horizontal ammonia tanks near the former Nitric Acid Plant. This site appears to have been erroneously listed as a underground storage tank. Within the regulations as they are in 2004, this would not be a UST. This pipeline has been vacated and rinsed with all above ground portions removed; the in ground pipe has been abandoned in place. | NA | AOC | Permittee Listed |
| UST-H-1 | **Former UST H-1 unknown** | TBD | TBD | removed | NA | AOC | Permittee Listed |
| UST-H-3 | **Former UST H-3 nitric acid** | 9000 to 10800 | 10400 to 11000 | Partially above and below grade piping from the former Nitric Acid Plant to the former Ammonium Nitrate Plant. This site appears to have been erroneously listed as a underground storage tank. Within the regulations as they are in 2004, this would not be a UST. This pipeline has been vacated and rinsed with all above ground portions removed; the in ground pipe has been abandoned in place. | NA | AOC | Permittee Listed |
| UST-H-5 | **Former UST H-5 sulfur?** | TBD | TBD | removed | NA | AOC | Permittee Listed |
| | | | | | | | |
| | | | **CAS** | **Corrective Action Site** - Solid Waste Management Units, Areas Of Concern, and Areas Of Interest; all need to be dispositioned but not all are RCRA Regulated Sites | | | |
| | | | **AOC** | **Area Of Concern** - Not RCRA Regulated but may be upon further investigation. | | | |
| | | | **AOI** | **Area Of Interest** - Not RCRA Regulated | | | |
| | | | **SWMU** | **Solid Waste Management Unit** - RCRA Regulated | | | |
| | | | **CO** | 1989 Administrative Order On Consent | | | |
| | | | | This Description or Historic Usage of the CAS's is being offered as the best knowledge of the Permittee at the time of update of this document; Permittee does not attest to its accuracy beyond Permittee's knowledge. | | | |

**This is an evolving document; modifications should be directed to Don Pawlowski at don_pawlowski@icl.com**

**Figure 1. Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs)**

**(Historic)**

MOD077887909

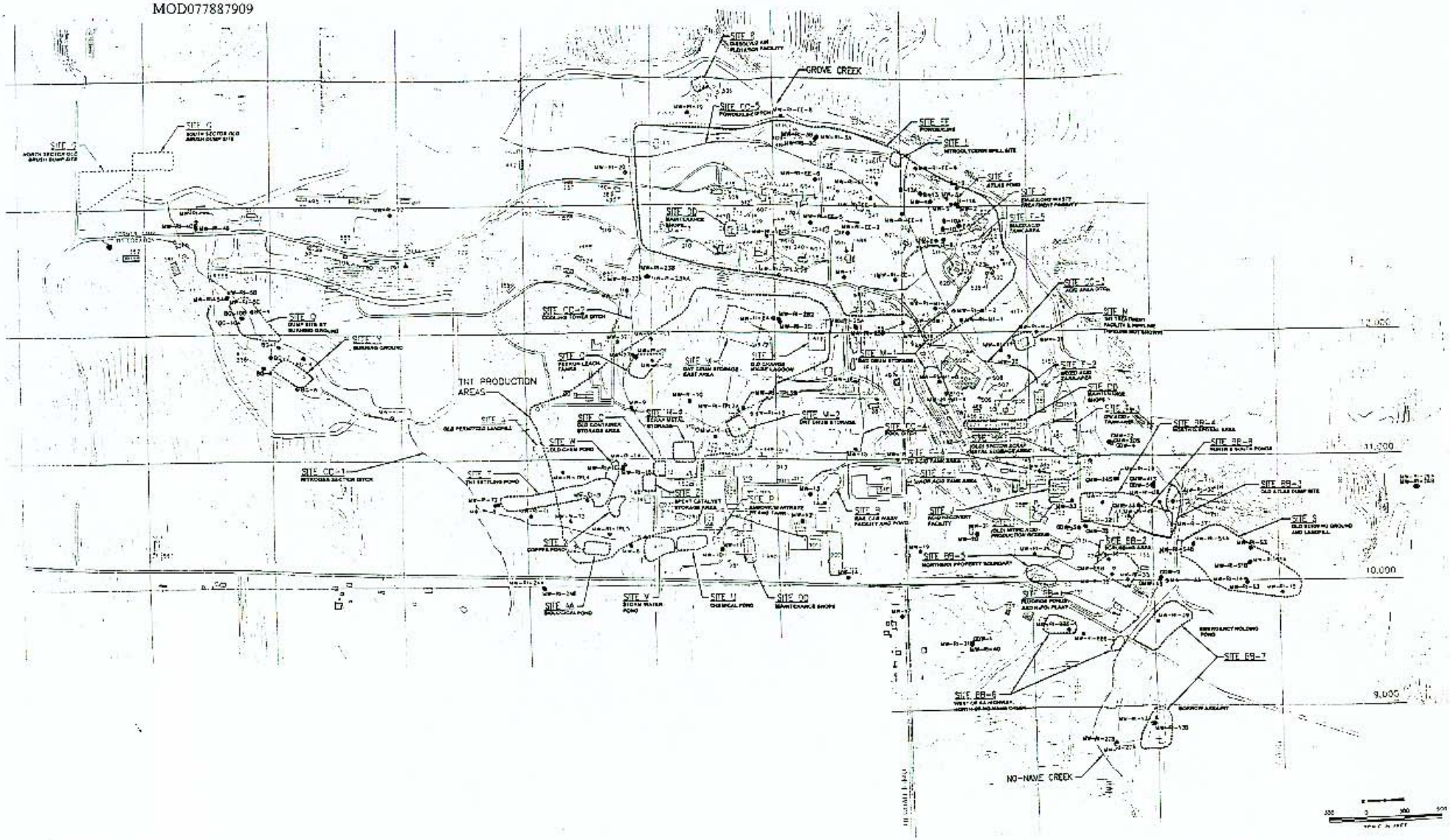



**Figure 1.** Solid Waste Management Units (SWMUs) and Areas of Concern (AOC

**Figure 2. Point of Compliance Wells**

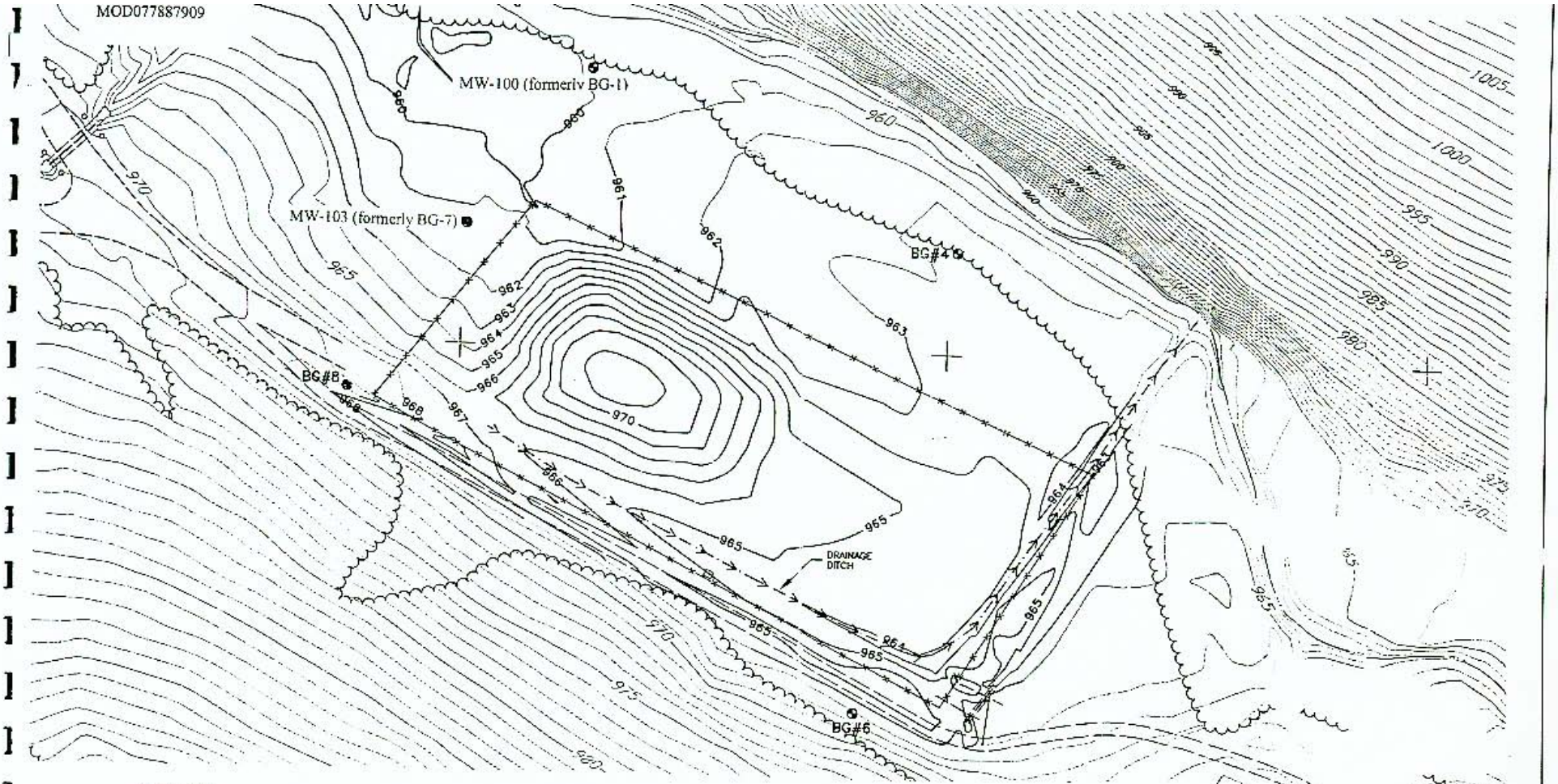
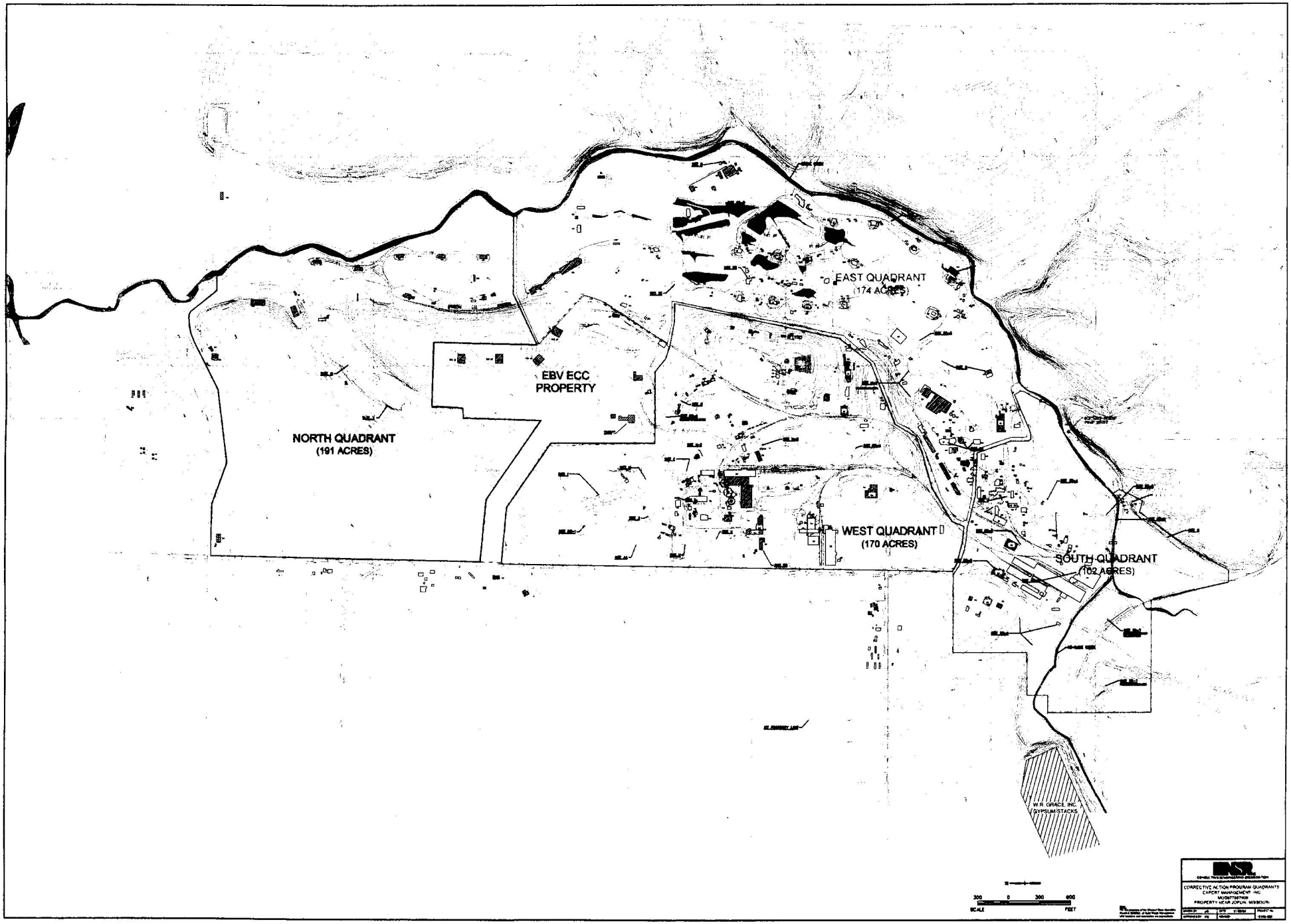



Figure 2. Point of Compliance Wells

**Figure 3. Quadrants Drawing**


EAST QUADRANT
(174 ACRES)
EBV ECC
PROPERTY
NORTH QUADRANT
(191 ACRES)
WEST QUADRANT
(170 ACRES)
SOUTH QUADRANT
(102 ACRES)
W.R. GRACE INC.
GYPSUM STACKS
300 0 300 600
SCALE
FEET
CORRECTIVE ACTION PROGRAM QUADRANTS
EXPORT MANAGEMENT INC
MOD977697WR
PROPERTY NEAR JOPLIN, MISSOURI