

# Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Commissioners

Date:

Thru: *MPD* Mark R. Vickery, P.G., Executive Director  
*JS* John Sadlier, Deputy Director, Office of Compliance and Enforcement

From: *BW* Brent Wade, Director, Remediation Division

CHIEF CLERKS OFFICE

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TEXAS  
COMMISSION  
ON ENVIRONMENTAL  
QUALITY

**Subject:** Executive Summary  
Docket No. 2008-1229-SPF  
Consideration of a Final Administrative Order, pursuant to Tex. Health & Safety Code ch. 361, regarding the Archem/Thames Chelsea State Superfund Site Houston, Harris County, RN105198618, which orders the responsible parties to remediate the Site, and includes the listing of the Site on the state registry of superfund sites, the determination of responsible parties, and the selection of the remedial action. The Archem/Thames Chelsea State Superfund Site is located on the Southeast side of Houston, Texas near the intersection of Interstate 45 and Beltway 8. (Subhash Pal, Patricia Scott)

## I. Overview

The Archem/Thames Chelsea State Superfund Site (Site) encompasses approximately 10 acres located at 13103 Conklin Lane near the intersection of Conklin Lane and Beltway 8 in Southeast Houston, Harris County, Texas. A map of the Site is attached for reference. The Site is a former specialty chemical and toll manufacturing facility. A wide range of organic chemicals and catalysts were used in manufacturing and processing operations at the Site from mid 1961 to 1991. Operations ceased after the last operator, Thames Chelsea Chemical Company USA, abandoned the Site in May 1991. Current structures at the Site include an office and warehouse buildings, concrete foundations in the former processing areas, a sludge drying bed, two landfarms, several containment areas associated with former above ground storage tanks, and two surface impoundments. The surface impoundments contain a mix of rainwater and wastewater.

During the Remedial Investigation (RI), the Texas Commission on Environmental Quality (TCEQ) identified chemicals of concern (COCs) that exceeded the Protective Concentration Level (PCL) in the landfarm soils, surface soil and sediment. The COCs include metals (antimony, lead, and mercury), volatile organic compounds (benzene, toluene and tetrahydrofuran) and semi-volatile organic compounds (2-nitroaniline, and furfural). No

concentrations of hazardous substances above the PCLs were detected in the Site's groundwater or surface water.

Part of the property is still owned by the Archem Company (Archem). Ownership of other portions of the Site has passed to the foreclosing taxing authorities due to non-payment of real estate taxes. Information about the Site can be found at <http://www.tceq.state.tx.us/remediation/superfund/state/archem.html>.

## **II. Site History**

The Site consists of four separately deeded parcels of land. The first manufacturing company to own part of the Site was Amchem Products, Inc. (Amchem). AmChem purchased the eastern-most tract of the facility in February 1961 and the adjacent tract in December 1962. Aerial photographs from 1965 and 1973 document the presence of three surface impoundments on one of the tracts of land, located in the vicinity of the current surface impoundments onsite. In 1976, Amchem sold the two eastern tracts of the Site to the H. B. Fuller Company.

The H. B. Fuller Company manufactured industrial latex coatings, adhesives and asphaltic emulsions at the Site. An August 12, 1977 fire destroyed the company's facility. After the fire, H. B. Fuller moved its manufacturing operations to a nearby location, but continued disposing of its washwaters from manufacturing of coatings and adhesives in the unlined surface impoundments on the eastern half of the Site.

Archem purchased the tract next to the H. B. Fuller facility in June 1970 and the adjacent western-most tract of the Site in May 1974 and began manufacturing epoxy curing agents on the Site. Archem constructed a surface impoundment on the western half of the Site into which it deposited wastes from truck washouts. On October 10, 1978, H. B. Fuller conveyed the ownership of the two eastern tracts of the Site to Archem. Archem handled a wide variety of chemicals, engaged in toll processing and manufactured an assortment of chemical products.

The Hazard Ranking System (HRS) survey is the method used by the United States Environmental Protection Agency (EPA) and the TCEQ to evaluate the relative potential of hazardous substance releases to cause health or safety problems, ecological or environmental damage. A HRS was conducted for the Site in August 1993 and the Site received a score of 39.79. A site must score 5 or greater to qualify as a State Superfund Site.

In addition to the scoring, the HRS documents multiple inspections and investigations of the Site which were conducted by the Texas Department of Water Resources (TDWR), Texas Water Quality Board (TWQB) and the Texas Water Commission (TWC) between 1976 and 1991. Numerous violations, spills and non-compliance releases were reported. Historical facts cited in the HRS report include:

- \* On August 17, 1978, the TWQB inspected the surface impoundments at the H. B. Fuller facility and noted that waste had been dumped outside the surface impoundments.

- \* In 1979, four surface impoundments were reported onsite. In 1982, Archem closed an evaporation pond located on the western half of the Site, closed one of the evaporation ponds located on the eastern portion of the Site, reconfigured two of the smaller impoundments into one large impoundment and constructed a new impoundment.
- \* On July 21, 1989, field investigators from the TWC compiled a waste drum inventory of the Site. Approximately 1,385 55-gallon drums, one roll-off bin and 141 pails of hazardous, industrial solid and unidentified wastes were stored in 15 different areas of the facility.
- \* On June 2, 1990, Archem filed for Chapter 11 Bankruptcy. On November 12, 1990, Thames Chelsea Chemical Company USA took physical control of the Site under a lease agreement approved by the United States Bankruptcy Court.
- \* On December 17, 1990 and January 18, 1991, the TWC conducted inspections of the Thames Chelsea Chemical Company USA facility and noted several issues of non-compliance with the Texas Administrative Code, including the discharge of wastewater from the eastern most surface impoundment located on the property into a stormwater outfall.
- \* Thames Chelsea Chemical Company USA had abandoned the facility by May 22, 1991. In September, 1991 the Site was referred to the State Superfund Program.

In October 1991, the Pre-Remedial Unit Staff of the TWC evaluated the Site and observed fifteen hazardous waste units used in the management of fourteen or more RCRA P listed wastes (acute hazardous wastes) and U listed wastes (generally hazardous wastes). Approximately 2,000 55-gallon drums containing waste in various states of deterioration were present on the Site. All sumps, secondary containment systems, and roll-off containers were found full of chemicals (liquids and solids). The two surface impoundments contained less than one foot of freeboard. Spills and surface contamination were wide spread throughout the Site, with evidence of contamination in drainage ditches.

Separate removal actions were conducted in the 1990s by some of the Potentially Responsible Parties (PRPs), the TWC, and the EPA. In 1992, the TWC performed a removal action at the Site. The focus of the TWC's 1992 removal action was to prevent further releases, and the response actions included repairing the fence; drumming waste that had accumulated in secondary containment structures; removing and storing liquids from the API separator to create four feet of freeboard; lab packing containers of chemicals; overpacking leaking and deteriorated drums; removing and drumming liquids from a roll-off bin; placing temporary covers over the drums, roll-off bins and API separator; and removing and disposing off-site approximately 280,000 gallons of Class I wastewater from the surface impoundments to create two feet of freeboard. After the planned sale of the property was aborted and Archem's bankruptcy was dismissed by the bankruptcy court, the TWC requested the known PRPs to conduct a second removal at the site in early 1993. The TWC performed this second removal

when no satisfactory offers were received from the PRPs. The second removal included the categorization and segregation of various drums; the treatment, discharge and disposal of wastewater from the surface impoundments; overpacking of leaking drums; drumming of spilled materials; construction of a semi-permanent cover over the API separator; capping of inlet and outlet piping of the API separator; and removal of a damaged monitoring well. The costs expended by the TCEQ to conduct the removal actions of 1992 and 1993 were approximately \$700,000. Notice that the TCEQ would seek cost recovery for its removal expenses was sent to all known PRPs in 1992 and 1993.

The EPA conducted a removal at the facility from June 1995 through June 1996. The EPA's removal involved the waste characterization of waste in all drums, surface tanks, reactor vessels and pails; removal and decontamination of all insulation, piping, tanks and reactor vessels; and the disposal or treatment of all liquid waste at the site. The EPA issued a Notice of No Further Action (NFRAP) for the site in March 1996, making funds from the Federal Government unavailable for the remedial activities at the Site. On May 4, 2001, legal notices were published in the *Houston Chronicle*, and the *Texas Register*, (26 TexReg 3413) proposing the site for listing on the State Registry of Superfund Sites, and also proposing commercial/industrial land use specifications for remediation of the site contamination. A public meeting to receive citizen comment on the proposed listing and land use was held in Houston on June 12, 2001.

In accordance with Section 361.185 of the Texas Health and Safety Code (Code), the identified PRPs were given an opportunity to fund or perform the remedial investigation/feasibility study (RI/FS) in April 2001. The PRPs did not come forward with a good faith offer to fund or perform the RI/FS.

### **III. Characterization of the Nature and Extent of Contamination and Selected Remedial Action**

The TCEQ conducted the Remedial Investigation (RI) of the soils, sediments, surface water and groundwater in five phases between April 2002 and July 2005. The first phase of the RI was conducted in April 2002 and included cone penetrometer testing to determine the site stratigraphy and hydrostratigraphy, groundwater testing to determine the depth and flow of the groundwater, and analysis of the groundwater for contamination. The second phase of the RI began in August 2002 and included replacement of the Site's monitoring wells, further analysis of the groundwater flow and yield, and continued monitoring of the ground water for contamination. The new wells were screened between 8 and 23 feet below ground surface. Based on yield, the groundwater at the shallow aquifer at the Site is designated as Class 3 under the Texas Risk Reduction Program rule. Phase III of the RI involved the initial characterization of the COCs in source materials, surface soils, sediments and surface water. A total of 121 soil samples, 20 sediment samples and 22 water samples were collected and analyzed for VOAs, SVOAs, metals, methanol and TPH. The investigation of the soils and sediments identified COCs at concentrations above the PCLs in eight areas of the site. A geophysical survey was also performed to investigate previous reports of buried drums and waste. Phase IV was performed in July 2003 and involved the installation of 22 subsurface borings to a depth of 7 feet to delineate the vertical extent of contamination at each sampling point with COC exceedances identified by Phase III. Phase IV also included the sampling of 176 surface soils around these points to

delineate the horizontal extent of contamination in the soils. This phase also characterized the sludge from the impoundments and the soils from the landfarm areas. Phase V involved continued sampling and analysis of the groundwater, analysis of the surface water to determine the treatment necessary for discharge, analysis of the landfarm soils for waste classification, an on-site treatability test of six impoundment sediment samples to determine the feasibility of in-situ capping, the investigation of seven areas where a previous geophysical survey had indicated the potential presence of buried drums or wastes, and the analysis of an additional five landfarm soil samples for waste characterization. The remedial investigation was completed in July 2005. The groundwater investigation involved six monitoring events of the five on-site wells over a sixteen-month period. No Volatile Organic Compounds (VOCs), Semi-Volatile Organic Compounds (SVOCs) or Metals were detected in the groundwater or surface water at concentrations above the PCLs, indicating that this media is safe for commercial/industrial use.

#### **IV. Selected Remedial Action**

A Feasibility Study (FS) was conducted to evaluate several remedial alternatives for the surface soils and sediments. The Proposed Remedial Action Document (PRAD), for the Site, evaluates the appropriateness of the range of remedial alternatives in the context of site-specific conditions.

All of the remedial alternatives considered for the Site require the removal of the wastewater from the surface impoundments so that the soil lining the bottom of the impoundments can be remediated. The cost of discharging the surface water from the impoundment is estimated at \$73,900. The surface water from the impoundments will be discharged into the Harris County Flood Control Ditch #A 119-06-00 which runs along the south side of the Site. The water from the impoundments will be tested and treated as necessary to achieve the required effluent limitation levels before discharge.

Remedies considered but not selected for the surface soils and sediments at the Site included:

- A: The soils and sediments that exceeded the PCLs would be consolidated in the east impoundment and this impoundment would be covered with an engineered clay cap. The soil and sediments would be stabilized with cement, lime or fly ash. This remedial alternative was estimated to cost \$744,000 and would require long-term monitoring.
- B: The soils and sediments that exceeded the PCLs would be consolidated in the east impoundment and this impoundment would be covered with an engineered clay cap. The soil and sediments would not be stabilized prior to placement of the cap. This remedial alternative was estimated to cost \$740,000 and would require long-term monitoring.
- C: The soils and sediments that exceed the PCLs would be stabilized in-situ and these affected areas of the Site will be covered with engineered concrete caps. The soils and sediments would be stabilized with cement, lime or fly ash. This

remedial alternative was estimated to cost \$2,051,000 and would require long-term monitoring.

The selected remedy meets the criteria established in 30 T.A.C. § 335.348, including the requirement that the remedy be the lowest cost alternative which is technically feasible and reliable, effectively mitigates and minimizes damage to the environment and provides adequate protection of public health and safety. The estimated cost is approximately \$775,000. The selected remedy includes:

The soil from both impoundments and contaminated areas, including the landfarm soils, will be excavated and disposed of off-site. The sediment and soil from the impoundments will be blended with other contaminated soil excavated from the Site and transported to a permitted disposal facility. Verification samples will be collected from the excavated areas to confirm removal of contaminated soil and sediment. The excavated areas will be backfilled with clean soil, covered with top soil and vegetated. No long-term operation and maintenance, or groundwater monitoring will be necessary.

The Site will be remediated to commercial/industrial cleanup levels. A notice will be placed in the real property records of Harris County notifying the current and future property owners that the site is appropriate for commercial/industrial, rather than residential use.

The selected remedy was presented for public comment in a public meeting on July 20, 2006 at Dobie High School, 11111 Beamer Road, Houston, Texas. No public comments were received in opposition to the selected remedy.

#### **V. Efforts to Identify Responsible Parties**

In parallel with the field investigation, the TCEQ retained a contractor to conduct record searches that might identify PRPs associated with the Site. These searches, conducted in phases as the RI expanded, included extensive review of historic land ownership records, aerial photographs and city directories. Initially, the TCEQ identified 112 entities that were associated with the Archem facility. Archem's accounts receivable, accounts payable and shipping logs were then examined. Information from the site indicates that the solid waste contributed to the Site by certain PRPs was completely addressed in the removal actions conducted in the 1990s. Since the waste of these PRPs was completely addressed in the early removal actions, response actions by the TCEQ that were conducted after the removal actions (e.g., RI/FS and after) did not relate to the waste of those PRPs. Therefore, the PRPs whose waste was completely addressed in the removal actions are not liable for costs related to TCEQ's work on Site conducted after these removal actions. Staff compared technical data and report documents from before and during the TCEQ and EPA removal actions to data collected during the remedial investigation to accurately identify which PRPs were liable solely for costs associated with the work before and including the removal actions and which parties were responsible for all of the response actions at the Site. At the conclusion of this analysis, thirty-one parties were found to be responsible solely for TCEQ's costs incurred prior to and including the removal action while nineteen of these PRPs were found to have contributed waste that was also the subject of the remedial investigation and

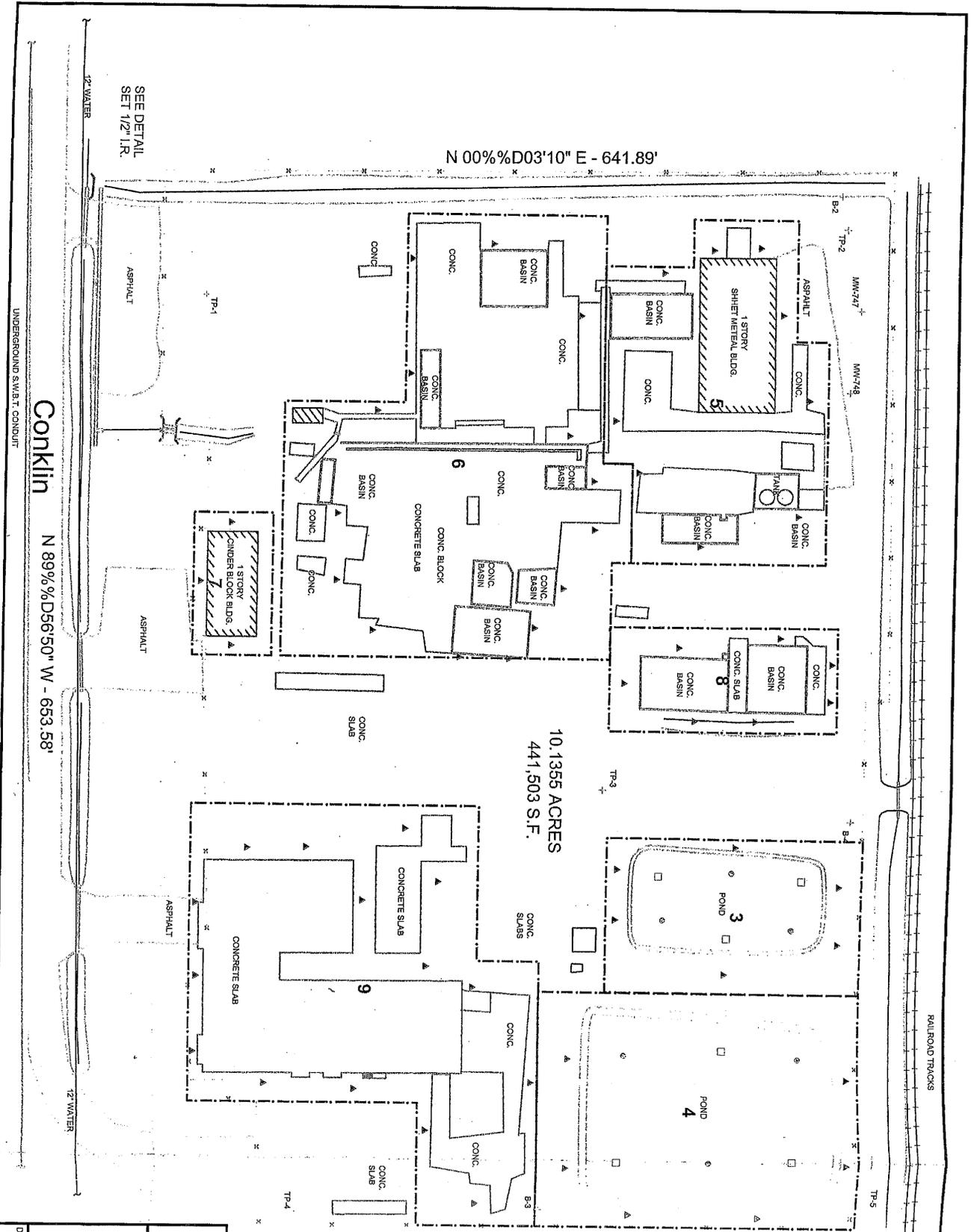
will be the subject of the remedial action. These distinct groups of PRPs are listed in the administrative order in separate sections to appropriately delineate liability for contamination at the Site.

In accordance with Section 361.187 of the Code and by letter dated October 18, 2006, the identified PRPs were given an opportunity to fund or perform the remedial action for the Site. On January 8, 2007, a partial group of PRPs responded with a qualified offer to fund or perform the remedy. The terms of the qualified offer refused to reimburse past costs incurred by TCEQ for response actions at the Site and were contingent on the granting of a full release, covenant not to sue, and contribution protection to the PRPs. The TCEQ did not accept the qualified offer since it did not include the payment of past costs as provided by 361.188 of the Code, but to further settlement discussions with the PRPs, the TCEQ extended the deadline for submittal of a good faith offer by sixty days with a new deadline of March 9, 2007. On March 13, 2007, the group of PRPs submitted an additional written offer to fund or perform the remedial action, and this offer again did not include payment for TCEQ's past costs. Therefore, the TCEQ informed the group of PRPs that it would proceed independently with the cleanup of the Site and seek recovery of all of its costs from the responsible parties under the applicable statutes and regulations. On August 14, 2008, the TCEQ conducted a meeting at the request of a partial group of the PRPs where the TCEQ reiterated that an acceptable offer to fund or perform the remedy must include the reimbursement of past costs. The TCEQ did not receive any offers from the PRP group to fully fund or perform the remedial action as well as reimburse the TCEQ for past costs associated with response actions.

#### **VI. Staff Recommendation**

The TCEQ staff recommends that the Commission issue this Administrative Order to require responsible parties to implement the selected remedial action, which is cost effective and protective of public health and safety and the environment, and to pay the TCEQ investigation costs as authorized by Section 361.188 of the Texas Health and Safety Code. Issuance of the Order will also cause the Site to be listed on the state registry of superfund sites and make a determination as to responsible parties.

If there are any questions, please contact Mr. Subhash C. Pal, P.E. Project Manager, State Lead Section at 239-4513 or Ms. Patricia Scott, Staff Attorney, Litigation Division at 239-0637.

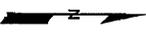


**LEGEND**

**SAMPLE LOCATIONS**

- SEDIMENT SAMPLES (0-6 IN. 12-18 IN)
- ▲ SURFACE SOILS SAMPLES (0-6 IN)
- SURFACE WATER SAMPLES
- ⊕ HISTORICAL SAMPLE LOCATIONS

- ⊞ AREA OF CONCENTRATION
- DITCH
- FENCELINE





**FIGURE 2 A**  
POND AND SLAB AREAS  
SAMPLE LOCATIONS AND  
AREAS OF CONCERN  
ARCHEM/T/HAMES CHELSEA  
STATE SUPERFUND SITE  
TXD042544270  
HOUSTON, HARRIS COUNTY, TEXAS

DATE MAY 2008	PROJECT NO. 200741028.015.0005	SCALE 1" = 80' APPROX
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**DOCKET NUMBER 2008-1229-SPF**

**IN THE MATTER OF  
THE SITE KNOWN AS  
ARCHEM /THAMES CHELSEA  
STATE SUPERFUND SITE**

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§  
§**

**BEFORE THE  
TEXAS COMMISSION ON  
ENVIRONMENTAL QUALITY**

**AN ADMINISTRATIVE ORDER**

**I. Introduction**

On February 25, 2009, the Texas Commission on Environmental Quality ("Commission" or "TCEQ") considered the Executive Director's ("ED") allegations of the existence of a release or threat of release of solid wastes and/or hazardous substances into the environment on, at, or from the ArChem/Thames Chelsea State Superfund Site ("Site") that poses an imminent and substantial endangerment to the public health and safety or the environment pursuant to the Solid Waste Disposal Act, TEX. HEALTH & SAFETY CODE, Chapter 361 (the "Act"), and the ED's requested relief including issuance of a Commission order to require persons responsible for such solid wastes or hazardous substances to perform the Work, including conducting the Remedial Activities, as authorized by Sections 361.188 and 361.272 of the Act.

After proper notice, the TCEQ makes the following Findings of Fact and Conclusions of Law:

**II. Findings of Fact**

A. For purposes of this Administrative Order ("AO"), TCEQ has identified the following persons that are potentially responsible parties ("PRPs") for the solid waste and/or hazardous substances at the Site:

Advanced Resin Systems, Inc.

AmChem Products, Inc.

Amoco Chemicals Company

Amspec Chemical Corporation  
ArChem Company  
Bio Resources, Ltd.  
Conoco Inc.  
Dixie Chemical Company, Inc.  
E.I. du Pont de Nemours and Company  
Emery Industries, Inc.  
Ferro Corporation  
First Chemical Corporation  
H. B. Fuller Company  
Roger W. Herrscher  
M & T Chemicals Inc.  
QO Chemicals, Inc.  
Thames Chelsea Chemical Company, USA  
United States Department of the Air Force  
Verle E. Cornish Company

and these parties

- (1) are the owners or operators of the Site;
- (2) owned or operated the Site at the time of processing, storage, or disposal of any solid waste;
- (3) by contract, agreement, or otherwise, arranged to process, store, or dispose of, or arranged with a transporter for transport to process, store, or dispose of solid waste owned or possessed by the PRPs or by any other person or entity at the Site; or
- (4) accepted solid waste for transport to the Site as selected by the PRP.

- B. For purposes of this AO, TCEQ has identified the following persons that are PRPs for the solid waste and/or hazardous substances at the Site that were present during the TCEQ Removal Actions that were conducted at the Site in 1992 and 1993.

Advanced Aromatics, Inc

Advanced Resin Systems, Inc.

Alco Chemical Corporation

AmChem Products, Inc.

Amspec Chemical Corporation

AmVac Chemical Corporation

Amoco Chemicals Company

ArChem Company

Arylessence, Inc.

Bio Resources, Ltd.

Chem-Crete Corporation

Chemical Exchange Industries Inc.

ChemLink Petroleum Chemicals Inc.

Ciba-Geigy Corporation

Conoco Inc.

D&O Chemicals, Inc.

Dixie Chemical Company, Inc.

E.I. du Pont de Nemours and Company

Emery Industries, Inc.

Ethyl Corporation

Exxon Chemical Company

Ferro Corporation

First Chemical Corporation  
GAF Chemicals Corporation  
Great Lakes Chemical Corporation  
H. B. Fuller Company  
Hardwicke Chemical Company  
Roger W. Herrscher  
Huls America, Inc.  
ICI Americas Inc.  
Industrial Raw Materials Corporation  
Kearney Chemicals  
Koch Chemical Company  
M & T Chemicals Inc.  
Mitsubishi International Corporation  
Morflex Chemical Company  
N L Industries, Inc. a.k.a. N. L. Treating Chemicals  
Novachem Incorporated  
Oxid, Inc.  
PMC Specialties Group, Inc.  
Pat-Chem, Inc.  
Petro-Tex Chemical Corporation  
Polarome Manufacturing Co.  
QO Chemicals, Inc.  
Thames Chelsea Chemical Company, USA  
Torback  
Union Carbide Corporation

United States Department of the Air Force  
Venture Chemicals South Carolina Division  
Verle E. Cornish Company

And, at the time of the TCEQ Removal Actions, these parties

- (1) were the owners or operators of the Site;
  - (2) owned or operated the Site at the time of processing, storage, or disposal of any solid waste;
  - (3) by contract, agreement, or otherwise, arranged to process, store, or dispose of, or arranged with a transporter for transport to process, store, or dispose of solid waste owned or possessed by the PRPs or by any other person or entity at the Site; or
  - (4) accepted solid waste for transport to the Site as selected by the PRP.
- C. The following PRPs entered into this AO as Agreeing Respondents but do not admit liability regarding the Site except for the purpose of enforcing this AO.  
None.
- D. When ranked, the Site had a State Superfund Hazard Ranking System ("HRS") score of 39.79.
- E. The portion of the Site used for ranking on the State Registry of Superfund Sites is described as follows:

Location: 13103 Conklin Lane, at the intersection of Conklin Lane and Beltway 8 located approximately one-half mile northwest of the intersection of FM 2553 and State Highway 3, and 7 miles southeast of the intersection of State Highway 3 and Interstate 45 in southeast Houston, Harris County, Texas. The site coordinates are 29°36'46" north latitude and 95°11'55" west longitude.

Site Legal Description: The site is composed of four separately deeded adjacent tracts of land identified in the deeds as Tract 2, Tract 4, Tract 7 and Tract 8. The site legal description as recorded at the time of conveyance from the Syndicate Land Company of Tract 2 on or about May 2, 1974; Tract 7 from the Texas Gulf Trust Company on June 30, 1970; and Tract 4 and 8 from the H.B. Fuller Company on October 10, 1978 to the ArChem Company, of the County of Harris, State of Texas is described as follows:

Tract 2 (Between Tract 1-W and 7): 2.5 acre tract of land out of the Syndicate Land Company 436.5 acre tract and being the East 2.5 acres out of that certain 10.896 acre tract in the Jesse Pruitt Survey, A-628, Harris County, Texas and described in the deed from the Syndicated Land Company to the ArChem Company, a Texas corporation, on or before May 2, 1974, recorded in Vol. 79, Pages 526-527, Deed Records, Harris County, Texas.

Tract 4: That certain 2.647 acre tract out of the Syndicate Land Company, 436.5 acre tract in the Jesse Pruitt Survey, Harris County, Texas and described in a Deed of Trust from Joseph M. Pellish, H.B. Fuller Company, a Minnesota Corporation to the ArChem Company dated October 10, 1978, recorded on Tape No. 109-97, Pages 1149-1152, Deed Records of Harris County, Texas.

Tract 7: That certain 2.5 acre tract out of the Syndicate Land Company, 436.5 acre tract in the Jesse Pruitt Survey, Harris County, Texas and described in a Deed of Trust from the Texas Gulf Trust Company to the ArChem Company dated June 22, 1970, recorded on Tape No. 117-39, Pages 1274-1275, Deed Records of Harris County, Texas.

Tract 8: That certain 2.5 acre tract out of the Syndicate Land Company, 436.5 acre tract in the Jesse Pruitt Survey, Harris County, Texas, and being adjacent to the West line of that certain 2.647 acre tract conveyed to AmChem Products, Inc., by Deed recorded in Volume 4280, Page 540, of the Deed Records of Harris County, Texas and described in the deed of trust from Joseph M. Pellish, H.B. Fuller Company, a Minnesota Corporation to the ArChem Company dated October 10, 1978, recorded on Tape No. 109-97, Pages 1149-1152, Deed Records of Harris County, Texas.

- F. The Site consists of the area listed in Paragraph E above. In addition, the Site includes any areas outside the area listed in Paragraph E above where as a result, either directly or indirectly, of a release of solid waste or hazardous substances from the area described in Paragraph E above, solid waste or hazardous substances have been deposited, stored, disposed of, placed or have otherwise come to be located.
- G. The Site was proposed for listing on the State Registry of Superfund Sites in the *Texas Register* on May 4, 2001, 26 Tex. Reg. 3413.
- H. The Site has historically been used as a specialty and toll chemical manufacturing facility. A wide range of organic chemicals and catalysts were used in manufacturing and processing operations at the site.
- I. The Chemicals of Concern at the Site are listed in Exhibit B. All of the substances listed in Exhibit B have been processed, deposited, stored, disposed of, placed or have otherwise come to be located on the Site.

- J. The substances listed in Exhibit B have been documented in soil at the Site.
- K. The substances listed in Exhibit B are:
1. substances designated under Section 311(b)(2)(A) of the Federal Water Pollution Control Act, as amended (33 United States Code ("U.S.C.") Section 1321);
  2. elements, compounds, mixtures, solutions, or substances designated under Section 102 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA") (42 U.S.C. Section 9601 et seq., as amended);
  3. hazardous wastes having the characteristics identified under or listed under Section 3001 of the Federal Solid Waste Disposal Act, as amended (42 U.S.C. Section 6921), excluding wastes, the regulation of which has been suspended by Act of Congress;
  4. toxic pollutants listed under Section 307(a) of the Federal Water Pollution Control Act (33 U.S.C. Section 1317);
  5. hazardous air pollutants listed under Section 112 of the Federal Clean Air Act, as amended (42 U.S.C. Section 7412); or
  6. any imminently hazardous chemical substances or mixtures with respect to which the administrator of the Environmental Protection Agency ("EPA") has taken action under Section 7 of the Toxic Substances Control Act (15 U.S.C. Section 2606).
- L. The substances listed in Exhibit B include the following: garbage; rubbish; refuse; sludge from a waste treatment plant, water supply treatment plant, or air pollution control facility; or other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from industrial, municipal, commercial, mining, and agricultural operations and from community and institutional activities, or hazardous substances, for the purposes of TEX. HEALTH & SAFETY CODE Sections 361.271 through 361.277 and 361.343 through 361.345.
- M. The substances listed in Exhibit B are solid wastes or hazardous substances.
- N. Solid wastes or hazardous substances at the Site listed in Exhibit B are, or potentially are, spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into the environment.
- O. Potential pathways for exposure to the solid wastes or hazardous substances listed in Exhibit B include physical contact, ingestion and inhalation.

- P. Exposure to levels of metals (antimony, lead, and mercury), volatile organic compounds (benzene, toluene and tetrahydrofuran), and semi-volatile organic compounds (2-nitroaniline and furfural) found at the Site poses an unacceptable carcinogenic risk or an unacceptable toxicity risk.
- Q. The solid wastes or hazardous substances at the Site listed in Exhibit B are not capable of being managed separately under the remedial action plan.
- R. In 1992 and 1993, the TCEQ conducted Removal Actions at the Site to address solid waste and hazardous substances disposed of at the Site that were spilled, released or posing a potential threat to release. In 1992, the TCEQ Removal Action included such measures as limiting public access to the Site through fencing and warning signs; lab packing, covering and/or drumming waste; removing and storing liquids from various processing units associated with the facility; and removing and disposing off-site approximately 280,000 gallons of Class I wastewater from the surface impoundments. In 1993, the TCEQ Removal Action included the categorization and segregation of various drums containing waste; the treatment, discharge and disposal of wastewater from the surface impoundments; overpacking of leaking drums; drumming of spilled materials; and construction of a semi-permanent cover and capping of the contaminated wastewater treatment equipment.
- S. On April 15, 2001, the Commission provided written notice of the proposed listing of the Site on the State Registry to each PRP identified as of that date at the PRP's last known address.
- T. On June 6, 2006, the Commission provided written notice of the public meeting and of the opportunity to comment on the proposed Remedy as specified in Sections 361.187(b) and (c) of the Act to each PRP identified as of that date at the PRP's last known address.
- U. On October 18, 2006, each PRP identified as of that date was provided an opportunity to fully fund or perform the proposed Remedial Activities, as specified in Sections 361.187(d) and 361.133 (c) of the Act.
- V. Except for removals performed by Advanced Resin Systems Inc., Amoco Corporation, E.I. du Pont de Nemours & Company, Elf Atochem North America, Inc., Ethyl Corporation and NovaChem Incorporated, no actions have been voluntarily undertaken at the Site.
- W. The Remedy Selection Document ("RSD") for the Site is attached to this AO as Exhibit A.
- X. The remedy adopted in Exhibit A is selected as the Remedy to be implemented in accordance with this AO.

### III. Conclusions of Law and Determinations

- A. The PRPs listed in Section II (Findings of Fact) Paragraph A are Responsible Parties ("RPs") pursuant to Section 361.271 of the Act. The PRPs listed in Section II (Findings of Fact) Paragraph B are RPs pursuant to Section 361.271 of the Act for liability associated with the Removal Actions conducted by the TCEQ in 1992 and 1993. The PRPs listed in Section II (Findings of Fact) Paragraph B will be designated as Removal Action Responsible Parties (RARPs) throughout this AO.
- B. Some of the substances referenced in Section II (Findings of Fact) Paragraph I, which are found at the Site, are hazardous substances as defined in Section 361.003(11) of the Act.
- C. Some of the substances referenced in Section II (Findings of Fact) Paragraph I, which are found at the Site, are solid wastes as defined in Section 361.003(34) of the Act.
- D. Hazardous substances were deposited, stored, disposed of, placed or otherwise came to be located at the Site and solid wastes were stored, processed, disposed of, or discarded at the Site.
- E. The Site is a facility as defined in Section 361.181(c) of the Act.
- F. The Site is a solid waste facility as defined in Section 361.003 (36) of the Act.
- G. "Imminent and substantial endangerment" is defined by rule as follows: A danger is imminent if, given the entire circumstances surrounding each case; exposure of persons or the environment to hazardous substances is more likely than not to occur in the absence of preventive action. A danger is substantial if, given the current state of scientific knowledge, the harm to public health and safety or the environment which would result from exposure could cause adverse environmental or health effects. 30 TEX. ADMIN. CODE Section 335.342.
- H. There has been a release (as defined in Section 361.003(28) of the Act) or threatened release of hazardous substances or solid wastes into the environment at the Site that poses an imminent and substantial endangerment (as defined in 30 TEX. ADMIN. CODE Section 335.342) to the public health and safety or the environment and, therefore, the Site will be listed on the State Registry of Superfund Sites as per Section V (Order) Paragraph A.
- I. The release or threatened release of hazardous substances or solid wastes into the environment at or from the Site to be addressed by the Remedy has not been proven to be divisible pursuant to Section 361.276 of the Act.
- J. The actions required by this AO are reasonable and necessary to protect the public health and safety or the environment.

- K. The TCEQ's 1992 and 1993 Removal Actions were conducted because there existed a spill, release, or threatened release of solid waste and/or hazardous substance at the Site that made immediate action necessary and appropriate to protect human health and the environment and prevent irreversible or irreparable harm to the public health and safety and the environment.
- L. The EPA issued a Notice of No Further Action (NFRAP) for the site on March 22, 1996. Funds from the Federal Government are unavailable for the Remedial Activities at this Site because the EPA has determined that no further Federal Action will be taken at the Site.

IV. Exhibits and Definitions

- A. The following exhibits are incorporated by reference into this AO:

- "Exhibit A" Remedy Selection Document
- "Exhibit B" List of Solid Wastes and Hazardous Substances at the Site
- "Exhibit C" Table of Contents for Field Sampling Plan

- B. The following terms have the meaning set out below:

- "Agreeing Respondent" The PRPs listed in Section II (Findings of Fact) Paragraph C that fund or perform the Work and have agreed to the terms and conditions of this AO as evidenced by signing a consent form.
- "Chemicals of Concern" Any chemical that has the potential to adversely affect ecological or human receptors due to its concentration, distribution, and mode of toxicity.
- "Day" A calendar day.
- "Defaulting Performing Party" Any Performing Party that fails to comply with the terms or conditions of this AO.
- "Demobilization" The dismantling and removal of all construction equipment from the Site.
- "Effective Date" The Day ten (10) days after the issue date of this AO.
- "Executive Director (ED)" The Executive Director of the TCEQ or a designee.

“include”	Use of the term include, in all its forms, in this AO is intended to express an enlargement or illustrative application specifying a particular thing already included within the preceding general words. It is not used as a term of limitation.
“Institutional Control”	A legal instrument which indicates the limitations on or the conditions governing use of the property which ensures protection of human health and the environment in accordance with 30 TEX. ADMIN. CODE Chapter 350 and as required by the Remedy.
“Parties”	Collectively, the Respondents and the Commission.
“Performing Parties”	Collectively, the Agreeing Respondents and persons that did not enter into this AO but that fund or perform the Work.
“Post Construction Activities (PCA)”	All Remedial Activities at the Site, subsequent to issuance of the Approval of RA Completion, required to complete the Remedial Activities in accordance with this AO.
“Post Construction Cost Estimate”	An estimate of the cost to perform all of the PCA for as long as post construction activities are needed.
“Project Manager”	The individual designated by the ED to oversee implementation of the Work and to coordinate communications with the Agreeing Respondents or, if there are no Agreeing Respondents to this AO, the Performing Parties.
“Remedial Action (RA)”	Those Remedial Activities, except for Post Construction Activities, undertaken at the Site, including on-site physical construction and any required institutional controls, to implement the Remedy. The areal extent of the RA is not limited to the Site. It includes all suitable areas in proximity to the Site necessary for implementation of the Remedial Activities.
“Remedial Activities”	The RD, RA, PCA, and any other actions required to implement and maintain the Remedy pursuant to the RSD and 30 TEX. ADMIN. CODE Chapter 335, Subchapter K and 30 TEX. ADMIN. CODE Chapter 350.
“Remedial Activities Contractors”	The individual, company, or companies retained by the Agreeing Respondents, or if there are no Agreeing Respondents to this AO, by the Performing Parties to undertake any or all phases of the Remedial Activities. Remedial Activities Contractors cannot assume the role of any quality assurance official required by this AO.

"Remedial Design (RD)"	Those Remedial Activities during which engineering plans and technical specifications are developed for the Remedy.
"Remediation Goals"	Cleanup standards or other measures of achievement of the goals of the Remedy, consistent with the Act, 30 TEX. ADMIN. CODE Chapter 335, Subchapter K and 30 TEX. ADMIN. CODE Chapter 350, determined by ED to be necessary at the Site to achieve and to maintain the Remedy.
"Remedy"	The Remedy adopted for the Site in the Remedy Selection Document to clean up or control exposure at the Site in accordance with all applicable laws and regulations and to be implemented in accordance with this AO. The Remedy includes all applicable requirements contained in the Act, 30 TEX. ADMIN. CODE Chapter 335, Subchapter K and 30 TEX. ADMIN. CODE Chapter 350.
"Remedy Selection Document (RSD)"	The document that was developed for the Site, based on Site specific information, that specifies the Remedy, and that, was adopted by the ED and TCEQ after the opportunity for public review and comment.
"Removal Action"	Activities consistent with the definition provided by section 361.003(30) of the Act, such as: cleaning up or removing released hazardous waste from the environment; taking necessary action in the event of the threat of release of hazardous waste into the environment; taking necessary action to monitor, assess, and evaluate the release or threat of release of hazardous waste; disposing of removed material; erecting a security fence or other measure to limit access; or taking any other necessary action to prevent, minimize, or mitigate damage to the public health and welfare or the environment that may otherwise result from a release or threat of release.
"Removal Action Responsible Parties (RARPs)"	The PRPs listed in Section II (Findings of Fact) Paragraph B who are responsible parties for the solid wastes and/or hazardous substances present on Site during the Removal Actions conducted by the TCEQ in 1992 and 1993.
"Responsible Parties (RPs)"	The PRPs listed in Section II (Findings of Fact) Paragraph A.
"Respondents"	Collectively, the Agreeing Respondents, the RPs, and the Performing Parties. Throughout this AO, the term Respondents shall not be generally construed as to include the RARPs. However, throughout this AO, any person who is a RP or a Performing Party would be

classified as a Respondent irrespective of whether that party was also classified as a RARP.

- “Samples” Samples of environmental media taken pursuant to and in accordance with this AO.
- “Sections” Those major divisions of this AO designated by Roman numerals.
- “Site Coordinator” The individual designated by the Agreeing Respondents, or if there are no Agreeing Respondents to this AO, the Performing Parties to oversee the Remedial Activities Contractors and the implementation of the Remedial Activities and to coordinate communications with the ED.
- “Site Representative” A person designated by the Project Manager that is authorized to oversee the Remedial Activities.
- “Substantial Completion” The point, as determined by the ED in his sole discretion, at which the Work (or a specified part thereof) has been substantially completed in accordance with any work plans or documents required to be developed pursuant to this AO.
- “Texas Commission on Environmental Quality (TCEQ)” The Texas Commission on Environmental Quality and its predecessor agencies.
- “Work” All activities to be undertaken or performed in accordance with and as required by this AO.

## V. Order

Therefore, the TCEQ orders:

- A. The Site will be listed on the State Registry of Superfund Sites.
- B. Reserved.
- C. Respondents shall reimburse the Hazardous and Solid Waste Remediation Fee Account for all of the ED's costs of the Remedial Investigation (“RI”) and the Feasibility Study (“FS”), including the oversight costs of these activities. Respondents and RARPs shall reimburse the Hazardous and Solid Waste Fee Account for all uncompensated Pre-Remedial Investigation costs, including the TCEQ's 1992 and 1993 Removal Actions, including oversight costs of these activities.

The RPs and any Defaulting Performing Parties shall reimburse the Hazardous and Solid Waste Remediation Fee Account for all costs incurred by the ED in implementing and in overseeing the Work and for any costs incurred by the ED for activities other than the RI and FS to the extent that such costs have not been paid.

Reimbursement is to be made within forty-five (45) Days after the ED transmits a Demand Letter stating the amount owed. Payment is to be paid by cashiers check, money order, or electronic deposit. All payments and accompanying letters or documentation should contain the following information: "Archem/Thames Chelsea State Superfund Site," "Cost Recovery Funds for the Hazardous and Solid Waste Remediation Fee Account (Fund 550) of the State of Texas," "PCA Code 55221," "Docket Number 2008-1229-SPF," and "TCEQ Project Manager, Subhash Pal." All payments and accompanying letters or documentation should be mailed to: Cashier's Office, MC-214, TCEQ, Re: "Archem/Thames Chelsea State Superfund Site," "Docket Number 2008-1229-SPF," "PCA Code 55221," "Project Manager, Subhash Pal," and "Administrative Order, Cost Recovery," P.O. Box 13088, Austin, TX 78711-3088. All checks and money orders shall be payable to the "Texas Commission on Environmental Quality," or "TCEQ." The requirement to make such payments will survive the termination of this AO in accordance with Section XXXIII (Termination of the Administrative Order).

This AO applies to and is binding upon Respondents, their agents, successors, and assigns. The applicable terms of this AO, as provided in the AO, are also binding upon the RARPs. Respondents, as specified above, are jointly and severally responsible for carrying out the Work. Performance of any or all of the Work by the Performing Parties or Agreeing Respondents shall not excuse any other Respondent from such performance. Upon performance by any Respondent of Remedial Activities, either alone or in conjunction with other Performing Parties, such Respondent shall, from such performance forward, become a Performing Party. Such performance by a Respondent of some of the Remedial Activities does not excuse the Respondent from performance of those Remedial Activities that took place prior to the Respondent becoming a Performing Party or any other preexisting requirement of this AO. No change in the ownership or corporate status and no acquisition of a Respondent will alter its respective responsibilities under this AO.

- E. Respondents that own or lease real property at the Site shall provide a copy of this AO to all of their lessees or sublessees of the Site until such time as this AO is terminated in accordance with Section XXXIII (Termination of the Administrative Order) and to any prospective owners or successors before all or substantially all property rights, stock, or assets are transferred.
- F. Respondents shall provide a copy of this AO to all contractors, subcontractors, laboratories, and consultants retained by Respondents to perform any or all of the Work within thirty (30) Days after the Effective Date or on the date such services are retained, whichever date occurs later. Notwithstanding the terms of any contract,

Respondents remain responsible for compliance with this AO and for ensuring that their contractors and agents comply with this AO.

- G. Within forty-five (45) Days after the Effective Date each Respondent that owns real property at the Site shall record a copy or copies of this AO, with all exhibits, in the appropriate office where land ownership and transfer records are filed or recorded, and shall ensure that the recording of this AO is properly indexed to each and every property comprising any part or all of the Site so as to provide notice to third parties of the issuance and terms of this AO with respect to those properties. Each Respondent that owns real property comprising all or any part of the Site shall, within sixty (60) Days after the Effective Date, send notice of such recording and indexing to the ED. The obligations and restrictions of this AO run with the land and are binding upon any and all persons who acquire any interest in any real property comprising all or any part of the Site.

Not later than ninety (90) Days before any transfer of any property interest in any property included within the Site and in accordance with Section XII (Notices and Submittals) Respondents that own or lease such real property shall submit the transfer documents to the ED.

- H. In accordance with Section 361.1855 of the Act and for the purpose of selecting the Remedy, the ED has selected commercial/industrial as the appropriate land use for the Site. Any change in use of any or all of the Site must comply with Section 361.190 of the Act.
- I. A qualified Remedial Activities Contractor shall direct and supervise all aspects of the Remedial Activities. Within ten (10) Days after the Effective Date each Respondent that is not an Agreeing Respondent shall notify the ED of its intent to perform the Work.

In addition to fulfilling the requirements of Section VIII (Project Manager/Site Coordinator) Paragraph C, within ten (10) Days after the Effective Date, Agreeing Respondents or, if there are no Agreeing Respondents, Performing Parties shall notify the ED in writing of the name, title, qualifications, relevant licenses, and permits of the Site Coordinator and Remedial Activities Contractor proposed to be used in carrying out the Remedial Activities. The Agreeing Respondents shall demonstrate or, if there are no Agreeing Respondents, the Performing Parties shall demonstrate that each proposed Remedial Activities Contractor has any licenses necessary to do business in the State of Texas and permits necessary to perform any or all of the Remedial Activities. If at any time the Agreeing Respondents or, if there are no Agreeing Respondents, Performing Parties propose to use a different Remedial Activities Contractor, the Agreeing Respondents or Performing Parties, as appropriate, shall notify the ED before the new Remedial Activities Contractor performs any of the Remedial Activities. The Agreeing Respondents' Site Coordinator shall be the Project Manager's and Site Representative's point of contact

for all Performing Parties. All Performing Parties must coordinate with and cooperate with any Agreeing Respondents in the performance of any and all of the Work.

- J. The Remedy may be modified as specified in 30 TEX. ADMIN. CODE Section 335.349. Except as specified in the previous sentence and in Section XVIII (Extension of Deadlines), the terms of this AO may be amended upon approval by the Commission after notice to all Respondents.
- K. Respondents shall provide all the necessary information and assistance for TCEQ's Community Relations personnel to implement the Community Relations Plan.
- L. All ED-approved final submittals, documents, plans, and reports required to be developed and approved by the ED pursuant to this AO will be incorporated in and enforceable under this AO.
- M. In complying with this AO, Respondents shall at all times comply with the requirements of the Act and 30 TEX. ADMIN. CODE Chapter 335, Subchapter K and 30 TEX. ADMIN. CODE Chapter 350, as applicable.

#### VI. Remedial Activities

- A. The Respondents shall undertake the Remedial Activities in the following phases:
  - 1. Remedial Design ("RD");
  - 2. Remedial Action ("RA"); and
  - 3. Post Construction Activity ("PCA").

The ED may, in his sole discretion, waive, in writing, a requirement to submit any report, submittal, document or plan otherwise required to be submitted by this AO.

- B. Remedial Design
  - 1. Not later than ten (10) Days after the Effective Date, Respondents shall submit a Design Concept Memorandum ("DCM") to the ED for review, comment, and approval. Respondents must submit a DCM that includes:
    - a. Description of key performance and design criteria for the Remedy necessary to meet the requirements of the Remedy Selection Document;

- b. Identification of all significant design options that may be considered by the design professional to meet the required performance and design criteria and the proposed option(s) to meet those criteria; and,
    - c. Identification of potential problems and unresolved issues which may affect the timely completion of the RD, RA and PCA, and proposed solutions to those problems.
  2. Within thirty (30) Days after the ED approves the DCM, Respondents shall:
    - a. Obtain written landowner consent for any institutional control to be placed on the land records for any or all of the Site as required by this AO or by TCEQ rule and submit a copy of the consent to the ED; and
    - b. Submit a Preliminary RD to the ED for review, comment, and approval.
  3. The Respondents shall submit a Preliminary RD that meets the requirements as set forth in this Section and consists of a 30% completion of all sections of the following RD submittals:
    - RA Schedule;
    - RA Field Sampling Plan ("RA FSP");
    - Remedial Action Construction Quality Assurance Project Plan ("RA C-QAPP");
    - RA Plans and Specifications;
    - RA Health and Safety Plan ("RA HASP"); and
    - Post Construction Activity Plan ("PCA Plan").
  4. The RA Schedule will describe the sequence, dependency on other activities, and duration of each activity to be conducted during the RA including Project Milestones (which will be subject to the provisions of Section XXI (Stipulated Penalties), Paragraph D) and the specific mobilization date to begin the RA.
  5. The RA Sampling and Analysis Plan (RA SAP) and RA C-QAPP will describe the means of assuring quality during the RA and will specify a quality assurance official ("Respondent QA Official"), independent of the RA Contractors, to conduct a quality assurance program during the RA.

- a. The RA SAP will be comprised of the RA FSP and the "Texas Commission on Environmental Quality Remediation Division Quality Assurance Project Plan for the Superfund Program," (Program QAPP) that is most current as of the Effective Date of this AO. The RA SAP will address sampling and analysis relating to environmental parameters which may present toxic risk to human health or the environment. Respondents and their contractors and subcontractors, including analytical laboratories, shall strictly adhere to all requirements of the approved RA SAP.
- b. The Program QAPP text will not be altered. Alterations to the Program QAPP necessitated by project specific circumstances will be effected by appropriate notation in Section 8.0 "Exceptions, Additions and Changes to the Program QAPP" of the RA FSP.
- c. The RA FSP will include:
  - i) All data required by the Program QAPP and the contents outline attached as Exhibit C to this AO;
  - ii) Data Quality Objectives ("DQO's") which provide for the collection and analysis of a sufficient quantity and quality of data to demonstrate attainment of the Remediation Goals and to demonstrate protection of off-site receptors from exposure to Chemicals of Concern during the RA. DQO's will be developed in accordance EPA "Guidance for the Data Quality Objectives Process, EPA QA/G-4"; and EPA's QA/CS-1: *Systematic Planning: A Case Study for Hazardous Waste Site Investigations*, February 2006. DQO's will be formally documented in Section 3 of the Field Sampling Plan; and
  - iii) A perimeter air monitoring plan including the action levels necessary to protect off-site receptors from exposure to the Chemicals of Concern; the Chemicals of Concern to be sampled; the kinds of sampling techniques to be used to sample; the number, type, and location of monitors; the calibration methods and schedule; and the sampling and reporting frequency.
- d. In regard to laboratories and laboratory analytical work, Respondents shall:
  - i) Ensure the laboratory has a documented quality assurance program in place that is consistent with the National

Environmental Laboratory Accreditation Conference (NELAC) standards.

- ii) Ensure that each laboratory it may use is qualified to conduct the proposed work. This includes use of methods and analytical protocols for the Chemicals of Concern in the media of interest within detection and quantitation limits consistent with both QA/QC procedures and approved DQOs for the site. The Respondent QA Official shall provide written certification that it has reviewed the laboratory's Quality Assurance Plan and capabilities and has determined that:
- (a) The laboratory has a documented quality assurance program in place that is generally consistent with National Environmental Laboratory Accreditation Conference (NELAC) standards;
  - (b) The laboratory has demonstrated and documented proficiency with each sample preparation and determinative combination to be used on the project;
  - (c) The laboratory has documented standard operating procedures for each of the methods required for the project;
  - (d) The laboratory has the capability of meeting the analytical objectives for the project; and
  - (e) The laboratory is NELAC accredited under the Texas Laboratory Accreditation Program according to Title 30 Texas Administrative Code (TAC) Chapter 25 (relating to Environmental Testing Laboratory Accreditation and Certification) Subchapters A and B as amended, for the matrices, methods and parameters of analysis, or a regulatory exception specified in 30 TAC 25.6 was allowed by TCEQ in addition, the Respondent QA Official shall provide with this written certification as applicable a copy of the laboratory's current National Environmental Laboratory Accreditation Program (NELAP) accreditation certificate to verify that the laboratory is NELAC accredited by the TCEQ in accordance with these requirements.

A table which presents the laboratory's method detection limits and quantitation limits and the preliminary remediation goal for each analyte of concern, and a table that presents the laboratory's control limits for quality control parameters, i.e., surrogates, matrix spike/matrix spike duplicate samples, and laboratory control samples must be submitted along with the certification letter and must be submitted attached or inserted into the RA FSP.

- iii) Ensure that all laboratories used for analysis of Samples are acceptable to the ED. A laboratory may be deemed unacceptable for any of the following reasons:
    - (a) repeated or numerous deficiencies found in the laboratory quality assurance program during the ED's or EPA's laboratory inspections;
    - (b) repeated or numerous deficiencies in laboratory performance;
    - (c) debarment by EPA; or
    - (d) failure to comply with any requirement or criteria of the Program QAPP or this AO.
  - iv) Ensure that all data submitted to the agency is produced by laboratories accredited by TCEQ according to 30 TEX. ADMIN. CODE Chapter 25 (relating to Environmental Testing Laboratory Accreditation and Certification) Subchapters A and B.
6. The RA C-QAPP will describe the activities necessary to ensure that the Remedy is constructed to meet or exceed all design criteria, plans, specifications, and all applicable Remediation Goals. The RA C-QAPP will address sampling and analysis relating to physical properties of constructed engineered controls which must meet specified criteria to ensure the long-term performance of those features (e.g. physical soil properties of soil backfill or constructed clay caps, physical properties of geotextiles and liner materials, leak testing of piping systems and containment vessels, etc.). At a minimum, the RA C-QAPP will include the following elements:
- a. The responsibility and authority of organizations and key personnel involved in designing and constructing the RA;

- b. The qualifications of the Respondent QA Official(s) and supporting inspection personnel;
  - c. The observations and tests that will be used to ensure that the construction meets or exceeds all design criteria, plans and specifications and all applicable Remediation Goals;
  - d. The sampling activities, sample size, methods for determining locations, frequency of sampling, acceptance and rejection criteria, and methods for ensuring that corrective measures are implemented; and
  - e. Detailed reporting requirements.
7. The RA Plans and Specifications will establish the sequences, procedures and requirements to be implemented at the Site including at a minimum:
- a. Demolition activities including monitor well closure, decontamination, building demolition methods, environmental controls, and disposal.
  - b. Excavation activities including: establishment of limits of initial excavation for surface and subsurface soils with provisions for field controls; excavation materials handling including stockpiling; excavation confirmation sampling; backfill procedures; air emissions control; stormwater management; cross-contamination prevention; and equipment and personnel decontamination procedures and facilities.
  - c. Estimated quantities of material to be excavated and estimated quantities of materials to be disposed of off-site.
  - d. Details regarding construction and installation of fences, signs and other engineered controls.
  - e. Detailed design of the treatment plan for the surface water from the east pond and its discharge into the Harris County flood control ditch.
  - f. Site restoration activities, including backfill materials, compaction, and final cover.
  - g. Plans including at a minimum:
    - i) Site plan;

- ii) Demolition plan;
- iii) Excavation plan, plan view;
- iv) Excavation plan, sections;
- v) Treatment plant design for the surface water from east pond
- vi) Final Site grading plan;
- vii) Construction details; and
- viii) All other plans and specifications necessary to describe sequences, procedures, and requirements to conduct the Remedial Activities in a manner protective of human health and the environment.

8. The RA HASP will specify the procedures that are sufficient to protect on-site personnel and the public from the physical, chemical and/or biological hazards of the site. The HASP will address all requirements of 29 CFR Chapter XVII - "Occupational Safety and Health Administration (OSHA), Department of Labor," 40 CFR §35.6015(a)(21) "Health and Safety Plan," and all applicable safety regulations, ordinances and statutes pertaining to the safety of on-site personnel and the public. The HASP and any revisions or addenda will be reviewed and signed by a Board Certified Industrial Hygienist.

The TCEQ relies on the Respondent in the preparation of an adequate HASP. However, TCEQ reserves the right to review and provide comments on the Respondent's HASP. If TCEQ provides comments, they constitute only general safety guidelines which are not intended to cause the Respondent to reduce the level of protection. Any language in the comments or in this AO which appears to give the TCEQ the right to direct or control the Respondent's means, methods and details of the Work shall be deemed to mean that the Respondent will follow TCEQ's desires only as to the results of the Work. The Respondent is solely responsible for preparing an adequate HASP, for complying with the RD and the applicable safety laws and regulations, for performing the Work in a safe manner and for protecting the health and safety of on-site personnel and the public. The Respondent shall address the TCEQ's comments and concerns and if necessary submit a revised HASP. TCEQ notation of "approval," "acceptance," or similar language in response to a HASP submittal for review shall not alter the responsibilities of the parties as described in this Section. In the event that TCEQ notes a HASP "approved" or "accepted" or uses similar language to

indicate that there are no further comments, such notation shall be deemed to mean only:

*We have reviewed your HASP under the AO provision reserving the right for TCEQ to review and provide comments constituting general safety guidelines (not intended to cause the Respondent to reduce the level of protection). The reviewer(s) might not be Board Certified Industrial Hygienist or any other type of safety professional. We have no comments (or further comments) at this time on your HASP. We recognize this HASP as your final HASP. If you change this HASP you must submit a revision or addendum for review and potential comment in accordance with this AO.*

***Do not rely on TCEQ review or comments (or lack thereof) on your HASP for any purposes.***

*By telling you we have no comments (or further comments) we are not assuming responsibility for your means, methods, details or sequences, nor are we assuming any duty of protection to you, your employees, your subcontractors or suppliers, or their employees, or to any third party. Any language in the comments or in this AO which appears to give the TCEQ the right to direct or control your means, methods and details of the Work shall be deemed to mean that you will follow TCEQ's desires only as to the results of the Work. You are solely responsible for preparing and implementing an adequate HASP, for complying with the RD and the applicable safety regulations, ordinances and statutes, for performing the Work in a safe manner and for protecting the health and safety of on-site personnel and the public.*

9. The PCA Plan will describe all sequences, procedures and requirements for implementing the PCA. The PCA Plan will, at a minimum, include the following:
  - a. A Post Construction Sampling and Analysis Plan ("PC SAP") and Post Construction Quality Assurance Project Plan ("PC-QAPP") meeting the criteria established herein for the RA SAP and RA C-QAPP but addressing all sampling and analyses relating to PCA;
  - b. Post Construction Plans and Specifications necessary to assure that the Remedial Activities attain and maintain the Remediation Goals;
  - c. A PCA Schedule describing the sequence, dependency on other activities, and duration of each activity to be conducted during the PCA including Project Milestones (which will be subject to Section XXI Stipulated Penalties Paragraph D), and the specific mobilization date to begin the PCA;

- d. A Post Construction Cost Estimate providing an estimate for a qualified third party to perform all of the tasks necessary for post construction for as long as PCA are needed, in accordance with the PCA Schedule; and
  - e. A Post Construction Activities HASP ("PCA HASP") which meets all of the requirements specified above for the RA HASP but which is appropriate to protect on-site personnel and the public from any physical, chemical and/or biological hazards of the site relating to the Post Closure period and activities.
10. Within thirty (30) Days after the ED provides written comments to the Site Coordinator on the Preliminary RD, Respondents shall submit a Pre-Final RD to the ED for review, comment, and approval. The Pre-Final RD will consist of 95% RD submittals. Respondents shall address the ED's comments on the Preliminary RD and submit a summary note which clearly and explicitly indicates how each comment by the ED on the Preliminary RD has been satisfactorily addressed and which will also identify all other revisions or changes from the Preliminary RD.
11. Within twenty (20) Days after the ED provides the Site Coordinator with the ED's written comments on the Pre-Final RD, Respondents shall submit the Final RD, prepared and sealed by a Professional Engineer licensed in the State of Texas, to the ED. The Final RD will consist of 100% complete RD submittals except the PCA Plan. A Professional Engineer shall include a certification that the design was prepared to attain all Remediation Goals upon implementation. Respondents shall address the ED's comments on the Pre-Final RD and submit a summary note which clearly and explicitly indicates how each of the ED's comments on the Pre-Final RD has been satisfactorily addressed and which will also identify all other revisions or changes from the Pre-Final RD.
12. The ED will notify the Site Coordinator of his approval or disapproval of the Final RD including written comments. Within fifteen (15) Days after the ED provides written comments to the Site Coordinator, Respondents shall resubmit the Final RD, in both clean and redline, strikeout format, with a summary note which clearly and explicitly indicates how each of the ED's comments on the previous draft of the Final RD has been satisfactorily addressed and which will also discuss all other revisions or changes from the previous draft of the Final RD.
13. The ED will notify the Site Coordinator of his approval or disapproval of each resubmittal of the Final RD. Each resubmittal will be submitted as specified in Paragraph 12 above. Disapproval of the first resubmittal, and

each subsequent resubmittal, is subject to assessment of stipulated penalties in accordance with Section XXI (Stipulated Penalties).

14. Upon the ED's approval, the documents comprising the Final RD will be incorporated as requirements into and will be enforceable under this AO.

C. Remedial Action

1. Respondents and Respondents' contractors and subcontractors shall not mobilize to the Site until the Final RD is approved by the TCEQ. Under no circumstance will mobilization occur prior to TCEQ approval of the RA HASP.<sup>1</sup> The Respondents will be responsible for initiating, maintaining, and supervising all safety precautions and programs required for the protection of: all persons who may be affected by the Work, the Work, and any property which maybe affected by the Work.
2. As soon as practicable after the award of any contract to ship solid wastes and/or hazardous substances from the Site and prior to any such actual shipment, Respondents shall submit to the Project Manager a written certification containing all relevant information regarding such shipments. The certification will include:
  - a. The name and location of the facility to which the solid wastes and/or hazardous substances are to be shipped;
  - b. The type and quantity of the solid wastes and/or hazardous substances to be shipped;
  - c. The expected schedule for the shipment of the solid wastes and/or hazardous substances; and
  - d. The method of transportation and the name, address, and phone number of the transporter.
3. In addition, Respondents shall certify that:
  - a. No enforcement order is currently imposed on any selected receiving facility or transporter by any regulating authorities;
  - b. The selected receiving facility and transporter are permitted to accept the specific solid wastes and/or hazardous substances to be shipped from the Site by all appropriate regulating authorities; and

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<sup>1</sup>TCEQ's "approval" or "acceptance" of the HASP will be given the meaning as explained in Section VI (Remedial Activities) Paragraph B.8.

- c. After appropriate inquiry, they have no knowledge that either the selected receiving facility or transporter is non-compliant with any federal, state, or local requirement.
4. The ED may inspect the Remedial Activities and/or the Site at any time to evaluate compliance with this AO.
5. At least ten (10) Days prior to the expected date of achieving Substantial Completion of the RA, the Site Coordinator shall conduct a pre-Substantial Completion inspection and shall develop and submit to the ED a preliminary punch list identifying any nonconformance with the requirements of the RA Plans and Specifications.
6. At the same time that the Performing Parties submit the Substantial Completion punch list, they shall schedule a Substantial Completion inspection by the ED. The Site Coordinator shall accompany the ED during the Substantial Completion inspection.
7. Within (10) Days after the ED's on-site inspection, the Respondents shall submit to the ED in writing a revised punch list incorporating any deficiencies identified by the ED during the Substantial Completion inspection, indicating those deficiencies that are completely addressed and providing a proposed schedule and list of activities necessary to complete the RA. The ED will notify the Site Coordinator in writing of his approval or disapproval of the revised punch list.

If the ED disapproves the revised punch list, the ED will provide written comments to the Site Coordinator. Within ten (10) Days after the ED provides written comments to the Site Coordinator on the revised punch list, Respondents shall submit a final punch list, in both clean and redline, strikeout format, with a summary note that clearly and explicitly indicates how each of the ED's comments on the revised punch list has been satisfactorily addressed. The ED will notify the Site Coordinator of his approval or disapproval of the final punch list with comments. If disapproved by the ED, within fifteen (15) Days after the ED provides written comments, Respondents shall resubmit the final punch list. The ED will notify the Site Coordinator of his approval or disapproval of each resubmittal of the final punch list. Disapproval of the first resubmittal and each subsequent resubmittal is subject to assessment of stipulated penalties in accordance with Section XXI (Stipulated Penalties).

8. When Respondents believe that they have completed the RA, they shall submit a certification to the ED that the RA is complete. If the ED identifies

RA items to be corrected or completed, Respondents shall immediately correct or complete these items.

9. Within forty five (45) Days after Respondents certify that the RA is complete, Respondents shall submit to the ED a draft RA Report, containing the following:
  - a. A certification from a Professional Engineer licensed in the State of Texas that the RA has been completed in compliance with the Final RD and this AO and that the RA is complete;
  - b. All data collected during the RA and documentation of compliance with the terms of the RA Quality Assurance Project Plan and the RA Construction Quality Assurance Plan;
  - c. Copies of waste manifests for all Class II, Class I, and hazardous wastes and substances disposed of off-site;
  - d. As-built drawings showing:
    - i. Areas and depths of excavation, with verification sample results by grid area;
    - ii. Final site plan with topographic contours;
  - e. Progress photographs;
  - f. Proposed areas for soil and groundwater that will require land use restrictions and/or other deed notices, certifications, or restrictions; and,
  - g. Proposed language for any institutional controls in accordance with and as required by this AO and TCEQ rules.
10. The ED will notify the Site Coordinator of his approval or disapproval of the draft RA Report. If the ED disapproves the draft RA Report, the ED will provide written comments to the Site Coordinator.
11. Within fifteen (15) Days after the ED provides written comments to the Site Coordinator on the draft RA Report, Respondents shall submit a final RA Report, in both clean and redline, strikeout format, with a summary note which clearly and explicitly indicates how each of the ED's comments on the draft RA Report has been satisfactorily addressed and which also discusses all other revisions or changes from the draft RA Report.

12. The ED will notify the Site Coordinator of his approval or disapproval of the final RA Report with comments.
13. If disapproved by the ED, within fifteen (15) Days after the ED provides written comments, Respondents shall resubmit the RA Report as specified in Paragraph 11 above. Each resubmittal will also be submitted in accordance with Paragraph 11 above.
14. The ED will notify the Site Coordinator of his approval or disapproval of each resubmittal of the final RA Report including written comments. Disapproval of the first resubmittal and each subsequent resubmittal is subject to assessment of stipulated penalties in accordance with Section XXI (Stipulated Penalties).
15. Within thirty (30) Days after approval of the final RA Report and after obtaining the required written landowner consent in accordance with Paragraph B2 of this Section Respondents shall:
  - a. record a copy or copies of any required institutional controls in compliance with the requirements found in 30 TEX. ADMIN. CODE Chapter 350.111 in the appropriate local or county office where land ownership and transfer records are filed or recorded;
  - b. ensure that the recording of these documents is properly indexed and recorded to each and every property at the Site in the appropriate office where land ownership and transfer records are filed so as to provide notice to third parties concerning those properties; and
  - c. send evidence of such recording, landowner consent, and indexing to the ED.
16. After he approves the final RA Report, receives evidence of the filing of any institutional control from each property owner or other person as required by Section V (Order) Paragraph G, and determines that the financial assurance requirements of Paragraph E below have been satisfied, the ED will issue an Approval of RA Completion to the Agreeing Respondents, or if there are no Agreeing Respondents to this AO, any Performing Parties.

D. Post Construction Activity

1. Concurrent with the submittal of the preliminary punch list for the Substantial Completion inspection, the Site Coordinator shall 1) submit a list of the name, title, qualifications, relevant licenses and permits of the Remedial Activities Contractors proposed to be used in carrying out any or all of the PCA and 2) submit to the ED a Revised PCA Plan.

2. The ED will notify the Site Coordinator of his approval or disapproval of the Revised PCA Plan including written comments to the Site Coordinator.
3. Within fifteen (15) Days after the ED provides written comments to the Site Coordinator, Respondents shall submit the Final PCA Plan, in both clean and redline, strikeout format, with a summary note which clearly and explicitly indicates how each of the ED's comments on the Revised PCA Plan has been satisfactorily addressed and which will also discuss all other revisions or changes from the Revised PCA Plan.
4. The ED will notify the Site Coordinator of his approval or disapproval of the submittal and each resubmittal of the Final PCA Plan. Each resubmittal will be submitted as specified in Paragraph 3 above. Disapproval of the first resubmittal and each subsequent resubmittal is subject to assessment of stipulated penalties in accordance with Section XXI (Stipulated Penalties).
5. Upon the ED's approval of the final PCA Plan, Respondents shall begin the PCA in accordance with the schedule included in the PCA Plan.

E. Post Construction Financial Assurance

1. Respondents shall provide financial assurance in the minimum amount of the final Post Construction Cost Estimate and shall maintain such financial assurance for the full duration of the PCA. Within ten (10) Days of the ED's approval of the PCA Plan, Respondents shall submit a written proposal for providing financial assurance to the ED for approval.
2. Subject to the ED's approval, financial assurance may be demonstrated by one or a combination of the following mechanisms: letter of credit, surety bond guaranteeing payment, surety bond guaranteeing performance, fully funded trust, insurance, escrow account or other approved mechanism. Each financial assurance document will be issued by an institution with the authority to issue the document whose operations are regulated and examined by a federal or state agency.
3. Within fifteen (15) Days after the ED provides written approval of Respondents proposed financial assurance mechanism to the Site Coordinator, Respondents shall submit the necessary financial assurance documents to the ED. The ED will notify the Site Coordinator of his approval or disapproval of the financial assurance documents with comments. If disapproved by the ED, within fifteen (15) Days after the ED provides written comments to the Site Coordinator, Respondents shall resubmit the financial assurance documents, in both clean and redline, strikeout format, with a summary note which clearly and explicitly indicates how each of the

ED's comments on the previous draft of the financial assurance documents has been satisfactorily addressed and which will also discuss all other revisions or changes from the previous draft of the financial assurance documents.

4. The ED will notify the Site Coordinator of his approval or disapproval, with comments, of each resubmittal of the financial assurance documents. Each resubmittal will be submitted in accordance with Paragraph 3 above. Disapproval of the first resubmittal and each subsequent resubmittal is subject to assessment of stipulated penalties in accordance with Section XXI (Stipulated Penalties).

VII. Failure to Attain Remediation Goals or Findings of Significant Difference

- A. If at any point in the Remedial Activities the Performing Parties conclude that the Remedial Activities as implemented in accordance with this AO will not attain the Remediation Goals, or if the Performing Parties find that conditions at the Site differ from those that form the basis of the RSD and significantly change the scope, performance or costs of the Remedial Activities, then the Performing Parties shall take the actions specified in this Section.
- B. Within ten (10) Days after the Performing Parties initially determine that a failure to attain Remediation Goals or that a significant difference in the scope, performance or cost of the Remedial Activities as described in this Section exists, Performing Parties shall notify the ED of that determination with a description of its basis.
- C. Not later than sixty (60) Days after the initial assertion of a failure to attain Remediation Goals or of a significant difference in the scope, performance or cost of the Remedial Activities, the Performing Parties shall submit a Failure Evaluation Report to the ED for his approval.
- D. The Performing Parties shall submit a Failure Evaluation Report that meets the requirements of this Section. The Failure Evaluation Report will include a discussion of the following: the data related to the failure to attain Remediation Goals or to the assertion of a significant difference, conclusions concerning all such data, and any known cause of the failure to attain Remediation Goals or of the significant difference, and a recommendation for any necessary additional studies. Data presented in the Failure Evaluation Report will comply with the DQOs.
- E. The ED will not consider the failure of a design element or remedial action that is not required by this AO to be the basis for a failure to attain the Remediation Goals.
- F. The ED will consider differences in the quantity or extent of contaminants as the basis for a determination of a significant difference only when such differences are so significant as to cause the Remedy not to be the lowest cost alternative that is

technologically feasible and reliable and that effectively mitigates and minimizes damage to and provides adequate protection of the public health and safety or the environment.

- G. After receipt of the Failure Evaluation Report, the ED will notify the Site Coordinator of his approval or disapproval of the report with comments. If the ED determines that the basis of the Performing Parties' assertion of a failure to attain Remediation Goals or of a significant difference is valid, no applicable stipulated penalties will be imposed for missed deadlines subsequent to the Performing Parties' notification made in accordance with Paragraph B above, except for failure to submit documents pursuant to this Section. If the ED determines that the basis of a failure to attain Remediation Goals or of an assertion of a significant difference is not valid, the ED will direct that Remedial Activities continue and that the Performing Parties pay any applicable stipulated penalties for any missed deadlines.
- H. Unless the ED approves the Failure Evaluation Report and/or directs continuation of Remedial Activities, within thirty (30) Days after the ED provides written comments to the Site Coordinator, the Performing Parties shall resubmit the Failure Evaluation Report, in both clean and redline, strikeout format, with a summary note which clearly and explicitly indicates how each of the ED's comment on the previous draft of the Failure Evaluation Report has been satisfactorily addressed and which will also identify all other revisions or changes from the previous version of the Failure Evaluation Report.
- I. The ED will notify the Site Coordinator of his approval or disapproval, with comments, of each resubmittal of the Failure Evaluation Report. Each resubmittal will be submitted in accordance with Paragraph H above. Disapproval of the first resubmittal and each subsequent resubmittal is subject to assessment of stipulated penalties in accordance with Section XXI (Stipulated Penalties).
- J. Not later than ninety (90) Days after a determination by the ED that the Remedy will not attain the Remediation Goals or a significant difference exists, the Respondents shall submit to the ED for approval a written report evaluating alternatives to the Remedial Activities and may submit a proposal for such alternative Remedial Activities as may be necessary to achieve the Remediation Goals. Any proposed alternatives must comply with the remedy selection criteria contained in 30 TEX. ADMIN. CODE Chapter 335, Subchapter K and 30 TEX. ADMIN. CODE Chapter 350. The Remedy may be modified, as stated in Section V (Order) Paragraph J, only as specified in 30 TEX. ADMIN. CODE Section 335.349.
- K. In the event TCEQ determines that alternate or additional remedial actions are necessary because of the Remedy's failure, TCEQ may terminate this AO.

VIII. Project Manager/Site Coordinator

- A. Not later than the Effective Date, the ED will designate a Project Manager to oversee implementation of the Work and to coordinate communication between the ED and the Agreeing Respondents or, if there are no Agreeing Respondents to this AO, the Performing Parties.
- B. Respondents shall direct all communications regarding the Remedial Activities, whether written or oral, at a minimum, to the Project Manager or, if not available, the alternate Project Manager.
- C. In addition to fulfilling the requirements of Section V (Order) Paragraph I, within ten (10) Days after the Effective Date, the Agreeing Respondents or, if there are no Agreeing Respondents to this AO, the Performing Parties shall submit a written notice to the Project Manager containing the Site Coordinator's address, phone number and/or pager number at which he/she may be contacted at any time in case of emergency. The Site Coordinator shall notify the ED in writing at least seven (7) Days prior to the start date of any field activities associated with the Remedial Activities. All Performing Parties must coordinate with and cooperate with any Agreeing Respondents in the performance of any and all of the Work.
- D. The Project Manager has the authority to require that the Remedial Activities are performed in accordance with all applicable statutes and regulations and with this AO and to require a cessation of the performance of any part or all of the Remedial Activities that:
  - 1. In the Project Manager's opinion, may present or contribute to an imminent and substantial endangerment to public health, welfare, or the environment because of an actual or threatened release of solid wastes or hazardous substances from the Site; or
  - 2. In the Project Manager's opinion, is not in conformance with any work plan developed in accordance with this AO; or
  - 3. In the Project Manager's opinion, is a violation of any work plan developed in accordance with this AO, HASP, or RA Quality Assurance Project Plan.
- E. Within 24 hours after the Project Manager issues an oral order to halt any or all of the Remedial Activities, if time permits, the Project Manager will provide a brief explanation of the basis for the order. As soon as possible, but in no event more than fourteen (14) Days after the initial order to halt any or all of the Remedial Activities, the Project Manager will provide a written explanation of the basis for the order to halt any or all of the Remedial Activities to the Site Coordinator. The Remedial Activities may be resumed only after the basis for the order to halt any or all of the

Remedial Activities has been corrected and instructions to proceed have been provided to the Agreeing Respondents or, if there are no Agreeing Respondents to this AO, the Performing Parties by the Project Manager. All additional costs associated with the cessation of any or all of the Remedial Activities will be borne by Respondents.

- F. During the RD and RA, the Project Manager and Site Coordinator shall hold meetings at least once per month to review the progress and details of the Remedial Activities and to review and resolve any discrepancies in data. At the ED's discretion, these meetings may be held by telephone. At least seven (7) Days prior to each meeting, the Performing Parties shall deliver an agenda for the meeting and any documents to be discussed to the Project Manager.
- G. The ED and the Agreeing Respondents or, if there are no Agreeing Respondents to this AO, the Performing Parties may change their respective Project Manager, Alternate Project Manager, or Site Coordinator by written notice to each other of the name, address, and telephone number of the new Project Manager, Alternate Project Manager, or Site Coordinator seven (7) Days prior to the change, or if seven (7) Days notice is not feasible, as soon as possible.
- H. The Project Manager may assign other persons, including other TCEQ employees or contractors, to serve as a Site Representative and may temporarily delegate her or his responsibilities to such Site Representative. The Project Manager will notify the Site Coordinator orally or in writing of such delegation.

IX. Endangerment and Immediate Threat

- A. In the event of any action or occurrence during the performance of the Remedial Activities which causes or threatens a release of a solid waste or hazardous substance or which may present an immediate threat to public health or welfare or the environment, Respondents shall immediately take all appropriate action to prevent, abate, or minimize such release or threat and shall immediately notify the Project Manager and Site Representative or, if the Project Manager cannot be contacted, the alternate Project Manager and Site Representative. Respondents shall also notify the TCEQ Emergency Response Unit, 1-800-832-8224, Region 12. Respondents shall take such action in accordance with all applicable provisions of the HASP. If Respondents fail to take appropriate response action as required by this Section and the ED takes such action instead, Respondents shall reimburse the ED all costs of the response action. Respondents shall make payments of such costs as specified in Section V (Order) Paragraph B and not later than forty-five (45) Days after the ED transmits a Demand Letter stating the amount owed.
- B. Nothing in the preceding paragraph will be deemed to limit any authority of the State of Texas to take, direct, or order all appropriate action to protect human health and

the environment or to prevent, abate, or minimize an actual or threatened release of solid wastes or hazardous substances to the environment on, at, or from the Site.

X. Submittals Requiring the ED's Approval

- A. Upon the ED's approval of a submittal, Respondents shall proceed to implement all actions required by the submittal according to the schedule approved by the ED.
- B. Approved submittals may be modified upon agreement by the ED and the Performing Parties. The Performing Parties shall submit proposed modifications and obtain approval in accordance with the process for submittals specified in this AO generally. Upon approval of any modification, the modification is incorporated into the original submittal for all purposes.
- C. The ED's approval of submittals or modifications is administrative in nature and allows the Agreeing Respondents or, if there are no Agreeing Respondents to this AO, the Performing Parties to proceed to the next steps in the Remedial Activities. The ED's approval does not imply any warranty of performance, does not imply that the Remedy, when constructed, will meet the Remediation Goals, nor does it imply that the Remedy will function properly and ultimately be accepted by the ED.

XI. Submittal of Documents, Sampling, and Analyses

- A. Respondents shall provide to the ED all data, information, documents, or records related to the Site which are generated or obtained by any Respondent within twenty (20) Days of any written request from the ED for such data, information, document, or record. Respondents shall provide written notice to the ED immediately upon generating or obtaining any such data, information, document or record.
- B. Subject to the confidentiality provisions set forth in Paragraph C below, all data, information, documents, and records developed pursuant to this AO or submitted by Respondents to the ED pursuant to this AO will be available to the public.
- C. Respondents may assert a claim of business confidentiality pursuant to the Texas Public Information Act as to any process, method, technique, or any description thereof that the Respondents claim constitutes proprietary or trade secret information developed by Respondents or developed by their contractors or subcontractors. If no confidentiality claim accompanies the process, method, technique, or description thereof when submitted to the ED, any such process, method, technique, or description thereof may be made available to the public by the ED or the State of Texas without further notice to Respondents. Respondents shall make business confidentiality determinations in good faith.
- D. The ED or his Site Representatives may take splits or duplicates of any samples obtained by any Respondent at the Site at any time including during the

implementation of the Remedial Activities. The Respondents shall provide assistance necessary for the ED to take split or duplicate samples.

- E. Respondents shall provide the ED with a schedule of routine sampling and notify the ED at least seven (7) Days before any non-routine sampling is conducted at the Site, except in the event of situations provided for by Section IX (Endangerment and Immediate Threat). Respondents shall collect and analyze all Samples in accordance with approved work plans developed pursuant to this AO and shall handle all Samples in accordance with the approved RA Quality Assurance Project Plan.
- F. Respondents shall submit all data, information, reports, schedules, and other documents required by this AO in hard copy format (two hard copies of draft submittals and three of final submittals) and in specific computer software format (one electronic copy of each draft and final submittal) as determined by the Project Manager.

## XII. Notices and Submittals

Respondents shall make all notices and submittals required by this AO in writing and in accordance with the contact information contained in this Section unless otherwise expressly authorized. Receipt by the Site Coordinator of any notice or communication from the ED relating to this AO will be deemed by the ED to be receipt by all Respondents. All information required to be submitted pursuant to this AO, including data, documents, records, reports, approvals, and other correspondence, will be submitted to the following Parties at the addressees listed below or to such other addressees as such Party hereafter may designate in a written communication to all other Parties:

*As to the Texas Commission on Environmental Quality:*

*For mail:*

Texas Commission on Environmental Quality  
Remediation Division  
Mail Code MC-136  
P.O. Box 13087  
Austin, TX 78711-3087  
Attention: Project Manager/ Archem/Thames Chelsea  
State Superfund Site

*For overnight express mail or delivery service:*

Project Manager  
Mail Code MC-136  
Archem/Thames Chelsea State Superfund Site  
TCEQ, Remediation Division  
Building D, Floor 1, Room 184  
12100 Park 35 Circle  
Austin, TX 78753

*By facsimile:*

Project Manager  
Archem/Thames Chelsea State Superfund Site  
Superfund Cleanup Section  
(512) 239-2450

### XIII. Periodic Review

- A. Respondents shall provide written progress reports on the Remedial Activities to the ED, as specified below in Paragraphs B and C.
- B. RD/RA Progress Reports
  1. Respondents shall submit written monthly progress reports to the ED beginning on the tenth Day of the month following the Effective Date. These progress reports will describe the actions taken pursuant to this AO during the previous month, including a general description of activities and progress during the reporting period, activities projected to be commenced or completed during the next reporting period, and any problems encountered or anticipated by Performing Parties in commencing or completing the Remedial Activities. Progress reports will include all data received during the reporting period and an up-to-date progress schedule. Progress reports will identify any violations of this AO and calculate any applicable stipulated penalty required under Section XXI (Stipulated Penalties). The requirement to submit these monthly progress reports will be terminated at the earlier of: 1) if no PCA Plan is required, when the AO is terminated in accordance with Section XXXIII (Termination of the Administrative Order) or 2) if a PCA Plan is required, upon the ED's approval of a Final PCA Plan in accordance with Section VI (Remedial Activities) Paragraph C.
  2. If an RD/RA progress report submitted by Performing Parties is deficient, the ED will provide written notice to the Site Coordinator. The notice will include comments and a description of the deficiencies.
  3. Within ten (10) Days of the ED providing the Site Coordinator with a notice of deficiency of an RD/RA progress report, Performing Parties shall make

such changes as the ED deems necessary and resubmit the progress report to the ED.

C. Post Construction Progress Reports

1. Performing Parties shall submit written monthly post construction progress reports to the ED beginning on the tenth Day of the month following the initiation of the PCA as described in Section VI (Remedial Activities) Paragraph D.1. These progress reports will describe the actions taken pursuant to this AO, including a general description of activities and progress during the reporting period, activities projected to be commenced or completed during the next reporting period, and any problems encountered or anticipated by Performing Parties in commencing or completing the Remedial Activities. Post construction progress reports will include all data received during the reporting period and an up-to-date progress schedule. Post construction progress reports will identify any violations of this AO and calculate any applicable stipulated penalty required under Section XXI (Stipulated Penalties). The requirement to submit monthly post construction progress reports will be terminated when the conditions specified in Section XIV (Termination of Post Construction Activities) have been met as determined by the ED in his sole discretion.
2. If a monthly post construction progress report submitted by Performing Parties is deficient, the ED will provide written notice to the Site Coordinator. This notice will include comments and a description of the deficiencies.
3. Not later than ten (10) Days after the ED provides the Site Coordinator with a notice of deficiency of a post construction progress report, Performing Parties shall make such changes as the ED deems necessary and resubmit the post construction progress report to the ED.

XIV. Termination of Post Construction Activities

The ED will terminate the requirement to perform PCA if Respondents demonstrate that all Remediation Goals have been met. The Respondents shall satisfactorily perform PCA for the duration of time specified in the RSD, and the Remediation Goals will not be deemed achieved before the time specified in the RSD.

XV. Records

- A. Each Respondent shall preserve and retain, and shall instruct its accountants, attorneys, employees, agents, contractors, and subcontractors and anyone else acting on its behalf at the Site to preserve and retain, in the form of originals or copies, all data, records, documents, and information of whatever kind, nature, or description

that relate in any way to the Site that are now or that come to be in its possession or control. The previous sentence is meant to include data, records, documents, or information relating to each Respondent's potential liability or to any other person's potential liability for the Site under Section 361.271 of the Act.

- B. All data, records, documents, and information required to be preserved and retained in accordance with Paragraph A will be preserved and retained for a minimum of ten (10) years after the ED's issuance of the Approval of RA Completion. At the end of this ten (10) years, each Respondent shall notify the ED at least ninety (90) Days before any such data, records, documents, or information is destroyed. If the ED requests, Respondents shall, at no cost to TCEQ, provide the ED originals or copies of such data, records, documents, or information which are not protected by a privilege as per Paragraph C below.

Until this AO is terminated in accordance with Section XXXIII (Termination of the Administrative Order), Respondents shall maintain an index of documents that Respondents claim contain privileged information. The index will contain, for each document, the date, author, addressee, and subject of the document. Respondents shall submit a copy of the index to the ED within ten (10) Days after the ED submits a written request.

- C. Any Respondent refusing to provide copies of any data, information, records, or documents based upon a claim of privilege shall identify the data, information, record, or document and explain the basis for the claim. Notwithstanding the immediately preceding sentence, any data, record, information, or document required to be developed or submitted pursuant to this AO will be available to the public.
- D. At any time prior to the completion of the Work, the ED may contact the Site Coordinator to determine the location and/or to obtain copies of any or all of the data, records, documents, or information developed in accordance with this AO. The Respondents shall provide copies of any such data, records, documents, and information to the ED at no cost to TCEQ.
- E. Upon request by the ED, Respondents shall submit to the ED all data, information, records, and documents requested, including those relevant to the items specified in Section 361.182(b) of the Act for possible inclusion in the administrative record in accordance with 30 TEX. ADMIN. CODE Section 335.345.

## XVI. Access

- A. As of the Effective Date, any Respondent that owns, in whole or in part, the Site, an off-site area that is to be used for access to the Site, property subject to or affected by the Remedial Activities, or other property where documents generated in accordance with this AO are or come to be located shall provide access to such property to the ED; any federal, state or local authorities and their contractors approved by the ED;

and the Performing Parties and their authorized representatives and contractors. Failure to provide such access may result in the imposition of statutory and/or stipulated penalties. Respondents shall indemnify TCEQ, and TCEQ will not be liable, for any loss or claim arising out of Respondents' activities at the Site, on off-site areas to be used for access to the Site, on property subject to or affected by the Remedial Activities, and on other property where documents generated in accordance with this AO are or come to be located.

- B. If a person other than a Respondent owns, in whole or in part, the Site, an off-site area that is to be used for access to the Site, property subject to or affected by the Remedial Activities, or other property where documents generated in accordance with this AO are or come to be located, Respondents shall obtain, or use their best efforts to obtain, Site access agreements from the then current owner(s) within ninety (90) Days of the Effective Date. Respondents shall secure agreements to provide access for the ED, federal, state or local authorities and their contractors as approved by the ED, and the Performing Parties and their authorized representatives and contractors. Respondents shall insure that such agreements specify that TCEQ is not liable for any loss or claim arising out of any activities at the Site, on off-site areas to be used for access to the Site, on property subject to or affected by the Remedial Activities, or on other property where documents generated in accordance with this AO are or come to be located. Respondents shall provide copies of such agreements to the ED before the Performing Parties initiate field activities. Respondents' best efforts shall include, if necessary, providing reasonable compensation to any property owner not a Party. If access agreements are not obtained within the ninety (90) Days, Respondents shall immediately notify the ED of their failure to obtain access. If the ED determines, in his sole discretion, that the Performing Parties have used best efforts to obtain such access, the ED will, pursuant to statutory authority, make appropriate efforts to obtain such access upon reasonable terms to the Agreeing Respondents or, if there are no Agreeing Respondents to this AO, to the Performing Parties. Any revision to the deadlines specified in this AO necessitated by Respondents' inability to obtain such access may be considered a reasonable ground for extending any affected deadline pursuant to Section XVIII (Extension of Deadlines).
- C. Subject to the Agreeing Respondents' reasonable safety and internal security requirements, the ED will have the authority to enter, freely move about, and exit the Site, any off-site area that is to be used for access to the Site, property subject to or affected by the Remedial Activities, or other property where documents generated in accordance with this AO are located or come to be located, for the purposes of: inspecting conditions at the Site, the Remedial Activities and all information, documents, data, records, operating logs, and contracts related to the Site; reviewing the Performing Parties' progress in performing the Remedial Activities; conducting such tests as the ED deems necessary; using a camera, sound recording device, or other documentary type equipment; verifying the data submitted to the ED by the Performing Parties; and performing any Remedial Activities not being performed or

not being satisfactorily performed by the Performing Parties. Nothing herein will be interpreted as limiting or affecting the ED's right of entry or inspection authority under state or federal law. All persons with access to the Site shall comply with the HASP.

#### XVII. Delay in Performance

Respondents shall notify the ED of any delay or anticipated delay in achieving compliance with any requirement of this AO. Such notification will be made by telephone to the Project Manager or, if not available, the alternate Project Manager, within forty-eight (48) hours after Respondents first knew or should have known that an event might cause a delay. Within seven (7) Days after notifying the ED by telephone, Respondents shall provide written notification fully describing the cause of the delay, the anticipated duration of the delay, the measures taken and to be taken by Respondents, their contractors, or consultants, to prevent or minimize the delay, and the timetable by which these measures have been, are being, and will be implemented. A revised timetable will be implemented upon its approval by the ED.

#### XVIII. Extension of Deadlines

Upon failure to comply with the terms and conditions of this AO, any Defaulting Performing Parties shall cease to be Performing Parties and all such rights and privileges as accrue to the Performing Parties pursuant to this AO will immediately terminate as to such Defaulting Performing Parties. At that time all responsibilities and obligations that attach to RPs in addition to those that attach to Performing Parties will attach to Defaulting Performing Parties that are RPs, including the requirement to pay TCEQ costs in accordance with Section V (Order) Paragraph C.

Notwithstanding anything to the contrary in this AO, the Agreeing Respondents or, if there are no Agreeing Respondents to this AO, the Performing Parties shall bear no costs for any fines, penalties, or increases in the ED's oversight of the Remedial Activities resulting from Defaulting Performing Parties actions or inactions. Defaulting Performing Parties and the RPs may be assessed the ED's full costs for oversight of the Work. If actions required by this AO are delayed or are not timely completed because of acts or omissions of one or more Defaulting Performing Parties, the Agreeing Respondents, or if there are no Agreeing Respondents to this AO, the Performing Parties may request a time extension. Upon such request, the ED will approve the time extension, disapprove it, or approve such alternative time extension as the ED in his sole discretion deems appropriate. Thereafter, Respondents shall adhere to all remaining deadlines in this AO and in any documents developed in accordance with this AO and approved by the ED.

The Agreeing Respondents may seek and the ED may grant an extension of any deadline contained in this AO or in any document submitted pursuant to this AO. Agreeing Respondents shall submit the request for a deadline extension no later than seven (7) Days prior to the deadline date and shall substantiate good cause for extension of the deadline.

The determination of what constitutes good cause and the length of any deadline extension will be at the ED's sole discretion.

XIX. Reserved

XX. Compliance with Applicable Laws

- A. Respondents shall perform all actions pursuant to this AO in accordance with the requirements of all applicable or relevant and appropriate federal, state, and local laws, including the Texas Solid Waste Disposal Act as codified in the Texas Health and Safety Code and the Texas Oil and Hazardous Substance Spill Prevention and Control Act as codified in the Texas Water Code. This AO is not, and shall not be construed to be, a permit issued pursuant to any federal or state statute or regulation.
- B. All materials removed from the Site shall be disposed of or treated at a facility which is in compliance with all applicable or relevant and appropriate Federal, State, and local laws and shall be disposed of or treated in accordance with all such requirements.

XXI. Stipulated Penalties

- A. Subject to the provisions of Sections XXII (Force Majeure) and XXIII (Resolution of Disagreements), noncompliance with this AO shall result in the imposition of stipulated penalties as set forth below.
- B. Penalties Related to Timeliness of Submittals Required by this AO  
For failure to:
  - 1. meet the deadlines set forth in Sections V (Order) and VI (Remedial Activities);
  - 2. submit timely reports as set forth herein;
  - 3. submit data in a timely fashion or provide timely notice of sampling as required by Section XI (Submittal of Documents, Sampling, and Analyses);  
or
  - 4. resubmit a document within the timeframes specified herein;

Agreeing Respondents shall pay stipulated penalties in the following amounts for each Day and part thereof during which any delay listed in Subparagraphs B.1 through B.4 above continues:

<i>Period of Delay</i>	<i>Amount/Day</i>
1st through 14th Day	\$ 500.00
15th through 45th Day	\$2,000.00
46th Day and beyond	\$3,000.00

C. Penalties Related to Competency of Submittals

This Paragraph applies to submittals of any document required by Sections VI (Remedial Activities), VII (Failure to Attain Remediation Goals or Findings of Significant Difference), and XIII (Periodic Review) which fail to be responsive and acceptable. Agreeing Respondents shall pay a stipulated penalty of \$5,000 for each week and part thereof that an acceptable and responsive document is not submitted. This penalty may be assessed in addition to any penalties assessed under Paragraph B of this Section.

D. Penalties Related to Project Milestones

For failure to:

1. achieve any RA Project Milestones in accordance with the schedule approved under Section VI (Remedial Activities) Paragraph B; or
2. achieve any PCA Project Milestones in accordance with the schedule approved under Section VI (Remedial Activities) Paragraph B.

Agreeing Respondents shall pay stipulated penalties in the following amounts for each Day and part thereof during which any delay listed in Subparagraphs D.1 through D.2 above continues:

<i>Period of Delay</i>	<i>Amount/Day</i>
1st through 14th Day	\$ 1,000.00
15th through 45th Day	\$ 3,000.00
46th Day and beyond	\$10,000.00

E. For disobeying an order to halt any or all of the Remedial Activities under Section VIII (Project Manager/Site Coordinator), Agreeing Respondents shall pay stipulated penalties of \$10,000 per Day.

F. For failure to use best efforts to obtain Site access in accordance with Section XVI (Access), Agreeing Respondents shall pay a stipulated penalty of \$1,000 per Day.

G. For denying access provided for in Section XVI (Access) Agreeing Respondents shall pay stipulated penalties of \$10,000 per Day.

H. Any Agreeing Respondent who fails to provide records within ten (10) Days after receipt of a written request from the ED or within such other period as specified herein shall pay a stipulated penalty of \$10,000 per Day.

- I. With the exception of the stipulated penalties referenced in Paragraphs E, G and H above which attach to individual Agreeing Respondents, all stipulated penalties assessed in accordance with this Section are joint and several, not individual, obligations.
- J. Agreeing Respondents shall pay stipulated penalties assessed under this Section as specified in Paragraph K below within sixty (60) Days after ED transmits a demand letter stating that stipulated penalties have accrued or after resolution of a disagreement as specified in Section XXIII (Resolution of Disagreements), whichever comes later. Stipulated penalties will accrue from the date of noncompliance until the noncompliance is corrected, provided however, that if any Agreeing Respondent prevails in resolution of disagreements as specified in Section XXIII (Resolution of Disagreements), it shall have no liability to pay stipulated penalties with regard to those matters submitted for resolution of disagreements in accordance with Section XXIII (Resolution of Disagreements) in which it prevails.
- K. Agreeing Respondents shall pay stipulated penalties to "General Revenue Fund of the State of Texas" and shall mail payments to:
- Chief Fiscal Officer (MC 180)  
Texas Commission on Environmental Quality  
"Re: Archem/Thames Chelsea State Superfund Site Administrative Order"  
Docket Number: 2008-1229-SPF  
P.O. Box 13088  
Austin, Texas 78711-3088
- L. The requirement to pay stipulated penalties that have been incurred prior to the termination of this AO in accordance with Section XXXIII (Termination of the Administrative Order) will survive termination of this AO.
- M. A single act or omission may be the basis for more than one type of stipulated penalty. A single act or omission may also be subject to more than one (1) Day of stipulated penalties. In cases where more than one stipulated penalty applies to a single act or omission, the ED may choose which stipulated penalties to assess.
- N. The ED has the sole discretion to reduce or waive stipulated penalties and to do so as to specific Agreeing Respondents or groups of Agreeing Respondents.
- O. Stipulated penalties against Agreeing Respondents will be in lieu of administrative and civil penalties for the same violation but will not prevent TCEQ from seeking enforcement of the ordering provisions by injunctive relief. Respondents that are not Agreeing Respondents are subject to administrative and civil penalties.

## XXII. Force Majeure

- A. If a delay in performance is caused (in whole or in part) by events beyond the reasonable control of the Agreeing Respondents, that failure will not be construed as a violation of this AO. The burden of establishing that an event is beyond their reasonable control lies with the Agreeing Respondents. The Agreeing Respondents shall notify the ED in writing within seven (7) Days of the start of the Force Majeure event and within seven (7) Days of the end of the Force Majeure event. Agreeing Respondents shall submit the notification as specified in this Section. Failure to so notify the ED will constitute a waiver of the claim of Force Majeure.

Such notice will describe in detail the cause of the delay, the anticipated duration of the delay, the measures taken and to be taken by the Agreeing Respondents their contractors, or consultants, to prevent or minimize the delay, the timetable by which these measures have been, are being, and will be implemented. Measures to prevent or minimize the delay will be implemented upon the ED's written approval of the timetable. The Agreeing Respondents shall also submit, for the ED's approval, a proposed schedule for subsequent Remedial Activities whose deadlines have been affected by the Force Majeure event. Neither the ED's approval of the timetable of measures to be taken to prevent or minimize delays or of the revised schedule of Remedial Activities will be construed as excusing the delay or as a waiver of TCEQ's rights to enforce this AO.

- B. Force Majeure events will not include increased costs or expenses of any part or all of the Work, nor the financial inability of any Agreeing Respondent to perform any part or all of the Work.
- C. If the ED and the Agreeing Respondents cannot agree that the cause for the delay was a Force Majeure event or cannot agree upon the schedule for subsequent Remedial Activities, then the disagreement will be resolved according to Section XXIII (Resolution of Disagreements). The Agreeing Respondents shall have the burden of demonstrating that Force Majeure is warranted.

## XXIII. Resolution of Disagreements

- A. The Agreeing Respondents and the ED shall attempt to resolve on an informal basis any issues arising under Sections V (Order) through XXXIII (Termination of the Administrative Order) on which there is disagreement. The Agreeing Respondents shall commence informal negotiations by notifying the Project Manager in writing that there is a disagreement and that this Section is being invoked. Except as provided below in Paragraph D, informal negotiations will not extend beyond thirty (30) Days from the date the Project Manager receives such notification, unless the Agreeing Respondents and the ED agree otherwise in writing.

- B. The Agreeing Respondents shall notify the Project Manager within thirty (30) Days after the Day the Agreeing Respondents knew or should have known of the events giving rise to the disagreement. Should the Agreeing Respondents fail to give such notice, the ED's decision on any disagreement will be binding.
- C. Notification of the Project Manager in accordance with Paragraph A above will not by itself postpone the deadlines established in accordance with this AO or stay the accrual of any applicable stipulated penalties for the matter at issue. However, the obligation to pay any applicable stipulated penalties to the TCEQ will be stayed pending resolution of the disagreement in accordance with this Section.
- D. If the ED makes a determination to perform a portion or all of the Remedial Activities, the Agreeing Respondents shall have five (5) Days after notification to the Site Coordinator to commence informal negotiations by notifying the Project Manager in accordance with Paragraph A above. Informal negotiations will not extend beyond fifteen (15) Days from the date the ED receives notification, unless the Agreeing Respondents and the ED agree otherwise in writing.
- E. The procedure for any resolution of disagreements subsequent to informal negotiations will be found in Sections 361.321 and/or 361.322 of the Act.
- F. Unless otherwise specifically set forth herein, the fact that resolution of disagreements is not specifically set forth in individual Sections is not intended to and will not bar the Agreeing Respondents from invoking this Section as to any disagreement arising under Sections V (Order) through XXXIII (Termination of the Administrative Order), including any disagreement concerning the ED's exercise of discretion under the terms of this AO.

#### XXIV. Indemnification

Respondents agree to indemnify and hold harmless TCEQ and its officers, employees, agents, principals and assigns from and against all fines, penalties, claims, damages, losses, demands, judgments, settlements, costs of suit, and attorney fees that arise out of or result from:

- A. Respondents' performance of an inherently dangerous activity or handling of a solid waste or hazardous substance at or from the Site;
- B. Respondents' negligent, reckless, or intentional acts or omissions or such acts or omissions of any of its agents or employees; and
- C. the negligent, reckless, or intentional acts or omissions of any of Respondents' contractors or suppliers or their agents or employees.

## XXV. Liability

The State of Texas, by issuing this AO, assumes no liability for any injuries or damages to persons or property resulting from acts or omissions of Respondents, or their directors, officers, employees, agents, representatives, successors, assigns, contractors, or consultants in carrying out any of the Work. Neither TCEQ nor the State of Texas will be deemed a party to any contract entered into by any Respondent or its directors, officers, employees, agents, successors, assigns, contractors, or consultants to perform any or all of the Work or any other activity at the Site.

## XXVI. Severability

The provisions of this AO are intended to be severable and are deemed severable. Should any provision of this AO be rendered unenforceable by a court of competent jurisdiction or other appropriate authority the remaining provisions will remain valid and enforceable.

## XXVII. TCEQ's General Reservation of Rights and Retention of Claims

Except as specified herein, nothing in this AO will constitute or be construed as a covenant not to sue by TCEQ or the State of Texas or a release from any claim, cause of action, or demand in law or equity against any person, firm, partnership, or corporation. Except as specified herein, the ED reserves and this AO is without prejudice to all rights against Respondents and RARPs with respect to all matters including:

- A. Claims based on Respondents' or RARPs' failure to fulfill the applicable requirements of this AO;
- B. Liability arising from the past, present, or future disposal, release, or threat of release of solid wastes or hazardous substances outside of or not related to the Site;
- C. Respondents' liability for future disposal of solid wastes or hazardous substances at the Site, other than as provided in the RSD or in any work plan required to be developed in accordance with this AO;
- D. Respondents' liability for violations of federal or state law which occur during or after implementation of the Remedial Activities;
- E. Claims based on criminal liability; and
- F. Claims for natural resource damages as defined by CERCLA (42 U.S.C. Sections 9601 et seq.), the Oil Pollution Act of 1990 (33 U.S.C. Sections 2701 et seq.), the Oil Spill Prevention and Response Act (Texas Natural Resources Code Chapter 40), and the Federal Water Pollution Control Act (33 U.S.C. Sections 1251 et seq.).

## XXVIII. Section Headings

Section headings are included for convenience of reference only and will be disregarded in the construction and interpretation of any of the provisions of this AO.

## XXIX. Continuing Authority

TCEQ specifically retains authority over Respondents for the duration of this AO for the purposes of issuing such further orders or directions as may be necessary or appropriate to construe, implement, modify, enforce, terminate, or reinstate the terms of this AO or for any further relief as the interest of the State of Texas may require.

## XXX. Enforcement

Except as provided in Section XXI (Stipulated Penalties) Paragraph O, nothing herein will preclude TCEQ from taking any additional enforcement actions against Respondents at any time including issuing such additional orders as TCEQ may deem necessary or from requiring Respondents to perform additional activities in the future and to completely perform all of the Work.

This AO in no way obligates the State of Texas to assist Respondents or RARPs in defending contribution actions brought by other persons or entities.

## XXXI. Computation of Time

- A. Deadlines falling on a weekend or a State of Texas holiday will be extended until the next business day.
- B. The terms "submit" and "provide" as used herein will refer to the date on which information, data, a document, or a record is to be received by the appropriate Party. Submittals received on the deadline date will be deemed timely.

## XXXII. Opportunity to Conference

- A. The Agreeing Respondents or, if there are no Agreeing Respondents to this AO, the Performing Parties may, within twenty (20) Days after the Effective Date, request a conference with the Project Manager. The request must be submitted in writing to the Project Manager. Any such conference will occur at the TCEQ's main campus in Austin.
- B. The purpose and scope of the conference will be limited to issues involving the implementation of the Remedial Activities. The conference is not an evidentiary hearing, does not constitute a proceeding to challenge this AO, and does not give Agreeing Respondents or, if there are no Agreeing Respondents to this AO, the Performing Parties the right to seek review of this AO.

### XXXIII. Termination of the Administrative Order

- A. The ED may terminate this AO when he determines that alternative or additional work is required at the Site because the Remediation Goals will not be attained by implementation of the Remedial Activities, unless Agreeing Respondents and the ED agree on such alternative or additional work, agree to modify the Remedial Action to include such additional or alternative work in accordance with Section V (Order) Paragraph J, and agree to modify this AO in accordance with Section V (Order) Paragraph J.
- B. Except as provided in this Section, when the ED determines that the Work has been completed in accordance with this AO, the ED will provide written notice to Agreeing Respondents that Agreeing Respondents have fully satisfied the requirements of this AO. Such notice will be issued within one hundred and eighty (180) Days after the ED determines that the Work has been completed in accordance with this AO. This notice will not, however, terminate Respondents' obligations to comply with those provisions specified herein that are intended to survive this AO, including requirements regarding record preservation and Sections XV (Records), XXI (Stipulated Penalties), XXV (Liability), XXIX (Continuing Authority), and XXX (Enforcement and Reservations).

### XXXIV. Rules of Construction

The masculine, feminine, and neuter gender will each include the other and the singular and plural number will each include the other.

This AO may be executed in two or more counterparts each of which will be deemed an original but all of which together will constitute one and the same document.

### XXXV. Sovereign Immunity

The Parties hereby agree that nothing in this AO waives the State of Texas' sovereign immunity relating to suit, liability, and the payment of damages. The Parties further agree that all claims, suits, or obligations arising under or relating to this AO are subject to and limited to the availability of funds appropriated by the Texas Legislature for that respective claim, suit or obligation.

*The Chief Clerk shall send a copy of this Administrative Order to all Parties.*

Issue Date:

TEXAS COMMISSION ON  
ENVIRONMENTAL QUALITY

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Buddy Garcia, Chairman

**ARCHEM/THAMES CHELSEA  
STATE SUPERFUND SITE  
ADMINISTRATIVE ORDER**

**EXHIBIT A**

**REMEDY SELECTION DOCUMENT**

**REMEDY SELECTION  
DOCUMENT**



ARCHEM/THAMES CHELSEA  
PROPOSED STATE SUPERFUND SITE  
Houston, Harris County, Texas

July 2, 2008

***PREPARED BY: SUBHASH C. PAL, P.E., PROJECT MANAGER  
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY  
STATE LEAD SECTION  
REMEDIATION DIVISION***

**TABLE OF CONTENTS**

**I. INTRODUCTION..... Page 3**

**II. PURPOSE..... Page 3**

**III. LEGAL AUTHORITY..... Page 4**

**IV. SITE HISTORY..... Page 5**

**V. SUMMARY OF REPORTS..... Page 7**

**VI. DESCRIPTION OF SELECTED REMEDY ..... Page 8**

**VII. REMAINING STEPS IN THE SUPERFUND PROCESS..... Page 9**

**VIII. GLOSSARY..... Page 9**

**ARCHEM/THAMES CHELSEA STATE SUPERFUND SITE**  
**Houston, Harris County, Texas**  
**REMEDY SELECTION DOCUMENT**

**I. INTRODUCTION**

The Archem/Thames Chelsea State Superfund Site (Site) occupies approximately 10 acres at 13103 Conklin Lane near the intersection of Conklin Lane and Beltway 8 in Southeast Houston, Harris County (figure 1). The Site is a former specialty and toll chemical manufacturing facility. A wide range of organic chemicals and catalysts were used in manufacturing and processing operations at the site, which operated from 1961 until 1991. Operations ceased after the Thames Chelsea Chemical Company abandoned the site. The Texas Water Commission (TWC) (a predecessor of the Texas Commission on Environmental Quality (TCEQ), the U.S. Environmental Protection Agency (EPA) and various Potentially Responsible Parties (PRPs) performed removal actions in the 1990s to address the immediate concerns from chemicals stored in drums and above ground storage tanks.

Current structures at the Site include an office and warehouse building, concrete foundations in the former process areas, a sludge drying bed, two landfarm areas, and containment areas associated with former aboveground storage tanks (ASTs). Two surface impoundments associated with wastewater from the former operations are located in the north-eastern portion of the facility. Pallet piles, metal scrap and debris from demolition activities are located throughout the site.

The TCEQ is the agency in the State of Texas given responsibility for implementing the laws of the state relating to the conservation of natural resources and the protection of public health and safety and the environment. The TCEQ addresses certain sites that may constitute an imminent and substantial endangerment to public health and safety or the environment through the state Superfund program.

**II. PURPOSE**

This *Remedy Selection Document* (RSD) presents the *Remedial Action* (also known as the remedy) for the Site, which is designed to address the contamination and provide protection of public health and safety and the environment. Words appearing in italics in this document are defined in Section VIII, "Glossary" of this document.

- A. The purpose of this document is to
  - 1. describe the actions taken by the TCEQ to investigate the contamination, including any mitigating actions; and
  - 2. describe the *Remedy* selected to address the contaminated soil and water at the Site.
  
- B. This RSD summarizes information that can be found in greater detail in various studies and reports located in the Site files. Relevant documents are identified and summarized in Part V, "Summary of Reports" of this document. Copies of the

documents summarized in this RSD, as well as other relevant information, can be viewed at the local repository:

Bracewell Branch Library  
10115 Kleckley  
Houston, Texas 77075  
Phone Number: (832) 393-2580

Or in Austin at the TCEQ Records Management Center:

Building E, 1st Floor  
12100 Park 35 Circle  
Austin, Texas 78753  
Phone Number: (512) 239-2930

### III. LEGAL AUTHORITY

The investigation of the nature and extent of contamination at the Site and the selection of the *Remedy* is in accordance with the *Solid Waste Disposal Act* (codified as Chapter 361 of the Texas Health and Safety Code); Subchapter K: Hazardous Substance Facilities Assessment and Remediation rules found in Chapter 335 of 30 Texas Administrative Code (Subchapter K); and the *Texas Risk Reduction Program* (TRRP) rules found in Chapter 350 of 30 Texas Administrative Code.

While the Subchapter K rules are specific to the Superfund process, the TRRP rules are a comprehensive program for addressing environmental contamination and apply to many different types of corrective action administered by the TCEQ. The goal of the TRRP rules is to reduce the risk at a site to acceptable levels in terms of the concentration of contaminants that are allowed to remain in the soil and water. Under the TRRP rules, these acceptable concentration levels are called *Protective Concentration Levels* (PCLs).

A three-tiered approach may be used under the TRRP rules to calculate the PCLs for a site. The tiers represent increasing levels of evaluation where site-specific information is factored into the process. For example, Tier 1 uses conservative, generic models that do not account for site-specific factors while Tiers 2 and 3 allow for more detailed and complex evaluations so that PCLs are appropriate for specific site conditions. The PCLs for this Site were developed under Tier 2 to protect human health and groundwater.

Critical to the analysis under all three of the tiers is the land use classification for the site. Under the TRRP rules, the land can be classified as either residential or commercial/industrial. Remediation to residential standards assumes that the site may be occupied by children and therefore is applicable not only to strictly residential land but also to playgrounds, schools, daycare centers and similar land uses. Remediation to commercial/industrial standards assumes that the site will not be regularly occupied by children and is protective of persons who may occupy the site as workers. Sites remediated to commercial/industrial standards cannot be used for residential-type activities unless

further controls are implemented to make the site safe for that use. After discussion at a public meeting on June 12, 2001, the TCEQ determined that a commercial/industrial land use was appropriate for the Site.

#### **IV. SITE HISTORY**

The Site consists of four separately deeded parcels of land. The first manufacturing company to own part of the Site was AmChem Products, Inc. AmChem purchased the eastern-most tract of the facility in February 1961 and the adjacent tract in December 1962. Aerial photographs from 1965 and 1973 document the presence of three surface impoundments on one of the tracts of land, located in the vicinity of the current surface impoundments on the Site. In 1976, AmChem sold the two eastern tracts of the Site to H. B. Fuller Company.

The H. B. Fuller Company manufactured industrial latex coatings, adhesives and asphaltic emulsions at the Site. An August 12, 1977, fire destroyed the company's facilities. After the fire, H. B. Fuller moved its manufacturing operations to a nearby facility, but continued disposing of their washwaters from the manufacturing of the coatings and adhesives in the unlined surface impoundments on the eastern half of the Site.

Archem purchased the tract next to the H. B. Fuller facility in June 1970 and the adjacent western most tract of the Site in May 1974 and began manufacturing epoxy curing agents on the Site. Archem constructed a surface impoundment on the western half of the Site in which they deposited wastes from truck washouts. On October 10, 1978, H. B. Fuller conveyed the ownership of the two eastern tracts of the Site to Archem. Archem handled a wide variety of chemicals, engaged in toll processing and manufactured an assortment of chemical products.

The Hazard Ranking System (HRS) is the method used by the United States Environmental Protection Agency (EPA) and the TCEQ to evaluate the relative potential of hazardous substance releases to cause health or safety problems, ecological or environmental damage. A HRS was conducted for the Site in August, 1993; generating a score of 39.79. A site has to score 5 or greater to qualify as a State Superfund Site.

The HRS documents multiple inspections and investigations, of the Site, conducted by the Texas Department of Water Resources (TDWR), Texas Water Quality Board (TWQB) and the Texas Water Commission (TWC) between 1976 and 1991. Numerous violations, spills and non-compliance releases were reported. Historical facts cited in the HRS report include:

- \* On August 11, 1978 an inspection by the TWQB of the Archem facility found evidence of wastewater pooled outside the impoundment and dead vegetation along the northern boundary of the property from an acetone spill.
  
- \* On August 17, 1978 the TWQB, inspected the surface impoundments at the H.B. Fuller facility and noted that waste had been dumped outside the surface impoundments.

- \* In 1979, four surface impoundments were reported on Site. In 1982, the Archem closed an evaporator pond located on the western half of the Site; closed one of the evaporation ponds located on the eastern portion of the Site, reconfigured two of the smaller impoundments into one large impoundment and constructed a new impoundment.
- \* On January 9, 1988, a storage tank containing toluene ruptured and exploded. The explosion caused wide-spread contamination of the soils and structures throughout the Site.
- \* On July 21, 1989, field investigators from the TWC compiled a waste drum inventory of the Site. Approximately 1,385 55-gallon drums, one roll-off bin and 141 pails of hazardous, industrial solid and unidentified wastes were stored in 15 different areas of the facility.
- \* On February 21, 1990, the TWC and Archem entered into an Agreed Order assessing a \$119,600 penalty for violations of the Texas Solid Waste Disposal Act, the Texas Water Code and the rules of the TWC, and requiring Archem to address waste contamination at the Site.
- \* On June 2, 1990, Archem filed for Chapter 11 Bankruptcy. On November 12, 1990, Thames Chelsea Chemical Company USA took physical control of the Site under a lease agreement approved by the United States Bankruptcy Court.
- \* On December 17, 1990 and January 18, 1991, the TWC District Office 7 conducted inspections of the Thames Chelsea Chemical Company USA facility and noted several issues of non-compliances with the Texas Administrative Code, including the discharge of wastewater from the easternmost surface impoundment located on the property into a stormwater outfall.
- \* Thames Chelsea Chemical Company USA had abandoned the facility by May 22, 1991. In September, 1991 the Site was referred to the State Superfund Program.

In October 9, 1991, the Pre-Remedial Unit Staff of the TWC evaluated the Site and observed fifteen hazardous waste units used in the management of fourteen or more RCRA P listed waste (acute hazardous wastes) and U listed waste (generally hazardous wastes). Approximately 2,000 55-gallon drums containing waste in various states of deterioration were present on the Site. All sumps, secondary containment systems, and roll-off containers were found full of chemicals (liquids and solids). The two surface impoundments contained less than one foot of freeboard. Spills and surface contamination were wide spread throughout the Site, with evidence of contamination in drainage ditches.

Removal actions conducted by a few Potentially Responsible Parties (PRPs), the TWC and by the EPA in the 1990's restricted access to the Site and removed most of the drums, surface tanks and other materials left on Site. Water from the surface impoundments, frac tanks, an API separator, and secondary containment areas was treated and disposed off-site. After their removal action in March, 1995 the EPA determined that no further federal action would be taken at the Site.

## V. SUMMARY OF REPORTS

### A. HAZARD RANKING SYSTEM

The *Hazard Ranking System* (HRS) is a numerically-based screening system that uses information from initial, limited investigations to assess whether a site qualifies for the state or federal Superfund program. Sites scoring 28.5 or greater may qualify for the federal Superfund program, while sites scoring 5 or greater may qualify for the state Superfund program. The HRS scoring for the Site was prepared by the TWC in August, 1993 and is presented in the report titled "Hazard Ranking System Assessment." The Site earned a score of 39.79 which qualified the Site for proposal to the State Registry of Superfund Sites. On June 12, 2001 the Site was accepted into the State Superfund program.

### B. REMEDIAL INVESTIGATION (RI)

The *Remedial Investigation* (RI) was conducted by Weston Solutions (Weston) beginning in April, 2002 and concluding in July, 2005. The RI included trash/debris consolidation, Cone Penetrometer Testing (CPT), installation of monitoring wells, sampling and analysis of soil, sub-surface soil, surface water and groundwater. The aquifer testing was conducted by Daniel B. Stephens and Associates (DBSA). The groundwater was characterized as a Class 3 aquifer based on yield. The RI characterized the chemicals of concern (COCs) in source materials, surface soils, sediments, and surface water and identified 20 areas of concern (AOCs). The groundwater at the site was determined not to be impacted.

The chemicals of concern (COCs) are compounds and elements for which the concentrations exceed the Critical Protective Concentration level (PCL). COCs in soil include metals (antimony, lead and mercury), VOCs (benzene, toluene and tetrahydrofuran) and SVOCs (2-nitroaniline and furfural). Horizontal and vertical delineation of surface soil contamination was completed in July, 2005 that marked the end of the RI. In August, 2005, remnant product and Investigation Derived Wastes (IDW) drums were characterized and removed from the site.

Surface water in the west impoundment meets the TCEQ's discharge criteria. Except for Total Organic Carbon (TOC) water in the east impoundment meets all other discharge criteria.

### C. FEASIBILITY STUDY (FS)

The *Feasibility Study* for the Site was conducted by TCEQ's contractor Weston Solutions, Inc., in August, 2005 and presents a summary of the specific contaminants identified at the Site and an evaluation of potential remedial alternatives for soil and surface water at the site. The remedy for the Site was selected after the evaluation of the feasibility study.

The evaluation of the remedial options are based on long term effectiveness, compliance with the applicable regulations, reduction in toxicity, mobility and volume, relative cost, impacts of implementation, technical merit and public acceptance. During a public meeting held on July 20, 2006 at Dobie High School, 10220 Blackhawk, Houston, Texas the proposed remedy for the site was presented to the public. There were no objections from the public.

The TRRP rules classify remedies as either conforming to "Remedy Standard A" or "Remedy Standard B." These standards are described in detail in 30 Texas Administrative Code Section 350.32 and Section 350.33, respectively. The remedy selected for the Site conforms to "Remedy Standard A."

## VI. DESCRIPTION OF SELECTED REMEDY

A *Remedial Action* may consist of any combination of removal or decontamination of contaminated media, physical controls such as landfills and caps, or institutional controls, such as, deed restrictions on the future use of the property. In accordance with 30 Texas Administrative Code Section 335.348(l) and the requirement of Section 361.193 of the *Solid Waste Disposal Act*, the TCEQ selects the *Remedial Action* for a site by determining which remedial alternative is "the lowest cost alternative which is technologically feasible and reliable, effectively mitigates and minimizes damage to the environment, and provides adequate protection of the public health and safety and the environment."

The selected remedy for the soil involves the excavation and off-site disposal of soil in both impoundments and the contaminated soils, including the landfarm soils. It has been assumed that the soils will be considered Class I non-hazardous waste and will be transported either to a Class I facility in the Houston area for disposal or to a recycling facility. The soil from the impoundments will be blended with the contaminated soil excavated from the site. Verification samples will be collected from the excavated areas to confirm removal of contaminated soil. The excavated areas will be backfilled with clean soil, covered with top soil and vegetated. No operation and maintenance or groundwater monitoring will be necessary. A notice will be placed in the real property records of Harris County notifying current and future property owners that the site is appropriate for commercial/industrial, rather than residential land use.

The surface water from the two impoundments will be discharged to a local water body, the Harris County Flood Control Ditch #A 119-06-00 along the south side. The ditch turns south at a point approximately 3/4 miles west of the site. From this point, the ditch flows south for approximately 1-1/2 miles before discharging into Turkey Creek. The TOC discharge

criteria for the water in the east impoundment will be attained through a treatment system prior to discharge. Water from the west impoundment does not require any treatment before discharge. Harris County Flood Control Department will be contacted before discharging impoundment water into the Harris County Flood Control Ditch.

The groundwater at the site is designated as Class 3 based on yield. Groundwater at the site is not impacted. During the six monitoring events no Volatile Organic Compounds (VOCs), Semi-volatile Organic Compounds (SVOCs), metals and Total Petroleum Hydrocarbons (TPH) concentrations were detected above the PCL concentrations. Therefore, no remediation is necessary for the groundwater.

## **VII. REMAINING STEPS IN THE SUPERFUND PROCESS**

The PRPs were notified of the selected remedy by letter dated October 18, 2006 and they were allowed a period of 60 days to make a good faith offer (GFO) to fund or perform the selected remedy. The dead line for GFO ended on January 8, 2007. No agreement between the TCEQ and the PRPs to fund or perform the remedy was reached. After the TCEQ issues the final administrative order as provided by §361.188 of the Texas Health and Safety Code, the Site will no longer be considered a "proposed" state Superfund site but will then be "listed" on the State Registry of Superfund Sites.

Following issuance of the 188 Order, either the Responsible Parties (RP's) or the TCEQ will complete the detailed design of the selected remedy and cause that remedy to be implemented in its entirety. At any time in this process, the TCEQ may determine that a *minor change, significant change, or fundamental change* should be made to the Remedial Action. If a minor change is implemented, the TCEQ will document the change in the Site files without the necessity for another public meeting. If a significant change is made, a notice describing the changes will be posted in the Texas Register and in a newspaper of general circulation in the county where the Site is located. If a fundamental change is considered, another public comment period and meeting will be held to discuss that fundamentally changed proposed remedy.

Upon completion of the Remedial Action, the TCEQ may propose to delete the Site from the State Registry of Superfund Sites. A public meeting will be held before the Site is deleted from the State Registry.

## **VIII. GLOSSARY**

Feasibility Study (FS) - A description, screening, and analysis of the potential Remedial Action alternatives for a site.

Fundamental Change - A change to the Remedial Action which uses a different approach to achieve the remedial action goals, or one that uses the same approach but results in a remedial action that is less protective than the originally proposed remedial action.

Hazard Ranking System (HRS) - The scoring system used by the TCEQ to evaluate a site for the state or federal Superfund program. The scoring system was developed by the U.S. Environmental Protection Agency (EPA) as described in 40 Code of Federal Regulations Part 300, Appendix A.

Minor Change - A change to the Remedial Action which does not significantly affect the scope, performance, or cost of the originally proposed Remedial Action.

Potentially Responsible Parties (PRPs) - Persons or entities that the TCEQ considers potentially responsible for the contamination of the site pursuant to Section 361.271 of the Texas Health and Safety Code.

Protective Concentration Level (PCL) - The concentration of a chemical of concern which can remain within the source medium and not result in levels which exceed the applicable human health risk-based exposure limit or ecological protective concentration level at the point of exposure for that exposure pathway.

Remedial Action (RA) - An action, including remedial design and post-closure care, consistent with a remedy taken instead of, or in addition to, a removal action in the event of a release or threatened release of hazardous substances into the environment to prevent or minimize the release of a hazardous substance so that the hazardous substance does not cause an imminent and substantial endangerment to present or future public health and safety or the environment.

Remedial Investigation (RI) - An investigative study which may include removals, and/or a feasibility study, in addition to the development of protective concentration levels, designed to adequately determine the nature and extent of release or threatened release of hazardous substances and, as appropriate, its impact on air, soils, groundwater and surface water, both within and beyond the boundaries of the facility.

Remedy Selection Document (RSD) - The document which describes the TCEQ's selected remedy for the site.

Significant Change - A change to the Remedial Action which materially affects the scope, performance, or cost of the Remedial Action but which uses the same approach and results in a Remedial Action at least as protective as the originally proposed Remedial Action.

Solid Waste Disposal Act - Chapter 361 of the Texas Health and Safety Code. The purpose of the Solid Waste Disposal Act is to safeguard the health, welfare, and physical property of the people and to protect the environment by controlling the management of solid waste, including any hazardous waste that is generated. Subchapter F of Chapter 361 relates to the state Superfund process. The Texas Health and Safety Code is available online at: <http://www.capitol.state.tx.us/statutes/statutes.html>.

Texas Risk Reduction Program (TRRP) - A program of the TCEQ that provides a consistent corrective action process directed toward protection of human health and the environment balanced with the economic welfare of the citizens of the state. The rules for this program are located in Chapter 350 of 30 Texas Administrative Code. The Texas Administrative Code is available online at: <http://www.sos.state.tx.us/tac/>.

**ARCHEM/THAMES CHELSEA  
STATE SUPERFUND SITE  
ADMINISTRATIVE ORDER**

**EXHIBIT B**

**LIST OF SOLID WASTES AND HAZARDOUS  
SUBSTANCES AT THE SITE**

## Solid Wastes and Hazardous Substances at the Site

### Chemicals of Concern:

Antimony  
Benzene  
Lead  
Mercury  
Furfural  
2-Nitroaniline  
Tetrahydrofuran  
Toluene

### Chemicals detected on-site during the Remedial Investigation in areas requiring remedial action that are co-mingled with the chemicals of concern:

Acetone	Acetophenone
Benzoic Acid	Biphenyl (diphenyl)
Bis (2-Ethylhexyl) phthalate	n-Butylbenzene
Sec-Butylbenzene	Chlorobenzene
p-Cymene (p-Isopropyltoluene)	Cyclohexane
Dimethyl phthalate	Di-n-butylphthalate
Ethylbenzene	Fluoranthene
Fluorene	Isopropylbenzene
MBTE	Methylcyclohexane
Methyl ethyl ketone	4-Methyl-2-pentanone
Methylene Chloride	1-Methylnaphthalene
2-Methylnaphthalene	Naphthalene
Phenanthrene	Phenol
n-Propylbenzene	Styrene
Tetrachloroethylene	1,2,4-Trichlorobenzene
1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene
m,p-Xylene	o-Xylene

**ARCHEM/THAMES CHELSEA  
STATE SUPERFUND SITE  
ADMINISTRATIVE ORDER**

**EXHIBIT C**

**TABLE OF CONTENTS  
FOR  
FIELD SAMPLING PLAN**

**TABLE OF CONTENTS  
FOR  
FIELD SAMPLING PLAN**

## FIELD SAMPLING PLAN

### TABLE OF CONTENTS

Title and Approval Sheet

Distribution List

Table of Contents

#### 1.0 Introduction

- **Investigation Phase: Purpose** – Briefly states the specific purpose of this Field Sampling Plan (FSP) relative to the Quality Assurance Project Plan, Work Plan and/or other documents. A schematic presentation of the project documents and the location of key planning components should be presented.
- **RA Phase: Purpose** – Briefly states the specific purpose of this FSP relative to the RA Contract Document, Quality Assurance Project Plan and/or other documents. A schematic presentation of the project documents and the location of key planning components should be presented.
- **Project/Task Organization** – Identifies the key individuals or organizations participating in the project, their role(s) and responsibilities, and the organizational chart for the project. (Project-specific information for QAPP Element A4)<sup>1</sup>

#### 2.0 Site and Project Summary

- **Investigation Phase: Problem Definition/Background** - Briefly states the site description, surrounding area, historical information, previous investigation, suspected contamination source, probable transport pathways and other site information. Most of this information is available from the Conceptual Site Model developed during the planning phase. Any specific data gaps and methods to fill the data gaps should also be discussed. States the specific problem to be solved or the decision to be made and identifies the decision maker. (Project specific information for QAPP Element A5)<sup>1</sup>
- **RA Phase: Problem Definition/Background** - Briefly states the site description, historical information, previous investigation, a summary of the selected remedy, a brief discussion of the remedial action activities. States the specific problem to be solved or the decision to be made and identifies the decision maker. (Project specific information for QAPP Element A5)<sup>1</sup>

- **Project/Task Description and Schedule** - Briefly summarizes the project and the project tasks, the turnaround time for the project, including the turnaround time requirement for laboratory analysis. (Project specific information for QAPP Element A6)<sup>1</sup>
- Describes any **special personnel and equipment** required for the specific type of work being planned or measurement being taken and any special training/certification requirements. (Project specific information for QAPP Element A8)<sup>1</sup>
- **Data Acquisition Requirements (Non-direct Measurements)** - Defines the criteria for the use of non-measurement sources, such as computer databases, programs, literature files, and historical databases. (Project specific information for QAPP Element B9)<sup>1</sup>
- **Assessment Techniques** - Defines the number, frequency, and type of quality assessment activities, the responsible staff, the procedures to be performed during the life of the project. (Project specific information for QAPP Element C1)<sup>1</sup>

### 3.0 Analytical Requirements and Data Quality Objectives

- **Data Quality Objectives** - Summarizes the project specific quality objectives and measurement performance criteria. This section should include the summary of the outcomes of the technical planning process (e.g., the 7-Step DQO process) used to develop the project objectives. The summary should also include a reference to Appendix B of the FSP, which contains a full discussion of the proposed DQOs for the project from which the summary was taken. Designates and briefly describes sampling units (e.g. AOCs, surface soil to 6 inches). States objectives by sampling unit or media. The project specific calculations or algorithms are also specified in this section. (Project specific information for QAPP Element A7)<sup>1</sup>
- This section should include a summary table containing a list of all chemicals of concern identified for the project with the corresponding Level of Required Performance (LORP)(e.g., action levels and preliminary remedial goals), analytical methods (including the preparation, analysis and cleanup methods), and the corresponding method quantitation limits for all analytes of concern.

### 4.0 Sampling Plan Design

- **Sampling Process Design** - All the relevant components of the experimental design and the key parameters to be evaluated are included in this section. This section should include the sampling activities, the rationale for the design (in terms of meeting the DQOs), the sampling design assumptions, the procedures for locating and selecting environmental samples, a classification of measurements as critical or non-critical, the type and number of samples required for the project including the required field QC samples, the sampling locations and frequency, the applicable sample matrices, and an identification of samples critical to the project. Most of this information should be available from the output from Step 7 of the DQO process. (Project specific information for QAPP Element B1)<sup>1</sup>

- *Describes the sampling plan for each media, as applicable, including figures and tables.*

*Surface Soil*

*Subsurface Soil*

*Groundwater*

*Surface Water and Sediment*

*Air*

*Other Matrices*

## 5.0 Sampling Methods and Sample Handling

- ***Sampling Method Requirements*** - *Identifies sampling methods and equipment and describes the procedures for sample collection, preparation, and decontamination. This section should reference the Standard Operating Procedures located in Appendix A. (Project specific information for QAPP Element B2)<sup>1</sup>*
- ***Sampling Handling and Custody Requirements*** - *This section should include the required sample volumes, container types, and preservation requirements for non-standard or other analytical methods proposed for project work that are not listed in Table B2-1 of the Superfund Program QAPP. This section also includes the field sample handling and custody requirements for the project. (Project specific information for QAPP Element B3)<sup>1</sup>*
- *This section contains the specific requirements for **field instrument/equipment testing, inspection and maintenance** for the project. Additionally, **field instrument calibration and frequency requirements** for water level, pH, temperature, conductivity, dissolved oxygen, redox potential, turbidity and other field measurements are addressed in this section as applicable to the project. This section also includes the critical field supplies, the inspection or acceptance testing requirements, and the acceptance criteria. (Project specific information for QAPP Element B6, B7, and B8)<sup>1</sup>*

## 6.0 Field Survey and Measurements

- *This section describes the sampling methods and criteria for **field survey and measurements**, such as land surveys, hydrogeological tests and measurements, geophysical surveys and soil gas surveys, required for the project.*

## 7.0 Additional Field Activities

- *This section contains descriptions and procedures for **other field activities**, such as presampling/mobilization activities, required notification, property access, site restoration and investigative-derived waste (IDW) handling and disposal.*

## 8.0 Exceptions, Additions and Changes to the TCEQ Superfund Program QAPP

List any **exceptions, additions and changes to the Superfund Program QAPP** in each of the appropriate sub-sections corresponding to the table of contents of the Program QAPP below. Site specific information (e.g., Group A and Group B elements) specified above should not be restated in this section. Please refer to the Program QAPP for details. This section should also include specifications for non-standard methods and other analytical methods not specified in the Program QAPP.

### GROUP A: PROJECT MANAGEMENT

- A.1 Title and Approval Sheet
- A.2 Table of Contents
- A.3 Distribution List
- A.4 Project/Task Organization
- A.5 Problem Definition/Background
- A.6 Project/Task Description
- A.7 Quality Objectives and Criteria
- A.8 Special Training/Certification
- A.9 Documentation and Records
  - A.9.1 Field Operation Records
  - A.9.2 Laboratory Data Package
  - A.9.3 Laboratory Performance Criteria Data
  - A.9.4 Data Handling Records
  - A.9.5 Data Reporting Package Format and Document Control
  - A.9.6 Field Records/Data Reporting Package Archiving and Retrieval

### GROUP B: DATA GENERATION AND ACQUISITION

- B.1 Sampling Process Design (Experimental Design)
- B.2 Sampling Methods
  - B.2.1 Sample Containers
  - B.2.2 Sample Volumes, Container Types, and Preservation Requirements
- B.3 Sample Handling and Custody
  - B.3.1 Field Sample Handling and Custody
  - B.3.2 Laboratory Sample Handling and Custody
- B.4 Analytical Methods
  - B.4.1 Screening Methods
  - B.4.2 Definitive Preparation Methods
  - B.4.3 Definitive Analysis Methods
  - B.4.4 Non-standard Method Validation
- B.5 Quality Control
  - B.5.1 Definitive Analytical Methods
  - B.5.2 Screening Methods
  - B.5.3 Quality Control Measure Descriptions
  - B.5.4 Elements of Quality Control
  - B.5.5 Method Detection Limit, Method Quantitation Limit and Sample Quantitation Limit

- B.6 *Instrument/Equipment Testing, Inspection, and Maintenance*
  - B.6.1 *Maintenance Responsibilities*
  - B.6.2 *Maintenance Schedules*
  - B.6.3 *Spare Parts*
  - B.6.4 *Maintenance Records*
- B.7 *Instrument/Equipment Calibration and Frequency*
- B.8 *Inspection/Acceptance of Supplies and Consumables*
- B.9 *Non-direct Measurements*
- B.10 *Data Management*
  - B.10.1 *Logbooks and Forms*
  - B.10.2 *Data Storage/Retrieval*

GROUP C: ASSESSMENT AND OVERSIGHT

- C.1 *Assessments and Response Actions*
- C.2 *Reports to Management*

GROUP D: DATA VALIDATION AND USABILITY

- D.1 *Data Review, Verification and Validation*
- D.2 *Verification and Validation Methods*
- D.3 *Reconciliation with User Requirements*

List of Tables

List of Figures

List of Appendices

- Appendix A - Standard Operating Procedures*
- Appendix B - Data Quality Objectives Document*
- Appendix C-Z - Other supporting documents as necessary.*

<sup>1</sup> Guidelines used in the preparation of the QAPP elements are:  
EPA Requirements for Quality Assurance Project Plans, EPA QA/R-5  
(EPA/240/B-01/003), March, 2001  
EPA Guidance for Quality Assurance Project Plans, EPA QA/G-5 (EPA/240/R-02/009),  
December, 2002