LTEVS OPERATION PLAN, REPORT AND RESIDUALS MANAGEMENT PLAN

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PREPARED FOR:

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

LTEVS OPERATION PLAN, REPORT AND RESIDUALS MANAGEMENT PLAN

1.0 EXCAVATION, TREATMENT AND DISPOSAL

Approximately 3,900 cubic yards of soil will be excavated and treated using low temperature thermal desorption for removal of VOCs. The excavated soil will be treated according to the requirements of the Land Disposal Restrictions (40 CFR Part 268) under RCRA. The remedy will comply with the Land Disposal Restrictions through a Treatability Variance (40 CFR 268.44) for the wastes. The treatment level range that will be established through the treatability variance is a 90 to 99.9 percent reduction in the concentration of the contaminants upon the completion of the treatment process. Air emissions from the treatment process will be monitored on a regular basis to ensure that emissions are below the appropriate regulatory levels.

The VOCs separated from the soil and source material will be catalytically converted to carbon dioxide, water, and hydrogen chloride gases. The gases will be scrubbed using water and sodium hydroxide to produce a very diluted acid stream. The acid stream will be neutralized to produce sodium chloride that is dissolved in the water used to scrub the acid. This water shall be collected and removed off site for disposal. The following sections detail the activities related to soil excavation, treatment, disposal, and site restoration.

1.1 Task 1 - Construction of the Pre-Treatment Stockpiling/Staging Area

A Pre-Treatment Stockpiling/Staging Area (PTSSA) will be constructed at the southern corner of the spill area as shown on Figure 1 Site Plan. Major features of this pad include:

- The clearing and grubbing of the spill area;

- The removal of salvageable and unsalvageable materials from the spill area;

- The excavation and stockpiling of a three day supply of contaminated soil on the southeast corner of the spill area using an area 60' x 40'. One-half of the three-day supply (265 cu yds) will consist of excavated materials from other parts of the spill area. The second half of the stockpile is the unexcavated soil under the stockpile (approximately 265 cu yds) for a total of 530 cu yds;

- The PTSSA will be covered with 8 mil thick plastic sheeting. The cover will be anchor using existing tires on-site; and

- No liner or sump will be needed, since the PTSSA is part of the spill area.

The PTSSA will be constructed in accordance with the appropriate specifications for Section 02211, Grading, and Section 13700, Low-Temperature Enhanced Volatilization. The entire Spill Area will be enclosed with silt fencing and will be bermed where necessary to prevent storm water from entering. The Post Treatment Staging Bins will be constructed over (i.e., lined with) 8 mil poly sheeting, fenced off with silt fencing, and covered with 8 mil poly sheeting. There will be 15 bins, each of which will be 50ft long by 18ft wide.

The covered stockpile will not be used if soil can be taken directly from the spill area. The covered stockpile will be used if soil from the spill area becomes wet due to rain, snow, or by other means, or is for any other reason temporarily rendered unfit for treatment. Soil from the stockpile that is not treated during bad weather will be the last material processed through the LTEV unit.

A Vehicle and Equipment Decontamination Station (VEDS) will be built as described in the Vehicle and Equipment Decontamination Plan. The VEDS will be built in accordance with applicable specifications included in Section 13750, Building Decontamination, and Section 13900, Off-Site Transportation and Disposal. The VEDS pad will be used to decontaminate debris that is unsuitable for treatment by LTEV. The VEDS will also be used to decontaminate construction and other equipment as needed. Liquid waste from decontamination activities will be collected in a sump and pumped to a 20,000 gallon frac tank for eventual off-site disposal. Hazardous waste solids generated during decontamination operations will be collected in appropriate containers for eventual treatment by LTEV. Personnel Decontamination will be performed as per Section 11.0 of the Safety, Health and Emergency Response Plan (SHERP), and at the personnel decontamination trailer.

1.2 Task 2 - Construction of Post-Treated Staging Bins

Post treatment staging bins (PTSB) will be built on the south side of the site as shown in Figure 1 Site Plan. There will be 15 bins, each of which will have the capacity to hold 100 cu yds of treated soil. Each bin will be 50' x 18' and open on both of the narrow ends to allow adequate access by the loader. The sides of the bins will be constructed of silt fencing. Bins containing soil will be covered at all times with 8 mil poly sheeting.

The bins will be used to store treated soils until laboratory test results on samples collected from these materials become available. If the test results indicate that the treated soils meet the remedial objectives then the treated material will be hauled to the Post-Treatment Stockpile Area. If the soil from a bin does not meet the treatment criteria it will be retreated and retested.

1.3 Task 3 - Construction of the Post-Treatment Stockpile Area

Soil meeting the treatment criteria will be hauled to the Post-Treatment Stockpile Area located to the west of the PTSBs. The stockpile will be covered at all times with 8 mil poly sheeting. The soil will be used to backfill the excavation in accordance with specification Section 02211, Excavation and Backfill.

1.4 Task 4 - Mobilization, Setup, and Performance Testing of LTEVS

1.4.1 General

The Low Temperature Enhanced Volatization System (LTEVS) to be utilized at Claremont

Polychemical for Low Temperature Enhanced Volatilization (LTEV) will consist of three primary trailers, one thermal desorbtion/particulate removal trailer (47 ft. long by 8 ft., 6 in. wide) and two identical catalytic oxidizer trailers (48 ft., 7 in. long by 8 ft., 6 in. wide). Each catalytic oxidizer trailer will be equipped with a specialized catalyst for treating chlorinated hydrocarbons, a multi-stage thermal quench, an acid-gas scrubber, and various ancillary equipment and structures. The particulate-free gases exiting the baghouse on the thermal desorption/particulate removal trailer are split into two equal volumes with each air stream routed to a separate catalytic oxidation/scrubber trailer.

A minimum area of 80 ft. by 60 ft. will be set aside for placement of the LTEVS. It is anticipated that 1 week to 10 days will be required to spot the system units and to complete hookup of the utilities. This will also include placement of ancillary equipment and structures such as the discharge moisturizing auger, a small dust suppression structure at the auger discharge, and an enclosure around the control panels. The Site Plan shows the location on the work site that is designated for thermal desorption operations. Figure 2, Soil Treatment Plant General Plot Plan, shows the general configuration of the three trailer system and certain ancillary equipment.

While placement and setup of the LTEVS is taking place, portions of the SHERP relevant to LTEV operations will be implemented. This will include education and orientation of workers to health and safety concerns relative to thermal desorption operations

1.4.2 Set-Up (First Week)

Equipment set-up is expected to require about 1 week to 10 days and will include the following tasks:

a. Place and secure the single desorber trailer, the two catalytic oxidizer/scrubber trailers, and any ancillary equipment on site in their designated operating locations;

b. Assemble connecting ducting and piping between all trailers and above the shipping break on the two catalytic oxidizer/scrubber trailers;

c. Locate the power screen on the contaminated soils pad (specification drawings of the power screen are contained in Appendix C);

d. Connect trailer and ancillary control systems via interconnecting control cables;

e. Connect utilities (i.e., propane, electricity, and water supply);

f. Place and connect the discharge moisturizing auger;

g. Construct temporary dust suppression housing around the exit port on the discharge moisturizing auger (specifications for the dust suppression structure appear in Appendix B). A temporary enclosure may also be placed around the control panels located at the ends of the trailers if considered necessary;

h. Construct a temporary secondary containment structure under the cold feed and continuous weigh conveyor belts of the desorber unit to contain any spillage that might occur; and

i. Locate scrubber blowdown holding tank (frac tank) on site as required.

1.4.3 Start-Up, Shakedown, and Performance Testing

Shakedown of the system is expected to begin during the second week that the LTEVS is on site. Shakedown operations will consist of "dry" running (i.e., operation without contaminated soils) of all LTEVS systems. This will confirm the appropriate functioning of each separate system unit and unit operations as a combined system. During this period all safety interlocks and shutdown devices within all systems, including the Process Logic Computer (PLC) system will be thoroughly checked for proper operation. A backup generator will be on-site during start-up, Performance Testing, and normal LTEV operations to ensure the capability of continuous operation in the event of power interruption.

Once dry running is completed and all systems are determined to be operational, fine-tuning of the LTEVS under actual operating conditions will begin. During this period soils will be processed, sampled, and analyzed as they will be during normal operations, thereby providing the opportunity to make any adjustments necessary to optimize operations. At any time while soils are being processed all systems will be operated using the operating parameters that are expected to be successful in meeting all regulatory requirements, including destruction and removal efficiencies. This short period of fine-tuning will assure that the system operates during Performance Testing and over the long run in a manner that will consistently achieve the required performance criteria.

1.4.4 Performance Testing

Once fine-tuning is completed and prior to full scale implementation of LTEVS operations, a complete system performance evaluation will be conducted on-site. This Performance Test will be executed in accordance with procedures and standards required by the EPA and the State of New York. The Performance Test will be conducted to verify the LTEVS can meet the specified soil treatment criteria and to verify that it can conform to the air emissions requirements. The Performance Test will be conducted by personnel experienced with evaluation of performance parameters generally required for thermal systems testing. The Performance Test will include characterization of the following waste streams and residuals: waste feed, stack gases (including target constituent air emissions and acid gas emissions), treated solids, and scrubber blowdown water. Performance testing will consist of two days of continuous running during which time two tests will be performed. Each of the two tests will consist of three 1 hour runs. The two tests will be used to evaluate LTEVS performance at different temperatures. A more detailed description of performance testing for Claremont appears in the LTEVS Performance Testing Plan. Table 1.1 outlines the Performance Test sampling and analysis procedures.

Table 1.1
Claremont Polychemical Superfund Site
LTEV Performance Test Procedure

DESCRIPTION		FREQUENCY OF SAMPLING/ MONITORING	OFF SITE TESTING	PARAMETERS	TEST METHOD(S)
Waste Feed		*1 Composite Sample per 1 Hr. Test Run *2 Grab Samples per Composite Sample (taken @ appx. 15 min &45 min)*	1 Composite Sample per Test Run *(i.e., 3 Samples per Test)*	PCE	Method 8260
		Continuous Monitoring @ Control Panel		Waste Feed Rate	LTEV Continuous Weight Belt
Air Emissions		Continuous Emissions (CEMs)	None	Total Hydrocarbon (THCs)	Method 25A
				Oxygen (O_2)	Method 3A
				Carbon Dioxide	Method 3A
				Carbon Monoxide	Method 10
				Nitrogen Oxides	Method 7E
		1 Sample/Test Run *(samples collected from stack)*	1 Sample/Test Run	Moisture	Method 4
				Volume/Velocity	Methods 1,2
				HCl	Method 26A
				Particulate Matter	Method 5
				VOC.	Method 18
		2 Samples/Test Run *(1 Sample from Upstream of Catalyst and 1 Sample Downstream of Catalyst)*	2 Samples/Test Run	PCE	SW 846 Method 0030
Residuals	Treated Soils	*1 Composite Sample per 1 Hr. Test Run *5 Grab Samples per Composite Sample (taken from treated soil pile)*	1 Composite Sample per Test Run *(i.e., 3 Samples per Test Condition)*	PCE	Method 8260
		* 1 Composite Sample per 3 Hr. Test *1 Grab Sample per each 1 hr. Test Run*	1 Composite Sample per Test Run *(i.e., 3 Samples per Test Condition)*	TCLP	Method 6010A
	Scrubber Blowdown	* 1 Composite Sample per 1 Hr. Test Run *2 Grab Samples per Composite Sample (taken @ 30 min & 60 min)*	1 Composite Sample per Test Run *(i.e., 3 Samples per Test Condition)*	PCE	Method 8260
				TCLP	Method 6010A

* Grab samples will be collected separately and composited at the analytical laboratory.

1.4.4.1 Waste Feed Characterization

Waste feed sampling and analysis and treatment rate will be monitored to characterize physical and chemical properties and to allow for adjustment of LTEVS parameters to accommodate potentially differing conditions. This approach will also be used to provide documentation of reasons for any operational changes if they should become necessary. The sampling program will include an analysis of each waste or mixture of wastes to be treated and will include moisture content and concentration of target compounds.

Two grab samples of waste feed material will be collected during each test run. Samples shall be collected in accordance with the Sampling and Analysis Plan (SAP) and as described in the Performance Testing Plan.

1.4.4.2 Stack Emissions

Continuous Emissions Monitors (CEMs) will be used during performance testing to assess stack emissions for total hydrocarbons (THCs), oxygen, carbon dioxide, carbon monoxide and nitrogen oxides. Stack testing will also include monitoring of acid gas emissions.

1.4.4.3 Residues

During each performance test run, grab samples of treated soils and scrubber blowdown water will be collected and analyzed to determine the effectiveness of the treatment process. The samples will be collected in accordance with the residue sample protocol presented in the Performance Testing Plan. The residue grab samples will be submitted to the laboratory for target constituent and metals analysis.

1.4.4.4 Operational Parameters

During the Performance Test the following critical operational parameters will be monitored and recorded: 1) waste feed rate, 2) temperature of treated soils at point of discharge, 3) temperature of gases at the catalyst inlet, 4) temperature of gases at catalyst exit, and 5) exit gas velocity. The parameters recorded during the Performance Test will become the operational limits for the treatment phase of the project. These limits include at a minimum the following: 1) maximum processing rate, 2) minimum soil exit temperature, 3) minimum catalyst bed temperature, and 4) maximum pressure drop across the baghouse. Additional limits, based on the results of the performance testing, may be prescribed by the NYSDEC.

1.5 Residuals Management

Residuals from LTEV operations will be characterized, staged, stored, and disposed as described below. Table 1.2 lists the primary residuals generated as a direct result of LTEV operations and from what part of the process they originated.

Table 1.2
Claremont Polychemical Superfund Site
Residuals from LTEV Operations

RESIDUE	ORIGIN
Solid Debris	Waste Feed Oversized and Inappropriate Materials
Treated Soils	LTEV Unit Discharge
Scrubber Blowdown	Scrubber/Quench Sump
Processed Gas Emissions	Discharge From the Common Stack
Waste Feed Spillage	Waste Feed Hopper and Belts
Decontamination Residues	Decon of LTEV and Screen and Heavy Equipment

In general, all residual streams from LTEV operations will be monitored to assure that they meet performance requirements in the specifications and/or requirements for disposal off-site or discharge when appropriate.

1.5.1 Solid Debris

Certain materials from the contaminated soils excavation area may be inappropriate for thermal desorption due to either size restrictions or chemical properties. Contaminated material that is oversized and debris unsuitable for treatment in the LTEVS will be cleaned as well as possible and disposed as outlined in the specifications in Section 13750, Building Decontamination, and Section 13900, Off-Site Transportation and Disposal. Debris found in the excavation area and debris generated from screening operations which is too large to be treated in the LTEVS will be transported by the contaminated feed loader to the Vehicle and Equipment Decontamination Station (VEDS) for decontamination by pressure washing (see the Vehicle and Decontamination Plan). One biased composite wipe sample will be taken from each load of decontaminated debris in accordance with the procedure detailed in Section 4.8.2.1. of the Field Sampling Plan (FSP) in the SAP. Once the laboratory analysis shows the material to be clean, it will be diposed of off-site as general refuse. If the analysis shows that contamination is still present, the material will be pressure washed again and resampled. Contaminated materials which are not amenable to decontamination will be stockpiled in the exclusion zone for eventual disposal as contaminated waste (see the Building and Salvagable Material Decontamination Plan). The Site Plan shows the location of the VEDS.

1.5.2 Treated Soils

Treated soils will be rehydrated in the moisturizing auger and discharged into a dust containment structure approximately 12 ft. from the desorption trailer. The processed soils are picked up via a clean front end loader and taken to one of 21 Post-Treatment Staging Bins (PTSBs). Treated soils will be stored in 100 yd^3 lots with one lot per PTSB. As soon as the 100 yd^3 lot of soil in a particular bin has sufficiently cooled 5 grab samples will be collected from various points in the lot. These samples will be recorded and entered into the chain-of-custody log and forwarded to the laboratory where the 5 samples from each PTSB will be composited and analyzed. This method ensures a representative sample of the contents of each bin will be used to evaluate compliance. When soil stored in a PTSB is found to meet the remedial objective of $\leq 200\ \mu g/kg$ the clean material will be placed in the Post-Treatment Stockpile Area (PTSA) from which it will eventually be backfilled into the excavation in accordance with specifications Section 02211, Excavation and Backfill. If the soil from a bin does not meet the treatment criteria it will either be taken to the PTSSA for storage and eventual retreatment or it will be taken directly to the soil treatment plant for retreatment. If, for any reason, soil in the PTSA is found to exceed the regulatory limit and can not be retreated, it will be disposed of off-site in accordance with specification Section 13900, Off-Site Transportation and Disposal. The Site Plan shows the location of the PTSBs and the PTSA at the facility.

1.5.3 Scrubber Blowdown

Waste water from the scrubber/quench sump will be intermittently pumped through an activated carbon filter bed and into a frac tank located on-site. Once sump water reaches a preset salinity a portion will be pumped out of the sump (i.e., referred to as "scrubber blowdown") and replaced with fresh water and caustic as needed to maintain the most efficient near-neutral pH. The process of "blowing-down" occurs intermittently with the volume of blowdown dependent on maintenance of the desired salinity. The salinity will be maintained at a level agreed to by the POTW or that is appropriate for other facilities when required. The scrubber blowdown, consisting primarily of salt (NaCl) contaminated water, will be stored on-site in a frac tank. If testing required by the POTW indicates that the scrubber blowdown is in compliance with discharge standards and only after permission is granted by the POTW, the stored blowdown will be pumped from the frac tank into the POTW sewer line. If, for any reason, the scrubber blowdown cannot be discharged to the POTW, then it will be placed in a tanker truck and shipped off-site for disposal in accordance with specification Section 13900, Off-Site Transportation and Disposal. Spent carbon filters will be tested for contamination and disposed of as hazardous or non-hazardous waste as appropiate.

1.5.4 Processed Gas Emissions

Processed gas emissions will be tested per the Performance Testing Plan. Based on the results of the Performance Test a continuous monitoring protocol will be established as described in the Performance Test Plan, Section 5.3.1. At a minimum, continuous monitoring of process emission gases during normal operations will be performed for CO, CO_2 and O_2.

1.5.5 Waste Feed Spillage

A temporary bermed area will be constructed under the thermal desorption trailer waste feed belts to contain any potential spillage from the belts. The temporary bermed area will be prepared by outlining the area with contiguous railroad ties or equivalent and then placing a single piece of 8 mil poly liner over the area, thus constructing a temporary bermed area. If spillage of contaminated feed soil occurs to the extent that it threatens to exceed the capacity of the bermed area then the area will be mostly emptied using shovels with care being taken not to breach the liner. The soil will be shoveled into the bucket of the contaminated soil loader and placed in the feed hopper for LTEV treatment. If a liner is found to be pierced or breached it will either be overlain with another plastic liner or it will be removed (with any spillage cleaned up and placed in the loader bucket) and replaced with another plastic liner.

1.5.6 Decontamination Residues

When demobilization takes place the LTEVS will be decontaminated before leaving the site. Once all contaminated materials have been processed, the LTEVS will be operated at temperature and without feeding waste materials for a minumum of 30 minutes to clear any contaminants from the system. Before being taken from the site the LTEVS equipment and trailers will be taken to the VEDS where they will be powerwashed. The resulting residues will be handled the same as other contaminated residues in accordance with specification Section 13900, Off-Site Transportation and Disposal.

2.0 DESCRIPTION OF LTEVS AND TREATMENT OPERATIONS

2.1 Equipment Description

The Low Temperature Enhanced Volatilization System (LTEVS) that will be provided by Dow Environmental for the remedial action at Claremont Polychemical has been designed to effectively remediate soils contaminated with certain chlorinated hydrocarbons including the target compound PCE, found at Claremont Polychemical. The LTEVS utilizes a non-contact, counter-current, low-temperature, enhanced volatilization process which first volatilizes target organic contaminants from the soil into the air within the system and then catalytically oxidizes these airborne contaminants in a specially designed low-temperature, catalytic oxidation system used for treatment of chlorinated organics. Dow Environmental's LTEVS has been designed as a stand alone, mobile processing unit for treating solid materials contaminated with chlorinated and non-chlorinated hydrocarbons. A complete set of operation and maintenance manuals and control instrumentation capabilities are available and have been provided to the USACOE.

2.2 Pretreatment Soil Conditioning Equipment

Contaminated feed material will be passed through a commercial construction type of vibrating screen. The screen will remove all materials greater than 4 inches from the contaminated soil waste stream. Contaminated materials 3 inches or less in diameter that pass through the screen will be placed in the feed hopper on the thermal desorption trailer. Materials greater than 3 inches in diameter will be managed and disposed as specified in Section 13750 of the specifications and in Section 1.5.1 above. If the consistency of contaminated materials is such that it inhibits a consistent feed to the desorber then the use of secondary pretreatment equipment such as a crusher or a shredder may become necessary prior to thermal treatment. Feed materials may be blended using a front end loader prior to placement on the power screen. Blending is commonly used to even out concentration of contaminants or debris such as vegetable matter in feed material. On occasion, the hot processed soils may be blended with difficult to feed soils in order to enhance handling characteristics (e.g., to reduce plasticity and/or moisture content of feed materials). Prior to any blending of soils or any other materials obtained outside of the excavation site, or treated soils from the site with contaminated soils from within the excavation site, a request will be submitted to the USACOE and USACOE permission must be granted.

2.3 Primary Thermal Desorption Trailer

The thermal desorption trailer is 8.5 ft. wide by 47 ft. long, with an integrated control panel. It consists of a 3 yd^3 feed hopper, a contaminated soil cold-feed conveyor, a weigh conveyor with a continuous sensing weigh scale, a rotary drum equipped with a gas fired low NOx burner, a propane vaporizer, a high-temperature/high-efficiency baghouse, a 4,600 SCFM induced draft (ID) system fan, and an ancillary discharge moisturizing auger. System controls include a microprocessor burner controller with manual operation and automatic safety controls, a fan damper position control, variable speed controls for components such as the cold feed conveyor and the discharge auger, and overall power controls. All electrical and burner systems are interlocked for safety and start-up protection. Data readouts located on the control panel show the burner opening position, conveyor speeds, damper position, exit soil temperature, baghouse temperature, differential pressure across the baghouse, process rate by weight (tons per hour), cumulative tons processed, and drum draft.

Hopper and Cold Feed System - The feed hopper is equipped with a vibrator to help in keeping difficult to feed materials from plugging the opening to the cold feed conveyor. The cold feed conveyor has a variable speed control and drops material onto the continuous weigh scale conveyor belt. The weigh belt in turn weighs the contaminated materials being processed and delivers these materials into the rotary drum.

Rotary Drum - Desorption is achieved in the counter-current designed rotary drum which is equipped with a 10 million BTU per hour low NOx emission burner. This burner is jacketed so that the flame cannot impinge directly on feed materials or volatilized contaminants, thereby using only the heated products of combustion and not an open flame to accomplish the desorption process.

Discharge Moisturizing Auger - Processed/desorbed soils and particulates from the baghouse are ejected into the 12 ft. long discharge moisturizing auger. The moisturizing auger is used to mix processed soils with baghouse fines; to wet processed materials for cooling, dust control, and remoisturizing soils for enhanced compaction when backfilling; and to convey processed materials away from the process trailer. Processed materials from the auger are dropped into a depression located inside of a dust suppression housing. Processed materials/soils are then transferred to a temporary storage pile.

Baghouse - The baghouse is designed to remove particulates greater than 5 microns in size, operate at high temperatures (up to 450°F), and uses an automatic pulse-jet system to clear the bags and recover filtered particulates. The trailer is supplied with a 10 HP air compressor for the pulse-jet system. The baghouse is equipped with 78 Nomex filter cloth bags possessing a total area of 900 ft^2, an air to cloth ratio of 5.0 to 1.0, and a permeability of 20 to 40 SCFM/ft^2 at 0.5 in. WC pressure drop. The collected baghouse fines are transferred via a closed auger system to the discharge moisturizing auger where they are mixed and rehydrated with the processed soil.

2.4 Secondary Treatment Trailers (Oxidizer/Scrubber Units)

The secondary treatment trailers are each 8.5ft wide by 48ft long. The process gas stream will be split in two with each trailer receiving 50 percent of the flow. Both trailers are identical and consist of a cross exchanger, a catalyst preheater, a five-layer catalyst bed, a flow sensor, a quench elbow, an acid gas scrubber, a system fan, and a common exhaust stack.

Cross Exchanger - A shell and tube 48 percent efficient heat exchanger is supplied to preheat the incoming air stream and reduce auxiliary fuel consumption. The heat exchanger is constructed of 316 L stainless steel with each welded seam leak tested to assure that there is no cross contamination. After leaving the baghouse at less than 450°F, VOC laden air passes through the tube side of the exchanger while the hot catalytically oxidized gas stream passes through the shell side at temperatures from 780°F to 850°F. There are two passes on the shell side to approach true counter flow conditions within the exchanger.

Preheater/Gas Train - The catalyst preheater gas train is fabricated to FM/IRI specifications and has a low NOx burner with a sleeve extension to allow no direct flame contact with the hydrocarbon laden air stream. The preheater gas burner has a maximum firing rate of 3,000,000 BTUs/hour and can be operated on either natural gas or propane. At the Claremont Site the burner will be operated using propane. The burner is mounted to allow the flame to fire in the direction of air flow. To achieve uniform temperatures entering the catalyst the gas train is designed to efficiently mix the hot gases downstream of the burner. Uniform temperatures entering the catalyst are achieved by proper air distribution over the burner with hot gas mixing downstream of the burner. The burner also has the capacity to maintain operating temperatures during VOC free, full air flow conditions. The system contains a direct fired liquefied petroleum gas (LPG) vaporizer that is mechanically and electrically integrated into the trailer system. The vaporizer is only used when liquefied gases are utilized to operate the STP, and therefore, may be bypassed at the Claremont Polychemical site.

Catalytic Reactor - The reactor interior on each of the catalytic oxidizer trailers is constructed of 316 L stainless steel. High-density mineral wool is placed between the inner and outer shells to maintain external skin temperature at safe levels. The catalyst is contained in a fully welded 316 L stainless steel bed and sealed with high-temperature gasketing to ensure that no VOCs bypass the catalyst. The catalyst bed configuration on each catalyst trailer consists of 30 full blocks and 15 three-quarter blocks of catalyst per unit. Each of the five facial areas consist of 6 full blocks and 3 three-quarter blocks. Dow Environmental will use 45 ft^3 of Johnson Matthey Ceramic Monolith HaloCat-LTC catalyst in each of the two catalyst/trailer units to destroy VOCs desorbed from contaminated soils. Each catalyst was designed to treat the complete air stream from the LTEV trailer at a destruction efficiency (DE) of 99%. This DE is based on the catalyst manufacturers calculation of the airflow across the catalyst relative to the average concentration of contaminants present at Claremont Polychemical and the catalyst surface area referred to as the gas hour space velocity (GHSV). However, when the air stream from the LTEV trailer is split between the 2 catalyst trailers the GHSV calculation indicates a DE of greater than 99.99%. Air stream temperature sensors are located before and after the catalyst bed on each trailer for proper control of temperature within the reactors.

Quench/Scrubber System - The oxidizer-to-scrubber connection is constructed of 316 L stainless steel and contains sampling ports. The outlet from the catalytic oxidizer is directed into a multi-stage quench on its way to the scrubber modules. A recirculation pump injects water from a sump into the Hastelloy quench which is equipped with Hastelloy spray nozzles. The gases exit the quench and enter the packed bed counter-current absorption column for removal of 99 percent or greater of HCl vapors from the oxidizer exhaust. The tower is packed with polypropylene packing and contains a demister to remove entrained water droplets. An FRP sump, common to both the quench and the scrubber towers, and a corrosion resistant FRP pump are provided to recirculate the scrubber/quench water to the quench and scrubber columns. Dual quench recirculation loops are located each with a nozzle in the quench tower. Sump water is also recirculated to one nozzle near the gas outlet from the scrubber tower. The 7.5 HP recirculation pump is monitored for proper water flow by a mechanical rotometer. Fresh water flow to the quench is also indicated via a mechanical rotometer within the piping. The pH in the sump is automatically maintained at a near neutral condition (generally a pH of 5 to 9) by the addition of a NaOH solution which is introduced into the sump/scrubber recirculation line as needed. A pH probe which continuously monitors pH in the sump is used to automatically control the caustic metering pump causing it to add caustic when the pH in the sump drops below the set point (usually pH 5). Generally a solution of about 25% NaOH is used to maintain pH, however, the concentration of NaOH solution used can vary since the solution will be automatically added in the amount required to maintain the pH at a near neutral condition.

System Fan and Stack - The air stream is pulled through the scrubber and forced from the stack via a system, induced draft fan. The system fan is constructed of fiberglass reinforced plastic and is statically and dynamically balanced. The fan is powered by a 60 HP motor. The stack is mounted over the system fan and is 18-ft long, 22-in. in diameter and constructed of fiberglass reinforced plastic. At Claremont Polychemical, each of the two trailer stacks will be replaced with a connection to a common stack. The common stack is equipped with a platform and sampling ports. The sampling ports comply with EPA requirements for placement of sampling devices. A general representation of the common stack appears in Figure 2.

2.5 Piping and Instrumentation Diagrams

A Process Flow Diagram of the LTEVS to be used at Claremont Polychemical appears in Figure 3, Soil Treatment Plant - Process Flow Diagram and a Piping and Instrumentation Diagram appears in Figure 4, Soil Treatment Plant - Process and Instrumentation Diagram. Descriptions of the equipment and control systems appear in the following sections.

2.6 Control System Description

The control system for the LTEVS has been designed to permit safe and efficient operation throughout the desorption and effluent control processes. Primary controls consist of state-of-the-art programmable logic controllers (PLCs) on each trailer. These PLCs facilitate troubleshooting via first-out detection systems. LCD displays indicate the reason for system shutdowns (i.e., high/low gas pressure, loss of air flow, high catalyst outlet temperature, low catalyst inlet temperature, high conductivity of the scrubber solution, loss of scrubber air flow, high scrubber outlet temperature, etc.). The PLCs also "walk" the operator through system start-ups by displaying such messages as "trial for ignition", "pilot on", "burner on", "caustic pump on", "recirculation pump operating", "OK to process fumes", and "push start button". The control panel includes displays for system status indication including LCD displays, conductivity meters, pH controllers, temperature gauges, and high-temperature shut-off controllers. A three-pen hard copy temperature recorder/controller for each of the air pollution control trailers controls and monitors the inlet and outlet temperatures for the catalytic oxidizer along with air flow. Flame strength meters indicate the strength of the flame signals to indicate any burner service needs. Following is a description of the function, operational settings, and operator responses for process control systems.

2.6.1 Main Control Panel

Cold-Feed Conveyor - The Cold Feed Conveyor is activated/deactivated by the cold feed ON/OFF control. The conveyor speed can be changed by rotating the feed rate potentiometer. The digital readout on the Cold Feed Conveyor indicates speed. The Cold Feed Conveyor serves to establish and maintain a steady flow of material to the Weigh Scale Conveyor. The Cold Feed Conveyor is normally adjusted to equal the speed of the Weigh Scale Conveyor which in turn feeds soils into the rotary drum desorption chamber.

Weigh Scale Conveyor - The Weigh Scale Conveyor speed is fixed. If necessary the speed can be changed by reducing the sheave ratio on the drive unit. The conveyor weighs the material as it is transported into the rotary drum desorption chamber.

Emergency Stop Switch - This red colored palm button instructs the PLC to execute an emergency shut down of the entire unit.

Scale - The scale is located on the Weigh Scale Conveyor and weighs the soil as it traverses into the rotary drum desorption chamber. The weigh scale is tested for accuracy on a daily basis using a known calibration weight. A complete manual for the scale is kept with the desorber trailer at all times during operation.

Baghouse Damper - The Baghouse Damper adjusts the air flow between the baghouse and the heat exchanger on the catalytic oxidizer/scrubber trailer. The Baghouse Damper has a digital readout which indicates the percent opening of the passageway from the baghouse to the catalytic oxidizer unit. By controlling the damper position the amount of air flowing through the system is controlled. The temperature in the baghouse can be adjusted by adjusting the flow of air through the system.

Pulse Controls - The Pulse Controls activate a burst of air from the compressor to the bags in the baghouse. The pulse should be "On" only when the desorber unit is running. Pulse rate can be adjusted by manual means or set on "Auto" to operate under the control of the Baghouse Differential Pressure Gauge.

Baghouse Differential Pressure Gauge - The Differential Pressure Gauge reads the difference in pressure across the baghouse. Normal indication should be between 3 and 6 in. of water. The differential pressure should not drop below 2 inches WC.

Rotary Drum Desorption Chamber Temperature Controller - The Rotary Drum Temperature is controlled by the Operator in accordance with target temperatures for desorption of known contaminants. Burner position/intensity is adjusted to achieve desired treated materials discharge temperatures. The thermocouple, located in the soil discharge port, monitors the temperature of soil leaving the desorption chamber which is generally maintained at 400°F to 650°F. This temperature is indicated by a digital readout on the main control panel.

Baghouse-Entry Temperature Controller - The Baghouse-Entry Temperature digital readout on the control panel monitors the temperature of desorption gases entering the baghouse. Interlock mechanisms are tripped causing a warning alarm and then a system shutdown when temperatures exceed set limits. A thermocouple is located in the baghouse inlet plenum to monitor temperature. The limit is generally set at 400°F or less to protect the filter bags from heat damage. The baghouse is actually designed to accept up to 450°F which is the maximum recommended temperature for the Nomex bags.

Catalyst - Inlet Temperature Controller - The Catalyst-Inlet Temperature Controller monitors the temperature of gases entering the catalyst. This unit controls the catalyst preheater which serves to maintain temperatures of gases entering the catalyst above the limit set as the minimum operating temperature for the catalyst.

Catalyst - Differential Pressure Control - Differential pressure is measured across the catalyst bed. If differential pressure indicates a plugging condition, the unit is shut down.

Make-Up Water Flow - Make-Up Water Flow is measured and monitored by flow indicators. If flow is lost, high-temperature results and the unit shuts down automatically.

Recirculation Water Flow and pH Control - Water Recirculation Flow is measured and monitored by flow indicators. If flow is lost, high-temperature will result and the unit will shut down. A digital pH controller is provided to control caustic addition and maintain scrubber water at a near neutral condition by controlling a caustic metering pump. The caustic metering pump adds a caustic solution as needed from a 400 gallon caustic storage tank located adjacent to the trailer. The pH controller also provides a high and low pH alarm/shutdown.

Quench Gas Temperature Controller - The Quench Gas Temperature is monitored and if temperatures high enough to adversely affect the quench or scrubber systems are detected then the unit is automatically shut down.

Scrubber - Differential Pressure Control - Differential pressure is measured across the scrubber. If differential pressure indicates a plugging condition, the unit is shut down.

2.6.2 LTEVS Safety Interlock System

The LTEVS safety interlock circuit is designed to progressively interact with each successive operation. The Baghouse Fan must be in operation before power is made available to start rotation of the drum, the drum burner system, baghouse auger, or incline auger used to remove particulates recovered in the baghouse.

The catalyst system startup/automatic selector switch overrides the catalyst inlet low temperature shutdown set point for the startup sequence only. The selector is moved to the auto position once the minimum preheat temperature (650°F) is obtained.

Once all operating parameters for temperature are reached and the cold feed is activated, any component subsystem failure or excursion from operating temperature high and low set-points will cause a shutdown of any specific component system necessary to prevent unsafe or out of compliance operation of the LTEVS.

Interlock to the LTEV unit from the scrubber unit is established by setting the selector switch to the scrubber position. If any limit is lost, the LTEVS is shut down due to loss of exhaust fan operation. The following limits must be met before the exhaust fan can be started:

- Reservoir level must be within high and low limits and water pressure must be available for makeup or system will shut down;

- Scrubber water pump must supply pressure within parameters or system will shut down;

- Wet scrubber discharge blower must maintain sufficient air pressure or system will shut down;

- Temperature of the air stream between the quench and the scrubber must be within set parameters; and

- The temperature inlet to the catalyst bed must be maintained within set limits.

2.6.3 Emergency Shutdown Procedures

The system units that are interlocked with the waste feed system and which can trigger a waste feed cutoff in case of failure are those that have the potential to cause uncontrolled emissions to the environment if they should fail. Most of these units, when operating outside of set limits, cut off the waste feed by causing a full system shutdown. All interlocks are immediate when set limits are exceeded. Tables 2.1 and 2.2 identify specific interlocks and set limits that will cause system shutdowns when those limits are violated. Tables 2.1 and 2.2 also show the high and low limits that result in shutdowns and other interlocks that cause alarm or prealarm conditions.

Table 2.1
Claremont Polychemical Superfund Site
Trailer 1 (Desorption Trailer) Interlocks

SYSTEM UNIT	PARAMETER	SET LIMIT	INTERLOCKS
Weigh Belt	Operation	Loss	Alarm Only
Drum Burner	Flame	Loss of Flame	Alarm/Controlled System Shutdown[1]
	Low Gas Pressure	4" (WC)	Alarm/Fuel Feed and Burner Shutdown
	High Gas Pressure	17" (WC)	Alarm/Fuel Feed and Burner Shutdown
	Combustion Air	Loss of Air Flow	Alarm/Drum Burner Shutdown
Baghouse	Inlet Temperature	≥ 470°F.	Prealarm/Alarm/Drum Burner Shutdown
Compressor	Air Pressure	≤ 0 psi	Controlled System Shutdown[1]

1 Controlled System Shutdown refers to shutdown of the Waste Feed System, all Burner Systems and System Fans on all three LTEV trailers. The scrubber/sump recirculation system (loop) is left running.

Table 2.2
Claremont Polychemical Superfund Site
Trailers 2 and 3 (Air Pollution Control Trailers) Interlocks

SYSTEM UNIT	PARAMETER	SET LIMIT	INTERLOCKS
Catalyst Preheater Burner	Low Gas Pressure	4" (WC)	Alarm/Controlled System Shutdown[1]
	High Gas Pressure	17" (WC)	Alarm/Controlled System Shutdown[1]
	Combustion Air	Loss	Alarm/Controlled System Shutdown[1]
Catalyst	Inlet Temperature	≤ 750°F	Alarm/Controlled System Shutdown[1]
	Outlet Temperature	≥ 830°F	Alarm/Controlled System Shutdown[1]
Quench	Water Flow	≤ 60 gpm (total)	Emergency Quench Activation
	Exit Gas Temperature	≥180°F	Controlled System Shutdown[1]
Scrubber	Recirc. Water Flow	Loss of Flow	Alarm/Controlled System Shutdown[1]
Scrubber/ Quench Sump	Liquid Level	Low	Close Blowdown Valve
		Low/Low	1) Alarm 2) Activate Emergency Quench Water 3) Shut Down Recirculation Pump 4) Controlled System Shutdown[1]
		High	Open Blowdown Valve
		High/High	Alarm/Controlled System Shutdown[1]
System Fan	Air Flow	Loss of Inlet Flow Pressure	Controlled System Shutdown[1]

1 Controlled System Shutdown refers to shutdown of the Waste Feed System, all Burner Systems and System Fans on all three LTEV trailers. The scrubber/sump recirculation system (loop) is left running.

3.0 TASK 5 - TREATMENT OF SOILS

As stated previously, approximately 3,900 cubic yards of soil will be treated through the LTEVS at the Claremont site. A Process Flow Diagram describing the LTEVS to be used at Claremont Polychemical appears in Figure 3, Soil Treatment Plant - Process Flow Diagram.

The Site Plan (Figure 1) shows the approximate location of the Spill Area that will be excavated, hauled, and treated in the LTEVS. This location was delineated based on historical investigations at Claremont Polychemical during excavation and treatment. Source material will consist of all materials from the Target Cleanup Depth Area and those materials through the Target Cleanup Concentration Area as specified in Section 02211 Paragraph 1.6, Excavation Criteria, on the Contract Drawings, and in the Excavation and Backfilling Plan.

Excavation of source material will be conducted in accordance with the requirements of the SHERP and all applicable Federal, state, and local regulations and guidelines. Structures that may potentially be damaged during operations will be properly shored by DEI in accordance with specific plans to be developed if or when the situation arises. If a potential exists for damaging a structure then the excavation next to the structure will be stopped until appropriate shoring has taken place.

Confirmation testing for excavation limits will be performed primarily by using field tests as detailed in the Excavation and Backfilling Plan and the SAP. Samples will be collected in the Target Cleanup Concentration Area for laboratory analysis. These samples will be tested for VOC content in accordance with Test Method 8260. Excavations will not be backfilled until results for confirmation sampling are available and validated by DEI. Also, backfilling will not start until approval is received from the USACOE. Backfilling will be in accordance with Section 02211, Excavation and Backfilling, and the Excavation and Backfilling Plan.

3.1 Hours of Operation and Staffing

It is anticipated that the LTEVS will be operated 24 hours per day for 6 days per week with Sundays off. Operating on a 24-hour basis increases production by decreasing unproductive down time. For instance, if the system is operated for only 20 hours per day then at least one hour must be allowed for cool-down and another hour for warm-up. This would allow only 18 hrs of actual operations. When down time for maintenance and trouble-shooting is added in at an estimated 20% of operating time only 14.4 hours could be expected to be productive time. Operating on a 24 hour per day schedule is expected to provide 20 hours per day of productive time.

Operation of the LTEVS normally requires 3 to 4 personnel per shift - a Lead Thermal Desorption Unit Operator and two Thermal Desorption Unit Operators. One or two Materials Feed Equipment Operators will also be needed.

The Lead Thermal Desorption Operator is normally the most experienced operator on site and is capable of performing detailed trouble-shooting on mechanical and control systems. The Lead Operator is responsible for operating the Unit within set parameters, safe operations, for obtaining required production, and for performing appropriate maintenance activities. Resumes of the Lead Thermal Desorption Operators can be found in Appendix A.

Thermal Desorption Operators are generally experienced Operators, but can sometimes be in training. These Operators are normally required to perform periodic maintenance inspections along with operations. He/she will be or will become familiar enough with operation of the LTEVS to operate the controls and to assist the Lead Operator in most situations.

The Materials Feed Operators will operate the front end loader in the contaminated soils area and the loader in the clean area servicing the PTSBs. These Operators are responsible for screening contaminated materials, providing waste feed to the LTEVS, handling debris, and for transferring processed materials and cleaned debris to the clean materials temporary storage area.

3.2 Preparation of Contaminated Materials For Processing

Soils excavated from the spill area will be transported directly to the LTEVS whenever possible. Blending of contaminated soils may be required to even out concentration of contaminants or debris (such as vegetable matter) in the contaminated feed material. On occasion, the hot processed soils may be blended with difficult to feed soils in order to enhance handling characteristics by reducing plasticity and/or moisture content of feed materials. Contaminated materials movement and/or their blending and placement into processing equipment will be performed with a front end loader.

Prior to transfer to the LTEVS, contaminated soils will be placed on a power screen to separate particles larger than 3 inches in diameter. Materials greater than 3 inches in diameter will be set aside for disposal, cleaning, or further processing if a crusher or shredder is utilized. If further processing for size reduction is performed the processed materials will be rescreened as they were originally.

3.3 Cleaning of Debris

Once enough debris greater than 3 inches in diameter is accumulated in the debris storage area the operator will remove it to the Vehicle and Equipment Decontamination Station (VEDS). The Debris Hopper will consist of a 14 ft by 6 ft metal screen with 1 ft high sides capable of being lifted by a fork lift. Debris will be leveled out on this hopper to about 6 inches deep and then steam cleaned using a portable steam power washer. Contaminated liquid residue from this cleaning will be allowed to drain into the VEDS sump from which it will be pumped to a frac tank. The solid residues will be treated in the LTEVS. After treatment, the debris will be transported to the clean soils storage area for sampling and/or backfilling along with treated soils. See the Vehicle and Equipment Decontamination Plan for more information.

3.4 Cold Feed and Weigh Belt Waste Feed

Screened contaminated soils will be hauled and loaded into the LTEV Unit hopper. The hopper will direct the feed materials onto the variable speed cold feed conveyor belt. The speed of the cold feed and the power screen conveyors will be coordinated to provide an even feed to the fixed speed continuous weigh conveyor. Here the material is weighed, with the continuous real-time and cumulative weights recorded at the control panel, immediately prior to its discharge into the rotary drum desorption chamber. The weigh scale is recalibrated daily using a known weight.

3.5 Primary Treatment (Desorption)

Contaminated materials are fed into the primary treatment unit from the continuous weigh belt. The primary treatment unit (i.e., the rotary drum desorption chamber) is equipped with special flighting which mixes contaminated feed materials with hot air as the drum rotates. As the soil moves down the drum, toward the hot air inlet, there is a distinct rise in the air temperature. The speed of soil movement through the drum is mainly dependent on drum rake, loading, and the type of flights used. Soil temperature continues to increase as the soil is cascaded down the rotating drum and through the heated air stream. As the temperature of the soil rises, the moisture and lighter hydrocarbons volatilize from the soil particles. The system ID fan pulls the gases from the desorption chamber into the baghouse. This causes the desorption chamber to be maintained under a slight negative pressure to preclude fugitive emissions during desorption operations. Soil residence time in the rotary drum is generally 4 to 8 minutes while temperature is maximized during the final 1 to 3 minutes of the process. The primary treatment unit is designed to achieve soil exit temperatures ranging from 400°F to 650°F. The actual feed rate for contaminated materials is dependent primarily on soil type, moisture content, and contaminant loading.

3.6 Treated Materials Discharge

The treated soil discharges from the rotary drum into the moisturizing/mixing auger unit. The moisturizing auger uses water injection at several points along its length to cool processed soil and to reduce fugitive particulate emissions (FPEs) or dust. Once the soil is cooled it can then be re-moisturized as more water is added. Rehydration is also necessary to achieve proper compaction when backfilling cleaned soils. Materials discharged from the auger are dropped through a small dust suppression housing onto a clean soils discharge belt conveyor for temporary stockpiling. The clean/rehydrated soil stockpile is then moved away via a backhoe or loader for storage and sampling in the Post Treatment Storage Bin.

3.7 Particulates Removal

Exhaust gases are pulled from the rotary drum desorption chamber into and through a high-efficiency baghouse. Gases exiting the desorption chamber contain some particulate materials as well as uncombusted hydrocarbons and/or chlorinated hydrocarbons. Due to the rotary drum's counter-current design, exhaust gases from the rotary drum have a lower exit temperature than that of the soil being discharged from the unit. These gases are moved by an ID fan which causes the drum and baghouse system to operate at a negative pressure. Process gases are maintained at high temperatures (generally from 350°F to 450°F) to avoid recondensation of hydrocarbons after leaving the desorption chamber.

The baghouse contains a pulse-jet, filter bag collection device used to capture particulates that remain in the exhaust gases. Fine grained particles collected in the baghouse are auger conveyed to the discharge moisturizing auger where they are combined with the treated materials discharged from the desorption chamber for blending and rehydration.

3.8 Catalytic Oxidation

When the VOC laden gas from the baghouse arrives at either of the catalytic oxidation trailers it is forced into the tube side of a heat exchanger where it is preheated with hot exit gases from the catalytic oxidizer. The gas then moves through the catalyst preheater section where it is heated to approximately 680°F and sent through the catalyst bed. In the catalyst bed, hydrocarbons and chlorinated hydrocarbons undergo a catalytically driven oxidation reaction. The hot gases exiting the catalyst then pass through the shell side of the cross exchanger where the incoming air is preheated as mentioned previously. The air stream that exits the catalytic oxidizer contains essentially carbon dioxide, water vapor, and acid gases from the oxidation of halogenated VOCs.

3.9 Process Gas Cooling and Scrubbing

The air stream is then directed to a scrubber module containing a multi-stage thermal quench and an acid gas absorption column. Fresh water followed by large volumes of sump recirculation water are pumped into a Hastelloy quench section. The quench section reduces oxidizer exhaust gas temperatures to approximately 130°F through evaporative cooling while it also absorbs a portion of the acid gas (i.e., hydrochloric acid vapor). A high-temperature shutdown is provided to protect the fiberglass reinforced plastic (FRP) portions of the scrubber and the scrubber packing. The gases exit the quench and enter a counter-current acid absorption column scrubber. Liquid collected in the quench/scrubber sump is recirculated through the absorption column where the remaining hydrochloric acid vapors are absorbed into the solution (i.e., $NaOH + HCl \rightarrow NaCl + HOH$). Sodium hydroxide (i.e., caustic) is metered into the sump solution to control pH. The scrubber column provides a minimum of 99% removal of the hydrochloric acid formed in the oxidation of chlorinated compounds. Finally, the remaining gas is passed through a mist eliminator to remove entrained water droplets after which the airstream exits the system via a common exhaust stack. A 60 HP system fan on each catalyst trailer keeps an induced draft on the rest of the catalyst/scrubber system while forcing exhaust gases from the common stack. The common stack is 40 ft. high from grade.

3.10 Treatment System Performance Monitoring

This section presents an outline of treated soils and stack gas monitoring to confirm efficiency of the treatment process. Prior to full scale implementation of LTEV operations, an initial testing program will be conducted to verify that the LTEVS can meet the soil action levels and that it can conform to the air emission requirements. Sampling during the performance test is discussed in Section 1.5.10.1 and in the Performance Testing Plan. Table 3.1 - LTEV Verification Monitoring During Normal Operations shows the testing activities, frequency of testing, parameters to be tested and test methods used during normal operations.

3.10.1 Continuous Emissions Monitoring of Stack Gases

Continuous Emissions Monitors (CEMs) will be used to assess stack emissions for total hydrocarbons (THCs), carbon dioxide, oxygen, carbon monoxide, and nitrogen oxides. This will confirm that operating parameters are maintained and ensure on-going compliance with all applicable air regulations.

3.10.2 Operational Parameters

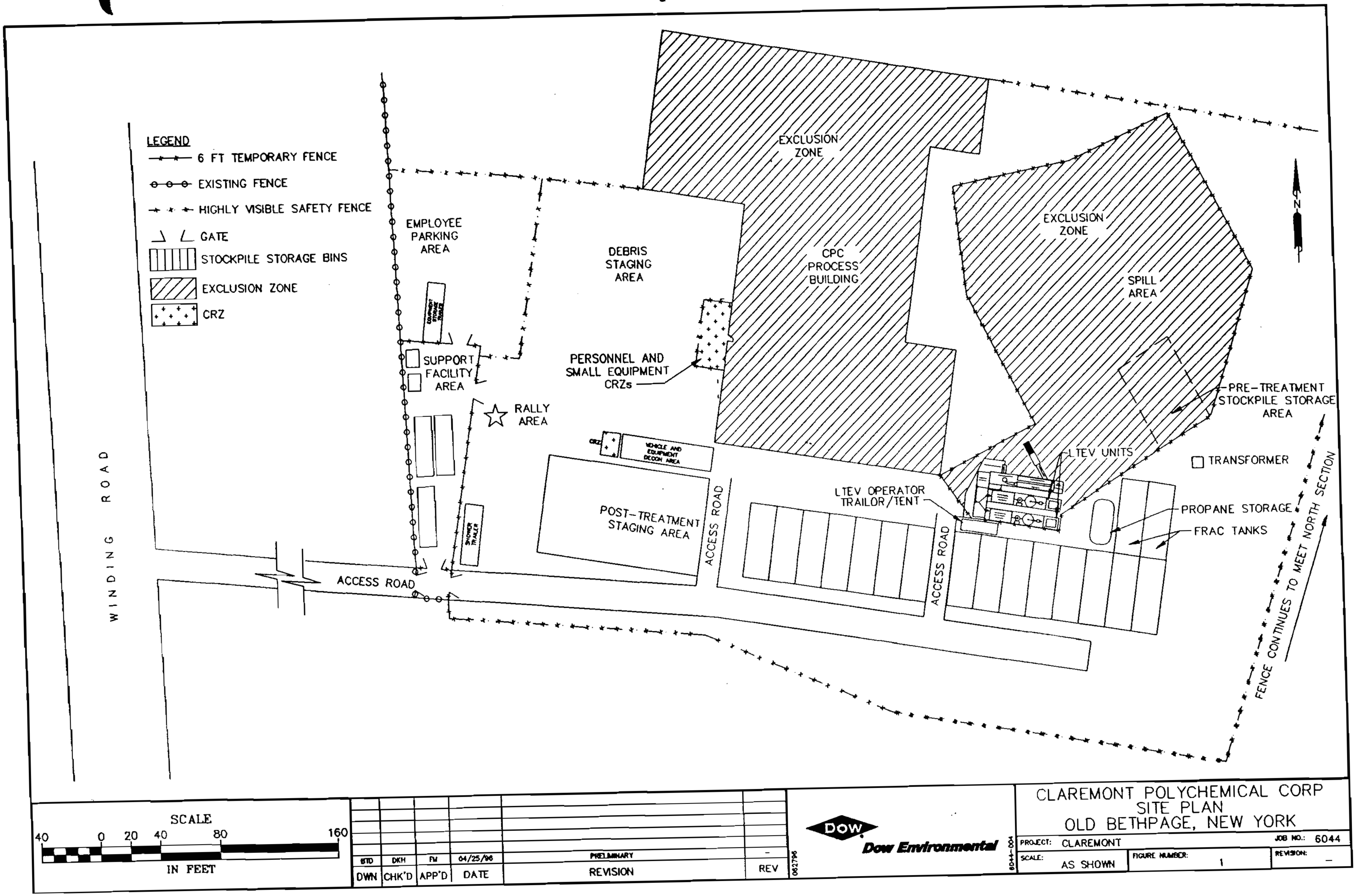
The LTEVS will be operated using the parameters shown to be effective in attaining the required performance standards as demonstrated during Performance Tests. The critical parameters are waste feed rate, soil discharge temperature, drum draft, differential pressure across the baghouse, catalyst inlet temperature, catalyst exit temperature, carbon dioxide and oxygen in the stack, and pH of the scrubber sump water.

Table 3.1
Claremont Polychemical
LTEV Verification Monitoring During Normal Operations

DESCRIPTION	FREQUENCY OF SAMPLING/MONITORING	OFFSITE TESTING	PARAMETER	TEST METHOD(S) 40CFR60 Apx. A
Waste Feed	Continuous Monitoring @ Control Panel		Waste Feed Rate	LTEV Continuous Monitor
Stack Emissions Monitoring	Continuous Emissions Monitoring (CEMs)	None	Total Hydrocarbons (THCs)	Method 25A
			Oxygen (O_2)	Method 3A
			Carbon Dioxide	Method 3A
			Carbon Monoxide	Method 10
	Continuous Monitoring @ Control Panel		Volume/Velocity	LTEV Continuous Monitor
Treated Soils	*1 Composite sample/100 yd^3 Bin Composite Made of 5 Grab Samples	1 Sample/ 100 yd^3	VOCs/Target Compound	Method 8260
Operational Parameters	Continuous Control Panel Display	None	Treated Soils Discharge Temp.	LTEV Continuous Monitor
			Catalyst Inlet Gas Temperature	LTEV Continuous Monitor
			Catalyst Exit Gas Temperature	LTEV Continuous Monitor
			Rotary Drum Draft	LTEV Continuous Monitor
			Scrubber Water Conductivity	LTEV Continuous Monitor

*Grab samples will be collected separately and composited by the analytic laboratory.

FIGURES



LEGEND
6 FT TEMPORARY FENCE
EXISTING FENCE
HIGHLY VISIBLE SAFETY FENCE
GATE
STOCKPILE STORAGE BINS
EXCLUSION ZONE
CRZ
WINDING ROAD
ACCESS ROAD
EMPLOYEE PARKING AREA
SUPPORT FACILITY AREA
RALLY AREA
DEBRIS STAGING AREA
PERSONNEL AND SMALL EQUIPMENT CRZs
VEHICLE AND EQUIPMENT DECON AREA
POST-TREATMENT STAGING AREA
EXCLUSION ZONE
CPC PROCESS BUILDING
EXCLUSION ZONE
SPILL AREA
PRE-TREATMENT STOCKPILE STORAGE AREA
LTEV UNITS
TRANSFORMER
LTEV OPERATOR TRAILOR/TENT
PROPANE STORAGE
FRAC TANKS
ACCESS ROAD
ACCESS ROAD
FENCE CONTINUES TO MEET NORTH SECTION
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SCALE
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Dow Environmental
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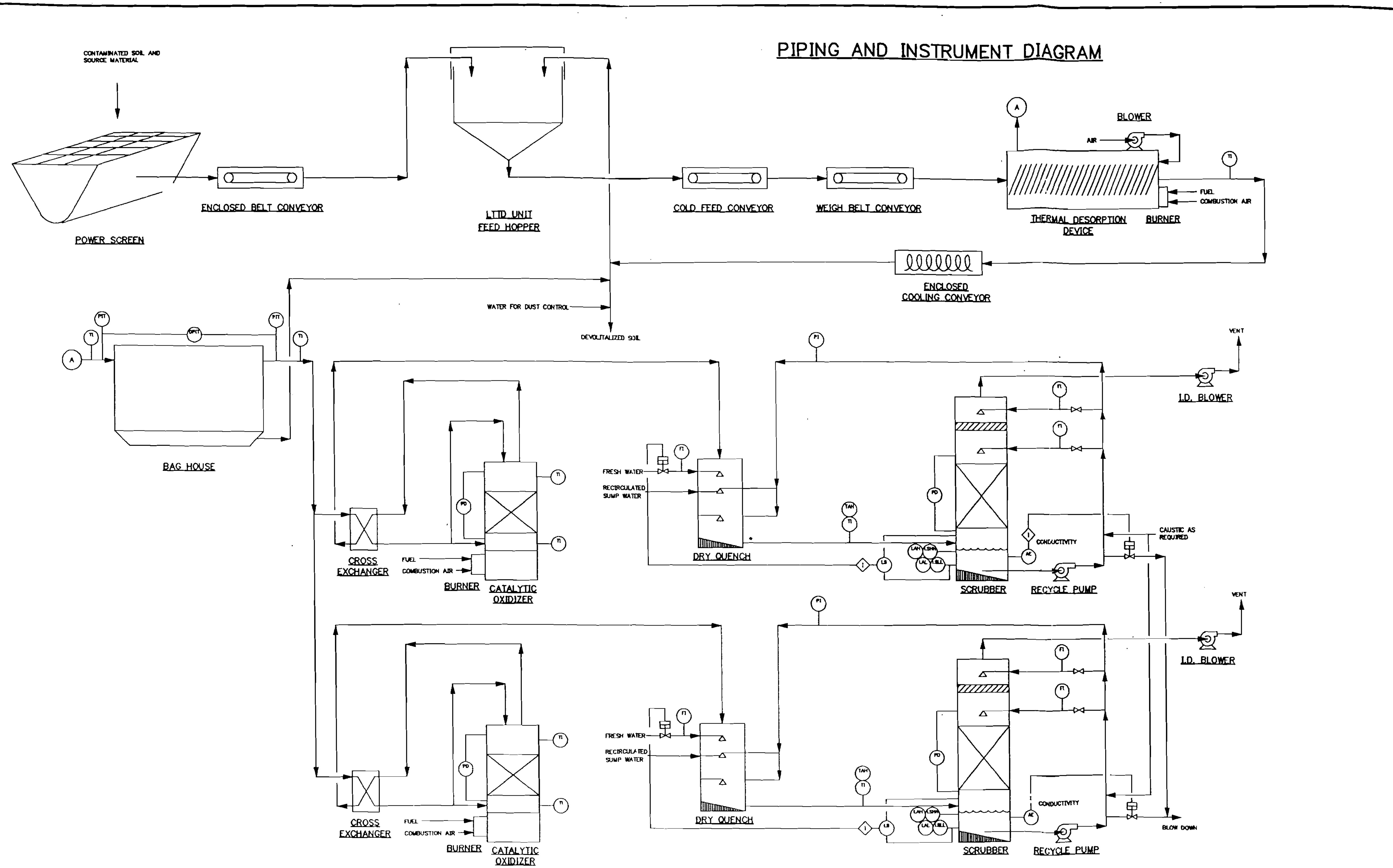
CLAREMONT POLYCHEMICAL CORP
SITE PLAN
OLD BETHPAGE, NEW YORK
PROJECT: CLAREMONT
JOB NO.: 6044
SCALE: AS SHOWN
FIGURE NUMBER: 1
REVISION: -

PIPING AND INSTRUMENT DIAGRAM



RADIAN INTERNATIONAL LLC	SOIL TREATMENT PLANT PROCESS AND INSTRUMENTATION DIAGRAM	FIGURE
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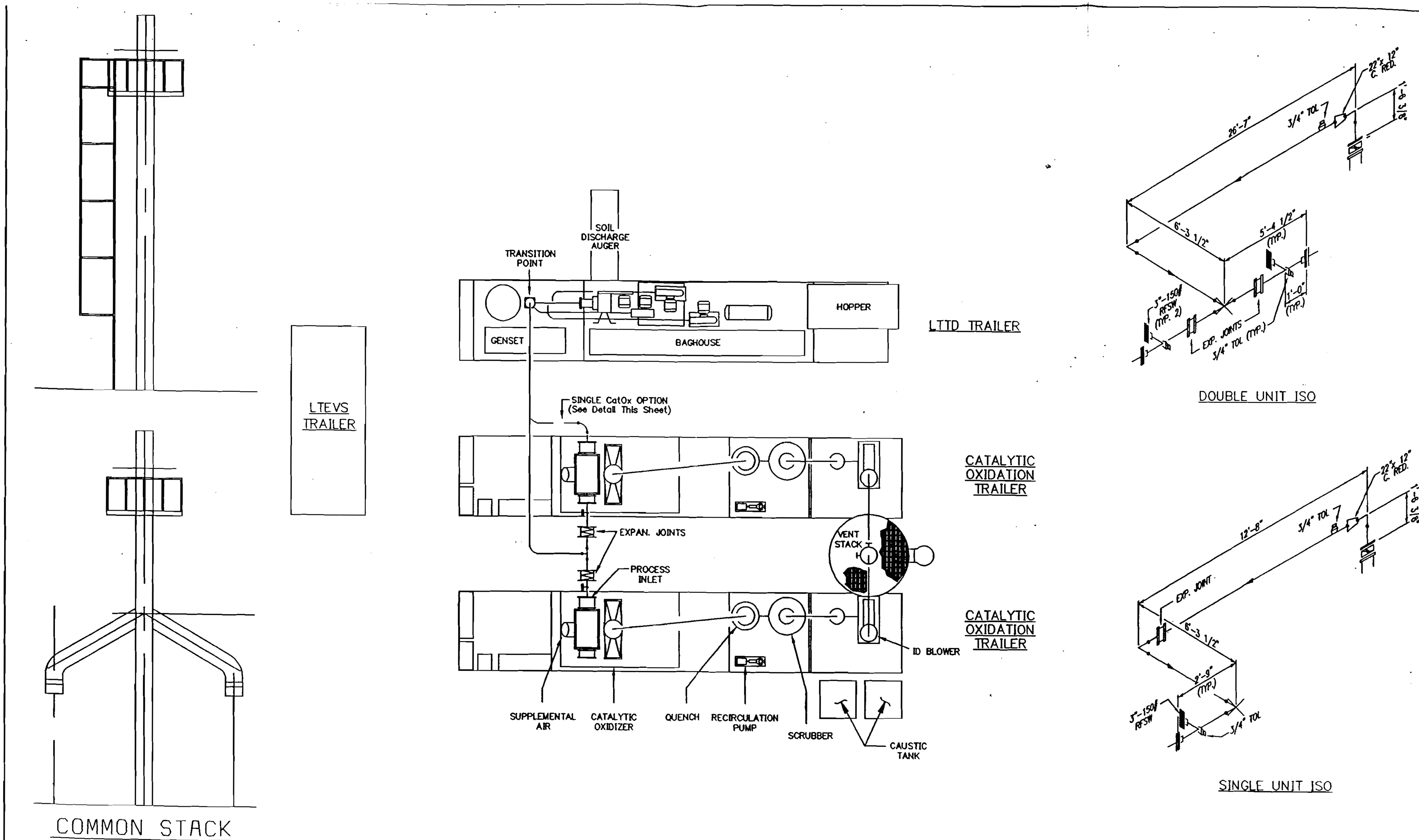

RADIAN INTERNATIONAL LLC	SOIL TREATMENT PLANT GENERAL PLOT PLAN		FIGURE LTEVS-2
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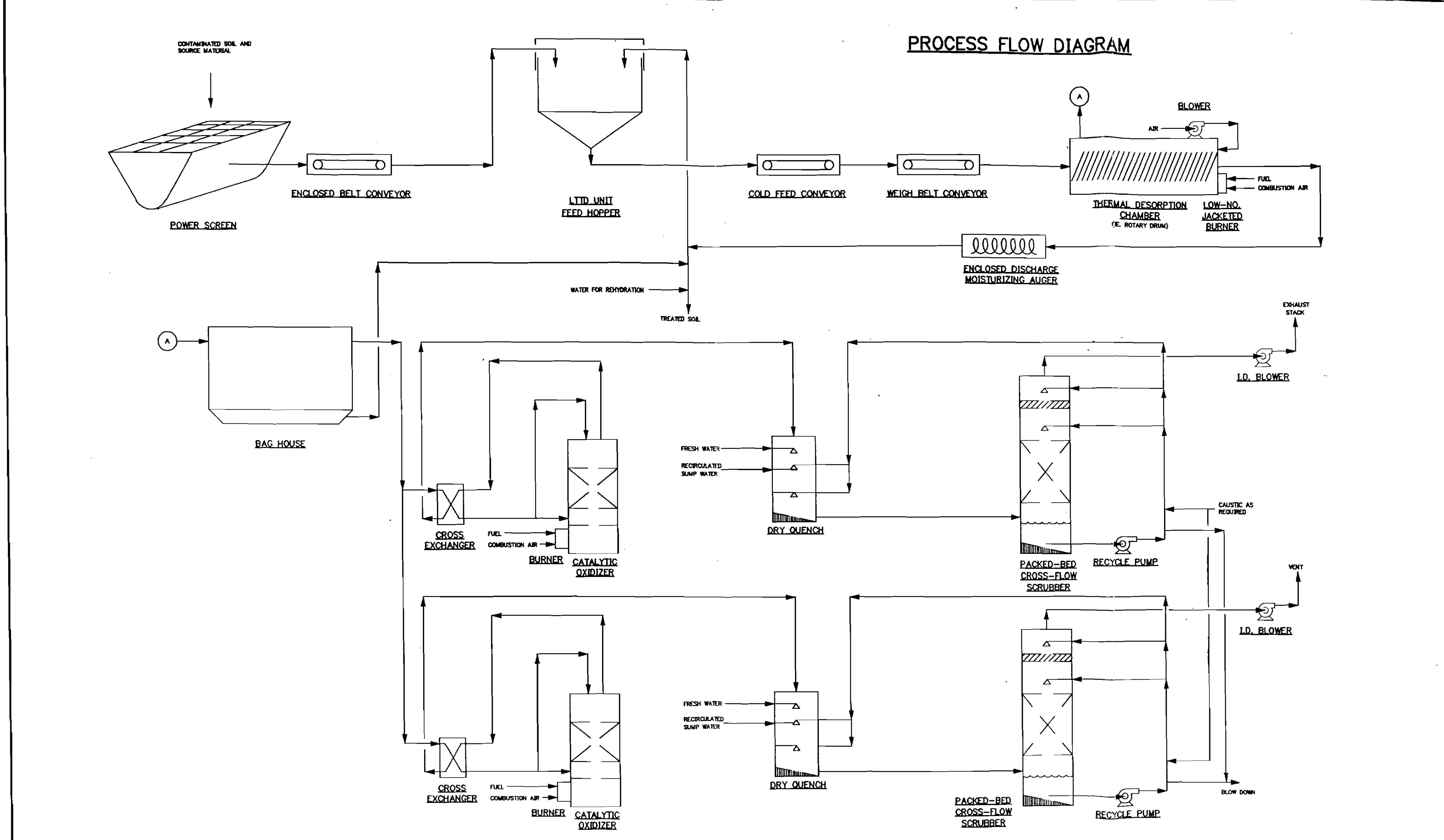


RADIAN INTERNATIONAL LLC

SOIL TREATMENT PLANT PROCESS FLOW DIAGRAM			FIGURE
USACE		OLD BETHPAGE, NEW YORK	LTEVS-3
SCALE: NOT TO SCALE	DATE: 04/24/96	DRAWN BY:	PROJECT NO: 6040

APPENDIX A
RESUMES OF LEAD THERMAL DESORPTION OPERATORS

VINCENT BARBER

EDUCATION

Southern Community College, 1983
Course of Studies: Drafting; Welding
40-Hour Hazardous Waste Operations Safety Course
8-Hour HAZWOPER Refresher Course, April 1995
8-Hour Health and Safety Supervisory Training Course
Welder D1 Classification Water and Public Works

REPRESENTATIVE EXPERIENCE

- The South Plains Army Air Field, Lubbock, TX; Hereford, Amarillo and Lubbock; The HAL Project - Operator of the Thermal Desorber Unit (TDU); Supervisor of field crew.

- Reese Air Force Base, Lubbock, Texas - Remediation/Upgrade of Underground Storage Tanks - Operator of TDU; loader; backhoe; and other heavy equipment as needed; vendor contact for supplies and maintenance.

- McAlester Army Ammunition Plant, McAlester, Oklahoma - Removal and Disposal of PCB-Contaminated Material and Soil at the Minol Building - Operated heavy equipment for special demolition and general site work.

REGISTRATIONS

Certified Welder D1 Classification
Water and Public Works

Professional References: Richard Young, formerly of Ryan-Murphy Inc., (301) 948 0040
Mike Salega, Land and Sea, Swedesboro, New Jersey
Ed Marshall, Clean Harbors, Stepford, New Jersey

KEITH SCHOEMAN Thermal Treatment Unit Operator

TRAINING

Associates of Science, Red Rocks Community College, 1989
Pre-engineering Studies, Colorado School of Mines
OSHA 40-Hour Health & Safety Training, February 1995
OSHA 8-Hour Supervisors Training, April 1992
First Aid/CPR, March 1994
Confined Space Entry Training, March 1995
USAF, Electronics Repair and Installation Training, 1978

PROFESSIONAL HISTORY

Dow Environmental Inc., Operator, Thermal Treatment Division, 1995-Present
Ryan Murphy, Inc., Thermal Desorption Operator/Sr. Site Supervisor, 1990-1995
Accutank Testing Corporation, Field Supervisor, 1990
Seisdata Services-Prairie Eagle Exploration, Senior Observer/Technician, 1981-1990
U.S. Air Force, Radio Equipment Repairman and Installer, 1976-1980

REPRESENTATIVE EXPERIENCE

Mr. Schoeman is an Operator for Dow Environmental Inc.'s (DEI) Thermal Treatment Division, and performs both field operations and troubleshooting of the DEI's Thermal Desorption Units. He advises management concerning field operations requirements including equipment operation and maintenance and repairs. In the field he serves as a Lead Operator, manages mobilization of the thermal desorbers and associated equipment, performs confirmation stack and soil sampling, and conducts health and safety meetings.

In addition, Mr. Schoeman has over five years experience in operating and trouble-shooting thermal desorption equipment for DEI's thermal desorption equipment manufacturer, Ryan Murphy, Inc., of Denver, Colorado. As Senior Site Supervisor, Mr. Schoeman was responsible for the management of soil remediation projects, usually associated with leaking underground storage tank systems. Field sites include project in both the U.S. and Europe. Mr. Schoeman was responsible for site evaluation; mobilization, setup and operation of the GEM; preparation of all paperwork, including regulatory compliance records; sampling of both unprocessed and processed soils; off-gas emissions testing and certification under local and federal EPA guidelines, and management of relationships of both clients and environmental regulation and safety inspectors.

REPRESENTATIVE PROJECT EXPERIENCE

Senior Site Supervisor/Operator

- Served as Senior Site Supervisor for Ryan-Murphy, Inc. on numerous projects including the remediation of the following:
  - 20,000 tons of petroleum contaminated soils in Freiberg, Germany.
  - 2,500 tons of diesel contaminated soils in Santa Barbara, California.
  - 5,000 tons of JP4 contaminated soils at the Washington National Airport.

REPRESENTATIVE PROJECT EXPERIENCE

- Project manager on various heavy construction projects.
- Self-employed construction management supervisor.
- Heavy equipment operator and mechanic.
- Managed over 35 GEM projects since 1990.

RICHARD F. YOUNG — Senior Thermal Treatment Unit Operator

EDUCATION

Colorado Aerotech, FAA Air Frame and Power Plant, Mechanics License, 1990

TRAINING

OSHA 40-Hour Basic Health and Safety Training, September 1990
OSHA 8-Hour Supervisors Training, September 1994
First Aid/CPR, March 1995

PROFESSIONAL HISTORY

Dow Environmental Inc., Senior Operator, Thermal Treatment Division, 1995-Present
Ryan Murphy, Inc., Thermal Desorption Operator/Sr. Site Supervisor, 1990-1994
U.S. Truck Driving Schools, Instructor, 1989-1990
Rocky Mountain Excavators, Inc., Operations Manager, 1979-1989
Randall and Blake. Inc., Heavy Equipment Operator, 1977-1979
U.S. Navy Seabees, Heavy Equipment Operator, 1972-1976

REPRESENTATIVE EXPERIENCE

Mr. Young is a Senior Operator for Dow Environmental Inc.'s (DEI) Thermal Treatment Division, and performs both field operations and troubleshooting of the DEI's Thermal Desörption Units. He advises management concerning field operations requirements including equipment operation, maintenance and repairs, and assists in the preparation of Standard Operating Procedures. In the field he serves as a Lead Operator, manages mobilization of the thermal desorbers and associated equipment, performs confirmation stack and soil sampling, and conducts health and safety meetings.

In addition, Mr. Young has over four years experience in operating and trouble-shooting thermal desorption equipment for DEI's thermal desorption equipment manufacturer, Ryan Murphy, Inc., of Denver, Colorado. As Senior Site Supervisor for Ryan Murphy, Mr. Young developed circulation for and trained thermal desorption operators for that Company's customers including DEI. He provided the latest revisions for both the technical and operational manuals for the GEM 1000C. He is knowledgeable in basic electronics, industrial electrical repair, heavy equipment operations and repair, techniques of instruction in his areas of expertise, and aircraft mechanics.

REPRESENTATIVE PROJECT EXPERIENCE

Site Supervisor/Operator

- Served as Senior Site Supervisor for the Ryan-Murphy, Inc. on numerous projects including the remediation of the following:

  - 15,000 tons of contaminated soils at March Air Force Base in Riverside County, CA

  - 7,000 tons of contaminated soils for Exxon Corporation in Montana

  - 12,000 tons of contaminated soils for Baxter Medical Supplies in Orange County, CA

  - 6,000 to 7,000 tons of contaminated soils for Unocal at various sites in the Los Angeles Basin in CA

  - Approximately 4,000 tons of contaminated soils for the Corps of Engineers at National Airport

- Provided training of Thermal Desorption Operators for various companies including:

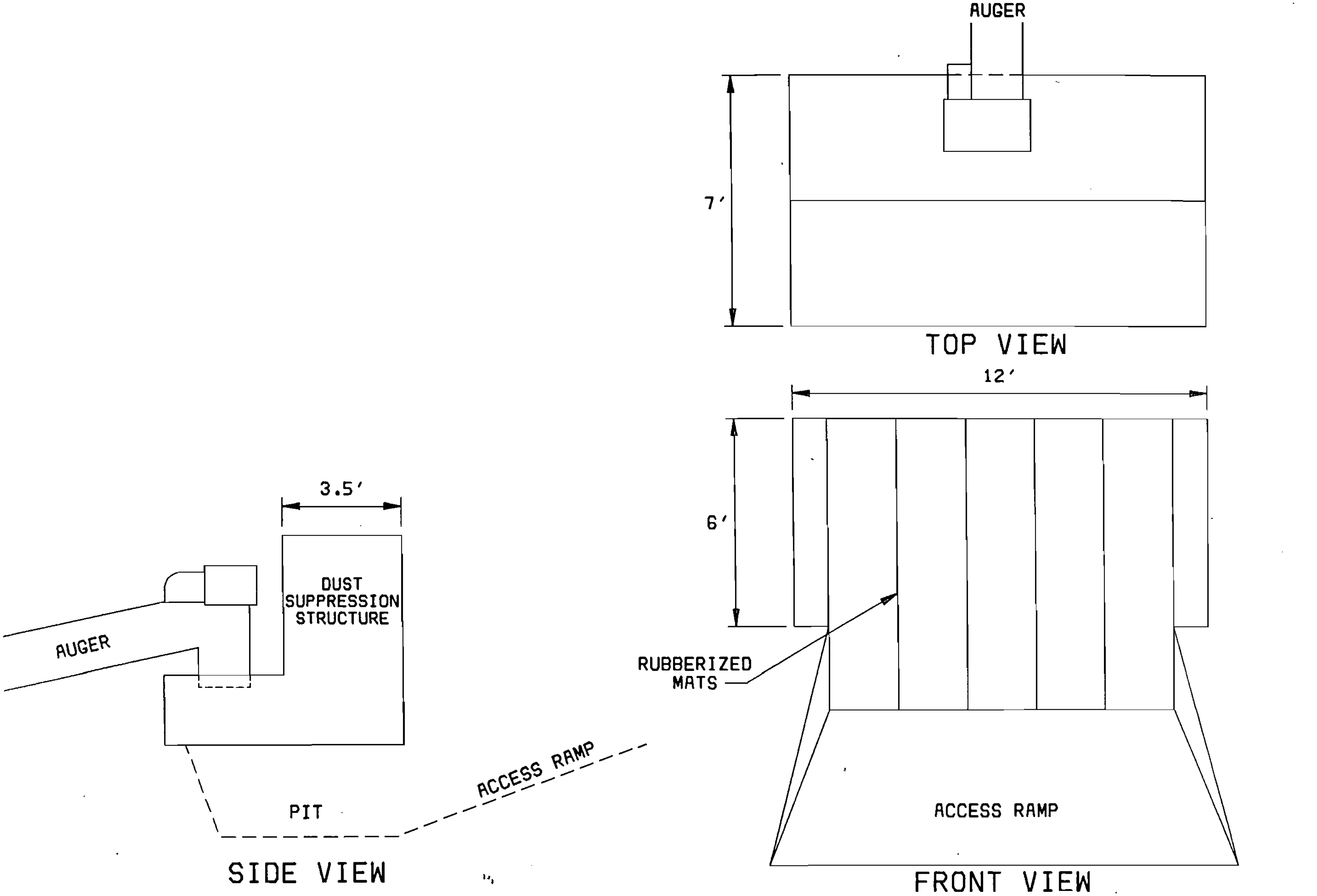
  - Southwest Soils, Inc. of Arizona
  - Midwest Soils, Inc. of Illinois
  - Marathon Oil of Alaska
  - Dow Environmental Inc. (formerly AWD Technologies, Inc.)
  - Green Plan Environmental, Inc. of Canada

APPENDIX B
SPECIFICATIONS FOR TEMPORARY LTEVS DUST SUPPRESSION STRUCTURE

SPECIFICATIONS FOR TEMPORARY LTEVS DUST SUPPRESSION STRUCTURE

A temporary dust containment/suppression structure will be constructed around the exit port of the discharge moisturizing auger and over a pit with a sloping access ramp. The pit will slope from one end to allow a loader to enter and will have a near vertical back wall to push against when picking up stockpiled soils. At its deepest point the pit will be about 2.5 to 4 feet deep, depending on the nature of the soil and terrain and loader access requirements. The dimensions of this structure will be approximately 12 ft wide by 7 ft deep by 6 ft high. The structure will be constructed of 3/4" plywood with 4 in X 4 in support legs and beams and with 2 in X 4 in nailers. A drawing of the structure appears below in Figure A-1 of this Appendix. Fiberglass insulation will be used to insulate and seal the opening where the auger discharge port enters the dust suppression structure. Rubberized sheeting or matting (or equivalent) will be hung in strips across the front of the structure to retain dust and still allow a loader bucket to reach into the structure to pick up remoisturized soils stockpiled within the structure.

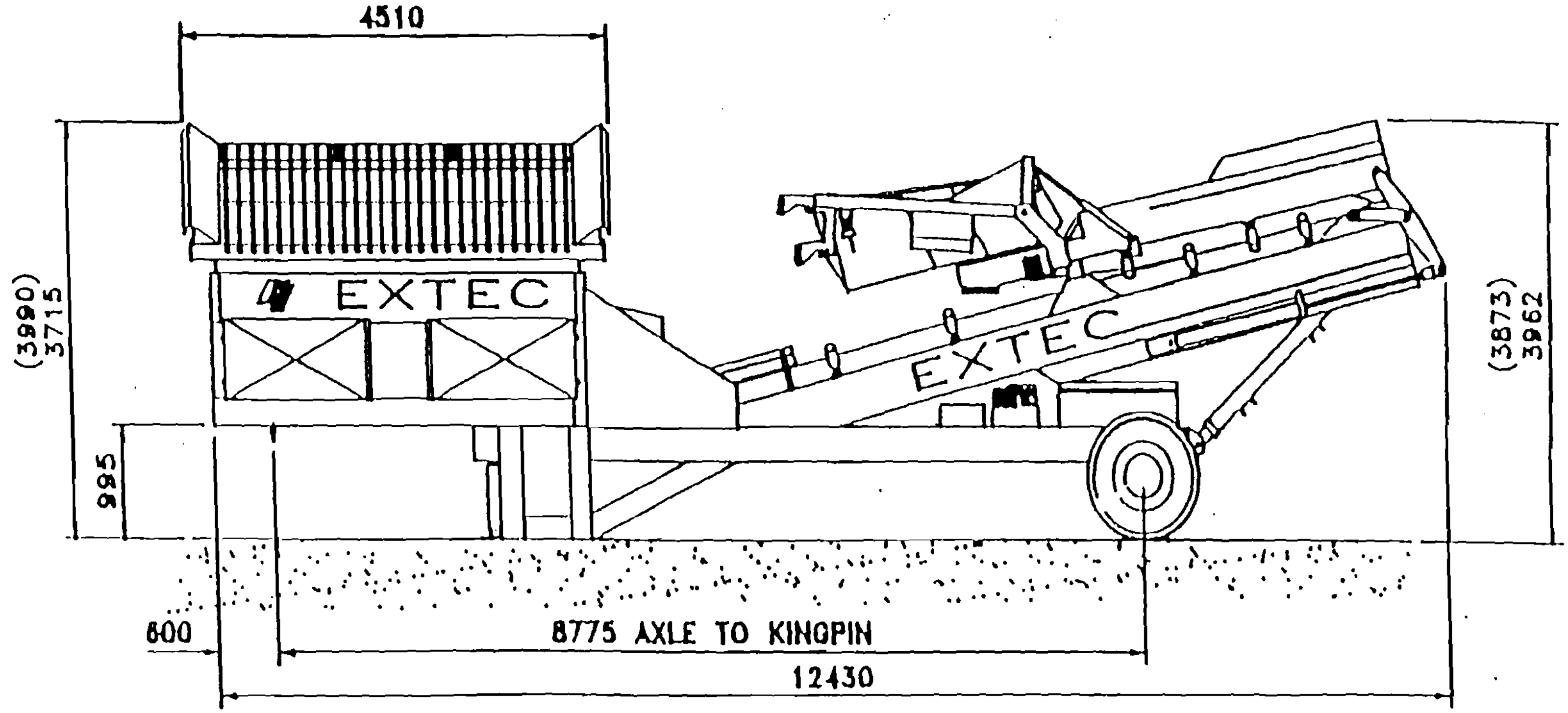
A minimum of 12 high pressure water fogging type spray nozzles will be located inside of the dust suppression structure along the top and oriented to produce a fog barrier to inhibit dust from exiting the front of the structure. These nozzles are part of a fog system designed and manufactured to suppress ultra-fine dust by Environmental Engineering Concepts, 1229 South Gene Autry Trail, Palm Springs, CA 92264. The system consists of a high pressure pump module, an atomization line, a manifold line, atomizing nozzles and plugs, and automatic drain valves.



RADIAN INTERNATIONAL LLC	DUST SUPPRESSION STRUCTURE		FIGURE A-1
	OLD BETHPAGE, NEW YORK	PROJECT NUMBER: 6044	
	SCALE: N.T.S.	DATE: 07/03/96	DELIVERY

EXTEC SCREENS AND CRUSHERS

Extec Screens and Crushers Limited
A subsidiary of Extec Industries plc



All dimensions in brackets show towing dimensions

EXTEC 6000S

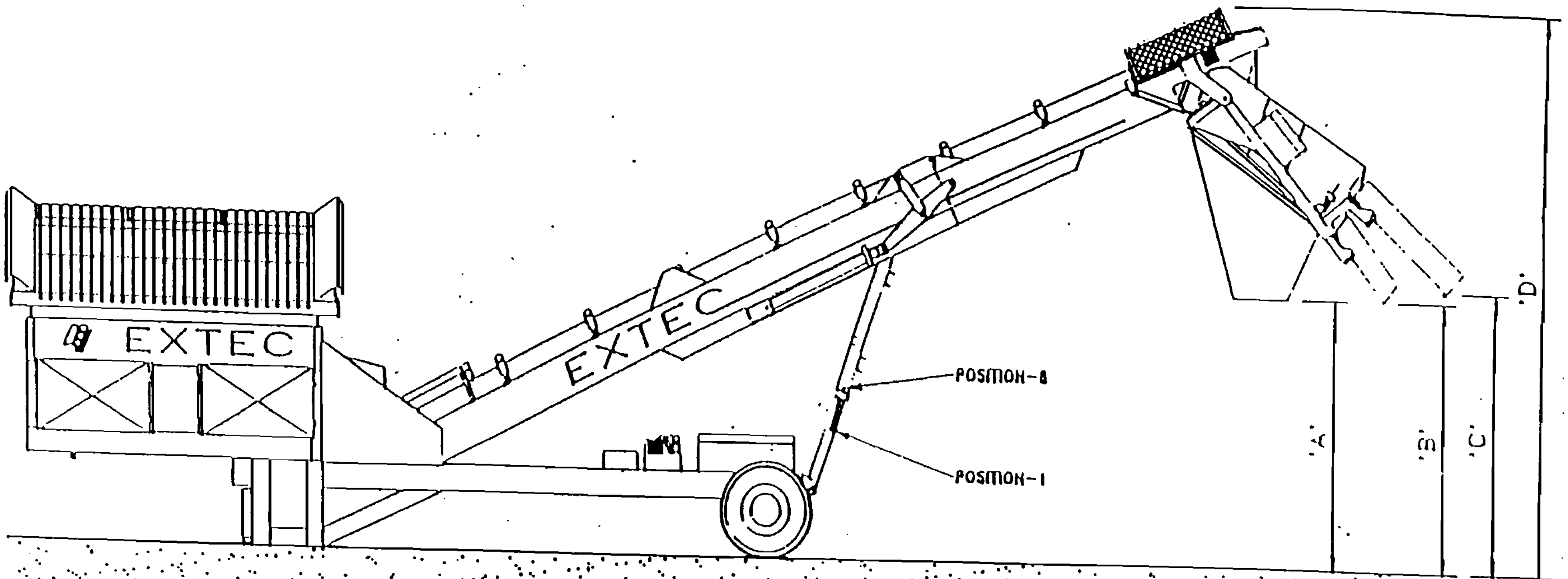
SPECIFICATION SUMMARY

Overall length (towing)	12.43M	40' 09"	Main conveyor width	1000mm	40"
Overall width (towing)	2.75M	9' 00"	Hopper loading width	4.5M	14' 07"
Overall height (towing)	3.99M	13' 01"	Feeder conveyor length	3.70M	12' 00"
Total gross weight	14.245kg	14.02 T	Feeder conveyor width	1000mm	40"
Hopper capacity	8.00 CuM	10.46Cu Yd	Hydraulic system capacity	530Ltrs	140U.S gall
Main conveyor length	12.8M	40' 00"	Power unit: DEUTZ 67Hp (50kw) Diesel engine		

Due to our Design Department constantly seeking ways to improve our products, we reserve the right to alter specifications at our descretion.

EXTE ; SCREENS AND CRJSHERS

Extec Screens and Crushers Limited
A subsidiary of Extec Industries plc



All dimensions approx

Dimensions taken when screenbox is in the optimum position.

EXTEC 6000S

POSITION	DIM 'A'	DIM 'B'	DIM 'C'	DIM 'D'
1	2070mm	1750mm	1870mm	4830mm
2	2200mm	1930mm	2060mm	5000mm
3	2360mm	2110mm	2250mm	5100mm
4	2500mm	2280mm	2440mm	5230mm
5	2670mm	2480mm	2630mm	5420mm
6	2820mm	2620mm	2810mm	5750mm
7	3000mm	2880mm	3030mm	5800mm
8	3100mm	2970mm	3150mm	5900mm

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