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MALCOLM PIRNIE

OPERATIONS AND MAINTENANCE MANUAL

ROCHESTER FIRE TRAINING ACADEMY
ROCHESTER, NEW YORK

MARCH 1998

MALCOLM PIRNIE, INC.

P. O. Box 1938
Buffalo, New York 14219

0965-086-140/OM

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B	Groundwater Collection and Treatment System Operating Variables - Daily Logs
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1.0 INTRODUCTION

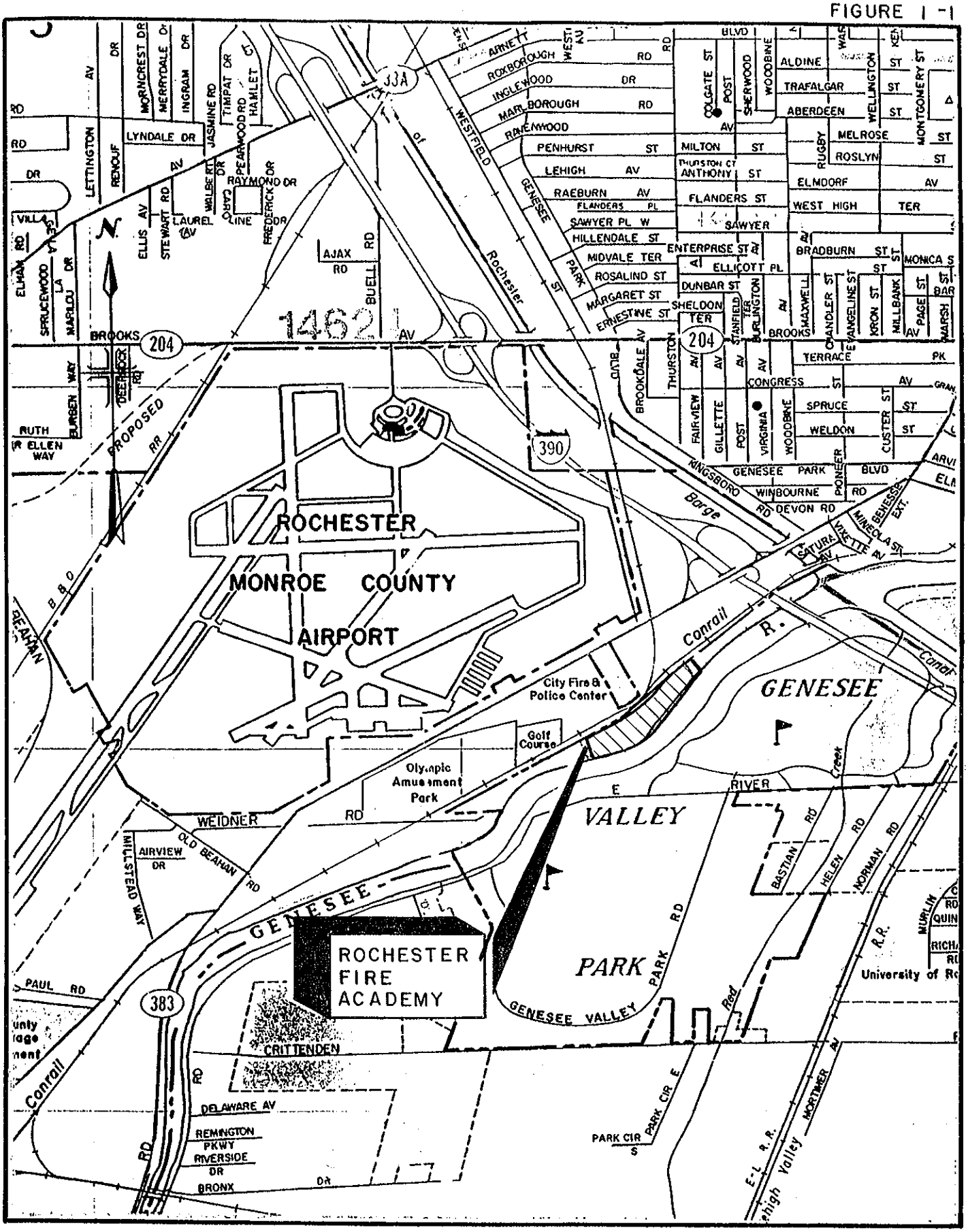
1.1 SITE DESCRIPTION

The Rochester Fire Training Academy site (see Figure 1-1 for site location) consists of four distinct areas as illustrated on Figure 1-2: the North Disposal Area (NDA), the South Disposal Area (SDA), the Training Grounds Area (TGA), and the Police Obstacle Course and Firing Range (PFR). The NDA, TGA, and SDA were involved in chemical use and disposal. The Genesee Valley Park Area (GVPA) adjacent to the eastern perimeter of this site, was also found to have elevated contaminant concentrations in the soil and was included in the remedial effort. The remedial measures implemented at the site included:

- Excavation and treatment of soils in the SDA and TGA followed by off-site/on-site disposal (in the NDA).
- Excavation and placement of GVPA soils in the NDA.
- Restoration of the remediation areas (SDA, TGA, and GVPA) and the capping of the North Disposal Area.
- Groundwater collection and treatment in the SDA.

The SDA was backfilled with clean fill and the ground surface was restored using six inches of seeded topsoil. TGA grades were reestablished with clean fill up to a prevailing grade of 523 feet above mean sea level (msl) in the eastern portion of the area to 522 feet above msl in the western portion, which is above the 100-year flood elevation. An asphalt cover system will be placed over the TGA under a separate Monroe County Construction contract for the Aircraft Rescue Firefighting Facility (ARFF) project. The GVPA was backfilled with clean fill and the asphalt bicycle path was replaced. The NDA was cleared and grubbed, and fill including excavated GVPA, SDA and TGA soils was placed and compacted in the NDA to achieve a minimum four percent (4%) grade. A composite synthetic/soil cover system consisting of a 6-inch sand layer, followed by a 40-mil HDPE synthetic membrane, a geocomposite drainage layer, 24-inches of barrier soil, and six

FIGURE 1-1



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ROCHESTER FIRE ACADEMY

SITE LOCATION MAP

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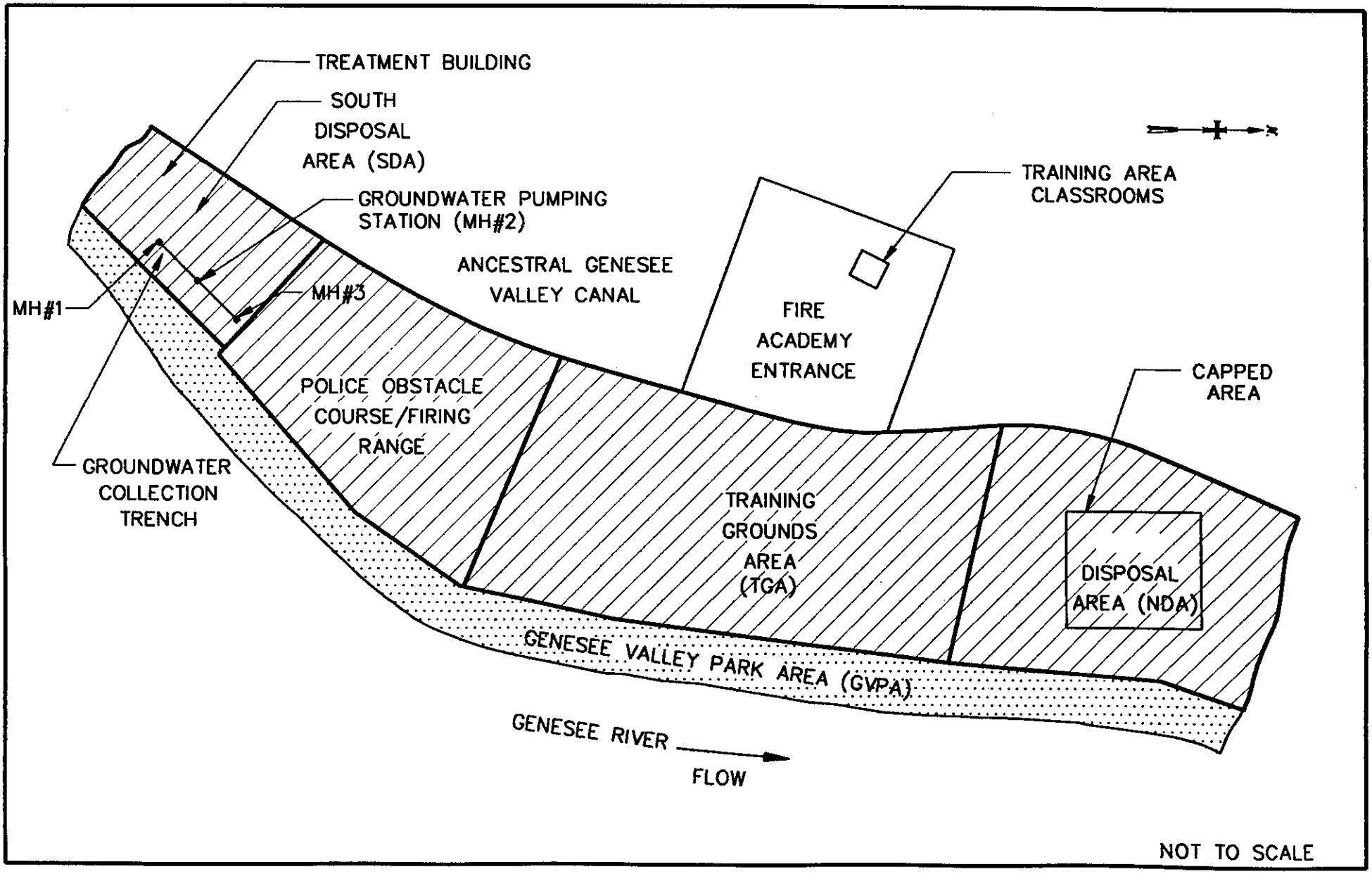

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SITE MAP

CITY OF ROCHESTER

SEPTEMBER 1997

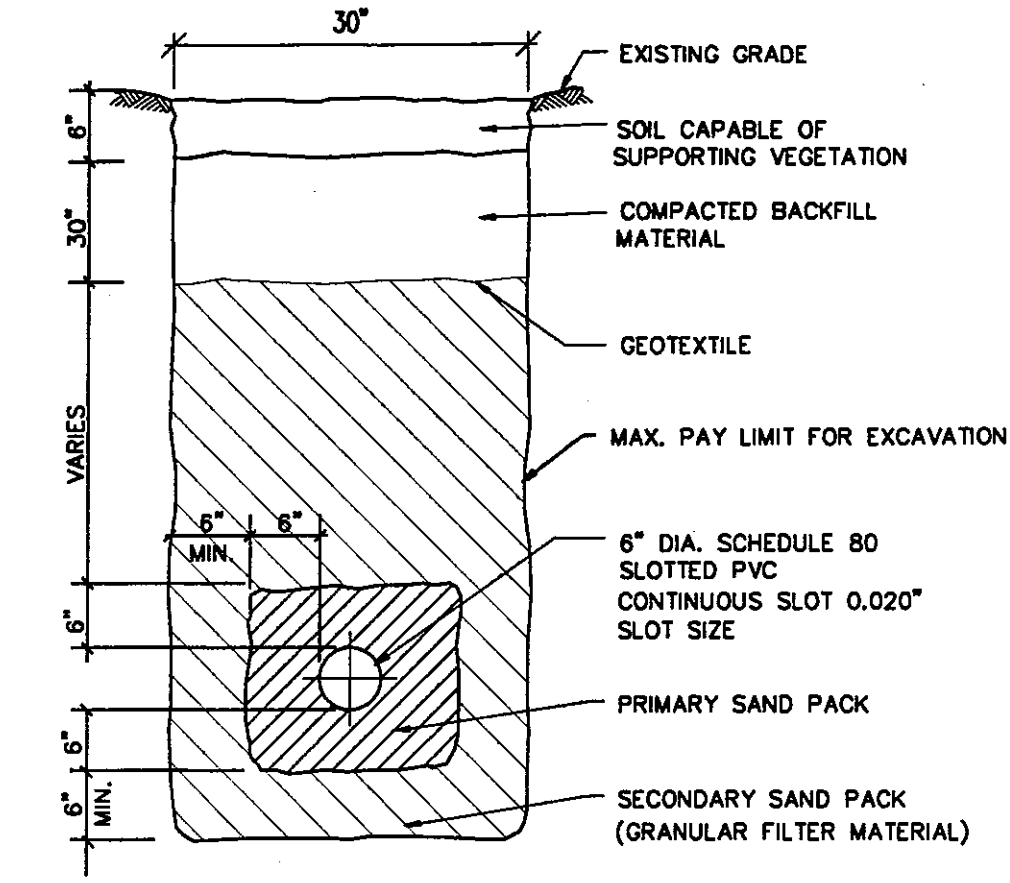
FIGURE 1-2

inches of seeded topsoil was placed over the NDA fill. Storm water drainage was provided in the TGA, NDA and PFR.

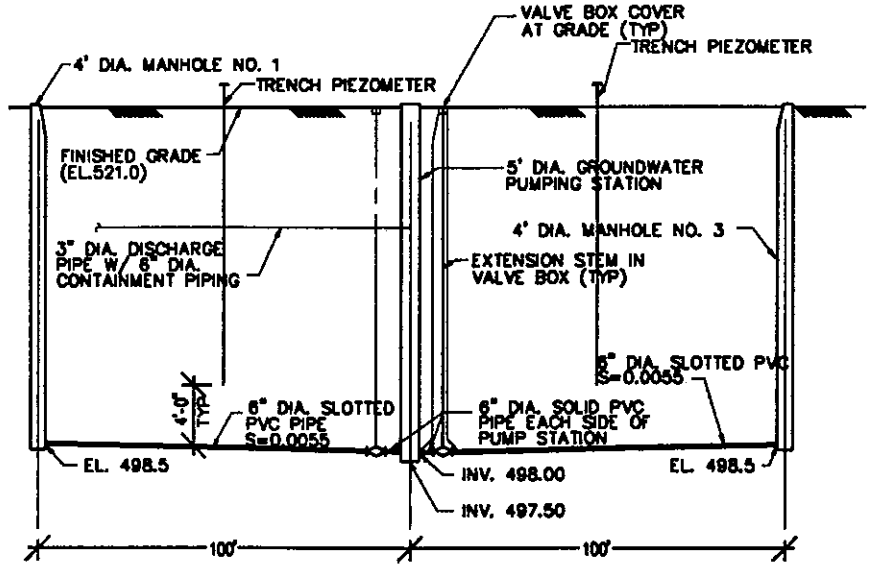
The groundwater collection system installed in the South Disposal Area consists of a 200-foot long, 22-foot deep groundwater collection trench installed in the overburden. The trench consists of two layers of gravel with a slotted 6-inch collection pipe that slopes from the manhole at each end to the sump (i.e., pumping station) in the center (see Figure 1-3). Groundwater is collected in the sump and pumped to the on-site treatment system. The treatment system is located in a clear-span, rigid-frame premanufactured metal building. Groundwater from the collection trench is conveyed to the treatment system via a PVC pipeline. A block flow diagram of the groundwater treatment process is provided in Figure 1-4.

The groundwater treatment system utilizes air stripping and activated carbon technologies to remove VOCs and PCBs, respectively, from the collected groundwater. The first step in the groundwater treatment process is the addition of a linear polyphosphate sequestering agent to minimize potential scale buildup in the process equipment. The groundwater then passes through a bag filter to remove particulates. During dewatering of the collection trench soils, one of the two bag filter vessels may be fitted with oil-adsorbing bags to remove non-aqueous phase liquid (NAPL) which may enter the treatment system. The filtered groundwater enters a 1,500-gallon feed tank and is pumped to the air stripper. The low profile air stripper removes VOCs from the groundwater. After flowing across the air stripper trays, the groundwater is pumped from the air stripper sump to the activated carbon system for removal of PCBs. Effluent from the activated carbon canisters is collected in a 1,500-gallon discharge tank prior to being pumped to the sanitary sewer located near the Fire Training Academy buildings.

The groundwater treatment system is designed for a continuous flow rate of 40 gpm with minimal operator attention. The control system provided will default to a batch mode process operation regime when influent flows are less than 40 gpm.



TYPICAL GROUNDWATER COLLECTION TRENCH BEDDING DETAIL



GROUNDWATER COLLECTION TRENCH PROFILE

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ROC-3

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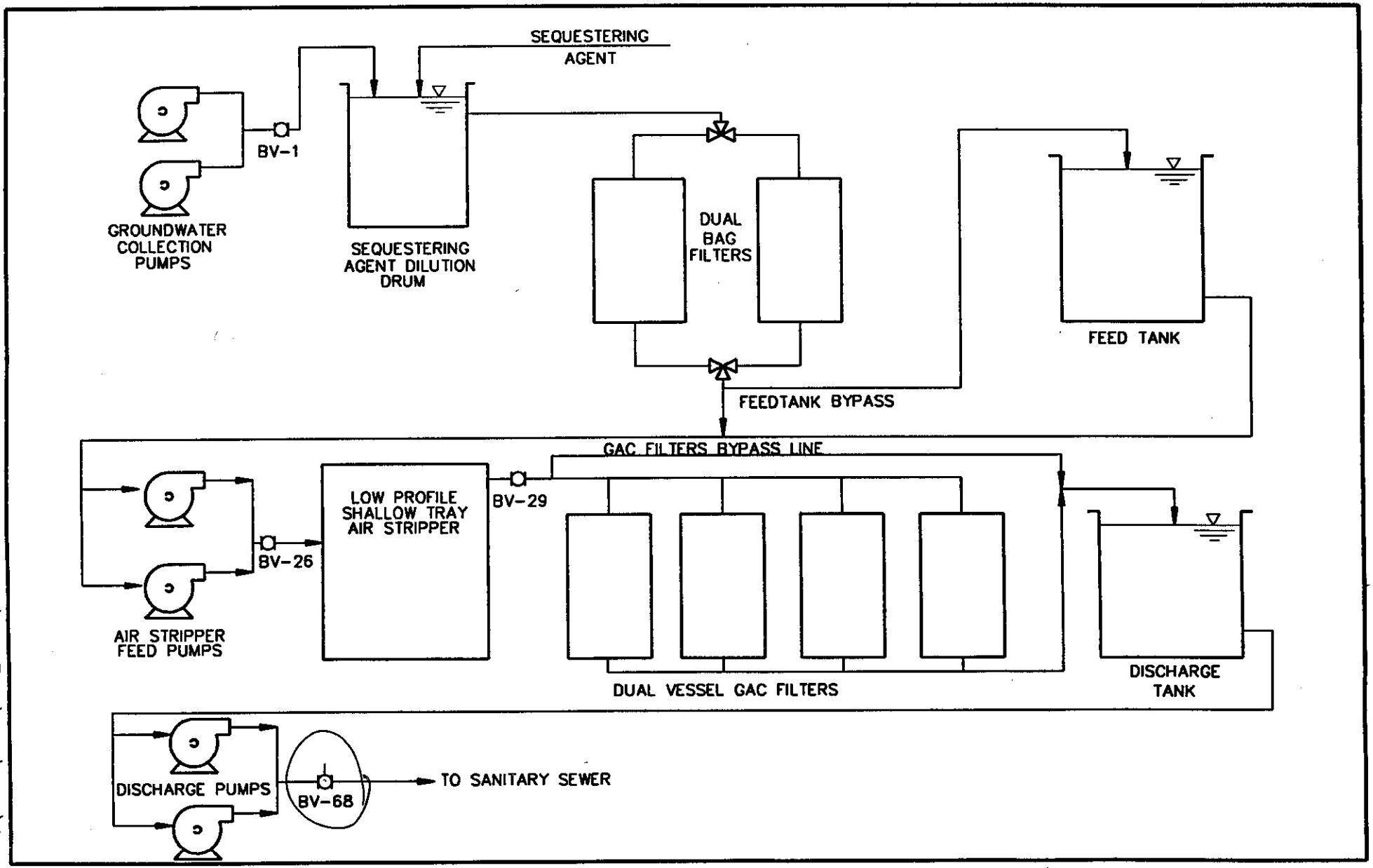
O&M MANUAL
GROUNDWATER COLLECTION TRENCH
SOUTH DISPOSAL AREA



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O&M MANUAL
GROUNDWATER TREATMENT
PROCESS SCHEMATIC

CITY OF ROCHESTER SEPTEMBER 1997

FIGURE 1-4

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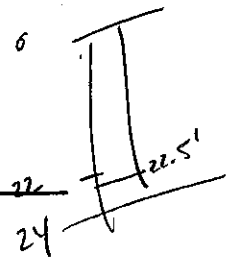
2.0 GROUNDWATER COLLECTION AND TREATMENT SYSTEM

The major components of the groundwater collection and treatment system are discussed below. This section describes the collection trench and process equipment, as well as control schemes, common operating problems, and laboratory controls (where appropriate). Appendix A presents a standard operating procedure (SOP) for start-up and shut-down of the overall collection and treatment system (Appendix A.1) as well as individual SOPs identifying several start-up, shut-down and maintenance procedures for the individual process units. Appendix A.10 presents a maintenance checklist and schedule for equipment requiring routine maintenance and cleaning.



2.1 GROUNDWATER COLLECTION TRENCH

2.1.1 General

2.1.1.1 Description

The groundwater collection trench collects overburden groundwater and maintains an inward hydraulic gradient in the water-bearing zone within the South Disposal Area. The collection trench is comprised of a 6-inch diameter slotted drain pipe enveloped in permeable backfill material (see Figure 1-3). The drain pipe is connected to a 24-foot deep, 5-foot diameter collection sump located midway across the length of the drain. Groundwater levels within the trench can be monitored using a water level indicator in piezometers installed within the trench backfill material between the collection sump and the end of the trench. The collected groundwater is pumped to the treatment system via force main.

2.1.1.2 Control

The groundwater collection trench contains piezometers. The piezometers should be checked periodically with a water level indicator to monitor the level of the groundwater (see Section 3.4).

24 well 19.3'

2.1.1.3 Major Components

The major components of the collection trench are the 6-inch diameter slotted drain pipe and the 24-foot deep collection sump. Refer to Figure 1-3 for these component details.

2.1.1.4 Common Operating Problems

There are no common operating problems associated with the groundwater collection trench.

2.1.1.5 Startup

Prior to the initial system startup, the 6-inch drain pipes and connections to the pump station should be inspected to ensure that there are no obstructions to flow. The level controller inside the groundwater collection sump should also be set to initiate/deactivate the pumps at the levels identified in Section 2.2.1.2. During the start-up period, water elevations in the piezometers should be monitored to ensure Drayton to the desired elevation. Specifically, the groundwater should, within a period of approximately 2 weeks or less, be continuously maintained at an elevation between the pump start and stop levels.

2.1.2 Normal Operating Procedures

In normal operating mode, the groundwater collection system draws down the surrounding groundwater through the collection trench into the collection sump. Collected groundwater is pumped from the collection sump to the groundwater treatment system via a PVC force main.

2.1.3 Maintenance

The groundwater elevation must remain above the sand bedding surrounding the collection trench, an approximate elevation of 499.5 feet above msl or 22.5 feet below the finish grade elevation of 522 feet above msl. If the groundwater elevation drops below this level, oxidation within the pores of the sand bedding may occur, resulting in clogged sand bedding. An SOP for maintenance of the groundwater collection trench and pump station is presented in Appendix A.2.

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2.2 PUMP STATION

2.2.1 General

2.2.1.1 Description

The groundwater collection pump station lifts the collected groundwater to the treatment system. The pump station consists of two submersible, end suction, centrifugal type pumps.

2.2.1.2 Control

The groundwater collection pumps are controlled by a pressure transducer in the pump station and the air stripper feed tank. The programmable logic controller (PLC - see Section 2.11) measures water level in the pump station and activates the collection pump at high level (approximately 20 feet below grade, or 502 feet above msl) and deactivates the pump at low level (approximately 22 feet below grade, or 500 feet msl). A high level alarm, set at approximately 18 feet below grade, activates if the groundwater level in the pump station rises to this point, indicating that the collection pumps have failed or are unable to maintain the desired groundwater drawdown. As well, the high level switch from the air stripper feed tank over-rides the pump station controls and turns off the collection pump. A flowmeter is also attached to the force main to measure the influent flow to the system.

2.2.1.3 Major Components

Major components include the impeller, pump shaft and motor. The impeller is constructed of thermoplastic material and the pump shaft is constructed of stainless steel. Design data are listed below:

Design Capacity (gpm)	38
Design Total Dynamic Head (ft)	80
Speed (rpm)	3450
Pump Discharge (in)	2
Motor Horsepower (hp)	1.5
Motor Voltage	460 V / 3 ϕ / 60 Hz
Solid Size (in)	3/4

2.2.1.4 Common Operating Problems

See the collection pump manufacturer's operations and maintenance manual for descriptions of and solutions to common operating problems.

2.2.1.5 Startup

Prior to startup, check all electrical connections to verify that the pump is correctly installed. Refer to the groundwater collection pump operating manual for additional startup procedures.

2.2.2 Normal Operating Procedures

Under normal operating conditions, the groundwater pump will transport groundwater from the collection trench sump to the groundwater treatment system. The low level switch will be positioned to ensure that the collection trench pipe and sand bedding remains flooded at all times. The high level switch in the air stripper feed tank, if activated, will turn off the groundwater collection pump to prevent an overflow in the treatment system.

2.2.3 Maintenance

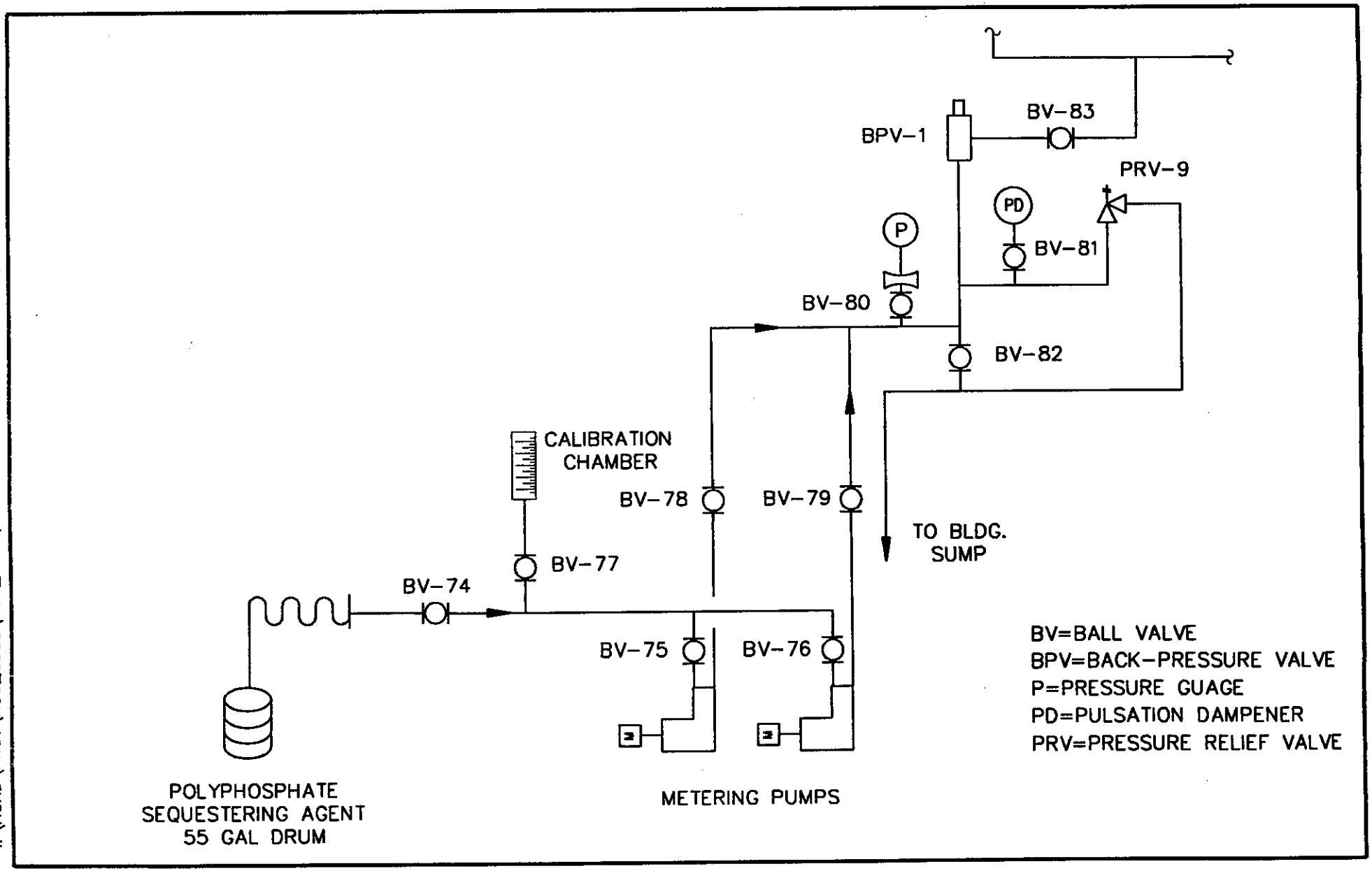
Refer to the collection pump manufacturer's operation and maintenance manual for detailed maintenance procedures of the groundwater collection pumps. The pumps must be removed from the collection sump using the lift cables and a tripod setup. An SOP covering general maintenance of the groundwater collection trench and pump station is presented in Appendix A.2.

2.3 SEQUESTERING AGENT FEED SYSTEM

2.3.1 General

2.3.1.1 Description

The sequestering agent feed system consists of one 55-gallon sequestering agent feed drum and two feed pumps as illustrated on Figure 2-1. The feed pumps are constant-speed



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ROC-1

ROCHESTER FIRE TRAINING ACADEMY
O&M MANUAL
POLYPHOSPHATE SEQUESTERING
AGENT FEED SYSTEM

CITY OF ROCHESTER SEPTEMBER 1997

FIGURE 2-1

simplex, pulseless hydraulically-activated, diaphragm metering pumps with automatic stroke adjustment. An external backpressure valve is provided to maintain metering pump discharge pressure above the manufacturer's recommended minimum pressure. A pressure relief valve is provided to protect the piping system from over pressurization. The polyphosphate sequestering agent is introduced into the groundwater upstream of the bag filters. The sequestering agent complexes with iron, manganese and hardness (calcium and magnesium) ions in solution, minimizing scale buildup in the process equipment. The groundwater then passes through the bag filters which remove suspended solids.

2.3.1.2 Control

The sequestering agent feed pumps are controlled by the integral electronic motor controller with auto/manual selection and digital capacity indicator. Manual control is accomplished with unit-mounted increase/decrease pushbuttons. Automatic speed control input is via a remote 4-20 mA signal from the influent flow meter (FE002).

2.3.1.3 Major Components

(i) Sequestering agent (55-gallon drum).

(ii) Two sequestering agent feed pumps; constant-speed simplex; pulseless, hydraulically-activated diaphragm-type with automatic stroke adjustment.

(iii) External backpressure valve.

(iv) Pressure relief valves with each pump to protect the piping system from overpressure (each pressure relief valve is factory preset for 50 psig).

(v) Calibration chamber for checking pump output periodically and during startup.

2.3.1.4 Laboratory Control

Determining the iron and total hardness concentrations in the process influent is required to establish the sequestering agent dosage. A grab sample should be collected periodically from the treatment system influent sample tap BV-1, and analyzed for total iron, total manganese and total hardness. Hach test kits are suitable for conducting these analyses.

The iron test kit should have a 0-10 mg/l range, the manganese test kit should have a 0-3 mg/l range, and the total hardness test kit should have a 20-400 mg/l as $CaCO_3$ range. The sample should be diluted if necessary to bring the concentrations into the range of the test kits.

2.3.1.5 Start-Up

Prior to start-up, all lines should be inspected for breakage and adequate attachment to equipment. Set the automatic response on the metering pumps to provide sequestering agent flow rates as indicated on the following table:

Metering Pump Flow Rates
Using Aqua-Mag Sequestering Agent

System Flow Rate (gpm)	Dilution	Metering Pump Flow Rate (gal/hr)	Metering Pump Flow Rate (ml/min)
10	10:1	0.06	3.84
15	10;1	0.09	5.76
20	10:1	0.12	7.68
30	10:1	0.18	11.5
40	10:1	0.24	15.1

Note: All rates are based on the use of Aqua-Mag Polyphosphate Sequestering Agent and the following groundwater concentrations, determined from pump test data:

Iron	*1.5 mg/L*
Manganese	*0.044 mg/L*
Hardness	*490 mg/L as $CaCO_3$*

The proper dosage rate of Aqua-Mag sequestering agent is determined using the procedure outlined as Appendix A.3. To calculate the dosage for initial operations, a system flow rate of approximately 40 gpm was assumed. Using Equation (1) in Appendix A.3, a dosage of 2.2 ppm as PO_4 is required. This equates to a sequestering agent flow rate of 0.024 gallons per hour using Equation (2). Therefore, a sequestering agent dilution factor of 10:1 is recommended to allow the metering pumps to operate in the middle or upper portion of their operating range (i.e., 0.0037 to 0.37 gallons per hour). Once the metering

pump rate is set, the signal from the influent flow meter (FE002) will automatically adjust the sequestering agent feed rate. However, if there is a change in the influent concentration of iron, manganese, and hardness, the dosage rate and, hence, the required dilution factor must be re-calculated using the formulas presented in Appendix A.3.

The backpressure valve should be set for 50 psi or as recommended by the pump manufacturer (the valve has an available range from 0 to 150 psi). The pressure relief valve should be set for 75 psi (the valve has an available range from 0 to 150 psi and should be set about 15 psi higher than the system pressure).

2.3.2 Specific Operating Procedures

2.3.2.1 Normal Operation

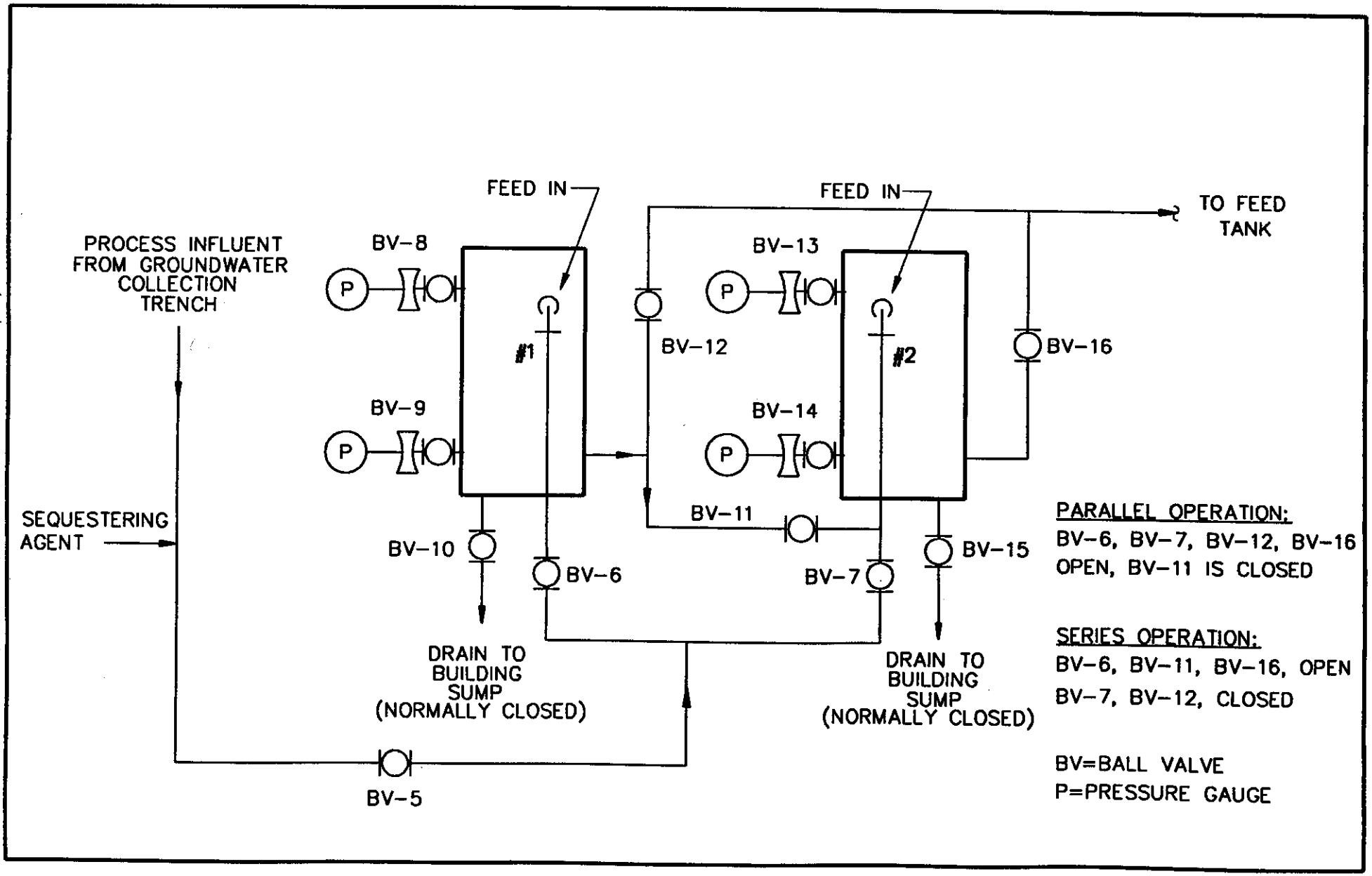
During normal operation (i.e., following initial start-up of the collection system and dewatering of the saturated overburden within the influence of the collection trench), the steady-state system flow rate will be at 15 gpm. Refer to the above table for the appropriate metering pump flow rate. The automatic response should be set at 4 to 20 mA.

2.3.2.2 Alternate Operations

When any sequestering agent other than Aqua-Mag is used, the dosage must be determined through discussions with the manufacturer and/or the distributor. If the manufacturer will not determine the proper dosage, sampling and laboratory testing must be used to determine dosage.

2.3.3 Maintenance

The diluted sequestering agent in the feed tank will be replaced based on usage. Aqua-Mag has a 12-year minimum shelf life [see Appendix A.3 for the material safety data sheet (MSDS) for Aqua-Mag]. The metering pumps should be calibrated every 6 months. The 4-20 mA set points should be modified as needed, based on changes in influent iron, manganese, and/or hardness concentration. The metering pumps will receive routine maintenance on an annual basis or when the calibration check indicates wearing of pistons



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O&M MANUAL

MULTI-BAG FILTERS

CITY OF ROCHESTER

SEPTEMBER 1997

FIGURE 2-2

or seals. General sequestering agent feed system maintenance procedures are presented in Appendix A.3.

2.4 BAG FILTER

2.4.1 General

2.4.1.1 Description

After addition of the sequestering agent, the groundwater is filtered through bag filters to remove particulates which could accumulate in the feed tank or foul the activated carbon beds. Filtration will be accomplished using two multiple bag filter vessels, as illustrated on Figure 2-2. Each filter housing is made of epoxy-lined carbon steel with eight filter bags. The filter bags, are 30 inches long and equipped with handles for easy removal. The bag filters are piped to allow single, series, or parallel operation.

2.4.1.2 Control

The operation of the bag filters is manually controlled by ball valves BV-6, BV-7, BV-11, BV-12 and BV-16 which allow the filters to be used in single, series, or parallel operation.

2.4.1.3 Major Components

The major components of the bag filter system and design data are listed below:

(i) Bag Filter Housing:

- No. of units: 2
- Epoxy-coated carbon steel vessels, each with eight #10 wire mesh filter bag support baskets
- Pressure gage connections equipped with gauge guards and liquid-filled pressure gauges (0-50 psi)
- Liquid displacers for each filter basket to assist in filter bag changeout.

- Pressure Rating: 150 psi

(ii) Filter Bags

- Standard #2 size bags, 30 inches deep, each with 4.4 square feet of surface area and equipped with handles for easy removal from filter vessel.
- 8 filter bags per vessel
- 10 micron woven nylon bags
- 30 micron woven nylon bags
- 25 micron oil adsorbing polypropylene bags

2.4.1.4 Initial System Startup

Prior to startup, each filter vessel and filter bag will be inspected for defects, damage, and conformance with the specifications. The bag filters will be installed on 6-inch high concrete bases and secured with anchoring devices in accordance with the manufacturer's recommendations. Each filter vessel will be pressure tested by the contractor to 50 psi using potable water.

It is anticipated that the groundwater will have a higher solids content during startup as compared to normal operation. Additionally, non-aqueous phase liquid (NAPL) may be present in the groundwater during startup. The bag filter vessels will be operated in series mode during startup. Oil adsorbing 25 micron rated bags should be installed in the lead vessel (vessel #1), and 10 micron woven nylon bags should be installed in the lag vessel (vessel #2). The oil adsorbing bags will provide removal of coarse solids and may adsorb NAPL, if present. The 10 micron bags will provide removal of fine solids to protect the activated carbon drums from plugging. A reusable envelope seal should be placed around the lip of each bag prior to installing the bag in the filter vessel. A liquid displacer should be placed in each filter bag after the bag is installed in the filter vessel. After placing the proper filter bags and displacers in each vessel, and ensuring the vessel lid is seated and tightened, the filter vessels are ready for use.

2.4.2 Specific Operating Procedures

2.4.2.1 Normal Operation

In normal operating mode (i.e., after steady-state conditions have been reached), one bag filter shall be in service and the second bag filter shall be in standby mode. Woven nylon 10 micron filter bags should be used during normal operation. Filter bags should be changed when the differential pressure exceeds 10 psi. To accomplish bag changeout, the standby vessel should be placed in operation and the other vessel placed in standby mode by opening and closing the appropriate ball valves. Alternately, the feed pumps can be shut down for a brief period while the bags in the primary vessel are changed out. Ensure that filter bags and displacers are placed in the standby vessel before the vessels are switched.

The bag filter vent should be opened first, followed by the drain valve (either BV-10 or BV-15) to allow the groundwater remaining in the vessel to drain. Loosen the lid eyebolts and use the hoist to lift the lid, then swing the lid to the side to expose the filter bags. Install the liquid displacers sequentially in each bag to remove standing water, then remove the filter bags, allowing the residual water to drain as much as possible. Place the used bags in a 55-gallon drum and characterize the contents in accordance with applicable state and federal regulations prior to disposal. Place new filter bags in the vessel (10 micron bags should be used for normal operation) and replace the vessel lid.

2.4.2.2 Alternate Operations

If the collected groundwater continues to exhibit a high solids concentration beyond the start-up period (i.e., development period), the bag filters may be operated in series mode, with the first bag filter fitted with coarse bags (30 micron) and the second filter fitted with 10 micron bags. Oil adsorbing bags (25 micron) may be used in place of the 30 micron bags if DNAPL is present.

2.4.3 Maintenance

A small amount of grease should be applied periodically to the swing davit which is used to lift the lid of the vessel. As described in Section 2.4.2.1, it is essential that either the

standby vessel is placed in operation or the feed pump is shutdown prior to filter bag changeout to avoid operating the pumps against a closed valve or overflowing the open vessel. An SOP covering general operation and maintenance of the bag filter system is presented in Appendix A.4.

2.5 FEED TANK

2.5.1 General

2.5.1.1 Description

The feed tank is designed for storage of the filtered groundwater and to allow operation of the treatment process in batch mode. The tank has a capacity of 1,500 gallons and is constructed of linear high density polyethylene (HDPE). The feed tank is located downstream of the bag filters and upstream of the air stripper. Duplex horizontal centrifugal feed pumps deliver groundwater from the feed tank to the air stripper.

2.5.1.2 Control

The feed tank is equipped with an ultrasonic liquid level transmitter to regulate the stripper feed pumps. At a low liquid level, the controller will shut off feed pumps. A rising level in the feed tank re-starts the feed pumps. At a high liquid level, the controller will shut off the collection trench pumps and the building sump pumps (building sumps discharge to the feed tank) to prevent the feed tank from overflowing. A falling level in the feed tank allows the collection trench pumps and the building sump pumps to re-start.

2.5.1.3 Major Components

(i) One 16-inch manway with non-vented cover

(ii) Four 2-inch side wall mounted PVC bulkhead fittings

(iii) One 1-inch side wall mounted PVC bulkhead fitting

(iv) One 2-inch flange top mounted vent connection

(v) One 3-inch diameter top mounted level transmitter stillwell

(vi) One bolt-on 130-inch high steel ladder with non-slip rungs to provide access to the manway

2.5.2 Normal Operating Procedures

During normal operation, groundwater will be pumped into the feed tank from the bag filter discharge. The tank provides liquid inventory for the air stripper feed pumps, which withdraws collected groundwater from the tank. Depending on the flow rate being delivered by the collection trench pumps and the flow rate of the air stripper feed pumps, the treatment system will operate in either continuous or batch mode.

2.5.3 Maintenance

No routine maintenance on the feed tank is required except for potential periodic cleaning to remove accumulated solids. An SOP for feed tank maintenance is presented in Appendix A.5.

2.6 AIR STRIPPER FEED PUMPS

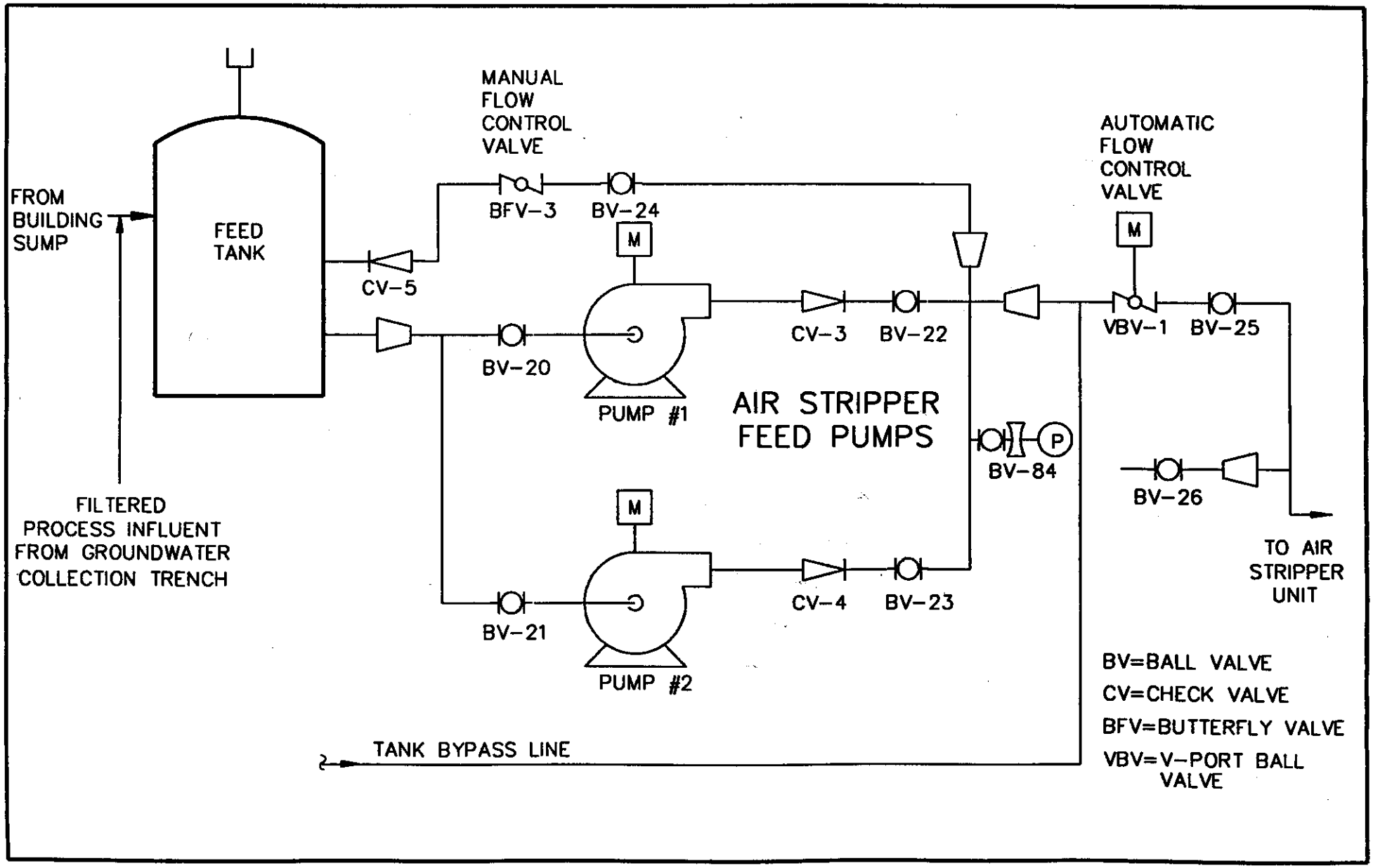
2.6.1 General

2.6.1.1 Description

Two self-priming, centrifugal, seal-less, magnetic drive pumps are used to feed the stored water from the feed tank to the air stripping unit (see Figure 2-3).

2.6.1.2 Control

Air stripper feed pump operation is governed by both feed tank level and liquid level in the air stripper sump. Lead/lag on/off control is based on the liquid level in the feed tank. With one pump operating (the lead pump), the second (lag) pump turns on once the liquid reaches a predetermined high level. The second (lag) pump turns off when the liquid reaches a predetermined low level. If the level continues to fall, the lead pump turns off when the low level shutoff is reached. When the level rises again, the pump which was previously the lag pump turns on and becomes the lead pump.



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AIR STRIPPER FEED PUMPS

CITY OF ROCHESTER

SEPTEMBER 1997

FIGURE 2-3

Air stripper pump operation is also indirectly controlled by the liquid level in the air stripper sump. The level transmitter in the air stripper sump (LT 004) controls the position of V-port ball valve VBV-1 in the feed pump discharge line. As the level in the air stripper sump increases, VBV-1 closes incrementally, increasing the air stripper feed pump discharge head, and thus reducing the flow from the pumps. Conversely, as the air stripper liquid level falls, VBV-1 opens incrementally, allowing the pumps to deliver more groundwater to the air stripper. If VBV-1 closes completely, a signal is sent from ZSC 004 to shut off the air stripper feed pumps.

Air stripper feed pump operation can also be controlled manually using butterfly valve BFV-3 in the air stripper feed pump recycle line. Ball valve BV-24 must be open to use the recycle line.

2.6.1.3 Major Components

Major components include the pump head and impeller, the magnetic drive and motor. The pump head and impeller are constructed of Kynar plastic. Design data are listed below:

Design Capacity (gpm)	40
Design Total Dynamic Head (ft)	38
Speed (rpm)	3450
Pump Suction (inches)	1 ½ " FPT
Pump Discharge (inches)	1 " MPT
Motor Horsepower (hp)	3/4
Motor Voltage	460 V / 3ϕ / 60 Hz
Motor Type	TEFC

2.6.1.4 Common Operating Problems

Problem	Possible Causes	Action to be Taken
1. Pump is running but no fluid is delivered.	a) Air leak to eye of impeller.	▪ Check all suction connections. ▪ Check for tightness of bolts on pump volute.

	b) Discharge head too high.	▪ Check for clogged lines or closed valves in the discharge line.
	c) Impeller clogged.	▪ Disassemble pump and clean impeller.
	d) Pump is damaged.	▪ Check impeller for damage.
	e) Suction valve closed.	▪ Open valve.
2. Pump flow rate is too low.	a) Discharge head higher than anticipated.	▪ Check for partially clogged lines or partially closed valves.
	b) Impeller or volute casing partially plugged.	▪ Check impeller and volute casing.
	c) Impeller worn or defective.	▪ Check impeller. Replace if found worn or damaged.
3. Pump is noisy and/or vibration.	a) Pump loose on foundation or supporting frame.	▪ Check pump base connections.
	b) Discharge head too high.	▪ Check for clogged or partially clogged lines or valves.
	c) Air in liquid.	▪ Check suction connections. ▪ Check for vortex in feed tank (Level too low).
	d) Damaged pump impeller.	▪ Check impeller for damage.
4. Motor not running.	a) Mechanical failure.	▪ Check circuit breakers. ▪ Check to see if motor turns freely. ▪ Replace motor.

2.6.1.5 Startup

Prior to initial pump startup, check the electrical connections by running the pump dry for less than 10 seconds. Check that the impeller turns in a clockwise direction when viewed through the inlet of the pump. Refer to the feed pump manufacturer's operating manual for additional startup procedures.

2.6.2 Normal Operating Procedures

Under normal operating conditions, the feed pumps deliver groundwater from the feed tank to the air stripper, and pump operation is controlled automatically. The control system provides for lead/lag alternating operation of the two feed pumps. Minor adjustments can be made manually using valve BFV-3.

2.6.3 Maintenance

Refer to the feed pump manufacturer's operation and maintenance manual for a detailed description of pump maintenance requirements. General maintenance requirements are identified in the SOP presented in Appendix A.6.

2.7 AIR STRIPPER

2.7.1 General

2.7.1.1 Description

The low profile air stripper is designed to remove volatile organic compounds from contaminated groundwater by forced draft, countercurrent contact of the inlet air stream with the contaminated water. Air is drawn from outside the treatment system enclosure and discharged to the atmosphere through a 38-foot (aboveground level) stack. After flowing across the air stripper trays, the groundwater is collected in the air stripper sump and pumped into the activated carbon system. The air stripper is illustrated schematically on Figure 2-3. The air stripper is comprised of four aeration trays, a collection sump, duplex pumps, duplex blowers, and a control panel.

2.7.1.2 Controls

The low profile air stripper is equipped with a high water level sensor, alarm, and feed pump shutoff switch. Also included is a sump low water level sensor, alarm, and air stripper discharge pump shutoff switch. High and low level sensors produce output for a common alarm. The sump is equipped with a water level probe capable of producing a 4 to 20 milliamp signal. An air pressure sensor, low air pressure alarm and feed pump shutoff switch are provided. The pump and blower controls are suitable for intermittent unit operation. Flow rate from the air stripper discharge pumps can be controlled manually using flow control valve BFV-5.

2.7.1.3 Major Components

The major components of the air stripping unit and the design data are listed below:

(i) Four perforated stainless steel trays with cleanout parts.

(ii) Integral collection sump (185 gallon) with liquid level sight tube.

(iii) Dual self-priming centrifugal seal-less magnetic drive discharge pumps. Characteristics are listed below.

Design Capacity (gpm)	40
Design Total Dynamic Head (ft)	38
Speed (rpm)	3450
Pump Suction (inches)	1 ½ " FPT
Pump Discharge (inches)	1 " MPT
Motor Horsepower (hp)	3/4
Motor Voltage	460 V / 3ϕ / 60 Hz
Motor Type	TEFC

(iv) Two dual direct drive blowers (1 primary, 1 backup) capable of delivering 900 cfm.

(v) Liquid level sensor.

(vi) Air exhaust equipped with polypropylene demister pad.

(vii) ½-inch sampling ports, water pressure gauges and temperature gauges on the influent and effluent lines.

(viii) Flowmeter with local digital readout and totalizer.

2.7.1.4 Common Operating Problems

Common operating problems associated with the air stripping unit include solids build-up, scaling, or biological growths. These conditions can be eliminated with pressure washing or brushing by following the maintenance instructions in the shallow tray air stripper manufacturer's operation and maintenance manual.

Another common operating problem is overheating blower motors. If the blower motors are overheating, check the condition of the bearings and replace noisy bearings. Also check the voltage supply to insure that the supplied voltage is within +/- 10% of the rated voltage.

2.7.1.5 Laboratory Control

A mass balance should be performed across the air stripper on a quarterly basis to determine compliance with air emissions limits. Samples from the feed tank and the effluent sample port of the air stripper should be analyzed for volatile organic compounds using EPA Methods 601 and 602.

2.7.1.6 Startup

Follow this procedure for startup of the low profile air stripper:

1) Complete and verify all mechanical and electrical connections.

2) Verify that all electrical inputs and shutdown indicators are as required per the appropriate control panel manual.

3) Close the valve on the inlet water line or pump.

4) Turn the power on to the system control panel. Check that all the control functions are properly indicated.

5) Start the system blower.

6) Start the water delivery pump or pumps. Now open the valve on the influent water line slowly until the desired water flow rate is reached.

7) Run the system for 1-2 minutes then turn the inlet water off. After 1 minute, turn off the blower. This procedure will insure that the water down tube in the sump is immersed in water, creating a seal against air escaping up the down tube. The system is now ready for continuous process operation.

8) The system may now be turned on by first turning on the blower, followed by the influent water.

9) Monitor water temperature, differential pressure and influent water flow rate to insure proper operation.

2.7.2 Specific Operating Procedures

2.7.2.1 Normal Operation

The operator should try to achieve continuous treatment system operation by balancing the flow rate produced by the air stripper discharge pumps with the collection trench flow rate. Seasonal changes in infiltration may require the operator to adjust the flow rate from the air stripper discharge pumps using flow control valve BFV-5. The air stripper feed pump flow rate will respond automatically to changes in the air stripper discharge pump flow rate since the feed pump discharge head is controlled by automatic valve VBV-1. The position of VBV-1 varies automatically in response to the liquid level in the air stripper sump.

Should intermittent (batch mode) operation occur, the air stripper blower control circuit is designed to allow the blower to continue to operate for a short period of time after the air stripper feed pumps shut off so that liquid inventory on the air stripper trays receives treatment before entering the air stripper sump.

2.7.2.2 Alternate Operation

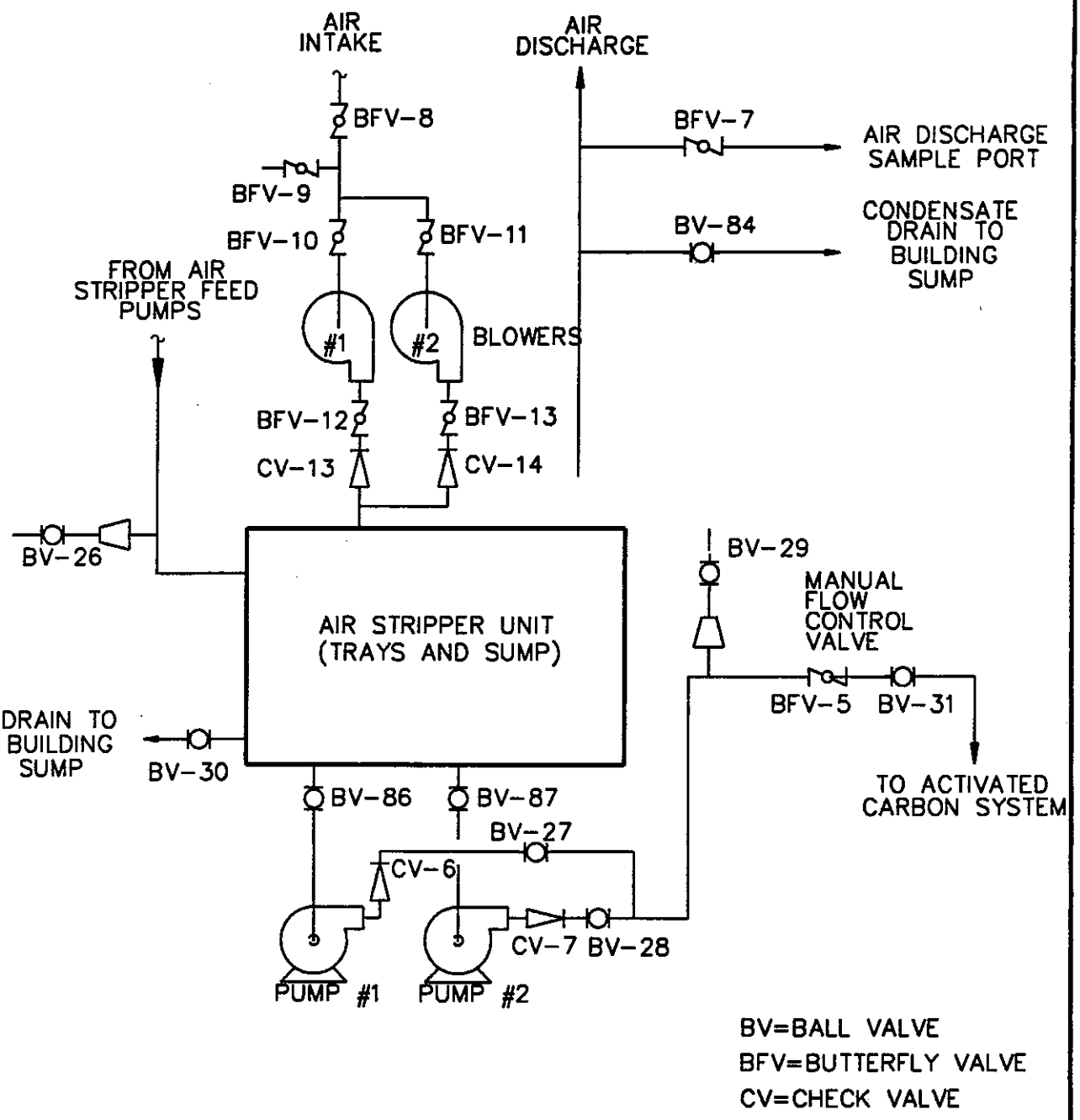
When the collection trench yields flow rates lower than the design flow rate of 40 gpm, the treatment system can be operated in a batch mode. The air stripper blower and feed pumps will cycle on and off automatically based on the level in the feed tank. Air stripper discharge pumps will cycle automatically based on the level in the air striper sump. Batch mode may require less operator attention, however, continuous operation is preferable to extend activated carbon service life. Under batch conditions, air stripper effluent with

residual organic compounds is held in a stagnant condition in the activated carbon drums until the system returns to operation. While the system is not in operation, the activated carbon will continue to adsorb organic compounds from the groundwater in the drums, which depletes carbon adsorption capacity.

In addition to batch operation capability, the air stripper blowers can be operated to draw 100% outside air (normal operation) or a combination of outdoor air and tempered indoor air through operation of valves BFV-8 and BFV-9. Introduction of tempered air to the system may enhance containment volatilization during cold weather months. Note that during tempered air operation it may be necessary to increase ventilation to the treatment building enclosure through manual adjustment of HVAC intake louvers. Use of 100% tempered air is not recommended, as the building unit heaters are not designed for ventilation of this extreme nature.

2.7.3 Maintenance

Although sequestering agent is injected into the collected groundwater at the head of the treatment system, iron and hardness deposits may still form on the aeration trays. The air stripper trays should be cleaned once at least every 6 months or when the influent air pressure increases above the manufacturer's recommended level (18 in. water). Note that once scale begins to form on the trays, holes may become clogged quickly as the roughened scale surface promotes adherence of precipitated minerals. After shutting down the system, the air stripper trays should be removed and replaced with clean spare trays. The system can be returned to service and the fouled trays cleaned when convenient. Follow the tray cleaning instructions provided in the air stripper manufacturer's operation and maintenance manual. The pumps and blowers should receive routine maintenance on a yearly basis. An SOP identifying general air stripper maintenance requirements is presented in Appendix A.7.



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SHALLOW AIR TRAY STRIPPER

2.8 ACTIVATED CARBON SYSTEM

2.8.1 General

2.8.1.1 Description

The activated carbon system is designed to remove PCBs from the groundwater. Eight, 55-gallon granular activated carbon canisters are installed in four parallel branches with two canisters in series on each branch (see Figure 2-4). Each canister contains 165 pounds of activated carbon. The activated carbon units are designed for continuous operation.

2.8.1.2 Control

There are no automatic controls on the activated carbon system.

2.8.1.3 Major Components

The major components and design data of the activated carbon system are listed below.

(i) Flowsorb activated carbon with Filtrasorb 300 activated carbon (8 units).

(ii) Maximum flow rate per series of two canisters: 10 gpm.

(iii) Maximum operating pressure: 8 psi.

(iv) One inlet and one outlet plug to prevent leakage.

2.8.1.4 Common Operating Problems

Common problems encountered when operating activated carbon systems are excessive headloss and premature exhaustion of carbon capacity. Large differential pressures indicate excessive headloss in the carbon canister. This can be caused by suspended solids accumulation, biological growth or fouling of the influent screen. For suspended solids accumulation or biological growth, backwashing is recommended. For fouling of the influent screen, reverse the flow through the screen to loosen up accumulation.

Premature exhaustion of the carbon capacity can be due to build-up of high molecular weight compounds, and/or as a result of an inadequate filter bag pore size. A build-up of high molecular solids can be checked by laboratory analysis of the canister samples. Fouling of the canister, indicated by a pressure differential, may be mitigated through use of filter bags with smaller pore size.

2.8.1.5 Laboratory Control

Samples from the head of the treatment system (feed tank) and from the individual canisters will be used to determine the efficiency of the carbon activated system. Detectable concentrations of PCBs following the first activated carbon canister in series will indicate that the primary canister is spent. The valves on the process feed to the carbon canisters should therefore be adjusted to convert the second series of canisters to the primary locations, and fresh carbon canisters should be placed in the secondary locations.

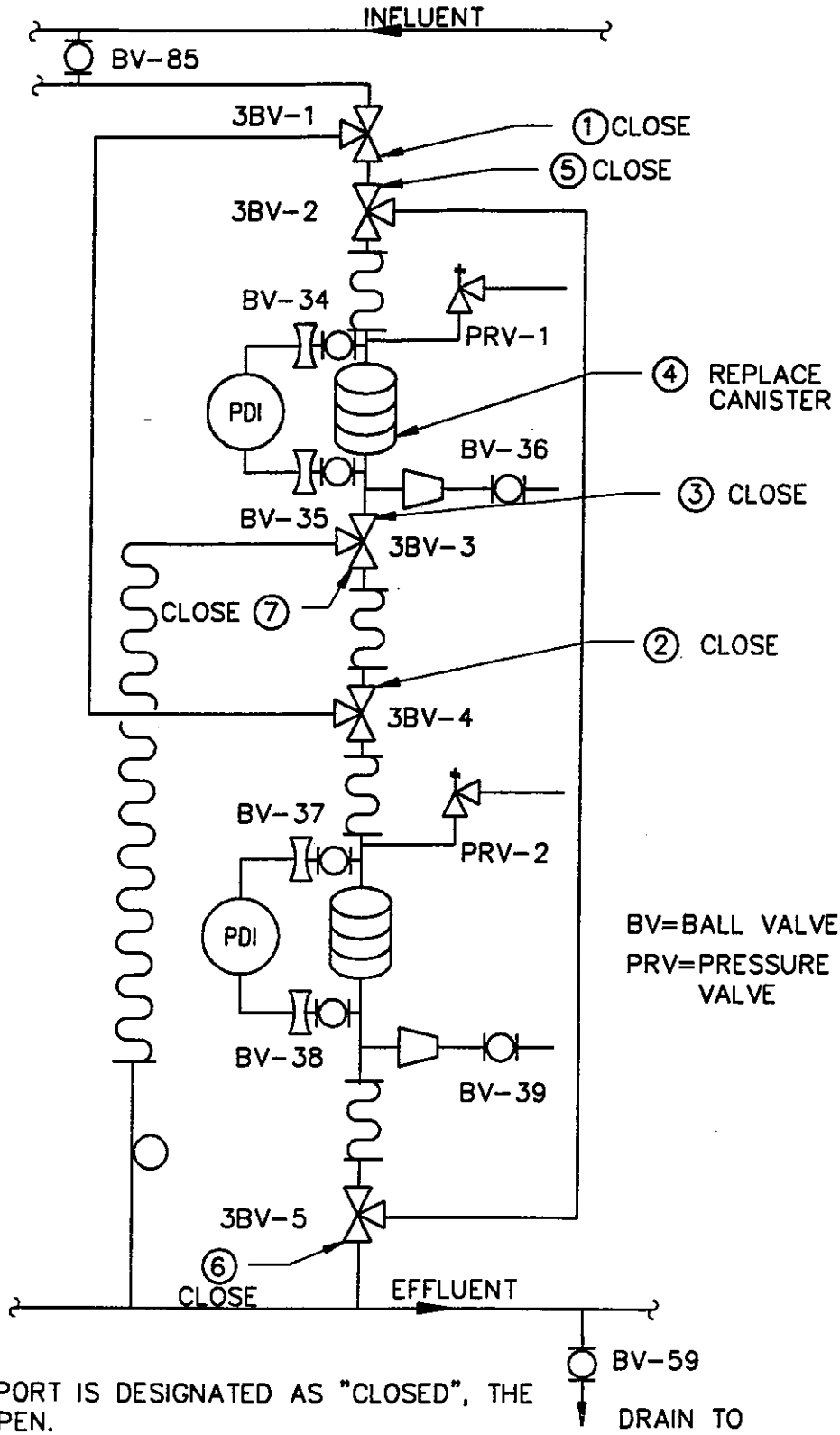
2.8.1.6 Startup

Prior to connection of the activated carbon system, insure that the canisters are placed on a level surface. Then fill the vessel with tap water and let soak for 24 hours and backflush. After this procedure is completed, the system can be connected to the rest of the treatment scheme and operated as described in the following sections. An SOP for back-flushing the activated carbon vessels is presented in Appendix A.8.

2.8.2 Specific Operating Procedures

2.8.2.1 Normal Operation

In normal operating mode, all eight carbon canisters will be in service. The flow will enter the canister system and then split into the four lead canisters. From each of the four primary canisters, the effluent flows into each secondary canister. This creates four parallel operations involving two canisters running in series as shown in Figure 2-5. The effluent is then directed into the discharge tank.



NOTES:

WHERE ONE VALVEPORT IS DESIGNATED AS "CLOSED", THE OTHER TWO ARE OPEN.

(1) DESIGNATES SEQUENCE OF STEPS TO SWITCH LEAD AND LAG VALVES.

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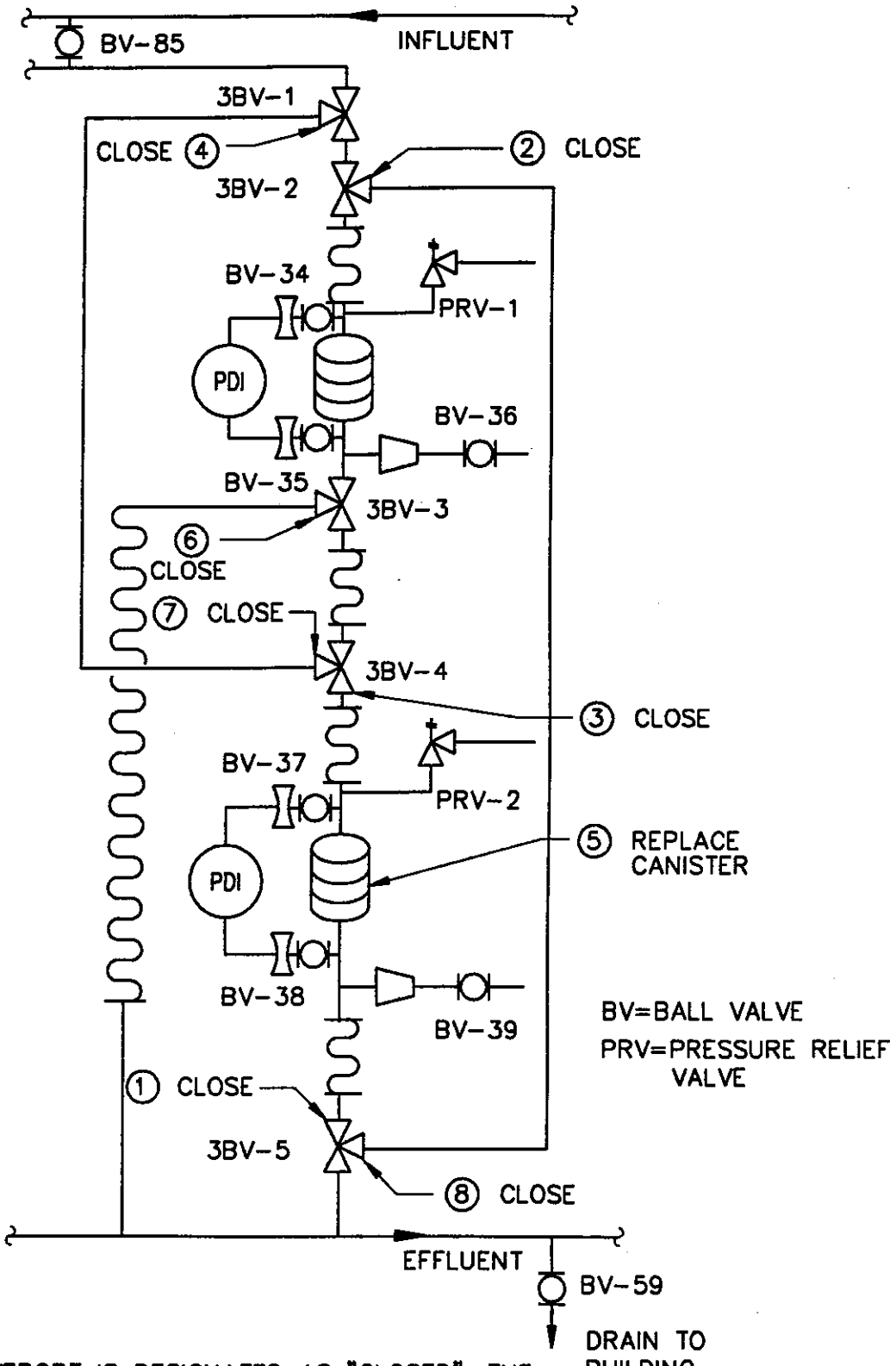
O&M MANUAL
SEQ. OF VALVES TO CHANGE ORDER OF PRI./SEC. CARBON CANISTERS

CITY OF ROCHESTER SEPTEMBER 1997



NOTES:

WHERE ONE VALVEPORT IS DESIGNATED AS "CLOSED", THE OTHER TWO ARE OPEN.

① DESIGNATES SEQUENCE OF STEPS TO SWITCH LEAD AND LAG VESSELS.

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O&M MANUAL
SEQ. OF VALVES TO REVERT TO ORIGINAL PRI./SEC. CARBON CANISTER ORDER

2.8.2.2 Alternate Operations

The primary canisters will always be the canisters first encountered along the flow lines. If a primary canister in any line becomes spent (i.e., saturated with contaminants to the point that no further PCB adsorption is feasible and breakthrough is occurring), the flow should be modified such that the secondary canister becomes the primary vessel and a new secondary canister is placed in service. Figure 2-5 illustrates valve configuration and sequencing to switch primary and secondary vessels, using the first two canisters in parallel as an example. Figure 2-6 illustrates sequencing and valve configuration to revert back to the original primary/secondary arrangement. By switching the primary and secondary vessels on each of the four series as necessary, different combinations of lead vessels may occur. However, the activated carbon system will always have four parallel operations with two canisters operating in series.

2.8.3 Maintenance

The activated carbon drums will be replaced yearly or as necessary based on sampling of the primary canister effluent. The groundwater stream will be sampled between the lead and lag vessels to determine if and when PCB breakthrough occurs. An SOP for maintenance of the carbon drums is presented in Appendix A.8.

2.9 DISCHARGE TANK

2.9.1 General

2.9.1.1 Description

The discharge tank will be used to store effluent from the activated carbon units prior to being pumped to the sanitary sewer.

2.9.1.2 Control

There are three main controls on the discharge tank; the level indicator, high level switch, and the high level alarm. The level indicator turns the discharge pumps on and off depending on the level of the liquid inside the tank. A rising liquid level re-starts the

discharge pumps. The high level switch overrides the air stripper sump controls to shut down the air stripper discharge pumps. A high level alarm at the system monitor panel is concurrently activated. A falling liquid level in the tank re-starts the air stripper discharge pumps.

2.9.1.3 Major Components

The major components of the discharge tank are:

(i) 16-inch manway with non-vented cover

(ii) Three 2-inch side wall mounted PVC bulkhead fittings

(iii) One 3-inch diameter top-mounted level transmitter

(iv) One 2-inch flange top-mounted vent connection

(v) One 1-inch side wall mounted PVC bulkhead fitting

(vi) One bolt-on 130-inch steel ladder with non-slip rungs to provide access to the manway.

2.9.1.4 Startup

The discharge tank shall be inspected for defects, damage, and conformance with the specifications. The tank will be field-tested to hold water without loss or evidence of weeping or capillary action for a period of 24 hours.

2.9.2 Maintenance

No routine maintenance on the discharge tank is required except for potential periodic cleaning to remove accumulated solids. An SOP for discharge tank cleaning is provided in Appendix A.5.

2.10 DISCHARGE PUMPS

2.10.1 General

2.10.1.1 Description

The discharge pumps will be used to transport the treated groundwater from the discharge tank to sanitary sewer outfall 001. The discharge pumps are designed to operate in a batch mode, controlled by high and low indicators in the discharge tank. A flowmeter (FE007) and totalizer were installed in the discharge line to monitor the flow from the discharge pumps.

2.10.1.2 Control

A high level indicator in the discharge tank will relay a signal that turns the discharge pumps on. There is a lead/lag control which determines if one or two pumps should be operated and which pump will be turned on. With one pump operating (the lead pump), the second (lag) pump is turned on as the liquid rises and reaches a predetermined level. The lead pump turns off once the liquid in the tank reaches low level shutoff. When the level rises again, the pump which was previously the lag pump turns on and becomes the lead pump.

2.10.1.3 Major Components

Major components include the pump head and impeller, the magnetic drive, and motor. The pump head is constructed of iron and the impeller of bronze. Design data are listed below:

Design Capacity (gpm)	160
Design Total Dynamic Head (ft)	40
Speed (rpm)	3500
Pump Suction (inches)	1 ½ FPT
Pump Discharge (inches)	1 1/4 MPT
Motor Horsepower (hp)	1 ½
Motor Voltage	460 V / 3 ϕ / 60 Hz
Motor Type	TEFC

2.10.1.4 Common Operating Problems

Refer to Section 2.6.1.4 for the common operating problems encountered with discharge pumps.

2.10.1.5 Startup

Prior to startup, check the electrical connections by running the pump dry for less than 10 seconds. Check that the impeller turns in a clockwise direction when viewed through the inlet of the pump. Refer to the discharge pump manufacturer's operating manual for additional startup procedures.

2.10.2 Normal Operating Procedures

Under normal operating conditions, the pumps will deliver treated groundwater from the discharge tank to the sanitary sewer and pump operation is controlled automatically. The control system allows for lead/lag alternating operation of the two feed pumps. Minor adjustments can be made manually using valve BFV-9.

2.10.3 Maintenance

Refer to the discharge pump manufacturer's operation and maintenance manual for a detailed description of pump maintenance requirements. A general SOP for discharge pump maintenance is presented in Appendix A.9.

2.11 INSTRUMENTATION

2.11.1 General

2.11.1.1 Description

The groundwater collection and treatment system instrumentation package provides operation and monitoring throughout the system. The system monitor panel will display any operational problems as detected by remote sensors. The system monitor panel provides a central location for instrumentation control of process equipment at remote locations. Instrumentation includes the ultrasonic level transmitters, magnetic flow transmitters, pump

controllers, pressure differential indicators, pressure gauges, system monitor panel, autodialer/cellular interface, building environmental security systems, and programmable logic controller (PLC).

2.11.1.2 Control

The PLC receives signals from the level and flow indicators and switches, and follows the appropriate program automatically. The pump controllers, system monitoring panel, fire/security system and dialer automatically operate by sending and receiving signals through a the system monitor panel. Pressure gauges and pressure differential indicators do not send signals to a panel and therefore must be checked by the operator to ensure proper system operation. There are a total of five alarms input to the monitoring PLC. These alarms are then sent to the auto dialer. Table 2-1 contains a list of the alarm conditions and troubleshooting guidelines.

2.11.1.3 Major Components

Major components are discussed in Sections 2.11.1.1 and 2.11.1.2.

2.11.2 Normal Operating Procedures

Each piece of instrumentation equipment will read information, send and receive signals, as designed and specified, to maintain proper operation of the treatment system. If a malfunction occurs, the automatic controls will terminate operation of the entire treatment system, or a portion of it, as necessary. Alarms will sound if a malfunction has the potential to cause a dangerous situation and/or requires external remedy. In this case, the source of the malfunction must be found and appropriate measures must be taken. Appropriate measures may include implementing troubleshooting or maintenance procedures as specified in the manufacturer's literature or herein.

If an emergency situation arises and the operator is not present, the automatic dialer will call programmed numbers to notify the recipient of the telephone call of the emergency using a pre-programmed recording.

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TABLE 2-1
ROCHESTER FIRE TRAINING ACADEMY

ALARMS AND TROUBLESHOOTING GUIDELINES

Alarm	Possible Cause	Remedy
1 Collection Sump High	Inlet sump pumps 1 and 2 not functioning	Check pump as per manufacturer's literature
	Faulty level transmitter	Check transmitter as per manufacturer's literature
2 Feed Tank High	Transfer pumps P202-P203 not functioning	Check pumps as per manufacturer's literature
	Faulty level transmitter	Check transmitter as per manufacturer's literature
3 Air Stripper Malfunction	Blower pressure failure	Check power supply
		Check inlet screen
		Check damper position
		Check solids build-up on trays
		Check blower manufacturer's literature
	High stripper sump water level	Check discharge pumps as per manufacturer's literature.
		Check level transmitter per manufacturer's literature.
		To clear alarms, the condition must be corrected, and power to the air stripper controller must be disconnected for 30 seconds.
4 Discharge Tank High	Discharge pumps P-200 & P201 not functioning	Check pumps as per manufacturer's literature.
	Faulty level transmitter	Check level transmitter as per manufacturer's literature.

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TABLE 2-1
ROCHESTER FIRE TRAINING ACADEMY

ALARMS AND TROUBLESHOOTING GUIDELINES

Alarm	Possible Cause	Remedy
5 Building Sump High	Sump pump P204 & 205 not functioning	Check pumps as per manufacturer's literature.
	Leak in system	Inspect sump and see if it's full. Check for leaks.
	Faulty level switch	Check level switch as per manufacturer's literature
6 Building Low Temperature	Heater not on	Check thermostat
	Heater not functioning	Check heater per manufacturer's literature
7 Building Security Breach	Intruder	Notify police
8 Building Fire Alarm	Smoke detector activated	Notify fire department

2.11.3 Maintenance

Refer to each instrumentation manufacturer's operations and maintenance manuals for maintenance instructions.

2.12 BUILDING SUMP PUMPS

2.12.1 General

2.12.1.1 Description

The building sump pumps are used to pump building washdown and drainage flow from the activated carbon system to the influent feed tank.

2.12.1.2 Control

The building sump pumps are controlled by float switches in the building pump and by the feed tank high level switch. Lead/lag on/off control is based on the liquid level in the sump. With one pump operating (lead pump), the second (lag) pump turns on once the liquid reaches a predetermined high level in the sump. The lag pump turns off at a predetermined low level. If the level falls below this level, the lead pump will turn off once the low level shutoff is reached. When the level rises again, the pump that was previously the lag pump turns on and becomes the lead pump.

Sump pump operations are also indirectly controlled by the liquid level in the feed tank. The high level switch in the feed tank defeats the sump pump controls.

2.12.1.3 Major Components

Major components include the impeller and motor. The vortex impeller is the non-clog type. Design data are listed below:

Design Capacity (gpm)	95
Design Total Dynamic Head (ft)	18
Speed (rpm)	1550
Pump Discharge (in)	2
Motor Horsepower (hp)	0.75
Motor Voltage	115 V / 1 ϕ / 60 Hz
Solid Size (in)	2

2.12.1.4 Common Operating Problems

Points to check if the sump pump does not run or does not run properly (Caution: Always unplug power cords or turn off all main and branch circuit breakers before doing any work on the pump):

1. Pump does not run or start when water is up in sump area.
   - Check for blown fuse or tripped circuit breaker.
   - Check for defective level switch.
   - Where control panel is used, be sure H-O-A switch is in the AUTO position. If it does not run, turn switch to the HAND position and if the pump runs then the trouble is in the automatic electrical system. Have electrician make electrical checks.
   - Check for burned out motor. Occasionally lightning can damage a motor even with lightning protection.
   - Where plug-in cords are used be sure contact blades are clean and making good contact. DO NOT USE PLUG-IN CORDS INSIDE A SUMP OR WET WELL.
   - Level control ball or weight may be stuck on side of basin. Be sure it floats freely.
2. Pump runs but does not deliver flow.
   - Check for air lock. Start and stop pump several times, if this does not help it may be necessary to loosen a union in the discharge line to relieve air lock.
   - Check valve may be installed backwards. Check flow arrow on valve body. Check shut-off valve. It may be closed.
   - Check vertical elevation. It may be higher than pump can develop. (See pump curve).
   - Pump inlet may be plugged. Remove pump to check.

Refer to the sump pump manufacturer's operation and maintenance manual for proper operation.

2.12.1.5 Startup

Prior to startup, check all electrical connections to verify that the pump is correctly installed. Check that the sump pump is grounded in a 115 or 230 volt receptacle with a minimum height above the floor of 4 feet. Refer to the building sump pump manufacturer's operating manual for additional startup procedures.

2.12.2 Maintenance

The automatic float, shaft seal or motor may eventually require replacement. Refer to the sump pump manufacturer's operation and maintenance manual for proper maintenance procedures.

3.0 COLLECTION AND TREATMENT SYSTEM MONITORING

Monitoring of the groundwater collection and treatment system will be conducted throughout the operational life of the system to: demonstrate compliance with regulatory requirements associated with operation of the system (i.e., air emissions and sewer use permit limitations); assist in the ongoing evaluation of the effectiveness of the system in remediating the overburden groundwater in the SDA; and to determine the degree and frequency of routine maintenance needs. A log of the pertinent groundwater collection and treatment system operating variables that will be recorded on a daily basis is presented as Appendix B. The logs will be maintained in the treatment building, and will be revised as necessary following the start-up period.

Groundwater collection system monitoring will consist of recording daily production rates from the flowmeter at the head of the treatment process, and recording monitoring well and piezometer water levels on a quarterly basis as discussed in Section 3.4. Groundwater treatment system monitoring will be conducted through daily recording of the system operating variable identified in Appendix B and through the collection and analysis of aqueous samples at various locations within the process train. A discussion of the anticipated treatment system sampling program is presented in Sections 3.1 through 3.4. Table 3-1 presents a summary of treatment system and monitoring well sampling requirements.

3.1 AIR EMISSIONS PERMIT

3.1.1 General

The air stripper discharges approximately 900 cfm of air containing volatile organic compounds (VOCs) stripped from the groundwater. Thus, the air stripper is an air emission point source. Because the Rochester Fire Academy groundwater remediation is conducted under a Consent Order (B8-02-5-87-09), the air stripper is exempt from formal permitting requirements. However, a New York State Department of Environmental Conservation (NYSDEC) Permit to Construct/Certificate to Operate (PC/CO) a Process, Exhaust, or

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TABLE 3-1
ROCHESTER FIRE TRAINING ACADEMY

SUMMARY OF ROUTINE GROUNDWATER TREATMENT SYSTEM AND MONITORING WELL SAMPLING

Location	Purpose	Sample Type	Sample Frequency	Parameters
GWTS Influent [1]	GWTS performance monitoring/estimate air emission rates	Grab	Quarterly	VOCs (601, 602), PCBs, Metals [2], pH, temperature, turbidity, hardness, alkalinity
Air Stripper Effluent [3]	GWTS performance monitoring/estimate air emission rates	Grab	Quarterly	VOCs, pH, temperature, turbidity
Between Primary & Secondary Carbon Vessels [4]	GWTS performance monitoring	Grab	Quarterly [5]	VOCs, PCBs
GWTS Effluent	GWTS performance monitoring/discharge compliance monitoring	Grab	Monthly [6]	VOCs (8015), total toxic organics [7], pH, temperature, turbidity, flow rate
		Composite	Monthly [6]	Phosphorus, metals [2]
MW-6S, 6I, 7S, 7I, 7D, 8S, 8I, 9S, 9I, 10S, 10I, 11S, 11I, 15S	Monitor groundwater quality	Grab [8]	Semi-Annually	pH, Eh, temperature, turbidity, specific conductivity, TCL volatiles, PCBs, arsenic, cadmium, lead

Notes:
(1) Collected prior to bag filter unit at Sample Part BV-1.
(2) Metals (total) include: arsenic, iron, cadmium, chromium, copper, lead, manganese, nickel, selenium and zinc.
(3) Collect from BV-29.
(4) Sample between primary and secondary vessel on each active train (4 possible samples).
(5) Sample frequency may need to be increased depending on breakthrough time.
(6) Compliance sampling shall be conducted weekly for the first month of sampling, monthly thereafter. Collect grab from BV-68, composites from effluent tank.
(7) Total toxic organics (TTO) includes analyses for VOCs (601, 602), semi-volatiles (625) and pesticides/PCBs (608).
(8) Follow procedures in Appendix E. Also measure water level in each well and collection trench piezometers.

Ventilation System was completed to convey the pertinent treatment process emissions information. This permit was submitted to the NYSDEC Division of Air Resources (DAR) for review and approval. A copy of the PC/CO application and the approval letter are provided as Appendix C. A discussion of the substantive requirements of the PC/CO is presented below.

3.1.2 Requirements

The VOC loadings to the atmosphere presented in the PC/CO application were considered acceptable by the NYSDEC and are presented in Table 3-2. Therefore, VOC loadings from the air stripper to the atmosphere must remain below these loadings at all times.

In general, VOC loadings will be calculated by means of a groundwater VOC mass balance around the air stripper. Grab samples of air stripper influent and effluent groundwater should be collected from sample taps BV-26 and BV-29, respectively (see Figure 2-3). The samples should be analyzed for organic compounds using EPA methods 601 and 602. The flow rate through the air stripper should be recorded from the air stripper flowmeter at the time of sample collection. Additionally, the daily total flow rate and the maximum groundwater flow rate should be recorded. The VOC loading will be calculated for each organic contaminant detected in the air stripper influent groundwater using the following formula:

$$M_i \text{ (lbs/hr)} = [C_{in(i)} (\mu g/l) - C_{out(i)} (\mu g/l)] \times Q \text{ (gal/min)} \times 60 \text{ (min/hr)} \times 3.785 \text{ (L/gal)} \times 2.205 \times 10^{-9} \text{ (lb/}\mu g)$$

$$= [C_{in(i)} (\mu g/l) - C_{out(i)} (\mu g/l)] \times Q \text{ (gal/min)} \times 5.007 \times 10^{-07} \text{ (min L lbs/hr gal } \mu g)$$

where:

M_i = Mass of compound I emitted to the atmosphere per hour
$C_{in(i)}$ = Air stripper influent concentration of compound I
$C_{out(i)}$ = Air stripper effluent concentration of compound I
Q = Air stripper influent groundwater flow rate

Note: The variables must be in the units noted in the formula (i.e. $C_{in(i)}$ and $C_{out(i)}$ must be in µg/l, and Q must be in gal/min). Conversion of units may be necessary.

VOC loadings to the atmosphere will be calculated on a quarterly basis. The VOC loading calculated using the daily total flow rate represents the daily average VOC loading, while the VOC loading calculated using the maximum daily flow rate represents the maximum daily VOC loading. The mass loadings for each compound detected in the air stripper influent will be compared to the limits presented in Table 3-2. Neither the average nor the maximum daily VOC loading should ever exceed the hourly emission rate potential (ERP) listed on Table 3-2. Both the average and daily VOC loading may exceed the hourly actual emissions; however, the average daily VOC loading at a flow of 15 gpm should not exceed these values. Records of the VOC loading results will be maintained at the groundwater treatment facility. The NYSDEC should be notified if emissions limits are exceeded. Reports of exceedances should be forwarded by the City of Rochester to:

Mr. Amerinderjit Nagi, P.E.
Project Manager
New York State Department of Environmental Conservation
50 Wolf Road
Albany, NY 12233
(518) 457-7878

If the emissions limits are not met, corrective actions will be taken.

3.2 SEWER USE PERMIT

3.2.1 General

An industrial sewer use permit (Permit No. 705) was issued by the Monroe County Pure Water District to the City of Rochester Fire Academy for discharge of treated groundwater from the groundwater treatment system to the sanitary sewer. The Rochester Fire Academy is located in Monroe County Pure Waters District No. 8535. A copy of the original sewer use permit application, the original permit, and the most recent permit renewal

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TABLE 3-2
ROCHESTER FIRE TRAINING ACADEMY

ACCEPTABLE VOLATILE ORGANIC COMPOUND LOADINGS

Contaminant	Hourly ERP[1] Emissions (lbs/hr)	Hourly Actual Emissions (lbs/hr)	Annual Emissions (lbs/yr)
Acetone	0.032	0.012	105.00
Chloroform	<0.001	<0.001	0.50
Benzene	<0.001	<0.001	0.60
1,1,1-Trichloroethane	0.158	0.059	519.00
Chloroethane	0.002	0.001	4.90
Vinyl chloride	0.004	0.002	14.50
Methylene Chloride	0.012	0.004	38.10
Bromodichloromethane	<0.001	<0.001	0.60
1,1-Dichloroethane	0.020	0.008	65.70
1,1-Dichloroethene	0.002	0.001	7.90
2-Butanone	0.003	0.001	9.90
Trichloroethylene	0.019	0.007	61.80
Ethylbenzene	0.007	0.003	22.30
1,2-Cichloroethane	0.001	<0.001	3.00
4-Methyl-2-Pentanone	0.003	0.001	10.50
Toluene	0.018	0.007	59.80
Chlorobenzene	<0.001	<0.001	0.50
Tetrachloroethylene	0.002	0.001	5.80
1,2-Dichloroethene	0.600	0.225	1970.00
Xylene	0.046	0.017	151.00

Note: [1] ERP = Emission Rate Potential (highest possible emission rate).

issued August 18, 1995 are presented as Appendix D. A discussion of the requirements of the sewer use permit is presented below.

3.2.1.1 Permit Requirements

The groundwater treatment system operator(s) should be thoroughly familiar with all requirements of the Rochester Fire Academy Sewer Use Permit (see Appendix D). Significant aspects of the Sewer Use Permit are summarized below.

General

a. The Director of Monroe County Pure Waters must be notified in writing of any revision to the plant sewer system or any change in the treatment system discharge to the public sewers listed in Exhibit B of the sewer use permit application (see Appendix D). Changes in the discharge include either: (i) an increase or decrease in average daily volume or strength of wastes listed in Exhibit B of the sewer use permit application; or (ii) discharge of new wastes that were not listed in Exhibit B of the sewer use permit application. Notices shall be sent to :

   Mr. John E. Graham
   Director of Pure Waters
   Department of Environmental Services
   350 East Henrietta Road
   Rochester, NY 14620

b. The operator(s) shall cooperate with the Director of Monroe County Pure Waters or his representative in their inspecting, sampling and study of wastes, or the facilities provided for pretreatment.

c. The Director of Monroe County Pure Waters must be notified immediately of any accident, negligence, breakdown of treatment equipment, or other occurrence that results in discharge to the public sewers of any wastes or process waters not covered by this permit. The notification shall be directed to the Industrial Waste Section at 274-8102 during normal working hours. At all other times the Rochester Operations Dispatcher shall be contacted at 274-8100.

d. Any and all slug discharges shall be reported to the Monroe County Pure Waters District. A slug discharge shall be defined as any discharge of a non-routine, episodic nature including, but not limited to, an accidental spill or a non-customary batch discharge. Following a review process, the Monroe

County Pure Waters District shall determine the applicability of a facility slug control plan.

e. The operator(s) shall contact the Monroe County Pure Waters District when a discharge known to be in violation of any permit requirement has occurred. The notification shall be directed to the Industrial Waste Section at 274-8102 during normal working hours. At all other times the Rochester Operations Dispatcher shall be contacted at 274-8100.

f. Records of all information resulting from any monitoring activities must be maintained for a minimum of three years. These records shall be available for inspection and copying by the Monroe County Pure Waters District.

Specific

a. ***Self Monitoring Frequency:*** Self monitoring of the treatment system effluent to confirm compliance shall be conducted by weekly sampling for the first month of operation, and monthly sampling thereafter. The discharge tank will serve as the sampling location for the collection of effluent composite samples. Sampling will be conducted in a manner such that the collected samples will be representative of normal treatment process operation and expected pollutant discharges to the sanitary sewer. Analytical results shall be submitted with a cover letter, immediately upon receipt, to:

Monroe County Pure Waters
Industrial Waste Section
Iola Campus, Building 5
350 East Henrietta Road
Rochester, NY 14620
Attn: Mr. Harry Reiter

b. ***Composite Sampling Protocol:*** Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CRF Part 136 and amendments thereto. The discharge tank provides a convenient location for collection of composite samples using automatic sampler collection methods. A 24-hour timed composite sample shall be collected and analyzed for the following parameters, and shall meet the corresponding concentration limits:

Parameter	Limit (ppm)
Phosphorus	10.0
Arsenic	0.5
Cadmium	1.0
Chromium	3.0
Copper	3.0
Lead	1.0
Manganese	5.0
Nickel	3.0
Selenium	2.0
Zinc	5.0
Note: All parameters are analyzed for total concentration.	

If any parameter exceeds the above limits, the Monroe County Pure Waters District Industrial Waste Section must be notified at 274-8102 within 24 hours of receipt of the analytical results.

c. ***Grab Sampling Protocol:*** Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CRF Part 136 and amendments thereto. A grab sample, collected from the treatment system effluent sample port (BV-68, see Figure 1-4), shall be analyzed for the following parameters, and shall meet the corresponding concentration limits:

Parameter	Limit
pH	5.5-10.0
Polychlorinated Biphenyls (PCBs)	BDL
Acetone	Monitoring
Methyl Ethyl Ketone (2-Butanone)	Monitoring
Methyl Isobutyl Ketone (4-methyl-2-pentanone)	Monitoring
4-Methylphenol (p-cresol)	Monitoring
Total Toxic Organics (TTO)	2.13 ppm
Notes: BDL = Below detection limit. TTO = The summation of Purgeable Halocarbons (EPA Method 601), Purgeable Aromatics (EPA Method 602), Xylene, acid extractables, base neutrals, pesticides, and PCBs.	

If any parameter exceeds the above limits, the Monroe County Pure Waters District Industrial Waste Section must be notified at 274-8102 within 24 hours of receipt of the analytical results.

d. All groundwater must be treated regardless of the influent concentrations.

e. Quarterly flow summaries shall be submitted, in a timely manner, for billing purposes to the Monroe County Pure Waters District at the following address:

Monroe County Pure Waters
Industrial Waste Section
Iola Campus, Building 5
350 East Henrietta Road
Rochester, NY 14620
Attn: Mr. Harry Reiter

3.2.2 Analytical Methodology

All samples collected for discharge permit monitoring will be analyzed by a New York State Department of Health ELAP-certified laboratory. Table 3-3 identifies the parameters, methods, method references, holding times, preservatives, and container specifications for analysis of the treatment system effluent in accordance with the Monroe County Pure Waters Districts discharge permit requirements.

3.3 TREATMENT SYSTEM PERFORMANCE MONITORING

3.3.1 Sample Locations and Analytical Parameters

Ports installed in the treatment system train allow for performance testing of individual unit process components. Following the start-up period, all performance monitoring should be conducted on a quarterly basis unless more frequent monitoring is required by the air or discharge permits. Sampling at the head of the treatment process (i.e., feed tank sample port) for VOCs, PCBs, metals, and water quality parameters (i.e., hardness, alkalinity, pH, temperature, and turbidity) will be conducted to provide information on the treatment system influent (i.e., raw groundwater) quality and to allow for a comparison with the system effluent to monitor the overall efficiency of the treatment process. The VOC removal efficiency of the air stripper will be measured by comparing VOC concentrations in samples collected at the air stripper inlet and outlet sampling ports. Sampling for VOCs and PCBs will be conducted between one pair of activated carbon canisters to provide an

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TABLE 3-3
ROCHESTER FIRE TRAINING ACADEMY

ANALYTICAL METHODS AND PROTOCOLS FOR GROUNDWATER TREATMENT SYSTEM MONITORING

Parameter	Method	Method Reference	Holding Time	Preservation	Container
pH, Temperature, Turbidity	Field		(2)	None	1-500 ml polyethylene bottle
Phosphorus (Total, as P)	365.4	(1)	28 days	H_2SO_4 to pH <2; Cool to 4°C	100 ml polyethylene bottle
Hardness	130.1	(1)	6 months	H_2SO_4 to pH <2	1-500 ml polyethylene bottle
Alkalinity	310.1	(1)	14 days	Cool to 4°C	1-500 ml polyethylene bottle
Total Metals:					
Arsenic	206.2	(1)	180 days	HNO_3 to pH <2	
Iron	200.7	(1)	180 days	HNO_3 to pH <2	
Cadmium	200.7	(1)	180 days	HNO_3 to pH <2	
Chromium	200.7	(1)	180 days	HNO_3 to pH <2	1-1 liter polyethylene bottle
Copper	200.7	(1)	180 days	HNO_3 to pH <2	
Lead	200.7	(1)	180 days	HNO_3 to pH <2	(Volume satisfies requirement for
Manganese	200.7	(1)	180 days	HNO_3 to pH <2	all metals listed)
Nickel	200.7	(1)	180 days	HNO_3 to pH <2	
Selenium	270.2	(1)	180 days	HNO_3 to pH <2	
Zinc	200.7	(1)	180 days	HNO_3 to pH <2	
Total Toxic Organics/Volatiles:					
Purgeable Halocarbons	601	(1)	14 days	Cool to 4°C, 0.008% $Na_2S_2O_3$	2-40 ml glass vials
Purgeable Aromatics	602	(1)	14 days	Cool to 4°C, 0.008% $Na_2S_2O_3$	2-40 ml glass vials
Xylene	602	(1)	14 days	Cool to 4°C, 0.008% $Na_2S_2O_3$	2-40 ml glass vials
Acid Extractables	625	(1)	7 days to	Cool to 4°C	1-1 liter amber glass jug
Base/Neutral Extractables (4)	625	(1)	extraction;	Cool to 4°C	1-1 liter amber glass jug
Pesticides	608	(1)	40 days to	Cool to 4°C	1-1 liter amber glass jug
PCBs	608	(1)	analysis	Cool to 4°C	1-1 liter amber glass jug
Other Organics:					
Acetone	8015	(3)	14 days	Cool to 4°C, 0.008% $Na_2S_2O_3$	2-40 ml glass vials
Methyl Ethyl Ketone	8015	(3)	14 days	Cool to 4°C, 0.008% $Na_2S_2O_3$	2-40 ml glass vials
Methyl Isobutyl Ketone	8015	(3)	14 days	Cool to 4°C, 0.008% $Na_2S_2O_3$	2-40 ml glass vials

Notes/References:
(1) 40 CFR Part 136; Chemical Analysis of Water and Wastewater, EPA 600/4-49-020, Revised March 1983.
(2) Conduct test immediately following collection of samples.
(3) USEPA SW-846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, September 1986, 3rd Edition.
(4) Includes analysis for 2-methylphenol.

early indication of breakthrough, thereby allowing for carbon change out prior to exceeding the discharge permit limit of non-detectable PCB concentrations.

3.3.2 Sample Methodology

Samples at the head of the treatment system, the air stripper effluent, and between the activated carbon canisters will be collected as single grabs by filling pre-cleaned sample bottles from sample ports.

3.3.3 Analytical Methodology

All samples collected for treatment system performance monitoring will be analyzed by a New York State Department of Health (NYSDOH) ELAP-certified laboratory. Table 3-3 identifies the analytical parameters, methods, method references, detection limits, holding times, preservatives, and container specifications for all analyses.

3.3.4 Data Interpretation

3.3.4.1 Influent Sample Results

Sample results at the head of the treatment system will be used in the air stripper mass balance to provide a baseline for assessing the efficiency of the treatment process, and to aid in refining and adjusting the individual treatment units. In addition, the future elimination of one or more treatment units, if feasible, will be supported by the process influent results (e.g., activated carbon may not be required in the long-term if PCBs are not present at the head of the treatment process).

Feed tank results will be maintained by the City of Rochester and transmitted to NYSDEC on an annual basis with the groundwater monitoring results discussed in Section 3.4.

3.3.4.2 Primary Carbon Effluent Results

Detectable concentrations of PCBs or VOCs following the first activated carbon canister in series will indicate that the primary canister is spent. The valves on the process feed to the carbon canister will be adjusted to convert the second series of canisters to the

primary locations, and fresh carbon canister will be placed in the secondary locations. Spent carbon canisters will be properly disposed. The City of Rochester will maintain records of the activated carbon sampling.

3.4 GROUNDWATER MONITORING

3.4.1 Sample Locations and Analytical Parameters

Upgradient and downgradient wells will be sampled from each of the SDA, TGA, and NDA on a semi-annual basis during the post-remediation period. The groundwater monitoring wells to be sampled are located on Figure 3-1, and include the following:

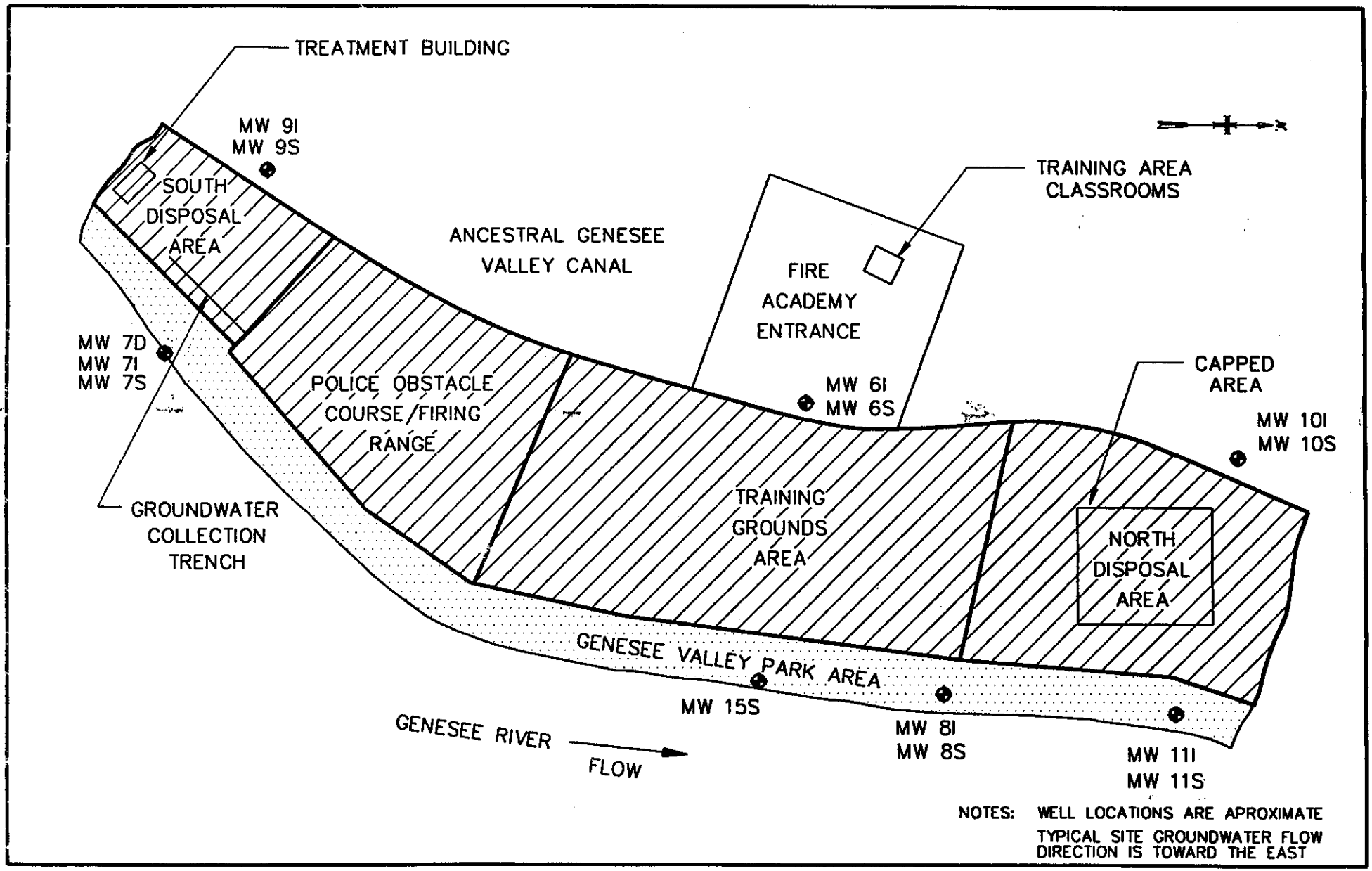
South Disposal Area
Upgradient Wells: 9S, 9I
Downgradient Wells: 7S, 7I, 7D

Training Grounds Area
Upgradient Wells: 6S, 6I
Downgradient Wells: 8S, 8I, 15S

North Disposal Area
Upgradient Wells: 10S, 10I
Downgradient Wells: 11S, 11I

Sampling upgradient monitoring well clusters 6, 9, and 10 will establish background groundwater quality in the TGA, SDA, and NDA, respectively. The remaining wells will be sampled to monitor the downgradient water quality in each of these three areas. In addition, groundwater elevation data should also be recorded at both of the groundwater collection trench piezometers.

Based on the results of previous investigations at the Site, groundwater samples from both the upgradient and downgradient monitoring wells will be analyzed for field parameter (i.e., pH, Eh, temperature, turbidity, and specific conductivity), TCL volatile organics, PCBs, and select metals (i.e., arsenic, cadmium, and lead).



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3603 ADMIN

MALCOLM PIRNIE

ROC7

ROCHESTER FIRE TRAINING ACADEMY
O&M MANUAL

GROUNDWATER MONITORING WELL LOCATIONS

CITY OF ROCHESTER SEPTEMBER 1997

FIGURE 3-1

3.4.2 Sample Methodology

Groundwater sampling will be performed using disposable polyethylene bailers. Monitoring well sampling will be conducted in accordance with the following procedure:

- Unlock and carefully remove well cover to avoid any foreign material falling into the well.
- Slowly lower a water level indicator probe into the well and record the static water level (in feet below the top of the well riser). Next, lower the probe to the bottom of the well, record the bottom depth, and calculate the standing well volume.
- Purge the well by removing 3 to five 5 well volumes from rapidly recharging wells, and at least 1 well volume (or to dryness) from slowly recharging wells. Procedures to be followed for well purging are presented as Appendix E.1.
- Transfer purge water to the head of the groundwater treatment system.
- Collect water samples following the procedure presented as Appendix E.2. Sample hierarchy will be volatile samples (first) followed by PCB samples and metals (last). Field parameters will be measured from aliquots of both the initial and final bailers of groundwater. In general, sample collection should be completed within 24 hours after well purging.
- Record all the pertinent information indicated on the field data sheet in Appendix E.2. All sample information should also be recorded in a bound field notebook.
- Label sample bottles and ship to the analytical laboratory under chain of custody command in accordance with Appendices E.3 and E.4, respectively.
- Replace the well cover and lock. Decontaminate water level probe and field instruments with laboratory-grade soap and analyte free water prior to sampling the next well.

3.4.3 Analytical Methodology

Field parameters will be measured by sampling personnel using portable field instruments. The remaining parameters will be analyzed by an independent, NYSDOH ELAP-certified analytical laboratory. Table 3-4 identifies the analytical parameters,

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TABLE 3-4
ROCHESTER FIRE TRAINING ACADEMY

ANALYTICAL METHODS AND PROTOCOLS FOR MONITORING WELL SAMPLING

Parameter	Method	Method Reference	Holding Time	Preservation	Container
pH, Eh, Temperature, Turbidity Specific Conductivity	Field	—	(1)	None	1-500 ml polyethylene bottle
TCL Volatiles	8260	1	14 days	4 drops concentrated HCl Cool to 4°C	2-40 ml glass vials w/ teflon-lined septa
PCBs	8080	1	7 days to extraction 40 days to analysis	Cool to 4°C	1-liter amber glass bottle
Arsenic	7060	1	180 days	HNO_3 to pH <2	1-500 ml polyethylene bottle
Cadmium	6010	1	180 days	HNO_3 to pH <2	1-500 ml polyethylene bottle
Lead	6010	1	180 days	HNO_3 to pH <2	1-500 ml polyethylene bottle

Notes:
(1) Conduct test immediately following collection of samples.

Reference:
1. USEPA SW-846 Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, September 1986, Third Edition.

methods, method references, detection limits, holding times, preservatives, and container specifications for analysis of the groundwater samples.

3.4.4 Data Interpretation

The results of the downgradient groundwater monitoring will be compared to Class GA Groundwater Quality Standards and the upgradient sample results. Based on this comparison, a determination will be made as to the effectiveness and integrity of the remedial measures, including the hydraulic and treatment efficiency of the groundwater collection and treatment system in the SDA.

4.0 TREATMENT BUILDING

4.1 STRUCTURE AND COMPONENTS

4.1.1 General

4.1.1.1 Description

The treatment building provides an environmentally controlled enclosure for process equipment and office facilities for one operator. The treatment building is a clear-span, rigid-frame, premanufactured metal building with an overhead door for equipment removal. The interior concrete floor is sloped to a centrally-located drainage trench and treated with a chemical floor hardener. A sump with a 1,500-gallon capacity is provided within the drainage trench. Equipment pads are provided to support the bag filters, pumps, and feed and discharge tanks.

4.1.1.2 Major Components

The structure includes a concrete masonry unit office, an overhead door, a drainage trench with grating, a sump pit, equipment pads, and a bag filter platform.

4.1.2 Maintenance

Maintenance of the building will depend on periodic inspection of the integrity of the structure. In general, the structure is designed to be free of routine maintenance such as painting, roof replacement, etc.

Concrete areas must be checked for cracks or other indications of structural failure. Patching of the concrete may be required for small cracks. Areas with larger separations in the concrete may need to be replaced. The drainage trench and sump pit must be inspected for obstructions in the path of flow. All obstructions must be removed. The enclosure walls should be checked for bowing due to excessive loads on the walls. If the walls are bowing, additional support must be provided to the piece of equipment causing the excessive load. In addition, a small amount of lithium grease should be periodically applied to the overhead door track.

4.2 UTILITIES

Operation and maintenance of the SDA groundwater treatment system requires potable water, sewer, natural gas, electric, and telephone service. General locations of these service lines are shown schematically on Figure 4-1.

4.2.1 Potable Water

The 4-inch diameter ductile iron potable water main servicing the TGA has been extended to the SDA. At the treatment building, the water main is reduced to a 2-inch copper line. Maintenance on the water main should not be required.

4.2.2 Sewer

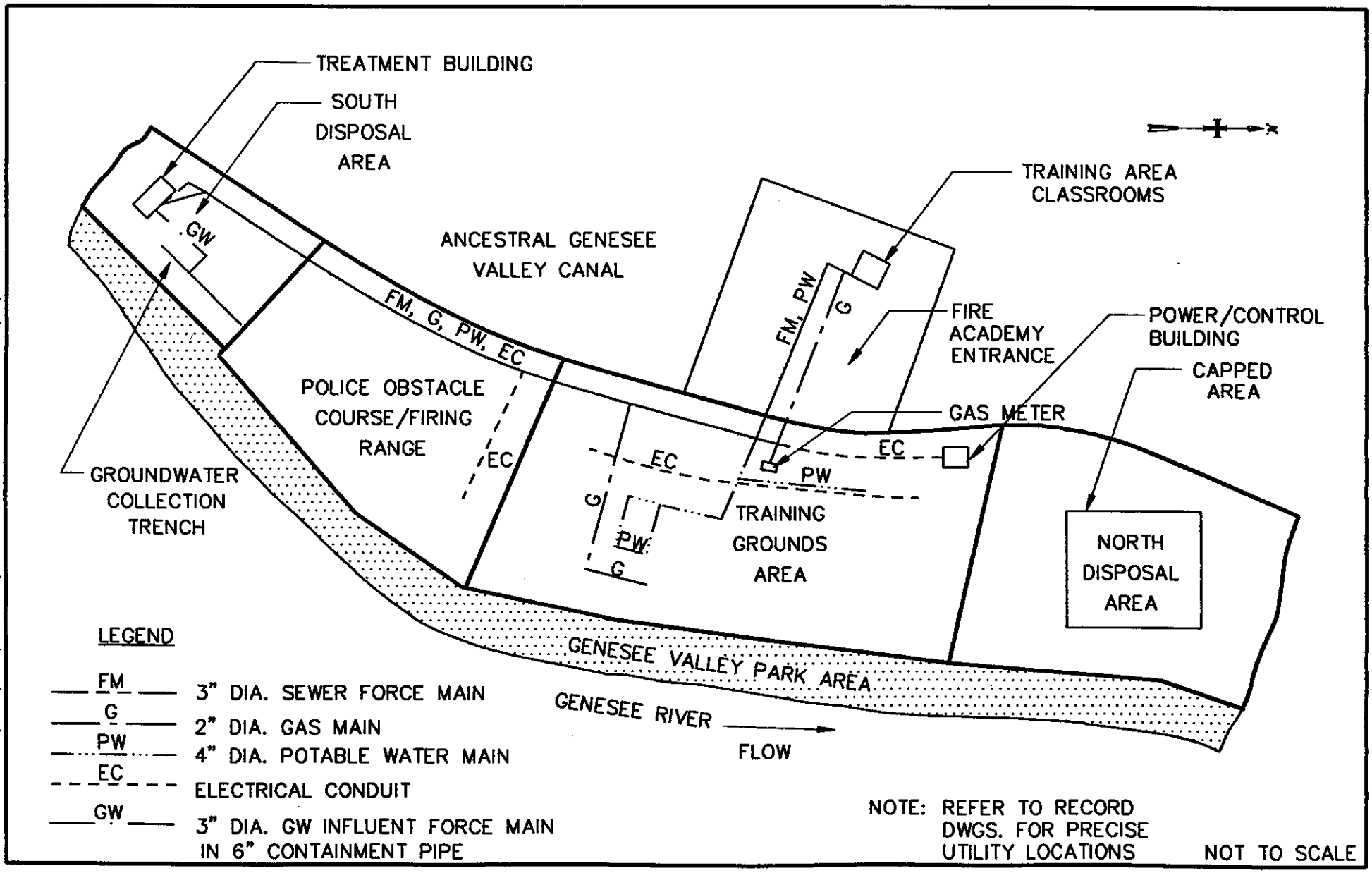
A 3-inch diameter ductile iron sewer force main, which serves as a conduit for discharge of treated groundwater to the sanitary sewer, extends from the SDA groundwater treatment system to the effluent manhole south of the existing classroom building. The force main may need to be flushed periodically to minimize solids buildup.

4.2.3 Natural Gas

The gas piping in the TGA has been abandoned in place and the gas meter relocated to the lawn area northwest of its former location in the TGA. A 2-inch diameter gas main has been extended from the metering point to the SDA along the SDA access road. Maintenance on the gas piping should not be required.

4.2.4 Electric

The power panels and service transformer at the pump house have been upgraded to provide power to the treatment facility as well as any future requirements in the TGA. The existing pump house services the SDA via underground conduit to the groundwater treatment system. Refer to Plate 1 for the one-line diagrams and panel schedules.



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ROCHESTER FIRE TRAINING ACADEMY
O&M MANUAL

UTILITIES SCHEMATIC

CITY OF ROCHESTER

OCTOBER 1997

FIGURE 4-1

4.2.5 Telephone

Cellular phone service in the treatment building control room provides for remote notification for plant alarms (via an auto dialer) as well as providing for emergency communications.

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5.0 COVER SYSTEM INSPECTION AND MAINTENANCE

Remedial activities undertaken in the North Disposal Area, South Disposal Area and Training Grounds Area involved placement of final cover systems upon completion of the work. The cover systems to be installed in each area are as follows:

North Disposal Area - Soil/Synthetic cover consisting of a 40 mil HDPE liner, 24 inches of barrier soil and 6 inches of topsoil

South Disposal Area - Soil cover consisting of 6-inches of topsoil

Training Grounds Area - Asphalt cover consist of base and surface courses

A summary of the inspection and maintenance/repair programs to be followed for the cover systems is presented in the following sections. These programs will be followed for a post-remedial period of at least 30 years. Following the 30-year period, the City and NYSDEC will assess the need for further site maintenance.

5.1 COVER SYSTEM INSPECTION

The City of Rochester will be responsible for routine inspection of the cover materials and supporting infrastructure in the North Disposal Area, Training Grounds Area, and South Disposal Area. The covers/infrastructure in each of these areas will be inspected on a quarterly basis throughout the post-remedial period, and will be examined for:

- Integrity of cover, including:
  - erosion or settling of cap materials
  - cracking/breaches in covers
  - slope loss
  - pooling or ponding of surface water
  - loss of vegetative cover (excluding the Training Grounds Area)
  - presence of undesirable plant or animal species
- Integrity of remaining groundwater monitoring wells

Appendix F.1 presents an inspection checklist for visual inspection of the cover systems.

The results of the quarterly inspection, including any maintenance actions planned or taken, will be submitted to NYSDEC on an annual basis.

5.2 COVER SYSTEM MAINTENANCE AND REPAIR

Maintenance of the cover systems will be performed by the City of Rochester as necessary over the post-remedial care period. Any signs of erosion, settling, cracking, or other site damage or maintenance problems detected during routine site inspections will be corrected as soon as possible. Routine maintenance of the cover systems and infrastructure will include mowing the vegetative covers of the North Disposal Area and South Disposal Area (i.e., within the fence line) frequently enough to prevent growth hindrance or smothering due to excessive clippings, and flushing sediments from the storm sewer and grating as necessary to prevent clogging. Mowing of the area outside the South Disposal Area fence line adjacent to the Genesee Valley Park Area will also be performed. Additional routine maintenance activities may be established by the City of Rochester during the post-remediation period as the maintenance requirements become more defined.

In general, most cover system repairs will be made following the same procedures and using the same materials as for the original construction. Minor asphalt cover cracks or holes will be repaired with surface course asphalt and a hand tamper. Minor soil cover material repairs will consist of replacement of lost/eroded soils with clean topsoil followed by the addition of starter fertilizer and perennial grass seed. If minor repairs to the HDPE liner are necessary, the liner surrounding the breach will be exposed, broomed and washed. The defective area will then be cut out, and the edges around the remaining section will be roughened to remove oxidized material. A round patch will be cut from remaining HDPE used in the original construction or from newly purchased material manufactured from the same or similar resins, and will extend a minimum of 6 inches around the defect. All seams used in the repairing procedure will be approved extrusion welded seams subjected to the same test procedures required in the original construction specification. Topsoil and barrier

protection soils removed for the purpose of exposing the defective liner will be replaced per the construction specifications.

If major cover system or infrastructure repairs are required, the repair procedure will be discussed with NYSDEC's Division of Hazardous Waste Remediation in Albany, NY prior to implementation. In addition, if any other construction or physical alterations to the North Disposal Area, South Disposal Area, Training Grounds Area, or Genesee Valley Park Area (in the immediate vicinity of the site) are required and would constitute a substantial change in site use as identified in 6NYCRR Part 375-1.6, NYSDEC's Division of Hazardous Waste Remediation will be contacted for review and approval of the proposed changes. Appendix I presents a soil management plan for the training grounds area, which presents guidelines for health and safety protection and soil characterization, handling and disposal in the event that excavation is required in this active area of the site.

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6.0 STORM WATER COLLECTION SYSTEM

6.1 STORM WATER COLLECTION SYSTEM

6.1.1 Description

The capacity of the existing Rochester Fire Academy storm water collection system was upgraded to handle increased storm water runoff resulting from the construction of the TGA and NDA caps. The new system is designed for storm water flows during the 25-year storm event in the Fire Academy Entrance Area, TGA, PFR, and NDA. The storm water collection system consists of the following specific components:

- Storm sewer through the TGA:
  - Drainage structure #1
  - 15" diameter pipe
  - Drainage structure #2
  - 21" diameter pipe
  - Drainage structure #3
  - 27" diameter pipe
  - Headwall structure with check valve
- Storm sewer from the PFR:
  - 12" diameter pipe
  - Headwall structure with check valve
- NDA run-off drainage swales #1 and #2
- NDA run-on drainage swale

6.1.2 Inspection

The storm water collection system will be examined for:

- Integrity of drainage swales and storm sewers including:
  - sediment build-up
  - cracking or breaching of storm water pipe or concrete channels
  - clogging of drainage grates
  - pooling or ponding of surface water
  - erosion of earthen channels

The integrity of these storm water collection system components should be recorded on the inspection checklist presented as Appendix F.2.

6.1.3 Maintenance

Routine maintenance of the storm water collection system includes flushing sediments from the storm sewer and grating as necessary to prevent clogging.

6.2 DRAINAGE STRUCTURES

6.2.1 Description

The storm water collection system consists of storm sewer pipes, Drainage Structures #1, #2, and #3, and two headwall structures.

6.2.2 Inspection

Visual inspection of the drainage and headwall structures is necessary to confirm that they are functioning as designed. As well, the outfall pipe in the headwall structure should be inspected to make sure the flapper valve that protects the pipe is not jammed open with debris. The integrity of the drainage structures should be recorded on the inspection checklist presented as Appendix F.2.

6.2.3 Maintenance

Periodic pumping of oil accumulated in Drainage Structure #3 is necessary to maintain the effectiveness of this drainage structure as an oil/water separator. In addition, any water accumulated in Drainage Structure #3 should be pumped out before the winter season to avoid damaging the sluice gate from potential freezing.

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7.0 FACILITY ACCESS SYSTEM

7.1 DESCRIPTION

The facility access system consists of on-site paved and gravel roads, fences, and gates. The purpose of the system is to provide access for inspection and maintenance activities, while preventing public access. The facility access system consists of the following specific components:

- Access Roads
  - 24' wide site access road
  - 12' wide paved access road to SDA treatment building
  - 12' wide gravel access road through PFR area
  - asphalt ramp from TGA to bicycle path
- Chain Link Fences
  - perimeter fence
  - fence separating four areas on-site
- Gates
  - 24' wide sliding, locking gate for site access
  - 16' wide sliding gate for treatment plant access
  - 12' wide sliding gate for PFR access
  - 16' wide double swing, locking gate for TGA access from the asphalt ramp
  - 16' wide double swing gate between TGA and NDA

7.2 INSPECTION

Visual inspection of the facility access system should focus on the condition of the roads, fences, and gates.

7.3 MAINTENANCE

Recommended maintenance actions for the facility access system are provided in Table 7-1.

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TABLE 7-1
ROCHESTER FIRE TRAINING ACADEMY

FACILITY ACCESS SYSTEM MAINTENANCE ITEMS

Inspection Item	Problem Noted	Action Required	Preventative Maintenance
1. Access Roads			
i. gravel	a. Pot holes/washout	Fill and compact holes with crushed gravel or stone.	Quarterly inspection
	b. Inadequate drainage	Regrade road surface and place grade crushed gravel or stone over area of concern.	Quarterly inspection
ii. paved	a. Cracks/open surfaces	Fill cracks or open surfaces with asphalt sealer.	Quarterly inspection
	b. Potholes	Fill potholes with asphalt patch.	
2. Access Gates	a. Hinges, locks, or gate worn or damaged	Replace with galvanized equipment.	Quarterly inspection and lubrication
3. Fences	a. Damage to fence posts, rails, braces, or chain link fabric	Replace with galvanized equipment.	Quarterly inspection

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8.0 RECORDS

8.1 DESCRIPTION

Operations and maintenance records must be updated by the City of Rochester and maintained on-site. Daily operating logs should be posted in the treatment area and archived in on-site files after 6 months. Maintenance records and records of incidental activities should also be maintained on-site, with environmental records (e.g., hazardous waste transportation manifests) maintained for the duration required by the appropriate agencies. Laboratory records and reports to State and local agencies should be maintained in an area accessible to all authorized personnel. As well, records of all information resulting from any monitoring activities must be maintained for a minimum of ten years. These records shall be available for inspection and copying by the Monroe County Pure Waters District. Incidents at the site will be documented and maintained on-site.

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9.0 HEALTH AND SAFETY PLAN

An example of a full Health and Safety Plan for the Rochester Fire Academy site is presented as Appendix G. It addresses those site-specific hazards which, at the time of this post-closure monitoring plan development, may potentially be encountered while performing the post-closure maintenance and monitoring tasks described herein. General Health and Safety guideines for non-intrusive activities are described below. Malcolm Pirnie does not accept responsibility for the Health and Safety of any individuals other than their own employees. Site representatives, contractors, or any other persons performing work at the site shall be required to provide their own site-specific HASP covering their employees and subcontractors. Appendix G contains the full HASP should intrusive activities be required.

9.1 HAZARD EVALUATION

9.1.1 Summary of Projected Risks

Based on the results of previous site investigations, potential hazards have been identified for each work task involved. These hazards are listed in Table 9-1. The principal points of exposure would be through direct contact with contaminated fill/soils and groundwater, through the inhalation of contaminated particles or vapors. Since work will be performed during summer/winter time periods, the potential exists for heat/cold stress to impact workers especially those wearing protective equipment and clothing.

Although no work can be considered completely risk-free, logical and reasonable precautions will be implemented to provide an adequate level of protection for workers. The integration of medical evaluations, worker training relative to chemical hazards, safe work practices, proper personal protection, environmental monitoring, work zones and site control, appropriate decontamination procedures and contingency planning into the project approach will minimize the chance of unnecessary exposures and physical injuries.

9.1.2 Physical Hazards

Field reconnaissance activities may present the following physical hazards:

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TABLE 9-1
ROCHESTER FIRE TRAINING ACADEMY

PROJECT TASKS WITH POTENTIAL HAZARDS

Project Task	Potential Hazards
1. Sample groundwater.	Exposure to contaminants: dermal, oral and inhalation. Physical hazards.
2. Conduct site inspections and maintenance.	Exposure to contaminants: dermal, oral, and inhalation. Physical hazards.
3. Conduct groundwater level monitoring.	Exposure to contaminants: inhalation. Physical hazards.

- The potential for heat/cold stress to employees during the summer/winter months (see Section 9.4).
- The potential for slip-and-fall injuries due to rough, uneven terrain.
- The potential for injury if a landfill gas or waste fire is experienced.

9.1.3 Chemical Hazards

The primary routes of exposure to the contaminants found on the site (see Appendix G) are through inhalation of dusts and by direct contact.

9.2 SAFE WORK PRACTICES

All employees shall obey the following safety rules during on-site work activities:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice which increases the probability of hand-to-mouth transfer of contaminated material is strictly prohibited.
- The hands and face must be thoroughly washed upon leaving the work area and prior to engaging in any activity indicated above.
- Contact with surfaces/materials either suspected or known to be contaminated will be avoided to minimize the potential for transfer to personnel, crosscontamination and need for decontamination.
- Medicine and alcohol can potentiate the effects of exposure to toxic chemicals. Due to possible contraindications, use of prescribed drugs should be reviewed with the Pirnie occupational physician. Alcoholic beverage and illegal drug intake are strictly forbidden during site work activities.
- All personnel shall be familiar with standard operating safety procedures and additional instructions contained in the Health and Safety Plan.
- All employees have the obligation to correct or report unsafe work conditions.

9.3 PERSONAL PROTECTION EQUIPMENT

Personnel must wear personal protective equipment (PPE) when work activities involve known or suspected atmospheric contamination or when direct contact with dermally active substances may occur. Chemical-resistant clothing will be used to protect the skin from contact with skin-destructive and skin-absorbable chemicals. All PPE shall be maintained and stored as specified by the manufacturer. Good personal hygiene and safe work practices, as identified in Section 9.2, are also necessary to limit or prevent the ingestion of potentially harmful substances.

Personal protection equipment has been designated for each project task where potential hazards exist. The designated PPE for each task is listed in Table 9-2. The Site Health and Safety Coordinator will monitor the use of PPE during extreme temperature conditions.

9.4 HEAT/COLD STRESS MONITORING

Since site inspections, maintenance, and monitoring activities will be scheduled for both the summer and winter months, measures will be taken to minimize heat/cold stress to employees. The Site Health and Safety Coordinator or his/her designee will be responsible for monitoring employees for symptoms of heat/cold stress.

9.4.1 Heat Stress Monitoring

Personal protective equipment may place an employee at risk of developing heat stress, probably one of the most common (and potentially serious) illnesses encountered at sites requiring PPE. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning and age. Personal protective equipment may severely reduce the body's normal ability to maintain equilibrium (via evaporation, convection and radiation), and by its bulk and weight increases energy expenditure.

The signs and symptoms of heat stress are as follows:

- Heat rash may result from continuous exposure to heat or humid air.

- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:

  - muscle spasms
  - pain in the hands, feet and abdomen

- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:

  - pale, cool, moist skin
  - heavy sweating
  - dizziness
  - nausea
  - fainting

- Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are:

  - red, hot, usually dry skin
  - lack of or reduced perspiration
  - nausea
  - dizziness and confusion
  - strong, rapid pulse
  - coma

The monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 110 beats per minute. If the rate is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. If the pulse rate is 100 beats per minute at the

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TABLE 9-2
ROCHESTER FIRE TRAINING ACADEMY

PPE FOR EACH PROJECT TASK WITH AN IDENTIFIED HAZARD

1.	Sample groundwater (Level D respiratory, Level C dermal): ▪ Tyvek Suit ▪ Chemical protective gloves (latex) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses
2.	Conduct site inspection and non-intrusive maintenance (Level D): ▪ Coveralls (or work clothes) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses ▪ For intrusive maintenance, upgrade to Level C dermal.
3.	Groundwater level monitoring (Level D respiratory, Level C dermal): ▪ Tyvek Suit ▪ Chemical protective gloves (latex) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses

beginning of the next rest period, the following work cycle should be further shortened by 33%.

- Body temperature may be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period should not exceed 99.6 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. However, if the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the following work cycle may be further shortened by 33%. Oral temperature should be measured again at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. No Malcolm Pirnie employee will be permitted to continue wearing semipermeable or impermeable garments when his/her oral temperature exceeds 100.6° Fahrenheit.

9.4.2 Cold Stress Monitoring

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages as shown below.

- **Frostbite** occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:

  1) **Frostnip** - This is the first stage of the freezing process. It is characterized by a whitened area of skin, along with a slight burning or painful sensation. Treatment consists of removing the victim from the cold conditions, removal of boots and gloves, soaking the injured part in warm water (102-108°F) and drinking a warm beverage.

  2) **Superficial Frostbite** - This is the second stage of the freezing process. It is characterized by a whitish-grey area of tissue which will be firm to the touch but will yield little pain. Treatment is identical to that for frostnip.

  3) **Deep Frostbite** - In this final stage of the freezing process the affected tissue will be cold, numb and hard, and will yield little to no pain. Treatment is identical to that for frostnip.

- **Hypothermia** occurs when the body loses heat faster than it can produce it. The stages of hypothermia (which may not be clearly defined or visible at first) are the following:

  1) Shivering

2) Apathy (a change to a disagreeable mood)
3) Unconsciousness
4) Bodily freezing
5) Death (if untreated)

Treatment of hypothermia is given below:

- Remove the victim from the cold environment and remove wet or frozen clothing. (Do this carefully as frostbite may have started.)
- Perform active re-warming with hot liquids for drinking (Note: do **not** give the victim any liquid containing alcohol or caffeine in this case) and a warm water bath (102-108°F)
- Perform passive re-warming with a blanket or jacket wrapped around the victim.

In any potential cold stress situation, it is the responsibility of the Site Health and Safety Officer to encourage the following:

- Workers should dress warmly, with more layers of thin clothing as opposed to one thick layer.
- Personnel should remain active and keep moving.
- Personnel should be allowed to take shelter in a heated area, as necessary.
- Personnel should drink warm liquids (no caffeine or alcohol if frostbite has set in).

9.5 EMERGENCY RESPONSE PLAN

Emergency medical treatment can be obtained at the Strong Memorial Hospital in Rochester. This information shall be posted in the on-site treatment building and in the field vehicle. It is the Site Safety Officer's responsibility to ensure that the information sheet is posted.

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Emergency Telephone Numbers:

Fire, Ambulance, Police	911
Strong Memorial Hospital	(716) 275-2100

Directions to Hospital:

The following directions describe the best route to Strong Memorial Hospital from the Rochester Fire Academy (refer to Figure 9-1). The route to the hospital will take about five minutes.

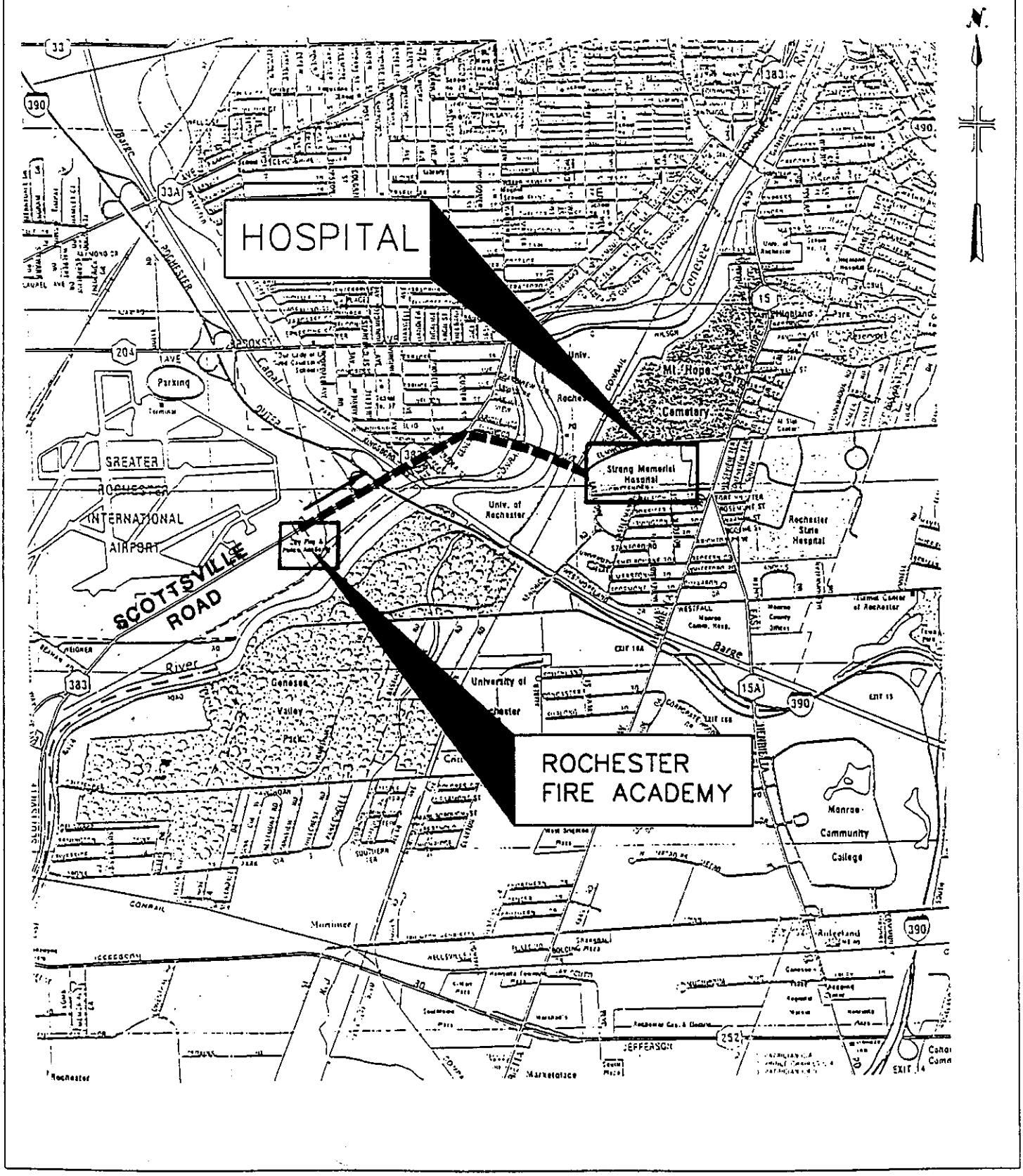
1. From the site, turn right onto Scottsville Road and proceed to Elmwood Avenue.

2. Turn right onto Elmwood Avenue; proceed on Elmwood over the Genesee River to Lattimore Road.

3. Turn right onto Lattimore Road and proceed one block to Crittenden Blvd.

4. Turn left onto Crittenden Blvd. and follow signs to the Strong Memorial Hospital Emergency Room located on the left side of the road.

FIGURE 9-1



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CITY OF ROCHESTER
ROCHESTER FIRE ACADEMY
HOSPITAL ROUTE

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10.0 EMERGENCY/CONTINGENCY PLANS

10.1 FIRE/EXPLOSION

In case of fire within the capped portion of the NDA, the fire department will be dispatched to the scene. Emergency numbers should be listed in the Health and Safety Plan (HASP) and updated annually. The fire department must be prepared with appropriate equipment to adequately handle anticipated emergencies at the Site.

In the event of a fire, only authorized personnel will be allowed at the Site. Details, including the source and cause of the fire, will be maintained at the fire department. The contaminated soils in the NDA are capped with several layers, these being: minimum 6-inch layer of sand; 40 mil HDPE synthetic membrane; geocomposite drainage layer; 24-inch barrier protection layer; and 6-inch seeded topsoil layer. Refer to the Record Drawing (Sheet G-11) for a detailed illustration of the cover layers. In all likelihood, due to the nature of the cap, the greatest potential for fire would be a grass fire without the threat of releases of contamination. If contaminated soils are exposed during a fire or during firefighting operations, appropriate air monitoring and personal protective equipment will be implemented until any damage to the cap is repaired and the risk of exposure no longer exists. Dermal protection will be required during fire-fighting activities.

10.2 PERSONAL INJURY

The security features of the Site should control access by unauthorized individuals. If an accident does occur, the following procedure will be followed:

Injury when person is not incapacitated. Authorized personnel who receive injuries that do not incapacitate them, such as minor burns, punctures, and sprains, will be given first aid at the site only when necessary. The victim will then be taken to the hospital emergency room for examination and treatment. The phone number and directions to the hospital should be included in of the HASP.

Unauthorized persons who receive injuries that are not incapacitating *should not* be given first aid at the Site unless absolutely necessary for the well being of the victim. If possible, obtain all personal information about the victim for purposes of completing accident forms. Instruct individual to go to his doctor for examination and required treatment. Inform police.

Serious Injury. First aid will be rendered only by individuals who have had first aid training. Give only that first aid which is necessary to prevent further harm to the accident victim. Seriously injured victims should not be moved unless they are in danger because of their location.

It is imperative to obtain personal information about the accident victims in order to complete accident forms. If the person is not authorized to be on the Site, inform the police. An ambulance should be called to transport the victim to the hospital. Contact numbers for ambulance services should be listed in the HASP.

Procedures After an Accident: If assistance is needed, the fire department will respond to a non-emergency, on-site accident. All witnesses to the accident will be interviewed. Once the facts surrounding the accident have been compiled, probable cause will be determined and an accident report will be completed. After a thorough investigation and determination of the causes, corrective measures will be implemented to prevent similar accidents in the future. Corrective measures may include, but are not limited to, instruction to authorized personnel, additional safety precautions, and elimination or repair of unsafe conditions.

10.3 SEVERE WEATHER CONDITIONS

The NDA cover system has been designed for adequate drainage and control of normal rain conditions. During severe weather conditions (e.g., heavy rainstorms), the integrity of the constructed cap and surrounding terrain may deteriorate in localized areas due to erosion. After the occurrence of a severe storm, an inspection of the capped area will be conducted to check for erosion of the cover, and adjacent areas that could eventually

affect the cover. In the event that excessive erosion has resulted, actions will be taken to repair and return the damaged area to its proper state.

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11.0 LIST OF MANUFACTURERS AND SUPPLIERS

11.1 DESCRIPTION

The manufacturer's literature is provided under separate cover due to the quantity of information included. Shop drawings, record drawings, and vendor O&M Manuals are on-site in the groundwater treatment building. Table 11-1 lists the components of the groundwater treatment system with the manufacturer's name and equipment number.

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TABLE 11-1
ROCHESTER FIRE TRAINING ACADEMY

MANUFACTURER'S LITERATURE

Item #	Manufacturer Number	Manufacturer Name & Description	Vendor Name and Phone Number	
Sequestering Agent Feed System:				
5.	A971-257	LMI, Polyphosphate Pumps	Pertech, Inc.	716-691-5450
8.	PRV025-PVC	Griffco, Pressure Relief Valves	Pertech, Inc.	716-691-5450
9.	BPV025-PVC	Griffco, Back Pressure Valves	Pertech, Inc.	716-691-5450
Bag Filter:				
13.	UF8-1802F-A2CE	Trumpler Clancy, Inc., Bag Filter	Trumpler Clancy, Inc.	315-488-3200
14.	UF81802DIS	Trumpler Clancy, Filter Displacers	Trumpler Clancy, Inc.	315-488-3200
Feed System:				
11.	SRM4MIC	F.E.Myers, Submersible Pumps	Fluid Kinetics, Inc.	716-662-7900
18.	TFD-PE1500	Remedial System, Inc., Feed Tank	Remedial System, Inc.	508-543-1512
Air Stripper:				
6.	TE-7K-MD	March Manufacturing, Feed Pumps	Pertech, Inc.	716-691-5450
19.	RTS-50-4 (Pumps, Blowers & Accessories)	Remedial System, Inc., Low Profile Shallow Tray Air Stripper	Remedial System, Inc.	508-543-1512
GAC System:				
17.	2RS117ELH	Durco, Butterfly Valves	R.M. Newell	716-632-0662
20.	LPC-D165	Remedial System, Inc., ctivated Carbon Canister System	Remedial System, Inc.	508-543-1512

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TABLE 11-1
ROCHESTER FIRE TRAINING ACADEMY

MANUFACTURER'S LITERATURE

Item #	Manufacturer Number	Manufacturer Name & Description	Vendor Name and Phone Number	
Discharge System:				
7.	2BF21534	Goulds Pumps, Discharge Pumps	Estabrook Corp.	1-800-959-9160
17.	TDS-PE1500	Remedial System, Discharge Tank	Remedial System, Inc.	508-543-1512
Instrumentation:				
3.	HydroRanger I	Milltronics, Ultrasonic Level Transmitters	Cyclops Process Equipment	315-638-8121
10.	SENTRY III CTP1010H	Griffco, Pulsation Dampner	Pertech, Inc.	716-691-5450
12.	IMT20-SA10FGZ	Foxboro, Magnetic Flow Transmitter	Wicker Technologies	716-377-2740
	8302-SABA-TST-GFNA	Foxboro, Magnetic Flow Tube	Wicker Technologies	716-377-2740
15.	P5045-G	Winters, Pressure Gauges	Winters	716-833-3416
Miscellaneous:				
1.	K150UVCM	Kitz, Λ-Port Control Valve	R.M. Newell	716-632-0662
2.	CE4ATAH	Automax, Actuator	R.M. Newell	716-632-0662
4.	N/A	CSK Technical, Skid	CSK Technical	1-800-833-2613
16.	#70	Winters, Diaphragm Seal	Winter's	716-833-3416

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TABLE 11-1
ROCHESTER FIRE TRAINING ACADEMY

MANUFACTURER'S LITERATURE

Item #	Manufacturer Number	Manufacturer Name & Description	Vendor Name and Phone Number
Electrical:			
21.	CP01R04	Exor Electronic, Operator Interface	Vordex Inc 716-924-4360
22.	SLC5/30	Allen-Bradley, PLC	Wehle Electric 716-854-3270
23.	VSS-8C	Raco, Autodialer/Cellular Interface	A.E. Hatch & Associates Inc. 315-463-7172

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11.0 LIST OF MANUFACTURERS AND SUPPLIERS

11.1 DESCRIPTION

The manufacturer's literature is provided under separate cover due to the quantity of information included. Shop drawings, record drawings, and vendor O&M Manuals are on-site in the groundwater treatment building. Table 11-1 lists the components of the groundwater treatment system with the manufacturer's name and equipment number.

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APPENDIX A

GROUNDWATER COLLECTION AND TREATMENT SYSTEM STANDARD OPERATING PROCEDURES (SOPs)

A.1 SOP for Groundwater Collection and Treatment System Start-Up and Shut-Down
A.2 SOP for Groundwater Collection Trench and Pumps
A.3 SOP for Sequestering Agent Feed System
A.4 SOP for Multiple Bag Filters
A.5 SOP for Feed and Discharge Tanks
A.6 SOP for Air Stripper Feed Pumps
A.7 SOP for Low Profile Air Stripper
A.8 SOP for Granular Activated Carbon (GAC) Vessels
A.9 SOP for Discharge Pumps

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APPENDIX A.1

Rochester Fire Academy
Operations and Maintenance Manual

Standard Operating Procedure for Groundwater Collection and Treatment System Start-up and Shut-Down

The following steps presents standard procedures for start-up and shut-down of the groundwater collection and treatment system at the Rochester Fire Academy that should be employed if maintenance activities or unforseen conditions (e.g., mechanical failure) result in or require extended shut-down of the system.

START-UP PROCEDURE

1. Contact Monroe County Pure Waters (Mr. Harry Reiter) at (716) 274-8102 if starting up after greater than 24-hours down time, and inform them of the start-up.

2. Verify all required mechanical connections are in-place and orientation of manually-operated valves will allow flow transfer from the collection trench through the bag filters, feed tank, air stripper, and activated carbon vessels prior to discharge to the sanitary sewer.

3. Toggle through process control set-points on PLC to verify that operating levels and alarm set-points for pump station, feed tank, discharge tank and building sump have not been lost from memory or altered.

4. If air stripper sump has been drained for maintenance, initiate the following procedure:

    A. Close the valve on the inlet water line

    B. Turn the power on at the system control panel. Check that all the control functions are properly indicated.

    C. Start the primary system blower by turning the HOA switch on the stripper control panel to "hand" (manual).

D. Verify that the feed tank is sufficiently full, and start one of the air stripper feed pumps. Open the valve on the influent water line slowly until the desired water flow rate is reached.

E. Run the system for 1-2 minutes then turn the inlet water off. After 1 minute, turn off the blower. This procedure will ensure that the down-tube in the sump is immersed in water, creating a seal against air escaping up the down tube. The system is now ready for continuous process operation.

5. Verify that bag filters are in-place and vessel lids are closed. Place the groundwater collection pump HOA switches in "auto" mode (note: the pump station high water level alarm may have activated prior to this time if the collection pumps were de-energized for an extended period of time. The alarm condition should be acknowledged, and will deactivate once the groundwater table is sufficiently lowered in the vicinity of the pump station). Slightly open sample tap on groundwater feed line to release any trapped air, then close.

6. Place, in succession, the following equipment in "auto" mode: air stripper primary blower; air stripper discharge pumps; air stripper feed pumps; process discharge pumps; and building sump pumps.

7. Place sequestering agent feed pumps in automatic mode. Verify that the sequestering agent feed rate is appropriate based on the recommended dosages presented in this manual or based on the results of subsequent water quality testing on the collected groundwater. The feed rate can be checked by: filling the calibration chamber with sequestering agent feed solution; re-orienting the valves on the metering pump influent line to draw from the calibration chamber; and timing the rate of withdrawal from the calibration chamber to establish a feed rate.

8. Monitor treatment system operation to verify that all processes are functioning appropriately.

9. If system was shut-down for greater than 48-hours, periodically monitor groundwater elevation in piezometers to verify groundwater drawdown across the collection trench.

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SHUT-DOWN PROCEDURE

1. Turn collection pump HOA switches to "off" position.

2. Place sequestering agent metering pumps in "off" mode.

3. Allow feed tank to reach low-level, automatically shutting down the air stripper feed pumps. Place stripper feed pumps in "off" mode.

4. Allow stripper blower run approximately 5 minutes after shutting down feed flow to ensure complete treatment of water in the stripper.

5. Turn blower and discharge pump HOA switches to "Off"

6. If carbon vessels are not being changed out during shut-down, close valves on activated carbon vessel discharge lines to ensure vessels remain saturated during shut-down period.

7. Allow discharge tank to reach low-level, automatically shutting down the discharge pumps. Place discharge pumps in "off" mode.

8. Leave building sump pumps in "auto" mode unless sump pump maintenance will be required.

9. Inform Monroe County Pure Waters (see above) if flow will be halted for greater than 24-hours.

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APPENDIX A.2

Rochester Fire Academy
Operations and Maintenance Manual

Standard Operating Procedure for Groundwater Collection Trench and Pumps

Description:	Groundwater Collection System
Model:	SRM4MIC (submersible pumps)
Manufacturer:	F.E. Meyers (pumps, lift station) 1101 Myers Parkway Ashland, Ohio 44805-1969 Phone: (419) 289-1144 Fax: (419) 289-6658
Vendor:	Fluid Kinetics, Inc. 251 Thorn Avenue Orchard Park, NY 14127 (716) 662-7900 Fax: (716) 662-7982

Start-up (initial):

1. Verify that collection trench lines are unplugged and free of obstructions. Verify all mechanical connections, and ensure that valves in treatment building are positioned to allow flow through bag filters into process feed tank.

2. Open valves on collection trench drain lines. Close recirculation line valve.

3. Set pump on/off and alarm levels via groundwater treatment system process logic controller (PLC) interface.

4. Turn feed pump HOA switches to "auto" mode.

5. Slowly open sample tap on influent feed line in treatment building to release any air.

6. Monitor level in collection trench piezometers and sump routinely to ensure that automatic shut-down level is not beneath top of collection trench sand bedding elevation.

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Start-up (normal):	1.	Ensure that valves in treatment building are positioned to allow flow from groundwater collection pumps through bag filters into process feed tank.
	2..	Turn feed pump HOA switches to "auto" mode.
	3.	The pumps will start automatically, and will cycle on/off as necessary based on sump level.
	4.	Adjust recirculation line butterfly valve as desired to avoid pump short-cycling (i.e., pumps energizing more than 30 times per hour) and maintain desired groundwater elevation drawdown. Open recirculation line valve to reduce net discharge rate from pump station. Close recirculation valve to increase net discharge rate.
Shut-down:	1.	Turn collection pump HOA switches to "off" position.
Maintenance:	1.	Routine maintenance of the collection trench, pump station and submersible collection pumps is not required. Monitor groundwater elevation in the collection trench piezometers monthly to ensure drawdown to desired elevation.
Troubleshooting:	1.	Refer to manufacturer's operation and maintenance manual for trouble-shooting procedures and additional operational information for collection pumps. Be aware that collection pump automatic operation will be halted if the treatment system process feed tank reaches pre-set high level.
	2.	Shut-down levels for collection pumps must be established to ensure collection trench sand bedding is always submerged. If surficial oxidation or clogging of perforated PVC drain lines occurs, (as evidenced by inability to maintain desired elevation in collection trench piezometers when pumps are operating properly) high-pressure cleaning as is commercially available for clogged sewer lines may be beneficial in loosening scale and unclogging the line. Oxidized sand bedding may require excavation and replacement.

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APPENDIX A.3

ROCHESTER FIRE ACADEMY

OPERATIONS AND MAINTENANCE MANUAL
STANDARD OPERATING PROCEDURE FOR
SEQUESTERING AGENT FEED SYSTEM

A.3.1 FEED SYSTEM START-UP/SHUT-DOWN AND MAINTENANCE
A.3.2 AQUA-MAG DOSAGE CALCULATIONS
A.3.3 MSDA/SUPPLIER INFO

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APPENDIX A.3.1

FEED SYSTEM START-UP/SHUT-DOWN AND MAINTENANCE

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APPENDIX A.3.1

Rochester Fire Academy
Operations and Maintenance Manual

Standard Operating Procedure for Feed System Start-Up/Shut-Down and Maintenance

Description: Sequestering Agent Feed System

Model: A971-257

Manufacturer: LMI
Liquid Metronics Division
8 Post Office Square
Acton, MA 01720
Phone: 508-263-9800

Vendor: Pertech, Inc.
586 North French Road, Suite 6
Buffalo, NY 14228
(716) 691-5450 Fax: (716) 691-5470

Start-up (initial):

1. Verify all mechanical connections on suction and discharge side of pumps have been made and valving is correctly positioned to allow unobstructed flow from sequestering agent feed drum to process influent line.

2. Set back pressure relief valve at 50 psi; set pressure relief valve at 75 psi.

3. Turn power on at panel on pump face and set mode to "manual." Adjust stroke rate to 50%.

4. Once air has been purged from suction and discharge lines, fill calibration tube with sequestering agent. Arrange valving to draw from calibration tube, and re-start pump. Adjust stroke rate to deliver maximum desired flow (i.e., 15.1 ml/min. per Section 2.3.1.5) at process flow rate of 40 gpm, with decrease in sequestering agent dosing rate proportional to decrease in process flow (see attached flow chart).

5. Leave pump set in automatic (i.e., external) mode.

Start-up (normal):

1. Under normal conditions, pump rate will automatically adjust based on influent flow rate. Turn power on or off at panel as desired.

Shut-down:

1. Turn power off at front panel. If pump will be shut down for an extended period (i.e., greater than one week), route suction line into clean water and manually operate pump so as to purge lines and pump head of sequestering agent.

Maintenance:

1. Replace Liquifram ® seal rings, valve balls and the Injection Check Valve spring annually (see manufacturer's O & M Manual for information on ordering replacement parts).

2. Depressurize, drain and disconnect discharge line prior to replacements. Flush head assembly with neutralizing solution. Then pump air until pump head purged of neutralizing solution.

3. While pump is running, set stroke knob to zero and turn pump off.

4. Replace all parts. Take care not to scratch the Teflon face of new Liquifram®.

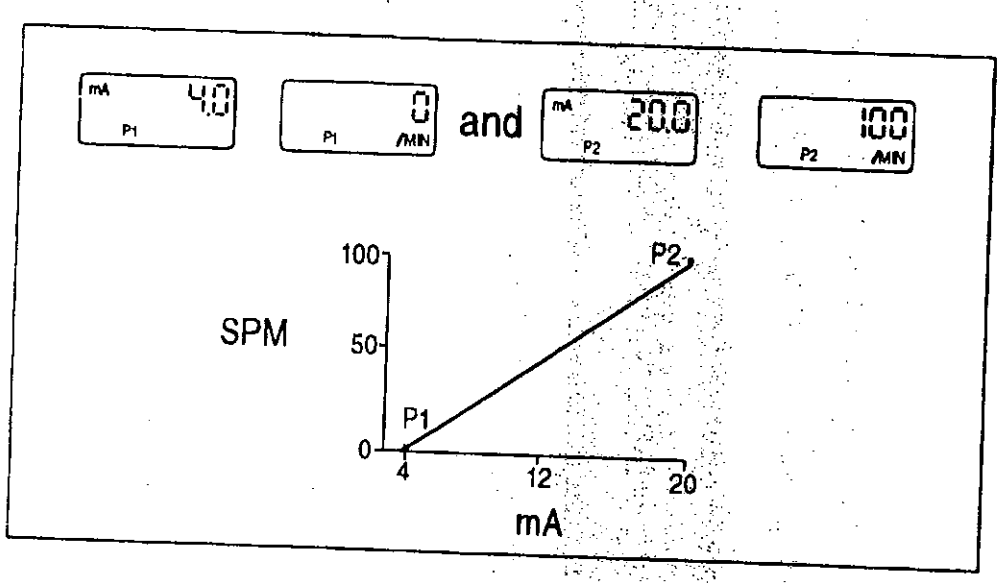
5. Start the pump and turn stroke knob to 90%. With pump running, screw new Liquifram® clockwise until center buckles inward. Stop the pump. Position and/or adjust Liquifram®.

6. After one week of operation, recheck screws and tighten if necessary.

Refer to manufacturer's operation and maintenance manual for additional operational information.

Programming the mA Response

The A9 accepts a 0-20mA or 4-20 mA signal directly. The response to this signal is fully programmable. In the mA mode, the pump speed is determined by the programmed response curve, as defined by points "P1" and "P2." The factory default set values for P1 and P2 are (4 mA, 0 SPM) and (20mA, 100 SPM) respectively. This is illustrated in the figure below.



While running in the mA mode, the pump speed [mA EXT 88 /MIN] and the mA value [mA 180] are displayed alternately every 4 seconds while the pump is running.

Programming Points 1 and 2 (Strokes per Minute)

To program the points P1 and P2, first ensure the pump is in the mA mode and OFF. If you wish to program the response in "strokes per minute", switch to the internal mode. The speed must be set to a strokes per minute value [INT 100 /MIN]. Return to the External mA mode.

PERTECH, INC.

Main Office:
588 N. French Rd #6
Buffalo, NY 14228
Tel: (716) 691-5450
Fax: (716) 691-5470

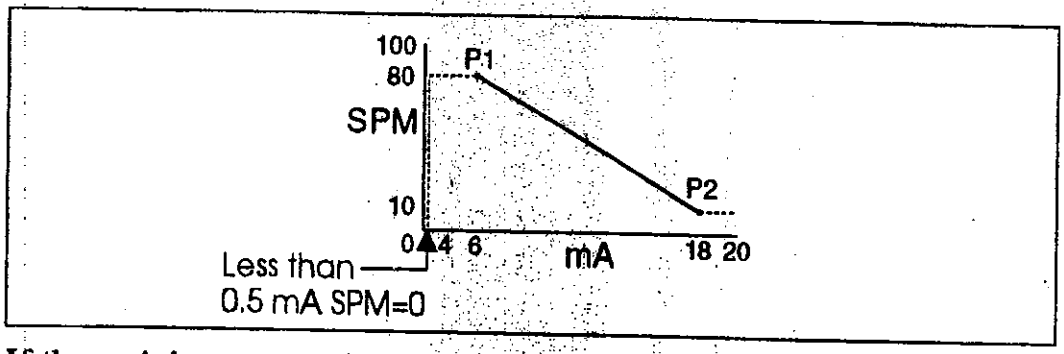
Branch Office:
P.O. Box 387
N. Syracuse, NY 13212
Tel: (315) 458-2173
Fax: (315) 458-3124

Post-it® Fax Note 7671	Date 3/4	# of pages ▶ 5
To TOM FORBES	From BILL PERKINS	
Co./Dept.	Co.	
Phone #	Phone #	
Fax # 687-0279	Fax #	

Press either the Up or Down key. The LCD screen will display [Pro]. After 5 seconds, the display will show the mA value for P1 [mA P1 4.0]. This value may be altered using the Up or Down key within 5 seconds (i.e. [P1 0 /MIN]). Five seconds following the last key press, the stroke rate for P1 will be displayed [P1 0 /MIN]. This value may be altered within five seconds using the Up or Down key (i.e. [P1 800 /MIN].

Five seconds after the last key press, the mA value for P2 is displayed [mA P2 20.0]. Edit as described in the above paragraph (i.e. [mA P2 18.0]). Likewise, five seconds after the last key press the stroke rate for P2 is displayed. Edit as described above (i.e. [P2 10 /MIN]).

The above examples would result in the inverse control profile shown below:



If the mA input goes below the value programmed for P1 or above the P2 value, the response will "plateau," as indicated by the dotted lines above.

NOTE:

The valid input range is from 0.5 to 21 mA. Below 0.5 mA, the pump will be off. Above 21 mA, the E5 error code will be displayed intermittently [EXT E5 FLOW P12.].

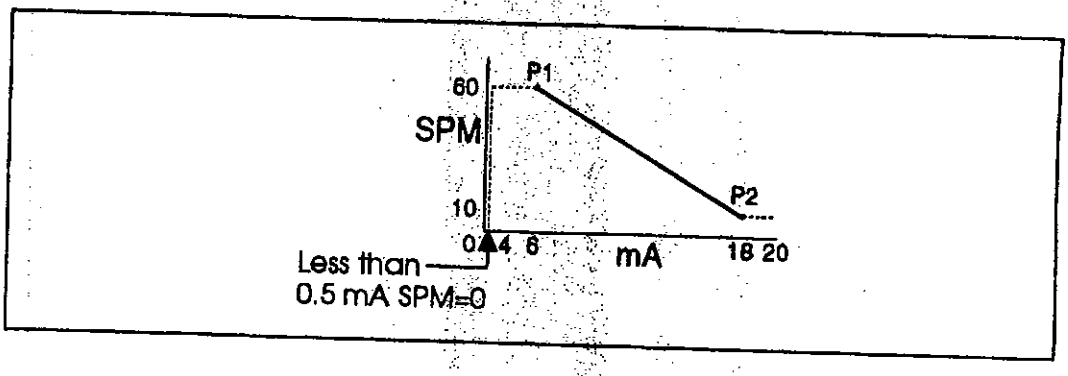
Programming Points 1 and 2 (Strokes per Hour)

If you wish to program the response in strokes per hour, start by being in the External mA mode. Next, switch to the Internal mode. If the Internal setting is in strokes per minute, change to strokes per hour by holding the Down key until the display reads 0 SPM. Continue to hold it for another 3 seconds. The display will now read SPH [INT H50]. Set the speed to any strokes per hour value (the actual setting has no bearing on mA response). Return to the External mA mode.

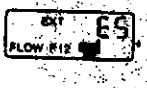
Press either the Down key or Up key. The LCD screen will display [Pro]. After 5 seconds, the display will show the mA value for P1 [mA P1 4.0]. This value may be altered by using the Up key or Down key within 5 seconds (i.e. [P1 0]). Five seconds following the last key press, the stroke rate for P1 will be displayed [P1 H0]. This value may be altered within 5 seconds using the Up or Down key (i.e. [P1 H60]).

Five seconds after the last key press, the mA value for P2 will be displayed [mA P2 20.0]. Edit as described above (i.e. [mA P2 18.0]). Likewise, 5 seconds after the last keypress, the stroke rate for P2 is displayed and may be altered as above (i.e. [P2 H10]).

The above example would result in the inverse control profile shown below:



NOTE:

The valid input range is from 0.5 to 21 mA. Below 0.5 mA, the pump will be off. Above 21 mA, the E5 error code will be displayed intermittently 

NOTE:

When programming strokes per hour, the maximum response rate is 60. P1 and P2 must both be strokes per minute or both be strokes per hour.

Keypad/Display Description and Function

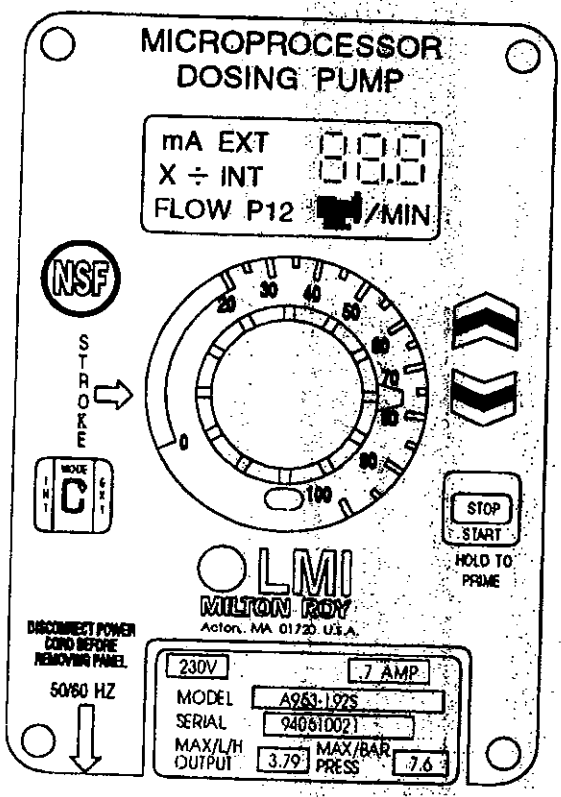


Figure 9: Series A9 Keypad

LCD Screen

The LCD screen is the window in which all values and menu choices are displayed. See figure below.

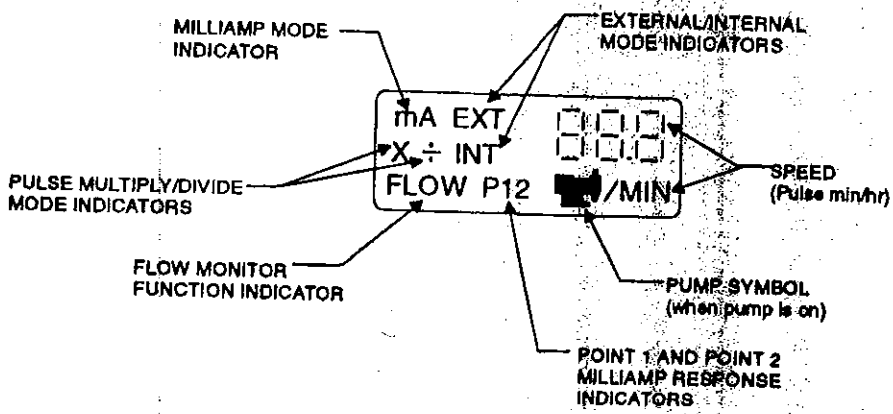


Figure 10: Liquid Crystal Display

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APPENDIX A.3.2

AQUA-MAG DOSAGE CALCULATIONS

(1)

$$Dosage\ (ppm\ as\ PO_4) = \left[\frac{Fe(mg/L) + Mn(mg/L)}{2}\right] + \left[\frac{0.5 \times Hardness\ (mg/L\ as\ CaCO_3)}{171}\right]$$

e.g., Fe = 1.5 mg/L, Mn = 0.044 mg/L, Hardness = 490 mg/L as $CaCO_3$

$\therefore$ Dosage = 2.2 ppm as PO_4

(2)

Dosage Rate (gal/day) = 4.61 x ppm as PO_4 x MGD

e.g., 40 gpm = 0.0576 MGD

$\therefore$ Dosage rate = 0.58 gal/day

= 0.024 gal/hr

To allow the metering pumps to operate in the middle to upper portion of their operating range (i.e., 0.0037 to 0.37 gal/hr), a dilution factor of 10:1 is recommended.

$\therefore$ Dosage rate of diluted Aqua-Mag = 0.24 gal/hr

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APPENDIX A.3.3

MSDA/SUPPLIER INFO

MSDS SHEET

KJELL WATER CONSULTANTS, INC.
P.O. BOX 834
BELOIT WISCONSIN 53511
608-755-0422 800-356-0422

Product Name: AQUA MAG

Date Prepared: June 18, 1986 Last Revision: August 1986

==========PRODUCT INFORMATION==========

Synonyms:	Sodium Phosphate
Chemical Family:	Liquid Polyphosphate
Formula:	Not Applicable

==========PRECAUTIONARY INFORMATION==========

Precautionary Statement: No Significant Health Effects Reported From Manufacturing Locations (as Defined by OSHA Hazard Communications Standard)

==========INGREDIENTS/COMPONENTS==========

Chemical Identity:	Sodium Polyphosphate
OSHA PEL:	Not Listed
ACGIH TLV:	Not Listed
CAS #:	68915-31-1
Hazard Class:	None

==========PHYSICAL DATA==========

Boiling Point:	Above 212 Degrees F.
Melting Point:	Not Applicable
Vapor Pressure:	Not Applicable
Vapor Density (AIR=1):	Not Applicable
Specific Gravity (H_2O=1)	1.368
Evaporation Rate (Butyl Acetate = 1)	Non-Volatile
Solubility in Water by Wt:	Complete
pH (neat)	5.6
pH (1% Solution):	6.8
Appearance:	Clear Liquid
Odor:	None

==========FIRE AND EXPLOSION DATA==========

Flash Point:	Non-Combustible
Flammable Limits - Upper:	Not Applicable
- Lower:	Not Applicable
Extinguishing Media:	Not Applicable
Special Fire Fighting Procedures:	Not Applicable
Unusual Fire & Explosion Hazards:	None

==========REACTIVITY DATA==========

Stability:	Stable
Incompatibility:	None
Hazardous Polymerization:	Will Not Occur
Conditions to Avoid:	None
Hazardous Decomposition Byproducts:	None

==========HEALTH HAZARD DATA==========

Routes of Exposure:

Eyes:	No Published Data
Skin Contact:	No Published Data
Skin Absorption:	No Published Data
Inhalation:	No Published Data
Ingestion:	Slightly Hazardous -Oral LD 50 (Rat) = 2.9 G/KG Source: FD. Cosmet Toxicol 2: 147 Date: 1964

Effects of Overexposure:

Acute Exposure:	No Published Data
Chronic Exposure:	When good Industrial Hygiene Practices are Followed, No Significant Inhalation Hazard or Skin Irritation.

Other Health Effects:

Medical Conditions Aggravated by Exposure:	None Known

Carcinogenic Potential:

NTP Annual Report:	Not Listed
IARC Monographs:	Not Listed
OSHA 29CFR Part 1910 Sub Z:	Not Listed

Additional Regulatory Information:

FDA:	GRAS List: permitted in Food
USDA:	Permitted in Meats

EMERGENCY AND FIRST AID PROCEDURES:

Eyes:	Flush with Water. If irritation occurs, seek medical attention.
Skin:	Wash with Water. If irritation occurs, seek medical attention.
Inhalation:	Remove from exposure.
Ingestion:	Rinse mouth and dilute stomach contents with water or milk if available.
Decontamination Procedure:	Wash with water.
Notes to Physicians:	Large doses may cause nausea and diarrhea.

==========STORAGE AND HANDLING==========

Spill or Leak Procedures:	Material should be wiped up for salvage or disposal. Flush with water.
Waste Disposal Method:	If not salvaged, dispose in a landfill in accordance with local, state, and federal regulations.
Precautions in Storing:	Should be stored in clean area for quality assurance. Keep container closed when not in use. Protect from freezing and extreme heat.

==========SPECIAL PROTECTION==========

Respiratory Protection:	None Required
Eye Protection:	Not Mandatory
Protective Gloves:	Not Mandatory
Special Clothing & Equipment:	No Special Requirement
Ventilation Requirements:	No Special Requirements
Work/Hygienic Practices:	No Special Requirements. Follow Good Industrial Hygiene Practices.

==========TRANSPORTATION DATA==========

DOT Proper Shipping Name:	Sodium Polyphosphate Solution
DOT Classification:	Not Regulated
DOT Labels:	Not Required
DOT Placards:	Not Required
Emergency Accident Precautions & Procedures:	Not Hazardous - See instructions above for release or spill.

==========MANUFACTURER'S DISCLAIMER==========

While Kjell Water Consultants, Inc. will make every effort to insure the validity of this information, we must rely on the information supplied to us by our suppliers, and thus make no warranty express or implied as to the validity of this data.

Any use of this product or method of application which is not described in the Product Data Sheet is the responsibility of the user.

PRODUCT INFORMATION

KJELL Water Consultants Inc.
Applied Chemistry...
Proven Performance

AQUA-MAG
THE LINEAR CHAIN PHOSPHATE

APPLICATION

Aqua-Mag is a formulated phosphate product intended for treating municipal, industrial and private water systems where the requirements of potability must be met. Aqua-Mag provides four distinct actions: first, control of red waters; second, cleaning action to remove rust and scale deposits from pipes and distribution systems; third, protection against corrosion and pitting; and fourth, inhibition of scale formation. Aqua-Mag contains only linear phosphates. The use of such phosphates is the first major advance in the treatment technique for potable water systems offering benefits never before satisfactorily realized with glassy phosphate types normally used for this purpose.

PRODUCT PROPERTIES

Composition	Clear Homogeneous Solution
Consistency	No Particles Above Two Microns
Components	100% Food Quality
Shelf Life	Proven for a Period of Twelve or More Years
Temperature Stability	Great 100°C. for Extended Periods
Weight	11.4 lbs./gal.
pH 1% Solution	6.8
Solubility	Total in any proportion

DOSAGE

Dosages of Aqua-Mag are started at 2 to 3 times the normal rate during the clean-up phase and continued at this dosage level for a period of 1 to 3 months, depending upon conditions of the system. Thereafter, dosage can be decreased to maintenance level. All dosages are proportioned to each individual water quality and criteria.

FEEDING

Aqua-Mag may be mixed with water or fed direct on a gradual and continuous basis to the system.

USAGE INFORMATION

Aqua-Mag is acceptable for use on potable water supplies in accordance with the terms of the Code of Federal Regulations, 121.101, "Substances that are generally recognized as safe".

TESTING & CONTROL

Dosages of Aqua-Mag are controlled by either the Hach PO-19 or PO-14 Test Kits.

HANDLING

Aqua-Mag can be handled safely with ordinary care.

PACKAGING & SHIPPING

Shipped in 5-35-55 gal. drums or bulk.

MALCOLM PIRNIE

APPENDIX A.4

Rochester Fire Academy
Operations and Maintenance Manual

Standard Operating Procedure for Multiple Bag Filters

Description: Multiple Bag Filter Unit and Filter Displacers

Model: UF8-1802F-A2CE (filter unit) UF81802DIS (displacers)

Manufacturer: Trumpler Clancy, Inc.
726 State Blvd, Syracuse, NY 13209
Phone: (315) 488-3200 Fax: (315) 488-3565

Vendor: Same as Above

Start-up (initial):

1. Complete and verify all mechanical connections. Make sure groundwater collection pumps are turned off at the control panel.
2. Install re-usable envelope seals on each of eight (8) oil-absorbing, 25-micron bags
3. Open lid on primery (lead) vessel and install eight (8) wire mesh filter baskets in the vessel openings. Install bags inside baskets such that envelope seals rest on outer perimeter of vessel openings.
4. Install liguid displacers inside each bag.
5. Close and seal vessel lid.
6. Repeat steps 1 through 5 for secondary (lag) vessel, using 10-micron woven nylon bags.
7. Ensure valving is arranged to direct flow in series from primary vessel through secondary vessel.
8. Start groundwater collection pumps.

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Start-up (normal):	1.	Follow same procedure as for initial start-up. If non-aqueous phase liquids are not present following the initial start-up period, 10 micron woven bags may be used and a single vessel may be placed in operation with the second vessel in standby mode.
Shut-down:	1.	Turn off groundwater collection pumps at the control panel.
	2.	Remove vessel lids and open drain valves.
	3.	Remove liquid displacers and bags. Examine and clean baskets, if required.
	4.	Remove envelope seals from bags for re-use. Dispose of bags in accordance with applicable State and Federal Regulations.
Maintenance:	1.	Monitor pressure differential across bag housing daily. Replace bags when differential pressure exceeds 10 PSI. Note that pressure build-up rate may not be linear, and pressure may build-up quickly as the filter capacity decreases.
	2.	Lubricate swing-davit on vessel lids semi-annually.

Refer to manufacturer's operation and maintenance manual for trouble-shooting procedures and additional operational information.

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APPENDIX A.5

Rochester Fire Academy
Operations and Maintenance Manual

Standard Operating Procedure for Feed and Discharge Tanks

Description:	Groundwater Feed and Discharge Tanks
Model:	TFD-PE1500 (feed tank); TDS-PE1500 (discharge tank)
Manufacturer:	Remedial System, Inc. 56 Leonard Street, Foxboro, MA 02035-2829 Phone: (508) 543-1512 Fax: (508) 543-7485
Vendor:	Same as above
Start-up (initial):	N/A
Start-up (normal):	N/A
Shut-down:	N/A
Maintenance:	Note: Routine maintenance of the feed and discharge tanks may involve periodic cleaning. Solids build-up in the feed and discharge tanks will be mitigated by proper bag filter operation. Solids buid-up in the discharge tank will be further precluded by the activated carbon vessels, which will filter suspended fines. Solids need only be removed from the tanks if accumulations cause operational problems such as excessive carbon canister plugging or build-up to the point that the pump inlets become clogged. Although several methods may be employed, the following procedure incorporates use of existing facilities and equipment to maximize efficiency and eliminate the need for significant plumbing modifications.

FEED TANK CLEANING

1. Shut-down groundwater collection system feed pumps and process water through the treatment system until tank level is no lower than 3-inches above stripper feed pump intake line. Shut-down air stripper.

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2. Close BV-25 (ball valve on air stripper feed pump discharge line - see O&M Plan Figure 2-3). Open BV-17 (ball valve on feed tank by-pass line)

3. Refer to O&M Plan Figure 2-2 (multi-bag filter schematic). Close BV-16, BV-6, BV-7 and BV-10. Open BV-12, BV-11 and BV-15 (drain on filter #2). Connect a flexible hose from the filter #2 drain to the building sump.

4. Place fresh, 10 micron woven nylon filter bags in bag filter #2.

5. Pressure-wash the feed tank to clean side-walls and suspend solids off tank bottom. Periodically energize one of the stripper feed pumps to transfer solids-laden water through bag-filter 2 into the building sump (sump pumps will periodically transfer filtered water back to the feed tank)

6. Continue this procedure until tank is reasonably clean. Note that fines may not be completely removed by the bag filters. Monitor pressure drop across bag filter unit and replace bags as necessary.

7. Dispose of filter bags in accordance with applicable State and Federal regulations. Re-configure process valves for normal treatment system operation, and re-start system.

DISCHARGE TANK CLEANING

1. Lower discharge tank level to within 6-inches of discharge pump inlet.

2. Pressure-wash discharge tank to clean side-walls and suspend solids off tank bottom.

3. Refer to process flow diagram in record drawings. Connect flexible hose from BV-68 to either the building sump or directly to the feed tank. Close BV-69 and BV-71.

4. Periodically transfer solids-laden water to feed tank or building sump (bulding sump will discharge to feed tank). Initiate feed tank cleaning procedure if required.

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APPENDIX A.6

Rochester Fire Academy
Operations and Maintenance Manual

Standard Operating Procedure for Air Stripper Feed Pumps

Description:	Feed Pumps	
Model:	TE-7K-MD	
Manufacturer:	March Manufacturing	
Vendor:	Pertech, Inc. 586 North French Road, Suite #6, Buffalo, NY 14228 Phone: (716) 691-5450 Fax: (716) 691-5470	
Start-up (initial):	1.	Verify all mechanical connections, and ensure that valves on inlet and discharge lines are positioned to allow flow from the feed tank to the air stripper.
	2.	Ensure air stripper blower is operating
	3.	Place feed pump HOA switches in "auto" position. Pumps will cycle automatically based on feed tank and stripper sump level.
Start-up (normal):	1.	Same as initial start-up procedure.
Shut-down:	1.	Turn feed pump HOA switches to "off" position.
Maintenance:	1.	Routine maintenance of these mag-drive pumps is not required.

Refer to manufacturer's operation and installation manual for trouble-shooting procedures and additional operational information for feed pumps.

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APPENDIX A.7

Rochester Fire Academy
Operations and Maintenance Manual

Standard Operating Procedure for Low Profile Air Stripper

Description: Low Profile Shallow Tray Air Stripper

Model: RTS-50-4

Manufacturer: Remedial Systems, Inc.
56 Leonard Street, Foxboro MA 02035-2829
Phone: (508) 543-1512 Fax: (508) 543-7485

Vendor: Same as Above

Start-up (initial):

1. Complete and verify all mechanical and electrical connections
2. Verify that all electrical inputs and shutdown indicators are as required per the appropriate control panel manual.
3. Close the valve on the inlet water line
4. Turn the power on at the system control panel. Check that all the control functions are properly indicated.
5. Start the primary system blower by turning the HOA switch on the stripper control panel to "hand" (manual).
6. Verify that the feed tank is sufficiently full, and water start one of the stripper feed pumps. Open the valve on the influent water line slowly until the desired water flow rate is reached.
7. Run the system for 1-2 minutes then turn the inlet water off. After 1 minute, turn off the blower. This procedure will ensure that the down-tube in the sump is immersed in water, creating a seal against air escaping up the down tube. The system is now ready for continuous process operation.

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8. Repeat steps 3 through 7 whenever the stripper sump is drained.

Start-up (normal):

1. Ensure that manually-operated process water feed line ball valves and discharge ball valves are open.

2.. Turn primary blower switch and discharge pump HOA switches on the stripper control panel to "auto" (back-up blower is off).

3. The blower will start automatically. The discharge pumps will cycle on/off as necessary based on sump level. The modulating valve on the system feed line will open and close proportional to sump level to maintain level relatively constant.

Shut-down:

1. Turn off feed pumps.

2. Allow blower to run approximately 5 minutes after shutting down feed flow to ensure complete treatment of water in the stripper.

3. Turn blower and discharge pump HOA switches to "Off"

Maintenance:

1. On a bi-weekly basis, shut down blower and feed pumps and open PVC boots on stripper tray and sump ports. Examine each tray (top and bottom) for build-up of calcite scale (precipitated calcium oxide) or sludge.

2. Loose sludges (e.g., biological) may be cleaned by inserting the washer wand from a pressure sprayer directly into the ports.

3. If holes in the trays are becoming clogged with scale, disassemble for cleaning through the following procedure:
   - A. Disconnect the process influent pipe
   - B. Unsnap tray connector clips
   - C. Lift each tray from the unit one at a time (requires two persons)
   - D. Replace the trays with clean spare set, re-start stripper.

4. Cleaning of heavy scale is best accomplished by tapping tray bottoms with a rubber mallet to loosen the scale, followed by high-pressure washing. Light scale can be cleaned by spraying a fine mist of dilute hydrochloric acid (<30%) across the tray bottoms with subsequent pressure washing. Contact of acid on bare steel and gaskets should be avoided.

Refer to manufacturer's operation and maintenance manual for trouble-shooting procedures and additional operational information.

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APPENDIX A.8

Rochester Fire Academy
Operations and Maintenance Manual

Standard Operating Procedure for Granular Activated Carbon (GAC) Vessels

Description: Activated Carbon Canister System

Model: LPC-D165

Manufacturer: Remedial Systems, Inc.
56 Leonard Street, Foxboro MA 02035-2829
Phone: (508) 543-1512 Fax: (508) 543-7485

Vendor: Same as Above

Start-up (initial):

1. Fill each vessel with tap water and allow it to soak for 24-hours.
2. Remove cam-lock fittings from vessel being replaced and install on new vessel.
3. Back-wash the vessel to remove fines by connecting the influent flexible hose on the carbon vessel feed piping to the Outlet (bottom) port of the unit. Connect a separate flexible fire hose from the inlet port to the treatment building sump.
4. Flush treated water from the air stripper sump through the vessel for a period of approximately 30 seconds to back-wash the unit. Note that during this time, the other three carbon trains should be in normal operation so as not to exceed the 10 gpm flow range on the vessel being back-washed.
5. Stop the air stripper discharge pump and connect the feed and outlets to the appropriate flexible hoses on the carbon feed piping arrangement.
6. Re-start the air stripper discharge pump and treatment processes.

Start-up (normal):	1.	Normal start-up during batch operation or following treatment system maintenance activities requires no special start-up procedure. Maximum vessel flow rate should be limited to 10 gpm.
	2.	Follow initial start-up procedure whenever a fresh carbon vessel is placed in service.
Maintenance:	1.	Check pressure drop across carbon vessels routinely. Backwash if pressure drop increases by 5 psi or greater across bed from initial (clean) pressure drop, or total pressure increases to 10 psi, whichever occurs first.
	2.	Replace carbon vessels based on results of performance monitoring specified in this manual.

Refer to manufacturer's operation and maintenance manual for additional operational information.

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APPENDIX A.9

Rochester Fire Academy
Operations and Maintenance Manual

Standard Operating Procedure for Discharge Pumps

Description:	Discharge Pumps	
Model:	2BF21534	
Manufacturer:	Goulds Pumps, Inc. P.O. Box 330, Seneca Falls, NY 13148 Phone: (315) 568-2811	
Vendor:	Estabrook Corp. 660 Front Street, Berea, Ohio 44017 Phone: 1-800-959-9161 Fax: 1-800-959-2234	
Start-up (initial):	1.	Verify all mechanical connections, and ensure that valves on inlet and discharge lines are positioned to allow flow from the discharge tank to the sanitary sewer.
	2.	Place discharge pump HOA switches in "auto" position. Pumps will cycle automatically based on discharge tank level.
Start-up (normal):	1.	Same as initial start-up procedure.
Shut-down:	1.	Turn discharge pump HOA switches to "off" position.
Maintenance:	1.	Routine maintenance of these pumps is not required.

Refer to manufacturer's operation and installation manual for trouble-shooting procedures and additional operational information for discharge pumps.

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APPENDIX A.10

ROCHESTER FIRE ACADEMY
OPERATIONS AND MAINTENANCE MANUAL

EQUIPMENT MAINTENANCE CHECKLIST AND SCHEDULE

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APPENDIX A.10
ROCHESTER FIRE ACADEMY

GROUNDWATER COLLECTION AND TREATMENT SYSTEM
EQUIPMENT MAINTENANCE SCHEDULE CHECKLIST

Item	Maintenance Activity	Recommended Frequency	Date Performed	Notes
Sequestering Agent Feed Pumps	Replace seal rings	Annually		
	Replace check valve balls	Annually		
	Replace check valve springs	Annually		
Bag Filter Unit	Replace bags	When diff pressure exceeds 10 PSI		
	Lubricate swing davit	Annually		
Feed Tank	Clean solids	As necessary		
Air Stripper	Examine trays	Bi-weekly		
	Clean/de-scale	Semi-annually*		
Activated Carbon Vessels	Backflush	When diff pressure exceeds 5 PSI above clean con. or 10 PSI total		
	Replace	Based on analytical results		
Discharge Tank	Clean solids	As necessary		

* Frequency may need to be adjusted based on field observations.

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APPENDIX B

GROUNDWATER COLLECTION AND TREATMENT SYSTEM OPERATING VARIABLES

DAILY LOGS

APPENDIX B
ROCHESTER FIRE TRAINING ACADEMY

GROUNDWATER TREATMENT SYSTEM
DAILY LOG

Date	Time	Operator Initials	Influent		BFV-1 Position	BFV-2 Position	Sequestering Agent		Bag Filter		Feed Tank Level (gal)	BFV-3 Position	BFV-4 Position	Air Stripper Feed Pump Pressure (psi)
			Flow Rate (gpm)	Total Flow (gal)			Drum Vol. (gal)	Pressure (psi)	No. 1 Pressure (psi)	No. 2 Pressure (psi)				

APPENDIX B
ROCHESTER FIRE TRAINING ACADEMY

GROUNDWATER TREATMENT SYSTEM
DAILY LOG

Air Stripper					BFV-5 Position	Act. Carbon Influent Pressure (psi)	Activated Carbon Drum Differential Pressure							
							Branch #1		Branch #2		Branch #3		Branch #4	
Air Pressure (in. water)	Flowrate (gal)	Total Flow Reading (gal)	Sight Tube Level (in. above sump base)	Discharge Pump Pressure (gal)			Drum #1 (psi)	Drum #2 (psi)	Drum #1 (psi)	Drum #2 (psi)	Drum #1 (psi)	Drum #2 (psi)	Drum #1 (psi)	Drum #2 (psi)

APPENDIX B
ROCHESTER FIRE TRAINING ACADEMY

GROUNDWATER TREATMENT SYSTEM
DAILY LOG

Discharge Tank Level (gal)	Discharge Pump Pressure (psi)	BFV-5 Position	Discharge		Notes
			Flow Rate (gpm)	Total Flow (gal)	

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APPENDIX C

GROUNDWATER TREATMENT SYSTEM
PC/CO APPLICATION AND LETTER OF APPROVAL

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
50 Wolf Road, Albany, New York 12233

MAR 2 1 1995

Mr. Mark D. Gregor
Department of Environmental Services
City of Rochester
30 Church Street, Room 300B
Rochester, New York 14614-1278

Dear Mr. Gregor:

Re: Site No. 8-28-015
Rochester Fire Academy
Rochester, Monroe County

The Department's Technology Section has completed review of the City of Rochester's (COR) application for approval of groundwater treatment system exhaust as submitted with its February 17, 1995 transmittal letter. The calculated discharges for the air stripper unit as provided in the enclosed application are acceptable.

Please call me at (518) 457-7878 if you have any questions.

Sincerely,

Amarinderjit S. Nagi, P.E.
Project Manager
Western Field Services Section
Bureau of Construction Services
Division of Hazardous Waste Remediation

cc: M. J. Peachey - NYSDEC Region 8
T. Marriot (w/enc.)
J. Harrington (w/enc.)
R. Cozzy

City of Rochester

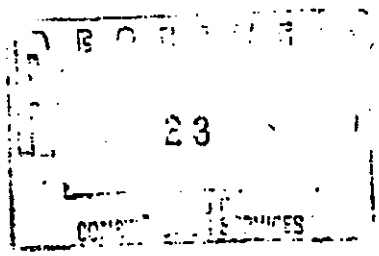
FAX (716) 428-6010
TDD/Voice 232-3260

Department of
Environmental Services

Office of the Commissioner
Division of Environmental Quality
30 Church Street, Rm. 300B
Rochester, New York 14614-1278
Tel.#: (716) 428-6011

February 17, 1995

Robert Cozzy
New York State Department of Environmental Conservation
Bureau of Central Remedial Action
50 Wolf Road
Albany, New York 12233



Re: Rochester Fire Academy, NYSDEC Site No. 828015
Application for Approval of Groundwater Treatment System Process Exhaust

Dear Mr. Cozzy:

The City of Rochester has received bids for the remediation of the Rochester Fire Academy site, located at 1190 Scottsville Road in the City of Rochester, New York. The site remediation will incorporate a groundwater treatment system to remove volatile organics (VOC) from collected groundwater, which will be accomplished through the use of a low profile air stripper. The groundwater treatment system design has been approved by the NYSDEC Division of Hazardous Waste Remediation. Construction of the groundwater treatment system is tentatively scheduled to begin in summer, 1995 with start-up on or about September 1, 1995. Although the project is being performed under Consent Order (B8-02-5-87-09 dated June 21, 1989) and, hence, is exempt from permitting requirements, the enclosed permit to construct/certificate to operate (PC/CO) application has been completed to convey the pertinent treatment process emissions information to the Division of Air Resources for review and approval. A description of the key assumptions behind the emissions loading calculations as well as a summary of the monitoring to be performed by the City of Rochester to verify the loadings are presented below.

Emissions Loading Calculations

The VOC emissions rates indicated in Section F of the PC/CO application are dependent on the performance of the groundwater collection system. Upon start-up, the process is expected to operate continuously at a rate of less than 40 gallons per minute (i.e., the design capacity of the treatment system). Within 3-4 months, it is expected that the collection and treatment rate will approach steady-state conditions of approximately 15 gallons per minute. Maximum contaminant concentrations, based on the highest concentrations detected during previous groundwater sampling events at the facility, were used to calculate emissions loadings for both the 40 gpm and 15 gpm flow rate scenarios.

The Emission Rate Potential (ERP) identified on the PC/CO application assumes a groundwater flow rate of 40 gpm and 100% transfer of the contamination to the air by the stripper. The actual emission rate presented on the application assumes 100% transfer of the contamination to the air by the stripper at a groundwater flow rate of 15 gpm.

Emissions Monitoring

VOC loadings to the atmosphere will be checked on a daily basis for the first three (3) days of treatment system start-up or longer until compliance with Division of Air Resources emissions limits is demonstrated. The emissions loadings will be calculated by means of a mass balance around the air stripper. Samples of the stripper influent and effluent groundwater will be collected and analyzed on each of three consecutive days in according with USEPA Methods 601 and 602, with 24-hour turnaround on the analytical results. The daily total and maximum groundwater flow rates will also be recorded. The difference in aqueous concentrations multiplied by the groundwater flow rates will provide the maximum and average VOC emission rates to the atmosphere, which will be compared to the emissions limits issued by the Department. If emissions limits are not met, corrective actions will be taken. The Department will be notified of all emissions monitoring results.

After the start-up period, the mass balance described above will be performed on a quarterly basis by the City of Rochester. The City will maintain records of the mass balance calculations and will notify NYSDEC if emissions limits are exceeded.

If you have any questions, please contact me at (716)428-5978.

Sincerely,

Mark D. Gregor
Environmental Specialist

jaf

xc: Amarinderjit Nagi,NYSDEC
Ford Ritz,MPI
Jim Raleigh,MPI
Jim Dinardo
Bill Kiselycznyk

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CALCULATIONS

The process will incorporate an air stripper to remove volatile organic compounds from groundwater. Mass loadings to the atmosphere reported in Section F of the Permit to Construct are based on a material balance around the stripper. An example calculation is presented below for 1,1-dichloroethene. The attached spreadsheets (Tables 1 and 2) present the actual and potential emmission rates, respectively, for all contaminants.

Material Balance:

Mass transfer to the atmosphere = concentration transferred from groundwater to air x groundwater flow rate = (stripper influent concentration - stripper effluent concentration) x flow rate.

Airstripper Influent Groundwater Concentration (mg/l):

Influent concentrations are conservatively assumed to be the highest concentration of the contaminant ever detected in all groundwater samples collected from the aquifer.

For 1,1-dichloroethene, influent concentration = 0.12 mg/l

Airstripper Effluent Groundwater Concentration (mg/l):

Effluent concentrations are conservatively assumed to be 0 (100% stripped to the atmosphere) for all contaminants.

For 1,1-dichloroethene, effluent concentration = 0 mg/l

Groundwater Flow Rate (gallons per minute):

Maximum stripper design operating capacity (start-up only) = 40 gpm
Anticipated average flow rate at steady-state = 15 gpm.

Mass Transfer to Air:

For 1,1-dichloroethene, ERP =

(0.12 mg/l - 0 mg/l) x 40 gal/min x 3.785 L/gal x 2.205 lb/1x10^{6}mg x 60 min/hr
= 0.0024 lbs/hr

Actual Emissions =

(0.12 mg/l - 0 mg/l) x 15 gal/min x 3.785 L/gal x 2.205 lb/1x10^{6}mg x 60 min/hr
= 0.0009 lbs/hr

TABLE 1

ROCHESTER FIRE ACADEMY - SOUTH DISPOSAL AREA

GROUNDWATER AIR STRIPPER

CALCULATION OF ACTUAL EMISSIONS RATE

AT A STEADY-STATE GROUNDWATER PRODUCTION RATE OF 15 gpm

CONTAMINANT	INFLUENT WATER CONC. (mg/l)	EFFLUENT WATER CONC. (mg/l)	NET (mg/l)	MAX WATER FLOW RATE (GPM)	MASS TRANSFER TO AIR (mg/min)	BLOWER CAP. (cfm)	STACK AIR CONC. (mg/cu m)	VOC LOADING TO AIR (lbs/hr)
1,1-Dichloroethene	0.12	0	0.12	15	6.82	900	0.27	0.0009
1,1-Dichloroethane	1	0	1	15	56.82	900	2.23	0.0075
1,2-Dichloroethene	30	0	30	15	1704.55	900	66.86	0.2255
Chloroform	0.008	0	0.008	15	0.45	900	0.02	0.0001
1,2-Dichloroethane	0.046	0	0.046	15	2.61	900	0.10	0.0003
Vinyl Chloride	0.22	0	0.22	15	12.50	900	0.49	0.0017
Acetone	1.6	0	1.6	15	90.91	900	3.57	0.0120
Methylene Chloride	0.58	0	0.58	15	32.95	900	1.29	0.0044
2-Butanone	0.15	0	0.15	15	8.52	900	0.33	0.0011
1,1,1-Trichloroethane	7.9	0	7.9	15	448.86	900	17.61	0.0594
Bromodichloromethane	0.009	0	0.009	15	0.51	900	0.02	0.0001
Trichloroethene	0.94	0	0.94	15	53.41	900	2.09	0.0071
Benzene	0.009	0	0.009	15	0.51	900	0.02	0.0001
4-methyl-2-pentanone	0.16	0	0.16	15	9.09	900	0.36	0.0012
Tetrachloroethene	0.088	0	0.088	15	5.00	900	0.20	0.0007
Toluene	0.91	0	0.91	15	51.70	900	2.03	0.0068
Chlorobenzene	0.008	0	0.008	15	0.45	900	0.02	0.0001
Ethylbenzene	0.34	0	0.34	15	19.32	900	0.76	0.0026
Total Xylenes	2.3	0	2.3	15	130.68	900	5.13	0.0173
Chloroethane	0.075	0	0.075	15	4.26	900	0.17	0.0006

TABLE 2

ROCHESTER FIRE ACADEMY - SOUTH DISPOSAL AREA

GROUNDWATER AIR STRIPPER

CALCULATION OF MAXIMUM POTENTIAL EMISSIONS RATE

AT A START-UP GROUNDWATER PRODUCTION RATE OF 40 gpm

CONTAMINANT	INFLUENT WATER CONC. (mg/l)	EFFLUENT WATER CONC. (mg/l)	NET (mg/l)	MAX WATER FLOW RATE (GPM)	MASS TRANSFER TO AIR (mg/min)	BLOWER CAP. (cfm)	STACK AIR CONC. (mg/cu m)	VOC LOADING TO AIR (lbs/hr)
1,1-Dichloroethene	0.12	0	0.12	40	18.18	900	0.71	0.0024
1,1-Dichloroethane	1	0	1	40	151.52	900	5.94	0.0200
1,2-Dichloroethene	30	0	30	40	4545.45	900	178.28	0.6013
Chloroform	0.008	0	0.008	40	1.21	900	0.05	0.0002
1,2-Dichloroethane	0.046	0	0.046	40	6.97	900	0.27	0.0009
Vinyl Chloride	0.22	0	0.22	40	33.33	900	1.31	0.0044
Acetone	1.6	0	1.6	40	242.42	900	9.51	0.0321
Methylene Chloride	0.58	0	0.58	40	87.88	900	3.45	0.0116
2-Butanone	0.15	0	0.15	40	22.73	900	0.89	0.0030
1,1,1-Trichloroethane	7.9	0	7.9	40	1196.97	900	46.95	0.1583
Bromodichloromethane	0.009	0	0.009	40	1.36	900	0.05	0.0002
Trichloroethene	0.94	0	0.94	40	142.42	900	5.59	0.0188
Benzene	0.009	0	0.009	40	1.36	900	0.05	0.0002
4-methyl-2-pentanone	0.16	0	0.16	40	24.24	900	0.95	0.0032
Tetrachloroethene	0.088	0	0.088	40	13.33	900	0.52	0.0018
Toluene	0.91	0	0.91	40	137.88	900	5.41	0.0182
Chlorobenzene	0.008	0	0.008	40	1.21	900	0.05	0.0002
Ethylbenzene	0.34	0	0.34	40	51.52	900	2.02	0.0068
Total Xylenes	2.3	0	2.3	40	348.48	900	13.67	0.0461
Chloroethane	0.075	0	0.075	40	11.36	900	0.45	0.0015

CONTAMINANT IMPACT SUMMARY OF AIR GUIDE 1 ANALYSIS

CAS NUMBER	EMISSIONS #/HOUR	EMISSIONS #/YEAR	ANNUAL EMISSIONS #/HOUR	SUMMATION OF SHORT-TERM IMPACTS, MAXIMUM (Cav,Pt,Area) ug/m3	SUMMATION OF CAVITY IMPACTS ACTUAL ANNUAL ug/m3	SUMMATION OF POINT or AREA SOURCE IMPACTS POTENTIAL ANNUAL ug/m3	SUMMATION OF POINT or AREA SOURCE IMPACTS ACTUAL ANNUAL ug/m3
000067641	0.032000	284.0000	0.032420	6.407278	0.000000	0.186804	0.189450
000071556	0.157000	1378.0000	0.157306	31.435709	0.000000	0.916505	0.919232
000075343	0.020000	177.4000	0.020251	4.004549	0.000000	0.116752	0.118340
000075354	0.003000	21.3000	0.002432	0.600682	0.000000	0.017513	0.014209
SUMMARY TOTALS	0.212000	1860.7001	0.212409	42.448215	0.000000	1.237575	1.241230

CONTAMINANT ASSESSMENT SUMMARY OF AIR GUIDE 1 ANALYSIS

CAS NUMBER	AGC ug/m3	SGC ug/m3	SUMMATION OF SHORT-TERM IMPACTS, MAXIMUM (Cav,Pt,Area) % OF SGC	SUMMATION OF CAVITY IMPACTS ACTUAL ANNUAL % OF AGC	SUMMATION OF POINT or AREA SOURCE IMPACTS POTENTIAL ANNUAL % OF AGC	SUMMATION OF POINT or AREA SOURCE IMPACTS ACTUAL ANNUAL % OF AGC
000067641	14000.000000000	0.0000	0.0000	0.0000	0.0013	0.0014
000071556	500.000000000	0.0000	0.0000	0.0000	0.1833	0.1839
000075343	500.000000000	0.0000	0.0000	0.0000	0.0234	0.0237
000075354	500.000000000	0.0000	0.0000	0.0000	0.0035	0.0028
SUMMARY TOTALS			0.0000	0.0000	0.2115	0.2117

Form 88-91 (Epson LQ 1070+)

LOCATION | FACILITY | EMISSION POINT | 1

A ADD
C CHANGE
D DELETE

READ INSTRUCTIONS CONTAINED IN FORM 78-11-12 BEFORE ANSWERING ANY QUESTION

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

COPIES
WHITE - ORIGINAL
GREEN - DIVISION OF AIR
WHITE - REGIONAL OFFICE
WHITE - FIELD REP
YELLOW - APPLICANT

PROCESS, EXHAUST OR VENTILATION SYSTEM

APPLICATION FOR PERMIT TO CONSTRUCT OR CERTIFICATE TO OPERATE

1. NAME OF OWNER / FIRM	9. NAME OF AUTHORIZED AGENT	10. TELEPHONE	19. FACILITY NAME (IF DIFFERENT FROM OWNER / FIRM)
City of Rochester	Malcolm Pirnie, Inc.	(716) 328-1300	Rochester Fire Academy
2. NUMBER AND STREET ADDRESS	11. NUMBER AND STREET ADDRESS		20. FACILITY LOCATION (NUMBER AND STREET ADDRESS)
City Hall - 30 Church Street	P.O. Box 1938		1190 Scottsville Rd.
3. CITY - TOWN - VILLAGE / 4. STATE / 5. ZIP	12. CITY - TOWN - VILLAGE / 13. STATE / 14. ZIP		21. CITY - TOWN - VILLAGE / 22. ZIP
Rochester / NY / 14614	Buffalo / NY / 14219		Rochester / 14624
6. OWNER CLASSIFICATION: A. ☐ STATE M. ☐ HOSPITAL; C. ☐ COMMERCIAL S. ☐ UTILITY F. ☒ MUNICIPAL I. ☐ RESIDENTIAL; N. ☐ INDUSTRIAL D. ☐ FEDERAL O. ☐ EDUC. INST. J. ☐ OTHER	15. NAME OF P.E. OR ARCHITECT PREPARING APPLICATION / 16. N.Y.S. P.E. OR ARCHITECT LICENSE NO. / 17. TELEPHONE		23. BUILDING NAME OR NUMBER / 24. FLOOR NAME OR NUMBER
	Paul H. Werthman / 57626 / (716) 328-1300		GW Treatment / 1
7. NAME & TITLE OF OWNER'S REPRESENTATIVE / 8. TELEPHONE	18. SIGNATURE OF OWNER'S REPRESENTATIVE OR AGENT WHEN APPLYING FOR A PERMIT TO CONSTRUCT		25. START UP DATE (MO / YR) / 26. DRAWING NUMBERS OF PLANS SUBMITTED
Mr. Mark Gregor, Sr. Environmental Specialist / (716) 428-5978			07 / 96 / G-2, M-2, M-3, A-2
			27. PERMIT TO CONSTRUCT: A. ☒ NEW SOURCE B. ☐ MODIFICATION / 28. CERTIFICATE TO OPERATE: A. ☐ NEW SOURCE C. ☐ EXISTING SOURCE B. ☐ MODIFICATION

29. EMISSION POINT ID.	30. GROUND ELEVATION (FT.)	31. HEIGHT ABOVE STRUCTURES (FT.)	32. STACK HEIGHT (FT.)	33. INSIDE DIAMETER (IN.)	34. EXIT TEMP. (°F)	35. EXIT VELOCITY (FT./SEC.)	36. EXIT FLOW RATE (ACFM)
00001	526.0	23.0	38.0	10	50	26.2	900

37. SOURCE CODE	38. HRS / DAY	39. DAYS / YR	40. % OF OPERATION BY SEASON: Winter	Spring	Summer	Fall
	24	365	25	25	25	25

41. DESCRIBE PROCESS OR UNIT

1. Air stripping for removal of volatile organics from groundwater.
2.
3.
4.
5.
6.
7.
8.

42. EMISSION CONTROL EQUIPMENT I.D.	43. CONTROL TYPE	44. MANUFACTURER'S NAME AND MODEL NUMBER	45. DISPOSAL METHOD	46. DATE INSTALLED - MONTH / YEAR	47. USEFUL LIFE
N/A	99	None		/	
48.	49.	50.	51.	52. /	53.

Page 1 of 4

CALCULATIONS

See Attached

CONTAMINANT NAME	CAS NUMBER	EMISSIONS: ACTUAL	UNIT	HOW DET.	PERMISSIBLE	% CONTROL EFFIC'Y	HOURLY EMISSIONS (LBS/HR): ERP	ACTUAL	ANNUAL EMISSIONS (LBS/YR): ACTUAL	"D"	PERMISSIBLE
54. Acetone	55. 000067-64-1	53. 12.000	60. 2	61. 8	62.	63. 0.000	64. 0.032	65. 0.012	66. 1.05	67. 2	68.
69. Chloroform	70. 000067-66-3	74. 0.100	75. 2	76. 8	77.	78. 0.000	79. 0.000	80. 0.000	81. 8.00	82. -1	83.
84. Benzene	85. 000071-43-2	89. 0.100	90. 2	91. 8	92.	93. 0.000	94. 0.000	95. 0.000	96. 8.00	97. -1	98.
99. 111-Trichloroethane	100. 000071-55-6	104. 59.300	105. 2	106. 8	107.	108. 0.000	109. 0.158	110. 0.059	111. 8.18	112. 2	113.
114. Chloroethane	115. 000075-00-3	119. 0.600	120. 2	121. 8	122.	123. 0.000	124. 0.002	125. 0.001	126. 4.90	127. 0	128.
129. Vinyl Chloride	130. 000075-01-4	134. 1.700	135. 2	136. 8	137.	138. 0.000	139. 0.004	140. 0.002	141. 1.45	142. 1	143.

SOLID FUEL TYPE	TONS / YR	% S	LIQUID FUEL TYPE	THOUSANDS OF GAL.	% S	GAS TYPE	THOUSANDS OF CF/YR	BTU/CF
144.	145.	146	147.	148	149	150.	151.	152.

APPLICABLE RULE	APPLICABLE RULE
153.	154.

Upon completion of construction sign the statement below and forward to the appropriate [illegible]

IF PROCESS, EXHAUST OR VENTILATION SYSTEM HAS BEEN CONSTRUCTED AND WILL BE OPERATED IN ACCORDANCE WITH STATED SPECIFICATIONS AND IN CONFORMANCE WITH ALL PROVISIONS OF EXISTING REGULATIONS

155. SIGNATURE OF AUTHORIZED REPRESENTATIVE OR AGENT | DATE

[illegible] DATE APPL. RECEIVED | DATE APPL. REVIEWED | DATE ISSUED

Form: 01/91 (Epson LQ 1070+)

84418

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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WHITE - REGIONAL OFFICE
WHITE - FIELD REP
YELLOW - APPLICANT

LOCATION | FACILITY | EMISSION POINT

A ADD
C CHANGE
D DELETE

READ INSTRUCTIONS CONTAINED IN FORM 78-11-12 BEFORE ANSWERING ANY QUESTION

PROCESS, EXHAUST OR VENTILATION SYSTEM

APPLICATION FOR PERMIT TO CONSTRUCT OR CERTIFICATE TO OPERATE

SECTION A

1. NAME OF OWNER / FIRM: City of Rochester
2. NUMBER AND STREET ADDRESS: City Hall - 30 Church Street
3. CITY - TOWN - VILLAGE: Rochester
4. STATE: NY
5. ZIP: 14614
6. OWNER CLASSIFICATION: A. ☐ COMMERCIAL B. ☐ INDUSTRIAL C. ☐ UTILITY D. ☐ FEDERAL E. ☐ STATE F. ☒ MUNICIPAL G. ☐ EDUC. INST. H. ☐ HOSPITAL I. ☐ RESIDENTIAL J. ☐ OTHER
7. NAME & TITLE OF OWNER'S REPRESENTATIVE: Mr. Mark Gregor, Sr. Environmental Specialist
8. TELEPHONE: (716) 428-6978
9. NAME OF P.E. OR ARCHITECT PREPARING APPLICATION
10. N.Y.S. P.E. OR ARCHITECT LICENSE NO.
11. TELEPHONE
12. NAME & STREET ADDRESS
13. CITY - TOWN - VILLAGE
14. STATE
15. ZIP
16. SIGNATURE OF OWNER'S REPRESENTATIVE OR AGENT WHEN APPLYING FOR A PERMIT TO CONSTRUCT
17. TELEPHONE
18. NAME OF AUTHORIZED AGENT
19. FACILITY NAME (IF DIFFERENT FROM OWNER / FIRM): Rochester Fire Academy
20. FACILITY LOCATION (NUMBER AND STREET ADDRESS): 1190 Scottsville Rd.
21. CITY - TOWN - VILLAGE: Rochester
22. ZIP: 14624
23. BUILDING NAME OR NUMBER: GW Treatment
24. FLOOR NAME OR NUMBER: 1
25. START UP DATE: 07 / 96 (MO / YR)
26. DRAWING NUMBERS OF PLANS SUBMITTED: G-2, M-2, M-3, A-2
27. PERMIT TO CONSTRUCT: A. ☒ NEW SOURCE B. ☐ MODIFICATION
28. CERTIFICATE TO OPERATE: A. ☐ NEW SOURCE B. ☐ MODIFICATION C. ☐ EXISTING SOURCE

SECTION B

29. EMISSION POINT ID.	30. GROUND ELEVATION (FT.)	31. HEIGHT ABOVE STRUCTURES (FT.)	32. STACK HEIGHT (FT.)	33. INSIDE DIMENSIONS (IN.)	34. EXIT TEMP (°F)	35. EXIT VELOCITY (FT./SEC.)	36. EXIT FLOW RATE (ACFM)	37. SOURCE CODE	38. HRS / DAY	39. DAYS / YR	40. % OF OPERATION BY SEASON (Winter Spring Summer Fall)
b b 0 0 1											

SECTION C

41. DESCRIBE PROCESS OR UNIT		
	1.	2.
	3.	4.
	5.	6.
	7.	8.

SECTION D

EMISSION CONTROL EQUIPMENT I.D.	CONTROL TYPE	MANUFACTURER'S NAME AND MODEL NUMBER	DISPOSAL METHOD	DATE INSTALLED MONTH / YEAR	USEFUL LIFE
42.	43.	44.	45.	46. /	47.
48.	49.	50.	51.	52. /	53.

SECTION E

CALCULATIONS

See Page 1

SECTION F

CONTAMINANT NAME	CAS NUMBER	INPUT OR PRODUCTION	UNIT	ENV RATING	EMISSIONS ACTUAL	EMISSIONS UNIT	EMISSIONS HOUR DET.	EMISSIONS PERMISSIBLE	% CONTROL EFFICIENCY	HOURLY EMISSIONS (LBS/HR) ERP	HOURLY EMISSIONS (LBS/HR) ACTUAL	ANNUAL EMISSIONS (LBS/YR) ACTUAL	ANNUAL EMISSIONS (LBS/YR) 10*	ANNUAL EMISSIONS (LBS/YR) PERMISSIBL
54. Methylene Chloride	55. 000075-09-2	56.	57.	58.	59. 4.400	60. 2	61. 8	62.	63. 0.000	64. 0.012	65. 0.004	66. 3.81	67. 1	68.
69. Bromodichloromethane	70. 000075-27-4	71.	72.	73.	74. 0.100	75. 2	76. 8	77.	78. 0.000	79. 0.000	80. 0.000	81. 0.00	82. -1	83.
84. 1,1-Dichloroethane	85. 000075-34-3	86.	87.	88.	89. 7.500	90. 2	91. 8	92.	93. 0.000	94. 0.020	95. 0.008	96. 6.57	97. 1	98.
99. 1,1-Dichloroethene	100. 000075-35-4	101.	102.	103.	104. 0.900	105. 2	106. 8	107.	108. 0.000	109. 0.002	110. 0.001	111. 7.90	112. 0	113.
114. 2-Butanone	115. 000078-93-3	116.	117.	118.	119. 1.100	120. 2	121. 8	122.	123. 0.000	124. 0.003	125. 0.001	126. 9.90	127. 0	128.
129. Trichloroethylene	130. 000079-01-6	131.	132.	133.	134. 7.100	135. 2	136. 8	137.	138. 0.000	139. 0.019	140. 0.007	141. 6.18	142. 1	143.

SECTION G

SOLID FUEL TYPE	SOLID FUEL TONS / YR	% S	LIQUID FUEL TYPE	LIQUID FUEL THOUSANDS OF GALLONS/YR	% S	GAS TYPE	GAS THOUSANDS OF CF/YR	BTU/CF
144.	145.	146.	147.	148.	149.	150.	151.	152.

APPLICABLE RULE	APPLICABLE RULE
153.	154.

Upon completion of construction sign the statement listed below and forward to the appropriate field representative

155. SIGNATURE OF AUTHORIZED REPRESENTATIVE OR AGENT | DATE

THE PROCESS EXHAUST OR VENTILATION SYSTEM HAS BEEN CONSTRUCTED AND WILL BE OPERATED IN ACCORDANCE WITH STATED [illegible] IN CONFORMANCE WITH ALL PROVISIONS OF EXISTING REGULATIONS

Form 88/91 (Epson LQ 1070+)

NEW YORK STATE
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WHITE - REGIONAL OFFICE
WHITE - FIELD REP
YELLOW - APPLICANT

NP | LOCATION | FACILITY | EMISSION POINT | I

A ADD
C CHANGE
D DELETE

READ INSTRUCTIONS CONTAINED IN FORM 75-11-12 BEFORE ANSWERING ANY QUESTION

PROCESS, EXHAUST OR VENTILATION SYSTEM

APPLICATION FOR PERMIT TO CONSTRUCT OR CERTIFICATE TO OPERATE

SECTION A

1. NAME OF OWNER / FIRM: City of Rochester
2. NUMBER AND STREET ADDRESS: City Hall - 30 Church Street
3. CITY - TOWN - VILLAGE: Rochester
4. STATE: NY
5. ZIP: 14614
6. OWNER CLASSIFICATION: A. COMMERCIAL C. UTILITY F. [X] MUNICIPAL I. RESIDENTIAL B. INDUSTRIAL D. FEDERAL G. EDUC. INST. J. OTHER H. HOSPITAL S. STATE
7. NAME & TITLE OF OWNER'S REPRESENTATIVE: Mr. Mark Gregor, Sr. Environmental Specialist
8. TELEPHONE: (716) 4[illegible]-5878
9. NAME OF AUTHORIZED AGENT
10. TELEPHONE
11. NUMBER AND STREET ADDRESS
12. CITY - TOWN - VILLAGE
13. STATE
14. ZIP
15. NAME OF P.E. OR ARCHITECT PREPARING APPLICATION
16. N.Y.S. P.E. OR ARCHITECT LICENSE NO.
17. TELEPHONE
18. SIGNATURE OF OWNER'S REPRESENTATIVE OR AGENT WHEN APPLYING FOR A PERMIT TO CONSTRUCT
19. FACILITY NAME (IF DIFFERENT FROM OWNER / FIRM): Rochester Fire Academy
20. FACILITY LOCATION (NUMBER AND STREET ADDRESS): 1190 Scottsville Rd.
21. CITY - TOWN - VILLAGE: Rochester
22. ZIP: 14624
23. BUILDING NAME OR NUMBER: GW Treatment
24. FLOOR NAME OR NUMBER: 1
25. START UP DATE: 07 (MO) / 96 (YR)
26. DRAWING NUMBERS OF PLANS SUBMITTED: G-2, M-2, M-3, A-2
27. PERMIT TO CONSTRUCT: A. [X] NEW SOURCE B. [ ] MODIFICATION
28. CERTIFICATE TO OPERATE: A. [ ] NEW SOURCE C. [ ] EXISTING SOURCE B. [ ] MODIFICATION

SECTION B

29. EMISSION POINT ID.	30. GROUND ELEVATION (FT.)	31. HEIGHT ABOVE STRUCTURES (FT.)	32. [illegible]	33. INSIDE DIMENSIONS (IN.)	34. EXIT TEMP (°F)	35. EXIT VELOCITY (FT./SEC.)	36. EXIT FLOW RATE (ACFM)	37. SOURCE CODE	38. HRS / DAY	39. DAYS / YR	40. % OPERATION BY SEASON (Winter / Spring / Summer / Fall)
00001											

SECTION C

41. DESCRIBE PROCESS OR UNIT

1. 2. 3. 4. 5. 6. 7. 8.

SECTION D

42. EMISSION CONTROL EQUIPMENT I.D.	43. CONTROL TYPE	44. MANUFACTURER'S NAME AND MODEL NUMBER	45. DISPOSAL METHOD	46. DATE INSTALLED - MONTH / YEAR	47. USEFUL LIFE
42.	43.	44.	45.	46. /	47.
48.	49.	50.	51.	52. /	53.

SECTION E

CALCULATIONS

See Page 1

SECTION F

CONTAMINANT NAME	CAS NUMBER	INPUT OR PRODUCTION	UNIT	ENV. RATING	EMISSIONS ACTUAL	UNIT	HOW DET.	PERMISSIBLE	% CONTROL EFFICIENCY	HOURLY EMISSIONS (LBS/HR) EPP	ACTUAL	ANNUAL EMISSIONS (LBS/YR) ACTUAL	10*	PERMISSIB
54. Ethylbenzene	55. 000100-41-4	56.	57.	58.	59. 2.600	60. 2	61. 8	62.	63. 0.000	64. 0.007	65. 0.003	66. 2.23 / 2.23	67. 1	68.
69. 1,2-Dichloroethane	70. 000107-06-2	71.	72.	73.	74. 0.300	75. 2	76. 8	77.	78. 0.000	79. 0.001	80. 0.000	81. 3.00 / 3.00	82. 0	83.
84. 4-Methyl-2-Pentanone	85. 000108-10-1	86.	87.	88.	89. 1.200	90. 2	91. 8	92.	93. 0.000	94. 0.003	95. 0.001	96. 1.05 / 1.05	97. 1	98.
99. Toluene	100. 000108-88-3	101.	102.	103.	104. 6.800	105. 2	106. 8	107.	108. 0.000	109. 0.018 / 0.018	110. 0.007 / 0.007	111. 5.98 / 5.98	112. 1	113.
114. Chlorobenzene	115. 000108-90-7	116.	117.	118.	119. 0.100	120. 2	121. 8	122.	123. 0.000	124. 0.000	125. 0.000	126. 5.00 / 5.00	127. -1	128.
129. Tetrachloroethylene	130. 000127-18-4	131.	132.	133.	134. 0.700	135. 2	136. 8	137.	138. 0.000	139. 0.002	140. 0.001	141. 5.80 / 5.80	142. 0	143.

SECTION G

SOLID FUEL TYPE	SOLID FUEL TONS / YR	% S	LIQUID FUEL TYPE	LIQUID FUEL THOUSANDS OF GALLONS/YR	% S	GAS TYPE	GAS THOUSANDS OF CF/YR	BTU/CF
144.	145.	146.	147.	148.	149.	150.	151.	152.

APPLICABLE RULE	APPLICABLE RULE
153.	154.

Upon completion of construction sign the statement listed below and forward to the appropriate field representative

THE PROCESS, EXHAUST OR VENTILATION SYSTEM HAS BEEN CONSTRUCTED AND WILL BE OPERATED IN ACCORDANCE WITH STATED SPECIFICATIONS AND IN CONFORMANCE WITH ALL PROVISIONS OF EXISTING REGULATIONS

155. SIGNATURE OF AUTHORIZED REPRESENTATIVE OR AGENT

DATE

Form: 08/91 (Epson LQ 1070+)

LOCATION | FACILITY | EMISSION POINT

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

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PINK - REGIONAL OFFICE
WHITE - FIELD REP
YELLOW - APPLICANT

A ADD
C CHANGE
D DELETE

READ INSTRUCTIONS CONTAINED IN FORM 78-11-12 BEFORE ANSWERING ANY QUESTION

PROCESS, EXHAUST OR VENTILATION SYSTEM

APPLICATION FOR PERMIT TO CONSTRUCT OR CERTIFICATE TO OPERATE

SECTION A

1. NAME OF OWNER / FIRM: City of Rochester
9. NAME OF AUTHORIZED AGENT:
10. TELEPHONE:
16. FACILITY NAME (IF DIFFERENT FROM OWNER / FIRM): Rochester Fire Academy

2. NUMBER AND STREET ADDRESS: City Hall - 30 Church Street
11. NUMBER AND STREET ADDRESS:
20. FACILITY LOCATION (NUMBER AND STREET ADDRESS): 1190 Scottsville Rd.

3. CITY - TOWN - VILLAGE: Rochester | 4. STATE: NY | 5. ZIP: 14614
12. CITY - TOWN - VILLAGE: | 13. STATE: | 14. ZIP:
21. CITY - TOWN - VILLAGE: Rochester | 22. ZIP: 14624

6. OWNER'S CLASSIFICATION: A. ☐ COMMERCIAL B. ☐ INDUSTRIAL C. ☐ UTILITY D. ☐ FEDERAL E. ☐ STATE F. ☒ MUNICIPAL G. ☐ EDUC. INST. H. ☐ HOSPITAL I. ☐ RESIDENTIAL J. ☐ OTHER
15. NAME OF P.E. OR ARCHITECT PREPARING APPLICATION:
16. N.Y.S. P.E. OR ARCHITECT LICENSE NO.:
17. TELEPHONE:
23. NAME OF BUILDING OR NUMBER: GW Treatment
24. FLOOR NAME OR NUMBER: 1

7. NAME & TITLE OF OWNER'S REPRESENTATIVE: Mr. Mark Gregor, Sr. Environmental Specialist
8. TELEPHONE: (716) 428-5678
18. SIGNATURE OF OWNER'S REPRESENTATIVE OR AGENT WHEN APPLYING FOR A PERMIT TO CONSTRUCT:
25. START-UP DATE: 07 / 95 (MO / YR)
26. DRAWING NUMBERS OF PLANS SUBMITTED: G-2, M-2, M-3, A-2
27. PERMIT TO CONSTRUCT: A. ☒ NEW SOURCE B. ☐ MODIFICATION
28. CERTIFICATE TO OPERATE: A. ☐ NEW SOURCE B. ☐ MODIFICATION C. ☐ EXISTING SOURCE

SECTION B

29. EMISSION POINT ID.	30. GROUND ELEVATION (FT.)	31. HEIGHT ABOVE STRUCTURES (FT.)	32. STACK HEIGHT (FT.)	33. INSIDE DIMENSIONS (IN.)	34. EXIT TEMP. (°F)	35. EXIT VELOCITY (FT./SEC.)	36. EXIT FLOW RATE (ACFM)	37. SOURCE CODE	38. HRS / DAY	39. DAYS / YR	40. % OPERATION BY SEASON: Winter	Spring	Summer	Fall
0 0 0 0 1														

41. DESCRIBE PROCESS OR UNIT:
1.
3.
5.
7.
2.
4.
6.
8.

SECTION C

42. EMISSION CONTROL EQUIPMENT I.D.	43. CONTROL TYPE	44. MANUFACTURER'S NAME AND MODEL NUMBER	45. DISPOSAL METHOD	46. DATE INSTALLED MONTH / YEAR	47. USEFUL LIFE
42.	43.	44.	45.	46. /	47.
48.	49.	50.	51.	52. /	53.

Page 4 of 4

SECTION E

CALCULATIONS
See Page 1

SECTION D

CONTAMINANT NAME	CONTAMINANT CAS NUMBER	INPUT OR PRODUCTION	UNIT	SAV. RATING	EMISSIONS ACTUAL	EMISSIONS UNIT	EMISSIONS HOW DET.	EMISSIONS PERMISSIBLE	% CONTROL EFFIC'CY	HOURLY EMISSIONS (LBS/HR) EMP	HOURLY EMISSIONS (LBS/HR) ACTUAL	ANNUAL EMISSIONS (LBS/YR) ACTUAL	ANNUAL EMISSIONS (LBS/YR) PERMISSIBLE
54. 1,2-Dichloroethene	55. 000540-59-0	56.	57.	58.	59. 0.225	60.	61.	62.	63. 0.000	64. 0.600 0.600	65. 0.225 0.225	66. 1.97 1.97	67. 3 3
68. Xylene	69. 001330-20-7	70.	71.	72.	73. 17.200	74.	75.	76.	77. 0.000	78. 0.046 0.046	79. 0.017 0.017	80. 1.51 1.51	81. 2. 2.
82.	83.	84.	85.	86.	87. 0.000	88.	89.	90.	91. 0.000	92. 0.000	93. 0.000	94. 0.00	95.
96.	97.	98.	99.	100.	101. 0.000	102.	103.	104.	105. 0.000	106. 0.000	107. 0.000	108. 0.00	109.
110.	111.	112.	113.	114.	115. 0.000	116.	117.	118.	119. 0.000	120. 0.000	121. 0.000	122. 0.00	123.
124.	125.	126.	127.	128.	129. 0.000	130.	131.	132.	133. 0.000	134. 0.000	135. 0.000	136. 0.00	137.

SECTION F

144. TYPE	145. LIQUID FUEL TONS / YR	146. % $	147. TYPE	148. LIQUID FUEL THOUSANDS OF GALLONS/YR	149. % $	150. TYPE	151. GAS THOUSANDS OF CF/YR	152. STUC?

153. APPLICABLE RULE	154. APPLICABLE RULE

20. I CERTIFY THAT I HAVE READ THE STATEMENT HEREIN BELOW AND KNOW IT TO BE APPLICABLE HERE AND THAT ALL INFORMATION CONTAINED HEREIN AND ATTACHED HERETO IS TRUE TO THE BEST OF MY KNOWLEDGE.

THE SOURCE(S) COVERED BY THIS APPLICATION HAS BEEN CONSTRUCTED AND WILL BE OPERATED IN ACCORDANCE WITH STATED PLANS AND IN COMPLIANCE WITH ALL PROVISIONS OF ENVIRONMENTAL CONSERVATION LAW AND REGULATIONS.

*155. SIGNATURE OF AUTHORIZED REPRESENTATIVE OR AGENT | DATE

MALCOLM PIRNIE

APPENDIX D

GROUNDWATER TREATMENT SYSTEM
SEWER USE PERMIT APPLICATION AND PERMITS

Section 7. Initial Sewer Licenses or Permits Form.

INITIAL INDUSTRIAL SEWER USE PERMIT

County of Monroe

Pure Waters District No. 8535

Permit No. 705

Expires: 9/30/94

Fee: $40.00

Firm Name: City of Rochester Fire Academy

Address: 30 Church St.

Rochester, NY 14614

Type of Business of Service: Groundwater remediation

I. The above-named applicant is permitted to discharge wastes into the Pure Waters Sewer System or Tributary thereto as applied for by an application dated and verified by the applicant except the Director of Pure Waters requires the following terms and conditions to govern the permitted discharge:

A. As stated in Permit Enclosure

B. _____

C. _____

II. The applicant further agrees to:

1. Accept and abide by all provisions of the Sewer Use Law of Monroe County and of all pertinent rules or regulations now in force or shall be adopted in the future.

2. Notify the Director of Pure Waters in writing of any revision to the plant sewer system or any change in industrial wastes discharge to the public sewers listed in Exhibit "B." The latter encompasses either (1) an increase or decrease in average daily volume or strength of wastes listed in Exhibit "B" or (2) new wastes that were not listed in Exhibit "B."

3. Furnish the Director of Pure Waters upon request any additional information relating to the installation or use of sewer or drain for which this permit is sought.

4. Operate and maintain any waste pretreatment facilities, as may be required as a condition of the acceptance into the

public sewer of the industrial wastes involved, in an efficient manner at all times, and at no expense to the County.

5. Cooperate with the Director Pure Waters or his representatives in their inspecting, sampling, and study of wastes, or the facilities provided for pretreatment.

6. Notify the Director of Pure Waters immediately of any accident, negligence, breakdown of pretreating equipment, or other occurrence that occasions discharge to the public sewers of any wastes or process waters not covered by this permit.

Applicant's Signature: Mark D Gregor Date: July 9, 1993

Title: ENVIRONMENTAL SPECIALIST

Name of person to be contacted for inspection or emergency purposes:

Permit approved by: John E Graham PE Date: SEP 09 [illegible]
Director of Pure Waters

COUNTY OF MONROE
SEWER USE PERMIT ENCLOSURE

City of Rochester - Fire Academy
150 Poole Street
Rochester, N.Y. 14624

PERMIT NUMBER: 705
DISTRICT NUMBER: 8535

TYPE OF BUSINESS: Groundwater Remediation
SIC CODE: N/A
SAMPLE POINT: pretreatment effluent sample port

REQUIRED MONITORING

SELF MONITORING FREQUENCY: start up - confirm compliance prior to discharge followed by one sampling per week for the first month of operation, thereafter, monthly sampling shall commence

SAMPLING PROTOCOL: Sampling and analysis shall be performed in accordance with the techniques prescribed in 40CFR part 136 and amendments thereto. A 24 hr. timed composite sample, collected from the above noted sample point, shall be analyzed for the following parameters:

Phosphorus (T)	10.0	ppm
Arsenic (T)	0.5	ppm
Cadmium (T)	1.0	ppm
Chromium (T)	3.0	ppm
Copper (T)	3.0	ppm
Lead (T)	1.0	ppm
Manganese (T)	5.0	ppm
Nickel (T)	3.0	ppm
Selenium (T)	2.0	ppm
Zinc (T)	5.0	ppm

SAMPLING PROTOCOL: Sampling and analysis shall be performed in accordance with the techniques prescribed in 40CFR part 136 and amendments thereto. A grab sample, collected from the above noted sample point shall be analyzed for the following:

parameter	limit
pH	5.5-10.0
Polychlorinated biphenol (PCB)	BDL
Acetone	monitoring only
Methyl ethyl ketone	monitoring only
Methyl isobutyl ketone (MIBK)	monitoring only
4 methylphenol (p cresol)	monitoring only
* Total Toxic Organics (TTO)	2.13 ppm

* TTO = the summation of the Purgeable Halocarbons (EPA Method 601), Purgeable Aromatics (EPA Method 602), Xylene, acid extractables, base neutrals, pesticides and polychlorinated biphenols

SPECIAL CONDITIONS:

1. All groundwater must be treated as described in Exhibit B regardless of the influent concentrations.
2. Quarterly flow summaries shall be submitted for billing purposes. It is imperative these summaries are submitted in a timely manner.

NOTES:

In addition to the parameters/limits outlined above, total facility discharge shall meet all the concentration values as described in Article II, Section 10e of the Monroe County Pure Waters Districts, Rules and Regulations-Sewer Use Law of the County of Monroe. Pursuant to Article VIII, Section 8.4k, the permittee shall immediately contact the District when a discharge known to be in violation of any permit requirement has occurred. This notification shall be directed to the Industrial Waste Section during normal working hours. At all other times the Rochester Operations Dispatcher shall be called at 274-8100.

In accordance with 40 CFR 403.8(f)(2)(vii), an industrial user is in significant noncompliance (SNC) if its violations meet one or more of the following criteria:

1. Chronic violations of wastewater discharge limits - defined as those which 66% or more of all the measurements taken during a six-month period exceed (by any magnitude) the daily maximum limit or the average limit for the same pollutant parameter. This criteria does NOT apply to the following Monroe County surchargeable parameters: Biochemical Oxygen Demand, Total Suspended Solids, Chlorine Demand, and Total Phosphorus (ref. Article X - Monroe County Sewer Use Law)
2. Technical review criteria (TRC) violations - defined as those in which 33% or more of all of the measurements for each pollutant parameter taken during a six-month period equal or exceed the product of the daily average maximum limit or the average limit times the applicable TRC. This criteria does NOT apply to the following Monroe County surchargeable parameters: Biochemical Oxygen Demand, Total Suspended Solids, Chlorine Demand, and Total Phosphorus (ref. Article X - Monroe County Sewer Use Law).
3. Any other violation or pretreatment effluent limit (daily maximum or longer-term average) that the Control Authority determines has caused, alone or in combination with other discharges, interference or pass-through (including endangering the health or POTW personnel or the general public).
4. Any discharge of a pollutant that has: caused imminent endangerment to human health, welfare or the environment or has resulted in the POTW's exercise of its emergency authority under paragraph (t) (1) (vi) (8) of 40 CFR part 403 to prevent such a discharge.
5. Failure to meet, within 90 days after the scheduled date, a compliance schedule milestone contained in a local control mechanism or enforcement order, for starting construction, completing construction, or attaining final compliance.
6. Failure to provide, within 30 days after the due date required reports such as BMR's, 90 day compliance reports, periodic reports on continued compliance.
7. Failure to accurately report noncompliance (i.e. - 24 hr. telephone notify, resample results within 30 days)
8. Any other violation or group of violations which the Control Authority determines will adversely affect the operation or implementation of the local pretreatment program.

Should your facility be considered SNC, based on the above-mentioned criteria, the minimum enforcement response by Monroe County will be the publication of the company name in the Gannett Rochester newspaper. You will be published as an Industrial User in Significant Non-Compliance (SNC). Fines and penalties may follow this publication.

Mr. Mark Gregor, Env. Specialist
City of Roch. Fire Academy
30 Church St.
Rochester, NY 14614-1290

Re: Sewer Use Permit

Dear Mr. Gregor:

Attached you will find your Sewer Use Permit No. 705 which will expire as indicated on Sep 30, 1996. Prior to expiration, we will mail you a renewal application.

This issue of the above permit is in compliance with the requirements of Section 6.1 of the Monroe County Sewer Use Law. In no way does it imply that you have complied with all present regulations. During the next six (6) months, a representative from the Industrial Waste Section may inspect your premises and sample your industrial wastes. If there should be any violations, you will be notified by mail.

If you have any questions regarding the permit, please call the Industrial Waste Section at (716)274-7720.

Yours truly,

Harry M. Reiter, Pretreatment Coordinator

HMR:jrh

enclosure

cc: Permit Section, Industrial Waste

COUNTY OF MONROE
SEWER USE PERMIT RENEWAL

Firm Name: City of Rochester
Location: 1190 Scottsville Rd.
Rochester, NY

Permit No: 705
Fee: $30.00
Expires: Sep 30, 1996

Mailing Address: City Hall, 30 Church St. Rm 300B W/C Expires: Self

Rochester, New York 14614 District No: 8535

Type of Business: Groundwater Remediation

Ck. 473625 8/24/95

Has there been any revisions to the plant sewer system or any change in industrial wastes discharged to the public sewer in the past twelve months Yes: ___ No: ___
If Yes, please explain in a separate letter.

Average monthly consumption for the past twelve (12) months:

Water Account No.(s) (No Discharge to date) (cu ft/gal) -0-

In consideration of the granting of this renewal permit the undersigned agrees to comply with all the requirements in the Initial Permit as listed under II.

Name of person to be contacted for inspection & sampling purposes:

Type or Print: Mark D. Gregor Phone No: 428-5978

YOUR PERMIT MUST BE SIGNED AS FOLLOWS:

1. For a corporation: by a responsible corporate officer means:
   (a) A president, secretary, treasurer or vice - president of the corporation in charge of a principal business function, or any other person who performs similar policy - or decision - making functions for the corporation: or
   (b) The manager of one or more manufacturing, production, or operation facilities employing more than 250 persons or having annual gross sales or expenditures exceeding $25 million (in second - quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

2. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively; or

3. By a duly authorized representative of the individual designated in items (1) or (2) above if:
   (a) The authorization is made in writing by the individual described in items (1) or (2);
   (b) The authorization specifies either an individual or a position having responsibility for the overall operation of the facility from which the industrial discharge originates such as the position of plant manager, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (a duly authorized representative may thus be either a named individual or any individual occupying a named position); and
   (c) The written authorization is submitted to this Department.

Print or Type: Edward Doherty Phone No: 428-6855

Signature: Edward J. Doherty Date: Aug. 18, 1995

Title: Commissioner, Environmental Services

Renewal Approved: John E Graham PE Date: 9-8-95
(Director of Pure Waters)

COUNTY OF MONROE
SEWER USE PERMIT ENCLOSURE

City of Rochester - Fire Academy
150 Poole Street
Rochester, N.Y. 14624

PERMIT NUMBER: 705
DISTRICT NUMBER: 8535

TYPE OF BUSINESS: Groundwater Remediation
SIC CODE: N/A
SAMPLE POINT: pretreatment effluent sample port

REQUIRED MONITORING

SELF MONITORING FREQUENCY: start up - confirm compliance prior to discharge followed by one sampling per week for the first month of operation, thereafter, monthly sampling shall commence

SAMPLING PROTOCOL: Sampling and analysis shall be performed in accordance with the techniques prescribed in 40CFR part 136 and amendments thereto. A 24 hr. timed composite sample, collected from the above noted sample point, shall be analyzed for the following parameters:

Phosphorus (T)	10.0	ppm
Arsenic (T)	0.5	ppm
Cadmium (T)	1.0	ppm
Chromium (T)	3.0	ppm
Copper (T)	3.0	ppm
Lead (T)	1.0	ppm
Manganese (T)	5.0	ppm
Nickel (T)	3.0	ppm
Selenium (T)	2.0	ppm
Zinc (T)	5.0	ppm

SAMPLING PROTOCOL: Sampling and analysis shall be performed in accordance with the techniques prescribed in 40CFR part 136 and amendments thereto. A grab sample, collected from the above noted sample point shall be analyzed for the following:

parameter	limit
pH	5.5-10.0
Polychlorinated biphenol (PCB)	BDL
Acetone	monitoring only
Methyl ethyl ketone	monitoring only
Methyl isobutyl ketone (MIBK)	monitoring only
4 methylphenol (p cresol)	monitoring only
* Total Toxic Organics (TTO)	2.13 ppm

* TTO = the summation of the Purgeable Halocarbons (EPA Method 601), Purgeable Aromatics (EPA Method 602), Xylene, acid extractables, base neutrals, pesticides and polychlorinated biphenols

SPECIAL CONDITIONS:

1. All groundwater must be treated as described in Exhibit B regardless of the influent concentrations.
2. Quarterly flow summaries shall be submitted for billing purposes. It is imperative these summaries are submitted in a timely manner.

TERMS AND CONDITIONS:

A. In addition to the parameters/limits outlined, total facility discharge shall meet all the concentration values as described in Article II, Section 10e of the Monroe County Pure Waters Districts, Rules and Regulations-Sewer Use Law of the County of Monroe. Included in Article II, Section 10e, is the definition of "Normal Sewage". "Normal Sewage" may be discharged to the sewer system in excess of the limits outlined in the Joint Rules and Regulations, however, the facility may be subject to the imposition of a sewer surcharge as a result. Surcharging procedures are outlined in Article X of the MCSUL. Regulatory sampling for analytyes not specified under "required monitoring" shall be conducted by the Industrial Waste Section at a minimum frequency of once every three (3) years.
B. This permit is not assignable or transferable.
This permit is issued to a specific user and location.
C. Per Article VIII, Section 8.11 of the MCSUL, a violation by the permittee of the permit conditions may be cause for revocation or suspension of the permit after a Hearing by the Administrative Board, or if the violation is found to be within the emergency powers of the Director under Sections 4.5 or 5.5.
The revocation is immediate upon receipt of notice to the Industrial User; however a Hearing shall be held as soon as possible.
D. As provided under Article VIII, Section 8.1, the Director and his duly authorized representatives shall gain entry on to private lands by permission or duly issued warrant for the purpose of inspection, observation, measurement, sampling and testing in accordance with the provisions of this law and its implementing Rules and Regulations. The Director or his representatives shall not have authority to inquire into any processes used in any industrial operation beyond that information having a direct bearing on the kind and source of discharge to the sewers or the on-site facilities for waste treatment. While performing the necessary work on private lands, referred to above, the Director or his duly authorized representatives shall observe all safety rules applicable to the premises as established by the owner and/or occupant.

REPORTING REQUIREMENTS:

A. Per the requirements of 40 CFR Part 403.5., Periodic Reports on Continued Compliance shall be submitted to the Control Authority on a biannual (2/yr) basis. Deadline dates of submission for these reports will be August 15 and February 15 respectively.
B. Any Industrial User subject to the reporting requirements of the General Pretreatment Regulations shall maintain records of all information resulting from any monitoring activities required by 403.12 for a minimum of three (3) years. These records shall be available for inspection and copying by the Control Authority. This period of retention shall be extended during the course of any unresolved litigation regarding the discharge of pollutants by the Industrial User or the operation of the POTW Pretreatment Program or when requested by the Director or the Regional Administrator.

NOTIFICATION REQUIREMENTS:

Pursuant to Article VIII, Section 8.4k, the permittee shall notify the District within 24 hours of becoming aware that a discharge known to be in violation of any permit requirement has occurred. This notification shall be directed to the Industrial Waste Section during normal working hours. At all other times the Rochester Operations Dispatcher shall be called at 274-8100.

A. SLUG CONTROL
An Industrial User shall be required to report any/all slug discharges to the Monroe County sewer system. For the purpose of this permit enclosure, a slug discharge shall be defined as any discharge of a non-routine, episodic nature, including but not limited to an accidental spill or a non-customary batch discharge. Following a review process, the Control Authority (Monroe County) shall determine the applicability of a facility slug control plan. If the Control Authority decides that a slug control plan is needed, the plan shall contain, at a minimum, the following elements:

1. Description of discharge practices, including non-routine batch discharges.
2. Description of stored chemicals.
3. Procedures for immediately notifying the Control Authority of slug discharges, including any discharge that would violate a prohibition under 40 CFR 403.5(b), with procedures for follow-up written notification within five (5) days.
4. If necessary, procedures to prevent adverse impact from accidental spills, including inspection and maintenance of storage areas, handling and transfer of materials, loading and unloading operations, control of plant site run-off, worker training, building of containment structures or equipment, measures for containing toxic organic pollutants (including solvents) and/or measures and equipment for emergency response.

SNC DEFINITION:

In accordance with 40 CFR 403.8 (f) (2) (vii), an industrial user is in significant noncompliance (SNC) if its violations meet one or more of the following criteria:

1. Chronic violations of wastewater discharge limits - defined as those which 66% or more of all the measurements taken during a six month period exceed (by any magnitude) the daily maximum limit or the average limit for the same pollutant parameter. This criteria does NOT apply to the following Monroe County surchargeable parameters: Biochemical Oxygen Demand, Total Suspended Solids, Chlorine Demand and Total Phosphorus (ref. Article X-Monroe County Sewer Use Law).
2. Technical review criteria (TRC) violations - defined as those in which 33% or more of all the measurements for each pollutant parameter taken during a six month period equal or exceed the product of the daily maximum limit or the average limit times the applicable TRC. This criteria does NOT apply to the following Monroe County surchargeable parameters: Biochemical Oxygen Demand, Total Suspended Solids, Chlorine Demand, and Total Phosphorus (ref. Article X-Monroe County Sewer Use Law).
3. Any other violation of a pretreatment effluent limit (daily maximum or longer-term average) that the Control Authority determines has caused, alone or in combination with other discharges, interference or pass-through (including endangering the health or POTW personnel or the general public).
4. Any discharge of a pollutant that has: caused imminent endangerment to human health, welfare or the environment or has resulted in the POTW's exercise of its emergency authority under paragraph (t) (1) (vi) (B) of 40 CFR part 403 to prevent such a discharge.
5. Failure to meet, within 90 days after the scheduled date, a compliance schedule milestone contained in a local control mechanism or enforcement order, for starting construction, completing construction, or attaining final compliance.
6. Failure to provide, within 30 days after the due date required reports such as BMR's, 90 day compliance reports, periodic reports on continued compliance.
7. Failure to accurately report noncompliance.
8. Any other violation or group of violations which the Control Authority determines will adversely affect the operation or implementation of the local pretreatment program.

PENALTIES:

Should the facility be considered in Significant Non Compliance (SNC), based on the above-mentioned criteria, the minimum enforcement response by Monroe County will be the publication of the company name in the Gannett Rochester newspaper. The company will be published as an Industrial User in Significant Non-Compliance (SNC). Fines and criminal penalties may follow this publication (ref. Article XII - Monroe County Sewer Use Law).

0965085 C-6

MALCOLM PIRNIE

MALCOLM PIRNIE, INC.
ENVIRONMENTAL ENGINEERS, SCIENTISTS & PLANNERS

June 25, 1993

Mr. Harry Reicher
Monroe County Division of Pure Waters
350 E. Henrietta Road
Rochester, New York 14620

Re: Application for Discharge of Treated Groundwater from
Rochester Fire Academy Inactive Hazardous Waste Site (828015)

Dear Mr. Reicher:

Per recent discussions between Malcolm Pirnie, Inc. and Mr. Mike Schifano of your office, The City of Rochester is herein submitting an application for discharge of treated groundwater from the Rochester Fire Academy site to the sanitary sewer. As indicated in Exhibit B of the application, ground water in the South Disposal Area of the Rochester Fire Academy site has been identified as requiring remedial action under NYSDEC's Record of Decision for the site dated March, 1993. The ground water will be pumped from a collection trench to an on-site pretreatment facility, where it will undergo air stripping and activated carbon treatment. Pending issuance of a discharge permit from the Monroe County Division of Pure Waters, the treated ground water will be transferred to the sanitary sewer. It is anticipated that this collection pretreatment system will operate for approximately ten (10) years. The enclosed application provides all available data from previous site investigations regarding the characteristics of the proposed discharge stream.

The remedial design for the site is currently underway under an Order-On-Consent with the NYSDEC, with start-up of the ground water collection and treatment system scheduled for summer 1995. The City of Rochester is making application at this time, however, as it will be necessary to incorporate any conditions or restrictions of the discharge permit into the treatment system design prior to completion of the final design documents in August, 1993.

The remediation of the soils in the South Disposal Area (i.e., removing the contributing source of groundwater contamination) will necessitate that all soil handling activities be performed within an enclosure, with exhaust gases to be treated with either a catalytic or thermal oxidation unit and scrubber. The soils will then undergo solidification/stabilization and be disposed of. Both the scrubber for the catalytic oxidation unit and the solidification/stabilization unit will have low flow wastewater streams which are proposed to be discharged to the sanitary sewer during the time period these units are operational (i.e., up to approximately one year). While the contractor will be responsible for obtaining the permit to discharge (thus these streams are not included in this application), we thought it would be appropriate to make you aware of these proposed temporary discharge streams.

S. 3515 ABBOTT RD. P.O. BOX 1938 BUFFALO, NY 14219-0138 716-828-1300 FAX 716-828-0431

If you have any questions or require any further information, please contact the undersigned or Mr. Tom Forbes at (716) 828-1300. We appreciate your continued assistance in this matter.

Very truly yours,

MALCOLM PIRNIE, INC.

Anne Marie McManus

Anne Marie C. McManus, P.E.
Associate

c: Mark Gregor, City of Rochester
File: C-6

0965-085
plb/085101PA.TL

Section 5. Application Form for Initial License or Permit.

APPLICATION FOR LICENSE OR PERMIT
FOR DISCHARGE INTO PURE WATERS
SEWER SYSTEM OR TRIBUTARY

1. Name of applicant: City of Rochester Department of Environmental Services
(company or individual)

2. Address of Applicant: City Hall, Room 300B
30 Church Street
Rochester, NY 14614-1290

3. Location of Property 1190 Scottsville Road, Rochester, NY 14624

4. Ownership of Property: City of Rochester

(Name/Address different than above)

5. Number of sewer connections requiring license/permit One

6. Type of activity producing wastes requiring license or permit pursuant to Sewer Use Law of Monroe County Groundwater Treatment

7. Department of Health or of New York State Permit Number (if any) N/A

8. Number of Attachments:

Exhibit A 2

Exhibit B 1

Exhibit C 1

Exhibit D N/A

Note: Fill in all applicable spaces. If not applicable, mark N/A in appropriate space.

ATTACHMENTS TO ACCOMPANY APPLICATION

1. A plot or tape location map of the property showing accurately the size and location of all sewer and drainage connections to the sewerage system, all pretreatment devices, and all manholes or other accessible sampling points. Each sewer or drain connection shown on drawing shall be designated by an identification number. The plot or tape location map shall be attached as Exhibit A.

2. A complete schedule of all process waters and industrial wastes produced or expected to be produced at said property, including a description of the character of each waste, the daily volume and whether the flow is continuous or intermittent. Each listed process waste stream shall carry the sewer or drain connection identification number listed in Exhibit A and corresponding to the sewer or drain which carries the waste stream. The schedule shall be attached as Exhibit B.

3. A summary of the total waste water characteristics to be received or received from the applicant of each sewer or drain connection shall be submitted in proper form as Exhibit C.

4. Additional information requested by the Director of Pure Waters shall be prepared as Exhibit D and be attached to the application as required. Copy of application and issued permit of the New York State Department of Health are required for haulers of scavenger wastes and will be attached as Exhibit D.

_____

_____

(Title)

Persons to be contacted for inspection or emergency purposes and phone/extension number

Mark Major to complete

_____

_____

Section 7. Initial Sewer Licenses or Permits Form.

INITIAL INDUSTRIAL SEWER USE PERMIT

County of Monroe

Pure Waters District No._____

Permit No._____

Expires:_____

Fee:_____

Firm Name:_____

Address:_____

_____

Type of Business of Service:_____

I. The above-named applicant is permitted to discharge wastes into the Pure Waters Sewer System or Tributary thereto as applied for by an application dated and verified by the applicant except the Director of Pure Waters requires the following terms and conditions to govern the permitted discharge:

A._____

B._____

C._____

II. The applicant further agrees to:

1. Accept and abide by all provisions of the Sewer Use Law of Monroe County and of all pertinent rules or regulations now in force or shall be adopted in the future.

2. Notify the Director of Pure Waters in writing of any revision to the plant sewer system or any change in industrial wastes discharge to the public sewers listed in Exhibit "B." The latter encompasses either (1) an increase or decrease in average daily volume or strength of wastes listed in Exhibit "B" or [illegible] new wastes that were not listed in Exhibit "B."

3. Furnish the Director of Pure Waters u[illegible] additional information relating to the installa[illegible] sewer or drain for which this permit is sought.

permit form to be signed by mark & [illegible] of applicant

4. Operate and maintain any waste pretreatm[illegible] as may be required as a condition of the acceptan[illegible]

public sewer of the industrial wastes involved, in an efficient manner at all times, and at no expense to the County.

5. Cooperate with the Director Pure Waters or his representatives in their inspecting, sampling, and study of wastes, or the facilities provided for pretreatment.

6. Notify the Director of Pure Waters immediately of any accident, negligence, breakdown of pretreating equipment, or other occurrence that occasions discharge to the public sewers of any wastes or process waters not covered by this permit.

Applicant's Signature:_____ Date:_____

Title:_____

Name of person to be contacted for inspection or emergency purposes:

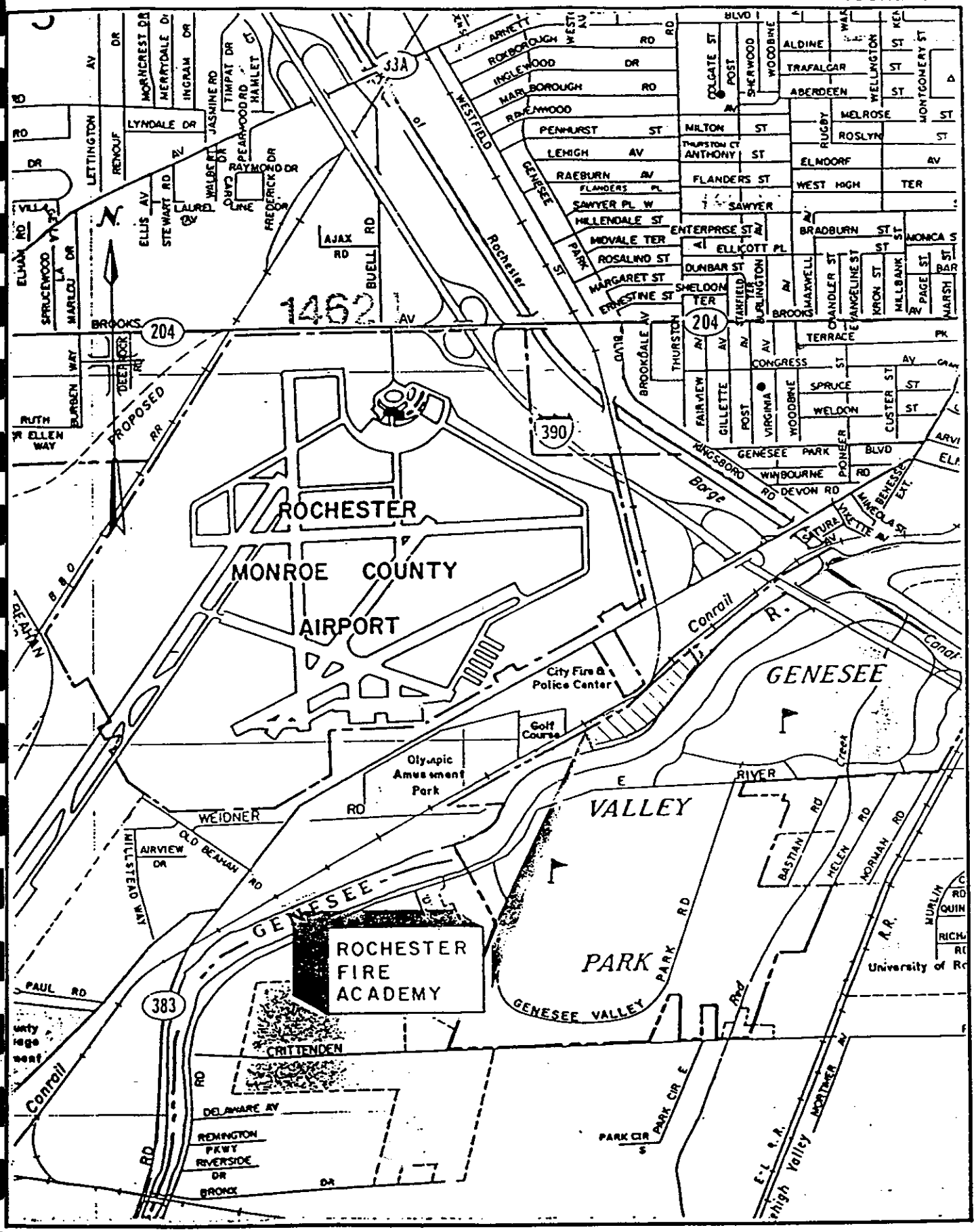
_____

Permit approved by:_____ Date:_____
Director of Pure Waters

MALCOLM PIRNIE

EXHIBIT A

ROCHESTER FIRE ACADEMY SITE MAPS OF PRETREATMENT EQUIPMENT AND FACILITY LAYOUT



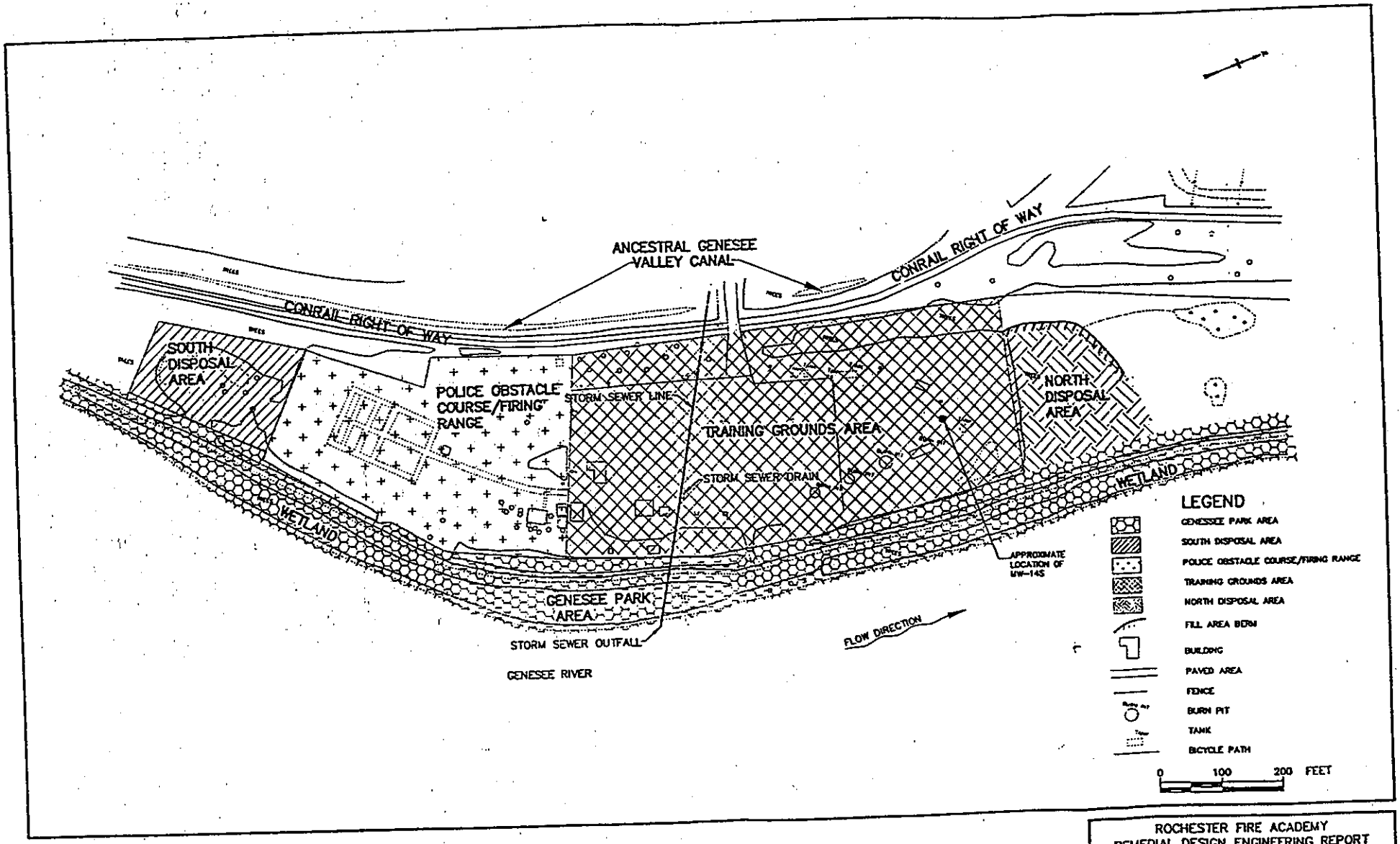
MALCOLM PIRNIE

ROC-07

ROCHESTER FIRE ACADEMY
FEASIBILITY STUDY
SITE LOCATION MAP

CITY OF ROCHESTER, NEW YORK JULY 1992

FIGURE 1-2



ROCHESTER FIRE ACADEMY
REMEDIAL DESIGN ENGINEERING REPORT
SPECIFIC AREAS AT ACADEMY SITE

CITY OF ROCHESTER, NEW YORK MAY 1993

MALCOLM PIRNIE

MALCOLM PIRNIE

EXHIBIT B

ROCHESTER FIRE ACADEMY SITE
DESCRIPTION OF PROCESS WATERS TO BE DISCHARGED TO SANITARY SEWER

MALCOLM PIRNIE

EXHIBIT B

ROCHESTER FIRE ACADEMY SITE
DESCRIPTION OF PROCESS WATERS TO BE DISCHARGED TO SANITARY SEWER

1.0 BACKGROUND

The Rochester Fire Academy, illustrated on Figures 1.1 and 1.2, has been owned and operated by the City of Rochester as a training facility used by the City's Fire and Police Departments since its inception in 1954. Prior to 1954, the area was undeveloped park land. During the period from approximately 1954 through 1980, the Fire Academy accepted flammable liquids from local industries and other sources for training activities. No records were kept on materials accepted by the Fire Department for burning practices. On-site personnel indicated that solvents, paint thinners and other organic chemicals in addition to metallic sludge residue and sludge-like materials were burned and/or disposed of at the Training Grounds and North and South Disposal Area portions of the site. As a result of these activities, the soils in the Training Grounds Area and the North and South Disposal Areas contain varying levels of PCB, metal and volatile organic contamination. These soils will be remediated in accordance with NYSDEC's March 1993 Record of Decision for the site. In addition, overburden ground water in the South Disposal Area contains elevated concentrations of volatile organic compounds as well as sporadic detections of low levels of PCBs. Consequently, the Record of Decision requires remediation of South Disposal Area ground water through a collection and treatment system, with discharge of the treated ground water to the sanitary sewer.

The remedial design for the Rochester Fire Academy site is currently underway. Remedial construction is currently scheduled to begin in late fall, 1993 and conclude in the summer of 1995. Start-up of the fully-operational ground water collection and treatment system is scheduled for July, 1995. A description of the ground water collection system and pretreatment equipment is provided below.

2.0 GROUNDWATER COLLECTION AND TREATMENT SYSTEM

The remediation of contaminated groundwater in the South Disposal Area will be accomplished using a permanent groundwater collection and treatment system. The primary contaminants requiring removal are VOCs. Because PCBs have been detected sporadically in the South Disposal Area groundwater, the treatment system has been designed to incorporate PCB removal as well.

The site remediation contractor will be responsible for the construction of the groundwater collection and treatment system. Operation and maintenance of the system following completion of construction will be the responsibility of the City of Rochester.

2.1 COLLECTION TRENCH

A groundwater collection trench will be installed within the South Disposal Area to collect overburden groundwater. The objective of the collection trench is to maintain an inward hydraulic gradient in the overburden water-bearing zone within the South Disposal Area to mitigate off-site contaminant migration (overburden groundwater currently discharges to the Genesee River). The collection trench will be 200 feet in length and extend to a depth of 22 feet above ground surface. Computer model simulations indicate that steady-state flow rates from the groundwater collection trench will be approximately 7 gpm. Transient flow rates at initial start-up and during wet weather events may be several times greater than the steady-state flow rate. These estimates are based on hydraulic data collected from wells in the vicinity of the groundwater collection trench. Actual flow rates may be slightly higher or lower based on the hydraulic conductivity of the soils in the immediate vicinity of the trench. A maximum ground water recovery rate of 40 gpm has been assumed for the design of the collection and pretreatment equipment. The collection trench will be operated in a flooded condition to minimize fouling of the collection pipe. Groundwater will be collected at a sump located in the center of the trench and pumped via force main for on-site treatment.

2.2 TREATMENT PROCESS DESIGN

The groundwater treatment process is illustrated schematically in Exhibit A, Sheet G16. Collected groundwater will be conveyed to the treatment system via a buried PVC pipeline. The first step in the treatment process will be an oil/water separator, which will remove any droplets of light or dense non-aqueous liquids which may be present in the groundwater. After passing through the oil/water separator, a linear polyphosphate sequestering agent will be added to the groundwater. The sequestering agent complexes with iron, manganese and hardness (calcium and magnesium) ions, thus minimizing scale build-up in process equipment. The groundwater will then pass though a bag filter to remove particulates (such as silts) which could accumulate in the feed tank or foul the activated carbon beds.

The filtered groundwater will be discharged into a 1500 gallon feed tank, which will provide hold-up volume should the City desire to operate the treatment process in a batch mode at a future date. In addition, process or floor washdown water collected in the building sump will be pumped to the feed tank for subsequent treatment. The contents of the feed tank will be pumped to the shallow tray air stripper using one of two centrifugal feed pumps.

A shallow tray air stripper will effect the removal of volatile organic compounds from the groundwater via countercurrent contact of the groundwater with a 900 cubic foot per minute (cfm) air stream. Air will be drawn from outside the treatment system enclosure and discharged to the atmosphere through a 24-foot high (above-ground level) stack. After flowing across the air stripper trays, the groundwater is collected in the air stripper sump and pumped to the activated carbon system, which will be required to remove PCBs which may be found in the groundwater. Effluent from the replaceable activated carbon units will be collected in a 1500-gallon discharge tank prior to being pumped to the sanitary sewer located near the Fire Training Academy buildings. The discharge pumps will operate in a batch mode, controlled by high and low level indicators in the discharge tank. A flowmeter and totalizer will be installed in the discharge line to monitor the process flow to the sanitary sewer. A 3" PVC discharge line will be installed from the treatment system discharge pump to the sanitary sewer manhole located adjacent to the Training Academy instruction building (see Exhibit A).

As indicated in Sheet G16, the treatment building office will incorporate sanitary facilities, including a toilet and sink. These facilities will be for sanitary use only; all process waters or waters resulting from process maintenance, sampling or related activities will pass through the ground water treatment process prior to entering the sanitary sewer. The elevation differential between the treatment building and the sanitary sewer manhole will not allow for gravity discharge of sanitary waste, therefore a grinder pump will be installed to transfer sanitary waste to the 3-inch discharge line downstream of the discharge tank.

2.2.1 Treatment System Operation and Maintenance

The groundwater treatment system has been designed for continuous flow operation with minimal operator attention. Operator attention will be more intensive during system start-up and draw down of the aquifer, and following periods of heavy rainfall, when flow from the groundwater collection trench may fluctuate. A log book of flow rates, air stripper air pressures, upstream and downstream pressures in the filter vessels and activated carbon drums, and general observations should be maintained on a regular basis.

The treatment system components will require periodic maintenance. Oil/water separator light and dense phase sumps will be cleaned out periodically. The supply of sequestering agent will be replaced as necessary, based on usage. Filter bags will be replaced when pressure drop through the filter vessel reaches a predetermined value. Periodic pressure washing of the air stripper trays will be required based upon air flow pressure drop through the air stripper unit. Activated carbon drums will be replaced yearly. Pumps and blowers will receive routine maintenance on a yearly basis.

2.2.2 Process Effluent Sampling and Verification

Monitoring of the treatment system effluent will be conducted in accordance with the terms of the industrial discharge permit obtained for the treatment system. Performance testing of the treatment system effluent will be conducted during system start-up. Additional effluent and in-plant monitoring during start-up will be conducted at the contractor's discretion. This section outlines the effluent sampling locations, sampling methodology, analytical methodology and detection limits, and data interpretation for process effluent monitoring.

1. Sample Locations

The discharge tank and the sample port downstream of the discharge pump will serve as the sampling locations for the collection of effluent compliance monitoring samples. The discharge tank provides a convenient location for collection of composite samples using automatic sampler collection methods. If grab samples are required for certain parameters, these samples can be collected from the sample port located downstream of the discharge pump. For the purpose of the sanitary sewer discharge permit application the discharge tank has been designated as P-1, which will denote the point of compliance with discharge limits established in the permit application. This designation will be used interchangeably with the downstream sample tap (used for grab samples), since there will be no change in water quality between these stations.

Numerous sampling ports have been installed in the treatment train to allow for performance testing of individual unit process components by the City of Rochester. The sample port at the head of the treatment works will provide a sample of raw groundwater. A sample of filtered groundwater can be collected either from the feed tank or from the air stripper influent sample port. The VOC removal efficiency of the air stripper can be measured by comparing VOC concentrations in samples collected at the air stripper inlet and outlet sampling ports. Sample ports are provided at each activated carbon drum discharge to determine organic removal efficiency and to monitor for potential PCB breakthrough. As a result of the activated carbon drum configuration (4 parallel banks, each operating with 2 drums in series), breakthrough will be detectable without contravention of sanitary sewer discharge limits.

For the purpose of monitoring the flow to the sanitary sewer, a flowmeter with a totalizer will be installed downstream of the treatment system discharge pump. It is proposed that industrial discharge billing be based on flow recordings from this meter, and that sanitary discharge be based on potable water usage. A Potable water meter will be installed on the waterline to the treatment building.

2. Sample Methodology

Sample collection for monitoring of the treatment system effluent in compliance with the industrial discharge permit obtained for the treatment system will be conducted using time-proportional automatic composite sampling techniques. One 24-hour composite sample

will be collected for analysis. Samples for pH and volatile organic analysis will be collected as grab samples from the sample port located downstream of the discharge pump. Per 40 CFR Part 403(5)(iii), a minimum of four grab samples will be collected for pH and volatile organic analysis. Sampling will be conducted in a manner such that the collected samples will be representative of normal treatment process operation and expected pollutant discharges to the sanitary sewer.

3. Analytical Methodology/Detection Limits

All samples collected for discharge permit monitoring will be analyzed by a New York State Department of Health ELAP-certified laboratory. All samples will be collected and analyzed according to the Methodology presented in 40 CFR Part 136, unless otherwise specified in the discharge permit. Detection limits will, in all cases, be below the discharge limit.

4. Data Interpretation

The daily maximum limits for the discharge permit parameters will be compared to measured concentrations of these parameters. Detection of concentrations above the discharge limits will require shut down of the groundwater treatment process, identification of the malfunctioning unit process, and immediate correction of the malfunction.

3.0 PROCESS DISCHARGE CHARACTERISTICS

Based on the South Disposal Area overburden ground water quality data collected at the Rochester Fire Academy site during past investigations and the calculated removal efficiency of the pretreatment system, Table 3-1 presents a schedule of the anticipated characteristics of the untreated groundwater and the treated discharge to be sent to the sanitary sewer. As indicated in Table 3-1, parameters which are not specifically designed for removal (e.g., metals) are listed with identical untreated (as observed during previous investigations at the site) and treated concentrations. In addition, although low concentrations of PCBs were detected sporadically during early site investigations, more recent data indicates that PCBs will not be present during full-scale collection and treatment activities. Hence, the untreated and treated concentrations for PCBs in Table 3-1 are both listed as

TABLE 3-1

SCHEDULE OF PROCESS WATERS TO BE DISCHARGED TO SANITARY SEWER FROM GROUNDWATER TREATMENT SYSTEM

Prosess Waste Stream originates at: P-1 (see Exhibit A)
Process Waste Stream connects to sanitary sewer at: MH-1 (see Exhibit A)
Process Waste Type: Groundwater
Estimated Maximum Daily Volume: 57,600 gallons
Flow Type: continues (40 gpm maximum)

ESTIMATED WASTE STREAM CHARACTERISTICS

Parameter	Approx. Untreated Concentration	Approx. Treated Concentration (at P-1)
Volatiles:		
1,1,1-Trichloroethane	7900 ug/l	<1 ug/l
1,1-Dichloroethane	690 ug/l	<1 ug/l
1,1-Dichloroethylene	250 ug/l	<1 ug/l
1,2-Dichloroethane	21 ug/l	<1 ug/l
Acetone	1600 ug/l	350 ug/l
Benzene	9 ug/l	<1 ug/l
Chorobenzene	8 ug/l	<1 ug/l
Ethyl Benzene	340 ug/l	<1 ug/l
Methyl Ethyl Ketone	150 ug/l	22 ug/l
MIBK	890 ug/l	189 ug/l
p-Xylene	2300 ug/l	1 ug/l
trans-1,2-Dichloroethylene	30,000 ug/l	4 ug/l
Tetrachloroethylene	88 ug/l	<1 ug/l
Toluene	1000 ug/l	4 ug/l
Trichloroethylene	2600 ug/l	<1 ug/l
Vinyl Chloride	170 ug/l	<1 ug/l
Metals:		
Arsenic	0.002 mg/l	0.002 mg/l
Iron	1.5 mg/l	1.5 mg/l
Magnesium	45.3 mg/l	45.3 mg/l
Manganese	0.04 mg/l	0.04 mg/l
Aluminum	3.8 mg/l	3.8 mg/l
Calcium	124 mg/l	124 mg/l
Chromium	0.001 mg/l	0.001 mg/l
Selenium	0.002 mg/l	0.002 mg/l
Sodium	18.5 mg/l	18.5 mg/l
Zinc	0.08 mg/l	0.08 mg/l

continued.....

TABLE 3-1

SCHEDULE OF PROCESS WATERS TO BE DISCHARGED TO SANITARY SEWER FROM GROUNDWATER TREATMENT SYSTEM

Prosess Waste Stream originates at: P-1 (see Exhibit A)
Process Waste Stream connects to sanitary sewer at: MH-1 (see Exhibit A)
Process Waste Type: Groundwater
Estimated Maximum Daily Volume: 57,600 gallons
Flow Type: continues (40 gpm maximum)

ESTIMATED WASTE STREAM CHARACTERISTICS

Parameter	Approx. Untreated Concentration	Approx. Treated Concentration (at P-1)
Water Quality Parameters:		
Hardness	487 mg equivalent $CaCO_3$/1	487 mg equivalent $CaCO_3$/1
Acidity	313 mg equivalent $CaCO_3$/1	313 mg equivalent $CaCO_3$/1
Alkalinity (Bicarbonate)	370 mg equivalent $CaCO_3$/1	370 mg equivalent $CaCO_3$/1
Chloride	79 mg/l	79 mg/l
Nitrate	0.32 mg/l	0.32 mg/l
Phosphorus (total)	0.04 mg/l	3.44 mg/l*
Sulfate	44 mg/l	44 mg/l
Sulfide	3 mg/l	3 mg/l
COD	140 mg/l	140 mg/l
Nitrogen, Ammonia	0.15 mg/l	0.15 mg/l
Nitrogen Kjeldahl, total	2.7 mg/l	2.7 mg/l
TOC	51 mg/l	51 mg/l
Oil and Grease	4.0 mg/l	<4 mg/l
Semi-Volatiles:		
4-Methylphenol	0.02 mg/l	0.02 mg/l
2,4-Dimethylphenol	0.01 mg/l	0.01 mg/l
Diethylphthalate	0.05 mg/l	0.05 mg/l
PCBs	Non-Detectable	Non-Detectable

NOTES:
* Includes added load of phosphorous from sequestering agent.

continued.....

non-detectable. As discussed earlier, the activated carbon treatment system will ensure that no detectable PCBs are discharged to the sanitary sewer.

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EXHIBIT C

SUMMARSY OF INDUSTRIAL WASTE CHARACTERISTICS

Section 6. Form for Exhibit "C".

SUMMARY OF INDUSTRIAL WASTE CHARACTERISTICS

Exhibit "C"

Firm: City of Rochester Department of Environmental Services

Address: 30 Church Strreet, Rochester, NY 14614-1290

Industrial Waste Characteristics and Quantity

Characteristics	(Unit)	Average	Minimum	Maximum
Volume	(Gal. or Cu.Ft./month)			1.7 MG/Month
Temperature	(F° or C°)	50°F	40°F	70°F
pH		7.0	6.0	9.0
Biochemical Oxygen demand	(mg/L or lbs./mil.gal.)	N/A		<300 mg/l
Chlorine Demand	(mg/L or lbs./mil.gal.)	N/A		< 25 mg/l
Suspended Solids	(mg/L or lbs./mil.gal.)	N/A		<300 mg/l
Phosphate or Phosphorus	(mg/L or lbs./mil.gal.)	3.1 mg/l		<10 mg/l

SUBSTANCES UNDER ARTICLES IV, V, VI, VII OF SEWER USE LAW

(List item and concentration (or volume) under appropriate heading; if none, so state)

1. Unpolluted Waters (Sect. 4.1) — N/A
2. Prohibited Materials (Sect. 4.2) — N/A
3. Certain Materials and /or characteristics (Sect. 4.3) — N/A
4. Toxic Substances (Sect. 5.1, 5.2) — N/A
5. Pathogenic Bacteria (Sect. (5.1) — N/A
6. Radioactive Wastes (Sect. 6.2) — N/A
7. Scavenger Wastes (Sect. 7.1, 7.2) — N/A

MALCOLM PIRNIE

MALCOLM PIRNIE, INC.
ENVIRONMENTAL ENGINEERS, SCIENTISTS & PLANNERS

August 26, 1993

Mr. Harry Reiter
Monroe County Div. of Pure Waters
350 E. Henrietta Road
Rochester, New York 14620

Re: Supplement to Application for Discharge of Treated Groundwater from Rochester Fire Academy Inactive Hazardous Waste Site (828015)

Dear Mr. Reiter:

Per your request, we are providing herein the source(s) of the effluent water quality data for the proposed groundwater treatment system at the Rochester Fire Academy site as presented in Exhibit B of our June 25, 1993 Industrial Discharge Permit Application. The sources, which are enclosed for reference, include: Section 3.0 of the May 1992 Supplemental Remedial Investigation (RI) Report for the Rochester Fire Academy Site; Section 7.0 of the May 1991 Remedial Investigation Report for the Rochester Fire Academy Site; and correspondence from Northeast Environmental Services (manufacturer of the proposed air stripper) dated April 27, 1993. Section 3.0 of the May 1992 Supplemental Remedial Investigation report includes analytical data (Table 3-1) from a mini-rate pump test performed on the South Disposal Area overburden groundwater aquifer, and is generally the most representative indication of the actual conditions which will be encountered during full-scale operation of the proposed pump and treat system. Section 7.0 of the May 1991 Remedial Investigation Report for the Rochester Fire Academy includes data from discreet sampling of monitoring well 7S, which is screened in the downgradient overburden groundwater in the South Disposal Area. The correspondence from Northeast Environmental Services provides VOC treatment data for a Model 3631 shallow tray air stripper operating under anticipated maximum VOC loading conditions (i.e., maximum VOC concentrations observed during the RI wells and Supplemental RI from sampling of discrete wells assuming a maximum flow rate of 40 gpm). Based on the data presented in these sources, a discussion of the anticipated effluent contaminant concentrations listed in the Discharge Application is provided below.

VOLATILE ORGANIC COMPOUNDS

Volatile organic compound (VOC) concentrations in the treatment system influent/effluent are based on performance estimates from Northeast Environmental Services. Northeast conservatively assumed maximum observed VOC concentrations as determined from Table 3-1 of the Supplemental RI report and Table 7-25 (MW-7S) of the RI report as the influent conditions, with treatment of the contaminated groundwater at a maximum rate of 40 gpm using a Model 3631 shallow tray airstripper. The effluent VOC concentrations reported in Exhibit B of the Discharge Application reflect Northeast's performance estimate, and do not take

S. 3515 ABBOTT ROAD P.O. BOX 1938 BUFFALO, NY 14219-0138 716-828-1300 FAX 716-828-0431

into account any further VOC removal which may occur in the proposed downstream activated carbon units.

METALS

Metals concentrations in the treatment system influent/effluent are based on observed monitoring well concentrations as summarized in Table 3-1 of the Supplemental RI report and Table 7-25 (MW-7S) of the RI report. Influent concentrations of arsenic, iron, magnesium and manganese reported in Exhibit B of the Discharge Application are based on the more representative Supplemental RI pump test data (i.e., Table 3-1). The remaining metal concentrations are based on maximum concentrations determined from Table 7-25 (MW-7S) of the RI report. It should be noted that metals data which was qualified as questionable due to limitations identified during the QC review was not included in the Discharge Permit Application. No treatment process has been incorporated to achieve metals removal, thus influent and effluent treatment system concentrations are conservatively assumed identical. However, the proposed filtration step is anticipated to decrease the metals loading to the sanitary sewer.

WATER QUALITY PARAMETERS

Water Quality Parameters in the treatment system influent/effluent are based on Table 3-1 of the Supplemental RI report and Table 7-21 (MW-7S) of the RI report. Influent concentrations of water quality parameters reported in Exhibit B of the Discharge Application are based on the more representative Supplemental RI pump test data (i.e., Table 3-1). The remaining water quality parameter concentrations are based on concentrations determined from Table 7-21 (MW-7S) of the RI report. Again, since no treatment process is planned to treat the water quality parameters, influent and effluent treatment system concentrations are conservatively assumed identical. As indicated in the Discharge Permit Application, the estimated treated effluent concentration of total phosphorous includes the addition of a phosphate-based sequestering agent.

SEMI-VOLATILE PARAMETERS

Semi-volatile parameters reported in the Discharge Permit Application are based on Table 7-25 (MW-7S) of the RI report. No samples for semi-volatiles were collected during the supplemental RI pump test. All semi-volatile data in Table 7-25 which was qualified as questionable due to limitations identified during the QC review was excluded from the Discharge Permit Application. The effluent semi-volatile concentrations in the Permit Application are conservatively presented as identical to the influent concentrations and do not reflect the activated carbon polishing step, which will likely decrease their levels prior to discharge to the sanitary sewer.

PCBs

PCBs in the treatment system influent/effluent are based on the more representative Supplemental RI pump test sampling (Table 3-1), which yielded non-detectable concentrations for all aroclors. However, if PCBs appear in the treatment system influent, the filtration and activated carbon treatment units are anticipated to effectively remove PCBs.

We hope this documentation adequately explains the contaminant concentration data submitted in Exhibit B of the Discharge Permit Application for the Rochester Fire Academy Site. If you have any questions, please do not hesitate to contact me.

Very truly yours,

MALCOLM PIRNIE, INC.

Thomas H. Forbes
Project Engineer

Enc.

c: Mark Gregor
File: C-6

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mcs/THF08253.L5

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APPENDIX E

STANDARD OPERATING PROCEDURES AND FIELD DATA SHEETS FOR MONITORING WELL SAMPLING

E.1 WELL PURGING PRIOR TO SAMPLING
WELL DEVELOPMENT / PURGING LOG

E.2 GROUNDWATER SAMPLING
WATER SAMPLING FIELD DATA SHEET

E.3 SAMPLE LABELLING

E.4 SAMPLE SHIPPING
CHAIN OF CUSTODY RECORD

Appendix E : Item 1 - WELL PURGING PRIOR TO SAMPLING

Applicability: GENERAL Revision No.: 1 Date: 2/7/91

Prepared By: MKR Date: 11/28/89 Approved By: RHQ Date: 2/7/91

1.0 INTRODUCTION

This guideline presents methods for well purging prior to ground water sample collection in order to collect representative ground water samples. Purging involves the removal of at least three to five volumes of water in wells with moderate yields and at least one volume from wells with low yields (slow water level recovery). Sampling should commence as soon as the well has adequately recharged.

2.0 WELL PURGING METHODOLOGY

1. Unlock and carefully remove the well cover to avoid introducing foreign material into the well. Monitor the top of the well casing for organic vapors using a photoionization detector (HNu), if applicable. If a reading of greater than 5 ppm is recorded, the well should be allowed to vent until levels drop below 5 ppm before proceeding with purging.

2. Calculate the volume of water in the well based on the water level below top of casing and the total depth of well using the following equation:

   $V = 5.825\ I^2\ (D-W)$

   V = one well volume (gallon)
   I = inside diameter of well casing (feet)
   D = Well Depth (feet)
   W = Depth to Water from Top of Casing (feet)

3. For wells where the water level is 20 feet or less below the top of casing, use a suction-lift pump to purge the well. Measure the purged volume using a calibrated container and record measurements in a field notebook. Use dedicated new low density polyethylene tubing for each well. During this

evacuation of shallow wells, the intake opening of the pump tubing should be positioned just below the surface of the water. As the water level drops, lower the tubing as needed to maintain flow. The intake level should not be lowered past the top of the screen. Pumping from the top of the water column will ensure proper flushing of the well. Continue pumping until the required volumes are removed. Adjust the purging rate to maintain the water level above the screen.

For wells that exhibit an elevated turbidity (values greater than 50 NTU), maintain a purging rate which limits drawdown of the water level in the well. This procedure will reduce the hydraulic gradient in the well vicinity and limit piping of sediment particles through the sand pack and into the well. Use a peristaltic pump to achieve purging rates below the minimum rate of a suction lift pump.

For wells where the screen straddles the water table, maintain purging at a rate which matches the rate of recovery of the well (well yield). If the well purges to dryness and is slow to recharge (greater than 15 minutes), terminate evacuation.

4. For wells where the water level is initially below about 20 feet, or draw down to this level because of a slow recharge rate, conduct purging using one of three (3) devices:

   - Bailer - A bottom filling bailer with a leader made of teflon stainless steel wire or single strand polypropylene monofilament of at least 10-feet long which is attached to a dedicated 1/4-inch nylon rope, should be used.

   - Well Wizard Purge Pump - This is a pneumatic pump that uses compressed air to push water to the surface. Ground water is in contact with the drive air during the pumping process, therefore the pump is not

used for sampling. Drive air is fully contained within the pump apparatus.

- Waterra™ pump - This is a manually operated pump which uses dedicated polyethylene tubing and a check valve, and can be used as an optional method for purging deeper wells. The pump and tubing should be removed prior to sampling.

Prior to use in a well, the bailer, exterior pump bodies, and pump tubing should be cleaned using decontamination protocols specified for the program.

5. Purging will continue until a predetermined volume of water has been removed. Record measurements for pH, temperature, conductivity and turbidity during purging. The stability of these measurements with time can be used to guide the decision to discontinue purging.

6. Record well purging data in the Project Field Book or on the attached "Well Development/Purging Log" form.

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WELL DEVELOPMENT/PURGING LOG

PROJECT TITLE: _____

PROJECT NO.: _____

STAFF: _____

DATE: _____

WELL NO.: _____

① TOTAL CASING AND SCREEN LENGTH (FT.): _____

② CASING INTERNAL DIAMETER (in.): _____

③ WATER LEVEL BELOW TOP OF CASING (FT.) _____

④ VOLUME OF WATER IN CASING (GAL.) _____

$V = 0.0408 (②)^2 \times (① - ③) =$ _____ GAL.

WELL I.D.	VOL GAL./FT
1"	0.04
2"	0.17
3"	0.38
4"	0.66
5"	1.04
6"	1.50
8"	2.60

PARAMETERS	ACCUMULATED VOLUME PURGED (GALLONS)										

COMMENTS:

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Appendix E : Item 2 - GROUNDWATER SAMPLING

Applicability: GENERAL Revision No.: 1 Date: 2/7/91

Prepared By: MKR Date: 11/28/89 Approved By: RHO Date: 2/7/91

1.0 INTRODUCTION

This guideline presents a method for collecting a ground water sample after the monitoring well has been purged and has sufficiently recovered. Sampling should be carried out according to the following protocol:

2.0 METHODOLOGY

1. Perform sampling as soon as practical after purging at any time after the well has recovered sufficiently to sample, or within 24 hours after evacuation, if the well recharges slowly. If the well does not yield sufficient volume for all required laboratory analytical testing (including quality control), a decision should be made to prioritize analyses based on contaminants of concern at the site. Analyses will be prioritized in the order of the parameters volatilization sensitivity. After volatile organics have been collected, field parameters must be measured from the next sample collected. If a well takes longer than 24 hours to recharge, the Project Manager should be consulted.

2. Following purging and recharging the well, collect samples into appropriate containers using a stainless steel or polytetrafluoroethylene(PTFE) bailer. The bailer should be equipped with a leader made of Teflon, stainless steel wires or single strand polypropylene monofilament of at least ten feet long which is attached to a new, dedicated 1/4-inch nylon rope. The bailer should be lowered slowly below the surface of the water so as to allow the water to touch only the "leader" and not the nylon rope. Prior to its use in the field, the stainless steel bailer and "leader" should be cleaned according to decontamination protocols specified for the program.

3. For wells that are known to produce turbid samples (values greater than 50 NTU), the bailer should be lowered and retrieved at a rate that limits surging of the well.

4. Pre label all sample bottles in the field using a waterproof permanent marker. The following information should be included on the label:

   - Site name
   - Sample identification code
   - Project number
   - Date/time of sample collection (month, day, year)
   - Sampler's initials
   - Preservation added (if any)
   - Analysis to be performed

5. Collect samples into pre-cleaned bottles provided by the analytical laboratory with the appropriate preservative(s) added, and the samples placed in coolers for shipment to the designated laboratory. Chain of custody procedures should be adhered to upon sample collection.

   All samples will be total (unfiltered) unless the project specific work plan states otherwise. Should sample filtration be required, ground water samples will be pressure-filtered through 0.45 um filters in the field using air.

6. Collect a separate sample of approximately 200 mls into an appropriate container to measure pH, conductivity, temperature and turbidity in the field.

7. Record well sampling data in the Project Field Book or on the attached "Water Sampling Field Data Sheet."

3.0 REFERENCES

(a) USEPA, September 1986, RCRA Groundwater Monitoring Technical Enforcement Guidance Document.

WATER SAMPLING FIELD DATA SHEET

PROJECT: _____ TYPE OF SAMPLE: _____

CLIENT: _____ LOCATION NO.: _____

JOB NO.: _____ LAB SAMPLE NO.: _____

WELL DATA: DATE: _____ TIME: _____

Casing Diameter (inches): _____ Casing Material: _____

Screened Interval (ft BGS): _____ Screen Material: _____

Static Water Level Below TOR (ft): _____ Bottom Depth (ft): _____

Elevation Top of Well Riser: _____ Datum Ground Surface: _____

PURGING DATA: DATE: _____ TIME: Start: _____ Finish: _____

Method: _____ Pumping Rate (gal/min): _____

Well Volumes Purged ($V=\pi R^2H/231$): _____ Was well purged dry? _____ Yes _____ No

Standing Volume (gal): _____ Was well purged below sand pack? ____ Yes ____ No

Volume Purged (gal): _____

Well I.D. (inches)	Volume (gal/ft)
2	0.17
4	0.66
6	1.50

Is purging equipment dedicated to sample location?

Yes _____ No _____

Field Personnel: _____

SAMPLING DATA: DATE: _____ TIME: Start: _____ Finish: _____

Method: _____ Sampler: _____

Present Water Level (ft): _____ Air Temperature (°F): _____

Depth of Sample (ft): _____ Weather Conditions: _____

Is sampling equipment dedicated to sample location? Yes _____ No _____

PRESERVATION DATA: DATE: _____ TIME: Start: _____ Finish: _____

Filtered: _____ Yes _____ No Cool to 4°C: _____

Preservative: _____ H_2SO_4 _____ HNO_3 _____ NaOH _____ Other

PHYSICAL AND CHEMICAL DATA:

Appearance: Clear: _____ Turbid: _____ Color: _____

Contains Sediment: _____ Odor: _____ Other: _____

Temperature (°C): _____ pH: _____ Specific Conductivity (umhos/cm): _____

Turbidity (NTU): _____ Other: _____

REMARKS:

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Appendix E : Item 3 - SAMPLE LABELING

Applicability: GENERAL Revision No.: 1 Date: 11/9/89

Prepared By: THF Date: 11/9/89 Approved By: KLB Date: 10/10/89

1.0 INTRODUCTION

This guideline presents a method for sample labeling in order to properly identify environmental samples collected during the field investigation.

2.0 METHODOLOGY

1. Assign each sample of each matrix a unique identification alpha-numeric code. An example of this code and a description of its components is presented on the following page.

2. Affix a non-removable (when wet) label to each sample container. The following information should be written on the label with permanent marker:

   - Site name
   - Sample identification
   - Project number
   - Date/time of sample collection (month, day, year)
   - Sampler's initials
   - Sample preservation
   - Analysis required

3. Wrap the label with 2-inch cellophane tape such that the label is completely covered and the tape wraps around the entire perimeter of the bottle.

Appendix E: Item 3 · SAMPLE LABELING

Applicability: GENERAL Revision No.: 1 Date: 11/9/89

Prepared By: THF Date: 11/9/89 Approved By: KLB Date: 10/10/89

Example of Sample ID: XX-MW1D

XX (Site Code)	MW1 (Sample Location)
D (Monitor/Sample Type)	MW = Ground Water Installation (Well Location No. 1)
(S) Shallow	SP = Sampling Point
(I) Intermediate	SW = Surface Water
(D) Deep	SB = Soil Boring (depth designation follows alpha code)
	SS = Stream Sediment (water depth designation follows alpha code).
	TB = Trip Blank
	RB = Field (Rinse) Blank

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Appendix E : Item 4 - SAMPLE SHIPPING

Applicability: GENERAL Revision No.: 3 Date: 5/10/90 MMY

Prepared By: THF Date: 11/9/89 Approved By: KLB Date: 10/10/89

1.0 INTRODUCTION

This guideline presents a method for chain-of-custody procedures to track sample shipments, to minimize loss or misidentification of samples, and to ensure that unauthorized persons do not tamper with collected samples.

2.0 METHODOLOGY

1. Fill out the chain-of-custody form completely (see attached example) with all relevant information (the white original goes with the samples and should be placed in a "ziploc" plastic bag and taped inside the sample cooler lid; the yellow copy should be retained by the sampler).

2. Mark liquid volume levels on sample bottles with grease pencil.

3. Place about 3 inches of inert cushioning material such as styrofoam peanuts or bubble pack in bottom of cooler. Place bottles in cooler with VOA vials (in a "ziploc" bag) in the center of the cooler.

4. Cover pack bottles, especially VOA vials, with ice in plastic bags. Pack cooler with blue ice in "ziploc" plastic bags and additional cushioning material.

5. Tape drain shut and wrap cooler completely with strapping tape to secure lid.

6. Place lab address on top of cooler. To protect the shipping coolers against tampering during shipment, the cooler lid will be taped to the cooler body. A chain-of-custody seal will be placed over the tape. A broken seal will indicate that the contents may have been tampered with.

7. For out-of-town laboratory shipments, specify that the contents are "Fragile" and place "This Side Up" labels on all four sides of the cooler. "This Side Up" labels are yellow labels with a black arrow with the arrow head pointing toward the cooler lid. "This Side Up" labels should not be affixed to the cooler lid or the cooler bottom.

MALCOLM PIRNIE, INC.

CHAIN OF CUSTODY RECORD

PROJECT NO.:	SITE NAME:
SAMPLERS (SIGNATURE):	

STATION NO.	DATE	TIME	COMP.	GRAB	STATION LOCATION	NO. OF CON-TAINERS							REMARKS

RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE):	RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED BY (SIGNATURE)
RELINQUISHED BY (SIGNATURE):	DATE/TIME:	RECEIVED FOR LABORATORY BY (SIGNATURE):	DATE/TIME:	REMARKS:	

Distribution: Original accompanies shipment, copy to coordinator field files

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APPENDIX F

INSPECTION CHECKLIST

F.1COVER SYSTEMS
F.2STORM WATER COLLECTION SYSTEM

APPENDIX F.1
ROCHESTER FIRE TRAINING ACADEMY

COVER SYSTEM INSPECTION CHECKLIST

Date: _____
Inspected By: _____

VISUAL EVALUATION ITEMS	CONDITION (Check)				Remarks
	Acceptable	Not Acceptable	Present	Not Present	
1. North Disposal Area					
a. Vegetative Cover Integrity	_____	_____			
b. Erosion			_____	_____	
c. Settling			_____	_____	
d. Slope Loss			_____	_____	
e. Pooling/ponding			_____	_____	
f. Undesirable species			_____	_____	
2. South Disposal Area					
a. Vegetative Cover Integrity	_____	_____			
b. Erosion			_____	_____	
c. Settling			_____	_____	
d. Slope Loss			_____	_____	
e. Pooling/ponding			_____	_____	
f. Undesirable species			_____	_____	
3. Training Grounds Area					
a. Surface Coarse Integrity	_____	_____			
b. Cracking			_____	_____	
c. Potholes			_____	_____	
d. Pooling/ponding			_____	_____	
e. Undesirable species			_____	_____	
4. Other Comments/Problems:					

APPENDIX F.2
ROCHESTER FIRE ACADEMY

STORM WATER COLLECTION SYSTEM INSPECTION CHECKLIST

Date: _____
Inspected By: _____

VISUAL EVALUATION ITEMS	CONDITION (Check)		Remarks
	Present	Not Present	
1. Drainage Channels			
a. Sediment build-up	_____	_____	
b. Pooling/ponding	_____	_____	
c. Severe cracking	_____	_____	
d. Erosion	_____	_____	
e. Slope loss	_____	_____	
2. Storm Sewers / Grates			
a. Sediment build-up	_____	_____	
b. Pooling/ponding	_____	_____	
c. Broken pipe	_____	_____	
d. Slope loss	_____	_____	
e. Grate clogging	_____	_____	
3. Drainage Structures #1, #2, #3			
a. Flapper valve functioning	_____	_____	
b. Broken/cracked pipe	_____	_____	
c. Cracked headwall structure	_____	_____	
4. Other Comments/Problems:			

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APPENDIX G

HEALTH AND SAFETY PLAN

MALCOLM PIRNIE

APPENDIX G

OPERATIONS AND MAINTENANCE PLAN FOR ROCHESTER FIRE TRAINING ACADEMY

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APPENDIX G

1.0 HEALTH AND SAFETY PLAN

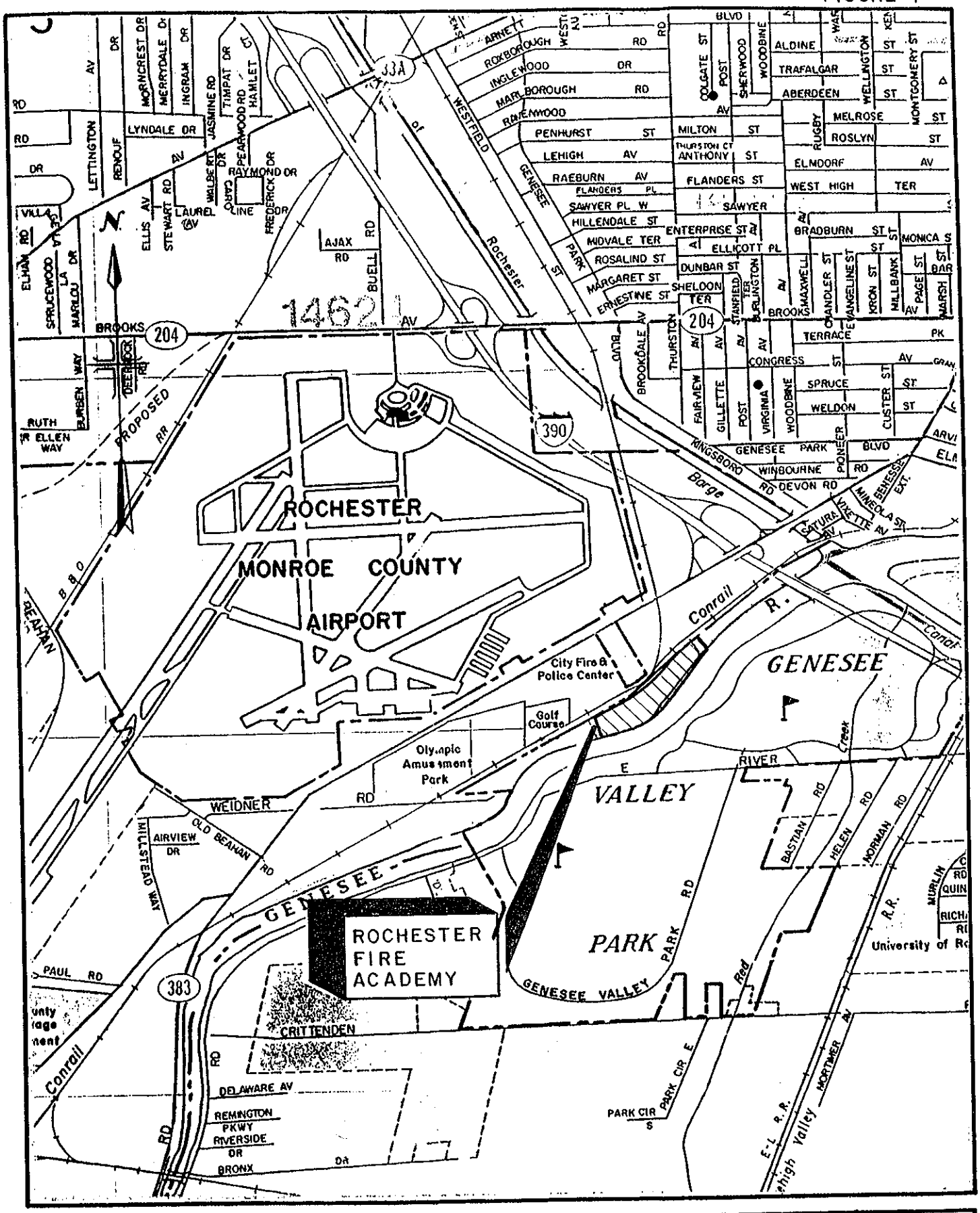
This Health and Safety Plan (HASP) has been prepared for informational purposes only. It addresses those site-specific hazards which may potentially be encountered while performing the operation and maintenance (O & M) tasks described herein. Malcolm Pirnie does not accept responsibility for the Health and Safety of any individuals other than their own employees. Site representatives, contractors, or any other persons performing work at the site shall be required to provide their own site-specific HASP covering their employees and subcontractors.

1.1 SITE LOCATION AND BACKGROUND

The Rochester Fire Training Academy (the Fire Academy) site is a 21-acre tract of land that has been used since 1954 as a training facility by the City of Rochester Fire and Police Departments. The Site is located on the west bank of the Genesee River at 1190 Scottsville Road in the City of Rochester, Monroe County, New York (Figure 1-1). Prior to 1954, the area was undeveloped park land. During the period from approximately 1954 through 1980, the Fire Academy accepted flammable liquids from local industries and other sources for training activities. No records were kept on materials accepted by the Fire Department for burning practices.

The Site consists of four distinct areas: the North Disposal Area (NDA); the South Disposal Area (SDA); the Training Grounds Area (TGA); and the Police Obstacle Course and Firing Range (PFR). Three of these areas have been involved with chemical use and disposal; the NDA, TGA, and SDA; which are 3.0, 5.4, and 0.8 acres in size, respectively. On-site personnel indicated that solvents, paint thinners and other organic chemicals in addition to metallic residue sludge-like materials were burned and/or disposed at the TGA, NDA, and SDA. The PFR and two adjacent off-site areas, the Genesee Valley Park Area (GVP) and the Genesee Valley Canal Area, are not believed to have been associated with

FIGURE 1



MALCOLM PIRNIE

ROCHESTER FIRE ACADEMY

SITE LOCATION MAP

CITY OF ROCHESTER, NEW YORK

historical dumping of potentially hazardous wastes. However, portions of the GVP soils have been affected by overland transport of contaminants from other areas of the site.

1.2 PURPOSE

The purpose of this HASP is to provide guidelines and establish procedures for the protection of approved personnel performing the following tasks at the site:

- Site inspections and maintenance.
- Groundwater, leachate/groundwater discharge, and sediment sampling.
- Landfill gas monitoring.
- Groundwater level monitoring.

All on-site personnel will be required to be familiar with the procedures and requirements of this HASP.

Contractors whose work will be performed on-site, or who otherwise could be exposed to health and safety hazards, will be advised of all known hazards through distribution of site-specific information. Contractors shall be solely responsible for the health and safety of their employees and shall comply with all applicable laws and regulations. All contractors and subcontractors are responsible for: (1) developing their own HASP including a written Hazard Communication Program (HCP) and any other written hazard specific programs required by Federal, State, and local laws; (2) providing their own personal protection equipment (PPE); (3) providing documentation that their employees have been trained in accordance with applicable Federal, State, and local laws; (4) providing evidence of medical surveillance and medical approvals for their employees; and (5) designating their own site safety officer.

1.3 PROJECT ORGANIZATION AND KEY PERSONNEL

The Malcolm Pirnie Project Manager, the Health and Safety Officer and the Site Health and Safety Coordinator (or his/her designee) identified below will determine and enforce compliance.

MALCOLM PIRNIE

- PROJECT MANAGER

Name:	Anne Marie C. McManus	
Telephone:	Office:	(716) 667-6611
	Home:	(716) 667-3081

- CORPORATE HEALTH AND SAFETY MANAGER

Name:	MarK McGowan, CIH	
Telephone:	Office:	(914) 694-2100
	Home:	(203) 350-2186

- SITE HEALTH AND SAFETY OFFICER

Name:	Judy Vangalio	
Telephone:	Office:	(716) 667-6650
	Home:	(716) 662-5404

- SITE HEALTH AND SAFETY COORDINATOR

Name:	Fordyce J. Ritz	
Telephone:	Office:	(716) 248-5161
	Home:	(716) 352-6294

The following roles have been identified for Malcolm Pirnie project personnel:

Project Manager - The Project Manager has full responsibility for implementing and executing an effective program of employee protection and accident prevention. He/She may delegate authority to expedite and facilitate any application of the program.

Health and Safety Manager - The Health and Safety Manager serves as the administrator of the corporation's health and safety program. He/She is responsible for ensuring that field personnel are properly trained, that they have obtained medical clearance to wear respiratory protection (per 29 CFR Part 1910.134(b)(10)), and that they are properly trained in the selection, use and maintenance of PPE, including qualitative respirator fit testing.

The Health and Safety Manager will also serve as scientific advisor for the duration of the project, providing guidance on data interpretation and the determination of appropriate levels of worker protection.

Site Health and Safety Officer - The Site Health and Safety Officer is knowledgeable in safety and worker protection techniques as they relate to the project. Responsibilities include the development of the specific provisions of this HASP, including the level of personnel protection to be employed, identification of emergency procedures, and personnel/equipment decontamination procedures. This individual will provide technical assistance to project management on problems relating to industrial hygiene and work site safety.

Any health and safety briefings required during the course of the project will be conducted by the Site Health and Safety Officer. Examples of briefings might include accident prevention, respirator refresher courses or current issues. The frequency of safety briefings will be based upon the potential hazards specific to the designated work tasks and any new information relative to such hazards which are discovered during the project.

Site Health and Safety Coordinator - The Site Health and Safety Coordinator or his/her designee will be responsible for enforcement of this HASP for employees at the site and for monitoring the personal exposures of employees to hazardous substances contained in air, soil or water. This will consist of spot checking workplace air sampling performed by the Subcontractor such as organic vapor monitoring and the documentation of such data. The Site Health and Safety Coordinator or his/her designee will communicate directly with the Site Health and Safety Officer on a regular basis to advise him/her of monitoring results and any unexpected conditions found at the site. As data are received and evaluated, the Site Health and Safety Officer will adapt this HASP to fit the current employee protection needs at the site. All affected employees and the Subcontractor's designated Site Health and Safety Officer (if any) will be informed of the air sampling results.

When unsafe work conditions are identified, the Site Health and Safety Coordinator or his/her designee is authorized to order his/her personnel to stop work. Resolution of all on-site health and safety problems will be coordinated through the Project Manager with assistance from the Health and Safety Manager and Site Health and Safety Officer as well as the Subcontractor's designated Health and Safety personnel.

1.4 HAZARD EVALUATION

1.4.1 Summary of Projected Risks

Based on the results of previous site investigations, potential hazards have been identified for each work task involved. These hazards are listed in Table 1-1. The principal points of exposure would be through direct contact with contaminated fill/soils and groundwater, through the inhalation of contaminated particles or vapors. Since work will be performed during summer/winter time periods, the potential exists for heat/cold stress to impact workers especially those wearing protective equipment and clothing.

Although no work can be considered completely risk-free, logical and reasonable precautions will be implemented to provide an adequate level of protection for workers. The integration of medical evaluations, worker training relative to chemical hazards, safe work practices, proper personal protection, environmental monitoring, work zones and site control, appropriate decontamination procedures and contingency planning into the project approach will minimize the chance of unnecessary exposures and physical injuries.

1.4.2 Physical Hazards

Field reconnaissance activities may present the following physical hazards:

- The potential for heat/cold stress to employees during the summer/winter months (see Section 9.10).
- The potential for slip-and-fall injuries due to rough, uneven terrain.
- The potential for injury if a landfill gas or waste fire is experienced.

1.4.3 Chemical Hazards

Previous field investigations have provided information concerning the types of contaminants which are likely to be encountered during operation and maintenance activities. Table 1-2 identifies contaminants determined present during previous field investigations at the site. Potential contaminants include volatile organics, lead, cadmium, and PCBs. Table 1-3 lists toxicity and exposure data for the "contaminants of concern"

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APPENDIX G
TABLE 1-1

ROCHESTER FIRE TRAINING ACADEMY

PROJECT TASKS WITH POTENTIAL HAZARDS

Project Task	Potential Hazards
1. Sample groundwater.	Exposure to contaminants: dermal, oral and inhalation. Physical hazards.
2. Conduct site inspections and maintenance.	Exposure to contaminants: dermal, oral, and inhalation. Physical hazards.
3. Groundwater level monitoring.	Exposure to contaminants: inhalation. Physical hazards.

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TABLE 1-2

ROCHESTER FIRE TRAINING ACADEMY

POTENTIAL CONTAMINANTS[1]

Parameter	SDA Max. Overburden Groundwater Concentration	Max. Soil Concentration			
		NDA	SDA	TGA	GVP
Inorganics: (ppm)					
Cadmium	ND	20	151	12	328
Lead	0.06	7860	4880	4380	964
Organics: (ppm)					
Total Volatile Organics [2]	45.9	<10	6,310	596	1.3
Chloroethane	0.075		0.2		
Chloroform	0.008		3.2		
1,1-dichloroethane	1.0		108		
1,2-dichloroethane	0.046		26		
1,1-dichloroethene	0.12		11.5		
Total 1,2-dichloroethene	30		291		
Tetrachloroethene	0.088		617		
1,1,1-trichloroethane	7.9		900		
Trichloroethene	0.94		2,572		
Vinyl chloride	0.22		3		
Acetone	1.6		182		
2-butanone (MEK)	0.15		2.7		
4-methyl-2-pentanone (MIBK)	0.16		96.0		
Benzene	0.009		ND		
Chlorobenzene	0.008		ND		
Ethylbenzene	0.34		74	26	
Toluene	0.91		802	350	
Total xylenes	2.3		491	210	
Methylene chloride			22		
1,2,4-Trimethyl Benzene			99		
Others			<10	<10	
Total Semi-Volatile Organics	0.159	7.4	90	1,357	5.6
PAHS		2.7	<1	409	<1
Phthalates		3.7	88	946	2.1
Others		<1	<1	1.6	2.5
Total PCBs	0.005	10	330	85	14

Notes:

(1) This is a list of maximum concentrations detected during field investigation at the site for soil and groundwater likely to be contacted during the remedial construction work.
NDA = North Disposal SDA = South Disposal
TGA = Training Grounds GVP = Genesee Valley Park

(2) Only trace concentrations of volatile organics have been detected in the NDA and GVP. Elevated concentrations of VOCs have been detected in the TGA soil as well as in the soil and groundwater in the SDA, therefore individual maximum VOC concentrations are presented for these media.

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TABLE 1-3

ROCHESTER FIRE TRAINING ACADEMY

TOXICITY AND EXPOSURE DATA

Contaminant of Concern	Inhalation Hazard		Dermal Hazard	LD_{50} mg/kg	Fire/ Explosion Hazard
	TWA (ppm)	TLV (ppm)			
Acetone	1,000	750	Low	9,750	high/mod
Benzene	10	10	High	3,800	high/mod
Chlorobenzene	75	75	—	—	—
Chloroethane	1,000	1,000	Mod	—	mod/mod
Chloroform	2	10	Mod	—	slight/slight
1,1-dichloroethane	100	200	Mod	1,120	—/—
1,2-dichloroethane	100	200	Mod	1,120	—/—
Ethylbenzene	100	100	Low	3500	high/—
Methylene Chloride	500	50	Mod		—
Methyl ethyl ketone	—	200	Mod	3,400	high/mod
Methyl isobutyl ketone	—	50	—	—	—/—
1,1,1-trichloroethane	350	350	Mod	10,300	slight/slight
1,2,4-trimethylbenzene	25	25	Mod-Low		mod/slight
Trichloroethene	100	50	High	4,920	slight
Toluene	200	100	Low	5,000	slight/mod
Vinyl Chloride	1	5	High	500	high/high
Xylenes	100	100	—	5,000	high/mod
PCBs	1 ug/m^3	*	High	—	slight/—
PAHs	*	*	Mod-High	—	—
Phthalates	*	*	Low	—	—
Lead	0.05 mg/m^3 total dust/ particulate	0.15 mg/m^3 total dust/ particulate			
Cadmium	0.005 mg/m^3 total dust/ particulate	0.01 mg/m^3 total dust/ particulate			

Notes:

* = TWA and TLV not applicable to these general classes of compounds.

TWA = Time Weighted Average established by OSHA, equals the maximum exposure concentration allowable for 8 hours per day @ 40 hours per week.

TLV = Threshold Limit Value established by ACGIH, equals the maximum exposure concentration allowable for 8 hours per day @ 40 hours per week.

identified in Table 1-2. Brief descriptions of the toxicology of some of these materials and related health and safety guidance and criteria are provided below.

- **Acetone** is a colorless liquid having a characteristic odor. In high concentrations, acetone vapors can irritate the eyes and skin. However, acetone has a very low skin toxicity rating. Prolonged inhalation of vapors may lead to headache or narcotic effects. Acetone is flammable, and explosion may occur if the vapors are exposed to flame.

- **1,1-Dichloroethane** may be moderately toxic via oral or skin absorption routes. Upon heating to decomposition, toxic fumes of chlorine will be emitted.

- **1,2-Dichloroethene** is a colorless, volatile liquid which is highly toxic via oral or inhalation routes. 1,1-Dichloroethene is a carcinogen and can explode spontaneously. Violent reactions can occur when this substance is exposed to oxidizing materials.

- **Ethyl Benzene** is a colorless, aromatic liquid which can irritate the eyes, skin and mucous membranes at a concentration of 0.1% in air. Exposure to higher concentrations may cause dizziness and a sense of constriction of the chest. Ethyl benzene is flammable, and can react vigorously with oxidizing materials.

- **Methyl Isobutyl Ketone (MIBK)** is a colorless liquid with a characteristic sweet, sharp odor. MIBK is a skin and eye irritant and has a narcotic effect upon exposure to high concentrations. MIBK poses a moderate explosion hazard when exposed to heat or flame.

- **Tetrachloroethene** is a colorless liquid having a chloroform-like odor. Tetrachloroethene may be toxic via inhalation routes, prolonged or repeated contact with the skin, or when ingested by mouth exposures to concentrations above 200 ppm can cause irritation and burning of the eyes, nose, and throat. There may be vomiting, nausea, drowsiness, an attitude of irresponsibility and even an appearance resembling alcoholic intoxication. This material acts as an anesthetic through the inhalation of excessive amounts within a short time. Tetrachloroethene can cause dermatitis, particularly after repeated or prolonged skin contact.

- **1,1,1-Trichloroethane** is moderately toxic by ingestion and intraperitoneal routes, is a moderate skin and severe eye irritant, narcotic in high concentrations. 1,1,1-TCA causes a proarrythmic activity which sensitizes the heart to epinephrine-induced arrhythmias. This sometimes will cause a

cardiac arrest particularly when this material is massively inhaled as in drug abuse for euphoria.

- **Trichloroethylene (TCE)** is a common industrial solvent used primarily in dry cleaning and metal degreasing. Trichloroethylene exposure at levels of 200 ppm has been associated with mild behavioral and psychomotor effects, including vertigo, fatigue and headache. TCE is a suspected human carcinogen. The principal routes of potential personnel exposure to TCE are through inhalation of volatized TCE and direct skin contact.

- **Toluene**is an organic liquid derived from coal tar. Exposure to toluene may cause narcotic effects (impairment of coordination and reaction time) loss of appetite, headache, nausea, and eye irritations. Generally, acute poisoning due to exposures to high concentrations are rare, and individuals recover easily when removed from the exposure.

- **Vinyl chloride** is a synthetic chlorinated organic chemical used in the manufacture of polyvinyl chloride (PVC). Its presence in site-specific circumstances may be attributable to breakdown of the halogenated aliphatic hydrocarbons TCE and 1,2-trans-dichloroethene to vinyl chloride. In high concentrations, vinyl chloride may cause reversible narcosis similar to alcohol intoxication. Skin contact with undiluted vinyl chloride results in frostbite by rapid evaporation and subsequent freezing. It is unlikely that these acute effects would be observed at the concentrations and site-specific exposure scenarios expected. Chronic exposure to vinyl chloride through inhalation has been associated with liver toxicity, fatty deposition in particular. Vinyl chloride is considered to be a suspect carcinogen.

Polychlorinated biphenyl compounds (PCBs) as a class, are moderately toxic substances which may cause changes to exposed tissue, but rarely cause permanent injury or death. However, some compounds are suspected to be carcinogenic to humans via oral exposures. Routes of entry to the body include ingestion and dermal contact. The main physical responses to PCB exposure include chloracne and liver atrophy. The ACGIH threshold limit value and the OSHA time weighted average concentration standard for some compounds is as low as 500 ug/m^3.

Cadmium compounds are highly toxic when ingested; however, associated irritating and emetic reactions can be so violent that little cadmium is absorbed and fatalities are very rare. The inhalation of cadmium fumes or dusts primarily affects the respiratory tract and liver, leading to cough, headache, constriction of the chest and shortness of breath. Cadmium may also be carcinogenic when inhaled.

Lead compounds are cumulative. The major routes of lead absorption are the gastrointestinal tract and the respiratory system. Small amounts of lead may also be absorbed from intact or abraded skin when applied in high concentration. The four major target systems consist of the central nervous system, the peripheral nerves, the kidney, and the blood-forming system.

- **Xylenes** are clear, colorless liquids which irritate the eyes at approximately 200 ppm. When exposed to heat or flame, these compounds may ignite or cause explosion. Upon heating to decomposition, acrid smoke and fumes may be emitted.

The use of proper respiratory protection (Section 1.8) and implementation of air monitoring (Section 1.9) will minimize the potential for exposure to airborne contamination. Further, exposure to contaminants through dermal and other routes will also be minimized through the use of protective clothing (Section 1.8) and safe work practices (Section 1.7).

1.5 MEDICAL SURVEILLANCE

Medical monitoring, including initial employment, annual and employment termination examinations, will be provided to employees whose work may result in potential chemical exposure or present unusual physical demands. Medical evaluations will be performed by an occupational physician. The medical evaluations will be conducted according to the Corporate Medical Monitoring Program and include an evaluation of the workers' ability to use respirator protective equipment (as per 29 CFR 1910). The examination will include:

- Occupational history.
- Medical history.
- Medical review.
- Medical surveillance examination with emphasis on organ systems potentially affected by toxic substances identified in the work environment.
- Medical certification of physical requirements (sight, hearing, musculoskeletal, cardiovascular) for safe job performance.

- Laboratory testing to include a complete blood count, white cell differential count, serum multiphasic screening and urinalysis.

The purposes of the medical evaluation are to: (1) determine fitness for duty on hazardous waste sites (such an evaluation is based upon the employee's occupational and medical history, a comprehensive physical examination and an evaluation of the ability to work while wearing protective equipment); and (2) establish baseline medical data.

Supplemental examinations may be performed whenever there is an actual or suspected excessive exposure to chemical contaminants or upon experience of exposure symptoms, or following injuries or temperature stresses.

In conformance with OSHA regulations, medical records will be maintained and preserved for a period of 30 years following termination of employment. Employees have access to the results of medical testing and to full medical records and analyses.

1.6 EMPLOYEE TRAINING PROGRAM

All employees who may be exposed to hazardous substances, health hazards, or safety hazards shall be adequately trained prior to engaging in any on-site work activities. At a minimum, such training shall include an initial 40-hour Hazardous Waste Site Worker Protection Course, an 8-hour Annual Refresher Course subsequent to the initial 40-hour training, and 3 days of actual field experience under the direct supervision of a trained, experienced supervisor (i.e., the Health and Safety Coordinator or his/her designee). This training shall be conducted by a qualified instructor and shall be specifically designed to meet the requirements of OSHA Standard 29 CFR 1910.120(e)(2). At a minimum, the initial 40-hour training course will include the following:

TOPICS

- OSHA/SARA/EPA/RCRA/HCS Requirements
- Decontamination of Personnel & Equipment
- Fire, Explosion & Accident Prevention
- Respiratory Protection Selection & Use
- Waste Site Safety
- Hazard Recognition
- Medical Surveillance
- Cold & Heat Stress

- Preparation of Health & Safety Plans
- Emergency Preparedness & Escape
- Protective Clothing Use & Selection
- Air Monitoring & Surveillance
- Work Practices to Minimize Risk
- Site Entry & Set-Up
- Permissible Exposure Limits
- Site Control & Work Zones
- Chemical & Physical Hazards
- Confined Space Entry

WORKSHOPS/EXERCISES

- Self-Contained Breathing Apparatus
- Air Monitoring Equipment Workshop
- Air Purifying Respirator Workshop
- Decontamination
- Qualitative/Quantitative Fit Test
- Level A/B Field Exercise
- Level B/C Field Exercise
- Air Tank Refilling Workshop

Records and certifications received from the course instructor documenting each employee's successful completion of the training identified above will be maintained on file in both local and corporate headquarters offices. Subcontractor(s) will be required to provide similar documentation of training for all their personnel who will be involved in on-site work activities.

Any employee who has not received adequate training and has been so certified shall be prohibited from engaging in on-site work activities that may involve exposure to hazardous substances, health hazards or safety hazards.

Periodic health and safety briefings will be conducted by the Site Health and Safety Officer for his/her employees on an as-needed basis. Problems relative to respiratory protection, inclement weather, heat/cold stress or the interpretation of newly-available environmental monitoring data are examples of topics which might be covered during these briefings.

1.7 SAFE WORK PRACTICES

All employees shall obey the following safety rules during on-site work activities conducted within the exclusion and support zones:

- Eating, drinking, chewing gum or tobacco, smoking, or any practice which increases the probability of hand-to-mouth transfer of contaminated material is strictly prohibited.

- The hands and face must be thoroughly washed upon leaving the work area and prior to engaging in any activity indicated above.

- Any required respiratory protective equipment and clothing **must** be worn by all personnel going on-site. Excessive facial hair (i.e., beards, long mustaches or sideburns), which interferes with the satisfactory respirator-to-face seal is prohibited.

- Contact with surfaces/materials either suspected or known to be contaminated will be avoided to minimize the potential for transfer to personnel, cross-contamination and need for decontamination.

- Medicine and alcohol can potentiate the effects of exposure to toxic chemicals. Due to possible contraindications, use of prescribed drugs should be reviewed with the Pirnie occupational physician. Alcoholic beverage and illegal drug intake are strictly forbidden during site work activities.

- All personnel shall be familiar with standard operating safety procedures and additional instructions contained in this Health and Safety Plan.

- On-site personnel shall use the "buddy" system. No one may work alone, i.e., out of earshot or visual contact with other workers in the exclusion zone.

- Personnel and equipment in the contaminated area shall be minimized, consistent with effective site operations.

- All employees have the obligation to correct or report unsafe work conditions.

- Use of contact lenses on-site will not be permitted. Spectacle kits for insertion into full-face respirators will be provided for employees as required.

1.8 PERSONAL PROTECTION EQUIPMENT

Personnel must wear personal protective equipment (PPE) when work activities involve known or suspected atmospheric contamination; when vapors, gases, or particulates may be generated; or when direct contact with dermally active substances may occur. Full-face respirators will be used to protect the lungs, the gastro-intestinal tract and the eyes

against air toxicants. Chemical-resistant clothing will be used to protect the skin from contact with skin-destructive and skin-absorbable chemicals. All PPE shall be maintained and stored as specified by the manufacturer. Good personal hygiene and safe work practices, as identified in Section 1.7, are also necessary to limit or prevent the ingestion of potentially harmful substances.

Personal protection equipment has been designated for each project task where potential hazards exist. The designated PPE for each task is listed in Table 1-4. The Site Health and Safety Coordinator will monitor the use of PPE during extreme temperature conditions.

1.9 ENVIRONMENTAL MONITORING

1.9.1 General On-Site Monitoring

Modifications to the level of protection established for employees for each task will be based upon measurements of the contaminants present in the work environment. Tasks and activities proposed for this site along with the estimated potential of exposure to contaminants known to be present in the groundwater and soil at each well location will be used to determine the minimum required levels of personal protection and is described in Section 9.8. Based upon the existing data base, the release of organic vapors may occur during the construction phase of the project. Ambient breathing zone concentrations may, at times, exceed the permissible exposure limits (PEL) established by OSHA for the individual compounds (see Table 1-3). Respiratory and dermal protection may be modified (upgraded or downgraded) based upon real-time field monitoring data.

Contaminated soil and groundwater are most likely to be encountered during liner repair and monitoring activities. The air monitoring program will monitor volatile contaminants as well as the presence of respirable dust when soil is physically disturbed. Real time monitoring, with a combustible gas meter and total organic vapor analyzer (HNu), will be performed by the Health and Safety Coordinator on a periodic basis during all sampling and field reconnaissance surveys. The level of respiratory and dermal protection in use will be based upon an evaluation of general air monitoring data.

MALCOLM PIRNIE

APPENDIX G

TABLE 1-4

ROCHESTER FIRE TRAINING ACADEMY

PPE FOR EACH PROJECT TASK WITH AN IDENTIFIED HAZARD

1.	Sample groundwater (Level D respiratory, Level C dermal): ▪ Tyvek Suit ▪ Chemical protective gloves (latex) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses
2.	Conduct site inspection and non-intrusive maintenance (Level D): ▪ Coveralls (or work clothes) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses ▪ For Intrusive Maintenance, upgrade to Level C Dermal
3.	Groundwater level monitoring (Level D respiratory, Level C dermal): ▪ Tyvek Suit ▪ Chemical protective gloves (latex) ▪ Rubber boots (pull-on) and safety shoes ▪ Safety glasses

Monitoring instruments will be protected from surface contamination during use to allow for easy decontamination. When not in use, the monitoring instruments will be placed on plastic sheeting to avoid surface contact. Additional monitoring instruments may be required if the situations or conditions change.

Any grab samples which are collected as part of an addended scope of work will be surveyed with the HNu, or similar equipment as each sample is retrieved. These values will be recorded with the respective sample number and will assist in the determination of the adequacy of employee protective equipment.

1.9.2 On-Site Monitoring Action Levels

The HNu or other appropriate instrument(s) will be used to monitor organic vapor concentrations as specified in this plan. Methane gas will be monitored during cover system repairs or other activities requiring significant cap disruption with the "combustible gas" option on an explosimeter/tritector or other appropriate instrument(s). In addition, fugitive dust/particulate concentrations will be monitored during cover system repairs or substantially intrusive activities using a real-time particulate monitor. Readings obtained in the breathing zone may be interpreted (with regard to other site conditions) as follows for on-site personnel:

- Total atmospheric concentrations of unidentified vapors or gases ranging from 0 to background on the HNu - Continue Operations Under Level D.
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings above background to 5 ppm on the HNu (vapors not suspected of containing high levels of chemicals toxic to the skin) - Continue Operations Under Level C.
- Total atmospheric concentrations of unidentified vapors or gases yielding sustained readings of 5 to 50 ppm above background on the HNu - continue operations under Level B, re-evaluate and alter activities (if possible) to achieve lower vapor concentrations.
- Total atmospheric concentrations of unidentified vapors or gases above 50 ppm on the HNu - discontinue engineering operations and exit the work zone immediately.

The explosimeter will be used to monitor levels of both combustible gases and oxygen during site activities. Action levels based on the instrument readings shall be as follows:

- Less than 10% LEL - Continue engineering operations with caution.
- 10-25% LEL - Continuous monitoring with extreme caution, determine source/cause of elevated reading.
- Greater than 25% LEL - Explosion hazard, evaluate source and leave the Work Zone.
- Less than 19.5% oxygen - leave Work Zone immediately.
- 19.5-25% oxygen - Continue engineering operations with caution.
- Greater than 25% oxygen - Fire hazard potential, leave Work Zone immediately.

The particulate monitor will be used to monitor respirable dust concentrations during all intrusive activities for the purpose of settling these actions, the air contaminant is considered to be 100 percent lead (Pb). Action levels based on the instrument readings shall be as follows:

- Less than 150 ug/m^3 - Continue field operations.
- Greater than 150 ug/m^3- Don dust/particulate mask or equivalent. Initiate engineering controls (viz. wetting of excavated soils or tools at discretion of Site Health and Safety Officer).

Readings with the explosimeter, particulate monitor, and organic vapor analyzer will be recorded and documented in the Health and Safety logbook. All instruments will be calibrated before use and the procedure will be documented in the Health and Safety logbook.

1.9.3 Community Monitoring Action Levels

In addition to the action levels prescribed in Section 1.9.2 for Malcolm Pirnie personnel on-site, the following criteria shall be adhered to for the protection of the nearby community.

Vinyl Chloride and Chloroform

- If the ambient air concentration of organic vapors exceeds 1 ppm above background at the perimeter of the exclusion zone, contaminant-specific monitoring for vinyl chloride and chloroform will be performed using either a draeger tube or a field GC. If neither vinyl chloride nor chloroform are detected at the perimeter of the exclusion zone, monitoring for total organic vapors will continue as discussed below. If vinyl chloride or chloroform are detected at the perimeter of the exclusion zone, total organic vapor monitoring will be conducted 200 feet downwind of the work area or half the distance to the nearest residential or commercial structure whichever is less. If the concentration of total organic vapors exceeds 1 ppm at this location and vinyl chloride or chloroform are detected, work activities will be halted and monitoring for vinyl chloride and chloroform will be conducted within 20 feet of the perimeter of the nearest residential or commercial structure. If either vinyl chloride or chloroform are detected in the 20-foot zone, the major vapor emission response plan will be implemented.

Total Organic Vapors

- If the ambient air concentration of organic vapors exceeds 10 ppm above background at the perimeter of the exclusion zone, work activities will be halted and monitoring continued. If the organic vapor decreases below 10 ppm over background, work activities can resume. If the organic vapor levels are greater than 10 ppm over background, but less than 25 ppm at the perimeter of the exclusion zone, activities can resume, provided that the organic vapor level 200 feet downwind of the work area or half the distance to the nearest residence or commercial structure, whichever is less, is below 10 ppm over background. If the organic vapor level is above 25 ppm at the perimeter of the exclusion zone, the Contractor's Health and Safety Officer must notify Malcolm Pirnie's Site Health and Safety Coordinator and shutdown work activities. When work shutdown occurs, downwind air monitoring, as directed by the Contractor's Health and Safety Officer, will be implemented per the Contractor's HASP to ensure that vapor emissions do not impact the nearest residential or commercial structure at levels exceeding those specified in the Major Vapor Emission Section (see below). The Contractor's Health and Safety Officer will determine when re-entry of the exclusion zone is possible.

Major Vapor Emission (Total Organic Vapors)

- If any organic levels greater than 10 ppm over background are identified 200 feet downwind from the work area or half the distance to the nearest residential or commercial property, whichever is less, all work activities must be halted.

- If, following the cessation of the work activities or as the result of an emergency, organic levels persist above 10 ppm above background 200 feet downwind or half the distance to the nearest residential or commercial property from the work area, then the air quality must be monitored within 20 feet of the perimeter of the nearest residential or commercial structure (20-foot zone).

- If efforts to abate the emission source are unsuccessful and if the following levels persist for more than 30 minutes in the 20-foot zone, then the Major Vapor Emission Response Plan shall automatically be placed into effect:

  - if organic vapor levels are approaching 10 ppm above background.

- However, the Major Vapor Emission Response Plan shall be immediately placed into effect if organic vapor levels are greater than 10 ppm above background.

Major Vapor Emission Response Plan:

Upon activation, the following activities will be undertaken:

1. The local police authorities will immediately be contacted by the Safety Officer and advised of the situation; and

2. Frequent air monitoring will be conducted at 30-minute intervals within the 20-foot zone.

The following personnel are to be notified in the listed sequence in the event that a Major Vapor Emission Plan is activated:

Responsible Person	Contact	Contact Location/Phone
Site Health and Safety Coordinator	Police	911
Site Health and Safety Coordinator	NYSDEC Representative Region 8 - Avon (if no DEC representative on-site)	(716) 226-2466
Site Health and Safety Coordinator	NYSDOH Representative Rochester Field Office	(716) 423-8071

Additional emergency numbers as listed in Section 1.13 (Emergency Response Plan).

Explosive Vapors

- Sustained atmospheric concentration of greater than 10% LEL in the work area - Increase monitoring frequency for combustible gases at the downwind portion of the site perimeter to at least every 30 minutes.
- Sustained atmospheric concentrations of greater than 10% LEL at the downwind site perimeter - Contact local Fire Department.

Airborne Particles

- Sustained atmospheric concentrations of greater than 150 ug/m^3 in the work area - Increase monitoring frequency for particulates at the downwind portion of the site to at least every 30 minutes.
- Sustained atmospheric concentrations of 150 ug/m^3 or greater at the downwind site perimeter - Stop work and evaluate situation.

Pertinent emergency response information including the telephone number of the Fire Department are included in Section 1.13 (Emergency Response Plan).

1.10 HEAT/COLD STRESS MONITORING

Since site inspections, maintenance, and monitoring activities will be scheduled for both the summer and winter months, measures will be taken to minimize heat/cold stress to employees. The Site Health and Safety Coordinator or his/her designee will be responsible for monitoring employees for symptoms of heat/cold stress.

1.10.1 Heat Stress Monitoring

Personal protective equipment may place an employee at risk of developing heat stress, probably one of the most common (and potentially serious) illnesses encountered at sites requiring PPE. The potential for heat stress is dependent on a number of factors, including environmental conditions, clothing, workload, physical conditioning and age. Personal protective equipment may severely reduce the body's normal ability to maintain equilibrium (via evaporation, convection and radiation), and by its bulk and weight increases energy expenditure.

The signs and symptoms of heat stress are as follows:

- Heat rash may result from continuous exposure to heat or humid air.
- Heat cramps are caused by heavy sweating with inadequate electrolyte replacement. Signs and symptoms include:
  - muscle spasms
  - pain in the hands, feet and abdomen
- Heat exhaustion occurs from increased stress on various body organs including inadequate blood circulation due to cardiovascular insufficiency or dehydration. Signs and symptoms include:
  - pale, cool, moist skin
  - heavy sweating
  - dizziness
  - nausea
  - fainting
- Heat stroke is the most serious form of heat stress. Temperature regulation fails and the body temperature rises to critical levels. Immediate action must be taken to cool the body before serious injury and death occur. Competent medical help must be obtained. Signs and symptoms are:
  - red, hot, usually dry skin
  - lack of or reduced perspiration
  - nausea
  - dizziness and confusion
  - strong, rapid pulse
  - coma

The monitoring of personnel wearing protective clothing should commence when the ambient temperature is 70 degrees Fahrenheit or above. For monitoring the body's recuperative ability to excess heat, one or more of the following techniques should be used as a screening mechanism.

- Heart rate may be measured by the radial pulse for 30 seconds as early as possible in the resting period. The rate at the beginning of the rest period should not exceed 110 beats per minute. If the rate is higher, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle should be further shortened by 33%.

- Body temperature may be measured orally with a clinical thermometer as early as possible in the resting period. Oral temperature at the beginning of the rest period should not exceed 99.6 degrees Fahrenheit. If it does, the next work period should be shortened by 10 minutes (or 33%), while the length of the rest period stays the same. However, if the oral temperature exceeds 99.6 degrees Fahrenheit at the beginning of the next period, the following work cycle may be further shortened by 33%. Oral temperature should be measured again at the end of the rest period to make sure that it has dropped below 99.6 degrees Fahrenheit. No Malcolm Pirnie employee will be permitted to continue wearing semipermeable or impermeable garments when his/her oral temperature exceeds 100.6° Fahrenheit.

1.10.2 Cold Stress Monitoring

Exposure to cold conditions may result in frostbite or hypothermia, each of which progresses in stages as shown below.

- **Frostbite** occurs when body tissue (usually on the extremities) begins to freeze. The three states of frostbite are:

  1) **Frostnip** - This is the first stage of the freezing process. It is characterized by a whitened area of skin, along with a slight burning or painful sensation. Treatment consists of removing the victim from the cold conditions, removal of boots and gloves, soaking the injured part in warm water (102-108°F) and drinking a warm beverage.

  2) **Superficial Frostbite** - This is the second stage of the freezing process. It is characterized by a whitish-grey area of tissue which will be firm to the touch but will yield little pain. Treatment is identical to that for frostnip.

3) **Deep Frostbite** - In this final stage of the freezing process the affected tissue will be cold, numb and hard, and will yield little to no pain. Treatment is identical to that for frostnip.

- **Hypothermia** occurs when the body loses heat faster than it can produce it. The stages of hypothermia (which may not be clearly defined or visible at first) are the following:

1) Shivering
2) Apathy (a change to a disagreeable mood)
3) Unconsciousness
4) Bodily freezing
5) Death (if untreated)

Treatment of hypothermia is given below:

- Remove the victim from the cold environment and remove wet or frozen clothing. (Do this carefully as frostbite may have started.)
- Perform active re-warming with hot liquids for drinking (Note: do **not** give the victim any liquid containing alcohol or caffeine in this case) and a warm water bath (102-108°F)
- Perform passive re-warming with a blanket or jacket wrapped around the victim.

In any potential cold stress situation, it is the responsibility of the Site Health and Safety Officer to encourage the following:

- Workers should dress warmly, with more layers of thin clothing as opposed to one thick layer.
- Personnel should remain active and keep moving.
- Personnel should be allowed to take shelter in a heated area, as necessary.
- Personnel should drink warm liquids (no caffeine or alcohol if frostbite has set in).

1.11 WORK ZONES AND SITE CONTROL

Work zones around the areas designated for site inspection and maintenance, sample collection, and landfill gas monitoring will be established by the Health and Safety Coordinator on a daily basis and communicated to all employees and other site users. It shall be the Site Health and Safety Coordinator's responsibility to ensure that all site workers are aware of the work zone boundaries and to enforce proper procedures in each area. The zones will include:

- **Exclusion Zone ("Hot Zone")** - the area where contaminated materials may be exposed, excavated or handled and all areas where contaminated equipment or personnel may travel. The zone will be delineated by flagging tape. All personnel entering the Exclusion Zone must wear the appropriate PPE.

- **Contamination Reduction Zone** - the zone where decontamination of personnel and equipment takes place. Any potentially contaminated clothing, equipment and samples must remain in the Contamination Reduction Zone until decontaminated.

- **Support Zone** - the part of the site which is considered non-contaminated or "clean". Support equipment will be located in this zone, and personnel may wear normal work clothes within this zone.

Access of non-essential personnel to the Exclusion and Contamination Reduction Zones will be strictly controlled by the Health and Safety Coordinator. Only personnel who are essential to the completion of the task will be allowed access to these areas and only if they are wearing appropriate PPE. Entrance of all personnel must be approved by the Site Health and Safety Coordinator.

A log containing the names of workers and their level of protection will be maintained on-site.

The zone boundaries may be changed by the Site Health and Safety Coordinator as environmental conditions warrant, and to respond to the necessary changes in work locations on-site.

1.12 FIRE PREVENTION AND PROTECTION

Recommended practices and standards of the National Fire Protection Association (NFPA) and other applicable regulations will be followed in the development and application of Project Fire Protection Programs. When required by regulatory (DEC) authorities, the project management will prepare and submit a Fire Protection Plan for the approval of the contracting officers, authorized representative or other designated official. Essential considerations for the Fire Protection Plan will include:

- Proper site preparation and safe storage of combustible and flammable materials.
- Availability of coordination with private and public fire authorities.
- Adequate job-site fire protection and inspections for fire prevention.
- Adequate indoctrination and training of employees.

1.12.1 Equipment and Requirements

- Fire extinguishers will be provided by the Subcontractor(s).
- Fire extinguishers will be inspected, serviced, and maintained in accordance with the manufacturer's instructions. As a minimum, all extinguishers shall be checked monthly and weighed semi-annually, and recharged if necessary.
- Immediately after each use, fire extinguishers will be either recharged or replaced.

1.12.2 Flammable and Combustible Substances

- All storage, handling or use of flammable and combustible substances will be under the supervision of qualified persons.
- All tanks, containers and pumping equipment, whether portable or stationary, which are used for the storage and handling of flammable and combustible liquids, will meet the recommendations of the NFPA.
- If the LEL exceeds 10% for any compound, fans will be used to dissipate volatile/combustible gases and to minimize the explosion hazard during drilling/ excavation activities. In addition, % O_2/explosive gas monitoring will be conducted throughout the drilling/excavation operations.

1.13 EMERGENCY RESPONSE PLAN

Emergency medical treatment can be obtained at the Strong Memorial Hospital in Rochester. This information shall be posted in the on-site treatment building and in the field vehicle. It is the Site Safety Officer's responsibility to ensure that the information sheet is posted.

Emergency Telephone Numbers:

Fire, Ambulance, Police	911
Strong Memorial Hospital	(716) 275-2100

Directions to Hospital:

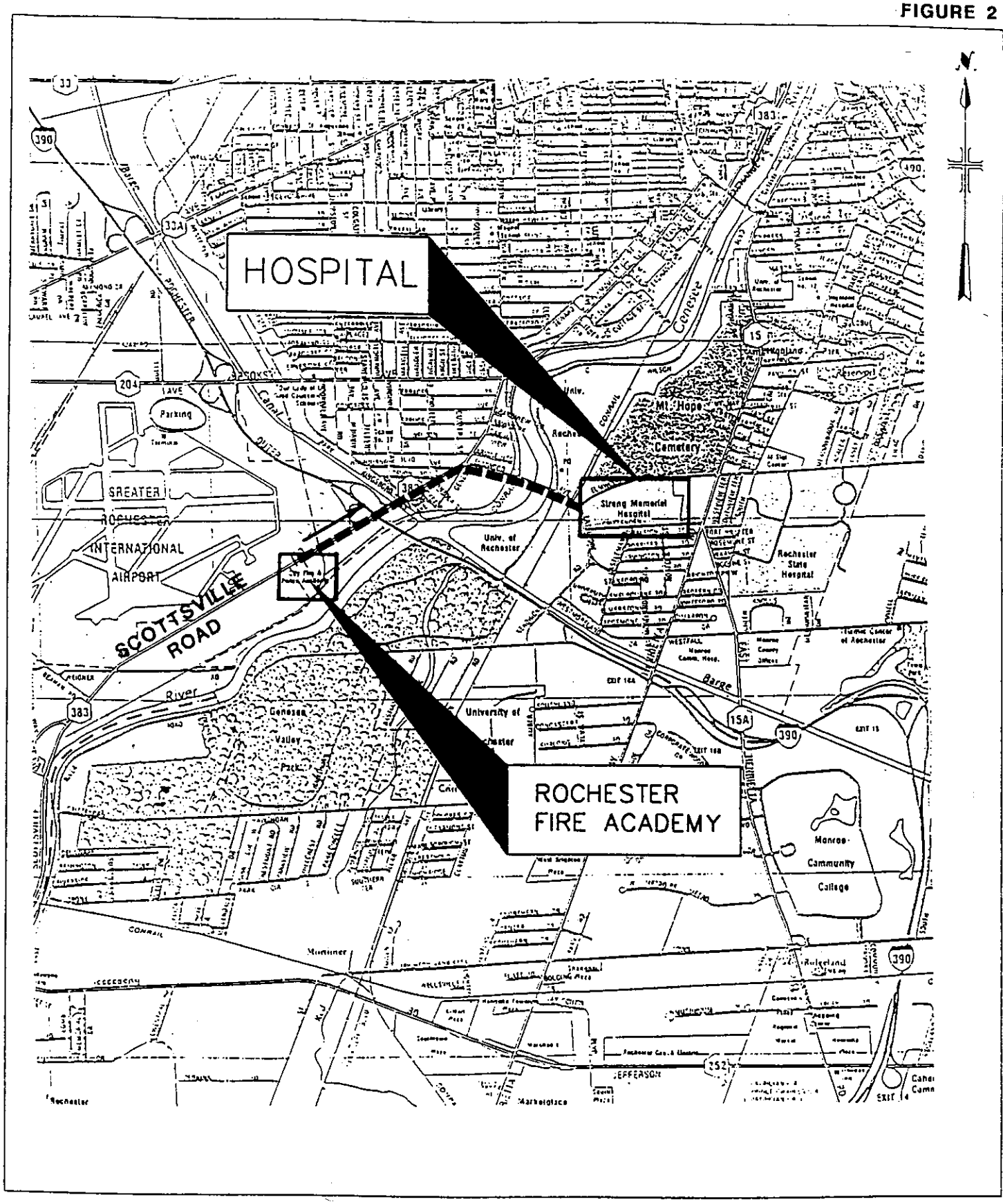
The following directions describe the best route to Strong Memorial Hospital from the Rochester Fire Academy (refer to Figure 1-2). The route to the hospital will take about five minutes.

1. From the site, turn right onto Scottsville Road and proceed to Elmwood Avenue.
2. Turn right onto Elmwood Avenue; proceed on Elmwood over the Genesee River to Lattimore Road.
3. Turn right onto Lattimore Road and proceed one block to Crittenden Blvd.
4. Turn left onto Crittenden Blvd. and follow signs to the Strong Memorial Hospital Emergency Room located on the left side of the road.

1.14 HAZARD COMMUNICATION STANDARD

In order to comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200), the Contractor and other site representatives must implement a Hazard Communica-

FIGURE 2



MALCOLM PIRNIE

CITY OF ROCHESTER
ROCHESTER FIRE ACADEMY
HOSPITAL ROUTE

tion Program (HCP). The program must be designed to provide employees with information on hazardous chemicals to which they may be exposed. Information is provided to employees through employee training, container labeling of all chemicals used, Material Safety Data Sheets (MSDS), and access to the written HCP. The only chemicals which should be introduced to the site are those used for sample preservation and decontamination (e.g., nitric acid, sulfuric acid and Alconox™). The MSDS's for these chemicals must be maintained at the site and provided for review by all field personnel.

MALCOLM PIRNIE

APPENDIX H

LIST OF DOCUMENTS MAINTAINED AT GROUNDWATER TREATMENT BUILDING OFFICE

MALCOLM PIRNIE

- Empire Soils Investigations, 1981
- Engineering Investigations at Inactive Hazardous Waste Site in the State of New York, Phase I Investigation, Rochester Fire Academy, Recra Research, Inc., 1983.
- Engineer Investigations at Inactive Hazardous Waste sites in the State of New York, Phase II Investigation, Rochester Fire Academy, Recra Research, Inc., 1985.
- Remedial Investigation for the Rochester Fire Academy Site-Results of Preliminary Surveys, Malcolm Pirnie, Inc., February 1990.
- Remedial Investigation Report for the Rochester Fire Academy Site, Malcolm Pirnie, Inc., May 1991.
- Interim Remedial Measures (IRM) Phase II Design Concept Report, Malcolm Pirnie, Inc., February 1992.
- Supplemental Remedial Investigation Report for the Rochester Fire Academy Site, Malcolm Pirnie, Inc., May 1992.
- Feasibility Study for the Rochester Fire Academy Site, Malcolm Pirnie, Inc., February 1993.
- Record of Decision, Rochester Fire Academy, Monroe County, New York, Site Number 828015, New York State Department of Environmental Conservation, March 1993.
- Draft Technical Report for Adjacent Property Owners, Malcolm Pirnie, Inc., April 1993.
- Subsurface Exploration and Geotechnical Engineering Report for Proposed Smokehouse and Pre-Engineered Treatment Plant Structures at Rochester Fire Academy Project, Rochester, New York, Buffalo Drilling Company, Inc., May 27, 1993.
- Closure Report, Interim Remedial Measures, Rochester Fire Academy Site, Malcolm Pirnie, Inc., July 1993.
- Drill Yard Remediation Plan, City of Rochester, New York, Fire Training Facility, Cowan and Cricenti Engineering Associates, Inc., August 1993.
- Remedial Design Engineering Report, Rochester Fire Training Academy, Rochester, New York, November 1993.

MALCOLM PIRNIE

- Project Manual, Fire Training Academy Remedial Construction, Malcolm Pirnie, Inc., December 1994.
- Fire Training Academy Remedial Construction Drawings and Record Drawings, Malcolm Pirnie, Inc., December 1994.
- Construction Monitoring Report for Fire Training Academy Remedial Construction, Malcolm Pirnie, Inc., November 1997.
- Rochester Fire Academy Groundwater Treatment System Operations and Maintenance Manual. CSR Technical, Inc., May 1996.
- Manufacturer's literature for individual groundwater collection, treatment, control and remote monitoring equipment, 1996-1997.
- Record Drawings for Rochester Fire Academy Remedial Construction (to be submitted by Thermocor Kimmons).

MALCOLM PIRNIE

APPENDIX I

TRAINING GROUNDS AREA
SOIL MANAGEMENT PLAN

City of Rochester

FAX (716) 428-6010
TDD/Voice 232-3260

Department of Environmental Services

Office of the Commissioner
Division of Environmental Quality
30 Church Street, Rm 300B
Rochester, New York 14614-1278
Tel#: (716) 428-6011

January 30, 1998
Suzanne Wheatcraft
Clough, Harbour & Associates
13 South Fitzhugh Street
Rochester, New York 14614-1497

Re: ARFF/PSTF Soils Management Plan

Dear Ms. Wheatcraft:

Attached please find our proposed soils management plan for future excavation work in the training ground at the existing Rochester Police and Fire Training Academy site. We prepared the plan with the assistance of Malcolm Pirnie Inc., the remedial project designer, and the plan is consistent with the draft Site Operations and Maintenance Plan. I have included the language from the City-County draft lease agreement regarding Monroe County's responsibilities for meeting the obligations of the O&M Plan and Record of Decision. We also have developed this plan from the perspective of the waste generator and site owner. As a result, we have based the process of waste determination and management of normal practices by the City.

If you have any questions about the plan or its implementation please give me a call at 428-5978. Thank you for your patience and cooperation.

Sincerely,

Mark D. Gregor
Manager, Division of Environmental Quality

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enc.
c A.Klumpp
J.Brennan
E.Tomasso
F.Ritz/MPI
A.Nagi/NYSDEC

EEO Employer/Handicapped

7. Enclosed is the City's proposed language for Article XX, third ¶, p. 20:

> Furthermore, pursuant to letters dated February 21, 1997 and April 9, 1997 between City and County, the County agrees to undertake, at its expense, a DEC required capping system for fire training grounds in accordance with Site Record of Decision and the Consent Order, Index No. B8-0205-87-09; the County is also responsible for operating and maintaining the facility consistent with the Site Record of Decision and the New York State approved Operations and Maintenance Manual for the Site. The County agrees to defend, indemnify and hold the City and MCC harmless against any and all liability, loss, damage, claim, suit, expense, fine, fee, penalty or cost of any kind, including attorney fees and consultant fees which the City or MCC may directly or indirectly incur, suffer or be required to pay as a result of the remediation work, undertaken by the County.

Aircraft Rescue and Firefighting/Public Safety Training Facility Project
Training Grounds Soils Management Plan

January 31, 1998

I. PURPOSE

Monroe County is constructing the Aircraft Rescue and Firefighting/Public Safety Training Facility (ARFF/PSTF) located at the Rochester Fire and Police Training Academy. This site recently underwent remediation by the City of Rochester under consent order with the New York State Department of Environmental Conservation (NYSDEC). A major element of the remediation was to remove soil contaminated with various hazardous wastes, including PCB's, fuel/solvent and lead and cadmium contaminated soil. The purpose of this soils management plan is to describe the steps which must be taken to characterize any soil excavated from the fire training grounds below the elevation where the previous remediation was completed and to manage any soil generated which is classified as a non-hazardous special waste or a hazardous waste. It is expected that soil excavated during the project below an elevation of 519 ft msl may still have contaminants present and could be classified either as a special waste or as a hazardous waste.

NYSDEC regulations regarding management of hazardous and non-hazardous special waste are contained in 6 NYCRR Parts 371, 372 and 6 NYCRR Part 360. Proper management requires that care be taken in planning, monitoring and testing excavated soil to properly characterize the soil and ensure proper disposition of the soil. This document provides guidance for the characterization and proper disposal of soils excavated from an elevation below 519 ft msl at the ARFF/PSTF construction site.

II. CITY OF ROCHESTER CONTACTS

Mark Gregor, City of Rochester, Manager, Division of Environmental Quality (428-5978) will provide technical assistance and consultation to Monroe County on issues of soil management and is the designated contact for communications with NYSDEC representatives.

Anne Klumpp, City of Rochester, Environmental Compliance Coordinator (428-7474), will coordinate waste transportation and disposal. Ms. Klumpp will assist Monroe County in securing waste profile acceptance from the disposal facility(ies) and will sign all waste profiles and hazardous waste manifests. She will be available to answer questions on waste transportation and disposal issues.

III. SOIL CHARACTERIZATION

A. Waste Types

It is anticipated that soils excavated from elevations below 519 ft msl may fall into one of three categories of waste:

1. Soil with no chemical constituents above NYSDEC cleanup levels

2. Contaminated soil containing levels of compounds above the NYSDEC cleanup levels, but which is classified as a non-hazardous special waste

3. Contaminated soil exhibiting characteristics which classify it as a hazardous waste

B. Sampling and Analysis

To determine which category these soils fall into, the Contractor must obtain one (1) representative sample per 100 yd^3 of soil excavated from below a level of 519 ft msl. Each sample must be analyzed by the contractor for the following:

- NYSDEC Record of Decision cleanup level list, limits are
  - Volatile organic compounds (VOC) by EPA method 8260 (ROD cleanup level = 10 ppm total VOCs),
  - PCBs by EPA method 8080 (ROD cleanup level =10 ppm total PCBs),
  - Total lead (ROD cleanup level = 250 ppm total lead) and
  - Total cadmium (ROD cleanup level = 10 ppm total cadmium).
- Guidance Values set forth in NYSDEC STARS #1 Policy (EPA methods 8020/8021, 8270)
- Hazardous Waste Characteristic of Toxicity, using the toxicity characteristic leaching procedure (TCLP) for EPA waste codes D004 - D043
- Polychlorinated biphenyls (PCBs) by EPA method 8080

C. Waste Determination Criteria

Soil which fails the TCLP for any of the hazardous waste characteristics of toxicity or contains greater than 50 ppm of PCBs will be classified as a hazardous waste.

Soil which is not characterized as a hazardous waste due to toxicity or PCBs, but which exceed any of the NYSDEC ROD cleanup levels or Stars #1 guidance values will be classified as non-hazardous special waste.

Since many disposal facilities require testing in addition to those listed above, it is recommended to the contractor that the following test also be performed by the contractor on each sample at the time of waste characterization:

- ignitability
- corrosivity
- reactivity
- paint filter test
- percent solids

IV. SOIL MANAGEMENT AND DISPOSAL

A. Soil Meeting all NYSDEC Cleanup Levels

Soils characterized as not exceeding any site cleanup levels or hazardous waste characteristic regulatory levels may be managed as typical construction and demolition debris. Such soils may be re-used on-site or disposed of at an off-site location that can legally accept C&D material. The contractor shall be responsible for selecting off-site disposal of soils meeting all cleanup levels.

B. Non-Hazardous Special Waste

The Contractor shall manage all non-hazardous special waste generated during the project must be managed in accordance with 6 NYCRR Part 360 regulations. Excavated special waste which will be staged on-site prior to off-site shipment must be placed on and covered with 6mm poly sheeting to prevent migration of contaminants. The material must be disposed of at an approved RCRA Subtitle D and 6 NYCRR Part 360 permitted facility such as the Monroe County Mill Seat Landfill.

The City of Rochester will be listed as the generator of the waste on all profiles and shipping papers and a City representative will sign all profiles and shipping papers.

C. Management of Hazardous Waste

The Contractor shall store all hazardous waste generated at the site will be stored in compliance with applicable federal and state hazardous waste management regulations. Hazardous waste stored at the site prior to shipment must be staged on and covered with 6 mm poly sheeting to prevent migration of hazardous waste.

Hazardous waste may be accumulated on site for as period not exceeding 90 days. The waste must be manifested and shipped to a treatment storage and disposal facility (TSDF) before the 90 day accumulation time is up. All hazardous waste will be shipped to CWM on a New York State Hazardous Waste Manifest. Manifests will be reviewed and signed by Anne Klumpp or Mark Gregor. The transporter utilized to transport hazardous waste must be a fully licensed and permitted hazardous waste transporter. A list of possible waste transporters can be supplied by the City to Monroe for this project.

Note to Contractor:
During the remediation project which took place recently at the Fire Academy, hazardous waste soil was shipped to CWM Chemical Services in Model City, New York. Copies of the profiles for these waste streams are attached to this plan. CWM has indicated hat the information from the existing profiles can be transferred to new profiles without waiting for a new approval to be obtained to facilitate shipment of any hazardous waste generated during the ARFF/PSTF project.

Waste generated during the remediation project at the Fire Academy met the land disposal restriction treatment standard for the hazardous waste characterization associated with the waste. Should initial laboratory analysis show that the hazardous waste does not meet the treatment standard for land disposal of hazardous waste, an alternative TSDF must be utilized for disposal. The City can assist the County in locating an alternative facility and in profiling the waste into the facility.

V. SITE MONITORING

During Training Grounds excavation work at the site below 519 ft msl, the contractor must provide a health and safety officer on site to monitor the work. The work must be performed in accordance with a Health and Safety Plan approved by the City prior to commencement of work. All site workers performing excavation below 519 ft msl must have received and is current in OSHA 1910.120 Hazardous Waste Operations and Emergency Response training.

VI. SUMMARY OF RESPONSIBILITIES

The Contractor shall:

1. Notify the City of its proposed schedule for performing work involving excavation below 519 ft msl at the site.
2. Sample soil excavated at or below 519 ft msl in increments of every 100 yd^3.
3. Perform the analytical testing outlined in this guidance document on waste

excavated at of below 519 ft msl.

4. Stage excavated soil in accordance with this plan
5. Submit proposed disposal facilities and transporters for non-hazardous special waste and hazardous waste to the City for approval prior to any shipment of waste from the site.
6. Have a trained Health and Safety Officer and trained OSHA 1910.120 workers at the site during excavation work.
7. Contract and schedule shipments directly with the disposal facility and transporters for waste removal.
8. Notify the City 24 hours in advance of planned shipments off-site so that a City representative can be present to sign manifests, shipping papers, land disposal restriction forms and other generator paperwork.
8. Prepare necessary profiles, manifests, bills of lading, and any associated paperwork necessary for waste approval and removal and provide completed unsigned original paperwork to the City for approval and signature.

The City of Rochester will:

1. Review and give final approval for waste transporters and disposal facilities submitted for consideration by the contractor within two (2) working days of receipt of proposed transporters and disposal facilities.
2. As the generator, within two (2) working days after receipt of test data, interpret analytical results from the soil samples to determine if the soil should be characterized as non-hazardous special waste or hazardous waste.
3. Sign all waste profiles, manifests, bills of lading and any associated paperwork necessary for waste approval and removal.
4. Be available to answer questions on waste issues related to waste approval and removal from the site.

G:\ENVQUAL\ARFFCONT.WPD

GENERATOR'S WASTE PROFILE SHEET

* PLEASE PRINT IN INK OR TYPE

Service Agreement on File? ☒YES ☐NO

Profile Number: WMI CF 7308

☒Hazardous ☐Non-Hazardous ☐TSCA

Renewal Date: / /

A. Waste Generator Information

1. Generator Name: City of Rochester
2. SIC Code:
3. Facility Street Address: 1190 Scottsville Road
4. Phone: ( )
5. Facility City: Rochester, NY
6. State/Province: NY
7. Zip/Postal Code: 14624
8. Generator USEPA/Federal ID #: NY0980535116
9. County: Monroe
10. State/Province ID #:
11. Customer Name: Thermoflex Kimmins
12. Customer Phone: (716) 328-6170
13. Customer Contact: Ralph Argen
14. Customer Fax: 716/328-6183
15. Billing Address: 1190 Scottsville Road, Rochester NY 14624 ☐Same as above

B. Waste Stream Information

1. Description

a. Name of Waste: lead, Cadmium Soil

b. Process Generating Waste: Site Remediation

Generator mailing address:
30 Church Street
Room 300 B
Rochester, NY 14614

c. Color	d. Strong odor (describe):	e. Physical state @ 70°F	f. Layers	g. Free liquid range
Black/Brown	NO	☑Solid ☐Liquid ☐Gas ☐Sludge ☐Other	☑Single Layer ☐Multi-layer	0 to %
				h. pH: Range N/A to %

i. Liquid Flash Point: ☐<73°F ☐73-99°F ☐100-139°F ☐140-199°F ☐≥ 200°F ☒Not applicable

j. Chemical Composition (List all constituents [including halogenated organics, debris, and UHC's] present in any concentration and submit representative analysis):

Constituents	Concentration Range	Constituents	Concentration Range
100% Soil	99.150		
lead, cadmium	0-1%		

TOTAL COMPOSITION MUST EQUAL OR EXCEED 100%

k. ☐Oxidizer ☐Pyrophoric ☐Explosive ☐Radioactive ☐Carcinogen ☐Infectious ☐Shock Sensitive ☐Water Reactive

l. Does the waste represented by this profile contain any of the carcinogens which require OSHA notification? (list in Section B.1.j) ☐YES ☒NO

m. Does the waste represented by this profile contain dioxins? (list in Section B.1.j) ☐YES ☒NO

n. Does the waste represented by this profile contain asbestos? ☐YES ☒NO
If yes, ☐friable ☐non-friable

o. Does the waste represented by this profile contain benzene? ☐YES ☒NO
If yes, concentration _____ ppm
Is the waste subject to the benzene waste operations NESHAP? ☐YES ☒NO

p. Is the waste subject to RCRA Subpart CC controls? ☐YES ☒NO
If yes, volatile organic concentration _____ ppmw

q. Does the waste contain any Class I or Class II ozone-depleting substances? ☐YES ☒NO

r. Does the waste contain debris? (list in Section B.1.j) ☐YES ☒NO

2. Quantity of Waste
Estimated Annual Volume 1600 ☒Tons ☒Yards ☐Drums ☐Other (specify) _____

3. Shipping Information

a. Packaging:
☒Bulk Solid; Type/Size: Dump ☐Bulk Liquid; Type/Size: _____
☐Drum; Type; Size: _____ ☐Other: _____

b. Shipping Frequency: Units 1600 Per: ☐Month ☐Quarter ☐Year ☒One time ☐Other _____

c. Is this a U.S. Department of Transportation (USDOT) Hazardous Material? (If no, skip d, e, and f) ☒YES ☐NO

Form WMI-4153

GENERATOR'S WASTE PROFILE SHEET

PLEASE PRINT IN INK OR TYPE

d. Reportable Quantity (lbs.; kgs.): 100 # e. Hazard Class/ID #: 9

f. USDOT Shipping Name: RQ Hazardous Waste, Solid, n.o.s. NA3077 PG III (D008, D

g. Personal Protective Equipment Requirements:

h. Transporter/Transfer Station:

C. Generator's Certification (Please check appropriate responses, sign, and date below.)

1. Is this a USEPA hazardous waste (40 CFR Part 261)? If the answer is no, skip to 2. ☒YES ☐NO
   a. If yes, identify ALL USEPA listed and characteristic waste code numbers (D, F, K, P, U) D008, D006
   b. If a characteristic hazardous waste, do underlying hazardous constituents (UHCs) apply? (If yes, list in Section B.1.j) ☐YES ☒NO
   c. Does this waste contain debris? (If yes, list size and type in Chemical Composition - B.1.) ☐YES ☒NO

2. Is this a state hazardous waste? ☐YES ☒NO
   Identify ALL state hazardous waste codes

3. Is the waste from a CERCLA (40 CFR 300, Appendix B) or state mandated clean-up? ☒YES ☐NO
   If yes, attach Record of Decision (ROD), 104/106 or 122 order or court order that governs site clean-up activity. For state mandated clean-up, provide relevant documentation.

4. Does the waste represented by this waste profile sheet contain radioactive material, or is disposal regulated by the Nuclear Regulatory Commission? ☐YES ☒NO

5. Does the waste represented by this waste profile sheet contain concentrations of Polychlorinated Biphenyls (PCBs) regulated by 40 CFR 761? (If yes, list in Chemical Composition - B.1.j) ☐YES ☒NO
   a. If yes, were the PCBs imported into the U.S.? ☐YES ☐NO

6. Do the waste profile sheet and all attachments contain true and accurate descriptions of the waste material, and has all relevant information within the possession of the Generator regarding known or suspected hazards pertaining to the waste been disclosed to the Contractor? ☒YES ☐NO

7. Will all changes which occur in the character of the waste be identified by the Generator and disclosed to the Contractor prior to providing the waste to the Contractor? ☒YES ☐NO

☐Check here if a Certificate of Destruction or Disposal is required.

Any sample submitted is representative as defined in 40 CFR 261 - Appendix I or by using an equivalent method. I authorize WMI to obtain a sample from any waste shipment for purposes of recertification. If this certification is made by a broker, the undersigned signs as authorized agent of the generator and has confirmed the information contained in this Profile Sheet from information provided by the generator and additional information as it has determined to be reasonably necessary. If approved for management, Contractor has all the necessary permits and licenses for the waste that has been characterized and identified by this approved profile.

Certification Signature: Anne E. Spaulding Title: Env. Compliance Coordina

Name (Type or Print): Anne E. Spaulding Company Name: City of Rochester Date: 9/18/97

☐Check if additional information is attached. Indicate the number of attached pages

D. WMI Management's Decision — FOR WMI USE ONLY

1. Management Method ☐Landfill ☐Non-hazardous Solidification ☐Bioremediation ☐Incineration ☐Hazardous Stabilization ☐Other (Specify)
2. Proposed Ultimate Management Facility:
3. Precautions, Special Handling Procedures, or Limitation on Approval:

4. Waste Form 5. Source 6. System Type

Special Waste Decision ☐Approved ☐Disapproved

Salesperson's Signature: Date:

Division Approval Signature (Optional): Date:

Special Waste Approvals Person Signature: Date:

Form WMI-4153

95032

Chemical Waste Management, Inc.

Date Printed 07/31/97

GENERATOR'S WASTE PROFILE SHEET

Profile # MWF BQ9346

(X) Check here if this is a Recertification LOCATION OF ORIGINAL MIDWEST REGIONAL LAB BQ9346

GENERAL INFORMATION

1. Generator Name: ROCHESTER POLICE & FIRE DEPTS
2. Generator Address: 1190 SCOTTSVILLE RD BLDG 1.11
   ROCHESTER NY 14624-5174
3. Technical Contact/Phone: MARK CHASLIN 716/428-5978
4. Alternate Contact/Phone: ANNE SPAULDING 716/428-7474

Generator USEPA ID: NYD980333116

Billing Address: (_) Same
THERMOCOR KIMMINS
250 3RD ST
PO BOX 120
NIAGARA FALLS NY 14303-8020

Billing Contact/Phone: ~~ROBERT ANDREWS~~ Ralph Avgen 716/282-7252

PROPERTIES AND COMPOSITION

5. Process Generating Waste: SITE REMEDIATION
6. Waste Name: SOIL CONTAMINATED WITH PCBS
7A. Is this a USEPA hazardous waste (40 CFR Part 261)? Yes (_) No (X)
B. Identify ALL USEPA listed and characteristic waste code numbers (D,F,K,P,U):
State Waste Codes: B007
8. Physical State @ 70F: A. Solid(X) Liquid(_) Both(_) Gas(_) B. Single Layer (X) Multilayer (_) C. Free liq. range 0 to 0%
9A. pH: Range _____ or Not applicable (X) B. Strong Odor (_):describe
10. Liquid Flash Point: < 73F (_) 73-99F (_) 100-139F (_) 140-199F (_) >= 200F (_) N.A. (X) Closed Cup (X) Open Cup (_)
11. CHEMICAL COMPOSITION: List ALL constituents (incl. halogenated organics) present in any concentration and forward analysis

Constituents	Range	Unit Description
SOIL	to 100	%
	to	
	to	
	to	
	to	
	to	
TOTAL COMPOSITION (MUST EQUAL OR EXCEED 100%):	100.000000	

12. OTHER: PCBs if yes, concentration _____ ppm, PCBs regulated by 40 CFR 761 (_). Pyrophoric (_) Explosive (_) Radioactive (_) Benzene if yes, concentration _____ ppm. WESTAF (_) Shock Sensitive (_) Oxidizer (_) Carcinogen (_) Infectious (_) Other
13. If waste subject to the land ban & meets treatment standards, check here: _ & supply analytical results where applicable.
000000

SHIPPING INFORMATION

14. PACKAGING: Bulk Solid (X) Bulk Liquid (_) Drum (_) Type/Size: OTHER Other END DUMPS
15. ANTICIPATED ANNUAL VOLUME: 2640 Units: TONS Shipping Frequency: DAY

SAMPLING INFORMATION

Sample Tracking Number:
16a. Sample Source (drum, lagoon, pond, tank, vat, etc.):
Date Sampled: Sampler's Name/Company:
16b. Generator's Agent Supervising Sampling: 17. (_) No sample required (See instructions.)

GENERATOR'S CERTIFICATION

I hereby certify that all information submitted in this and all attached documents contains true and accurate descriptions of this waste. Any sample submitted is representative as defined in 40 CFR 261 - Appendix I or by using an equivalent method. All relevant information regarding known or suspected hazards in the possession of the generator has been disclosed. I authorize CWM to obtain a sample from any waste shipment for purposes of recertification.

Signature

Anne Spaulding Env. Compliance Coord 8/1/97
Name and Title Date

Date Printed 07/31/97

~~Is your waste hazardous considering [illegible] if the waste contains any of the following~~

ORGANICS	TCLP Information: Check only ONE for each constituent				TCLP Data	TCA or TOTAL
	Less than	Regulated Level	Equal or More	Waste No.	TCLP Analytical Test Results Use units: ppm or mg/l	Use units: ppm, mg/l or %
Benzene	X	0.5 mg/l		D018		
Carbon Tetrachloride	X	0.5 mg/l		D019		
Chlordane	X	0.03 mg/l		D020		
Chlorobenzene	X	100.0 mg/l		D021		
Chloroform	X	6.0 mg/l		D022		
m-Cresol	X	200 mg/l		D024		
o-Cresol	X	200.0 mg/l		D023		
p-Cresol	X	200.0 mg/l		D025		
Cresol	X	200.0 mg/l		D026		
2,4-D	X	10.0 mg/l		D016		
1,4 Dichlorobenzene	X	7.5 mg/l		D027		
1,2-Dichloroethane	X	0.5 mg/l		D028		
1,1-Dichloroethylene	X	0.7 mg/l		D029		
2,4-Dinitrotoluene	X	0.13 mg/l		D030		
Endrin	X	.02 mg/l		D012		
Heptachlor, & Hydroxide	X	0.008 mg/l		D031		
Hexachloro-1,3 Butadiene	X	0.5 mg/l		D033		
Hexachlorobenzene	X	0.13 mg/l		D032		
Hexachloroethane	X	3.0 mg/l		D034		
Lindane	X	0.4 mg/l		D013		
Methoxychlor	X	10.0 mg/l		D014		
Methyl Ethyl Ketone	X	200.0 mg/l		D035		
Nitrobenzene	X	2.0 mg/l		D036		
Pentachlorophenol	X	100.0 mg/l		D037		
Pyridine	X	5.0 mg/l		D038		
Tetrachloroethylene	X	0.7 mg/l		D039		
Toxaphene	X	0.5 mg/l		D015		
2,4,5-TP Silvex	X	1.0 mg/l		D017		
Trichloroethylene	X	0.5 mg/l		D040		
2,4,5-Trichlorophenol	X	400.0 mg/l		D041		
2,4,6-Trichlorophenol	X	2.0 mg/l		D042		
Vinyl Chloride	X	0.2 mg/l		D043		