TECHNICAL REPORT

Contingency Plan
Groundwater Remedy

Universal Instruments
Kirkwood, New York

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engineers & scientists

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1. Introduction

On behalf of Universal Instruments Corporation (Universal Instruments), Blasland, Bouck & Lee, Inc. (BBL) has prepared this Contingency Plan regarding the groundwater remedy at the former Dover Electronics Site (Site) (Site Number 7-04-026) located in Kirkwood, New York. This Contingency Plan was prepared to satisfy the requirements of the executed Order on Consent between Universal Instruments and the New York State Department of Environmental Conservation (NYSDEC), dated January 2001. These requirements stipulate that a contingent plan for groundwater control and treatment be available should the primary remedy for the dissolved-phase groundwater plume fail to meet its performance criteria.

1.1 Purpose

This submittal has been prepared in accordance with the approved Remedial Design Work Plan (RDWP, June 2001) for the Site. The RDWP was prepared pursuant to the Record of Decision (ROD, 2001) and Administrative Consent Order (ACO, 2001) for the Site.

To satisfy the Contingency Plan requirements of the ROD and ACO, this document presents a design for a groundwater pump and treat system for the downgradient edge of the dissolved-phase plume area. Given the current understanding of groundwater quality at the site, an in-situ enhanced bioremediation pilot study has been initiated. The enhanced in-situ bioremediation should more effectively accomplish the groundwater remediation objectives of the ROD.

The purpose of this Contingency Plan is to provide a design and schedule for:

- the horizontal and vertical hydraulic control of the downgradient portion of the groundwater plume should the volatile organic compounds (VOCs) in groundwater begin to migrate;
- the basis for preparation of a groundwater extraction and treatment system construction package should the evaluation of the alternative remedy show that the plume is not being reduced, controlled, nor mitigated to the extent practicable; and
- the requirements for submittal of a System Construction Package for groundwater extraction and treatment, which will contain construction specifications and a construction schedule for the system.

Based on recent correspondence and conversations with the NYSDEC, the remedial action of groundwater extraction and treatment will only be implemented in the event that the in-situ bioremediation field study fails to demonstrate its effectiveness in attaining the remedial action objectives for the site.

1.2 Goals

The goals of the Contingency Plan are the same as those of the overall groundwater remediation program as described in the ROD (see Section 6, page 13 of ROD). These remediation goals, in essence, are to meet the NYSDEC's Standards, Criteria, and Guidance (SCGs) for constituents of concern (COCs) and to be protective of human health and the environment. The goals of the Contingency Plan for this site are:

- to reduce, control, or eliminate, to the extent practicable, the COCs present in the groundwater beneath the site;

- to reduce, control, or eliminate, to the extent practicable, the continued migration off site of groundwater affected by VOCs;

- to eliminate, to the extent practicable, exceedances of applicable environmental quality standards related to groundwater;

- to protect human health and the environment through implementation, operation, and monitoring of the groundwater extraction and treatment system described in this Contingency Plan.

2. Background

The former Dover Electronics facility is located at 29 Industrial Park Drive, Kirkwood, Broome County, New York. The facility is located on a site approximately 9.58 acres in size. A site location map is shown on Figure 1, and Figure 2 is the site map.

The property is situated in an industrial setting. Major plants in the area include Truckstops of America Landfill (0.5 mile southeast), Frito Lay Plant (0.5 mile south), Universal Instruments (147 Industrial Park Drive, 0.5 mile east), Kason Industries (eastern property boundary), Consolidated Freightways (northern property boundary), and the newly developed Pilot Truckstop to the south. Industrial properties surround the property to north, east, and west. The property consists of an industrial building with areas outside and inside used for drum and chemical storage. The site currently serves as the corporate headquarters for Universal Instruments and is being used as an electronic circuit board manufacturing facility.

2.1 Site History

The facility was first constructed in 1973, with subsequent additions built in 1978, 1982, and 1984. It has been occupied by Universal Instruments and Dover Electronics. In 1993, Dover Electronics was renamed Dovatron, Inc. (Dovatron). In 1995, Dovatron transferred its title to the facility to Universal Instruments. In 1996, Dovatron changed its name to the DII Group. The site currently serves as the corporate headquarters for Universal Instruments. The facility has reportedly been used for electronic circuit board manufacturing since 1973.

Previous on-site circuit board manufacturing processes used tetrachloroethene (PCE) as a cleaning solvent. Originally, the virgin PCE was stored in 55-gallon drums at an outer drum storage area. During the initial facility expansion, a ramp to the east-side overhead door served as the entry point for PCE drums. As production increased and the facility was again expanded, virgin PCE was stored in a 3,000-gallon aboveground storage tank that has since been removed. An aboveground 5,000-gallon waste PCE flux storage tank was also located on the site. In March 1992, a 10,000-gallon fuel oil tank was reportedly removed from the site, and in March 1993, the aboveground PCE system was dismantled. Two 480-gallon PCE tanks were reportedly dismantled and removed from the building interior at that time. Historical handling and use of PCE has resulted in its documented presence in the soil, stormwater, and groundwater at this site.

2.2 Summary of Previous Site Investigations

Several environmental investigations at the facility have been conducted since the 1990s by various environmental consultants. These site investigations included various phases of soil and groundwater sampling, a soil gas survey, test trenching, and sediment sampling within the stormwater system.

After the former aboveground 5,000-gallon flux tank that contained PCE was dismantled in March 1993, a groundwater extraction program was implemented as an interim remedial measure (IRM). Two groundwater recovery wells (RW-1 and RW-2) were installed near the former PCE tanks located at the rear of the facility building in April 1993. These wells were constructed of 4-inch-diameter PVC to a depth of approximately 58 feet below ground surface (bgs). This groundwater treatment system became operational on August 17, 1994. Due to cracked piping, the system was not operational from December 1994 to May 1995. The piping was replaced with polyethylene tubing with heat trace tape. The system was again not operational from July 1995 to October 1995 due to a decline in the groundwater levels to below the bottom of the recovery wells. Historically, groundwater at the two recovery wells (RW-1 and RW-2) has been pumped at very low flow rates. Reportedly,

the maximum amount of groundwater pumped in one day was 90 gallons. The recorded flow over 150 days of operation (early operational data) shows the system pumping an average of 30 gallons per day. The system operated on a limited schedule, but was shut down and abandoned in 1996. This IRM may have removed up to 12,000 gallons of groundwater.

Two more recovery wells were installed (RW-3 and RW-4) in 1997. RW-3 was installed adjacent to MW-7 as part of another IRM groundwater extraction and treatment system. RW-4 was used for a vacuum-enhanced pumping pilot treatment well in the source area.

The vacuum-enhanced pumping (VEP) pilot test was performed in December 1997 at well RW4 to test the potential for source area remediation and to reduce downgradient contaminant migration. The pilot test lasted approximately three hours. After a vacuum was applied to RW-4, low magnitude responses were observed in the vapor monitoring points (VMPs) at different depths and lateral points of the formation. The radius of influence (ROI) observed in the field was generally not radially symmetrical. The largest recorded manometer response was in VMP-2 (shallow) at 15 lateral feet from the vacuum well.

The second IRM groundwater extraction and treatment program was installed next to MW-7 to help control the migration of the dissolved-phase PCE plume. Groundwater treatment was accomplished using granulated activated carbon (GAC). This groundwater extraction and treatment system was installed in November 1997 and this IRM became operational in April 1998 and remained in operation into December of 1998. During this time approximately 41,000 gallons of water were extracted from well RW-3. The groundwater withdrawal rate was estimated to average on continuous basis 0.124 gallon per minute (gpm). This well yield was substantially below the estimated yield for RW-3 of 1.0 gpm.

2.3 Summary of the Remedial Investigation/Feasibility Study

Shield Environmental initiated the RI fieldwork in October 1998. The scope of the work included an additional contaminant source area investigation, surface water and sediment sampling, geologic investigation, on-site and off-site groundwater investigation, and indoor air monitoring.

Three investigative techniques were used in the contaminant source area investigation. These techniques included exploratory trenching, split-spoon soil sampling, and surface water and sediment sampling.

Groundwater monitoring well installation, monitoring well sampling, and aquifer testing were conducted during the RI field activities. Monitoring wells MW-1 through MW-14 existed prior to the initiation of RI activities, with the exception of MW-4 and MW-10, which had been abandoned. RW-1, RW-2, and RW-4 were also abandoned prior to the initiation of RI field activities. Shield Environmental installed 23 groundwater monitoring wells during the RI field activities. The monitoring wells were gauged and/or sampled in November 1998 and February, April, and July 1999 to determine the potentiometric surface of the aquifer and the lateral and vertical extent of the dissolved-phase contaminant plume. These groundwater sampling events showed that the plume extended in the subsurface from the onsite southeast basin outfall pipe offsite onto the Pilot Truck Stop property. Two primary areas of higher dissolved-phase PCE concentrations were detected: an onsite area extending from MW-24 to the lower parking lot and an offsite area centered around the MW-25/MW-28/MW-34 well cluster.

Aquifer tests were also performed using limited (in time and in observation points) pumping tests in monitoring wells MW-3, MW-12, MW13, MW-22, MW-25, and MW-34 to establish the approximate hydraulic conductivity, transmissivity, and permeability of the aquifer(s). Another goal of the pumping test was to assess potential hydraulic connections between clustered wells screened within the same aquifer or in different

aquifers. The estimated hydraulic conductivities derived from the pump testing ranged from 10^{-3} to 10^{-6} cm/sec, indicating that there is variation in the hydrogeologic setting at the site. Hydraulic connections between the clustered well pairs were not observed.

Air monitoring activities were conducted in the building to document worker safety and potential exposure. Three different air sampling events were conducted inside the facility. The air sampling was conducted according to the amended IRM Work Plan based on Shield Environmental's letter dated October 30, 1999. Canisters were placed in the office area, A/C area, electrical area, and outside (background sample). Sampling events were conducted on November 3, 1998; December 7, 1998; and March 4, 1999.

The RI and FS final reports were presented to the NYSDEC in July 2000. The RI Report summarizes the results of all investigations conducted to date at the site and presents a conceptual model of contaminant migration. It also evaluates the nature and extent of any threat to human health or the environment caused by contamination at the site. The FS Report contains alternatives for appropriate remedial action to minimize or mitigate any identified risks associated with chemicals of concern at the site. The remedy recommended in the FS Report and subsequently selected in the March 2000 ROD by the NYSDEC was summarized above in Section 1.1.

Further evaluation of site environmental data resulted in Universal Instruments proposing the use of hydrogen and oxygen releasing compounds that can accelerate the removal of dissolved constituents at the site, and provide containment and control of the byproducts that are produced during the in-situ biodegradation process. As a result of the conference call on November 8, 2000, the NYSDEC agreed to the proposed in-situ, full-scale bioremediation pilot-testing program.

The FS presented a conceptual design for a groundwater pump and treat system which formed the basis of the remedy selected in the ROD. This conceptual design includes pumping from extraction wells located at the periphery of an inferred primary plume, with re-injection into the center of the inferred plume via a recharge trench.

Recent groundwater sampling in September 2001 indicates differing conditions within the plume area than those documented at the completion of the RI and FS. These differing conditions are described in the Soil Pre-Design Report dated January 23, 2002. In summary the differing conditions observed include:

- groundwater impacts related to chlorinated COCs have ameliorated because of natural degradation processes to lesser concentrations within the both the shallow and deeper zones of the primary plume areas, as well as in the adjoining lesser affected areas;
- the present configuration of the groundwater plume shows that the total area affected has diminished as compared to the plume shape from two to three years ago, which indicates a stable to shrinking plume resulting from the mass removal of COCs by natural attenuation;
- the detections of VOCs representing the degradation products of PCE along with reduction-oxidation potentials indicating reducing conditions, which support the conclusion that a favorable environment for in-situ, enhanced biodegradation of the groundwater plume exists in the saturated subsurface; and
- additional information related to aquifer geochemistry within the plume area was collected in December 2001, which supports the conditions reported above.

The design for groundwater extraction and treatment presented in this Contingency Plan incorporates the most recent groundwater data.

3. Design For Pump and Treat Contingency

The Remedial Design for the Contingency Plan groundwater extraction and treatment system includes the following proposed elements:

- placement of extraction wells;
- preliminary design and operational flow rates;
- design mass-loading rates and effluent goals;
- treatment technologies to be employed prior to surface water discharge; and
- layout of the treatment works.

The Remedial Investigation Report (Shield, 2000; Section 3.3.3) indicates that the only quantitative data available for hydraulic conductivity in the targeted saturated interval in the vicinity where the contingent remedy would be implemented was acquired during a very brief single-well pump test at monitoring well MW-25. This hydraulic conductivity data is semi-quantitative and insufficient to allow for more than a preliminary design.

The data provided in the Remedial Investigation Report indicates that the upper part of the shallow saturated zone has a hydraulic conductivity of approximately 1.00×10^{-3} centimeters per second (cm/s), the average of the pumping and recovery analysis for a partially penetrating well test[1]. Based on this data and a review of the boring logs for other monitoring wells located on the Pilot Truck Stop, the hydraulic conductivity value probably represents the upper limit of a range where the lower limit of hydraulic conductivity is approximately 1.00×10^{-4} cm/s (an average value for a silty sand). The middle of this range, 5.00×10^{-4} cm/s, was used in designing the layout of the extraction well network.

Should implementation of the Contingency Plan be necessary, a 48-hour aquifer performance test will be performed on a test well (proposed extraction well near MW-31) to better assess hydraulic conductivity in the full thickness of the shallow saturated zone. Installation of the test well and subsequent aquifer performance testing would be conducted during the second week after written notification from NYSDEC that implementation of the Contingency Plan was required. Groundwater produced during this pump test, if performed, would be stored in temporary storage tanks (10,000-gallon total capacity) on the Pilot Truck Stop site. Production of groundwater is not anticipated to exceed 8,700 gallons (rate of 3 gallons per minute for 48 hours). The stored groundwater would be discharged to the Pilot Truck Stop storm water sewer system, upon regulatory approval, through granulated activated carbon vessels. Should unacceptable concentrations of vinyl chloride be present in the stored groundwater, the water will be treated with a combination of hydrogen peroxide and Fenton's reagent prior to discharge.

3.1 Proposed Groundwater Hydraulics

The objectives of the proposed groundwater hydraulics for the pump and treat system are to:

[1] Monitoring Well MW-25 was pumped at a rate of 0.6 gallons per minute for 4.5 hours. The well construction details (Shield, 2000) show that MW-25 fully penetrates the shallow saturated zone, but the slotted interval covers just the bottom 15 percent. A drawdown response was not observed in either other two nearby monitoring wells in the cluster (MW-28 and MW-34). The geologic logs clearly show that MW-34 is screened within an entirely separate hydrogeologic unit, whereas MW-28 has a screened interval that covers the top half of the shallow saturated zone. A drawdown response should have occurred in MW-28, unless vertical conductivity in this area is much less than the horizontal. This would appear to be the case here.

- collect affected groundwater from the downgradient edge of the dissolved-phase plume area to allow VOC removal with the goal of intercepting and controlling horizontal and vertical plume migration to prevent further downgradient movement within the limits of technical practicability;
- discharge groundwater to surface water to minimize the potential for spreading groundwater impacts into unaffected areas; and
- optimize the quantity of ground water treated such that the environmental benefit of remediating of the aquifer is not offset by energy usage and waste production.

The design of the proposed groundwater extraction and treatment system was performed using existing site data. The Construction Package will include additional and more detailed information about site-specific groundwater hydraulics.

3.1.1 Extraction Wells

The location of the groundwater extraction wells is consistent with the objectives stated above. The extraction wells will remove groundwater in a downgradient location outboard of the present location where oxygen-releasing compound (ORC) was injected into the shallow saturated zone. These wells should extract groundwater at a rate sufficient to create a combined horizontal and vertical capture zone that will prevent dissolved-phase COCs from moving further downgradient of the existing leading edge of the plume at concentrations greater than NYSDEC standards.

In order to control groundwater and create the capture zone described above, each extraction well will be constructed with a 6-inch diameter casing with a screened interval 20 feet in length. Each of the extraction wells will be completed to a total depth of 36 feet.

The wells should serve to intercept groundwater throughout the vertical extent of the unconfined saturated interval as it approaches the well barrier thereby preventing the migration of the COCs further downgradient.

The extraction scheme consists of a single row of four wells pumping at an average combined pumping rate between 4.0 to 6.0 gallons per minute (1.0 to 1.5 gpm average from each well). These flow rates are preliminary and are based on the data available at this time. Final design pumping rates and extraction well construction details will be based on the results of the aquifer test described above.

The location of the proposed groundwater extraction wells is presented on Figure 3. The proposed groundwater extraction wells are located on the Pilot Truck Stop property between wells MW-30 and MW-31. An agreement to allow access to the Pilot Truck Stop property for groundwater remediation has been obtained.

3.1.2 Surface Water Discharge

The extracted groundwater will be discharged after treatment to surface water through the existing stormwater discharge system on the Pilot Truck Stop. The discharge of treated groundwater to surface water would occur only after all of the substantive requirements of a State Pollutant Discharge Elimination System (SPDES) permit have been met and are in place. The groundwater will be discharged to surface water for the following reasons:

- prevent uncontrolled spreading of the plume because of a lack of sufficient groundwater hydraulic data to confidently predict the ability of the subsurface to accept the treated water and to predict resulting changes in localized groundwater gradients;
- prevent unpredicted groundwater movement resulting from iron precipitation in infiltration wells or trenches;

- discharge to the publicly-owned treatment works (POTW) is unfeasible because new permits for remediation wastewater cannot be issued due to POTW capacity limits; and
- limit the size of the piping and well network on the Pilot Truck Stop.

3.2 Basis of Design Influent and Effluent

The Basis of Design Influent was developed using the available groundwater quality data from 1999 to 2001. Table 2 presents the Basis of Design Influent concentrations. The anticipated concentrations were developed using the following methodology:

- compilation of the groundwater quality data;
- identifying compounds which are most important to the design of the proposed treatment works;
- evaluating the maximum and average concentrations of the identified compounds by location and frequency of detection within the immediate area anticipated to contribute COCs to groundwater captured by the extraction well network;
- developing anticipated dilution factors to address the flow from the complete set of extraction wells.

Table 3 presents the Basis of Design Effluent. The effluent requirements listed in the table are intended to be consistent with SPDES discharge requirements and/or New York Surface Water Quality Standards.

3.3 Proposed Process Flow

The proposed treatment system consists of four primary pieces of equipment:

- the equalization tank;
- low-profile air stripper;
- vapor phase granulated activated carbon adsorption (to treat the vapor exhaust from the low profile air stripper); and
- liquid phase granulated activated carbon adsorption (to polish the wastewater discharge from the air stripper).

These pre-engineered, packaged systems were selected based on the given site constraints, anticipated influent conditions, capital and operational costs, and operation, maintenance, and monitoring requirements. Assumptions used to develop the proposed design for the treatment system, in order to meet the effluent requirements, include the following:

- the treatment system will operate continuously, 24 hours per day, 7 days per week;
- no emergency backup power is required;
- no redundancy in treatment equipment, process pumps, or piping is required;
- process pumps will deliver a constant rate of flow (i.e., variable speed drive pumps will not be provided); and
- the system is not designed to treat compounds other than those identified in this basis of design as shown in Table 2.

The proposed groundwater treatment system is to be constructed on the Site, within a pre-treatment building to provide security and to protect the system from natural elements. The proposed treatment system will receive water from four groundwater extraction wells at a normal combined flow rate of 6 gpm (16 gpm maximum). Ground water pumped from the extraction wells will be conveyed to the groundwater treatment system through secondary containment underground piping. Water entering the treatment system will collect in a 1,500-gallon equalization tank. It will then be pumped directly to the inlet of the low-profile air stripper. Treated water will be pumped from the air stripper through two carbon vessels then returned through underground piping to a hookup with the stormwater discharge system for the Pilot Truck Stop. Vapor exhaust from the low profile air stripper will be blown through three GAC vessels linked in a series.

A site plan showing the proposed extraction well locations and the proposed layout of extraction well piping and wastewater discharge piping is shown on Figure 3. A schematic of a typical groundwater extraction well is shown on Figure 4. The process flow diagram for the groundwater treatment system is presented on Figure 5, and the proposed building layout is presented on Figure 6. Presented below are descriptions of the groundwater treatment system equipment, instrumentation and controls, and preliminary operation, maintenance and monitoring requirements.

3.3.1 Extraction Wells

The groundwater extraction scenario consists of four extraction wells located in a row between monitoring wells MW-30 and MW-31. Each extraction well will consist of a six-inch diameter stainless steel cased well. The extraction wells will be approximately 30 feet deep. The well screens will intercept, at a minimum, 80% of the vertical profile of the shallow and unconfined groundwater zone. The length of the screen will be approximately 15 feet. Individual pumps will be located in each extraction well to pump water from the well. The pump intakes will be set vertically in the well approximately 4 feet from the bottom. Preliminary construction details of a typical extraction well for this plan are shown on Figure 4.

3.3.2 Equalization Tank

Ground water pumped from the extraction wells will be routed directly to an equalization tank. The purpose of the equalization tank will be to provide sufficient storage to equalize the treatment system flow rates. The equalization tank will be located within the pre-treatment building. The proposed tank is an 7-foot-diameter by approximately 5-foot-high linear low density polyethylene (LLDPE) tank with a 1,500 gallon nominal capacity (an existing tank from a prior IRM exists onsite and meets the specification). Water will be discharged from the tank to the proposed low profile air stripper treatment system by a centrifugal pump located adjacent to the tank.

3.3.3 Low Profile Air Stripper

The proposed low-profile air stripper will be a shallow tray type such as manufactured by Northeast Environmental Products (NEEP). The air stripper will consist of a tank with four trays constructed of stainless steel, a forced draft blower, a discharge pump, and associated controls.

The proposed low-profile air stripper will use forced draft, counter-current air stripping through four baffled aeration trays to remove VOCs from the water. The water is sprayed into the inlet chamber through a coarse mist spray nozzle. The water flows over a flow distribution weir and along the baffled aeration trays. Clean air, blown up through 3/16-inch-diameter holes in the aeration trays, forms a froth of bubbles generating a large mass transfer area where the VOCs partition from the liquid to vapor phase. After passing through the air stripper, the water is pumped from the air stripper sump to a pre-engineered, skid-mounted carbon absorption

system. Vapors leaving the air stripper will be routed through ductwork to the vapor phase carbon adsorption canisters for treatment.

3.3.4 Carbon Adsorption System

Treated water from the air stripper will be pumped through a carbon adsorption system. This system will include two steel vessels in series, each containing 500 pounds of granular activated carbon operating. The carbon adsorption system will be a skid-mounted system and will be provided with piping and valves as necessary to accommodate backwashing the carbon vessels (if necessary). In addition, the carbon system will be capable of deactivating one of the carbon vessels while the other vessel remains active to allow for maintenance to be performed without shut down of the treatment system.

The carbon vessels will be provided for polishing of the water treated in the air stripper in order to remove residual COCs (i.e., PCE and breakdown generated VOCs that may not be fully removed by the air stripper. During the operation of the treatment system, the need for continued operation of two carbon vessels for the adsorption system will be evaluated by monitoring treated water following the air stripper. After passing through the carbon adsorption system, the treated water will be discharged to surface water.

Vapor laden with VOCs from the air stripper will be blown through a carbon adsorption system. This system will include three steel vessels in series, each containing 250 pounds of granular activated carbon operating. The carbon adsorption system will be a skid-mounted system and will be provided with piping and valves as necessary to accommodate backwashing the carbon vessels (if necessary). In addition, the carbon system will be capable of deactivating one of the carbon vessels while the other vessel remains active to allow for maintenance to be performed without shut down of the treatment system.

The carbon vessels will be provided in removal of VOCs from the exhaust of the air stripper. During the operation of the treatment system, the need for continued operation of three carbon vessels for the adsorption system will be evaluated by monitoring treated vapor following passage through each of the carbon vessels. After passing through the carbon adsorption system, the treated vapor will be discharged to the atmosphere through a stack located above the building housing the treatment works.

Should significant vinyl chloride concentrations be detected in the influent groundwater (as determined during the aquifer test); the air stripper technology for groundwater treatment will be replaced with ultraviolet (UV) oxidation technology. In any event, should the Contingency Plan be implemented, the air discharge requirements of NYSDEC's Air Guide 1 will be met for vapor-phase VOCs generated during groundwater influent treatment.

3.3.5 Instrumentation and Control

The proposed groundwater treatment system will be equipped with instrumentation necessary for continuous operation with minimal operator attention. The system will include direct reading instrumentation for measuring system pressure and flow rate. In addition, sample collection and isolation valves will be installed to facilitate sample collection and maintenance activities.

The submersible pump operation at the four proposed extraction wells will be controlled via a two-probe type level controller corresponding to pump "off" and pump "on". Submersible pumps and probes will be controlled through a local control panel or a central programmable logic controller (PLC).

The proposed equalization tank will be equipped with a level indicating transmitter. The discharge flow rate from the equalization tank will be controlled by a control valve. The control valve will receive a 4-20 mA signal from the level transmitter through the PLC based on a programmed set point level. Three alarm conditions will be programmed into the PLC based on equalization tank level. A low-low level alarm will signal the equalization tank transfer pump to turn "off". A low-level alarm will signal the control valve to close. A high-level alarm will signal all extraction wells and sump pumps feeding the equalization tank to turn "off".

The proposed low-profile air stripper system will be a prepackaged system with level switches, pressure switches, and alarms primarily controlled by a local control panel. Three primary alarm conditions will be tied back to the PLC. A high-level alarm, low-pressure alarm, and high pressure alarm at the air stripper will signal the equalization transfer pump to turn "off" through the PLC.

The proposed carbon system will be equipped with pressure gauges. Two alarm conditions will be programmed into the PLC via output from the pressure gauge transmitters. A low or high level alarm will signal for the appropriate valves to be closed to by-pass the appropriate carbon vessel and direct the flow through the remaining two carbon vessels. If the vessels are all in simultaneous alarm mode, the signal will direct the pumps to deactivate.

3.4 Operations and Maintenance Summary

The general components of the Operations and Maintenance (O&M) Plan for the proposed ground-water treatment system as will be presented in a manual include:

- Process sampling;
- Performance monitoring;
- Equipment maintenance; and
- Progress reporting.

A detailed O&M Manual will be prepared at the 35 percent construction stage. The O&M Manual will include the following information:

- equipment manufacturer's O&M information and spare parts lists;
- system start-up, system operation, and shut-down procedures;
- emergency response procedures;
- system monitoring and process sampling requirements; and
- documentation and record keeping requirements.

3.4.1 Sampling

Sampling activities will be conducted in accordance with surface water discharge and air emissions permit conditions (substantive requirements to be met and in place before discharges can occur)[2]. Personnel will

[2] As shown on the proposed Contingency Plan Implementation Schedule (Figure 7), a nine-week long time period exists from implementation until submission of the Final Construction Package. During this nine week period the applicable substantive water and air effluent discharge requirements will be determined using the groundwater influent data obtained during the aquifer test.

collect grab sample from the air stripper water effluent and carbon adsorption system effluent for laboratory analysis for VOCs and other parameters that may be relevant to the system's performance (such as inorganic compounds, dissolved metals, and total dissolved solids). Laboratory analytical results will be used to track air stripper (or UV oxidation unit) performance, evaluate the need for continuing polishing of the air stripper effluent using activated carbon, and verify compliance with the groundwater discharge permit. As part of the performance verification plan, a treatment system influent sample may be collected prior to equalization tank and after the tank discharge on a periodic basis and analyzed for select basis of design parameters.

Groundwater monitoring to assess remedy effectiveness will also be performed. Groundwater quality samples will be collected from a set of specific wells located within and outside of the capture zone on a periodic basis. A Performance Verification Plan will be submitted with the Final Construction Package detailing the sampling methods, analytes, locations and frequency. The Performance Verification Plan will be used in the acquisition of data that will be used for comparison with baseline conditions existing prior to implementation of the Contingency Plan.

3.4.2 Monitoring

Monitoring of the groundwater treatment system will be performed by appropriately-trained personnel who are familiar with groundwater treatment systems and have been instructed on the monitoring requirements of this system. The routine monitoring described below will be on a monthly and quarterly basis once system operation has become stabilized and predictable. During the start-up phase of operation the monthly monitoring will be performed daily and the quarterly monitoring will be performed weekly. Air and water influent and effluent samples will be collected as described below. The start-up phase monitoring is anticipated to last approximately three weeks.

Additional system performance monitoring will be performed to verify that the regulatory requirements for air and effluent discharges are met. Performance monitoring criteria are summarized below.

- Baseline Conditions – establish existing site groundwater conditions prior to system startup using existing sampling methodology and protocols;
- System Startup – startup, test, and calibrate all equipment and instrument systems, and conduct temporary operations (several hours per day for several days, then 8-hour days for five days) until demonstrated that the system is properly calibrated and functioning as designed; and
- Full Operation – commence full operation 24-hours per day seven days per week with weekly inspections of the system to start (with inspection frequency as needed to maintain system performance).

During the startup phase the groundwater influent to the treatment system will be sampled initially and after several hours of operation for VOCs using EPA method 624 and other parameters specified in the O&M manual (to be completed at the 35% construction point). Treated water will be stored in on-site temporary holding tanks. Daily effluent water samples will be collected from a sampling point located after the air stripper and liquid-phase GAC vessels. This effluent sampling for VOCs using EPA method 624 will be conducted during the startup phase until three consecutive daily sample results are below discharge requirements. Once acceptable discharge results are obtained, the treated water stored in the temporary tanks will be discharged through GAC vessels to surface water. The temporary tanks will then be removed from the Pilot Truck Stop site.

The air discharge will be monitored at points after the air stripper and after the vapor-phase GAC vessels at 15-minute intervals using a portable gas chromatograph at the site to determine vapor-phase VOC concentrations and prevent any exceedance of air discharge requirements. Air samples will be collected from after the vapor-

phase GAC vessels at the end of each workday during the last phase of startup (continuous operation) and be analyzed for VOCs using EPA method TO-15. Once it is established that the air discharge meets regulatory requirements the monitoring frequency will be such that it is in compliance with the applicable regulatory requirements including 6 NYCRR Chapter III and the New York State Air Guide – 1.

The final part of the startup phase will be a sustained 5-day 24-hour per day operational period to confirm that the system is operating properly and as designed. If a breakdown occurs, this test will be repeated until successfully run to completion. Air and groundwater samples collected during the startup phase will be analyzed on an expedited turnaround (24-hour to 48-hour) basis.

After the startup phase is completed, daily groundwater level measurements will be made at selected monitoring wells during the first week of full operation. This groundwater level monitoring will be followed by weekly groundwater level measurements for the next three weeks, and then in turn followed by monthly measurements for the remaining two months of the first quarter of full operation. This water level data will be used to assess the extent of the capture zone that is being generated by the system's extraction of groundwater.

3.4.2.1 Monthly Monitoring

Monthly monitoring of the groundwater treatment system will include performing a walk-through of the system to observe and record treatment system operating parameters. This will include a monitoring step such as:

- observe containment areas and piping/tanks for leaks and spills;
- record instantaneous flow rates and totalized flow to the equalization tank from the groundwater extraction wells;
- collect influent groundwater samples and treated effluent water samples;
- collect post-air stripper air samples and post-GAC air discharge samples;
- observe the equalization tank for signs of leaks or deterioration;
- record the pH reading in the equalization tank;
- record the level reading in the equalization tank;
- record the effluent discharge rate from the equalization tank. Verify that it nearly equals the total influent rate to the equalization tank;
- observe the air stripper system for proper operation;
- verify that influent and effluent flow rates are equal on the proposed air stripper. If flow rates are not equal, adjust manual valve on air stripper pump discharge line until they are equal;
- record the pressure readings for the following:
  - air stripper influent line;
  - air inlet line;
  - air discharge line; and
  - air stripper effluent line.
- record the pressure readings at the influent and effluent lines of each granular activated carbon vessel; and
- observe the carbon system to determine the operational status of the carbon vessels and verify the system is operating properly.

3.4.2.2 Quarterly Monitoring

Additional anticipated quarterly monitoring tasks include:

- check and change-out, if necessary, the flow recorder paper;
- open well caps at the extraction wells and injection wells. Check piping for leaks, record pressure gauge readings, and note any unusual sounds if pumps are running;
- visually observe the inside of the equalization tank from the roof manway;
- check individual alarm lights on extraction well control panels;
- check pressure gauges on extraction wells;
- collect influent groundwater samples from each of the extraction wells; and
- check ball valves on extraction wells for free movement.

3.4.3 Maintenance

Maintenance activities will be performed to ensure the most continuous operation possible. Maintenance activities occur on a routine basis. The following presents a summary of the anticipated maintenance on an equipment basis.

3.4.3.1 Extraction Wells

Extraction well maintenance can include:

- replacement of faulty gauges and/or valves;
- re-development of wells due to fouling; and
- replacement and/or rebuilding of extraction pumps.

3.4.3.2 Equalization Tank Area

Equalization Tank Maintenance can include:

- replacement of pressure gauges and/or valves;
- maintenance of pump seals and replacement of impellers; and
- draining and cleaning of the Equalization Tank.

3.4.3.3 Air Stripper Maintenance

The low-profile air stripper is designed to operate with a minimal amount of maintenance. The following general maintenance should be performed on the air stripper annually, except where noted:

- clean blower motor housing;
- clean blower blades;
- lubricate blower fan and motor bearings as necessary;
- check and tighten/replace blower belts as necessary; and

- clean air stripper aeration trays and sump.

3.4.4 Reporting

Summary reports documenting the operational, maintenance, and monitoring activities associated with the groundwater treatment system will be maintained at the site. The summary reports document:

- total volume of ground water treated and the duration over which the ground water was treated (based on flow totalizer readings);
- laboratory analytical results;
- system downtime/reason; and
- operational issues.

3.5 Construction Package Preparation and Submittal

The preparation of a Construction Package for the groundwater extraction and treatment system will begin upon NYSDEC's written notification that the Contingency Plan must be implemented because of the failure of the in-situ, enhanced bioremediation field trial to meet the remediation objectives of the ROD.

3.5.1 Technical Specifications and Design Drawings

The technical specifications of the groundwater extraction and treatment system will be prepared to include a detailed engineering design of the selected remedial actions, the material and schedule of the associated equipment, controls, equipment enclosure, operational monitoring systems, manifold piping, etc. A detailed set of construction drawings will also be prepared to show site plans, well and equipment details, and sections of the proposed equipment and work.

3.5.2 Operation and Maintenance Program

The O&M Program will be developed to monitor the progress of the remedial actions and maintain optimal performance of the remedial system.

3.5.3 Health and Safety Plan

The site-specific Health and Safety Plan will be prepared for the protection of persons at and in the vicinity of the site during the construction and O&M of the remedial system. It will be prepared in accordance with 29 CFR 1910 by a certified health and safety professional.

3.5.4 Construction Package Submittal

The components described above will be compiled into the Groundwater Extraction and Treatment Construction Package, which will be submitted to the NYSDEC for review and comment. This Construction Package will include the following:

- Technical Specifications for each of the Construction Divisions used, such as General Requirements, Site Work, Concrete, Finishes, Equipment, Mechanical, and Electrical;
- A List of Drawings detailing the construction of the groundwater extraction and treatment system, including but not limited to General Site Plan, Groundwater Extraction System – Plan Sections and

Details, Groundwater Extraction System – Piping Plan and Details, Groundwater Treatment Plant – Foundation Plan (Sections and Details), Groundwater Treatment Plant – Building Plan (Sections and Details), Groundwater Treatment Plant – General Arrangement, Process Flow Diagram, Piping and Instrumentation Diagram, Electrical Schematic and Panel Schedule, Electrical Plan; and

- An Appendix containing catalog cuts for equipment specified in the Technical Specifications and Drawings.

The Construction Package will be prepared by and bear the signature and seal of a professional engineer who will certify that the design was prepared in accordance with the Order on Consent (NYSDEC, 2001) and the ROD (NYSDEC, 2000).

4. Schedule and Submittals

Upon the NYSDEC's written approval of this Contingency Plan, the plan will be filed until such time that implementation of the contingent plan is warranted. The schedule presented in this section is for use if the Contingent Plan is to be implemented. The schedule for the preparation and submittal to the NYSDEC of the full construction plans and specifications for implementation of the Contingency Plan, construction of the groundwater extraction and treatment system, start-up and operation, and progress reporting is summarized on Figure 7. The schedule presented below and on Figure 7 is based on a 110-day implementation period.

The deliverables and their dates of submission to the NYSDEC are listed below:

- Draft System Construction Package – 45 days after notification to implement Contingency Plan
- Final System Construction Package – 15 days after approval of draft System Design Package
- Installation of Groundwater Extraction and Treatment System – 30 days (completion) after submission of Final System Construction Package
- System Start-up – 5 days after satisfactory completion of system installation

Copies of the final Contingency Plan and Full Remedial Construction Package (if Contingency Plan implemented) will be distributed as follows:

- Four copies (one unbound) to:

  Andrew English
  Division of Environmental Remediation
  New York State Department of Environmental Conservation
  625 Broadway
  Albany, New York 12233-7017

- One copy to:

  Regional Director
  New York State Department of Environmental Conservation, Region 7
  615 Erie Boulevard West
  Syracuse, New York 13204-2400

- Two copies to:

  Gary Litwin
  Director, Bureau of Environmental Exposure Investigation
  New York State Department of Health
  Flanigan Square
  547 River Street
  Troy, New York 12180-2216

- One copy to:

  Maura C. Desmond, Esq.
  Division of Environmental Enforcement
  New York State Department of Environmental Conservation
  270 Michigan Avenue
  Buffalo, New York 14203

Each report submitted to the NYSDEC will be reviewed and either approved or disapproved in writing. Once a report is approved, it will be incorporated into and become an enforceable part of the Order on Consent. Should the NYSDEC disapprove a report submittal, a revised submittal addressing all of the NYSDEC's reasons for disapproval will be submitted within 45 calendar days of receiving the written notice, unless a shorter duration is specified.

Within 30 days of the NYSDEC's approval of any submitted report, a computer readable magnetic media copy of the approved report in American Standard Code for Information Interchange (ASCII) format will be submitted to the Director of the Division of Environmental Remediation.

Ninety days following construction of the Contingency Plan Groundwater Remediation System, a detailed post-remedial O&M Plan, as-built drawings, and a final engineering report will be submitted to the NYSDEC. Within 30 days of the NYSDEC's approval of the submittal, one microfilm copy (16-mm roll film M type cartridge) of these drawings and submittals will be prepared. The microfilm copy will be submitted to the NYSDEC, as well as the Division of Environmental Remediation, upon request.

5. References

Blasland, Bouck & Lee, Inc. June 2001. *Remedial Design Work Plan.*

Blasland, Bouck & Lee, Inc. September 2001. *Pilot Study Design.*

Javandel, I., and Tsang, C. September/ October 1986. *Capture-Zone Type Curves: a Tool for Aquifer Cleanup.* Groundwater, V. 24, no. 5, p. 616-625.

New York State Department of Environmental Conservation (NYSDEC). March 2000. *Record of Decision: Dover Electronics Site, Kirkwood (T), Broome County, Site Number 7-04-026.*

New York State Department of Environmental Conservation (NYSDEC). January 2001. *Order on Consent: Index #B7-0515-97-05.*

Shield Engineering Associates, Inc. July 2000. *Feasibility Study Report.*

Shield Environmental Associates, Inc. October 14, 1998. *Remedial Investigation/Feasibility Study Work Plan.*

Shield Environmental Associates, Inc. February 20, 1999. *Baseline Summary Report.*

Shield Environmental Associates, Inc. February 20, 1999. *Addendum Baseline Summary Report.*

Shield Environmental Associates, Inc. July 2000. *Remedial Investigation Report.*

Tables

TABLE 1

PRELIMINARY DESIGN BASIS FOR EXTRACTION WELLS

Universal Instruments Corporation
Former Dover Electronics Site
Kirkwood, New York

Preliminary Extraction Well Construction Well Specifications

The objective for extraction well design is to allow for capture of the horizontal and vertical extent of the dissolved-phase PCE plume and minimize the total number of extraction wells required. Therefore, the well shall be fully penetrate the shallow saturated zone and the screened interval shall be made of wire-wrapped, stainless steel casing to achieve maximum practical well efficiency (assumed to be 60-percent). Because the shallow saturated zone extends from 14 feet to 36 feet below grade, each extraction well will have a total depth of 36 feet with the screened interval constructed in the lower 20 feet. The well casing will be made of 6-inch diameter stainless steel.

Preliminary Extraction Well Capture Zone Calculations

The methodology of Javandel and Tsang (1986) as presented in Demenico and Schwartz (1998) was used to calculate the number of extraction wells required to create a capture zone that would hydraulically control the dissolved-phase PCE plume.

The formula $Q = (B)(U)(TCV)$; where Q is the well pumping rate, B is the aquifer thickness, U is the aquifer specific discharge [defined as KI where K is the hydraulic conductivity and I is the hydraulic gradient], and TCV is the Q/BU value read from the capture zone type curves.

For the Kirkwood site the values of the variables were assigned as follows:

B = 22 feet; U = 0.0071 feet/day K = 1.42 feet/day I = 0.005

For the single pumping well solution TCV as read from the type curve was 2,640 feet. Therefore, Q was found to equal 412 cubic feet per day (or 2.14 gallons per minute). The discharge rate was checked for validity by comparing the aquifer thickness against the drawdown that would be generated. The formula to calculate drawdown is:

> $s = (2.3Q / 4\pi T) \log (2.25Tt / r^2S)$; where T is transmissivity [defined as KB], t is duration of pumping, which was assumed to by 2.5 years (912 days), r is the well radius (0.5 feet), and S is storativity (0.044 from Shield aquifer test data for MW-28).

Drawdown was calculated to be 16.43 feet, which when adjusted for a 60-percent efficient well equals 27.4 feet. This exceeds the available 22 feet, therefore a multiwell system is necessary.

For the double pumping well solution TCV as read from the type curve was 1,320 feet. Therefore, Q was found to equal 206 cubic feet per day (or 1.07 gallons per minute). As above, the discharge rate was checked for validity by comparing the aquifer thickness against the drawdown that would be generated.

TABLE 1
(continued)

Drawdown was calculated to be 8.22 feet, which when adjusted for a 60-percent efficient well equals 13.7 feet. This is within the available 22 feet, but leaves a very small error margin when other design parameters, such as a required 3 feet height of water over the pump, 3 feet of water below the pump and a pump length of 1.5 feet are factored into the analysis.

To provide a safety factor for the submersible pumps in the extraction wells (to be set 4 feet off the bottom of the well), a four pumping well solution was evaluated. The TCV as read from the type curve was 660 feet. Therefore, Q was found to equal 103 cubic feet per day (or 0.53 gallons per minute). As above, the discharge rate was checked for validity by comparing the aquifer thickness against the drawdown that would be generated.

Drawdown was calculated to be 4.12 feet, which when adjusted for a 60-percent efficient well equals 6.87 feet. This is within the available 22 feet, but leaves a comfortable height of water over the pump, while providing sufficient drawdown to create an effective capture zone to hydraulically control the dissolved-phase PCE plume.

The well spacing was calculated using a formula analytically derived by Javendal and Tsang (1986). The formula is used to calculate a spacing that minimizes well interference while maintaining the desired hydraulic control. The formula for a four well system is:

Well Spacing = $1.2Q / \pi BU$

The solution equals 252 feet between wells. When adjusted for 60-percent well efficiency, the spacing becomes 151 feet.

TABLE 2
UNIVERSAL INSTRUMENTS CORPORATION

Basis of Design Influent

Former Dover Electronics Site
Kirkwood, New York

Constituent	CAS No.	Concentrations Min	Max	Avg	Design	ROD/ TAGM#4046
VOLATILE ORGANIC CONSTITUENTS						
Tetrachloroethene	127-18-4	0.50	1200.00	210.89	250.00	5.0
Trichloroethene	79-01-6	0.50	20.00	2.93	40.00	5.0
1,2-Dichloroethene	540-59-0	0.50	20.00	3.24	20.00	5.0
Vinyl Chloride	75-01-4	0.50	0.50	0.50	10.00	2.0

Notes:
All concentrations reported in ug/L
Ranges and averages reported are for monitoring well data (MW-18 through MW-20 and MW-25 through 39) from 1999-2001

TABLE 3
UNIVERSAL INSTRUMENTS CORPORATION

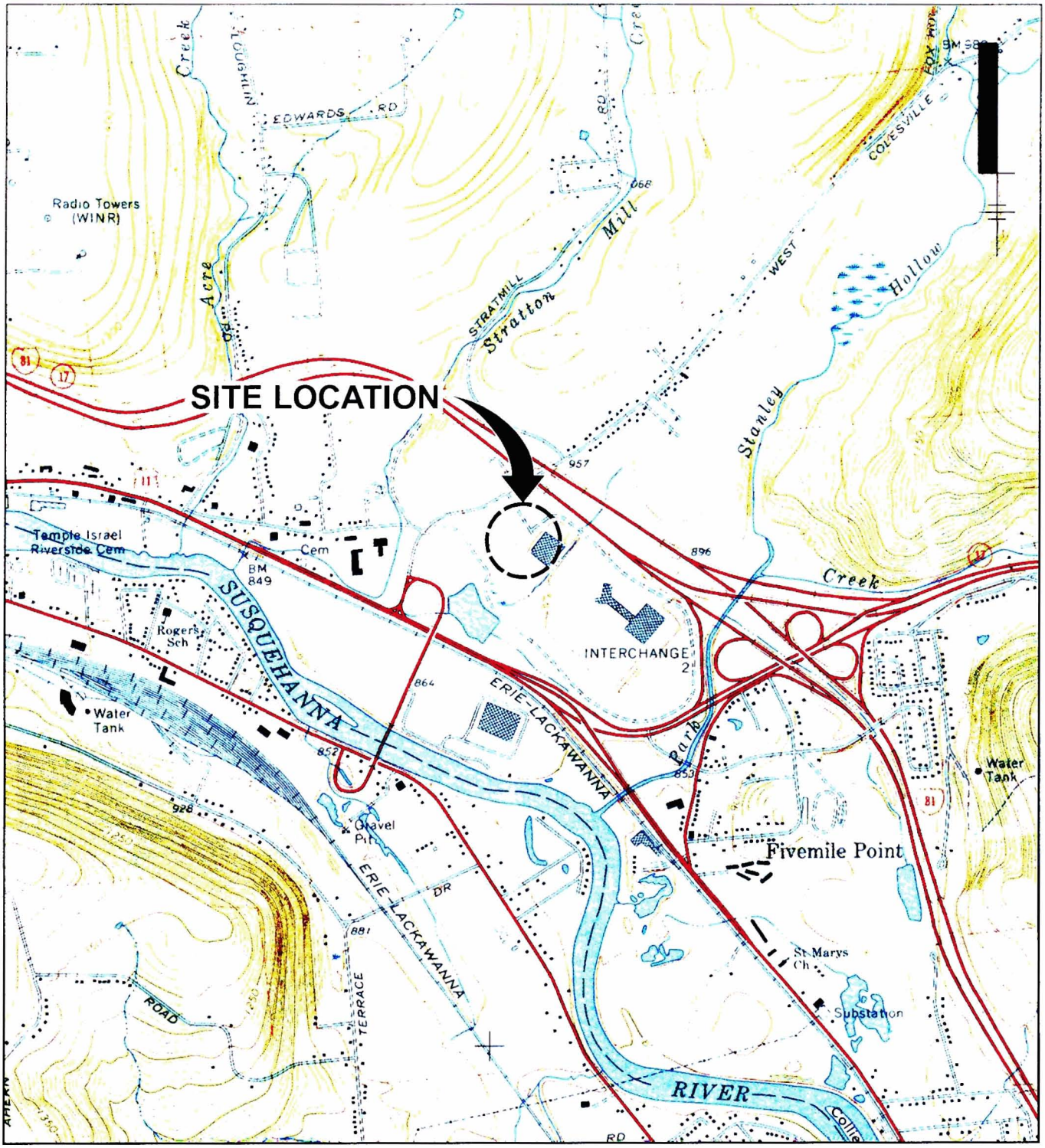
Basis of Design Effluent

Former Dover Electronics Site
Kirkwood, New York

Constituent	CAS No.	Design (ug/L)	Design Basis
VOLATILE ORGANIC CONSTITUENTS			
Tetrachloroethene	127-18-4	5	6 NYCRR
Trichloroethene	79-01-6	5	6 NYCRR
1,2-Dichloroethene	540-59-0	5	6 NYCRR
Vinyl Chloride	75-01-4	2	6 NYCRR

6 NYCRR - Effluent limits taken from Table 1 (Water Quality Standards, Surface Waters and Groundwater) of Section 703.5, Chapter X

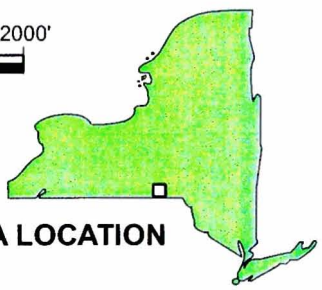
Figures



REFERENCE: Base Map Source USGS 7.5 Minute Quad. Series Binghamton East, New York, 1968, Photorevised 1976.

2000' 0 2000'

Approximate Scale: 1" = 2000'



AREA LOCATION

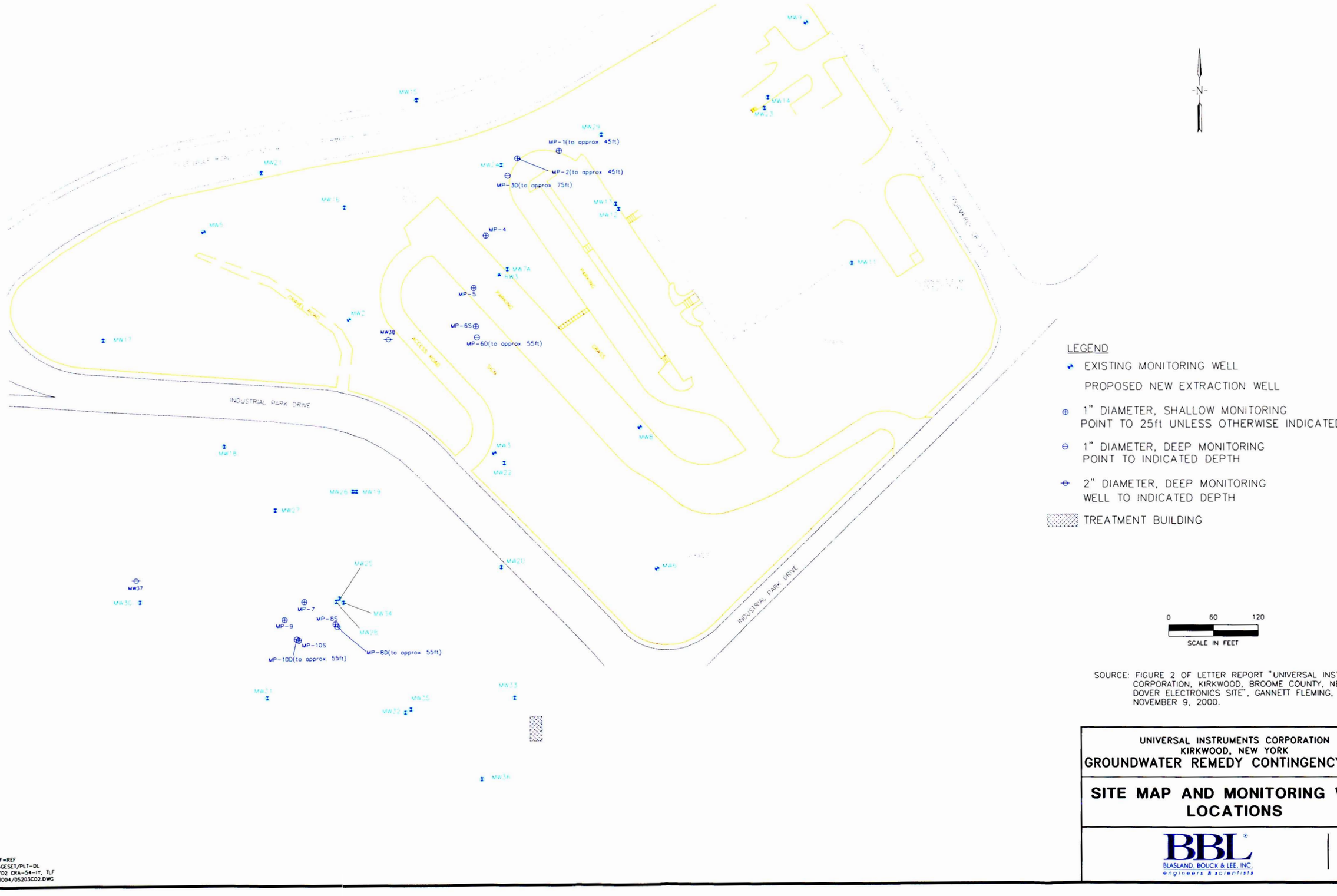
07/18/01 CRA-54-IY
05203003/05203n01.cdr

UNIVERSAL INSTRUMENTS CORPORATION
KIRKWOOD, NEW YORK

LOCATION MAP

BBL BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE 1



LEGEND

- EXISTING MONITORING WELL
- PROPOSED NEW EXTRACTION WELL
- ⊕ 1" DIAMETER, SHALLOW MONITORING POINT TO 25ft UNLESS OTHERWISE INDICATED
- ⊖ 1" DIAMETER, DEEP MONITORING POINT TO INDICATED DEPTH
- ⊖ 2" DIAMETER, DEEP MONITORING WELL TO INDICATED DEPTH
- TREATMENT BUILDING

0 60 120

SCALE IN FEET

SOURCE: FIGURE 2 OF LETTER REPORT "UNIVERSAL INSTRUMENTS CORPORATION, KIRKWOOD, BROOME COUNTY, NEW YORK: DOVER ELECTRONICS SITE", GANNETT FLEMING, INC., NOVEMBER 9, 2000.

X:
L: OFF=REF
P: PAGESET/PLT-DL
2/14/02 CRA-54-IY, TLF
05203004/05203C02.DWG

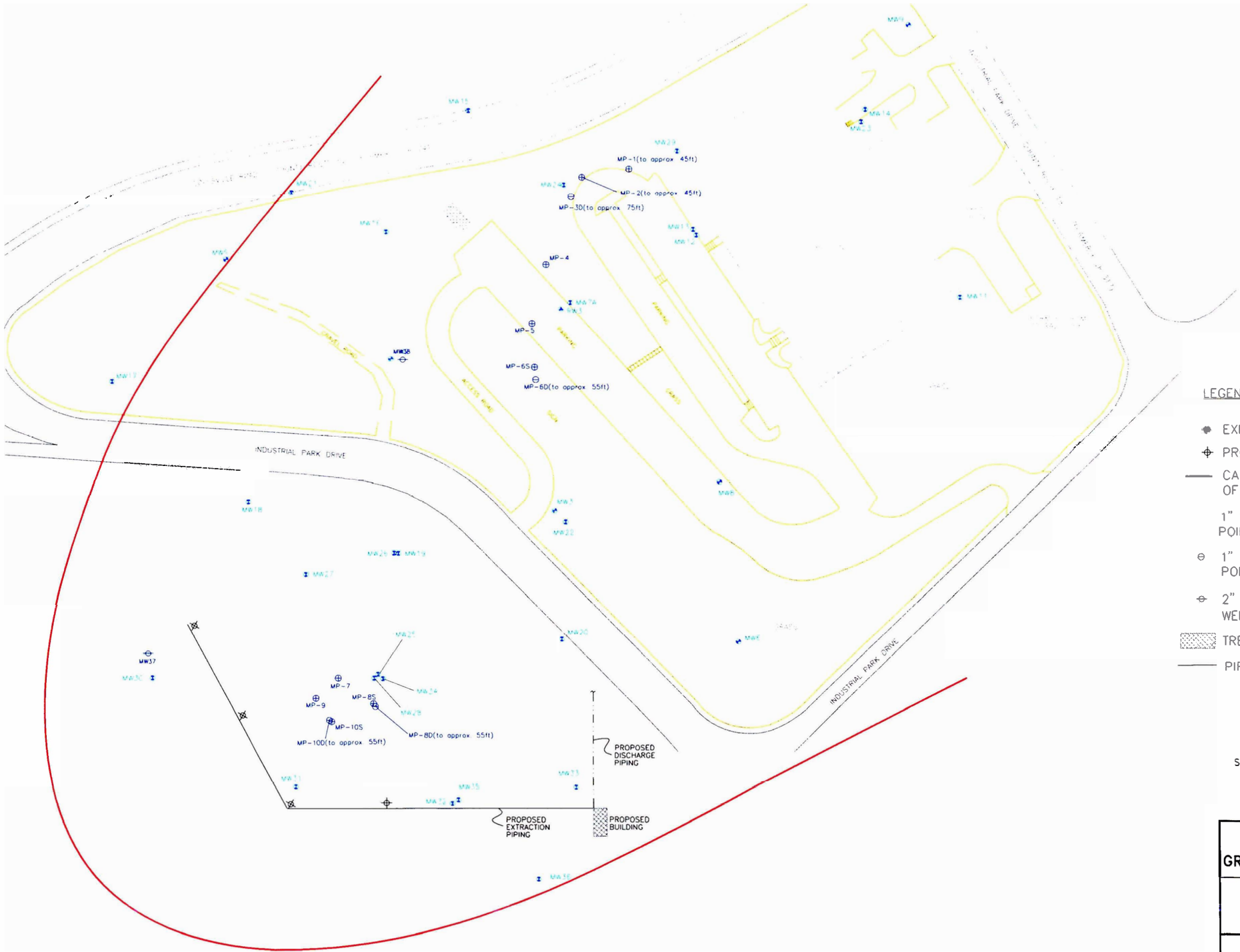
UNIVERSAL INSTRUMENTS CORPORATION
KIRKWOOD, NEW YORK

GROUNDWATER REMEDY CONTINGENCY PLAN

SITE MAP AND MONITORING WELL LOCATIONS

BBL
BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE
2



LEGEND

- EXISTING MONITORING WELL
- PROPOSED NEW EXTRACTION WELL
- CALCULATED EXTENT OF CAPTURE ZONE
- 1" DIAMETER, SHALLOW MONITORING POINT TO 25ft UNLESS OTHERWISE INDICATED
- 1" DIAMETER, DEEP MONITORING POINT TO INDICATED DEPTH
- 2" DIAMETER, DEEP MONITORING WELL TO INDICATED DEPTH
- TREATMENT BUILDINGS
- PIPING RUNS

0 60 120
SCALE IN FEET

SOURCE: FIGURE 2 OF LETTER REPORT "UNIVERSAL INSTRUMENTS CORPORATION, KIRKWOOD, BROOME COUNTY, NEW YORK DOVER ELECTRONICS SITE", GANNETT FLEMING, INC., NOVEMBER 9, 2000

UNIVERSAL INSTRUMENTS CORPORATION
KIRKWOOD, NEW YORK
GROUNDWATER REMEDY CONTINGENCY PLAN

EXTRACTION WELL AND PIPING LOCATIONS

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FIGURE 3

X:
L: OFF=REF
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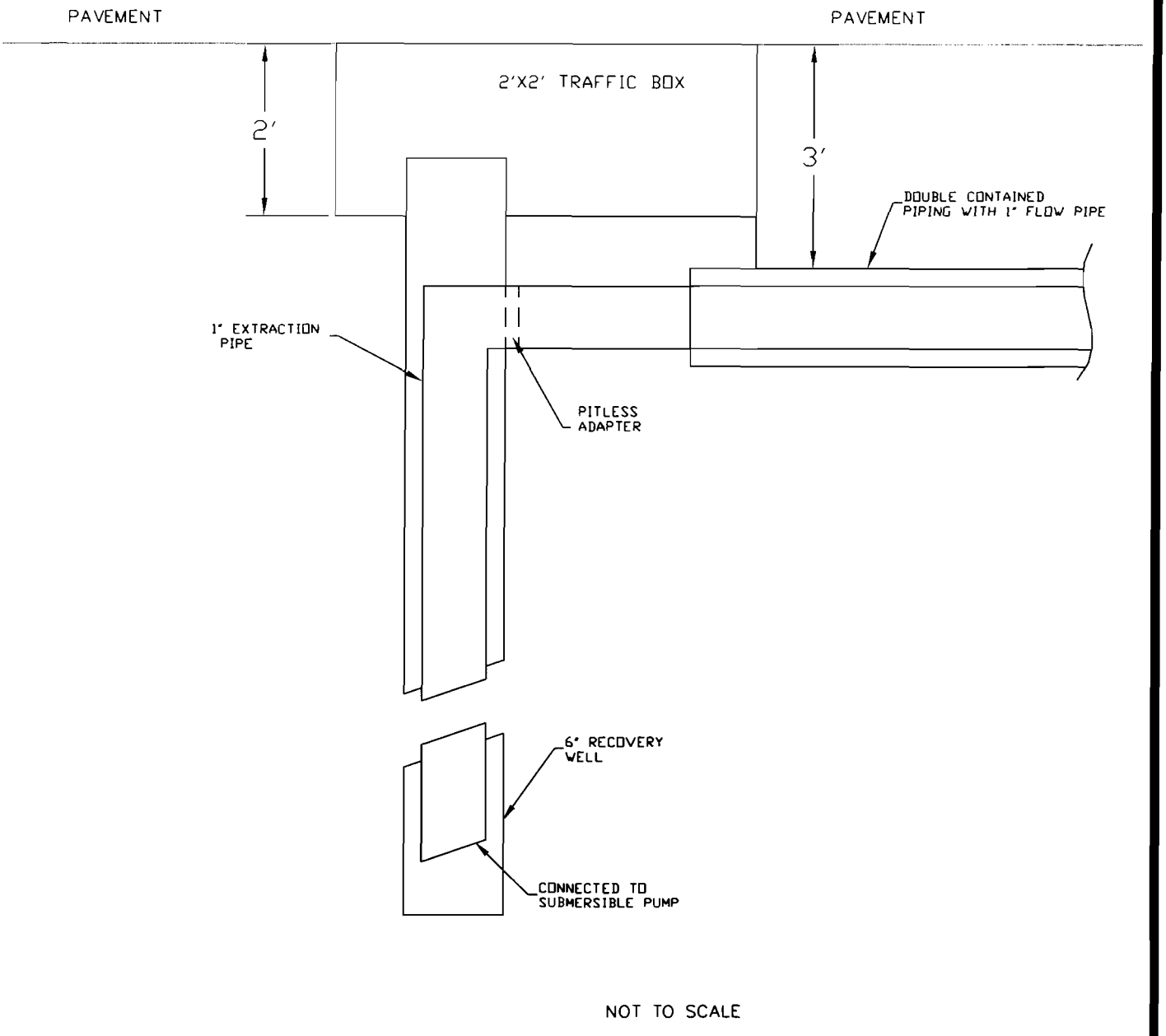
02/05/02 CRA-54-IY, TLF, IY
05203004/05203B01.DWG



NOT TO SCALE

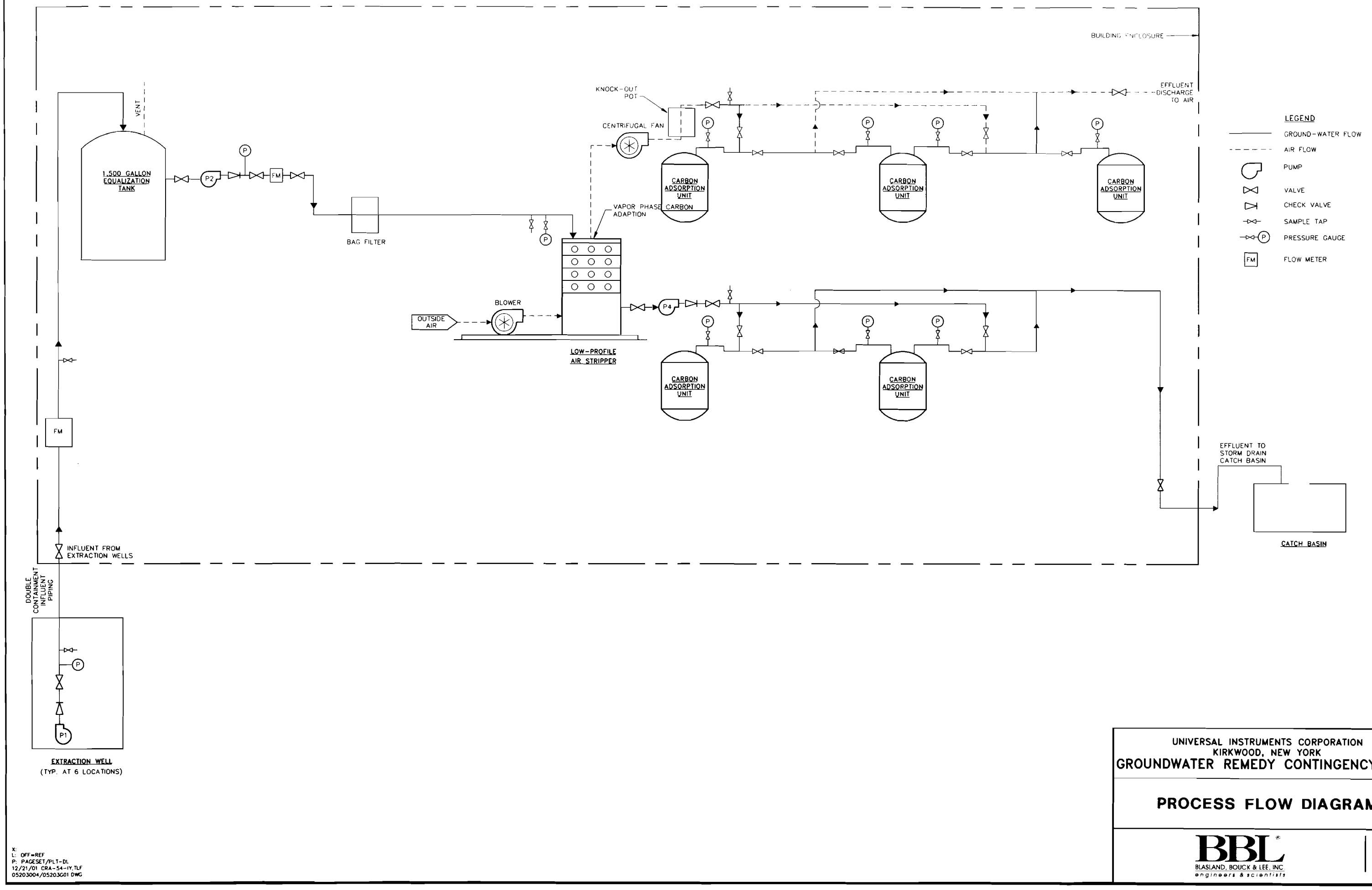
UNIVERSAL INSTRUMENTS CORPORATION
KIRKWOOD, NEW YORK
GROUNDWATER REMEDY
CONTINGENCY PLAN

RECOVERY WELL PIPING SCEMATIC

BLASLAND, BOUCK & LEE, INC.
engineers & scientists

FIGURE **4**

X:
L: OFF=REF
P: PAGESET/PLT-AP
12/21/01 CRA-54-IY.TLF
05203004/05203G02.DWG



X:
L: OFF=REF
P: PAGESET/PLT-DL
12/21/01 CRA-54-IY.TLF
05203004/05203G01.DWG

UNIVERSAL INSTRUMENTS CORPORATION
KIRKWOOD, NEW YORK

GROUNDWATER REMEDY CONTINGENCY PLAN

PROCESS FLOW DIAGRAM

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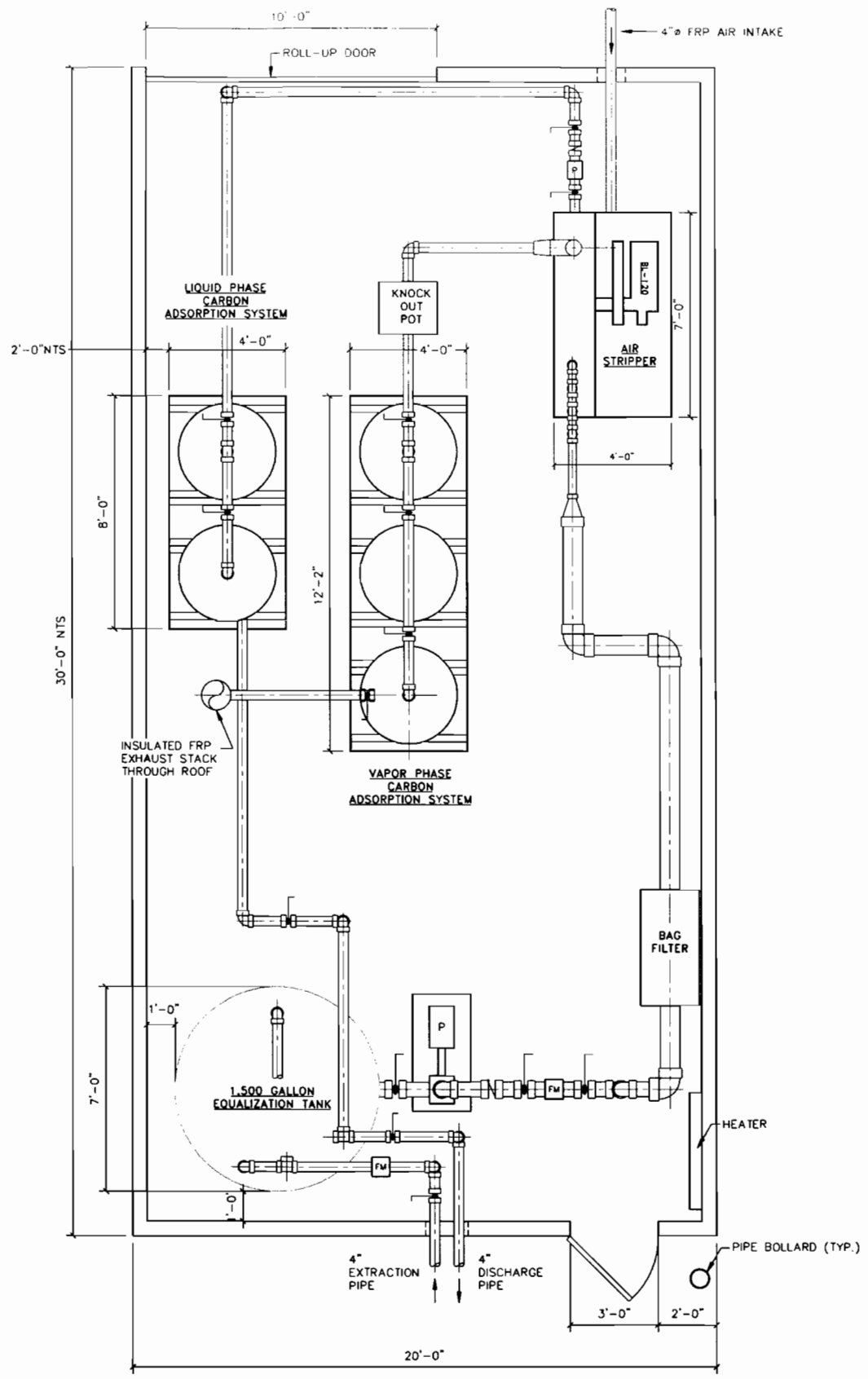
engineers & scientists

FIGURE
5



LEGEND:

- ELBOW
- ELBOW DOWN
- ELBOW UP
- LATERAL TEE
- CONCENTRIC REDUCER
- LATERAL TEE DOWN
- LATERAL TEE UP
- BALL VALVE
- CHECK VALVE
- FM — FLOW METER
- P — PUMP

GENERAL NOTES:

1. EQUIPMENT AND PIPING LAYOUT SHOWN IS FOR GENERAL REFERENCE. REFER TO THE PROCESS FLOW DIAGRAM PRESENTED ON FIGURE 2 FOR EQUIPMENT AND PIPING CONNECTIONS.

3/16"=1'-0" 2' 0 3' 6'

UNIVERSAL INSTRUMENTS CORPORATION
KIRKWOOD, NEW YORK

GROUND-WATER REMEDY CONTINGENCY PLAN

BUILDING EQUIPMENT LAYOUT PLAN

BBL BLASLAND, BOUCK & LEE, INC. *engineers & scientists*

FIGURE 6

L: ON=*, OFF=REF*
P: STD-PCP/D2BL
12/21/01 CRA-54-TLF
D5203004/D5203M01.DWG

Figure 7
Universal Instruments
Kirkwood, New York
Proposed Contingency Plan Schedule

	Description	*Duration* (days)	Columns represent working weeks (5-day periods) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
Contingency Plan (Groundwater)	Written Notification from NYSDEC to implement CP	---	*																							
	Draft System Design Package	25		■	■	■	■	■																		
	NYSDEC Review	20							■	■	■	■														
	Final System Design Package	15											■	■	■											
	Installation of Groundwater Extraction and Treatment System	30											■	■	■	■	■	■	■	■						
	System Start -up	15																			■	■	■			

Notes: