OPERATION, MAINTENANCE, AND MONITORING PLAN

ARKWIN INDUSTRIES, INC. SITE

WESTBURY, NEW YORK

NYSDEC SITE # 01-30-043D

PREPARED FOR

ARKWIN INDUSTRIES, INC.

FOR SUBMITTAL TO THE

NEW YORK STATE
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

PREPARED BY

FPM group

909 MARCONI AVENUE
RONKONKOMA, NEW YORK 11779

MARCH 2003

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FPM

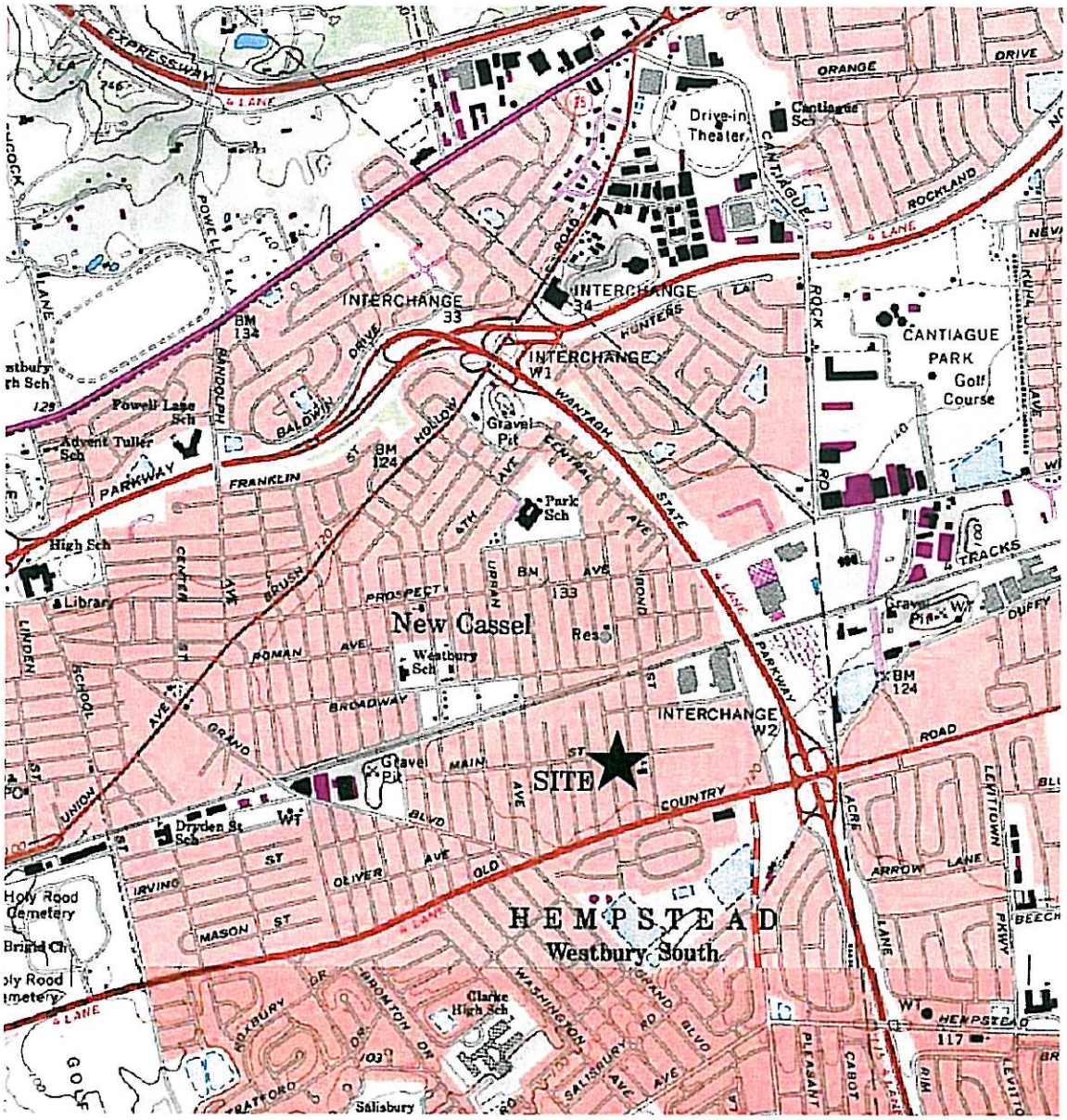
SECTION 1.0
INTRODUCTION

This Operation, Maintenance, and Monitoring (O M & M) Plan has been prepared by FPM Group (FPM) on behalf of Arkwin Industries (Arkwin) for the two soil vapor extraction (SVE) and air sparging (AS) systems installed at the Arkwin Industries Inactive Hazardous Waste Disposal Site (NYSDEC Registry # 1-30-043D) located in Westbury, New York (the Site). The two remediation systems were installed in October and November 2002 in accordance with the New York State Department of Environmental Conservation (NYSDEC)-approved Soil Vapor Extraction and Air Sparging Pilot Test Report - Arkwin Industries, Inc. Site, Westbury, New York (Pilot Test Report) dated July 2002. Figure 1.1 depicts the Site location and Plate 1 depicts the site and remediation systems layout.

The remediation systems were installed in two areas of concern as identified by previous investigations performed at the Site. These investigations had detected the presence of several volatile organic compounds (VOCs) in an on-site leaching pool. Based upon these detections, an interim remedial measure (IRM), consisting of leaching pool remediation, was performed to address the soil contamination. No additional significant on-site soil contamination has been identified.

To determine the extent of the suspected groundwater contamination, groundwater sampling was performed at the Site on several occasions. Several VOCs, including trichloroethane, trichloroethylene and tetrachloroethylene, were detected in on-site groundwater. It was also noted that several similar VOCs were present in upgradient monitoring wells and, therefore, it was concluded that impacted groundwater is also migrating onto the Site from an off-site source.

Based on the findings of the investigations, the NYSDEC issued a Record of Decision (ROD) in December 1999 stipulating that remediation of the impacted on-site groundwater be performed. The selected remedy included the installation of an air sparging/soil vapor extraction (AS/SVE) system to remediate on-site groundwater contamination. In addition, semiannual groundwater sampling of select on-site and off-site monitoring wells would be conducted to evaluate the effectiveness of the AS/SVE system.



0 5 MILE

0 1000 FEET 0 500 1000 METERS

FPM GROUP		
FIGURE 1.1 SITE LOCATION ARKWIN INDUSTRIES, INC.		
Drawn By: L.G.	Checked By: P.D.	Date: 10/06/00

SECTION 2.0
AIR SPARGING/SOIL VAPOR EXTRACTION REMEDIATION SYSTEMS

The following sections detail the installation of the remedial systems proposed by FPM in the report entitled "Soil Vapor Extraction and Air Sparge Pilot Test Report – Arkwin Industries, Inc. Site Westbury, New York" (July 2002) and approved by the NYSDEC. In addition, this section also includes information concerning the systems startup, performance, emissions monitoring, and operation and maintenance. A site plan showing the remediation system layouts is presented on Plate 1.

2.1 System Installations

Installation of the two AS/SVE systems (one system in each area of concern) was performed by EnviroTrac, Ltd (EnviroTrac) of Ronkonkoma, New York. EnviroTrac coordinated the procurement and installation of the remediation equipment and the installation of the AS and SVE wells. The specifications for installation of the remediation system equipment and wells were based upon the NYSDEC-approved Pilot Test Report prepared by FPM. System A is located on the south side of the 670 Main Street building and System B is located on the south side of the 648 Main Street building.

2.1.1 AS/SVE Well Installation

Installation of the AS and SVE wells was performed by Land, Air, Water, Environmental Services, Inc. under the supervision of an EnviroTrac geologist. The installation was conducted between October 15, 2002 and October 28, 2002. In general, installation of the AS wells (AS-3 and AS-5) was conducted in accordance with the proposed specifications. However, installation of the combined AS/SVE wells (AS-2/SVE-2 and AS-4/SVE-3) was problematic due to the high torque placed on the hollow stem augers at a depth of approximately 75 feet below grade. Therefore, individual AS and SVE wells were installed in close proximity to each other at the original AS-2SVE-2 and AS-4/SVE-3 locations. The well construction diagrams for both the newly-installed wells and the wells installed during the pilot test are included in Appendix A.

The AS wells were constructed of 1.5-inch diameter Schedule 40 PVC and were screened from approximately 89.5 to 92 feet below grade. The SVE wells were constructed of 2.0-inch diameter Schedule 40 PVC and were screened from approximately 43 to 63 feet below grade.

Soil cuttings generated during the installation of the AS and SVE wells were visual examined for lithology and screened for VOCs using a calibrated photoionization detector (PID). Based upon visual and PID screening, no impacted soils were noted by the EnviroTrac geologist. Therefore, the stockpiled soil cuttings were subsequently utilized onsite to backfill the subsurface piping trenches created during the remediation system installation.

2.1.2 AS/SVE Systems Description

Installation of the two remediation systems, including the installation of well manways and subsurface piping, was conducted between October 21 and October 29, 2002 by EnviroTrac. Process instrumentation diagrams and equipment specifications are included in Appendices B and C, respectively.

The installation of the subsurface system piping for both the AS and SVE wells was accomplished by the emplacement of Schedule 80 PVC piping in subsurface trenches, which extended from each individual well to the remediation system enclosure. The piping diameter for the AS and SVE systems was chosen based upon the equipment specifications, and was 1.5-inches and 2.0-inches, respectively. Galvanized pipe was utilized in the construction of the aboveground portion of the AS manifolds to provide additional heat resistance to the anticipated high temperatures caused by the generation of compressed air.

The equipment utilized for each AS system includes a 208-volt, 3-phase totally-enclosed fan-cooled (TEFC) rotary-vane compressor, a high-temperature shut off switch, air flow gauges, pressure gauges, a galvanized metal manifold and an associated control panel with timer. Systems A and B are equipped with a 5.0-horsepower (hp, Becker model KDT 3.80) and 10.0-hp (Becker model KDT 3.100) compressor, respectively.

The equipment utilized for each SVE system includes a 2-hp, 208-volt, 3-phase TEFC blower (Siemans model 2BH1590), a moisture separator equipped with an explosion-proof high water safety switch, an air filter, a manifold, an air flow meter, vacuum gauges, an effluent stack, and an associated control panel. The control panel is also equipped with an electrical interlock which prevents the AS system from operating when the SVE system is offline. Each system's effluent stack was completed to a height of 25 feet above grade, approximately five feet above the adjacent building, and is outfitted to allow the use of carbon treatment, if required.

2.2 Systems Startup

On November 14, 2002, remediation systems A and B were placed online by FPM with assistance of EnviroTrac. The systems were monitored until system vacuums, pressures and airflow stabilized. A calibrated PID was also utilized to monitor effluent emissions. In general, slight modifications (valve adjustments) were made to both the AS and SVE systems to optimize system performance. Additional modifications were also made to the systems during the first month following startup as the systems continued toward equilibrium. Information summarizing the monitored system parameters for both Systems A and B are included in Table 2.2.1 and 2.2.2.

2.2.1 System Performance Measurements

The remediation systems have been outfitted with several airflow, pressure and vacuum gauges. These gauges have been installed to assist in optimizing system performance and also to monitor system component operation. The process instrumentation diagrams prepared (included in Appendix B) for each system show a schematic layout with the locations of all gauges and associated valves. A system logbook has been prepared for each system and is kept at the site for operator reference. Each book contains operating logs for the recording of system parameters from the various gauges and figures of the system well and equipment configuration.

2.2.2 Emissions Monitoring

To ensure system emissions compliance, FPM performed system effluent sampling on December 12, 2002. The effluent samples were collected from the effluent sampling port (SP-1) utilizing tedlar air sampling bags and transported via overnight courier to Severn Trent Laboratories, a NELAP-approved laboratory, for analysis of VOCs by EPA Method T01/T02. Table 2.2.2.1 summarizes the laboratory data and the complete laboratory analytical report is included in Appendix D.

Following receipt of the analytical data and using site-verified parameters, the detected analytes were utilized to calculate various air impacts as outlined in Appendix B of the NYSDEC Division of Air Resources DAR-1 policy document entitled "Guidelines for the Control of Toxic Ambient Air Contaminants" (November 1997). These impacts were then compared with the corresponding Annual Guidance Concentration (AGC) or Short-Term Guidance Concentration (SGC) value, as applicable. These comparisons are shown on Table 2.2.2.1. Only one compound, 1,1-dichlorethene, was noted to be above its AGC for both systems and the exceedances were noted to be only slightly above the AGC value.

TABLE 2.2.1
SOIL-VAPOR EXTRACTION/ AIR SPARGE SYSTEM OPERATING LOG - SYSTEM A
ARKWIN INDUSTRIES SITE
66 BROOKLYN AVENUE, WESTBURY, NEW YORK

Date	Name	SVE/AIR SPARGE MONITORING DATA												Comments/ Observations
		SVE System						Air Sparge System						
		Vacuum Before Air Filter VG-1 ("H2O)	Vacuum After Air Filter VG-2 ("H2O)	Vacuum @ Well SVE-1 VG-3 ("H2O)	Vacuum @ Well SVE-2 VG-4 ("H2O)	Total System Flowrate FM-1 (scfm)	Discharge Analysis w/PID SP-1 (ppm)	Compressor Discharge Pressure PG-1 (psi)	Pressure @ Well AS-2 PG-2 (psi)	Pressure @ Well AS-1 PG-3 (psi)	Flow To Well AS-2 FM-2 (scfm)	Flow To Well AS-1 FM-3 (scfm)	Compressor Discharge Temperature TG-1 (oF)	
11/14/2002	B.C.	35	35	25	24	104	1.5	14	12.5	13	14	14	110	
11/21/2002	B.C.	33	33	23	22	108	0.4	14.5	14	13			109	
12/5/2002	G.Y.	35	34	23	21	110		16	16	15			60	System Restarted, High Water
12/12/2002	G.Y.	37	30	20	20	110		16	15	14	18	10	81	
12/12/2002	B.C.	33	33	23	21	110		15	13	14	14	13	110	Adjusted Valves
12/27/2002	G.Y.	37	36	25	24	107		15	15	14	15	13	94	System Restarted, High Water
12/30/2002	G.Y.	System Shutdown - No Drain - Reset and Restarted												
1/3/2002	G.Y.	38	38	27	25	105		15	14	13	15	14	100	
1/10/2003	B.C.	36	36	25	25	105	0.7	15	13.5	13	14	14	108	

Notes:

B.C. = Ben Cancemi
G.Y. = George Young
"H_2O = inches of water
scfm = standard cubic feet per minute
ppm = parts per million
psi = pounds per square inch

TABLE 2.2.2
SOIL-VAPOR EXTRACTION/ AIR SPARGE SYSTEM OPERATING LOG - SYSTEM B
ARKWIN INDUSTRIES SITE
648 MAIN STREET, WESTBURY, NEW YORK

Date	Name	SVE/AIR SPARGE MONITORING DATA													Comments/ Observations
		SVE System					Air Sparge System								
		Vacuum Before Air Filter VG-1 ("H2O)	Vacuum After Air Filter VG-2 ("H2O)	Vacuum @ Well SVE-3 VG-3 ("H2O)	Total System Flowrate FM-1 (scfm)	Discharge Analysis w/PID SP-1 (ppm)	Compressor Discharge Pressure PG-1 (psi)	Pressure @ Well AS-3 PG-4 (psi)	Pressure @ Well AS-4 PG-2 (psi)	Pressure @ Well AS-5 PG-3 (psi)	Flow To Well AS-3 FM-4 (scfm)	Flow To Well AS-4 FM-2 (scfm)	Flow To Well AS-5 FM-3 (scfm)	Compressor Discharge Temp TG-1 (oF)	
11/14/2002	B.C.	44	43	35	102	0.9	15.5	15	15.5	15	14	15	14	116	
11/21/2002	B.C.	44	43	35	105	0.3	15	14	13	14	14	14.5	13.5	113	
12/5/2002	G.Y.	54	52	44	105		18	17	16	17	10	16	13	70	High Water
12/11/2002	G.Y.	46	46	37	105		15	17	16	17	9	16	14	75	High Water
12/12/2002	B.C.	44	44	36	105		15	15	14	14	10	15	14	120	
12/16/2002	G.Y.	System Restarted - High Water													
12/27/2002	G.Y.	47	45	36	105		18	17	16	17	11	13	11	64	Restarted
12/30/2002	G.Y.	System Shutdown - Drained Drum - Reset and Restarted													
1/3/2003	G.Y.	45	44	36	104		16	15	14	15	17	13	11	102	
1/10/2003	B.C.	45	44	35	102	0.5	15	14	14	14	12	12	12	116	

Notes:

B.C. = Ben Cancemi
G.Y. = George Young
"H_2O = inches of water
scfm = standard cubic feet per minute
ppm = parts per million
psi = pounds per square inch

TABLE 2.2.2.1
SOIL VAPOR EXTRACTION SYSTEMS EFFLUENT CHEMICAL ANALYTICAL DATA - DECEMBER 12, 2002
ARKWIN INDUSTRIES SITE
WESTBURY, NEW YORK

SYSTEM A												
CAS	**Compound**	**Flowrate**	**Concentration**	**Daily Loading**	**Annual Loading**	**Worst Case Annual Cavity Impact (Cc)**	**Maximum Actual Annual Impact (Ca)**	**Maximium Annual Potential Cavity Impact (Cp)**	**AGC**	**Cavity Imapct Evaluation Method (Ccst)**	**Maximum Short Term Impact (Cst)**	**SGC**
		SCFM	**ppbvv**	**lbs/hr**	**lbs/yr**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**
75-35-4	1,1-dichloroethene	110	302.5	0.000818232	7.16771451	**0.030821172**	**0.033730421**	**0.033691916**	0.02	1.849204885	2.189974551	--
156-60-5	trans-1,2-dichloroethene	110	ND	NA	NA	NA	NA	NA	NA	NA	NA	--
75-34-3	1,1-dichlorethane	110	222.3	0.000601299	5.267381605	0.022649741	0.024787678	0.024759382	20	1.35893635	1.609359811	--
156-59-2	cis-1,2-dichloroethene	110	356.6	0.000964567	8.449609898	0.036333323	0.03976287	0.039717479	0.1	2.179922188	2.581636116	--
71-55-6	1,1,1-trichlorethane	110	1,673.2	0.004525839	39.64634684	0.170479291	0.186571044	0.186358063	1000	10.22839542	12.11327411	68000
79-01-06	trichloroethene	110	541.3	0.001464162	12.82606236	0.055152068	0.060357941	0.060289039	0.45	3.309006956	3.91878752	54000
127-18-4	tertrachlorethene	110	2,062.4	0.005578586	48.86841126	0.210134168	0.229968994	0.229706472	1000	12.60760382	14.93092071	1
		Total VOCs =	**5,158.3**									

SYSTEM B												
CAS	**Compound**	**Flowrate**	**Concentration**	**Daily Loading**	**Annual Loading**	**Worst Case Annual Cavity Impact (Cc)**	**Maximum Actual Annual Impact (Ca)**	**Maximium Annual Potential Cavity Impact (Cp)**	**AGC**	**Cavity Imapct Evaluation Method (Ccst)**	**Maximum Short Term Impact (Cst)**	**SGC**
				lbs/hr	**lbs/yr**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**	**ug/m3**
75-35-4	1,1-dichloroethene	105	625.2	0.001614235	14.14069983	**0.060805009**	**0.06654447**	**0.066468506**	0.02	3.648171416	4.320452875	--
156-60-5	trans-1,2-dichloroethene	105	20.4	5.26718E-05	0.461404793	0.001984041	0.002171317	0.002168838	1900	0.119038223	0.14097447	--
75-34-3	1,1-dichlorethane	105	662.0	0.001709251	14.97303788	0.064384063	0.070461355	0.070380919	20	3.862907034	4.574759762	--
156-59-2	cis-1,2-dichloroethene	105	611.3	0.001578346	13.82631127	0.059453138	0.065064994	0.064990719	0.1	3.567062039	4.224396741	--
71-55-6	1,1,1-trichlorethane	105	2,500.5	0.006456166	56.55601394	0.24319086	0.266145948	0.265842128	1000	14.5909351	17.27973834	68000
79-01-06	trichloroethene	105	1,045.4	0.002699171	23.64473384	0.101672356	0.111269336	0.111142316	0.45	6.100125398	7.224250536	54000
127-18-4	tertrachlorethene	105	1,414.2	0.003651394	31.98620872	0.137540698	0.150523335	0.150351505	1000	8.252149739	9.772847817	1
		Total VOCs =	**6,879.0**									

CAS = Chemical Abstract Service Registry Number
SCFM = Standard Cubic Feet Per Minute
ppbv = Parts Per Billion Per Volume
lbs/hr = Pounds per hour
lbs/yr = Pounds Per Year
ug/m3 = Micrograms Per Cubic Meter
AGC = Annual Guideline Concentration
SGC = Short Term Guideline Concentration
ND = Not Detected
NA = Not Applicable
VOC's = Volatile Organic Compunds

Based upon the results of this analysis, FPM conducted a second round of effluent sampling on January 14, 2003, to confirm the 1,1-dichloroethene values. These samples were collected for analysis by EPA Method TO-14 (a slightly more sensitive method then the TO1/T02 method) and submitted to York Analytical Laboratories, a NELAP-approved laboratory for analysis. Each sample was collected from the effluent collection port (SP-1) using a tedlar air sampling bag in the same manner as the December 12, 2002 samples.

The results of this sampling are summarized in Table 2.2.2.2 and indicate that neither 1,1-dichlorethene nor any other analyte was detected above the AGC value in either System A or B. Therefore, no effluent treatment measures are necessary at this time. FPM will continue effluent monitoring of both systems on a quarter basis to ensure compliance. The complete laboratory analytical report for this second sampling round is included in Appendix D.

2.3 System Operation and Maintenance

System operation and maintenance will be performed FPM personnel on a quarterly basis to ensure proper system operation and emissions compliance. In addition, trained Arkwin personnel will also assist with more frequent routine system operation checks, consisting primarily of draining the moisture separator on a weekly or as-required basis and collecting system data. Arkwin personnel have been instructed to notify FPM should other conditions arise requiring FPM's attention. The following is a summary of tasks to be performed on each system to maintain the remediation system components and monitor the system operation:

Weekly Tasks:

- Perform system check and service moisture separator;
- Read and record all system airflow rates, pressures, and vacuums.

Quarterly Tasks

- Collect effluent sample for both laboratory analysis by EPA method T0-14 and PID screen to ensure emissions compliance.

TABLE 2.2.2.2
SOIL VAPOR EXTRACTION SYSTEMS EFFLUENT CHEMICAL ANALYTICAL DATA - JANUARY 14, 2003
ARKWIN INDUSTRIES SITE
WESTBURY, NEW YORK

SYSTEM A												
CAS	Compound	Flowrate	Concentration	Daily Loading	Annual Loading	Worst Case Annual Cavity Impact (Cc)	Maximum Actual Annual Impact (Ca)	Maximium Annual Potential Cavity Impact (Cp)	AGC	Cavity Imapct Evaluation Method (Ccst)	Maximum Short Term Impact (Cst)	SGC
		SCFM	ppbvv	lbs/hr	lbs/yr	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
75-35-4	1,1-dichloroethene	102	46	0.000115376	1.010696213	0.004345994	0.004756217	0.004750788	0.02	0.260750393	0.30880122	--
156-60-5	trans-1,2-dichloroethene	102	ND	NA	NA	NA	NA	NA	NA	NA	NA	--
75-34-3	1,1-dichlorethane	102	164	0.000411342	3.603351715	0.015494412	0.016956949	0.016937592	20	0.929631835	1.10094348	--
156-59-2	cis-1,2-dichloroethene	102	283	0.000709815	6.217978874	0.026737309	0.029261077	0.029227674	0.1	1.604181764	1.89979881	--
71-55-6	1,1,1-trichlorethane	102	870	0.002182117	19.11534142	0.082195968	0.089954548	0.08985186	1,000	4.931583516	5.8403709	68,000
79-01-06	trichloroethene	102	329	0.000825191	7.228675087	0.031083303	0.034017295	0.033978462	0.45	1.864932157	2.20860003	54,000
127-18-4	tertrachlorethene	102	400	0.001003272	8.78866272	0.03779125	0.041358413	0.0413112	1,000	2.26739472	2.685228	1
76-13-1	freon-113	102	199	0.000499128	4.372359703	0.018801147	0.02057581	0.020552322	960,000	1.128028873	1.33590093	160,000
		Total VOCs =	2,291									

SYSTEM B												
CAS	Compound	Flowrate	Concentration	Daily Loading	Annual Loading	Worst Case Annual Cavity Impact (Cc)	Maximum Actual Annual Impact (Ca)	Maximium Annual Potential Cavity Impact (Cp)	AGC	Cavity Imapct Evaluation Method (Ccst)	Maximum Short Term Impact (Cst)	SGC
				lbs/hr	lbs/yr	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3	ug/m3
75-35-4	1,1-dichloroethene	102	36	9.02945E-05	0.790979645	0.003401212	0.003722257	0.003718008	0.02	0.204065525	0.24167052	--
156-60-5	trans-1,2-dichloroethene	102	ND	NA	NA	NA	NA	NA	NA	NA	NA	--
75-34-3	1,1-dichlorethane	102	81	0.000203163	1.779704201	0.007652728	0.008375079	0.008365518	20	0.459147431	0.54375867	--
156-59-2	cis-1,2-dichloroethene	102	266	0.000667176	5.844460709	0.025131181	0.027503345	0.027471948	0.1	1.507817489	1.78567662	--
71-55-6	1,1,1-trichlorethane	102	356	0.000892912	7.821909821	0.033634212	0.036808987	0.036766968	1,000	2.017981301	2.38985292	68,000
79-01-06	trichloroethene	102	176	0.00044144	3.867011597	0.01662815	0.018197702	0.018176928	0.45	0.997653677	1.18150032	54,000
127-18-4	tertrachlorethene	102	103	0.000258343	2.26308065	0.009731247	0.010649791	0.010637634	1,000	0.58385414	0.69144621	1
76-13-1	freon-113	102	14	3.51145E-05	0.307603195	0.001322694	0.001447544	0.001445892	960,000	0.079358815	0.09398298	160,000
		Total VOCs =	1,032									

CAS = Chemical Abstract Service Registry Number
SCFM = Standard Cubic Feet Per Minute
ppbv = Parts Per Billion Per Volume
lbs/hr = Pounds per hour
lbs/yr = Pounds Per Year
ug/m3 = Micrograms Per Cubic Meter
AGC = Annual Guideline Concentration
SGC = Short Term Guideline Concentration
ND = Not Detected
NA = Not Applicable
VOC's = Volatile Organic Compunds

Semi-annual Tasks:

- Measure dissolved oxygen concentration in monitoring wells and/or points situated within the systems; radius of influence;
- Perform groundwater monitoring as per the November 2000 Groundwater Remediation Work Plan.

Remediation system performance and progress will be evaluated semi-annually on the basis of the SVE system emissions data and the semi-annual groundwater sampling results.

SECTION 3.0
GROUNDWATER MONITORING AND QUALITY ASSURANCE PROCEDURES

The following sections present the groundwater monitoring procedures and quality assurance/quality control (QA/QC) procedures to be utilized during the OM&M activities at the Site. A site plan showing the groundwater monitoring well locations is presented on Plate 1. A Health and Safety Plan to be utilized during work at the Site is included in Appendix E.

Groundwater sampling shall be performed on a semiannual basis in monitoring wells situated upgradient and downgradient of the installed remediation systems as proposed in FPM's Groundwater Remediation Work Plan (November 2000) and January 15, 2002 addendum and subsequently approved by the NYSDEC. A total of nine shallow (MW-1 through MW-4, MW-7, AIMW-9A through AIMW-11A) and four intermediate-depth (AIMW-9B through AIMW-11B) monitoring wells will be included in the semiannual groundwater monitoring plan to evaluate groundwater VOC concentrations upgradient and downgradient of the remediation systems. If the monitoring results indicate the advisability of adding or removing select monitoring wells from the program, FPM may make recommendations to the NYSDEC and request to change the program. The groundwater monitoring program shall not be changed without the written approval of the NYSDEC.

3.1 Groundwater Monitoring Procedures

At each well to be sampled the depth to groundwater shall be measured to the nearest 0.01 foot. These measurements shall be utilized together with the well depth information to calculate the volume of groundwater within each well casing. The wells to be sampled shall then be purged of at least three but no more than five casing volumes of water using a decontaminated low-flow submersible pump or dedicated disposable bailers. Sampling shall generally performed after the turbidity of the discharged water is less than 50 nephelometric turbidity units (NTU) and the parameters pH, conductivity, and temperature have stabilized between removal of successive casing volumes of water. If the turbidity cannot be reduced to less than 50 NTU but the other parameters appear to be stable, sampling will proceed. Well purging and sampling data shall be recorded on well sampling forms, which shall be included in the bi-annual groundwater monitoring reports.

Following purging, each well shall be sampled using a dedicated disposable bailer. The retrieved samples shall be transferred to laboratory-supplied sample bottles with appropriate preservatives and the filled sample bottles shall be labeled and placed in a cooler with ice to depress

the sample temperature to four degrees Celsius. A chain of custody form shall be completed and kept with the filled cooler to document the sequence of sample possession. The filled coolers shall be transmitted via overnight courier to a New York State Department of Health ELAP-certified laboratory. All samples shall be analyzed for VOCs by the CLP-equivalent of USEPA method 8260 using NYSDEC ASP methods with Category B deliverables.

3.2 Quality Assurance/Quality Control

Quality assurance/quality control (QA/QC) protocols include several types of procedures to assure the quality of the analytical data collected. The QA/QC procedures to be utilized during groundwater monitoring activities at the Site are described in the following sections.

3.2.1 Sampling Equipment Decontamination Procedures

All non-disposable equipment (i.e., water level indicator and pump) used during the groundwater purging activities will be decontaminated prior to use at each location to prevent cross contamination. For groundwater sampling, dedicated disposable bailers will be used. All non-disposable equipment will be decontaminated using the following procedures:

1. The equipment will be scrubbed in a bath of potable water and low-phosphate detergent;
2. Distilled water rinse; and
3. Air dry.

3.2.2 Chain-of-Custody Procedures

For each day of sampling, a chain-of-custody form will be completed and submitted to the laboratory. A copy of the chain-of-custody form will also be retained by FPM for sample tracking purposes. The chain-of-custody form will include the project name, the sampler's signature, the types and sizes of sample bottles and preservatives used, the sampling locations, intervals, and the analytical parameters and methods requested.

3.2.3 QA/QC Samples

Several types of QA/QC samples shall be obtained during the groundwater sampling. The results shall be utilized to evaluate the accuracy and precision of the laboratory data.

An equipment blank sample shall be prepared by pouring laboratory-supplied water through the sampling apparatus and capturing the liquid in the appropriate sample bottles. The equipment blank sample shall be labeled so as not to be identified by the laboratory personnel and shall be tested for the same parameters as the associated primary environmental samples. The equipment blank sample results shall be evaluated to determine the potential for either laboratory or field contamination and to attest to the quality of the equipment decontamination procedures. One equipment blank sample shall be collected each day that sampling is conducted.

A blind duplicate sample shall also be collected and analyzed for the same constituents as the associated parent sample. The blind duplicate sample shall be obtained at the same time as the parent sample and shall be labeled so as not to be identified by the laboratory personnel. Blind duplicate samples shall be obtained at a frequency of at least one sample per 20 primary environmental samples. The blind duplicate results shall be compared to the parent sample results for the purpose of evaluating the precision of the laboratory analysis.

A trip blank sample shall be submitted with each cooler that contains samples for VOC analysis. Trip blank samples consist of filled, preserved, and unopened vials of laboratory water that are kept with the unfilled sample bottles and transported to the laboratory with the filled sample bottles in the coolers. The purpose of the trip blank samples is to provide an indication of the potential for cross-contamination of the VOC samples within the coolers and at the laboratory.

Matrix spike/matrix spike duplicate (MS/MSD) samples consist of field samples spiked with known concentrations of the analytes of interest for the purpose of assessing the effect of the matrix on the reliability of the analytical results. Spiking occurs in the laboratory prior to sample preparation and analysis. One MS/MSD sample shall be collected per sample delivery group (up to 20 primary environmental samples) and the results shall be evaluated together with the other laboratory results for that sample delivery group.

Laboratory QA/QC samples shall include method blank samples, the results of which are included in the chemical analytical data packages and are used to evaluate the accuracy of the laboratory equipment. The laboratory shall also utilize spiked laboratory control samples (LCSs) to evaluate the accuracy of the laboratory results.

3.3 Sample Analysis

All samples will be submitted to a New York State ELAP-approved laboratory. The laboratory testing and data reporting will conform to USEPA Contract Laboratory Protocol (CLP). Laboratory testing and data reporting will be performed by a subcontracted laboratory. The proposed subcontractor laboratory is Severn-Trent Laboratories of Shelton, Connecticut.

The CLP laboratory reports will conform to ASP Category B requirements and will include sample analytical results, methods of analysis, surrogate recoveries, reportable field and laboratory QA/QC sample analytical results, method limits of detection, and sample practical quantification limits (PQLs). All samples will be analyzed for TCL VOCs with NYSDEC ASP Category B deliverables.

3.4 Data Evaluation and Reporting

Samples will be tracked through the field collection, laboratory analysis, and laboratory report preparation processes. FPM will perform the sample tracking and assemble the analytical results as they are received. The collected data will be assembled, reviewed, and evaluated to assure satisfaction of the groundwater monitoring objectives. The data from the primary environmental samples, the QA/QC samples and the laboratory QA/QC samples will be evaluated to verify that the analytical results are of sufficient quality to be relied upon to assess the potential contamination in the groundwater. The results of the data evaluation, including the QA/QC results, will be presented in the monitoring reports together with the remediation system performance data.

The groundwater monitoring data collected will be organized and analyzed to evaluate the nature and extent of impacted groundwater at the Site, the impact from upgradient off-site sources, the groundwater flow direction, and trends in groundwater contaminant concentrations. The evaluation will include preparation of a groundwater elevation contour map utilizing the depth-to-water measurements and the top of well casing elevations. The distribution and concentrations of groundwater contaminants detected will be considered relative to the former sources of the contaminants, their environmental behavior, and previous groundwater monitoring results. Maps and tables of the data from the previous Site sampling programs will be used as appropriate to assist in the analysis. The results of the data evaluation will be discussed in each bi-annual monitoring report.

3.5 Schedule

In general, groundwater monitoring will be performed during the first quarter (February or March) and in the third quarter (August or September) until the system is shut-down. Following shut-down FPM will increase the groundwater sampling to quarterly. If, after four quarters of ground water monitoring, no increase in downgradient shallow groundwater VOC contamination is noted relative to upgradient monitoring well VOC concentrations, then closure of Operable Unit No. 2 (groundwater) will be requested.

Semi-annual groundwater monitoring and remediation system performance reports will prepared following receipt of the laboratory analyses, which generally require six weeks to be completed. Report preparation requires another four to six weeks to complete. Therefore, each monitoring report is planned to be submitted to the NYSDEC several months prior to the next monitoring event. This schedule allows for changes in the configuration of the monitoring well network between sampling events so as to better evaluate the groundwater VOC plume behavior over time.

SECTION 4.0
REFERENCES

FPM, November 2000 (January 2002 Addendum). *Groundwater Remediation Work Plan for Arkwin Industries Inc., Westbury, New York, NYSDEC Registry # 1-30-043D.*

FPM, January 15, 2002. *Addendum letter.*

FPM, July 2002. *Soil Vapor Extraction and Air Sparging Pilot Test Report for Arkwin Industries Site, Westbury, New York, NYSDEC Registry # 1-30-043D.*

APPENDIX A

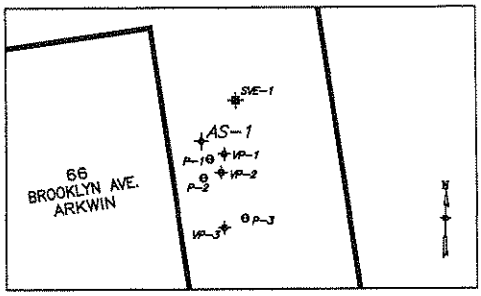
AIR SPARGING AND SOIL VAPOR EXTRACTION WELL INSTALLATION LOGS

FPM

ENVIRO-SCIENCES, INC.
312 E. MAIN STREET
PATCHOGUE, N.Y. 11772
PHONE: (631) 207-9005

Well Number AS-1

Project Arkwin (D & B)



Project Address: 66 Brooklyn Ave., New Cassel

Date Drilled 1/4/02 T.D. of Hole 96' Diameter 4"

T.O.C. _____ Water Depth, Initial 58.25'

Screen: Diam. 2" Length 2' Slot Size 0.020"

Casing: Diam. 2" Length 89.5' Type Sch 40 PVC

Drilling Co. Land, Air, Water Env. Drilling Method Hollow Stem Auger

Driller Carl Pedersen Log by Tom Stolworthy Sampling Method Split Spoon

Depth (Feet)	Well Construction	PID (ppm)	Sample ID Blow Count	% Recovery	USCS Class	Description/Soil Classification (Color, Texture, Structures) Trace < 10%, Little 10% to 20%, Some 20% to 35% and 35% to 50%
0						
2						*(0-6") CONCRETE*
4						*(1'-2') CEMENT GROUT*
6						
8						
10						
12						
14						
16						
18						
20						
22						
24						(0-45') TAN, DRY, FINE SAND, SOME MEDIUM SAND, LITTLE FINE AND COARSE GRAVEL, LITTLE SILT.
26						*(2'-56') NATIVE FILL*
28						*(6"-90') CASING*
30						
32						
34						
36						
38						
40						
42						
44						
46						
48						

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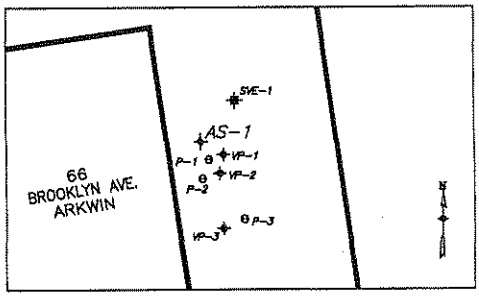
ENVIRO-SCIENCES, INC.
312 E. MAIN STREET
PATCHOGUE, N.Y. 11772
PHONE: (631) 207-9005

Well Number AS-1

Project Arkwin (D & B)



Project Address: 66 Brooklyn Ave., New Cassel, New York

Date Drilled 1/4/02 T.D. of Hole 96' Diameter 4"

T.O.C. _____ Water Depth, Initial 58.25'

Screen: Diam. 2" Length 2' Slot Size 0.020"

Casing: Diam. 2" Length 89.5' Type Sch 40 PVC

Drilling Co. Land, Air, Water Env. Drilling Method Hollow Stem Auger

Driller Carl Pedersen Log by Tom Stolworthy Sampling Method Split Spoon

Depth (Feet)	Well Construction	PID (ppm)	Sample ID / Blow Count	% Recovery	USCS Class	Description/Soil Classification (Color, Texture, Structures) Trace < 10%, Little 10% to 20%, Some 20% to 35% and 35% to 50%
48						
50						(45'–55') LT. BROWN, DRY TO MOIST, SILT, SOME FINE SAND.
52						
54						
56		0.0	6 11 / 23 30	60%		*BEGAN SPLIT SPOONING AT 55'.* (55'–57') WHITE TO LT. BROWN, DRY, FINE SAND, SOME SILT. *(56'–58') BENTONITE SEAL.*
58	▼	0.0	9 14 / 21 26	50%		(57'–59') TAN, MOIST TO WET AT 58', FINE SAND, LITTLE SILT.
60		0.0	18 25 / 33 46	70%		(59'–61') TAN, WET, FINE SAND, SOME SILT.
62		0.0	12 39 / 47 53	30%		(61'–63') SAME AS ABOVE.
64		0.0	6 7 / 9 11	25%		(63'–65') TAN/WHITE, WET, FINE SAND, SOME SILT.
66		0.0	11 14 / 26 29	25%		(65'–67') TAN, WET, FINE SAND, SOME SILT.
68		0.0	14 17 / 20 25	65%		(67'–69') SAME AS ABOVE.
70		0.0	8 14 / 19 24	85%		(69'–71') TAN, WET, FINE SAND, SOME SILT.
72		0.0	7 10 / 14 22	90%		(71'–73') SAME AS ABOVE. *(58'–86') NATIVE FILL.*
74		0.0	11 16 / 17 23	80%		(73'–75') TAN, WET, FINE SAND, SOME SILT, TRACE OF GRAVEL.
76		0.0	8 14 / 17 22	90%		(75'–79') FINE SAND, SOME SILT, TRACE OF GRAVEL.
78		0.0	6 9 / 11 15	70%		(77'–79') TAN/ORANGE, WET, FINE SAND, SOME SILT.
80		0.0	7 10 / 12 13	75%		(79'–81') TAN/ORANGE, WET, FINE SAND, LITTLE SILT, TRACE OF GRAVEL.\
82		0.0	8 11 / 19 18	70%		(81'–83') TAN, WET, FINE SAND, SOME SILT.
84		0.0	11 15 / 19 21	60%		(83'–85') TAN, WET, FINE SAND, LITTLE SILT, TRACE OF GRAVEL (IRON).
86		0.0	10 18 / 19 24	90%		(85'–87') TAN/ORANGE, WET, FINE SAND, SOME SILT. *(86'–88') BENTONITE SEAL.*
88		0.0	11 14 / 17 20	95%		(87'–89') TAN, WET, FINE SAND, SOME SILT.
90		>2000?	8 10 / 15 18	80%		(89'–91') SAME AS ABOVE. *(90'–92') SCREEN.*
92						*(88'–96') #2 FILTER GRAVEL.*
94						
96		530?	7 11 / 14 20	95%		(94'–96') TAN/ORANGE, WET, FINE SAND, SOME SILT. *END OF BORING AT 96 FT.*

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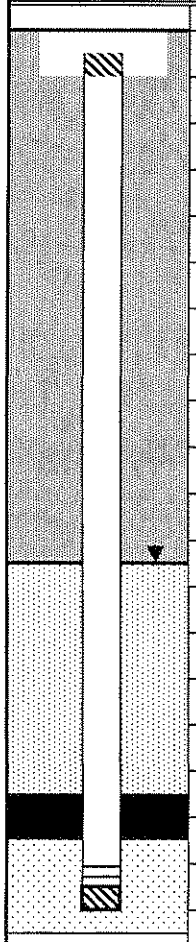
Geologic Log and Well Construction Details
AS-2

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Fanning, Phillips and Molnar Group, Ltd.		Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name: Arkwin Industries	Address: 66 Brooklyn Avenue, Westbury, NY	Date: N/A	DTW: NM	NM
Drilling Company: Land, Air, Water Environmental Services, Inc.	Method: Hollow Stem Auger			Measuring Point Elevation
Date Started: 10/16/02	Date Completed: 10/28/02			NM
Completion Depth: 93 feet below grade	*ENVIROTRAC* Geologist: Tara Staskowski			

WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES: Recovery (in.)	SAMPLES: Blow per 6 in.	SAMPLES: OVM (ppm)	SOIL DESCRIPTION
	0	NM	NM	0	0-5' Hand dug
	5	NM	NM	0	Brown, fine to coarse **SAND** with **GRAVEL**, dry, no odor 5-10'
	10	NM	NM	0	Tan, medium to course **SAND** with **GRAVEL**, dry, no odor 10-15'
	15	NM	NM	0	Same as above 15-20'
	20	NM	NM	0	Same as above 20-25'
	25	NM	NM	0	Same as above 25-30'
	30	NM	NM	0	Same as above 30-35'
	35	NM	NM	0	Same as above 35-40'
	40	NM	NM	0	Same as above 40-45'
	45	NM	NM	0	Brown, fine to coarse **SAND** with **GRAVEL**, dry, no odor 45-50'
	50	NM	NM	0	Tan-brown, **GRAVEL** with medium to coarse **SAND**, dry, no odor 50-55'
	55	NM	NM	0	Brown/light tan, fine to medium **SAND**, trace **SILT**, wet, no odor 55-60'
	60	NM	NM	0	Same as above 60-65'
	65	NM	NM	0	Pink/brown, fine to medium **SAND**, trace **SILT**, trace **CLAY**, wet, no odor 65-70'
	70	NM	NM	0	Grey-brown, fine to medium **SAND** and **SILT**, wet, no odor 70-75'
	75	NM	NM	0	Same as above 75-80'
	80	NM	NM	0	Light brown, fine **SAND** and **SILT**, wet, no odor 80-85'
	85	NM	NM	0	Same as above 85-90'
	90	NM	NM	0	Same as above 90-93'
	95				Same as above

LEGEND:

- Native Fill
- Bentonite Grout
- Bentonite Seal
- Gravel pack (morie #2)
- Screen
- End/Top Cap

Note: Soils observed from cuttings

Well Construction Details

Bottom of Well:	92 feet below grade
Screen Zone:	92'-89.5'
Screen material:	# 20 slot, 1.5", schedule 40 PVC
Casing material:	1.5", schedule 40 PVC
SAND Pack:	Morie #2
Bentonite Seal:	88.5'-86'

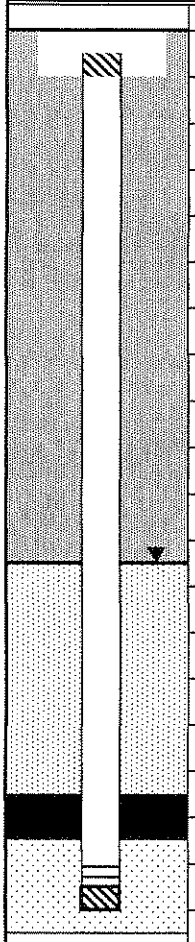
NTS - Not to Scale ND - Not Detected NM - Not Measured N/A - Not Available DTW - Depth to Water

Geologic Log and Well Construction Details
AS-3

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Fanning, Phillips and Molnar Group, Ltd.		Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name: Arkwin Industries	Address: 648 Main Street, Westbury, NY	Date: N/A	DTW: NM	NM
Drilling Company: Land, Air, Water Environmental Services, Inc.	Method: Hollow Stem Auger			Measuring Point Elevation
Date Started: 10/16/02	Date Completed: 10/16/02			NM
Completion Depth: 93 feet below grade	*ENVIROTRAC* Geologist: Tara Staskowski			

WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES: Recovery (in.)	SAMPLES: Blow per 6 in.	SAMPLES: OVM (ppm)	SOIL DESCRIPTION
	0				
	5	NM	NM	0	0-5' Hand dug Brown/grey, fine to coarse **SAND** and **CLAY**, trace **GRAVEL**, dry, no odor
	10	NM	NM	0	5-10' Brown, fine to coarse **SAND** and **GRAVEL**, some **CLAY**, dry, no odor
	15	NM	NM	0	10-15' Brown, medium to coarse **SAND** with **GRAVEL**, dry, no odor
	20	NM	NM	0	15-20' Same as above
	25	NM	NM	0	20-25' Same as above
	30	NM	NM	0	25-30' Same as above
	35	NM	NM	0	30-35' Same as above
	40	NM	NM	0	35-40' Same as above
	45	NM	NM	0	40-45' Brown, fine to coarse **SAND** and **GRAVEL**, trace **SILT**, dry, no odor
	50	NM	NM	0	45-50' Same as above
	55	NM	NM	0	50-55' Brown, fine to coarse **SAND** and **SILT**, trace **GRAVEL**, dry, no odor
	60	NM	NM	0	55-60' Red brown/grey, **CLAY** and fine to coarse **SAND**, trace **SILT**, wet, no odor
	65	NM	NM	0	60-65' Grey brown, fine to coarse **SAND**, wet, no odor
	70	NM	NM	0	65-70' Same as above
	75	NM	NM	0	70-75' Red brown, fine to coarse **SAND**, trace **SILT**, wet, no odor
	80	NM	NM	0	75-80' Same as above
	85	NM	NM	0	80-85' Same as above
	90	NM	NM	0	85-90' Same as above
	95	NM	NM	0	90-93' Same as above

LEGEND:

- Native Fill
- Bentonite Grout
- Bentonite Seal
- Gravel pack (morie #2)
- Screen
- End/Top Cap

Note: Soils observed from cuttings

Well Construction Details

Bottom of Well:	92 feet below grade
Screen Zone:	92'-89.5'
Screen material:	# 20 slot, 1.5", schedule 40 PVC
Casing material:	1.5", schedule 40 PVC
SAND Pack:	Morie #2
Bentonite Seal:	88.5'-86'

NTS - Not to Scale ND - Not Detected NM - Not Measured N/A - Not Available DTW - Depth to Water

Geologic Log and Well Construction Details
AS-4

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Fanning, Phillips and Molnar Group, Ltd.		Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name: Arkwin Industries	Address: 648 Main Street, Westbury, NY	Date: N/A	DTW: NM	NM
Drilling Company: Land, Air, Water Environmental Services, Inc.	Method: Hollow Stem Auger			Measuring Point Elevation
Date Started: 10/18/02	Date Completed: 10/18/02			NM
Completion Depth: 93 feet below grade	*ENVIROTRAC* Geologist: Tara Staskowski			

WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES: Recovery (in.)	SAMPLES: Blow per 6 in.	SAMPLES: OVM (ppm)	SOIL DESCRIPTION
	0				
	5	NM	NM	0	0-5' Hand dug Brown, fine to coarse **SAND** with **GRAVEL**, dry, no odor
	10	NM	NM	0	5-10' Same as above
	15	NM	NM	0	10-15' Light brown, medium to coarse **SAND** with **GRAVEL**, dry, no odor
	20	NM	NM	0	15-20' Same as above
	25	NM	NM	0	20-25' Same as above
	30	NM	NM	0	25-30' Same as above
	35	NM	NM	0	30-35' Tan, medium to coarse **SAND** with **GRAVEL**, dry, no odor
	40	NM	NM	0	35-40' Same as above
	45	NM	NM	0	40-45' Light brown, fine to coarse **SAND** with **GRAVEL**, dry, no odor
	50	NM	NM	0	45-50' Tan-brown, **GRAVEL** with coarse **SAND**, dry, no odor
	55	NM	NM	0	50-55' Light brown, fine to medium **SAND** with **SILT**, trace **GRAVEL**, dry, no odor
	60	NM	NM	0	55-60' Pink/grey, fine to medium **SAND** with **SILT**, trace **GRAVEL**, wet, no odor
	65	NM	NM	0	60-65' Same as above
	70	NM	NM	0	65-70' Tan/grey, fine to medium **SAND** with **SILT**, wet, no odor
	75	NM	NM	0	70-75' Same as above
	80	NM	NM	0	75-80' Same as above
	85	NM	NM	0	80-85' Tan/grey, fine to medium **SAND** with **SILT**, trace **GRAVEL**, wet, no odor
	90	NM	NM	NM	85-90' Same as above
	95	NM	NM	NM	90-93' Same as above

LEGEND:

- Native Fill
- Bentonite Grout
- Bentonite Seal
- Gravel pack (morie #2)
- Screen
- End/Top Cap

Note: Soils observed from cuttings

Well Construction Details

Bottom of Well:	92 feet below grade
Screen Zone:	92'-89.5'
Screen material:	# 20 slot, 1.5", schedule 40 PVC
Casing material:	1.5", schedule 40 PVC
SAND Pack:	Morie #2
Bentonite Seal:	88.5'-86'

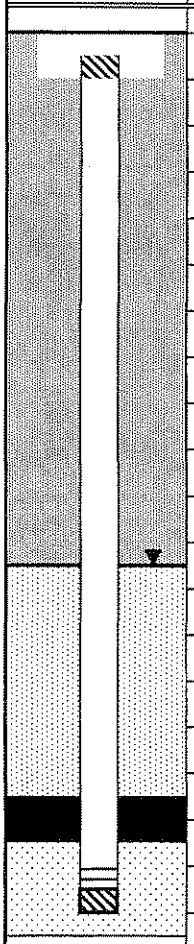
NTS - Not to Scale ND - Not Detected NM - Not Measured N/A - Not Available DTW - Depth to Water

Geologic Log and Well Construction Details
AS-5

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Fanning, Phillips and Molnar Group, Ltd.		Depth to Water (ft. from measuring pt.)		Site Elevation Datum: NM
Site Name: Arkwin Industries	Address: 648 Main Street, Westbury, NY	Date: N/A	DTW: NM	
Drilling Company: Land, Air, Water Environmental Services, Inc.	Method: Hollow Stem Auger			Measuring Point Elevation: NM
Date Started: 10/15/02	Date Completed: 10/15/02			
Completion Depth: 93 feet below grade	*ENVIROTRAC* Geologist: Tara Staskowski			

WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES: Recovery (in.)	SAMPLES: Blow per 6 in.	SAMPLES: OVM (ppm)	SOIL DESCRIPTION
	0				
	5	NM	NM	0	0-5' Hand dug Brown, fine to coarse **SAND** and **GRAVEL**, trace **SILT**, dry, no odor
	10	NM	NM	0	5-10' Same as above
	15	NM	NM	0	10-15' Same as above
	20	NM	NM	0	15-20' Same as above
	25	NM	NM	0	20-25' Light brown, medium to coarse **SAND** and **GRAVEL**, dry, no odor
	30	NM	NM	0	25-30' Same as above
	35	NM	NM	0	30-35' Same as above
	40	NM	NM	0	35-40' Brown, fine to course **SAND** with **GRAVEL**, dry, no odor
	45	NM	NM	0	40-45' Same as above
	50	NM	NM	0	45-50' Brown, **GRAVEL** and coarse **SAND**, dry, no odor
	55	NM	NM	0	50-55' Light brown, fine to coarse **SAND**, dry, no odor
	60	NM	NM	11.1	55-60' Light brown, fine to medium **SAND**, dry, no odor
	65	NM	NM	0	60-65' Reddish brown, fine **SAND** and some **CLAY**, wet odor
	70	NM	NM	0	65-70' Same as above
	75	NM	NM	0	70-75' Reddish-brown, fine to coarse **SAND** and **GRAVEL**, trace **CLAY**, wet, no odor
	80	NM	NM	0	75-80' Brown, fine to coarse **SAND** and **GRAVEL**, wet, no odor
	85	NM	NM	0	80-85' Reddish-brown, fine to coarse **SAND**, trace, **SILT**, wet, no odor
	90	NM	NM	0	85-90' Same as above
	95	NM	NM	0	90-93' Same as above

LEGEND:

- Native Fill
- Bentonite Grout
- Bentonite Seal
- Gravel pack (morie #2)
- Screen
- End/Top Cap

Note: Soils observed from cuttings

Well Construction Details

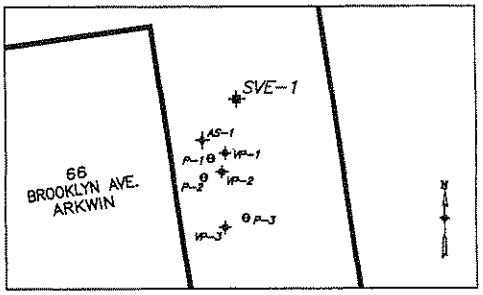
Bottom of Well:	92 feet below grade
Screen Zone:	92'-89.5'
Screen material:	# 20 slot, 1.5", schedule 40 PVC
Casing material:	1.5", schedule 40 PVC
SAND Pack:	Morie #2
Bentonite Seal:	88.5'-86'

NTS - Not to Scale ND - Not Detected NM - Not Measured N/A - Not Available DTW - Depth to Water

ENVIRO-SCIENCES, INC.
312 E. MAIN STREET
PATCHOGUE, N.Y. 11772
PHONE: (631) 207-9005

Well Number SVE-1

Project Arkwin (D & B)



Project Address: 66 Brooklyn Ave., New Cassel, New York

Date Drilled 1/7/02 T.D. of Hole 65' Diameter 4"

T.O.C. _____ Water Depth, Initial 58.25'

Screen: Diam. 2" Length 20' Slot Size 0.020"

Casing: Diam. 2" Length 42.5' Type Sch 40 PVC

Drilling Co. Land, Air, Water Env. Drilling Method Hollow Stem Auger

Driller Carl Pederson Log by Tom Stolworthy Sampling Method NA

Depth (Feet)	Well Construction	PID (ppm)	Sample ID Blow Count	% Recovery	USCS Class	Description/Soil Classification (Color, Texture, Structures) Trace < 10%, Little 10% to 20%, Some 20% to 35% and 35% to 50%
0						
3						*(0–6") CONCRETE*
6						*(1'–2') CEMENT GROUT*
9						
12						
15						
18						
21						*(2'–39') NATIVE FILL*
24						*(6"–43') CASING*
27						(0–58') TAN, DRY, FINE SAND, SOME SILT, LITTLE GRAVEL.
30						
33						
36						
39						
42						
45						
48						*(41'–65') #2 FILTER GRAVEL*
51						
54						
57		▼				*(43'–63') SCREEN*
60						(58'–65') TAN, WET, FINE SAND, SOME SILT.
63						
66						*END OF BORING AT 65 FT.*
69						
72						

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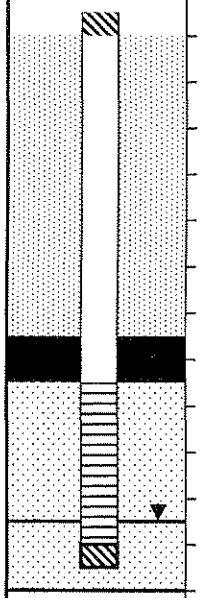
Geologic Log and Well Construction Details
SVE-2
ENVIROTRAC LTD.
80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Fanning, Phillips and Molnar Group, Ltd.		Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name: Arkwin Industries	Address: 66 Brooklyn Avenue, Westbury, NY	Date: N/A	DTW: NM	NM
Drilling Company: Land, Air, Water Environmental Services, Inc.	Method: Hollow Stem Auger			Measuring Point Elevation
Date Started: 10/28/02	Date Completed: 10/28/02			NM
Completion Depth: 65 feet below grade	*ENVIROTRAC* Geologist: Tara Staskowski			



DEPTH (ft below grade)	SAMPLES Recovery (in.)	SAMPLES Blow per 6 in.	SAMPLES OVM (ppm)	SOIL DESCRIPTION
0	NM	NM	0	0-5' Hand dug Brown, coarse **SAND** with **GRAVEL**, dry, no odor
5	NM	NM	0	5-10' Same as above
10	NM	NM	0	10-15' Same as above
15	NM	NM	0	15-20' Same as above
20	NM	NM	0	20-25' Same as above
25	NM	NM	0	25-30' Same as above
30	NM	NM	0	30-35' Same as above
35	NM	NM	0	35-40' Same as above
40	NM	NM	0	40-45' Brown, medium to coarse **SAND** with **GRAVEL**, dry, no odor
45	NM	NM	0	45-50' Tan-brown, **GRAVEL** with medium to coarse **SAND**, dry, no odor
50	NM	NM	0	50-55' Tan, fine to medium **SAND** with **GRAVEL**, dry, no odor
55	NM	NM	0	55-60' Tan, fine to medium **SAND**, trace **SILT**, dry, no odor
60	NM	NM	0	60-65' Tan/grey, fine to medium **SAND**, trace **SILT**, trace **CLAY**, wet, no odor
65	NM	NM	0	
70				
75				
80				
85				
90				Note: Soils observed from cuttings
95				

LEGEND:
- Bentonite Grout
- Bentonite Seal
- Gravel pack (morie #2)
- Screen
- End/Top Cap

Well Construction Details
- Bottom of Well: 63 feet below grade
- Screen Zone: 63'-43'
- Screen material: # 20 slot, 2", schedule 40 PVC
- Casing material: 2", schedule 40 PVC
- SAND Pack: Morie #2
- Bentonite Seal: 42'-39'

NTS - Not to Scale ND - Not Detected NM - Not Measured N/A - Not Available DTW - Depth to Water

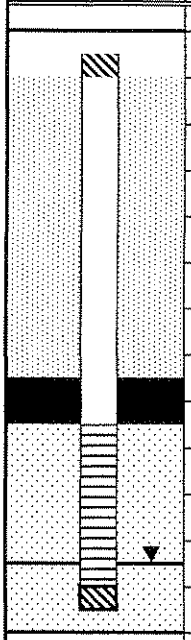
Geologic Log and Well Construction Details

SVE-3

ENVIROTRAC LTD.

80 B Air Park Drive, Ronkonkoma, NY 11779

Client: Fanning, Phillips and Molnar Group, Ltd.		Depth to Water (ft. from measuring pt.)		Site Elevation Datum
Site Name: Arkwin Industries	Address: 648 Main Street, Westbury, NY	Date: N/A	DTW: NM	NM
Drilling Company: Land, Air, Water Environmental Services, Inc.	Method: Hollow Stem Auger			Measuring Point Elevation
Date Started: 10/18/02	Date Completed: 10/18/02			NM
Completion Depth: 65 feet above grade	*ENVIROTRAC* Geologist: Tara Staskowski			

WELL CONSTRUCTION (NTS)	DEPTH (ft below grade)	SAMPLES: Recovery (in.)	SAMPLES: Blow per 6 in.	SAMPLES: OVM (ppm)	SOIL DESCRIPTION
	0	NM	NM	0	0-5' Hand dug Brown, fine to coarse **SAND** with **GRAVEL**, dry, no odor
	5	NM	NM	0	5-10' Light brown, fine to coarse **SAND** with **GRAVEL**, dry, no odor
	10	NM	NM	0	10-15' Brown/tan, medium to coarse **SAND** with **GRAVEL**, dry, no odor
	15	NM	NM	0	15-20' Same as above
	20	NM	NM	0	20-25' Tan, medium to coarse **SAND** with **GRAVEL**, dry, no odor
	25	NM	NM	0	25-30' Same as above
	30	NM	NM	0	30-35' Same as above
	35	NM	NM	0	35-40' Same as above
	40	NM	NM	0	40-45' Brown, **GRAVEL** with coarse **SAND**, dry, no odor
	45	NM	NM	0	45-50' Brown, coarse **SAND** with **GRAVEL**, dry, no odor
	50	NM	NM	0	50-55' Light brown, fine to medium **SAND** with **SILT**, trace **GRAVEL**, dry, no odor
	55	NM	NM	0	55-60' Brown, fine to medium **SAND** with **SILT**, trace **CLAY**, wet, no odor
	60	NM	NM	0	60-65' Light tan/red, grey, fine to medium **SAND** with **SILT**, wet, no odor
	65	NM	NM	0	
	70				
	75				
	80				
	85				
	90				Note: Soils observed from cuttings
	95				

LEGEND:

- Bentonite Grout
- Bentonite Seal
- Gravel pack (morie #2)
- Screen
- End/Top Cap

Well Construction Details

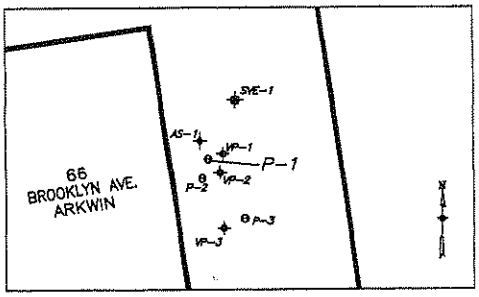
Bottom of Well:	63 feet below grade
Screen Zone:	63'-43'
Screen material:	# 20 slot, 2", schedule 40 PVC
Casing material:	2", schedule 40 PVC
SAND Pack:	Morie #2
Bentonite Seal:	42'-39'

NTS - Not to Scale ND - Not Detected NM - Not Measured N/A - Not Available DTW - Depth to Water

ENVIRO-SCIENCES, INC.
312 E. MAIN STREET
PATCHOGUE, N.Y. 11772
PHONE: (631) 207-9005

Well Number AS P-1

Project Arkwin (D & B)



Project Address: 66 Brooklyn Ave., New Cassel, New York

Date Drilled 1/8/02 T.D. of Hole 76' Diameter 4"

T.O.C. _____ Water Depth, Initial 58.25'

Screen: Diam. 1" Length 20' Slot Size 0.020"

Casing: Diam. 1" Length 52.5' Type Sch 40 PVC

Drilling Co. Land, Air, Water Env. Drilling Method Hollow Stem Auger

Driller Carl Pedersen Log by Tom Stolworthy Sampling Method NA

Depth (Feet)	Well Construction	PID (ppm)	Sample ID Blow Count	% Recovery	USCS Class	Description/Soil Classification (Color, Texture, Structures) Trace < 10%, Little 10% to 20%, Some 20% to 35% and 35% to 50%
0						
4						*(0-6") CONCRETE*
8						*(1'-2') CEMENT GROUT*
12						
16						
20						
24						
28						*(2'-49') NATIVE FILL*
32						*(6"-53') CASING*
36						(0-58') TAN, DRY, FINE SAND, SOME SILT, TRACE OF GRAVEL.
40						
44						
48						*(49'-51') BENTONITE SEAL*
52						
56		▼				
60						*(51'-76') #2 FILTER GRAVEL*
64						*(53'-73') SCREEN*
68						(58'-76') TAN, WET, FINE SAND, SOME SILT.
72						
76						*END OF BORING AT 76 FT.*
80						
84						
88						
92						
96						

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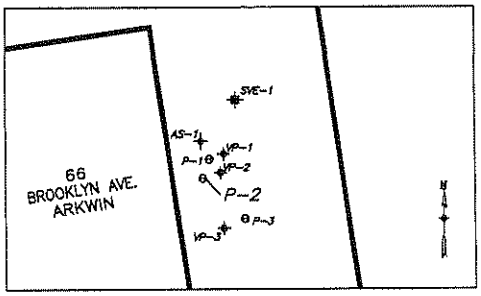
ENVIRO-SCIENCES, INC.
312 E. MAIN STREET
PATCHOGUE, N.Y. 11772
PHONE: (631) 207-9005

Well Number P-2

Project Arkwin (D & B)



Project Address: 66 Brooklyn Ave., New Cassel, New York

Date Drilled 1/8/02 T.D. of Hole 76' Diameter 4"

T.O.C. _____ Water Depth, Initial 58.25'

Screen: Diam. 1" Length 20' Slot Size 0.020"

Casing: Diam. 1" Length 52.5' Type Sch 40 PVC

Drilling Co. Land, Air, Water Env. Drilling Method Hollow Stem Auger

Driller Carl Pedersen Log by Tom Stolworthy Sampling Method NA

Depth (Feet)	Well Construction	PID (ppm)	Sample ID Blow Count	% Recovery	USCS Class	Description/Soil Classification (Color, Texture, Structures) Trace < 10%, Little 10% to 20%, Some 20% to 35% and 35% to 50%
0						
4						*(0–6") CONCRETE*
8						*(1'–2') CEMENT GROUT*
12						
16						
20						
24						
28						
32						*(2'–49') NATIVE FILL*
36						*(6"–53') CASING*
40						(0–58') ORANGE–BROWN, DRY, FINE SAND, LITTLE SILT, LITTLE GRAVEL.
44						
48						*(49'–51') BENTONITE SEAL*
52						
56		▼				
60						*(51'–76') #2 FILTER GRAVEL*
64						*(53'–73') SCREEN*
68						(58'–76') TAN, WET, FINE SAND, SOME SILT.
72						
76						*END OF BORING AT 76 FT.*
80						
84						
88						
92						
96						

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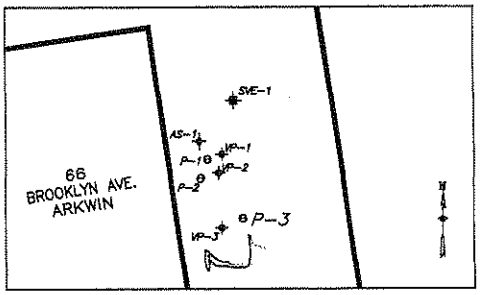
ENVIRO-SCIENCES, INC.
312 E. MAIN STREET
PATCHOGUE, N.Y. 11772
PHONE: (631) 207-9005

Well Number P-3

Project Arkwin (D & B)



Project Address: 66 Brooklyn Ave., New Cassel, New York

Date Drilled 1/14/02 T.D. of Hole 75' Diameter 4"

T.O.C. _____ Water Depth, Initial 58.25'

Screen: Diam. 1" Length 20' Slot Size 0.020"

Casing: Diam. 1" Length 52.5' Type Sch 40 PVC

Drilling Co. Land, Air, Water Env. Drilling Method Hollow Stem Auger

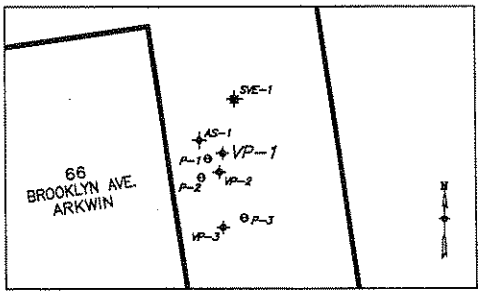
Driller Carl Pedersen Log by Tom Stolworthy Sampling Method NA

Depth (Feet)	Well Construction	PID (ppm)	Sample ID Blow Count	% Recovery	USCS Class	Description/Soil Classification (Color, Texture, Structures) Trace < 10%, Little 10% to 20%, Some 20% to 35% and 35% to 50%
0						
4						*(0-6") CONCRETE*
8						*(1'-2') CEMENT GROUT*
12						
16						
20						
24						
28						
32						*(2'-49') NATIVE FILL*
36						*(6"-53') CASING*
40						(0-58') TAN, DRY, FINE SAND, SOME SILT, LITTLE GRAVEL.
44						
48						*(49'-51') BENTONITE SEAL*
52						
56		▼				
60						*(51'-75') #2 FILTER GRAVEL*
64						*(53'-73') SCREEN*
68						(58'-75') TAN, WET, FINE SAND, SOME SILT.
72						
76						*END OF BORING AT 75 FT.*
80						
84						
88						
92						
96						

ENVIRO-SCIENCES, INC.
312 E. MAIN STREET
PATCHOGUE, N.Y. 11772
PHONE: (631) 207-9005

Well Number VP-1

Project Arkwin (D & B)



Project Address: 66 Brooklyn Ave., New Cassel, New York

Date Drilled 1/9/02 T.D. of Hole 65' Diameter 4"

T.O.C. _____ Water Depth, Initial 58.25'

Screen: Diam. 1" Length 10' Slot Size 0.020"

Casing: Diam. 1" Length 52.5' Type Sch 40 PVC

Drilling Co. Land, Air, Water Env. Drilling Method Hollow Stem Auger

Driller Kieth McGourty Log by Tom Stolworthy Sampling Method NA

Depth (Feet)	Well Construction	PID (ppm)	Sample ID Blow Count	% Recovery	USCS Class	Description/Soil Classification (Color, Texture, Structures) Trace < 10%, Little 10% to 20%, Some 20% to 35% and 35% to 50%
0						
3						*(0–6") CONCRETE*
6						*(1'–2') CEMENT GROUT*
9						
12						
15						
18						
21						
24						*(2'–49') NATIVE FILL*
27						*(6"–53') CASING*
30						(0–58') TAN, DRY, FINE SAND, LITTLE SILT, TRACE OF GRAVEL.
33						
36						
39						
42						
45						
48						*(49'–51') BENTONITE SEAL*
51						
54						*(51'–65') #2 FILTER GRAVEL*
57						*(53'–63') SCREEN*
60						(58'–65') TAN, WET, FINE SAND, SOME SILT.
63						
66						*END OF BORING AT 65 FT.*
69						
72						

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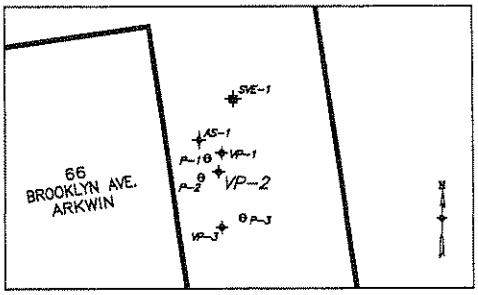
ENVIRO-SCIENCES, INC.
312 E. MAIN STREET
PATCHOGUE, N.Y. 11772
PHONE: (631) 207-9005

Well Number VP-2

Project Arkwin (D & B)



Project Address: 66 Brooklyn Ave., New Cassel, New York

Date Drilled 1/14/02 T.D. of Hole 65' Diameter 4"

T.O.C. _____ Water Depth, Initial 58.25'

Screen: Diam. 1" Length 10' Slot Size 0.020"

Casing: Diam. 1" Length 52.5' Type Sch 40 PVC

Drilling Co. Land, Air, Water Env. Drilling Method Hollow Stem Auger

Driller Carl Pedersen Log by Tom Stolworthy Sampling Method NA

Depth (Feet)	Well Construction	PID (ppm)	Sample ID Blow Count	% Recovery	USCS Class	Description/Soil Classification (Color, Texture, Structures) Trace < 10%, Little 10% to 20%, Some 20% to 35% and 35% to 50%
0						
3						*(0–6") CONCRETE*
6						*(1'–2') CEMENT GROUT*
9						
12						
15						
18						
21						
24						*(2'–48.5') NATIVE FILL*
27						(0–58') TAN, DRY, FINE SAND, LITTLE SILT, TRACE OF GRAVEL.
30						
33						
36						
39						
42						
45						
48						*(48.5'–51') BENTONITE SEAL*
51						
54						*(51'–65') #2 FILTER GRAVEL*
57		▼				*(53'–63') SCREEN*
60						(58'–65') TAN, WET, FINE SAND, SOME SILT.
63						
66						*END OF BORING AT 65 FT.*
69						
72						

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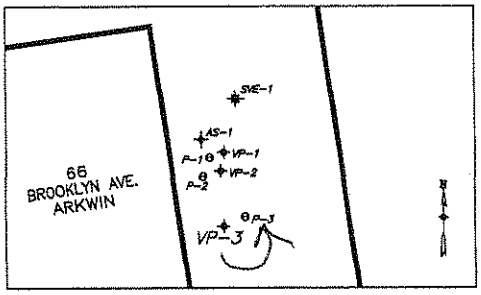
ENVIRO-SCIENCES, INC.
312 E. MAIN STREET
PATCHOGUE, N.Y. 11772
PHONE: (631) 207-9005

Well Number VP-3

Project Arkwin (D & B)



Project Address: 66 Brooklyn Ave., New Cassel, New York

Date Drilled 1/3/02 T.D. of Hole 65' Diameter 2.25"

T.O.C. _____ Water Depth, Initial 58.25'

Screen: Diam. 1" Length 10' Slot Size 0.020"

Casing: Diam. 1" Length 52.5' Type Sch 40 PVC

Drilling Co. Land, Air, Water Env. Drilling Method Hollow Stem Auger

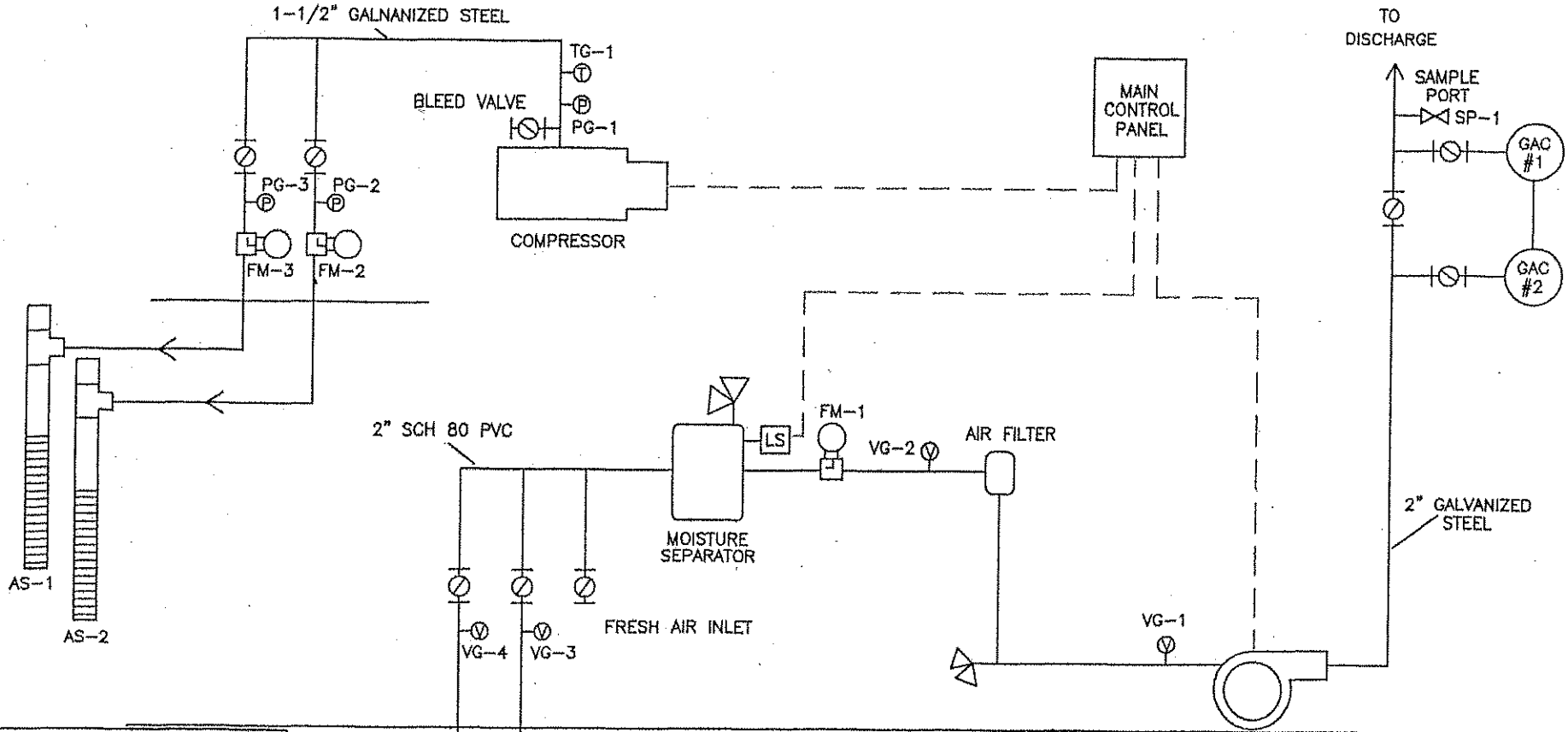
Driller Carl Pedersen Log by Tom Stolworthy Sampling Method NA

Depth (Feet)	Well Construction	PID (ppm)	Sample ID Blow Count	% Recovery	USCS Class	Description/Soil Classification (Color, Texture, Structures) Trace < 10%, Little 10% to 20%, Some 20% to 35% and 35% to 50%
0						
3						*(0–6") CONCRETE*
6						*(1'–2') CEMENT GROUT*
9						
12						
15						
18						
21						
24						*(2'–48') NATIVE FILL*
27						(0–58') TAN, DRY, FINE SAND, LITTLE SILT, TRACE OF GRAVEL.
30						
33						
36						
39						
42						
45						
48						*(48'–50') BENTONITE SEAL*
51						
54						*(50'–65') #1 FILTER GRAVEL*
57		▼				*(53'–63') SCREEN*
60						(58'–65') TAN, WET, FINE SAND, SOME SILT.
63						
66						*END OF BORING AT 65 FT.*
69						
72						

APPENDIX B

SYSTEM PROCESS INSTRUMENTATION DIAGRAMS

FPM



SYSTEM LEGEND:

- VACUUM GAUGE
- TEMPERATURE GAUGE
- PRESSURE GAUGE
- SAMPLE PORT
- BALL VALVE
- FLOWMETER
- VACUUM RELIEF VALVE
- LS — LEVEL SWITCH
- ELECTRIC LINE
- AIR FLOW DIRECTION

NOTES:

BLOWER: SIEMENS MODEL NO: 2BH1590
AIR FILTER: AIRTECH MODEL NO: ATF 200-15124
ENCLOSURE: RUBBERMAID MODEL NO: 3784

COMPRESSOR: BECKER MODEL NO: KDT 3.80
MOISTURE SEPARATOR: ROTRON MODEL NO: MS200PS

Enviroiac
80 B AIR PARK DRIVE
RONKONKOMA, NEW YORK 11779
PHONE: (631)471-1500 FAX: (631)471-6363

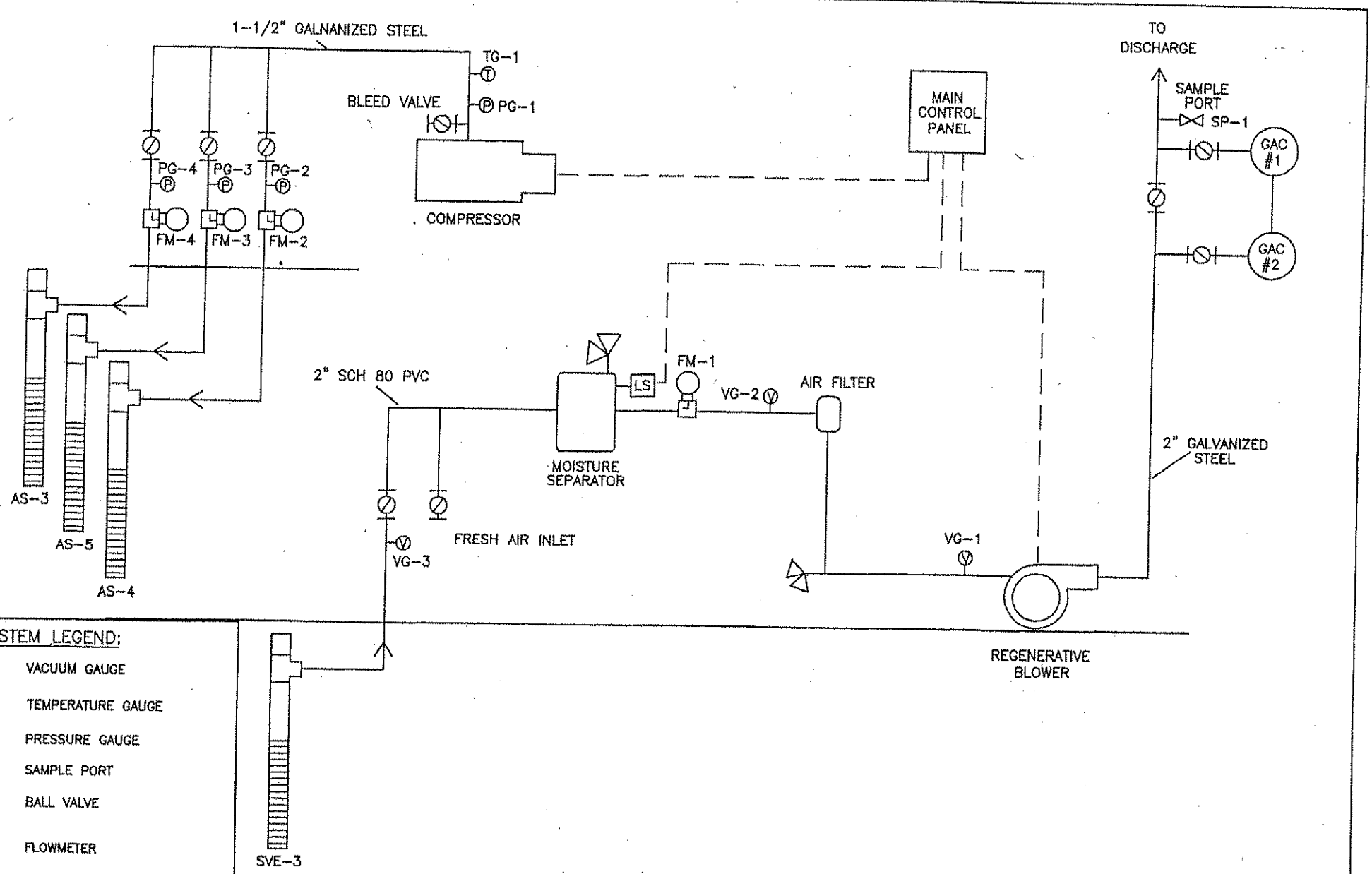
NOT TO SCALE

REVISED BY: TB
REVISED: NOVEMBER 1, 2002

ARKWIN INDUSTRIES
66 BROOKLYN AVENUE
WESTBURY, NEW YORK

AIR SPARGE / SOIL-VAPOR EXTRACTION SYSTEM A PROCESS AND INSTRUMENTATION DIAGRAM

FIGURE # 3



SYSTEM LEGEND:

- VACUUM GAUGE
- TEMPERATURE GAUGE
- PRESSURE GAUGE
- SAMPLE PORT
- BALL VALVE
- FLOWMETER
- VACUUM RELIEF VALVE
- LS — LEVEL SWITCH
- ELECTRIC LINE
- AIR FLOW DIRECTION

NOTES:

BLOWER: SIEMENS MODEL NO: 2BH1590
AIR FILTER: AIRTECH MODEL NO: ATF 200-15124
ENCLOSURE: RUBBERMAID MODEL NO: 3784

COMPRESSOR: BECKER MODEL NO: KDT 3.100
MOISTURE SEPARATOR: ROTRON MODEL NO: MS200PS

Envirotrac
80 B AIR PARK DRIVE
RONKONKOMA, NEW YORK 11779
PHONE: (631)471-1500 FAX: (631)471-6363

NOT TO SCALE

REVISED BY: TB
NOVEMBER 1, 2002

ARKWIN INDUSTRIES
648 MAIN STREET
WESTBURY, NEW YORK

AIR SPARGE / SOIL-VAPOR EXTRACTION SYSTEM B PROCESS AND INSTRUMENTATION DIAGRAM

FIGURE # 4

APPENDIX C

EQUIPMENT SPECIFICATIONS

FPM

3784

BIG MAX SHED - 7X7

Product Size

Benefits:

- Store product is available: Only at Home Depot

Ordering Specifications

Rubbermaid Number System Character:
(For UPC Users)
0

Coupon Family Code
n/a

Description:
n/a

Available Colors:
n/a

UPC/Check Digit:
Product:
Carton:

Case Pack:
1

Case Weight:
/

Cube:

Carton/Pallet Size:
Carton:

Pallet:

PC Pallet:
n/a

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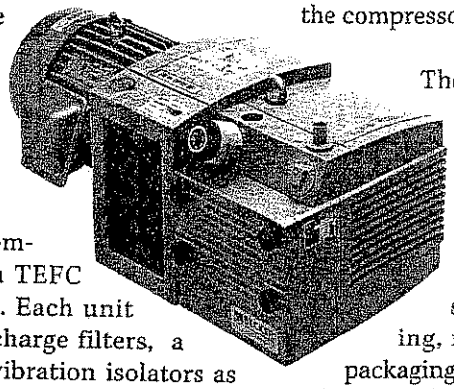
BECKER

KDT Series

ISO 9001 Certified
CE Compliant

100% OIL-LESS COMPRESSORS

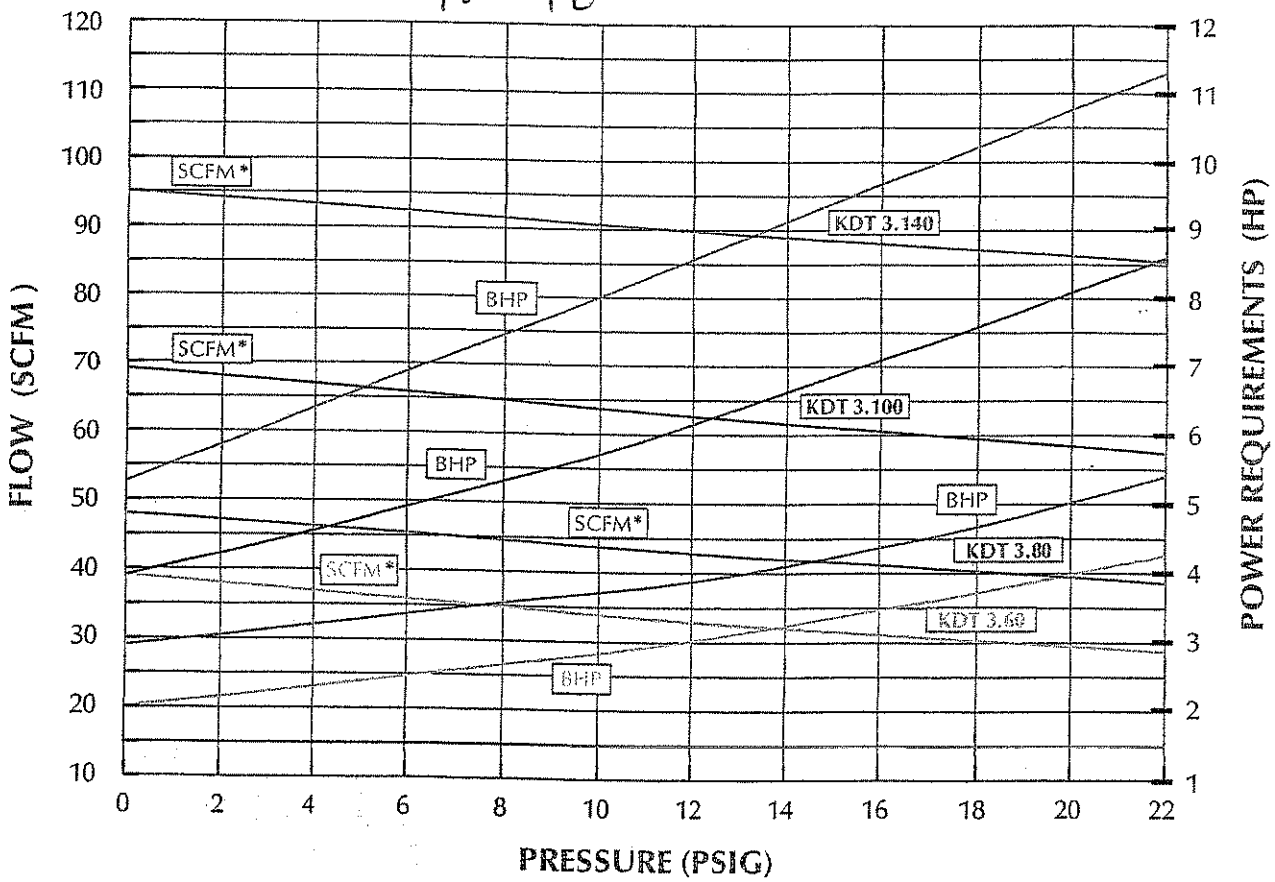
The Becker KDT series is a line of 100% Oil-less, rotary vane, low pressure compressors. They are designed to operate on a continuous basis throughout a pressure range from atmospheric pressure to 22 PSIG.



Each KDT unit is a direct drive compressor and is supplied with a TEFC flange mounted electric motor. Each unit is equipped with inlet and discharge filters, a pressure regulating valve, and vibration isolators as standard equipment, all of which are an integral part of the compressor.

The Becker KDT compressor is ideal for applications where air is the gas and where operation is in the low pressure range where high pressure compressors are less efficient. Applications for the KDT compressor include graphic arts, soil remediation, pneumatic conveying, robotics and material handling, packaging, and paper converting.

SITE A KDT 3.60 (5HP, 3Φ, TEFC)
SITE B KDT 3.80 (~~7.5~~10HP, 3Φ, TEFC)

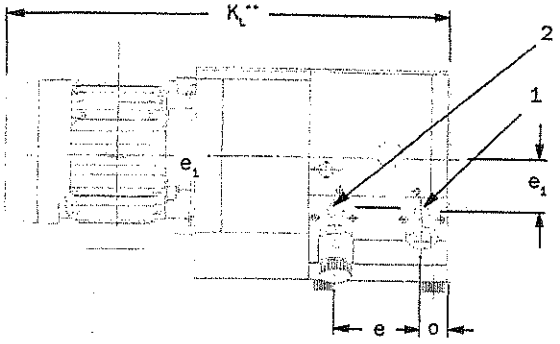


* @ 29.92" Hg Bar. Pr.; 68°F; 36% R.H.; 0.075#/ft³

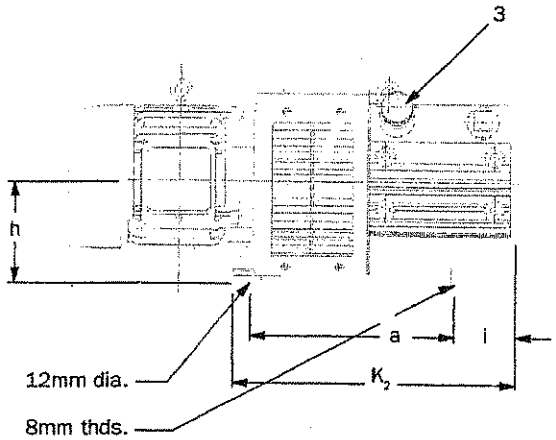
Becker Pumps Corp. • 100 East Ascot Lane • Cuyahoga Falls, Ohio 44223-3768
Ph. (330) 928-9966 · (888) 633-1083 · FAX: (330) 928-7065 · e-mail: beckerpc@bright.net · www.beckerpumps.com

BECKER

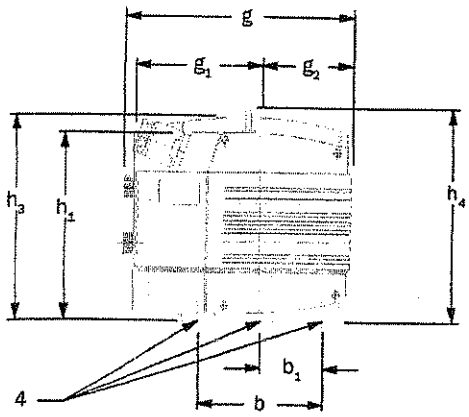
TECHNICAL DATA



Top View



Side View



End View (Opposite Motor End)

All data based on 60 Hz operation	A KDT 3.60	B KDT 3.80	KDT 3.100	KDT 3.140
Flow (SCFM @ 0 PSIG)	39	48	69	95
Horsepower	5 *	7 1/2 *	10 *	12 *
Speed (RPM)	1740	1740	1740	1740
Maximum Pressure (PSIG)	22	22	22	22
Weight (lbs.)—w/o motor	104	108	156	172
Weight (lbs.)—w/ motor**	191*	265 *	323*	368*
Noise Level (Max. dBA)	74	76	78	84
Outlet size (BSP, inches)	1	1	1 1/2	1 1/2
Dimensional Data	(Inches)			
a	12.83	12.83	15.67	15.67
b	7.5	7.5	9.65	9.65
b_1	3.75	3.75	4.82	4.82
e	5.43	5.43	7.5	7.5
e_1	2.56	2.56	3.75	3.75
g	13.9	13.9	18.5	18.5
g_1	7.68	7.68	8.78	8.78
g_2	5.55	5.55	9.06	9.06
h	6.38	6.38	6.38	6.38
h_1	11.38	11.38	11.7	11.7
h_3	12.28	12.28	13.0	13.0
h_4	12.9	12.9	13.25	13.25
i	3.78	3.78	5.5	5.5
k_2	17.64	17.64	22.17	22.17
k_L	28.2	30	34.15	36.6
o	1.81	1.81	2.36	2.36

Manufacturer reserves right to alter data without notice.
* Operation at lower pressure may use smaller motor.
** May vary with motor type and manufacturer

1 - Inlet Port
2 - Discharge Port
3 - Pressure Relief Valve
4 - Vibration Isolators

3LIT0006 • 2/00

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SIEMENS

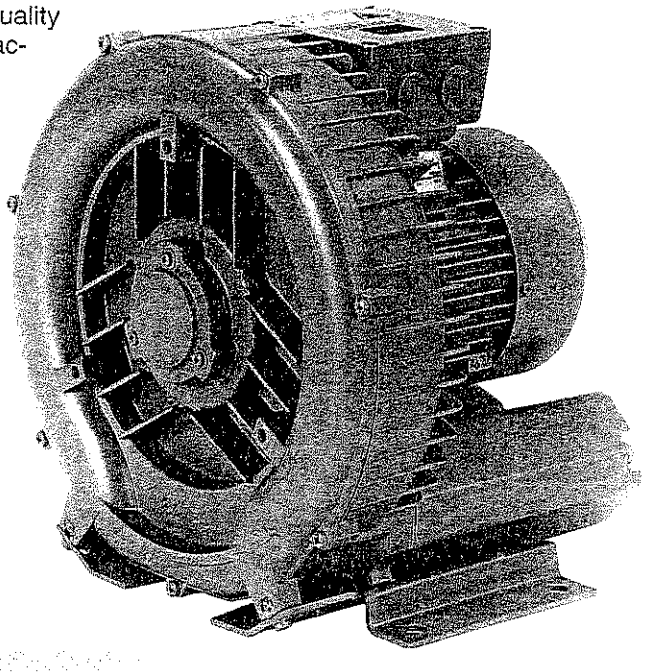
Vacuum Pumps & Compressors

Regenerative Blowers—2BH1500 Series

- Maximum Flow–145 CFM
- Maximum Pressure–75 inches H_20
- Maximum Vacuum–70 inches H_20

Features

- Cooler running, outboard bearing provides virtually maintenance-free operation in continuous duty service.
- Environmentally friendly oil-free design prevents downstream contamination of gas or components.
- Quiet operation; as low as 73 dB(A)
- Easily mounts in any axle orientation.
- Shock absorbing mounting plate design reduces transmission of vibration between process machinery and the blower.
- Thermal overload protection standard on all models.
- Equipped with high quality TEFC motors manufactured by Siemens, sized to match your operating requirements providing for superior power efficiency.
- IP54 with Class F insulation.
- Quality assured; manufactured in accordance with ISO 9001.
- UL Recognized, CE Compliant. DIN VDE 0530



Recommended Accessories

Relief Valve

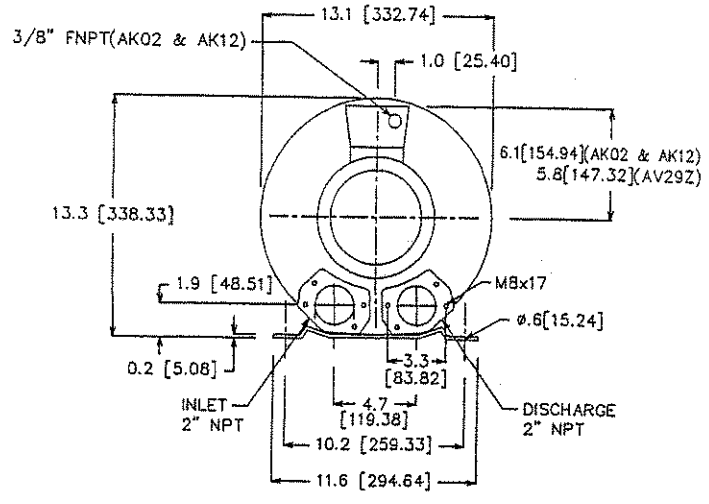
Model Number	Part Number	
	Pressure (60 Hz*)	**Vacuum** (60 Hz*)
2BH15001AK02	2BX2115Z07	2BX2114Z24
2BH15001AK12	2BX2115Z160M	2BX2114Z116
2BH15001AV29Z	2BX2115Z170M	2BX2114Z25

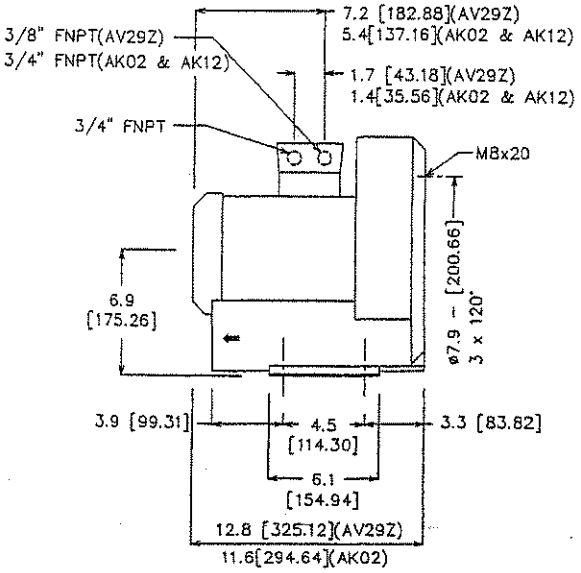
** consult factory for 50 Hz valve selection*

Filter

Filter	
Inlet Filter Assembly (Pressure Applications)	2BX200SF
In-line Filter Assembly (Vacuum Applications)	2BXSL200
Inlet Replacement Element	2BX200SS30
In-line Replacement Element	2BX150SS850

- Muffler (for additional sound reduction)—Part # 2BX3030 • Pressure Gauge—Part # 2BX7100/PRESS • Vacuum Gauge—Part # 2BX7100/7.5
- Recommended Starter Sizes: AK02–NEMA1, AK12–NEMA1



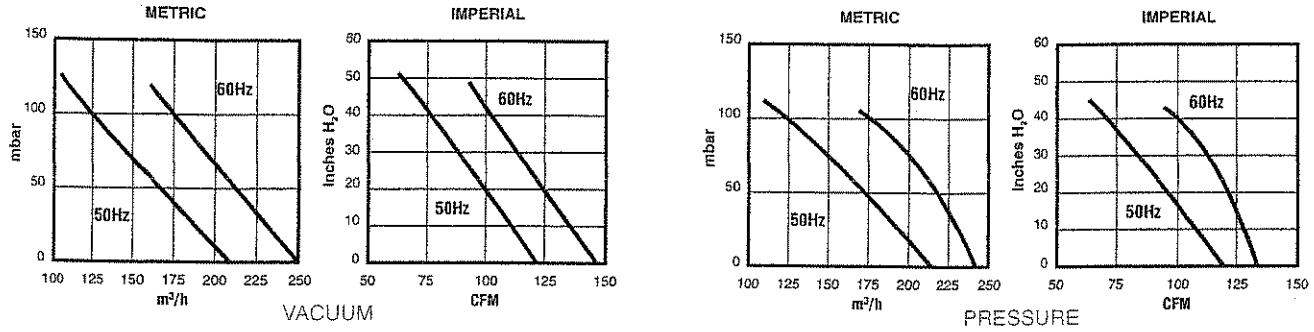


Specifications

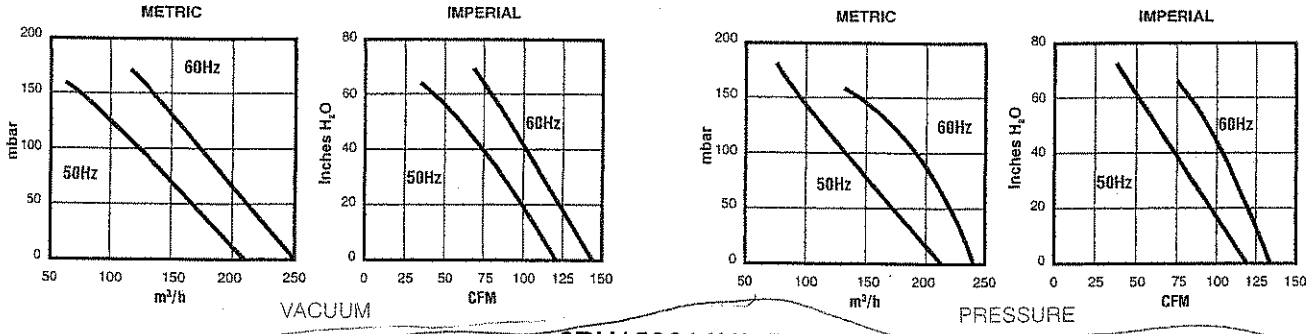
Item Number	Hz	Voltage Range	Rated Amps	Rated HP	RPM	Maximum Vacuum		Maximum Pressure		Maximum Flow		Net Weight	
						in H_2O	mbar	in H_2O	mbar	CFM	m^3/h	lbs.	kg
2BH15001AK02	60	208-230/415-460	4.0/2.0	1.15	3600	48	120	45	110	145	250	40	18
	50	220/380/415	4.6/1.9/2.0	1.00	3000	52	130	45	110	125	210	40	18
2BH15001AK12	60	208-230/415-460	5.2/2.6	1.77	3600	65	170	65	160	145	250	44	20
	50	220/380/415	10.0/4.6/5.0	1.50	3000	65	160	75	180	125	210	44	20
2BH15001AV29Z	60	115/230	20.2/10.1	2.35	3600	70	180	70	170	145	250	46	21
	50	115/230	20.4/10.2	2.01	3000	70	180	75	190	125	210	46	21

Performance

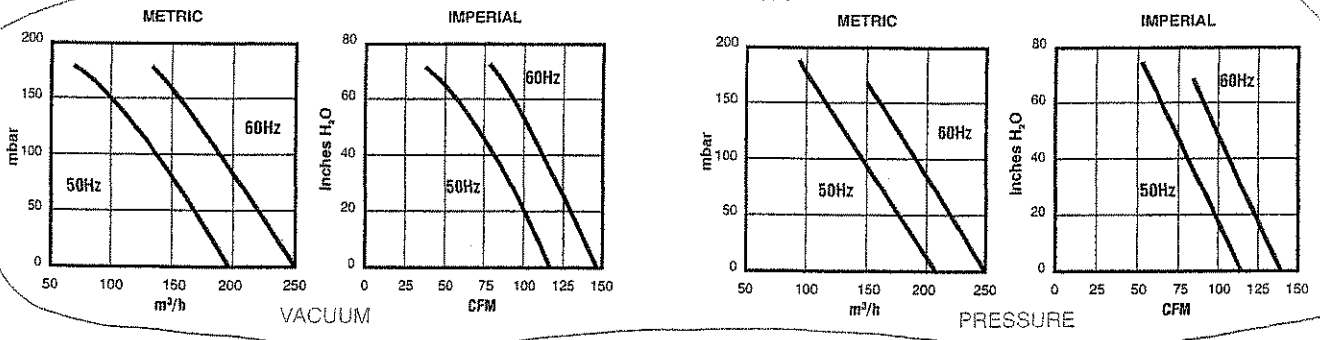
2BH15001AK02



2BH15001AK12



2BH15001AV29Z



Note: Performance tolerance is +/– 10 percent.
Performance curves are based on an air temperature of 60° F (15° C) at the inlet connection and 29.92 Hg abs (1013 mbar) at the discharge connection.
Specification and performance data is subject to change without notice.

For More Information

AIRTECH INC
150 South Van Brunt Street
Englewood, NJ 07631
Phone: (201) 569-1173 • 800-222-9940
Fax: (201) 569-1696
Email: airtechnj@msn.com
Visit our website: www.airtechusa.com

SIEMENS

INLET VACUUM AIR FILTERS
"CSL" Series 3/8" - 3" FPT

APPLICATIONS

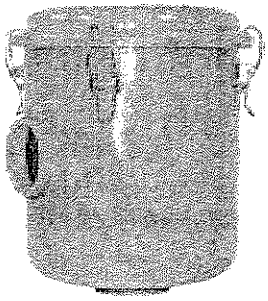
- Blowers-Side Channel
- Medical
- Vacuum Lifters
- Woodworking
- Factory Automation
- Printing Industry
- Vacuum Packaging
- Leak Detection
- Soil Venting/Remediation
- Vacuum Pumps & Systems

FEATURES & SPECIFICATIONS

- ;99%+ removal efficiency standard: Paper = 2 micron, Polyester = 5 micron
- Filter change out differential: 10"-15" in. H_2O above initial Delta P
- Low pressure drop
- *Pressure drop graphs available upon request*
- Stainless steel torsion clips for durability
- Vacuum level: Typically $1x10^{-3}$ mmHg ($1.3x10^{-3}$ mbar)
- Brazed fittings for high vacuum duty
- Fully-drawn one piece canister
- Positive sealing O-ring seal system
- *Rugged all steel construction with baked enamel finish*
- Temp (continuous): min -15° F (-26° C) max 220° F (104° C)

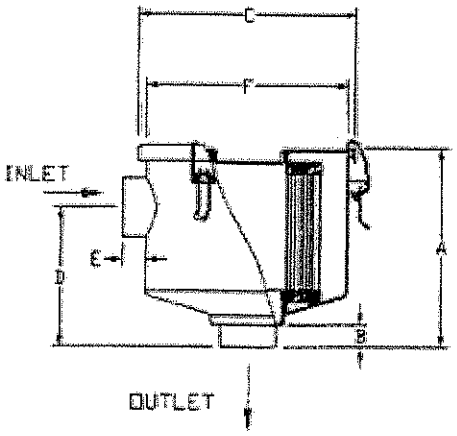
OPTIONS

- Activated carbon prefilter to reduce odor
- *Epoxy coated housings*
- Special connections
- Various elements available
- Alternate Top-to-canister fastening system for low pressure or pulsating systems
- Extra tap fittings for pressure gauge and vacuum regulator
- Support brackets
- Available in Stainless Steel
- Larger sizes available
- Vacuum regulator & gauge available



Click to see larger image.

Line Drawing



***All measurements are shown in American standards.**

- typically in stock

- part normally requires lead time

Add To Order	Model Number	Element Type	Inlet in. NPT or FLG	Outlet in. NPT or FLG	Dim A in.	Dim B in.	Dim C in.	Dim D in.	Dim E in.	Dim F in.	Dim G in.	Parent Flow SCFM	Element Parent Flow SCFM	Approx. Weight lbs.
Add	CSL-851-200HC	Polyester	2	2	10.25	0.75	8.75	5	0.75	7.62	9.25	175	290	15

Solberg Mfg.
1151 W. Ardmore Ave.·Itasca, IL 60143·(630)773-1363· Fax: (630)773-0727

OPERATION & MAINTENANCE MANUAL

ROTRON INDUSTRIAL PRODUCTS
75 North Street, Saugerties, NY 12477 U.S.A.
Telephone: 845 -246-3401 Fax: 845-246-3802
e-mail: rotronindustrial@ametek.com website: www.rotronindustrial.com

AMETEK

Rotron Moisture Separator

Thank you for purchasing an AMETEK Rotron MS series moisture separator. When matched with the correct Rotron blower, and properly installed and maintained, this separator will effectively and efficiently remove moisture from the air stream. To ensure good results, please take the time to read these instructions before starting the installation of your moisture separator.

Sizing for Optimal Efficiency

Separator	Max. CFM	Max. Vac	Capacity	Blowers – DR, EN & CP
MS200P(S)	200	12* IHg	7 gal.	101-555, 513, 523, 623
MS200D(S)	200	22 IHg	10 gal.	101-555, 513, 523, 623
MS300P(S)	300	12* IHg	7 gal.	606, 6, 707, 823
MS300D(S)	300	22 IHg	10 gal.	606, 6, 707, 823
MS350B(S)	350	22 IHg	40 gal.	808, 1223
MS500B(S)	500	22 IHg	40 gal.	858
MS600B(S)	600	22 IHg	40 gal.	909
MS1000B(S)	1000	22 IHg	65 gal.	14
Note: "S" suffix denotes presence of XP high level switch. * Special Construction with 20 IHg capability available.				

Installation

1. **Unpacking** - For MS200/300, remove drain valve taped to packing material and box containing liquid level switch, if so equipped. For MS350/500/600, remove box containing valve hardware as well as box containing liquid level switch (if so equipped) and remove internal cardboard packaging and cable ties from screen assembly.

2. **Bolt Down** (w/ feet included) - For MS200/300 models, built-in feet or a mounting ring is included. It is recommended that these units be bolted in place. All models will only work in an upright position.

3. **Piping** - Attach to system piping with flexible couplings to minimize stress incurred by rigid system piping. The connections should be airtight but not sealed with an adhesive for ease of disassembly during routine maintenance. Install drain valve, using teflon tape on threads.

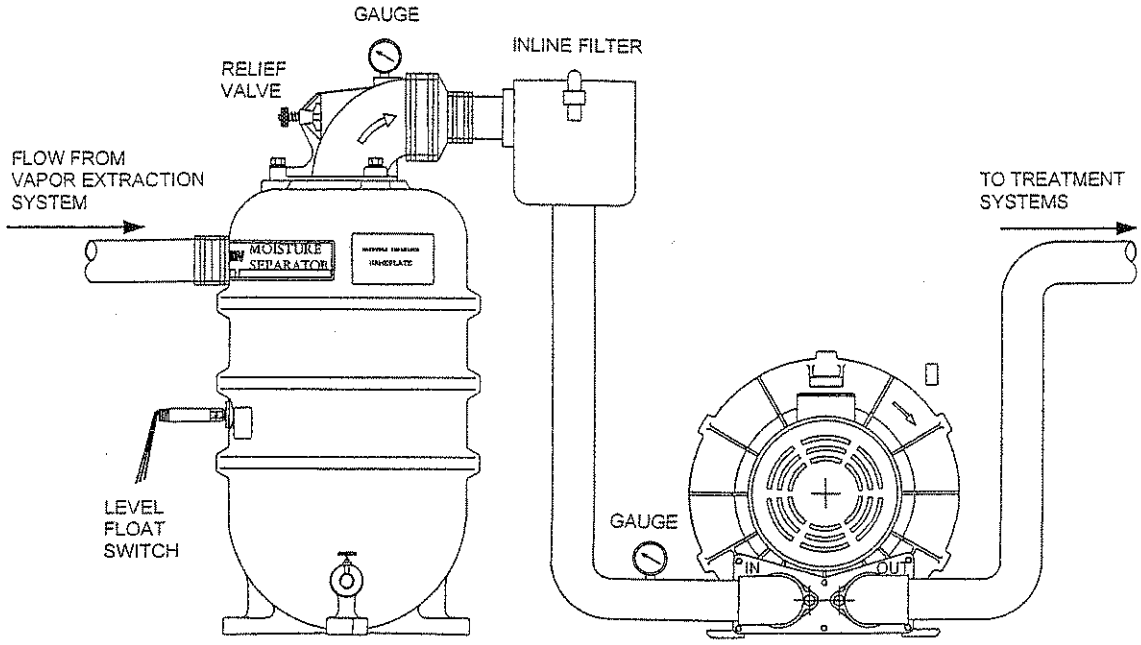
4. **Installation and Wiring of Liquid Level Switch** - Remove plug from the bulkhead fitting. Thread the switch by hand until snug with index arrow pointing down. Wire in accordance with the nameplate wiring schematic. Typically, the wiring is connected back to the starter to shut down the system but can be used for other purposes.

5. **Install/Adjust Relief Valve** - For MS500/600, first install the relief valve with teflon tape on threads. Use a wrench, but tighten only enough to prevent leakage. Next step for all MS units, back off the relief valve adjuster relaxing spring pressure. Then block the moisture separator inlet while measuring the motor current. Adjust the valve until the motor current is 90% of the max. nameplate blower amps.

6. **Continuous Service** - For cold weather service, appropriate steps should be taken to prevent freezing. Also, the maximum vacuum ratings are based on 115°F maximum. Consult factory for higher potential ambients.

Note: A moisture separator is not a substitute for an inline air filter. A Rotron inline filter should be used to remove particles that pass through the separator.

Typical Vapor Extraction System



Operation

Moisture-laden air enters the separator through the tangential inlet. Cyclonic action removes free moisture from the air stream and allows the air to discharge through the top of the separator. When the separator is full, the float valve shuts off the air flow through the separator, and the relief valve opens to limit the vacuum of the blower.

To drain the separator, turn off the blower and open the drain valve at the bottom of the separator. Caution: The liquid contained in the separator should be analyzed before it is released back into the environment. It may be considered hazardous waste in certain geographical areas and require special treatment/disposal. Once the liquid is drained, the unit can be reset by turning the blower back on.

Automatic draining options are at the discretion of the customer.

Maintenance

This MS series moisture separator has been designed to require minimal maintenance. During normal operation a layer of sludge may build up on the bottom of the separator. As necessary, the top assembly of the moisture separator should be removed and the inside cleaned out with water. Keeping the inside clean will prevent the valve from becoming clogged with sediment. The relief valve should be inspected upon emptying the separator and readjusted (per installation instruction 5) upon restart.

If you have any questions regarding this product, contact your local sales representative or our Application Engineering Department at the factory.

APPENDIX D

LABORATORY ANALYTICAL REPORTS

FPM

CC: BC
Arkwin
01

RECD JAN - 3 2003

ANALYTICAL REPORT

JOB NUMBER: 202738

Prepared For:

FANNING, PHILLIPS AND MOLNAR
909 Marconi Avenue
Ronkonkoma, NY 11779

Project: ARKWIN INDUSTRIES

Attention: Ben Cancemi

Date: 12/30/2002

Signature

Date 12/30/02

Name: Johanna L. Dubauskas

Title: Project Manager

E-Mail: jdubauskas@stl-inc.com

STL Connecticut
128 Long Hill Cross Road
Shelton, CT 06484

This Report Contains (12) Pages

STL Report : 202738
FANNING, PHILLIPS AND MOLNAR

Case Narrative

Sample Receipt – All samples were received in good condition.

Volatile Organics – Volatile organics were determined by purge and trap GC/MS using guidance provided in Method TO1/TO2. The instrumentation used was an Envirochem Unicon Series 810 interfaced with a Hewlett-Packard Model 5970A GC/MS/DS.

Sample Calculation:

Sample ID – EFFLUENT SYS A
Compound –Tetrachloroethene

$\frac{(563218)(100)}{(786688)(.53)} = 135.08 = 140$ NG.

$\frac{(140NG)(.08206)(298K)}{(.01L)(166)(1.0ATM)} = 2062.4$ NL/L.

The following table contains samples and the sample volumes they were analyzed at:

EFFLUENT SYS A	.01L
EFFLUENT SYS B	.025L

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to NELAP requirements are noted in the case narrative.

S A M P L E I N F O R M A T I O N

Date: 12/30/2002

Job Number.: 202738
Customer...: FANNING, PHILLIPS AND MOLNAR
Attn.....: Ben Cancemi

Project Number.....: 20000435
Customer Project ID....: ARKWIN INDUSTRIES
Project Description....: Arkwin Industries

Laboratory Sample ID	Customer Sample ID	Sample Matrix	Date Sampled	Time Sampled	Date Received	Time Received
202738-1	EFFLUENT SYS A	Air	12/12/2002	13:00	12/13/2002	10:00
202738-2	EFFLUENT SYS B	Air	12/12/2002	13:15	12/13/2002	10:00

Form 1

STL Connecticut		Client Sample ID	**VBLKMR**
Method: T01/T02		Lab Sample ID	VBLKMR
Sample Volume (L)	1.000	Date Sampled	4/11/2002
Temp (C)	25	Date Analyzed	12/18/2002

Compound	nL/L (ppbv/v)	Qualifier	RL	mg/M3	Qualifier	RL
1,1-Dichloroethene	2.5	U	2.5	0.010	U	0.010
trans-1,2-Dichloroethene	2.5	U	2.5	0.010	U	0.010
1,1-Dichloroethane	2.5	U	2.5	0.010	U	0.010
cis-1,2-Dichloroethene	2.5	U	2.5	0.010	U	0.010
1,1,1-Trichloroethane	1.8	U	1.8	0.010	U	0.010
Trichloroethene	1.9	U	1.9	0.010	U	0.010
Tetrachloroethene	0.9	J	1.5	0.006	J	0.010

Form 1

STL Connecticut		Client Sample ID	EFFLUENT SYS A
Method: T01/T02		Lab Sample ID	202738-1
Sample Volume (L)	0.010	Date Sampled	4/11/2002
Temp (C)	25	Date Analyzed	12/18/2002

Compound	nL/L (ppbv/v)	Qualifier	RL	mg/M3	Qualifier	RL
1,1-Dichloroethene	302.5		252.1	1.200		1.000
trans-1,2-Dichloroethene	254.7	U	254.7	1.000	U	1.000
1,1-Dichloroethane	222.3	J	247.0	0.900	J	1.000
cis-1,2-Dichloroethene	356.6		254.7	1.400		1.000
1,1,1-Trichloroethane	1673.2		183.9	9.100		1.000
Trichloroethene	541.3		186.7	2.900		1.000
Tetrachloroethene	2062.4	B	147.3	14.000	B	1.000

Form 1

STL Connecticut		Client Sample ID	**EFFLUENT SYS B**
Method: T01/T02		Lab Sample ID	202738-2
Sample Volume (L)	0.025	Date Sampled	4/11/2002
Temp (C)	25	Date Analyzed	12/18/2002

Compound	nL/L (ppbv/v)	Qualifier	RL	mg/M3	Qualifier	RL
1,1-Dichloroethene	625.2		100.8	2.480		0.400
trans-1,2-Dichloroethene	20.4	J	101.9	0.080	J	0.400
1,1-Dichloroethane	662.0		98.8	2.680		0.400
cis-1,2-Dichloroethene	611.3		101.9	2.400		0.400
1,1,1-Trichloroethane	2500.5		73.5	13.600		0.400
Trichloroethene	1045.4		74.7	5.600		0.400
Tetrachloroethene	1414.2	B	58.9	9.600	B	0.400

2A
AIR VOLATILE SYSTEM MONITORING COMPOUND RECOVERY

Lab Name: STL/CT Contract:

Lab Code: STLCT Case No.: 202738 SAS No.: SDG No.: 202738

	EPA SAMPLE NO.	SMC1 (DCE) #	SMC2 (TOL) #	SMC3 (BFB) #	OTHER	TOT OUT
01	VBLKMR	97	96	92		0
02	EFFLUENT SYS	98	100	93		0
03	EFFLUENT SYS	99	102	100		0
04						
05						
06						
07						
08						
09						
10						
11						
12						
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28						
29						
30						

	QC LIMITS
SMC1 (DCE) = 1,2-Dichloroethane-d4	(70-130)
SMC2 (TOL) = Toluene-d8	(70-130)
SMC3 (BFB) = Bromofluorobenzene	(70-130)

Column to be used to flag recovery values

* Values outside of contract required QC limits

LABORATORY CHRONICLE

Job Number: 202738

Date: 12/30/2002

CUSTOMER: FANNING, PHILLIPS AND MOLNAR | PROJECT: ARKWIN INDUSTRIES | ATTN: Ben Cancemi

Lab ID: 202738-1 Client ID: EFFLUENT SYS A
Date Recvd: 12/13/2002 Sample Date: 12/12/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
TO1/TO2	Volatile Organics (Air)	1	13025		12/18/2002	1413	1.00000

Lab ID: 202738-2 Client ID: EFFLUENT SYS B
Date Recvd: 12/13/2002 Sample Date: 12/12/2002

METHOD	DESCRIPTION	RUN#	BATCH#	PREP BT #(S)	DATE/TIME ANALYZED		DILUTION
TO1/TO2	Volatile Organics (Air)	1	13025		12/18/2002	1619	1.00000

REPORT COMMENTS

1) All pages of this report are integral parts of the analytical data. Therefore, this report should be reproduced only in its entirety.

2) Soil, sediment and sludge sample results are reported on a "dry weight" basis except when analyzed for landfill disposal or incineration parameters. All other solid matrix samples are reported on an "as received" basis unless noted differently.

3) Reporting limits are adjusted for sample size used, dilutions and moisture content if applicable.

4) The test results for the noted analytical method(s) meet the requirements of NELAC. Lab Cert. ID# 10604
5) According to 40CFR Part 136.3, pH, Chlorine Residual and Dissolved Oxygen analyses are to be performed immediately after aqueous sample collection. When these parameters are not indicated as field (e.g. pH Field) they were not analyzed immediately, but as soon as possible on laboratory receipt.

Glossary of flags, qualifiers and abbreviation

Inorganic Qualifiers (Q-Column)

U	Analyte was not detected at or above the reporting limit.
<	Not detected at or above the reporting limit.
J	Result is less than the RL, but greater than or equal to the method detection limit.
B	Result is less than the CRDL/RL, but greater than or equal to the IDL/MDL.
S	Result was determined by the Method of Standard Additions.

Inorganic Flags (Flag Column)

^	ICV,CCV,ICB,CCB,ISA,ISB,CRI,CRA,MRL: Instrument related QC exceed th upper or lower control limits.
*	LCS, LCD, MD: Batch QC exceeds the upper or lower control limits.
+	MSA correlation coefficient is less than 0.995.
4	MS, MSD: The analyte present in the original sample is 4 times greater than the matrix spike concentration; therefore, control limits are not applicable.
E	SD: Serial dilution exceeds the control limits.
H	MB, EB: Batch QC is greater than reporting limit or had a negative instrument reading lower than the absolute value of the reporting limit.
N	MS, MSD: Spike recovery exceeds the upper or lower control limits.
W	PS: Post-digestion spike was outside 85-115% control limits.

Organic Qualifiers (Q - Column)

U	Analyte was not detected at or above the reporting limit.
ND	Compound not detected.
J	Result is an estimated value below the reporting limit or a tentatively identified compound (TIC).
Q	Result was qualitatively confirmed, but not quantified.
C	Pesticide identification was confirmed by GC/MS.
Y	The chromatographic response resembles a typical fuel pattern.
Z	The chromatographic response does not resemble a typical fuel pattern.
E	Result exceeded calibration range, secondary dilution required.

Organic Flags (Flags Column)

^	MB,EB, MLE: Batch QC is greater than reporting limit.
*	LCS, LCD, CCV, MS, MSD, Surrogate, RS:Batch QC exceeds the upper or lower control limits.
A	Concentration exceeds the instrument calibration range or below the reporting limit.
B	Compound was found in the blank and sample.
D	Surrogate or matrix spike recoveries were not obtained because the extract was diluted for analysis; also compounds analyzed at a dilution will be flagged with a D.
H	Alternate peak selection upon analytical review
I	Indicates the presence of an interfence, recovery is not calculated.
M	Manually integrated compound.
P	The lower of the two values is reported when the % difference between the results of two GC columns is greater than 25%.

QUALITY ASSURANCE METHODS

REFERENCES AND NOTES

Report Date: 12/30/2002

Abbreviations

Batch	Designation given to identify a specific extraction, digestion, preparation set, or analysis set
CAP	Capillary Column
CCB	Continuing Calibration Blank
CCV	Continuing Calibration Verification
CF	Confirmation Analysis
CRA	Low Level Standard Check - GFAA; Mercury
CRI	Low Level Standard Check - ICP
Dil Fac	Dilution Factor
DL	Secondary dilution and analysis
DLFac	Detection Limit Factor
DSH	Distilled Standard - High Level
DSL	Distilled Standard - Low Level
DSM	Distilled Standard - Medium Level
EB	Extraction Blank
ICB	Initial Calibration Blank
ICV	Initial Calibration Verification
IDL	Instrument Detection Limit
ISA	Interference Check Sample A
ISB	Interference Check Sample B
Job No.	The first six digits of the sample ID which refers to a specific client, project and sample group
Lab ID	An 8 number unique laboratory identification
LCD	Laboratory Control Standard Duplicate
LCS	Laboratory Control Standard with reagent grade water or a matrix free from the analyte of interest
MB	Method Blank or (PB) Preparation Blank
MD	Method Duplicate
MDL	Method Detection Limit
MLE	Medium Level Extraction Blank
MRL	Method Reporting Limit Standard
MSA	Method of Standard Additions
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ND	Not Detected
PACK	Packed Column
PREPF	Preparation factor used by the Laboratory's Information Management System (LIMS)
PS	Post Spike
PSD	Post Spike Duplicate
RA	Re-analysis
RE	Re-extraction and analysis
RL	Reporting Limit
RPD	Relative Percent Difference of duplicate (unrounded) analyses
RRF	Relative Response Factor
RS	Reference Standard
RT	Retention Time
RTW	Retention Time Window
SampleID	A 9 digit number unique for each sample, the first six digits are referred as the job number
SCB	Seeded Control Blank
SD	Serial Dilution
UCB	Unseeded Control Blank

One or a combination of these data qualifiers and abbreviations may appear in the analytical report.

STATE CERTIFICATIONS

In some instances it may be necessary for environmental data to be reported to a regulatory authority with reference to a certified laboratory. For your convenience, the laboratory identification numbers for the STL-Connecticut laboratory are provided in the following table. Many states certify laboratories for specific parameters or tests within a category (i.e. method 325.2 for wastewater). The information in the following table indicates the lab is certified in a general category of testing such as drinking water or wastewater analysis. The laboratory should be contacted directly if parameter-specific certification information is required.

STL-Connecticut
Certification Summary (as of May 2002)

State	Responsible Agency	Certification	Lab Number
Connecticut	Department of Health Services	Drinking Water, Wastewater	PH-0497
Maine	Department of Health and Environmental Services	Drinking Water, Wastewater/Solid, Hazardous Waste	CT023
Massachusetts	Department of Environmental Protection	Potable/Non-Potable Water	M-CT023
New Hampshire	Department of Environmental Services	Drinking Water, Wastewater	2528
New Jersey	Department of Environmental Protection	Drinking Water, Wastewater	CT410
New York	Department of Health	CLP, Drinking Water, Wastewater, Solid/ Hazardous Waste NELAC	10602
North Carolina	Division of Environmental Management	Wastewater	388
Rhode Island	Department of Health	Chemistry...Non-Potable Water and Wastewater	A43
Utah	Department of Health	RCRA	2032614458
Wisconsin	Department of Natural Resources	Wastewater	998355710

Chain of Custody Record

STL
128 LONG HILL CROSS ROAD
SHELTON, CT 06484

SEVERN TRENT SERVICES — Severn Trent Laboratories, Inc.

STL-4124 (0901)

Client: FPM Group	Project Manager: Ben Cancemi	Date: 12/12/02	Chain of Custody Number: 151192
Address: 909 Marconi Avenue	Telephone Number (Area Code)/Fax Number: 631-737-6200 / 631-737-2410	Lab Number:	Page 1 of 1
City: Ronkonkoma / State: NY / Zip Code: 11779	Site Contact:	Lab Contact:	
Project Name and Location (State): Arkwin Industries / 652-00-01	Carrier/Waybill Number: Fedex 8361 9055 6950		
Contract/Purchase Order/Quote No.			

Sample I.D. No. and Description (Containers for each sample may be combined on one line)	Date	Time	Matrix: Air	Aqueous	Sed.	Soil	Containers & Preservatives: Unpres.	H2SO4	HNO3	HCl	NaOH	ZnAc/ NaOH	Analysis: 1,1 DCE	1,1 DCA	1,2 DCE	1,1,1 TCA	TCE	PCE	Special Instructions/ Conditions of Receipt
$ EFFluent Sys A (01)	12/12/02	1300	X				X						X	X	X	X	X	X	1-Tedlar Bag
EFFluent Sys B (02)	12/12/02	1315	X				X						X	X	X	X	X	X	1-Tedlar Bag

01

202738
12/27/2002
FANNING, PHILLIPS AND MOLNAR
BEN CANCEMI
ARKWIN INDUSTRIES

22°C
"PASSED RAD SCREEN"

Possible Hazard Identification: [X] Non-Hazard [ ] Flammable [ ] Skin Irritant [ ] Poison B [ ] Unknown

Sample Disposal: [ ] Return To Client [X] Disposal By Lab [ ] Archive For ____ Months (A fee may be assessed if samples are retained longer than 1 month)

Turn Around Time Required: [ ] 24 Hours [ ] 48 Hours [ ] 7 Days [ ] 14 Days [ ] 21 Days [X] Other STD

QC Requirements (Specify):

	Date	Time
1. Relinquished By: [illegible]	12/12/02	1700
2. Relinquished By:		
3. Relinquished By:		
1. Received By: Alex C. Yaworowski S-T-L CT	12-13-02	10:00
2. Received By:		
3. Received By:		

Comments

DISTRIBUTION: WHITE - Returned to Client with Report; CANARY - Stays with the Sample; PINK - Field Copy

rpjsckl | Job Sample Receipt Checklist Report | V2

Job Number.: 202738 Location.: 57207 Check List Number.: 1 Description.:
Customer Job ID.....: Job Check List Date.: 12/16/2002 Date of the Report..: 12/16/2002
Project Number.: 20000435 Project Description.: Arkwin Industries Project Manager.....: jld
Customer.....: FANNING, PHILLIPS AND MOLNAR Contact.: Ben Cancemi

Questions ?	(Y/N)	Comments
Chain-of-Custody Present?	Y	
...If "yes", completed properly?	Y	
Custody seal on shipping container?	Y	
...If "yes", custody seal intact?	Y	
Custody seals on sample containers?	N	
...If "yes", custody seal intact?		
Samples iced?	N	
Temperature of cooler acceptable? (4 deg C +/- 2).	N	22 C
Samples received intact (good condition)?	Y	
Volatile samples acceptable? (no headspace)		
Correct containers used?	Y	
Adequate sample volume provided?	Y	
Samples preserved correctly?		
Samples received within holding-time?	Y	
Agreement between COC and sample labels?	Y	
Radioactivity at or below background levels?	Y	
A Sample Discrepancy Report (SDR) was needed?	N	
Comments		
If samples were shipped was there an air bill #?	Y	
Sample Custodian Signature/Date	Y	12/16/02

Severn Trent - Connecticut
Internal Chain-of-Custody

202738

12/27/2002

FANNING, PHILLIPS AND MOLNAR
BEN CANCEMI
ARKWIN INDUSTRIES

Trip Blank: ____

QC: ____

FB: ____

Soil: ____

~~Water~~ AIR: 01-02

Date Received: 12/13/02

Sample #s: 01-02

Locations: TEDLAR Box

Laboratory Sample #	Relinquished by	Accepted by	Date	Time	Reason	Relinquished by	Accepted by	Date	Time
1-2	CC	ka	12/17/02	20:40	VOA	Used			

STL Form# SMF00506.CT

CC: BC

RECD JAN 2 1 2003

YORK
ANALYTICAL LABORATORIES, INC.

Technical Report

prepared for

FPM Group
909 Marconi Avenue
Ronkonkoma, New York 11779
Attention: Ben Cancemi

Report Date: 1/15/2003
Re: Client Project ID: Arkwin/652-00-01
York Project No.: 03010364

Rocksole yonkers

CT License No. PH-0723 New York License No. 10854 Mass. License No. M-CT106 Rhode Island License No. 93 EPA I.D. No. CT00106

ONE RESEARCH DRIVE STAMFORD, CT 06906 (203) 325-1371 FAX (203) 357-0166

Report Date: 1/15/2003
Client Project ID: Arkwin/652-00-01
York Project No.: 03010364

FPM Group
909 Marconi Avenue
Ronkonkoma, New York 11779
Attention: Ben Cancemi

Purpose and Results

This report contains the analytical data for the sample(s) identified on the attached chain-of-custody received in our laboratory on 01/15/03. The project was identifed as your project "Arkwin/652-00-01 ".

The analyses were conducted utilizing appropriate EPA, Standard Methods, and ASTM methods as detailed in the data summary tables .

All samples were received in proper condition meeting the NELAC acceptance requirements for environmental samples except those indicated under the Notes section of this report.

All the analyses met the method and laboratory standard operating procedure requirements except as indicated under the Notes section of this report, or as indicated by any data flags, the meaning of which is explained in the attachment to this report, if applicable.

The results of the analyses, which are all reported on an as-received basis unless otherwise noted, are summarized in the following table(s).

Analysis Results

Client Sample ID			System A-Effluent		System A-Dilution	
York Sample ID			03010364-01		03010364-02	
Matrix			AIR		AIR	
Parameter	Method	Units	Results	MDL	Results	MDL
Volatiles(TO-14 list)	EPA TO14	ppbv	---	---	---	---
1,1,1-Trichloroethane			870	1.0	693	1.0
1,1,2,2-tetrachloroethane			Not detected	1.0	Not detected	1.0
1,1,2-Trichloroethane			Not detected	1.0	Not detected	1.0
1,1-Dichloroethane			164	1.0	119	1.0
1,1-Dichloroethylene			46	1.0	33	1.0
1,2,4-Trichlorobenzene			Not detected	1.0	Not detected	1.0
1,2,4-Trimethylbenzene			Not detected	1.0	Not detected	1.0
1,2-Dibromoethane			Not detected	1.0	Not detected	1.0
1,2-Dichlorobenzene			Not detected	1.0	Not detected	1.0
1,2-Dichloroethane			Not detected	1.0	Not detected	1.0
1,2-Dichloropropane			Not detected	1.0	Not detected	1.0
1,2-Dichlorotetrafluoroethane			Not detected	1.0	Not detected	1.0
1,3,5-Trimethylbenzene			Not detected	1.0	Not detected	1.0
1,3-Dichlorobenzene			Not detected	1.0	Not detected	1.0
1,4-Dichlorobenzene			Not detected	1.0	Not detected	1.0
3-Chloropropene			Not detected	1.0	Not detected	1.0

YORK

Client Sample ID			System A-Effluent		System A-Dilution	
York Sample ID			03010364-01		03010364-02	
Matrix			AIR		AIR	
Parameter	Method	Units	Results	MDL	Results	MDL
4-Ethyltoluene			Not detected	1.0	Not detected	1.0
Benzene			Not detected	1.0	Not detected	1.0
Benzyl Chloride			Not detected	1.0	Not detected	1.0
Bromomethane			Not detected	1.0	Not detected	1.0
Carbon Tetrachloride			Not detected	1.0	Not detected	1.0
Chlorobenzene			Not detected	1.0	Not detected	1.0
Chloroethane			Not detected	1.0	Not detected	1.0
Chloroform			Not detected	1.0	Not detected	1.0
Chloromethane			Not detected	1.0	Not detected	1.0
cis-1,2-Dichloroethylene			283	1.0	220	1.0
cis-1,3-Dichloropropylene			Not detected	1.0	Not detected	1.0
Dichlorodifluoromethane			Not detected	1.0	Not detected	1.0
Ethylbenzene			Not detected	1.0	Not detected	1.0
Freon-113			199	1.0	147	1.0
Hexachloro-1,3-Butadiene			Not detected	1.0	Not detected	1.0
Methylene Chloride			Not detected	1.0	Not detected	1.0
o-Xylene			Not detected	1.0	Not detected	1.0
p- & m-Xylenes			Not detected	1.0	Not detected	1.0
Styrene			Not detected	1.0	Not detected	1.0
Tetrachloroethylene			400	1.0	504	1.0
Toluene			Not detected	1.0	Not detected	1.0
trans-1,3-Dichloropropylene			Not detected	1.0	Not detected	1.0
Trichloroethylene			329	1.0	304	1.0
Trichlorofluoromethane			Not detected	1.0	Not detected	1.0
Vinyl Chloride			Not detected	1.0	Not detected	1.0

Client Sample ID			System B-Effluent		System B-Dilution	
York Sample ID			03010364-03		03010364-04	
Matrix			AIR		AIR	
Parameter	Method	Units	Results	MDL	Results	MDL
Volatiles(TO-14 list)	EPA TO14	ppbv	---	---	---	---
1,1,1-Trichloroethane			356	1.0	172	1.0
1,1,2,2-tetrachloroethane			Not detected	1.0	Not detected	1.0
1,1,2-Trichloroethane			Not detected	1.0	Not detected	1.0
1,1-Dichloroethane			81	1.0	38	1.0
1,1-Dichloroethylene			36	1.0	17	1.0
1,2,4-Trichlorobenzene			Not detected	1.0	Not detected	1.0
1,2,4-Trimethylbenzene			Not detected	1.0	Not detected	1.0
1,2-Dibromoethane			Not detected	1.0	Not detected	1.0
1,2-Dichlorobenzene			Not detected	1.0	Not detected	1.0
1,2-Dichloroethane			Not detected	1.0	Not detected	1.0
1,2-Dichloropropane			Not detected	1.0	Not detected	1.0
1,2-Dichlorotetrafluoroethane			Not detected	1.0	Not detected	1.0
1,3,5-Trimethylbenzene			Not detected	1.0	Not detected	1.0
1,3-Dichlorobenzene			Not detected	1.0	Not detected	1.0
1,4-Dichlorobenzene			Not detected	1.0	Not detected	1.0
3-Chloropropene			Not detected	1.0	Not detected	1.0
4-Ethyltoluene			Not detected	1.0	Not detected	1.0
Benzene			Not detected	1.0	Not detected	1.0

YORK

Client Sample ID			System B-Effluent		System B-Dilution	
York Sample ID			03010364-03		03010364-04	
Matrix			AIR		AIR	
Parameter	Method	Units	Results	MDL	Results	MDL
Benzyl Chloride			Not detected	1.0	Not detected	1.0
Bromomethane			Not detected	1.0	Not detected	1.0
Carbon Tetrachloride			Not detected	1.0	Not detected	1.0
Chlorobenzene			Not detected	1.0	Not detected	1.0
Chloroethane			Not detected	1.0	Not detected	1.0
Chloroform			Not detected	1.0	Not detected	1.0
Chloromethane			Not detected	1.0	Not detected	1.0
cis-1,2-Dichloroethylene			266	1.0	120	1.0
cis-1,3-Dichloropropylene			Not detected	1.0	Not detected	1.0
Dichlorodifluoromethane			Not detected	1.0	Not detected	1.0
Ethylbenzene			Not detected	1.0	Not detected	1.0
Freon-113			14	1.0	6.5	1.0
Hexachloro-1,3-Butadiene			Not detected	1.0	Not detected	1.0
Methylene Chloride			Not detected	1.0	Not detected	1.0
o-Xylene			Not detected	1.0	Not detected	1.0
p- & m-Xylenes			Not detected	1.0	Not detected	1.0
Styrene			Not detected	1.0	Not detected	1.0
Tetrachloroethylene			103	1.0	48	1.0
Toluene			Not detected	1.0	Not detected	1.0
trans-1,3-Dichloropropylene			Not detected	1.0	Not detected	1.0
Trichloroethylene			176	1.0	84	1.0
Trichlorofluoromethane			Not detected	1.0	Not detected	1.0
Vinyl Chloride			Not detected	1.0	Not detected	1.0

Units Key: For Waters/Liquids: mg/L = ppm ; ug/L = ppb For Soils/Solids: mg/kg = ppm ; ug/kg = ppb

Notes for York Project No. 03010364

1. The MDL (Minimum Detectable Limit) reported is adjusted for any dilution necessary due to the levels of target and/or non-target analytes and matrix interference.
2. Samples are retained for a period of thirty days after submittal of report, unless other arrangements are made.
3. York's liability for the above data is limited to the dollar value paid to York for the referenced project.
4. This report shall not be reproduced without the written approval of York Analytical Laboratories, Inc.
5. All samples were received in proper condition for analysis with proper documentation.
6. All analyses conducted met method or Laboratory SOP requirements.
7. It is noted that no analyses reported herein were subcontracted to another laboratory.

Approved By: Robert Q. Bradley
Managing Director

Date: 1/15/2003

YORK

YORK

Analytical Laboratories, Inc.

QA/QC Summary Report

Associated Samples: AB67322 — 15-Jan-03

Client: FPM Group

Analysis Name: *Volatiles(TO-14 list) QA ONLY* **Batch Name:** $TO14_-10287 **QA Sample #:** AB67322

Unit of Measure: ppbv **York's Sample ID:** **Batch QC**

Parameter	LCS(%)	Unspiked Result	Blank	Matrix Spike Amount	Matrix Spike Result	Matrix Spike Recovery, %	Spike Duplicate Duplicate	Spike Duplicate Recovery,%	Spike Duplicate Precision, RPD
1,2-Dichloroethane		Not detected	Not detected	5	5.4	**108.0**	Not detected		
Benzyl Chloride		Not detected	Not detected	0	Not detected	**Not detected**	Not detected		
Benzene		Not detected	Not detected	5	5.6	**112.0**	Not detected		
4-Ethyltoluene		Not detected	Not detected	0	0	**0.0**	Not detected		
3-Chloropropene		Not detected	Not detected	0	0	**0.0**	Not detected		
1,4-Dichlorobenzene		Not detected	Not detected	5	4.8	**96.0**	Not detected		
1,3-Dichlorobenzene		Not detected	Not detected	5	4.8	**96.0**	Not detected		
1,3,5-Trimethylbenze		Not detected	Not detected	5	5.3	**106.0**	Not detected		
1,1,1-Trichloroethane		Not detected	Not detected	5	5.5	**110.0**	Not detected		
1,2-Dichloropropane		Not detected	Not detected	5	5.3	**106.0**	Not detected		
Chlorobenzene		Not detected	Not detected	5	5.1	**102.0**	Not detected		
1,2-Dichlorobenzene		Not detected	Not detected	5	4.9	**98.0**	Not detected		
1,2-Dibromoethane		Not detected	Not detected	5	4.9	**98.0**	Not detected		
1,2,4-Trimethylbenze		Not detected	Not detected	5	5.3	**106.0**	Not detected		
1,2,4-Trichlorobenze		Not detected	Not detected	5	4.8	**96.0**	Not detected		
1,1-Dichloroethylene		Not detected	Not detected	5	5.7	**114.0**	Not detected		
1,1-Dichloroethane		Not detected	Not detected	5	5.6	**112.0**	Not detected		
1,1,2-Trichloroethane		Not detected	Not detected	5	5.4	**108.0**	Not detected		
1,1,2,2-tetrachloroet		Not detected	Not detected	5	5.3	**106.0**	Not detected		
1,2-Dichlorotetrafluor		Not detected	Not detected	5	5.9	**118.0**	Not detected		
Freon-113		Not detected	Not detected	5	5.5	**110.0**	Not detected		
Trichlorofluorometha		Not detected	Not detected	5	5.5	**110.0**	Not detected		
Trichloroethylene		Not detected	Not detected	5	5.2	**104.0**	Not detected		
trans-1,3-Dichloropro		Not detected	Not detected	5	3.9	**78.0**	Not detected		
Toluene		1.6	Not detected	5	5.2	**104.0**	1.8		**11.8**
Tetrachloroethylene		Not detected	Not detected	5	4.8	**96.0**	Not detected		
Styrene		Not detected	Not detected	5	5.2	**104.0**	Not detected		

YORK

QA/QC Summary Report

p- & m-Xylenes	Not detected	Not detected	5	5.2	104.0	Not detected
o-Xylene	Not detected	Not detected	5	5.3	106.0	Not detected
Bromomethane	Not detected	Not detected	5	5.4	108.0	Not detected
Hexachloro-1,3-Buta	Not detected	Not detected	5	5.2	104.0	Not detected
Carbon Tetrachloride	Not detected	Not detected	5	5.4	108.0	Not detected
Ethylbenzene	Not detected	Not detected	5	5.2	104.0	Not detected
Dichlorodifluorometh	Not detected	Not detected	5	5.5	110.0	Not detected
cis-1,3-Dichloroprop	Not detected	Not detected	5	4.5	90.0	Not detected
cis-1,2-Dichloroethyl	Not detected	Not detected	5	5.6	112.0	Not detected
Chloromethane	Not detected	Not detected	5	6.2	124.0	Not detected
Chloroform	Not detected	Not detected	5	5.5	110.0	Not detected
Chloroethane	Not detected	Not detected	5	5.9	118.0	Not detected
Vinyl Chloride	Not detected	Not detected	5	5.8	116.0	Not detected
Methylene Chloride	Not detected	Not detected	5	5.7	114.0	Not detected

YORK
ANALYTICAL LABORATORIES, INC.
ONE RESEARCH DRIVE
STAMFORD, CT 06906
(203) 325-1371 FAX (203) 357-0166

Field Chain-of-Custody Record

0301103604.

Company Name	Report To:	Invoice To:	Project ID/No.	
FPM	Ben Cakens	FPM	ARKEMA 652-00-01	Samples Collected By (Signature) / Ben Cakens Name (Printed)

Sample No.	Location/ID	Date Sampled	Sample Matrix: Water	Soil	Air	OTHER	ANALYSES REQUESTED	Container Description(s)
	System A - Effluent	1/14/03 1100			X		1,1-Dichloroethene; trans-1,2-Dichloroethene; 1,1-Dichloroethane; cis-1,2-Dichloroethene; 1,1,1-Trichloroethane; Trichloroethene; Tetrachloroethene	1-Tedlar Bag
	System A - Dilution							
	System B - Effluent							
	System B - Dilution							

Chain-of-Custody Record

Bottles Relinquished from Lab by	Date/Time	Sample Relinquished by	Date/Time	Sample Received by	Date/Time
Bottles Received in Field by	Date/Time	Sample Relinquished by	Date/Time	Sample Received in LAB by	1/14/03 10AM Date/Time

Comments/Special Instructions

Turn-Around Time

X Standard ___ RUSH(define)_____

APPENDIX E

HEALTH AND SAFETY PLAN

FPM

HEALTH AND SAFETY PLAN

FOR THE

GROUNDWATER REMEDIATION

AT THE ARKWIN INDUSTRIES SITE

NEW CASSEL INDUSTRIAL AREA

WESTBURY, NEW YORK

PREPARED BY

FPM group

909 MARCONI AVENUE
RONKONKOMA, NEW YORK 11779

NOVEMBER, 2000

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLES

SITE WORKER
HEALTH AND SAFETY STATEMENT

I have read this Health and Safety Plan (HASP) for the groundwater remediation at the Arkwin Industries Site (the Site), Westbury, New York and I have reviewed and understand the potential hazards and the precautions/contingencies of each potential hazard.

I agree to abide by the stipulations of this HASP and further agree to hold FPM Group harmless from, and indemnify against, any accidents which may occur as a result of activities at the Site regardless of whether or not they were covered in the HASP.

Name: _____ Representing: _____

_____ Date: _____
Sign

Name: _____ Representing: _____

_____ Date: _____
Sign

Name: _____ Representing: _____

_____ Date: _____
Sign

Name: _____ Representing: _____

_____ Date: _____
Sign

SECTION 1.0
INTRODUCTION

This Health and Safety Plan (HASP) has been written for compliance with "OSHA Hazardous Waste Operations Standards (29 CFR 1910.120)", the guidance documents, "Standard Operating Safety Guidelines (Office of Solid Waste and Emergency Response, 1988)" and the "Occupational Safety and Health Guidance Manual for Hazardous Waste Activities" (U.S. Department of Health and Human Services, 1985).

1.1 Scope and Applicability of the HASP

This HASP is designed to be applicable to locations where soil vapor extraction (SVE) and air sparging (AS) system installations are performed at the Arkwin site (the Site). This HASP may also be modified or amended to meet specific needs of the work proposed. This HASP will detail the Site safety procedures, Site background, and safety monitoring. Contractors will be required to adopt this HASP in full.

The Health and Safety Officer (HSO) will be present at the Site to inspect the implementation of the HASP, however, it is the sole responsibility of the contractor(s) to comply with the HASP.

The HASP has been formulated as a guide to complement professional judgment and experience. The appropriateness of the information presented should always be evaluated with respect to unforeseen Site conditions which may arise.

1.2 Site Work Zone and Visitors

The Site work zone (a.k.a. exclusion zone) during SVE or AS system installation will be a 30-foot radius about the work location. This work zone may be extended if, in the judgment of the health and safety officer (HSO), Site conditions warrant a larger work zone.

No visitors will be permitted within the work zone without the consent of the HSO. All visitors will be required to be familiar with, and comply with, the HASP. The HSO will deny access to those whose

presence within the work zone is unnecessary or those who are deemed by the HSO to be in non-compliance with the HASP.

All Site workers including the contractors will be required to have 40-hour hazardous material training (eight-hour refresher courses annually), respirator fit test certification, and medical surveillance as stated in 29 CFR 1910.120.

The HSO will also give an on-Site health and safety discussion to all Site personnel, including the contractors, prior to initiating the Site work. Workers not in attendance during the health and safety talk will be required to have the discussion with the HSO prior to entering the work zone.

Emergency telephone numbers and directions to the nearest hospital are found in Table 1.2.1.

TABLE 1.2.1
EMERGENCY TELEPHONE NUMBERS

Police	911
Ambulance	911
Poison Control Center	516-542-2323
N.Y.S. Department of Environmental Conservation	631-444-0320
Nassau County Medical Center	516-542-3311

FPM Contact Personnel (631-737-6200)

Dr. Kevin J. Phillips, P.E.
Stephanie Davis, Project Manager
Greg Menegio or John Bukoski, Health & Safety Officer

Directions to Nassau County Medical Center (516-542-3311)

Head north on Brooklyn Avenue to end, make a right on to Summa Avenue and go to end. Make a right turn on to Frost Street. Cross over Old Country Road (Frost Street becomes Carman Avenue). Follow Carman Avenue for approximately two miles and Nassau County Medical Center is located on the left side of the road at the corner of Carman Avenue and Hempstead Turnpike in East Meadow.

SECTION 2.0
KEY PERSONNEL AND RESPONSIBILITIES

The project manager for this project will be Stephanie Davis. The project field staff may include Stephanie Davis, Greg Menegio, and John Bukoski. Contractor personnel may also be on Site. The senior FPM staff member on Site will act as HSO and will report to the project manager. Contractor personnel will be provided with health and safety information by the HSO.

SECTION 3.0
SITE BACKGROUND

3.1 Site History and Known Chemical Constituents at the Site

The Site is comprised of five buildings located at 648, 656, 662, and 670 Main Street and 66 Brooklyn Avenue in Westbury, New York. The Site is approximately 1.7 acres in size. Groundwater at the Site may be impacted with chemicals related to the previous industrial use at the Site and to off-Site sources. The primary chemicals known to be present at the Site are presented in Table 3.1.1.

TABLE 3.1.1
PRIMARY CHEMICALS WITH THRESHOLD LIMIT VALUES

CONTAMINANT	SHORT TERM EXPOSURE LIMIT (STEL) 15 MINUTES	TIME-WEIGHTED AVERAGE 8 HOUR EXPOSURE LIMIT
Perchloroethylene (PCE)	200 ppm 1,357 mg/m^3	50 ppm 339 mg/m^3
Trichloroethylene (TCE)	200 ppm 1,070 mg/m^3	50 ppm 269 mg/m^3
Trichloroethane (TCA)	450 ppm 2,460 mg/m^3	350 ppm 1,910 mg/m^3
cis-1,2-dichloroethene	-	200 ppm 793 mg/m^3

SECTION 4.0
TASK/OPERATION HEALTH AND SAFETY ANALYSIS

This section will present health and safety analyses for the SVE/AS system installation.

4.1 Safety Analysis

A hollow-stem auger drilling rig will be utilized to install the SVE/AS wells. A photoionization detector (PID) will be used to monitor VOCs in the worker's breathing zone during drilling and installation of piping.

Steady-state PID readings greater than five ppm in the worker's breathing zone will require upgrading to Level C personal protective equipment. Steady-state readings, for this purpose, will be defined as readings exceeding five ppm above background for a minimum of ten seconds. Readings will be obtained at points approximately one foot above and then around the borehole. These points will define the worker's breathing zone.

Upon encountering PID levels greater than five ppm above background in the worker's breathing zone, all personnel will be evacuated from the work zone in the upwind direction (if applicable). Specific evacuation routes will be discussed prior to commencement of work at each location based on work location and wind direction. In addition, an evacuation meeting place will be determined. Level C personal protection will be implemented including full-face air-purifying respirators with dust and organic vapor cartridges (personal protective equipment will be described in greater detail in Section 7.0). All FPM personnel and contractors must be properly trained and fit tested prior to donning respirators. If, at any time, PID readings exceed steady-state levels greater than 50 ppm above background, or any conditions exist which the HSO determines will require Level B personal protective equipment, all work at the Site will cease immediately and all personnel will evacuate the work zone. Evacuation will occur in the upwind direction if discernable. Level B conditions are not anticipated to be encountered; however, if level B

conditions arise, no Site work will be performed by FPM or contractors and a complete evaluation of the operation will be performed and this HASP will be modified.

All personnel who may directly contact soil will be required to wear chemical-resistant gloves (such as butyl or nitrile) when the potential for dermal contact with the soil is possible. Dermal contact with excavated soils will be avoided.

Hard hats and steel-toe, steel-shank safety boots will be required when work is performed in the vicinity of heavy equipment (drill rigs, backhoes, etc.).

4.2 Other Safety Considerations

4.2.1 Noise

During AS/SVE system installation, operation of generators, or any other operation which may generate potentially harmful levels of noise, the HSO will monitor noise levels with a Realistic[tm] hand-held sound level meter. Noise levels will be monitored in decibels (dBs) in the A-weighted, slow-response mode. Noise level readings that exceed the 29 CFR 1910.95 permissible noise exposure limits will require hearing protection (see Table 4.2.1.1 for permissible noise exposures).

Hearing protection will be available to all Site workers. The hearing protection will consist of foam, expansion-fit earplugs (or other approvable hearing protection) with an Environmental Protection Agency noise reduction rating of at least 29 dB. Hearing protection must alleviate worker exposure to noise to an eight-hour time-weighted average of 85 dB or below. In the event that the hearing protection is inadequate, work will cease until a higher level of hearing protection can be incorporated.

4.2.2 Slip/Trip/Fall Preventative Measures

To reduce the potential for slipping, tripping, or falling, the work zone will be kept clear of unnecessary equipment. All Site workers will be required to wear work boots with adequate tread to reduce the potential for slipping (work boots must be leather or chemical-resistant and contain steel toes and steel shanks).

TABLE 4.2.1.1
PERMISSIBLE NOISE EXPOSURES*

Duration Per Day Hours	Sound Level dBA Slow Response
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼	115

Notes:

When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1+C_2/T_2$ C_6/T_6 exceeds unity, then, the mixed exposure should be considered to exceed the limit value. Cn indicates the total time of exposure at a specified noise level, and Tn indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140 dB peak sound pressure level.

* Standards derived from 29 CFR 1910.95

4.2.3 Insects and Ticks

Insect and tick problems are expected to be minimal. Potential insect problems include, but are not limited to, bees, wasps, and hornets. Prior to commencement of work, each work area will be surveyed for nests and hives to reduce the possibility of disturbing these insects. In addition, each Site worker will be asked to disclose any allergies related to insect stings or bites. The worker will be requested to keep his or her anti-allergy medicine on Site.

Tick species native to Long Island consist of the pinhead-sized deer tick and the much-larger dog tick. All Site workers will be advised to avoid walking through tall grassy areas where possible and will be advised to check for ticks on clothing periodically.

4.2.4 Heat/Cold Stress

Heat stress may become a concern especially if protective clothing is donned which will decrease natural ventilation. To assist in reducing heat stress the following measures will be taken:

- An adequate supply of water or other liquids will be brought on Site. To prevent dehydration, personnel will be encouraged to drink generous amounts of water even if not thirsty.
- A shady rest area will be designated (such as beneath the trees in the northeast corner of the property) to provide shelter during sunny days.
- In hot weather, workers wearing protective clothing may be rotated.

When the temperature is over 70 degrees Fahrenheit and personnel are wearing protective clothing, heat stress monitoring may be implemented as follows:

- Heart rate may be measured by counting the radial pulse for 30 seconds at the beginning of the rest period. The heart rate should not exceed 110 beats per minute. If the rate is higher, the next work period will be shortened by ten minutes (or 33%). If the pulse rate is 100 beats per minute at the beginning of the next rest period, the following work cycle will be shortened by 33%. The HSO will decide on the length of work periods and rest periods based on Site conditions.

- Body temperature may be measured, if deemed necessary, at the beginning of the rest period. Oral temperature should not exceed 99 degrees Fahrenheit. If it does, the next work period will be shortened by ten minutes (or 33%). However, if the oral temperature exceeds 99.7 degrees Fahrenheit at the beginning of the next period, the following work cycle will be further shortened by 33%. Work will not re-commence until by temperature has dropped below 99 degrees Fahrenheit.

Indications of heat stress range from mild (fatigue, irritability, anxiety, decreased concentration, dexterity or movement) to fatal. Medical help will be obtained for serious conditions. Heat-related problems are:

- Heat rash: caused by continuous exposure to heat and humid air and aggravated by chafing clothes. Decreases ability to tolerate heat as well as being a nuisance.
- Heat cramps: caused by profuse perspiration with inadequate fluid intake and chemical replacement (especially salts). Signs: muscle spasm and pain in the extremities and abdomen.
- Heat exhaustion: caused by increased stress on various organs to meet increased demands to cool the body. Signs: shallow breathing; pale, cool, moist skin; profuse sweating; dizziness and lassitude.
- Heat stroke: the most severe form of heat stress. Can be fatal. Medical help must be obtained immediately. Body must be cooled immediately to prevent severe injury and/or death. Signs: red, hot, dry skin; no perspiration; nausea; dizziness and confusion; strong, rapid pulse; coma.

Cold exposure is a concern if work is conducted during cold weather or marginally cold weather during precipitation periods or moderate to high wind velocity periods. To assist in reducing cold exposure the following measures will be taken:

- All personnel will be required to wear adequate and appropriate clothing. This will include head gear to prevent the high percentage loss of heat that occurs in this area (thermal liners for hard hats if hard hats are required).
- Provide a readily available warm shelter near each work zone.

- Carefully schedule work and rest periods to account for the current temperature and wind velocity conditions.
- Monitor work patterns and physical condition of workers and rotate personnel, as necessary.

Indications of cold exposure range from shivering, dizziness, numbness, confusion, weakness, impaired judgement, impaired vision to drowsiness. Medical help will be obtained for serious conditions if they occur. Cold exposure-related problems are:

- Frost bite: Ice crystal formation in body tissues. The restricted blood flow to the injured part results in local tissue destruction.
- Hypothermia: Severe exposure to cold temperature resulting in the body losing heat at a rate faster than the body can generate heat. The stages of hypothermia are shivering, apathy, loss of consciousness, decreasing pulse rate and breathing rate and death.

4.2.5 Potential Electrical Hazards

Potential electric hazards consist primarily of underground and overhead power lines. Potential underground electrical hazards will be minimized by having a utility markout performed for the Site. In addition, available as-built Site blueprints will be used to avoid contact with subsurface utility lines or structures. Overhead electrical hazards will be evaluated by visually observing the work location prior to raising the drill rig mast or performing other operations which have the potential to contact overhead utilities. No work shall be performed in close proximity to overhead utilities.

There is also the potnetial for electrical hazard associated with the AS/SVE system installation. To avoid these potential electrical hazards, all AS/SVE system electrical work will be performed by a licensed electrician. The electrician shall utilize standard industry procedures and practices for avoiding electrical hazards.

4.2.6 The Buddy System

All activities in contaminated or potentially contaminated areas will be conducted by pairing off the Site workers in groups of two (or three if necessary). Each person (buddy) will be able to:

- Provide his or her partner with assistance.
- Observe his or her partner for signs of chemical or heat exposure.
- Periodically check the integrity of his or her partner's protective clothing.
- Notify the HSO or others if emergency help is needed.

The buddy system will be instituted at the beginning of each workday. If new workers arrive on Site, a buddy will be chosen prior to the new worker entering the work zone.

4.2.7 Site Communications

Two sets of communication systems will be established at the Site: internal communication among personnel on-Site, and external communication between on-Site and off-Site personnel.

Internal communication will be used to:

- Alert team members to emergencies.
- Pass along safety information such as heat stress check, protective clothing check, etc.
- Communicate changes in the work to be accomplished.
- Maintain Site control.

Due to ambient noise, verbal communications may be difficult at times. The HSO will carry a whistle (and compressed air horn if respirators are donned) to signal Site workers. A single whistle blast will be the signal to immediately evacuate the work zone through the access control point. This signal will be discussed with all Site workers prior to commencement of work.

An external communication system between on-Site and off-Site personnel will be established to:

- Coordinate emergency response
- Report to the Project Manager

- Maintain contact with essential off-Site personnel

A field telephone will be available at all times in the HSO's vehicle. In addition, the nearest stationary phone will be identified prior to the commencement of Site operations and this location will be relayed to all Site workers.

4.2.8 General Safe Work Practices

Standing orders applicable during Site operations are as follows:

- No smoking, eating, drinking, or application of cosmetics in the work zone.
- No matches or lighters in the work zone.
- All Site workers will enter/exit work zone through the Site access point.
- Any signs of contamination, radioactivity, explosivity, or unusual condition such as dead animals will require evacuating the Site immediately and reporting the information to the HSO.
- Loose fitting clothing or loose long hair will be prohibited in the work zone during drilling operations.
- A signal person will direct the backing of work vehicles.
- Equipment operators will be instructed to check equipment for abnormalities such as oozing liquids, frayed cables, unusual odors, etc.

SECTION 5.0
PERSONNEL TRAINING REQUIREMENTS

All FPM personnel and contractor personnel will receive adequate training prior to entering the Site. FPM and contractor's personnel will, at a minimum, have completed OSHA-approved, 40-hour hazardous materials Site safety training and OSHA-approved, eight-hour safety refresher course within one year prior to commencing field work. The HSO will have received the OSHA-approved, eight-hour course on managing hazardous waste operations. In addition, each worker must have a minimum of three days field experience under the direct supervision of a trained, experienced supervisor.

Prior to Site fieldwork, the HSO will conduct an in-house review of the project with respect to health and safety with all FPM personnel who will be involved with fieldwork at the Site. The review will include discussions of signs and symptoms of chemical exposure and heat stress that indicate potential medical emergencies presented in Table 5.1. In addition, review of personal protective equipment will be conducted to include the proper use of air-purifying respirators.

TABLE 5.1
SIGNS AND SYMPTOMS OF EXPOSURE TO CHEMICALS

Type of Hazard	Signs and Symptoms
Chemical Hazard	Behavioral changes Breathing difficulties Changes in complexion of skin color Confusion Coordination difficulties Coughing Depression Dermatitis Dilated Pupils Dizziness Euphoria Fatigue and/or weakness Flushed face and/or neck Insomnia Irregular heartbeat Irritability Irritation of eyes, nose, respiratory tract, skin or throat Headache Lacrimation Light-Headedness Muscle Fatigue Nausea Nervousness Numbness in limbs Paresthesia Sleepiness Tingling Tremors Vertigo Visual disturbance Vomiting

TABLE 5.1 - CONTINUED
SIGNS AND SYMPTOMS OF EXPOSURE TO CHEMICALS

Type of Hazard	Signs and Symptoms
Heat Exhaustion	Clammy skin Confusion Dizziness Fainting Fatigue Heat rash Light-headedness Nausea Profuse sweating Slurred speech Weak pulse
Heat Stroke (may be fatal)	Confusion Convulsions Hot skin, high temperature (yet may feel chilled) Incoherent speech Staggering gait Sweating stops (yet residual sweat may be present) Unconsciousness

SECTION 6.0
MEDICAL SURVEILLANCE PROGRAM

All workers at the Site must participate in a medical surveillance program in accordance with 29 CFR 1910.120. A medical examination and consultation must have been performed within the last twelve months to be eligible for fieldwork.

The content of the examination and consultation will include a medical and work history with special emphasis on symptoms related to the handling of hazardous substances, health hazards, and fitness for duty including the ability to wear required personal protective equipment under conditions (i.e., temperature extremes) that may be expected at the work Site. All medical examinations and procedures shall be performed by, or under the supervision of, a licensed physician.

The physician shall furnish a written opinion containing:

- The results of the medical examination and tests.
- The physician's opinion as to whether the employee has any detected medical conditions that would place the worker at increased risk of material impairment of the employee's health from work in hazardous waste operations.
- The physician's recommended limitations upon the worker assigned to the work.
- A statement that the worker has been informed by the physician of the results of the medical examination and any further examination or treatment.

An accurate record of the medical surveillance will be retained. The record will consist of at least the following information:

- The name and social security number of the employee.
- Physician's written opinions, recommended limitations, and results of examinations and tests.

Any worker medical complaints related to exposure to hazardous substances.

SECTION 7.0
PERSONAL PROTECTIVE EQUIPMENT

7.1 General Considerations

The two basic objectives of the personal protective equipment (PPE) are to protect the wearer from safety and health hazards, and to prevent the wearer from incorrect use and/or malfunction of the PPE.

Potential Site hazards were discussed previously in Section 4.0. The duration of Site activities is estimated to be several months. All work is expected to be performed during daylight hours and workdays, in general, are expected to be eight to ten hours in duration. Any work performed beyond daylight hours will require the permission of the HSO. This decision will be based on the adequacy of artificial illumination and the type and necessity of the task being performed.

Personal protection levels for the Site activities, based on past investigations, are anticipated to be Level D with the possibility of upgrading to Level C. The equipment included for each level of protection is provided as follows:

Level C Protection

Personnel protective equipment:

- Air-purifying respirator, full-face
- Chemical-resistant clothing includes: Tyvek[tm] (spunbonded olefin fibers) for particulate and limited splash protection or Saranex[tm] (plastic film-laminated Tyvek) for permeation resistance to solvents.
- Coveralls*, or
- Long cotton underwear*
- Gloves (outer), chemical-resistant
- Gloves (inner), chemical-resistant
- Boots (outer), leather or chemical-resistant, steel toe and shank.

- Boot covers (outer), chemical-resistant (disposable)*
- Hard hat (face shield)*
- Escape mask*
- 2-way radio communications (inherently safe)*

(*) optional

Criteria for Selection of Level C Protection

Meeting all of these criteria permits use of Level C Protection:

- Oxygen concentrations are not less than 19.5% by volume.
- Measured air concentrations of identified substances will be reduced by the respirator below the substance's threshold limit value (TLV).
- Atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect any body area left unprotected by chemical-resistant clothing.
- Job functions do not require self-contained breathing apparatus.
- Direct readings are below 50 ppm on the PID.

Level D Protection

Personnel protective equipment:

- Coveralls
- Gloves*
- Boots/shoes, leather or chemical-resistant, steel toe and shank.
- Safety glasses or chemical splash goggles*
- Hard hat (face shield*)
- Escape mask*

(*) optional

Criteria for Selection of Level D Protection

Meeting any of these criteria allows use of Level D Protection:

- No contaminant levels above 5 ppm organic vapors or dusty conditions are present.
- Work functions preclude splashes, immersion, or the reasonable potential for unexpected inhalation of any chemicals above the TLV.

Additional Considerations for Selecting Levels of Protection

Other factors which will be considered in selecting the appropriate level of protection are heat and physical stress. The use of protective clothing and respirators increases physical stress, in particular, heat stress on the wearer. Chemical protective clothing greatly reduces natural ventilation and diminishes the body's ability to regulate its temperature. Even in moderate ambient temperatures, the diminished capacity of the body to dissipate heat can result in one or more heat-related problems.

All chemical protective garments can be a contributing factor to heat stress. Greater susceptibility to heat stress occurs when protective clothing requires the use of a tightly fitted hood against the respirator face piece, or when gloves or boots are taped to the suit. As more body area is covered, less cooling takes place, increasing the probability of heat stress.

Wearing protective equipment also increases the risk of accidents. It is heavy, cumbersome, decreases dexterity, agility, interferes with vision, and is fatiguing to wear. These factors all increase physical stress and the potential for accidents. In particular, the necessity of selecting a level of protection will be balanced against the increased probability of heat stress and accidents.

7.2 Donning and Doffing Ensembles

Donning an Ensemble

A routine will be established and practiced periodically for donning a Level C ensemble. Assistance may be provided for donning and doffing since these operations are difficult to perform alone.

Table 7.2.1 lists sample procedures for donning a Level C ensemble. These procedures should be modified depending on the particular type of suit and/or when extra gloves and/or boots are used.

Doffing an Ensemble

Exact procedures for removing Level C ensembles must be established and followed to prevent contaminant migration from the work area and transfer of contaminants to the wearer's body, the doffing assistant, and others.

Doffing procedures are provided in Table 7.2.2. These procedures should be performed only after decontamination of the suited worker. They require a suitably attired assistant. Throughout the procedures, both worker and assistant should avoid any direct contact with the outside surface of the suit.

7.3 Respirator Fit Testing

The fit or integrity of the facepiece-to-face seal of a respirator affects its performance. Most facepieces fit only a certain percentage of the population; thus each facepiece must be tested on the potential wearer in order to ensure a tight seal. Facial features such as scars, hollow temples, very prominent cheekbones, deep skin creases, dentures or missing teeth, and the chewing of gum and tobacco may interfere with the respirator-to-face seal. A respirator shall not be worn when such conditions prevent a good seal. The worker's diligence in observing these factors shall be evaluated by periodic checks. Fit testing will comply with 29 CFR 1910.1025 regulations.

7.4 Inspection

The PPE inspection program will entail five different inspections:

- Inspection and operational testing of equipment received from the factory or distributor.
- Inspection of equipment as it is issued to workers.
- Inspection after use.
- Periodic inspection of stored equipment.

TABLE 7.2.1
SAMPLE DONNING PROCEDURES

---

1. Inspect the clothing and respiratory equipment before donning (see Inspection in subsection 7.4).

2. Adjust hard hat or headpiece if worn, to fit user's head.

3. Standing or sitting, step into the legs of the suit; ensure proper placement of the feet within the suit; then gather the suit around the waist.

4. Put on chemical-resistant safety boots over the feet of the suit. Tape the leg cuff over the tops of the boots.

5. Don the respirator and adjust it to be secure, but comfortable.

6. Perform negative and positive respirator facepiece seal test procedures.

   - To conduct a negative-pressure test, close the inlet part with the palm of the hand or squeeze the breathing tube so it does not pass air, and gently inhale for about 10 seconds. Any inward rushing of air indicates a poor fit. Note that a leaking facepiece may be drawn tightly to the face to form a good seal, giving a false indication of adequate fit.

   - To conduct a positive-pressure test, gently exhale while covering the exhalation valve to ensure that a positive pressure can be built up. Failure to build a positive pressure indicates a poor fit.

7. Depending on type of suit:

   - Put on inner gloves (surgical gloves).

   - Additional overgloves, worn over attached suit gloves, may be donned later.

8. Put on hard hat

9. Have assistant observe the wearer for a period of time to ensure that the wearer is comfortable, psychologically stable, and that the equipment is functioning properly.

TABLE 7.2.2
DOFFING PROCEDURES

---

1. Remove any extraneous or disposable clothing, boot covers, outer gloves, and tape.

2. Remove respirator by loosening straps and pulling straps over the top of the head and move mask away from head. Do not pull mask over the top of the head.

3. Remove arms, one at a time, from suit, avoiding any contact between the outside surface of the suit and wearer's body and lay the suit out flat behind the wearer. Leave internal gloves on, if any.

4. Sitting, if possible, remove both legs from the suit.

5. After suit is removed, remove internal gloves by rolling them off the hand, inside out.

- Periodic inspection when a question arises concerning the appropriateness of the selected equipment, or when problems with similar equipment arise.

The inspection checklist is provided in Table 7.4.1. Records will be kept of all inspection procedures. Individual identification numbers will be assigned to all reusable pieces of equipment and records should be maintained by that number. At a minimum, each inspection should record the ID number, date, inspector, and any unusual conditions or findings. Periodic review of these records may indicate an item or type of item with excessive maintenance costs or a particularly high level of down-time.

7.5 Storage

Clothing and respirators will be stored properly to prevent damage or malfunction due to exposure to dust, moisture, sunlight, damaging chemicals, extreme temperatures, and impact. Storage procedures are as follows:

Clothing:

- Potentially contaminated clothing will be stored in an area separate from street clothing.
- Potentially contaminated clothing will be stored in a well-ventilated area, with good air flow around each item, if possible.
- Different types and material of clothing and gloves will be stored separately to prevent issuing the wrong material by mistake.
- Protective clothing will be folded or hung in accordance with manufacturer's recommendations.

Respirators:

- Air-purifying respirators should be dismantled, washed, and placed in sealed plastic bags.

TABLE 7.4.1
PPE INSPECTION CHECKLIST

CLOTHING

Before use:

- Determine that the clothing material is correct for the specified task at hand.
- Visually inspect for:
  - imperfect seams
  - non-uniform coatings
  - tears
  - malfunctioning closures
- Hold up to light and check for pinholes.
- Flex product:
  - Observe for cracks
  - Observe for other signs of shelf deterioration
- If the product has been used previously, inspect inside and out for signs of chemical attack:
  - discoloration
  - swelling
  - stiffness

During the work task, periodically inspect for:

- Evidence of chemical attack such as discoloration, swelling, stiffening, and softening. Keep in mind, however, that chemical permeation can occur without any visible effects.
- Closure failure
- Tears
- Punctures
- Seam discontinuities

TABLE 7.4.1 - CONTINUED
PPE INSPECTION CHECKLIST

GLOVES

Before use:

- Pressurize glove to check for pinholes. Either blow into glove, then roll gauntlet toward fingers or inflate glove and hold under water. In either case, no air should escape.

AIR-PURIFYING RESPIRATORS

- Inspect air-purifying respirators:
  - before each use to be sure they have been adequately cleaned
- Check material conditions for:
  - signs of pliability
  - signs of deterioration
  - signs of distortion
- Examine cartridges to ensure that:
  - they are the proper type for the intended use
  - the expiration date has not been passed
  - they have not been opened or used previously
- Check faceshields and lenses for:
  - cracks
  - crazing
  - fogginess
- Air purifying respirators will be stored individually in resealable plastic bags.

7.6 Maintenance

Specialized maintenance will be performed only by the factory or an authorized repair person. Routine maintenance, such as cleaning, will be performed by the personnel to whom the equipment is assigned. Respirators will be cleaned at the end of each day with alcohol pads or, preferably, by washing with warm soapy water.

7.7 Decontamination Methods

All personnel, clothing, equipment, and samples leaving the contaminated (work zone) area of the Site must be decontaminated to remove any harmful chemicals or infectious organisms that may have adhered to them. Decontamination methods either (1) physically remove contaminants (2) inactivate contaminants by chemical detoxification or disinfection/sterilization, or (3) remove contaminants by a combination of both physical and chemical means. In many cases, gross contamination can be removed by physical means involving dislodging/displacement, rinsing, wiping off, and evaporation. Contaminants that can be removed by physical means include dust, vapors, and volatile liquids. All reusable equipment will be decontaminated by rinsing in a bath of detergent and water (respirators, gloves to be reused). Monitoring equipment will be decontaminated by wiping with paper towels and water.

The effectiveness of the decontamination will be evaluated near the beginning of Site activities and will be modified if determined to be ineffective. Visual observation will be used for this purpose. The HSO will inspect decontaminated materials for discoloration, stains, corrosive effects, visible dirt, or other signs of possible residual contamination.

All disposable PPE will be discarded following use. All used PPE to be discarded will be placed in an appropriate receptacle for disposal.

SECTION 8.0
DECONTAMINATION PROCEDURES FOR SAMPLING AND EXCAVATION EQUIPMENT

All non-dedicated sampling equipment shall be decontaminated prior to, and following, use at each sampling location. Decontamination procedures shall consist of the following:

1. Scrub equipment in a bath of low-phosphate detergent and potable water.
2. Potable water rinse.
3. Methanol followed by hexane rinse.
4. Distilled water rinse, air dry.
5. Aluminum foil wrap, shiny side out, for transport.

Personal protective equipment decontamination has been discussed in Subsection 7.7.

All excavation equipment and other equipment which has contacted Site soil or groundwater will be decontaminated prior to leaving the Site. Decontamination of this equipment will consist of physically removing adhering soil using hand tools followed by rinsing the equipment with potable water. Decontamination will be performed in the immediate vicinity of the soil excavation area so that the removed soil and rinseate will be discharged in the area undergoing remediation.

SECTION 9.0
CALIBRATION PROCEDURES, FREQUENCIES, AND MAINTENANCE

This section will present the calibration procedures, frequencies, and maintenance for the health and safety field monitoring instruments. The use of the monitoring equipment is presented as follows (the manufacturer's owner's manuals for all equipment used will be present at the Site):

1. Photovac MicroTIP - this instrument is a photoionization detector (PID) that measures the concentration of airborne ionizable gases and vapors. The MicroTIP does not distinguish between individual compounds and will not read methane. The calibration will be performed using ambient air to "zero" the instrument and a 95 ppm cylinder of isobutylene to calibrate the span. The calibration will be performed as follows:

1. Connect the supplied regulator to the Span Gas cylinder. Hand-tighten the fittings.
2. Open the valve on the gas bag by turning the valve stem fully counter clockwise.
3. Attach the gas bag adapter nut to the regulator. Hand-tighten the fittings.
4. Turn the regulator knob counter clockwise about half turn to start the flow of gas.
5. Fill the gas bag about half full and then close the regulator fully clockwise to turn off the flow of gas.
6. Disconnect the bag from the adapter and empty it. Flush the bag a few times with the Span Gas and then fill it.
7. Close the gas bag by turning the valve clockwise.
8. Press SETUP and select the desired Cal Memory with arrow keys and press ENTER. Press EXIT to leave Setup.
9. Press CAL and expose MicroTIP to ambient air. Press ENTER and MicroTIP sets its zero point.

10. MicroTIP then asks for the Span Gas concentration. Enter the Known Span Gas concentration and then connect the Span Gas bag adapter to the inlet.

11. Press ENTER and MicroTIP sets its sensitivity.

12. When MicroTIP's display reverts to normal, MicroTIP is calibrated and ready for use. Remove the Span Gas bag from the inlet.

The instrument will be calibrated prior to the commencement of each day's work. The instrument will be charged overnight prior to each day's work.

SECTION 10.0
EMERGENCY RESPONSE PLAN

This section will present the Emergency Response Plan (ERP) for the Site. Pre-emergency planning will consist of reviewing the ERP with all workers at the Site prior to initiation of work.

Personnel Roles

It is anticipated that during system installation activities at the Site, in general, several persons will be on the Site: the HSO and contractors. Should an emergency situation arise at the Site, the HSO will assume control and decision-making. The HSO will also resolve all disputes concerning health and safety requirements and precautions. The HSO will also:

- Be authorized to seek and purchase supplies as necessary.
- Have control over activities of everyone entering the Site.

The HSO will communicate, by field telephone or other, with off-Site personnel to include the Project Manager to evaluate data and assist in the decision-making process. Phone numbers for the fire department, police, ambulance, poison control center, Nassau County Department of Health Services, NYS Department of Environmental Conservation Spill Response Department, are listed in Table 1.2.1 of this document. The hospital which will be utilized during an emergency will be Nassau County Medical Center. The directions to the hospital, along with the hospital's emergency room phone number are presented in Table 1.2.1. Copies of Table 1.2.1 will be available at the Site and will be placed in all vehicles of personnel involved in activities at the Site.

Internal communications will consist of a single whistle (or compressed air horn if Level C is donned) blast. This blast will signal all workers to evacuate the work zone by the nearest exit.

Response Follow-Up

Following an emergency, or incident, a detailed report will be generated by the HSO. All equipment will be restored to pre-emergency conditions. The HASP will be reviewed following an emergency to determine if it provides adequate information to assist in dealing with the emergency. The HASP may be revised to incorporate additional information as needed.

Emergency Recognition and Prevention

Before daily work assignments begin, each day a brief on-Site meeting will be held by the HSO which will address health and safety issues related to the day's work. Prior to initiation of work, a detailed on-Site health and safety meeting will be held to review all potential hazards, contingencies, and safety measures.

Safe Distances and Places of Refuge

The main potential cause of work zone evacuation is a significant vapor release. Vapor release evacuation will be discussed prior to subsurface activities at the Site and in general will be in the upwind direction. Wind direction will be monitored at each work location and all workers will be notified of the direction of evacuation prior to commencement of work. Safe distances will be discussed at each location and determined by the HSO. The PID will be used to determine if workers have evacuated a sufficient distance.

At all times, vehicles which may be utilized in an emergency for transport to the hospital (or other destination) will have clear access to leave the Site. The HSO will assure that an emergency vehicle does not become blocked-in by other vehicles.

Site Security and Control

The HSO will control entry of personnel into the work zone. No unnecessary persons shall be permitted in the work zone.

Decontamination Procedures During Emergencies

In the event of a medical emergency, decontamination will be performed if it does not interfere with essential treatment. Decontamination will be performed by washing, rinsing, and/or cutting off protective clothing and equipment.

If decontamination cannot be performed, the victim will be wrapped in plastic to reduce contamination to other personnel. Emergency and off-Site medical personnel will be alerted to the potential contamination.

Emergency Medical Treatment and First Aid

Medical emergencies will be treated, in general, by medical experts by transporting the victim to the nearby hospital. A first aid kit will be present on Site for minor medical treatment.

LEGEND

MW-7	MONITORING WELL
	DRYWELL
	GEOPROBE SAMPLE LOCATION
AS-6	PROPOSED SPARGING WELL LOCATION AND ESTIMATED AREA OF INFLUENCE
SVE-1	PROPOSED SOIL VAPOR EXTRACTION WELL LOCATION AND ESTIMATED AREA OF INFLUENCE

PLATE 1

REVISED REMEDIATION SYSTEM LAYOUT
ARKWIN INDUSTRIES, INC. SITE
WESTBURY, NEW YORK

Drawn By: H.C., J.S.

Checked By: B.C.

Scale: 1"=50'

Date: 3/11/03

File Name:
Drawing No.

Sheet 1 of 1

GARY A. MOLNAR
N.Y.S.P.E. No.055142

FPM GROUP
Ronkonkoma New York