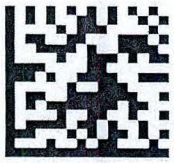

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Ecosystems Strategies, Inc. *Environmental Services and Solutions*

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REC'D: 7-30-02

July 24, 2002

Mr. Paul Olivo
United States Environmental Protection Agency
290 Broadway
New York, New York 10007-1866

Re: Proposed Revised Groundwater Sampling Plan for the General Switch Site, City of Middletown, Orange County, New York (a.k.a. Wallkill Well Field Site)
ESI File Number: LM97145.40

Dear Mr. Olivo:

This letter constitutes a proposed Revised Groundwater Sampling Plan, which was requested at our meeting of December 12, 2001. This sampling plan was initially submitted to the USEPA and dated March 25, 2002. This revised sampling plan incorporates comments made by the USEPA in their letter dated May 29, 2002. This revised plan is an addendum to the Interim Groundwater Remediation Workplan (ESI Interim Workplan) prepared by this office and most recently revised June 20, 2000 (this document is not provided herein). In preparing this revised plan, Ecosystems Strategies, Inc. (ESI) has reviewed the complete Site Characterization Report (5 volumes) by Jacobs Environmental, Inc., Shakti Consultants, Inc., and Sadat Associates, Inc. and dated February 18, 1994 (Shakti Report); researched natural attenuation of chlorinated solvents (including the USEPA document entitled "Technical Protocol for Evaluating Natural Attenuation of Chlorinated Solvents in Ground Water" EPA/600/R-98/128); and recalculated the direction of groundwater flow for both overburden and bedrock aquifers.

To facilitate your review, this letter is divided into sections that address the following:

Section 1: December 2000/January 2001 Sampling Event - Additional Detail
Section 2: Proposed Locations of Additional Wells
Section 3: Proposed Sampling Procedure (including Bio-Attenuation Analytes)
Section 4: Proposed Data Validation
Section 5: Proposed Data and Report Presentation
Section 6: Proposed Project Schedule

Section 1.0 December 2000/January 2001 Sampling Event – Additional Detail

Groundwater Elevation Contour Maps for December 2000/January 2001 Sampling Event

From survey annotations on the site basemap (Map 2-1 from the above-referenced Shakti Report), the elevations of the monitoring wells and residential wells were obtained to prepare Table 1 and Figures 1 and 2 (all Figures are provided in Attachment A; all Tables are provided in Attachment B). The water levels in all of the monitoring wells accessed in December 2000 and January 2001 were compiled from field notes and are presented in Table 1. The measuring point elevations are provided in the basemap and the water elevations calculated. Since the data set for December was the most complete, the water table for the shallow (overburden) wells and the potentiometric surface for the deep bedrock wells were contoured using that data. However, the location of MW-6 was unknown (under the snow) at the time of the December sampling, and it was found during the January event.

To facilitate contour line and flow direction comparisons, the attached Groundwater Elevation Maps for Shallow Overburden and Deep Bedrock Wells (Figures 1 and 2) were drawn on the corresponding maps provided in the Shakti Report (Figures 4-8 and 4-7, respectively). For Figure 1, the water table elevation for MW-6 was measured in January 2001 with the remainder of the data from December 2000. Figures 1 and 2 included here are draft maps, and final versions will be prepared for inclusion in the next sampling report.

The Groundwater Elevation Map of Shallow, Overburden Monitoring Wells (Figure 1) shows a water table surface and flow direction similar to the Shakti Report's corresponding map. The water level from monitoring well MW-6 imposes a bit of a curve on the 610-foot contour line, not seen on the 1993 map because that well was not yet installed. This interpretation is similar to the water table contour map prepared by Fred C. Hart for water levels recorded on September 14, 1984 (Shakti Report, Figure 3-14).

The Groundwater Elevation Map of Deep Bedrock Wells (Figure 2) shows a more convex pattern of contours in the flow direction than the 1993 map. Water levels were obtained for only five wells during the December 2000 sampling event (the Con-Tel well and the four deep monitoring wells), whereas the March 31, 1993 map is based on the site deep wells and many off-site residential wells.

The Shakti Report suggests that the major factor moving the contaminant plume westward from under the General Switch site was pumping from residential water supply wells. This tentative conclusion is supported by more recent data generated by this office.

Pumping seemed to move the contaminants westward along an east-west bedrock fracture trend, centered along a line between the Parella and Ruppert wells (Shakti Report, Figures 5-27, 5-28, and 5-29 for late 1983, early 1984, and late 1984, respectively). The fracture zone was interpreted from an anomaly on the EM-34 geophysical survey (Shakti Report, Figure 3.3). From studying the Shakti Report, there is an alternative hypothesis governing the movement of the plume westward and that is the pumping of the Parella and Ruppert wells may have controlled movement of the plume carried by groundwater at the base of the overburden on the top of the bedrock surface in the downslope direction as shown on the topographic fishnet diagram of the top of bedrock surface (Shakti Report, Figure 3-7). If the slope of the bedrock surface controls the movement of the plume, then once the homes were connected to municipal water (November 1983) and the pumping stopped, the plume could flow downslope to the south or southwest from the site. If the fracture hypothesis is correct, the majority of the plume may have been removed with the sustained pumping of the Parella well (October 17 to December 26, 1983). An estimate of 21 pounds of dissolved PCE was removed in the groundwater from bedrock.

In the absence of pumping, the maps for December 1992 and March 31, 1993 can be assumed to represent gradients reflecting equilibrium non-pumping conditions in the shallow and bedrock wells. The new maps for December 2000/January 2001 show slightly different flow regimes. Because the deep bedrock water table elevations are based on only five wells, a more complete picture of present day flow conditions could be gained with additional water level measurements from the homeowner wells along the southeast side of Highland Avenue and from the wells at Lubricants, Inc. and Guild Moulders, Inc. if permission can be obtained. Information on those wells is summarized in Table 2.

Deep Bedrock Monitoring Wells, Location of Fractures

The borehole geophysics logs from the Shakti Report were reviewed for fractures shown on the caliper log. The following zones were identified on the deep bedrock monitoring wells:

Well	Fracture Depth
MW-202	53 feet
MW-203	17.5-18 feet
MW-204	91.5 feet
MW-207	No evidence of fractures

Because PCE and its degradation products are heavier than water, it would be logical to sample from the bottom of wells to find product trapped in the bottom of wells using low flow purging. However, if product is moving along fractures, other samples should be taken at the elevation of known fracture zones using a pump to move water and dissolved product out the fracture. For the three wells with identified fractures, two samples should be taken: one at the level of the fracture aperture and another from the bottom of the well. For MW-207, the sample should be taken from near the bottom of the well, as before.

Section 2.0 Proposed Location of Additional Wells

Additional data points are warranted at this site, as recommended by this office in previous reports and verbally at the NYSDEC December 12, 2001 meeting. Additional data points are proposed in two ways: (a) collection of groundwater samples and groundwater elevation data from existing supply wells present on nearby residential properties; and (b) the installation of new shallow overburden and deep bedrock wells. Both proposals are detailed below.

A. Sampling of Existing Deep Bedrock Wells

A review of the Shakti Report's geophysical logs for other deep bedrock wells indicated the presence of fractures in three wells that are close to the site and relatively isolated in relation to the other bedrock monitoring wells:

Well	Fracture Depth(s)
Con-Tel W-33	67-81 feet just below casing Deepest fracture at 75 feet
Parella W-30	Fractures at 34-41, 45.5 and 74 and 75 feet Deepest at 74 and 75 feet
Electra W-31	55 feet Depth measured from top of concrete slab

Sampling the Con-Tel and Electra wells may identify the edge of the contaminant plume. Sampling the Parella well may indicate if any residual PCE and degradation products are left behind or entering the well after the pumping of 1984. By separately sampling from the fractures and bottom of the wells, it can be determined if contaminants are moving through fractures in the groundwater or becoming trapped in the bottom of wells.

Formal communications between this office and each well owner will occur before the sampling. This office will notify the USEPA if permission to sample any of these wells is denied.

B. Installation of Additional On-Site Wells

In order to identify plume movement along the unmonitored anomalies, and based on a review of the EM-34 geophysical survey and the change in direction of groundwater flow after residential pumping stopped, additional wells should be installed at locations shown in Figure 3. Specifically, a shallow overburden well should be installed at MW-19 to define the lateral extent of the plume, and three deep bedrock monitoring wells should be installed at MW-206, MW-209, and MW-219 to identify the edge of the plume in the deep bedrock.

The bedrock monitoring wells will also be used to define the vertical extent of the plume. After the steel surface casing is seated into the top 10 feet of bedrock, bedrock cores will be taken, and packer tests will be conducted by sealing off each successively deeper water-bearing zone to determine presence or absence of hydraulic connectivity with the overlying zone. Groundwater will be monitored for VOCs with a photo-ionization detector (PID) to identify zones of contamination. It is anticipated that drilling, coring and testing will continue downward until uncontaminated groundwater is found. When the bedrock borehole has reached final depth, borehole geophysical logging or downhole video camera logging will be conducted to characterize fracture zones. Once the hydraulic relationships of the various water-bearing zones are established and a vertical contamination profile is obtained, the vertical monitoring interval can be identified and the well constructed accordingly. If it is determined that more than one interval requires monitoring, an additional well will be constructed in close proximity to monitor the additional interval.

These drilling, coring, packer testing, and well installation procedures will be described in detail in a separate workplan which will be submitted for approval to the USEPA prior to installation of additional bedrock monitoring wells. The workplan will also detail the standard operating procedures for the slug tests and pumping tests as well as geophysical borehole logging techniques that will be used to characterize aquifer conditions in the new bedrock wells.

All groundwater obtained during pumping tests, well development and sampling events will be collected and containerized on-site in a portable aboveground storage tank (AST). All contaminated water generated during decontamination procedures will be collected and containerized on-site in the same manner. At the conclusion of all site activities, all containerized water will be sampled and a waste characterization profile will be developed in anticipation of office site disposal. A copy of all documents, including disposal manifests, will be included in the groundwater report.

Well installation will be conducted consistent with the procedures outlined below:

> Groundwater monitoring wells will be developed to enable collection of representative samples of groundwater for chemical analysis, to restore the natural hydraulic connection between the well screen and surrounding soils, to reduce turbidity, and to remove fines and drilling/well installation fluids or materials. Each well will be developed using a 1.5-inch diameter, properly decontaminated, submersible pump with dedicated Teflon tubing attached. Deep wells will be developed and purged with the pumps placed in series. Development water will be placed in mobile tanks for sampling, treatment, and disposal.

The new unused length of tubing will be stored in a clean plastic bag or on clean plastic sheeting until ready for use and handled with new clean gloves at every well location. The pump will be raised and lowered 1 to 2 feet within various portions of the screened interval to force groundwater back and forth throughout the well screen. Well development will begin at the top of the saturated portion of the screened interval to prevent clogging of the pump within the well casing. Repeated surging and pumping at intervals of less than 5 feet will be performed to the bottom of the screen until the discharged water appears to be clear.

Field indicator parameters (i.e., temperature, pH, specific conductance, dissolved oxygen, turbidity, and salinity) will be measured during well purging to ensure that the well has been properly developed. A Horiba U-10 instrument will be used for this purpose. Well development will be considered adequate when the field-measured parameter readings have stabilized as outlined on page 7 of the USEPA Region 2 Groundwater Sampling Procedures, included in Appendix G of this Revised Workplan. All observations, including turbidity, odor, presence of a sheen, etc., and instrument measurements will be recorded in a bound field notebook.

After well development and a quiescence interval, groundwater samples will be collected from the new wells along with the other wells installed during previous investigations (as described in Section 2.3 of the ESI Interim Workplan).

Decontamination procedures will be performed in the following manner:

All drilling equipment in contact with soils (e.g., augers) will be steam cleaned at the beginning of each day and between boreholes. Sampling pumps will be decontaminated in accordance with the procedures outlined in the USEPA Region 2 Groundwater Sampling Procedures, included in Appendix G of the ESI Interim Workplan. Other reusable sampling equipment will be decontaminated in the following manner:

1. Pressure wash with water and a designated brush to remove any visible dirt.
2. Wash and scrub in a mild detergent (e.g., Alconox) and de-ionized water using a designated brush.
3. Rinse with de-ionized water.
4. Rinse with 10% Nitric Acid solution.
5. Rinse with de-ionized water.
6. Rinse with methanol.
7. Rinse with de-ionized water.
8. Allow to air dry and use immediately or wrap in aluminum foil (shiny side out).

Slug tests will be conducted to estimate hydraulic conductivity of the overburden or bedrock materials surrounding the wells. If the contaminant plume is detected, those wells will be candidates for remedial pumping wells. Pumping step tests will be conducted to estimate the pumping capacity and measure the cone of depression in nearby wells. Pumped test water will be placed in mobile tanks for sampling, treatment, and disposal. Hydraulic parameters from those pumping tests and previous pumping tests will be used in analytical computer program models to plan and predict remedial pumping rates and capture zones. Analytical solution models are based on linear flow equations requiring one value for each parameter, in contrast to numerical solution models that are based on calculating flow through a series of cells forming data grids with input values in each cell or grid point.

Section 3.0 Proposed Sampling Procedure (including Bio-Attenuation Analytes)

ESI proposes to conduct all quarterly groundwater sampling in a manner consistent with the procedures proposed in the ESI Interim Workplan (Section 2.3) previously approved by the USEPA for this site.

As in the December 2000/January 2001 sampling event, future sampling events shall use the low-flow purge technique with the Grundfos Readiflo pump at the desired depth in the well and measuring field indicator parameters with a Horiba U-22 low-flow cell. The Horiba measurements will be recorded in the field notebook and provided in the summary report. The depth of the pump during sampling will be recorded in the field notebook and included in the summary report. For the Spring 2002 sampling event, separate samples will be collected from fracture zones and near the bottom of the well for the following wells: MW-202, MW-203, MW-204, W-33, W-30, and W-31 as discussed above in Section 1.0. The use of a diffusion bag sampler will be considered. If deemed appropriate, that method will be used for sampling the residential wells.

As part of the sampling event, water level measurements will be obtained from residential wells along Highland Avenue and other wells at Lubricants, Inc. and Guild Moulders, Inc. to obtain data for contouring hydraulic gradients in shallow and deep water-bearing units surrounding the site (as mentioned in Section 1.0 and listed on Table 2). Written permission will be sought prior to the sampling event.

In addition to the parameters set forth in the approved ESI Interim Workplan, ESI proposes to analyze groundwater samples for the parameters specified below and/or to conduct field testing of water to document conditions that may be favorable to natural attenuation.

Additional Laboratory Analysis and Field Testing for Assessing Natural Attenuation

A review of previous sampling results and the results from December 2000 and January 2001 suggests that the concentrations of PCE are declining and various concentrations of daughter products are present in concentrations less than PCE. A cursory review of water quality indicators measured in the low flow purge process suggests the likelihood of favorable subsurface conditions for natural attenuation: additional sampling and testing will be conducted to characterize subsurface conditions and to confirm/refute this assumption. Demonstration of that likelihood and characterization of shall obviously require additional sampling and testing. Based on a review of the protocol for natural attenuation assessment, the groundwater sampling procedures shall include more field and laboratory tests to conduct a full assessment of natural attenuation of PCE contaminants at the site as outlined below.

For the next groundwater sampling event (Spring 2002), all monitoring wells on the site shall include the low flow purge method and recording of the following parameters with the Horiba U-22 six-parameter meter: pH, Conductivity, Turbidity, Oxidation-Reduction Potential, Dissolved Oxygen, Temperature, Salinity, and Total Dissolved Solids.

Also, another Horiba will be outfitted with sensors for Nitrate and Chloride ions and measurements taken when the sample reaches stabilization with the low flow parameters.

Also, once stabilization is reached, water samples will be analyzed with field tests for the following parameters using the following methods.

Parameter	Field Method
Ferrous Iron (++)	Hach method 8146 colorimetric
Sulfate (- -)	Hach method 8051 colorimetric
Manganese	Hach method 8034 colorimetric
Carbon Dioxide	CHEMetrics method 4500 titrimetric

Also, laboratory analysis will be conducted for methane, ethane, ethene, Total Organic Carbon, and major cations, as well as hydrogen from the sample obtained by the bubble strip collection method.

In addition, volatile organic compounds will be analyzed using EPA Method 8010.

Use of Future Sampling Data

Based on the results of field testing and laboratory analyses for the next sampling round, existing contaminant conditions will be evaluated with respect to groundwater characteristics in support of or limiting natural attenuation. Behavior of the chlorinated solvent plume will be classified by types enumerated in the USEPA protocol.

Based on the installation of additional wells, slug testing, water level mapping, and a second round of sampling, the conceptual model of the site will be developed and described. Site conditions with respect to natural attenuation will continue to be evaluated. Preliminary pre-modeling calculations will be set up. Preparation of a fate and transport model will begin if the data warrants monitoring natural attenuation at the General Switch site.

After four quarterly sampling events, the conceptual model can be fully developed and the pre-modeling calculations completed. Next, the fate and transport model will be used to estimate movement of the plume and degradation rates.

Compilation and Interpretation of Data Relative to Presence of Active Anaerobic Biodegradation in the Subsurface at General Switch

A systematic review of data from the December 2000/January 2001 sampling round is summarized in Table 3 for each well. In addition to the laboratory results presented in the ESI Interim Workplan, field measurements are tabulated from the Horiba used in the low flow cell during purging. This table also includes qualitative scoring with respect to analytical parameters for preliminary screening for anaerobic biodegradation processes (defined in Table 2.3 of the EPA's protocol).

For the following shallow wells, PCE was "Not Detected" (ND) or below 5 ppb: MW-1, MW-2, MW-7, MW-8, MW-10, MW-12, and MW-14. For the deep bedrock wells, PCE of 2 and TCE of 2 ppb were measured in MW-207 and for the remainder *cis*-1,2DCE concentrations exceeded 80 percent of the total DCE indicating the likelihood that the *cis*-1,2DCE is a daughter product of the biodegradation of TCE from PCE.

For dissolved oxygen, nearly all well samples (13 of 17) were within the prescribed 0.5 to 5 mg/L range. Two of the four wells exceeding this range did so by approximately 10% (MW-5 at 5.66 mg/L and MW-10 at 5.49 mg/L); MW-207 and MW-9 had dissolved oxygen levels of 6.4 and 7.71 mg/L, respectively.

In MW-5, with the daughter product *cis*-1,2DCE exceeding 80% total DCE, it is reasonable to conclude that biodegradation is occurring. Similarly, MW-207 (PCE = 2 ppb and TCE = 2 ppb) and MW-10 (Non Detect for PCE and TCE) exhibit evidence that biodegradation processes have been occurring and are approaching their end stages.

For temperature, all wells are in the range of 7 to 14 degrees Centigrade, which is below the optimum condition of greater than 20 degrees Centigrade.

For this preliminary review, alkalinity is considered to be the release of the negative ions, while Total Dissolved Solids (TDS) are considered to be the positive ions from the dissociation of carbonates and bicarbonates in groundwater. All of the measured pH values fall in the 5 to 9 optimal range for the reductive pathway. With respect to TDS, values range from 0.08' to 0.55'. It is assumed that the TDS value of MW-9 at 0.08' is approximately background. All the other (16) values were at least twice this assumed background, and 12 of the 16 are at least five times that of MW-9.

The Oxidation Reduction Potential (ORP) is greater than 50 mV in 12 of the 16 wells for which this measurement was collected. In the other four wells, the ORP is –8 mV or less, and therefore within the range in which the reductive pathway is described as "Possible" in Table 2.3 of the USEPA protocol. In two of the deep bedrock wells, ORP is closer to –100 mV, thereby approaching the condition of "reductive pathway likely".

In the deep bedrock wells, ORP approaches the condition of "reductive pathway likely" in three of the wells. Based on these limited data, the processes of biodegradation of PCE and TCE are active in the shallow overburden and deep bedrock groundwater where monitoring wells are located at the General Switch site. Also, conditions to complete the biodegradation of vinyl chloride seem likely because the only measured concentrations found in four wells (MW-3, MW-16, MW-203, and MW-204) are all less than 10 ppb.

Eight individual wells have total point scores currently between 7 and 11, and these scores do not include the analytes nitrate, iron (II), sulfate, methane, total organic carbon, carbon dioxide or hydrogen. Future sampling will include these additional analytes to document the presence or absence of evidence of acceptable rates of biodegradation.

On this topic, EPA's comments were found to be very helpful. This brief analysis is included to demonstrate how future data will be used in the characterization of subsurface conditions and no conclusions of the presence or absence of natural attenuation are drawn at this time.

Section 4.0 Proposed Data Validation

Data validation was not possible during the previous sampling rounds due to failure at the selected laboratory. Quality control reports could not be provided to the data validator.

ESI is committed to ensuring that data validation occurs as part of the sampling round. Data validation of no less than 20 percent of all samples analyzed will be conducted by an independent data validator who will expand the data validation process to a greater percentage of total samples as determined appropriate by the validator. The complete report by the independent data validator will be presented to the USEPA.

Section 5.0 Proposed Data and Report Presentation

Upon completion of all services, ESI will prepare an Interim Data Summary Report to be submitted to the USEPA in DRAFT form. Comments from the USEPA will be considered, and appropriate revisions will be made.

Section 6.0 Proposed Project Schedule

ESI will complete all work substantially in conformance with the following schedule:

Sample Collection:	within 30 days of USEPA approval,
Data Validation:	within 90 days of USEPA approval,
Draft Report:	within 120 days of USEPA approval, and
Final Report:	within 45 days of receipt of USEPA comments.

ESI will advise EPA of planned sampling dates at least two weeks prior to actual date of field work to allow time for coordination with oversight personnel. Also, as indicated in Section 2.0, an additional workplan will be submitted by ESI to cover the proposed installation of bedrock monitoring wells addressing the topics of bedrock coring, geophysical logging, packer tests, well construction, slug tests, and pumping tests.

Please review the above and contact me at (845) 452-1658 if you have any questions.

Sincerely,

ECOSYSTEMS STRATEGIES, INC.

Paul H. Ciminello
President

Attachments: A (Figures 1-3)
B (Tables 1-3)

cc: W. Stern
M. Baker
K. Beinkafner
File

ATTACHMENT A

Maps 1-3

DRAFT Figure 1 - Groundwater Elevation Contour Map of Shallow, Overburden Monitoring Wells
December 2000/January 2001 Sampling Event
General Switch Site, Middletown, NY
LM97145.40, March 2002
Ecosystems Strategies, Inc.

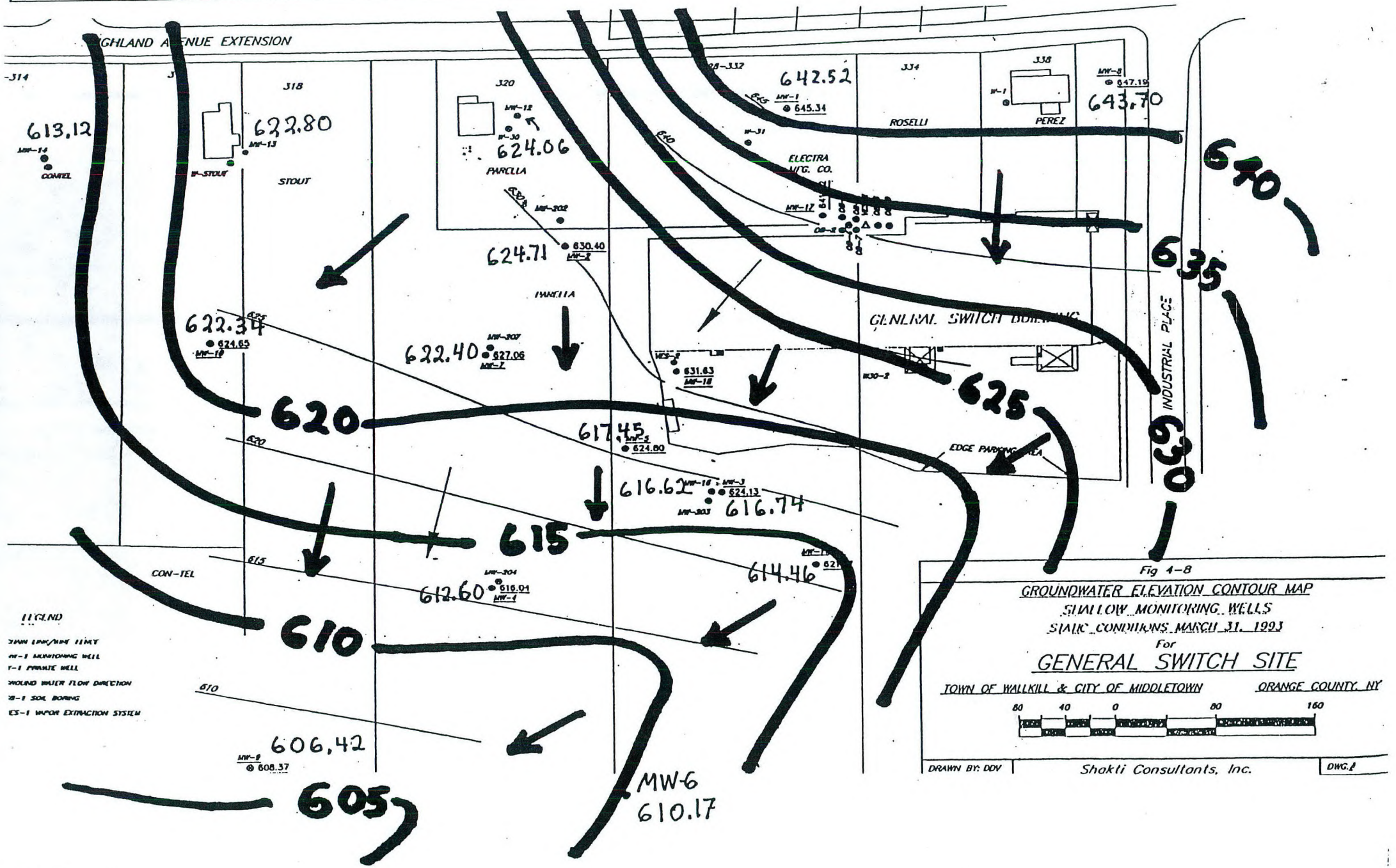


Fig 4-8

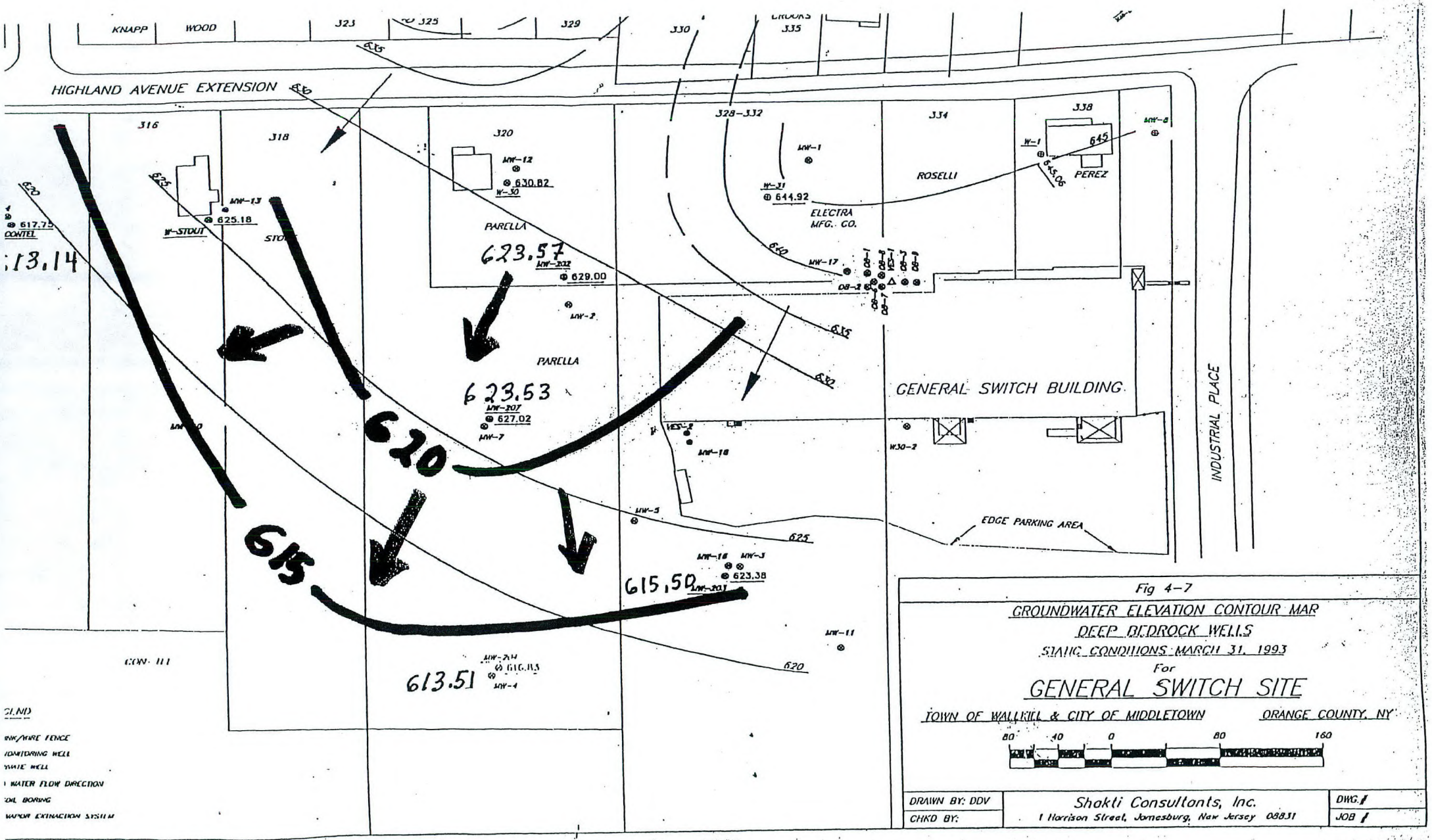
GROUNDWATER ELEVATION CONTOUR MAP
SHALLOW MONITORING WELLS
STATIC CONDITIONS MARCH 31, 1993
For
GENERAL SWITCH SITE

TOWN OF WALLKILL & CITY OF MIDDLETOWN — ORANGE COUNTY, NY

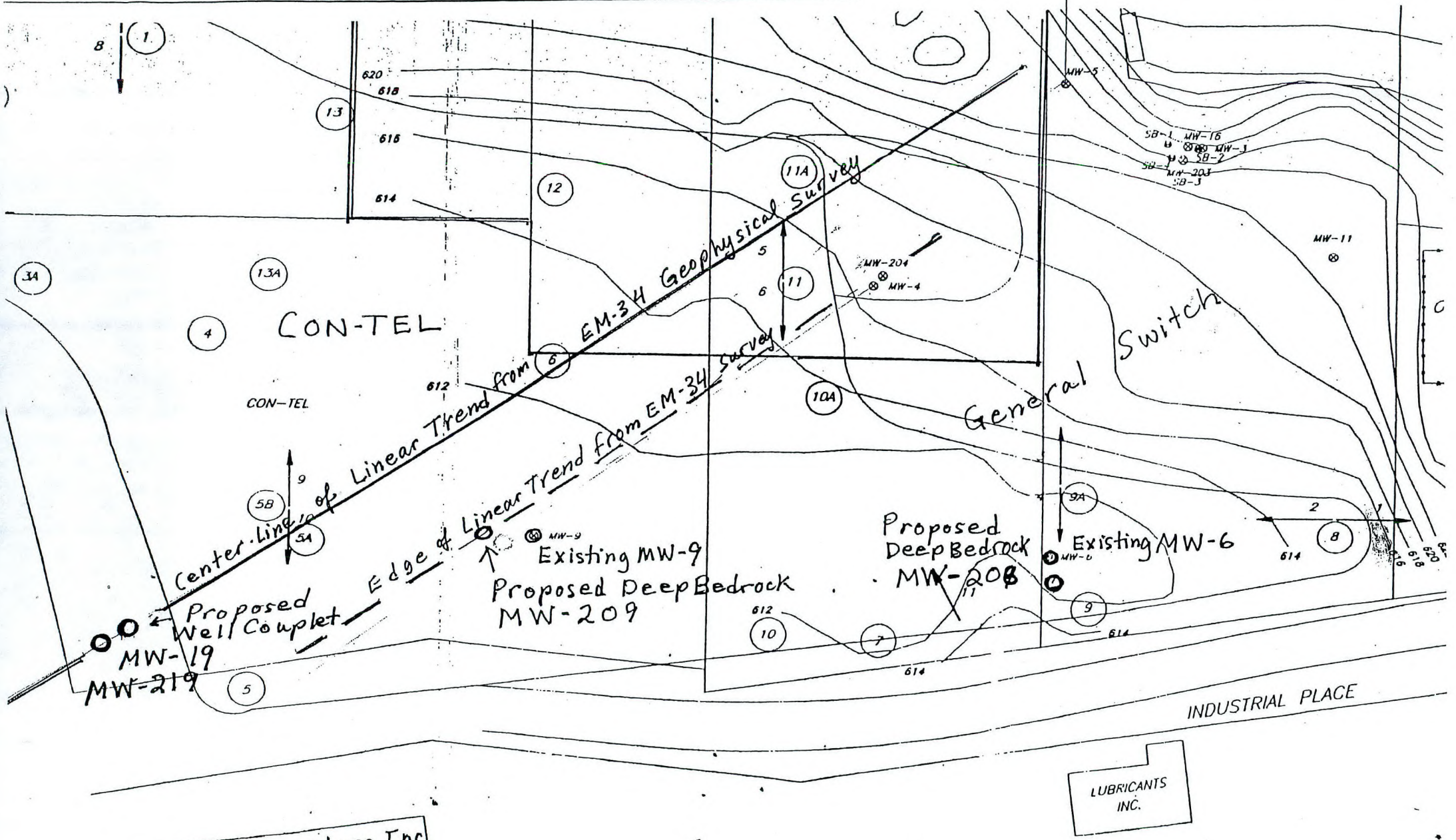
80 40 0 80 160

DRAWN BY: DDV | Shakti Consultants, Inc. | DWG.#

DRAFT Figure 2 - Groundwater Elevation Contour Map of Deep Bedrock Monitoring Wells
December 2000/January 2001 Sampling Event
General Switch Site, Middletown, NY
LM97145.40, March 2002
Ecosystems Strategies, Inc.



DRAFT Figure 3 - Proposed Locations of Additional Monitoring Wells
Base Map: Original Topographic Map 2-1 (1994)
General Switch Site, Middletown, NY
LM97145.40, March 2002
Ecosystems Strategies, Inc.



ATTACHMENT B

Tables 1-3

Table 1
Water Levels and Elevations Measured During December 2000 and January 2001 Sampling Events
General Switch, Middletown, NY

Monitoring Well	Total Depth (feet)	Elevation of Measuring Point	Depth to Water (12/00)	Depth to Water (01/01)	Water Elevation (12/00)	Water Elevation (01/01)
MW-1	18.6	652.08	9.56	N/A	642.52	N/A
MW-2	38.4	639.07	14.36	13.54	624.71	625.53
MW-3	13.17	626.22	9.48	9.3	616.74	616.92
MW-4	10.92	619.35	6.75	6.88	612.6	612.47
MW-5	13.17	627.87	10.42	10.21	617.45	617.66
MW-6	6.84	612.3	NFY	2.13	N/A	610.17
MW-7	19.92	628.68	6.28	N/A	622.4	N/A
MW-8	14.15	655.12	11.42	N/A	643.7	N/A
MW-9	14.56	612.83	6.41	6.9	606.42	605.93
MW-10	31.71	626.98	4.64	N/A	622.34	N/A
MW-11	11.08	624.73	10.27dry	N/A	614.46	N/A
MW-12	65.3	646.62	22.56	N/A	624.06	N/A
MW-13	88.9	638.12	15.32	17.69	622.8	616.07
MW-14	80.17	635.81	22.69	22.05	613.12	613.76
MW-15	N/A	637.08	N/A	N/A	N/A	N/A
MW-16	10.92	625.7	9.04	8.33	616.66	617.37
MW-202	100	640.11	16.54	16.08	623.57	624.03
MW-203	100	625	9.5	8.11	615.5	616.89
MW-204	100	618.9	5.39	6.45	613.51	612.45
MW-207	>35	629.18	5.65	N/A	623.53	N/A
W-33	180	634.31	21.17	N/A	613.14	N/A

Notes:
NFY = well not found until January 2001
N/A = not available

Table 2
Additional Wells to Take Water Levels
to improve water table and potentiometric contour maps
General Switch, Middletown, NY

Well	Elevation	Name	Street Address
W-33	634.31	Contel	306-314 Highland Ave
W-32	636.57	Stout	316 Highland Ave
W-30	644.34	Parella	320 Highland Ave
W-31	647.92	Electra	328-332 Highland Ave
W-1	656.16	Perez	338 Highland Ave
Alternatives to Above			
W-18	637.16	Ruppert	307 Highland Ave
W-17	639.2	Barry	309 Highland Ave
MW-15	637.08	MW-15	311 Highland Ave
W-16	N/A	Lewis	313 Highland Ave
W-14	644.72	Knapp	317 Highland Ave
W-13	644.32	Wood/Ogden	319 Highland Ave
W-12	645.63	Seeley	321 Highland Ave
W-8	653.59	Osbourne	329 Highland Ave
W-7	654.42	Cornelius	330? Highland Ave
Other Wells on Industrial Place			
W-30-2	647.92	General Switch	20 Industrial Place
		Lubricants, Inc	
		Guild Moulders, Inc	
		Recycling Ctr	

Table 3
Preliminary Review of Groundwater Conditions in Monitoring Wells
with respect to anaerobic biodegradation of PCE by reductive dechlorination
Points as defined by analytical parameters and weighting for preliminary screening in Table 2.3 of Protocol.
General Switch , Middletown, NY
Bold typeface indicates revisions based on USEPA comments in letter of May 28, 2002

Well ID	Slow Purge Final Horiba Measurements							Lab Analysis			POINTS							TOTAL POINTS	Comment
															Daughter Products				
	pH	Cond	Dissolved Oxygen	Temp	Salinity	TDS	ORP	PCE	TCE	cis1,2DCE	pH	DO	ORP	Alk	cis-	TCE	VC		
Shallow Overburden Wells																			
MW-1	6.6	0.787	3.29	9.25	0.03	0.51	288	ND	ND	ND	0	3	0	1				4	PCE is ND
MW-2	7.51	0.546	1.74	9.68	0.02	0.35	N/A	ND	ND	ND	0	3	0	1				6*	PCE is ND
MW-3	6.41	0.623	1.66	12.28	0.03	0.4	238	7300	820	12	0	3	0	1	2	2	2	10	
MW-4	6.85	0.415	3.99	10.32	0.02	0.27	238	15000	320	560	0	3	0	1	2	2		8	
MW-5	6.72	0.29	5.66	9.29	0.01	0.19	236	13000	220	350	0	**-3**	0	1	2	2	**0**	**2**	
MW-6***	**	**	**	**	**	**	**	16	3	ND	0		0	1		2		3	Horiba not working
MW-7	7.61	0.644	2.48	9.07	0.03	0.41	207	ND	ND	ND	0	3	0	1				4	PCE is ND
MW-8	7.85	0.785	1.79	14.06	0.03	0.5	170	ND	ND	ND	0	3	0	1				4	PCE is ND
MW-9	6.37	0.129	7.71	8.2	0	0.08	220	1000	85	120	0	**-3**	0	0	2	2		**4**	
MW-10	6.94	0.791	5.49	8.32	0.03	0.51	244	ND	ND	ND	0	**-3**	0	1				**-2**	PCE is ND
MW-12	7.37	0.715	1.98	10.18	0.03	0.46	-105	ND	5	ND	0	3	1	1		2		7	
MW-13	8.62	0.864	2.88	8.9	0.04	0.55	233	180	960	22	0	3	0	1	2	2		8	
MW-14	7.62	0.724	2.44	8.14	0.03	0.46	249	ND	ND	ND	0	3	0	1				4	PCE is ND
MW-16	6.24	0.657	3.57	7.55	0.03	0.42	237	7000	810	580	0	3	0	1	2	2	**2('92)**	10	
Deep Bedrock Wells																			
MW-202	77.43	0.697	0.65	8.23	0.03	0.45	-88	490	1800	280	0	3	1	1	2	2		9	
MW-203	6.21	0.537	3.84	9.04	0.02	0.35	84	6000	500	450	0	3	0	1	2	2	2	10	
MW-204	7.4	0.835	1.7	8.87	0.04	0.55	-79	2400	160	200	0	3	1	1	2	2	2	11	
MW-207	7.13	0.649	6.4	7.87	0.03	0.42	-8	2	2	ND	0	**-3**	1	1		2		**1**	PCE very low conc

Notes:
* some BTEX in well, 2 additional points
**Horiba did not seem to register properly, cleaned and recalibrated for later measurements
***MW-6 not found until January 2001 sampling event, used January concentrations
Protocol refers to "Technical Protocol for Evaluatiing Natural Attenuation of Clorinated Solvents in Groundwater" EPA/600/R-98/128 September 1998