Occidental Chemical Corporation

FUTURE MONITORING AND ASSESSMENT REQUIREMENTS

HYDE PARK LANDFILL SITE

Hyde Park RRT Program
Niagara Falls, New York

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CONESTOGA-ROVERS & ASSOCIATES

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1.0 INTRODUCTION

All major construction activities at the Hyde Park Landfill Site (Site) have been completed. Therefore, a review of the monitoring and assessment programs required for future operations has been undertaken. All of the requirements of the monitoring programs and operations of the remedial systems are described in the "Stipulation on Requisite Remedial Technology Program" (RRT Stipulation), dated May 13, 1986 and the "Stipulation and Judgment Approving Settlement Agreement (Settlement Agreement), dated January 19, 1981.

This document lists the future monitoring and assessment requirements of the RRT Stipulation or the Settlement Agreement, as applicable. The primary purpose is to provide one condensed document containing all future monitoring and reporting requirements which all parties (both OCC and EPA/State) can reference when collecting data, reporting and assessing the status of any particular component of the Hyde Park Remedial Program in the future. If the requirements listed in this document and the RRT Stipulation or Settlement Agreement are inconsistent, then the RRT Stipulation or Settlement Agreement shall govern.

2.0 SOURCE CONTROL (SECTION 2.0 OF RRT STIPULATION)

2.1 PERFORMANCE CRITERIA

The purpose of the Source Control program is to "...reduce the amount of chemicals migrating downward from the Landfill to the maximum extent practical..." by removing any remaining non-aqueous phase liquids (NAPL) from within the landfilled waste materials. The only performance criteria is the collection of a reasonable amount of NAPL.

2.2 DATA COLLECTION

The Source Control (SC) extraction wells and associated monitoring wells are identified below and their respective locations are presented on Figure 2.1.

Extraction Wells	*Monitoring Wells*	
SC-2	SC-1	OEW-5
SC-3	OEW-1	OEW-6
SC-4	OEW-2	OEW-7
SC-5	OEW-3	OW33-82
SC-6	OEW-4	OW35-82

The data collection activities required for the Source Control program are as follows:

a) annually determine amount of NAPL collected by each well; and

b) monitor water levels in all extraction wells, continuously monitor water elevations in one monitoring well, and manually monitor water elevations monthly in all other monitoring wells during pumping of extraction wells.

Other operational data regarding extraction well pumping times and total flow rates will also be collected.

Total recovered NAPL will be measured in Decanter No. 3 on a monthly basis, and the potential amount of NAPL collected by each well will be determined annually. This annual evaluation will be conducted using a portable large-volume sampling trailer. The trailer, and it's a 300-gallon polyethylene tank, will be staged adjacent to each of the SC extraction wells on an individual well basis, with connection of a hose to the well sampling port. Flow from each extraction well will be then diverted into the tank instead of the forcemain system by closing the main valve and opening the sampling port. The collected liquid will be allowed to settle for a minimum of four hours (or longer if necessary) such that phase separation can occur. NAPL will then be decanted off the bottom and the remaining APL volume determined by subtracting the decanted NAPL volume from the total volume collected (up to 300 gallons).

Hydraulic monitoring will continue to be performed monthly at all landfill monitoring wells. The water level data within the SC wells will automatically be recorded at the treatment facility. A continuous recorder is also installed within one of the monitoring wells which will need to be downloaded periodically to ensure retrieval of continuous data.

2.3 REPORTING

OCC will submit a report to EPA/State annually following the individual SC well NAPL evaluation in the third quarter of each year. All monitoring data will be included in this annual report.

2.4 ASSESSMENTS

The initial assessment of the prototype system indicated that a reasonable amount of NAPL could be collected by a Source Control System. The RRT Stipulation indicates that reassessments of the SC System will be required after system changes and may be required in conjunction with any required RRT studies for NAPL presence in other formations or

other systems. The specific times for any reassessment are listed on pages 17 and 18 of the RRT Stipulation. Reassessment will also occur pursuant to Section 10.0 of this report. The first such reassessment is scheduled for 1997.

2.5 TERMINATION

Termination of the SC system will not occur for 35 years following the effective date of the RRT Stipulation (May 13, 1986) unless it is demonstrated that operation is no longer requisite. At any time after 5 years following completion of the landfill cap (1994), this determination may be made by both parties or by the Court.

3.0 OVERBURDEN RRT SYSTEM (SECTION 3.0 OF RRT STIPULATION)

3.1 PERFORMANCE CRITERIA

There are two overburden collection systems, the older on-Site collection system and the newer off-Site Overburden RRT system, as shown on Figure 3.1. The following section addresses only the more recent system installed pursuant to the RRT Stipulation.

Performance of the Overburden RRT System will be assessed based on monitoring data collected from the Overburden Barrier Collection System (OBCS). The performance criteria are:

- demonstrate hydraulic gradient toward the OBCS or downward into bedrock; and
- demonstrate by visual monitoring that there is no lateral expansion of the NAPL plume.

3.2 DATA COLLECTION

The OBCS will be monitored using the stipulated overburden monitoring well pairs [OBCS Monitoring Wells (OMWs)] and associated bedrock wells identified below, and their respective locations are presented on Figure 3.2.

Inner Wells	*Outer Wells*	*Bedrock Wells*
OMW-1	OMW-2	
OMW-3	OMW-4	
OMW-5	OMW-6	B1U
OMW-7	OMW-8	B1U
OMW-9	OMW-10	BC3U
OMW-11	OMW-12	D3U
OMW-13R	OMW-14R	
OMW-15	OMW-16	

Hydraulic stabilization has occurred, and the data collection activities required for the OBCS are as follows:

a) Hydraulic Monitoring
   - water levels monthly in all wells, and
   - evaluate gradients quarterly.

b) Physical Monitoring
   - semi-annually, concurrent with hydraulic monitoring, conduct visual inspection of samples from wells inside APL plume, but outside the NAPL plume, for presence of NAPL to assess lateral expansion of NAPL plume.

3.3 REPORTING

The monthly water level data (hydraulic monitoring) will be evaluated and reported quarterly, the semi-annual visual sample inspection results for NAPL presence will be included with every other quarterly hydraulic gradient report submitted to EPA/State.

3.4 ASSESSMENTS

If the performance criteria are not achieved, the APL plume will be redefined, the Residential Community Monitoring Program will be re-evaluated, and the OBCS will be modified to achieve the first three objectives stated in Paragraph 3.1 of the RRT Stipulation. If performance is not achieved with a modified system, a further RRT study is to be undertaken.

3.5 TERMINATION

Hydraulic and physical monitoring will continue as long as the Overburden RRT System is in operation. The System will be in

operation for 35 years following the effective date of the RRT Stipulation (May 13, 1986), unless one of the following three criteria are met.

1. (i) a) Over a period of four consecutive years, no specific chemical parameter listed below has been detected at more than 10 µg/L in APL samples collected from the two OBCS systems as described in Section 9.2.1.

- Phenol
- Monochlorobenzene
- Monochlorotoluenes
- Trichlorobenzenes
- Tetrachlorobenzenes
- Hexachlorobutadiene
- Hexachlorocyclopentadiene
- Monochlorobenzotrifluorides
- 2,4,5-Trichlorophenol
- Hexachlorocyclohexanes

b) Such termination shall not interfere with the effective operation of the remaining Barrier Collection systems or any component thereof;

c) If monitoring following termination reveals levels for any chemical parameter listed in (a) at more than 10 µg/L, the terminated operations shall be resumed;

(ii) Prior to termination as described in (i), OCC will make a submission to EPA/State describing the basis for its conclusion accompanied by all appropriate analytical data;

2. Notwithstanding the fact that the criteria described in 1. above is not satisfied, at any time after 15 years after initiation of operation of the OBCS (1991) or 17 years after initiation of operation of the bedrock prototype purge well system (1992), whichever comes later, it is

determined either by agreement of EPA/State and OCC or by order of the Court that operation of the OBCS is no longer requisite; and

3. Notwithstanding the fact that the criteria described in 1. above is not satisfied, at any time after 5 years following covering of the landfill (1994), it is determined either by agreement of EPA/State and OCC or order of the Court that operation and maintenance of the Existing System is no longer requisite.

4.0 LOCKPORT BEDROCK RRT SYSTEM (SECTION 4.0 OF RRT STIPULATION)

The Lockport Bedrock RRT System is comprised of two major components as follows:

- NAPL Plume Containment System; and
- APL Plume Containment System.

Both systems contain purge wells to remove bedrock APL and/or NAPL as well as bedrock monitoring wells. The NAPL plume containment system also contains a recirculation well and hydraulic channel for recirculating groundwater back to bedrock.

The future requirements for each component are discussed separately in the following two subsections.

4.1 NAPL PLUME CONTAINMENT SYSTEM

4.1.1 Performance Criteria

The performance criteria for the NAPL Plume Containment System are:

- prevent lateral NAPL migration to the extent practicable; and

- prevent lateral APL migration from the NAPL plume to the extent practicable by maintaining an inward hydraulic gradient at the NAPL plume boundary.

4.1.2 Data Collection

4.1.2.1 NAPL Plume Monitoring Wells (NPWs)

The currently installed NPWs are identified below, and their respective locations are presented on Figures 4.1, 4.2 and 4.3.

	Gradient Monitoring		*NAPL*
	Inner Well	*Outer Well*	*Presence Only*
Upper Zone:	BC3U *	B1U *	
	BC3U *	C1U *	
	D4U *	D3U *	
	E4U	E3U *	
	F5UR	F4U *	
	G3U	G4U *	
	H3U	H1U *	
	J3U	J1U *	
Middle Zone:	BC3M *	B1M *	
	BC3M *	C1M *	
	D1M *	D2M *	
	E4M	E3M *	
	F4M *	F1M *	
	G3M	G1M *	
	H1M	H2M *	
	J1M *	J2M *	
Lower Zone:	BC3L *	B1L *	
	BC3L *	C1L *	
	D4L *	D1L *	D5L
			E4L
			F4L
	G3L *	G1L *	
	H4L	H3L *	
	J4L	J3L *	

Note: Gradient wells indicated with an asterisk are monitored for NAPL presence as well.

The data collection activities required for the NPWs are as follows:

a) inspect NPWs outside NAPL plume quarterly for visual evidence of NAPL (this includes wells D5L, E4L and F4L specifically installed in non-waterbearing lower bedrock zones for NAPL presence monitoring only);

b) sample outer NPWs quarterly and analyze for NAPL System Effectiveness Parameters (NSEP) outlined below; and

Parameter	*Detection Levels*
Total Organic Halogen	500 µg/L
Benzoic Acid	100 µg/L
Phenol	250 µg/L
Monochlorobenzoic Acids (sum of o,p,m-isomers detected)	100 µg/L
Chlorendic Acid	250 µg/L

c) measure water elevations monthly through 1996, and quarterly thereafter, and evaluate data quarterly.

Continuous recorders are currently installed at well clusters C1 and C2, but may be moved periodically.

Complete system quarterly sampling and NAPL presence checks will commence in the first quarter of 1996 (February).

Additional operating data from the system purge and recirculation wells will be collected to aid in making system operating changes, if the performance criteria are not achieved.

4.1.2.2 Purge/Recirculation Wells

The existing purge and recirculation wells are identified below, and their locations are presented on Figures 4.1, 4.2 and 4.3.

	Purge Wells	*Recirculation Well*
Upper Zone:	PW-1U PW-2UR PW-4U PW-5UR PW-6UMR	RW-3UM
Middle Zone:	PW-2M PW-3M PW-4M	
Lower Zone:	PW-1L PW-2L PW-3L	

The data collection activities required for the purge and recirculation wells are as follows:

a) purge wells and recirculation well flow rates as recorded at the treatment plant control room;

b) water levels of purge wells:
   - continuous recorder information available from the computer at the treatment plant control room;

c) quarterly NAPL/APL ratio determination for the entire system using total purge well flow rates and total NAPL volumes collected in Decanter No. 1; and

d) NAPL/APL volume ratio determinations for individual purge wells measured annually using the portable sampling trailer.

4.1.3 Reporting

The following data from the NAPL Plume Containment System will be reported quarterly:

(i) Monitoring Wells (NPWs)

- water levels and calculated gradients;
- all visual NAPL inspection results; and
- groundwater sampling analytical results (outer wells) and results of the statistical evaluation.

(ii) Purge/Recirculation Wells

- water levels (monthly average);
- flow rates (monthly average);
- total system NAPL/APL ratio; and
- annual NAPL/APL ratios from each purge well to be reported with the third quarter report.

4.1.4 Assessments

4.1.4.1 Lateral NAPL Plume Migration

The NAPL Plume Containment System operation will be modified or, if necessary, supplemented with additional purge wells to satisfy the objectives of NAPL containment if either of the following occurs during monitoring of the performance monitoring wells:

- visual and olfactory evidence of NAPL is identified in any sample; and

- for any well, a statistically significant increase occurs in TOH concentration or any two of phenol, benzoic acid, monochlorobenzoic acids (sum of o,p,m-isomers detected) or chloroendic acid (NSEP) [if a significant increase for any well is identified for any of phenol, benzoic acid, monochlorobenzoic acids (sum of o,p,m-isomers detected) or chlorendic

acid, additional sampling of performance monitoring wells to assess the reason for the increase will be undertaken].

If the objectives are not achieved following modification or supplementation with additional wells, an RRT Study will be undertaken and Source Control will be reassessed.

4.1.4.2 Lateral APL Migration from the NAPL Plume

The NAPL Plume Containment System operations will be modified or, if necessary, supplemented with additional purge wells to satisfy the objectives of APL containment in the NAPL plume if piezometer pairs do not demonstrate an inward hydraulic gradient.

If the objectives are not achieved following modification or supplementation with additional wells, an RRT Study will be undertaken and Source Control will be reassessed.

4.1.5 Termination

Monitoring of the NPWs will continue as long as the NAPL Plume Containment System is in operation. The system will be in operation for 35 years following the effective date of the RRT Stipulation (May 13, 1986), unless one of the following conditions are met:

1. a) At any time after 7 years from initiation of operation of the bedrock prototype purge well system (1993), any party may submit proposed criteria to govern termination of the NAPL Plume Containment System and post-termination monitoring and maintenance. The proposed criteria will be consistent with the objectives of the NAPL Plume Containment System and will continue to protect against endangerment to human health and the environment in the Hyde Park - Bloody Run area;

b) following submission of the proposed termination criteria, EPA/State and OCC shall engage in good faith discussions. If no agreement is reached by the EPA/State and OCC within 3 years after submission of such proposal, any party may petition the Court to establish criteria for termination; and

2. at any time after 17 years from initiation of operation of the bedrock prototype purge well system, it is determined either by agreement of EPA/State and OCC or by Order of the Court that operation of the NAPL Plume Containment System is no longer requisite.

4.2 APL PLUME CONTAINMENT SYSTEM

4.2.1 Performance Criteria

The purpose of the APL Plume Containment System is to contain, by pumping to the extent practicable, APL in the Lockport bedrock within the area of the remediated APL Plume, as shown on Figure 4.4.

The APL Plume Containment System consists of two purge wells and four monitoring well pairs at the Gorge Face as shown on Figure 4.4. The performance criteria for the APL Plume Containment System (remediated APL Plume) is to achieve flow convergence or eliminate Gorge Face seeps to the extent practicable.

The unremediated APL plume will be monitored by three nests of Flux Monitoring Wells located south of the remediated APL plume as shown on Figure 4.5. The performance criteria for the Flux Monitoring Wells is to determine whether the flux measured in these wells exceeds the Flux Action Levels.

The operations of the APL Plume Containment System shall be modified if such action is necessary and appropriate to eliminate Gorge Face seeps to the extent practicable; however, no additional wells,

unless as directed by EPA/State to redistribute pumpage, shall be required to achieve this objective.

4.2.2 Data Collection

4.2.2.1 Remediated APL Plume

The installed purge and monitoring wells are identified below, and their respective locations are presented on Figure 4.4:

Purge Wells	*Monitoring Well Pairs*	
APW-1	ABP-1	ABP-2
APW-2	ABP-3	ABP-4
	ABP-5	C2U (ABP-6)
	ABP-7	ABP-8

The APL Plume Containment System will not begin operation until the NAPL Plume Containment System has demonstrated an inward gradient at the edge of the bedrock NAPL plume (assumed: end of 1997).

The data collection activities required for the remediated APL Plume are as follows:

- starting one month after initiation of operations; collect water levels monthly from monitoring wells until hydraulic stabilization (assumed: end of 1998) and quarterly thereafter;

- collect sample of APL from the purge wells semi-annually for the first three years of operation and annually thereafter and analyze for Collected Liquids Monitoring Parameters as discussed in Section 9.0, as well as benzoic acid, monochlorobenzoic acids (sum of o,p,m-isomers detected), and chlorendic acid at monitoring levels of 100, 100, and 250 µg/L, respectively; and

- inspect Gorge Face seeps within remediated APL plume for flow quarterly for first 2 years of operation and annually thereafter.

4.2.2.2 Unremediated APL Plume

The installed Flux Monitoring Wells are identified below, and their respective locations are presented on Figure 4.5:

AFW-1U	AFW-2U	AFW-3U
AFW-1M	AFW-2M	AFW-3M
AFW-1L	AFW-2L	AFW-3L

Data collection activities will commence one month after initiation of operations for the APL Plume Containment system (assumed: end of 1997). The data collection activities required for the unremediated APL Plume are as follows:

- collect composite samples from AFWs/APWs quarterly and analyze for APL Plume Flux Parameters and APL Plume Monitoring Parameters outlined below:

APL Plume Flux Parameters	*Detection Level*	*Flux Action Level*
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.5 ng/L	0.5 g/year (3.0×10^{-6} lbs/day)
Perchloropentacyclodecane (C_{10} Cl_{12})	1.0 µg/L	0.005 lbs/day
Polychlorobiphenyls as Aroclor 1248 *	1.0 µg/L	0.005 lbs/day
Chloroform	10 µg/L	1.7 lbs/day

* analyze for tri-, tetra-, and penta-chlorobiphenyls and report as Aroclor 1248, unless the reassessment per Section 10.0 indicates that such reported concentration represents less than 90 percent of the total quantity of polychlorobiphenyls.

APL Plume Monitoring Parameters	*Monitoring Level*
Phenol	50 µg/L
Benzene	10 µg/L
Hexachlorocyclohexanes	10 µg/L
2-Chlorophenol	10 µg/L
2,4-Dichlorophenol	10 µg/L
2,4,5-Trichlorophenol	10 µg/L

- calculate lbs/day of chemical flux of APL Plume Flux Parameters to Niagara River from Lockport Bedrock and calculate total groundwater flow from the APL plume past the monitoring wells.

Unremediated APL plume sampling will commence following initiation of pumping from the APL Plume Containment System.

4.2.3 Reporting

The water level gradient information and seep inspection results will be submitted separately each quarter or year, as appropriate.

The unremediated APL plume sample results and associated APL flux calculations will be reported to the EPA/State quarterly, once monitoring is initiated.

4.2.4 Assessments

4.2.4.1 Operation

The operation of the APL Plume Containment System will be assessed based on the performance criteria as described below:

i) if operation of the APL Plume Containment System does not achieve flow convergence or eliminate Gorge Face seepage to the extent practicable, the following actions will be undertaken:

- the operations of the APL Plume Containment System shall be modified if such action is necessary and appropriate to eliminate Gorge Face seeps to the extent practicable, however, no additional well installation (other than the well described below) shall be required to achieve this objective;

  [(additional well) - even if monitoring at the ABPs indicates convergence of APL Plume flow to purge wells APW-1 and APW-2, a third well will be installed along the Gorge Face, if EPA/State so requests, in order to redistribute pumpage to eliminate seepage at the Gorge Face to the extent practicable; however, in no event shall the total pumpage from the three wells exceed the prior total pumpage from the two wells]

- if monitoring at the ABPs does not indicate convergence of flow to the two APWs and a third purge well, if installed, the operations of the APL Plume Containment System shall be modified, and if necessary, supplemented with the installation of one or more additional purge wells in the remediated APL plume in order to establish conveyance of flow; if an additional purge well is installed to establish convergence, additional pumping in the NAPL plume shall occur when it is necessary to maintain an inward gradient across the boundary of the refined NAPL plume; and

ii) no operational modifications or supplemental well installations will occur if they result in a total pumpage of greater than 15 gpm.

4.2.4.2 Flux Parameters

To confirm appropriateness of the APL Plume Flux Parameters to be used for flux monitoring, samples will be taken from the

NAPL Plume Containment System outer monitoring wells west of the NAPL plume and composited. These wells are as follows:

B1U	D3U
B1M	D2M
B1L	D1L
C1U	E3U
C1M	E3M
C1L	
	F4U
	F1M

The composite sample will be analyzed by conducting a complete GC/MS survey so that full mass spectra are obtained over the complete gas chromatogram with sufficient interpretation to identify the majority of compounds present. High Pressure Liquid Chromatography (HPLC) will also be used to meet this objective. Commercially available standard compounds will be used, if necessary, to confirm and quantitate compound assignments. Non-commercially available standard compounds will not be synthesized. The objective of the GC/MS survey will be to identify, to the extent feasible, all components with a response greater than ten percent of the internal standard for that scan. The analytical results will be used with all other available data and information in any reassessment of the list of APL Plume Flux Parameters pursuant to Section 10.0 to determine whether it is appropriate to adjust the list of APL Plume Flux Parameters; except in no event will 2,3,7,8-tetrachlorodibenzo-p-dioxin (2,3,7,8-TCDD or TCDD) be removed from the list.

The first survey shall be conducted following initiation of the APL Plume well performance monitoring. In addition, at the time of the first GC/MS survey, an analysis for polychlorodibenzodioxins (PCDD's) and polychlorodibenzofurans (PCDF's) at detection levels of 0.5 ng/L for each group of isomers containing the same number of chlorine atoms will be performed.

4.2.4.3 Flux Action Level

If the flux calculated pursuant to Section 4.2.2.2 or the sum of the flux calculated pursuant to Sections 4.2.2.2 and 5.3 (Intermediate Formations) exceeds a Flux Action Level for any APL Plume Flux Parameter for two consecutive quarters, OCC shall collect representative samples from each of the APL Plume Flux Monitoring Wells and a composite sample representative of the liquids pumped from the APL Plume Containment System purge wells and analyze these samples for the APL Plume Monitoring Parameters (per Section 4.2.2.2). This data and the data collected pursuant to Section 4.2.2.1 shall be considered in selecting the locations, pumping rates, and other design and operational criteria if the modification of existing containment systems or the addition of purge wells to such systems is required to reduce such flux below the Flux Action Level.

If the sum of the flux calculated pursuant to Section 4.2.2.2 plus the flux calculated per Section 5.3 for the Intermediate Formations exceeds a Flux Action Level for any APL Plume Flux Parameter for four out of any five consecutive monitoring periods following stabilization of the NAPL Plume and APL Plume Containment Systems, OCC shall take the following remedial action to reduce the flux level below the Flux Action Level:

- OCC shall modify the operation of the existing APL Plume or NAPL Plume Containment Systems or, if necessary, add purge wells to the NAPL Plume or APL Plume Containment Systems; and

- if additional purge wells are installed in the APL Plume outside the remediated APL plume, total pumpage from wells in the remediated APL plume shall be reduced by the amount of the pumpage outside the remediated APL plume, but in no event shall pumpage from wells in the remediated APL plume be reduced below 5 gpm. In the event of any reduction of pumping within the remediated APL plume, the requirements of Section 4.2.4.1(i) shall be inapplicable.

4.2.5 Termination

Termination of operation of the APL Plume Containment System (i.e., no pumping from APWs) will occur if either of the following criteria is satisfied:

i) system has been operated for at least 10 years and during the last 5 years of operation, 50 percent of any Flux Action Level for any parameter has not been exceeded for any of the quarterly samplings; or

ii) at any time after 15 years of operation, if it is determined by agreement of EPA/State and OCC or by order of the Court that continued system operation is no longer requisite.

Regardless of the criteria which is satisfied, post-termination monitoring for a period of 5 years will be required as described in Section 4.4.6.2 of the RRT Stipulation.

5.0 INTERMEDIATE FORMATIONS MONITORING (SECTION 5.0 OF RRT STIPULATION)

5.1 PERFORMANCE CRITERIA

Since the Lower Formation Survey Parameters were exceeded in the Irondequoit/Reynales (Intermediate) Formations during the initial survey, chemical monitoring from the Intermediate Formations will continue annually to provide data for the calculation of bedrock flux.

5.2 DATA COLLECTION

The Intermediate Formations Wells (IFWs) installed are listed below, and their respective locations are presented on Figure 5.1.

IFW-1R	IFW-5
IFW-2	IFW-6
IFW-3	IFW-7
IFW-4	

The Intermediate Formations have proven to be a bedrock unit with very low transmissivity. Repeated monitoring events indicated that well IFW-5 was the only well which could consistently yield sufficient water to collect a sample, and even at this location sampling efforts typically spanned two to four days. Therefore, future hydraulic and chemical monitoring will be based on data from well IFW-5 only.

The only future monitoring activity required for the Intermediate Formations Program is as follows:

a) annually obtain a water level from IFW-5 and collect a groundwater sample:

The IFW-5 sample is to be analyzed for APL Plume Flux Parameters outlined below:

Parameter	*Detection Level*	*Flux Action Level*
2,3,7,8-Tetrachlorodibenzo-p-dioxin	0.5 ng/L	0.5 g/year (3.0×10^{-6} lbs/day)
Perchloropentacyclodecane	1.0 µg/L	0.005 lbs/day
Aroclor 1248	1.0 µg/L	0.005 lbs/day
Chloroform	10 µg/L	1.7 lbs/day

5.3 REPORTING

OCC will submit a report to EPA/State annually, following IFW sampling in the third quarter of each year.

5.4 ASSESSMENTS

If the Flux Action Levels are exceeded through one of the three scenarios presented below, the Deep Formations Study is to be undertaken.

i) if 70 percent of Flux Action Levels is exceeded by the flux from the upper, middle and lower Lockport Formations (i.e., three AFW well clusters);

ii) if 50 percent of Flux Action Levels is exceeded by the sum of the flux from the Intermediate and Deep Formations. The flux from the Deep Formations is to be estimated by multiplying the Intermediate Formations flux by the ratio of Deep Formations thickness divided by the thickness of the Irondequoit/Reynales Formations; and

iii) if 100 percent of Flux Action Levels is exceeded by the sum of the flux from the Lockport, Intermediate and Deep Formations (Deep Formations flux to be estimated as described in ii) above).

5.5 TERMINATION

Intermediate Formations groundwater sampling and associated flux calculations will continue until such time as the APL Plume Containment System operation is terminated (Section 4.1.5). At that time, Lockport flux calculations and thus Intermediate Formations flux calculations will not be required.

6.0 GORGE FACE SEEP PROGRAM (SECTION 7.0 OF RRT STIPULATION)

6.1 PERFORMANCE CRITERIA

The purpose of the Gorge Face Seep Program is "...to address flowing seeps, wet areas and the Bloody Run drainage area at the Gorge Face and take action, as required, to protect people in the Gorge Face area". The criteria for assessing the Gorge Face seeps are subjective and performance will be based on comparisons with historic seeps and flows.

6.2 DATA COLLECTION

In July of each year, a field survey by representatives of EPA/State and OCC will be undertaken of the Gorge Face between the extension of the Garfield Avenue Sewer and the New York Power Authority (NYPA) fence on the Lower Access Road. The purpose of the survey is to monitor the status of previously identified seeps/wet areas and to identify new flowing seeps and wet areas.

If the annual sampling of the APL Plume Flux Monitoring Wells (Section 4.2.2.2) detects any APL Plume Definition Parameters, the survey shall be extended past the Garfield Avenue Sewer outfall to the Gorge Face area approximately 750 feet upriver of the Flux Monitoring Well in which such parameter was detected. The annual survey shall also be extended to include any Gorge Face area to which EPA/State demonstrates that the APL plume attributable to the landfill has migrated.

In addition to the survey activities, the seeps identified as No. 7d and No. 12 shall be sampled and analyzed for the APL Plume Definition Parameters outlined below:

Parameter	*Definition Level*
pH	Less than 4.5 or greater than 9.5 units
Conductivity	10 times background level (µmhos/cm)
Total Organic Carbon (TOC)	200 mg/L
Total Organic Halogen (TOH)	0.5 mg/L
Phenol	0.25 mg/L
Monochlorobenzene	10 µg/L
Monochlorotoluenes	10 µg/L
Trichlorobenzenes	10 µg/L
Tetrachlorobenzenes	10 µg/L
Octachlorocyclopentene	10 µg/L
Monochlorobenzotrifluorides	10 µg/L
2,4,5-Trichlorophenol	10 µg/L
Hexachlorocyclohexanes	10 µg/L

Also, a sediment sample will also be collected from the culvert identified as No. 1 and analyzed for the Soil Survey Parameters outlined below:

Parameter	*Soil Survey Level*
Monochlorobenzene	10 µg/kg
Monochlorotoluenes	10 µg/kg
Hexachlorobenzene	100 µg/kg
2,4,5-Trichlorophenol	100 µg/kg

6.3 REPORTING

The results of the seep survey will be reported to the EPA/State annually following each third quarter survey.

6.4 ASSESSMENTS

Any new flowing seeps and wet areas identified during the annual survey, will be addressed by a localized remedial action consisting,

as appropriate, of one or more of the following: seep diversion, covering, soil removal up to 0.5 feet to permit contouring, and excavation of a maximum of 1.0 foot of soil.

6.5 TERMINATION

The frequency and the need for future surveys shall "...be assessed following installation of the APL Plume Containment System...".

7.0 RESIDENTIAL COMMUNITY MONITORING PROGRAM (SECTION 8.0 OF RRT STIPULATION)

7.1 PERFORMANCE CRITERIA

The purpose of the Residential Community Monitoring Program is to "...supplement other monitoring and remedial programs by monitoring to provide "early warning" of APL plume migration toward residential areas...". Detection of any of the identified monitoring parameters will result in confirmatory sampling and possible further action.

7.2 DATA COLLECTION

The installed Community Monitoring Wells (CMWs) are identified below and their respective locations are presented on Figure 7.1:

Overburden	*Shallow Bedrock*
CMW-1OB	CMW-1SH
CMW-2OB	CMW-2SH
CMW-3OB	CMW-3SH
CMW-4OB	CMW-4SH
CMW-5OB	CMW-5SH
CMW-6OB	CMW-6SH
CMW-7OB	CMW-7SH
CMW-8OB	CMW-8SH
	CMW-9SH
	CMW-11SH

The data collection activities required for the Residential Community Monitoring Program are as follows:

a) hydraulic monitoring of overburden and bedrock groundwater elevations will be conducted quarterly;
b) where no overburden groundwater is present, soil air samples will be collected and analyzed; and

c) annual groundwater sampling and analysis of the overburden well (CMW-2OB) located near the intersection of Hyde Park Boulevard and New Road.

The air and groundwater samples collected will be analyzed for the Community Early Warning Parameters outlined below:

Parameter	*Detection Level Water*	*Detection Level Soil Air*
Total Organic Halogen	500 µg/L	Not Applicable
Chlorendic Acid	250 µg/L	Not Applicable
Benzoic Acid	100 µg/L	Not Applicable
Monochlorobenzoic Acids (sum of o,p,m-isomers detected)	100 µg/L	Not Applicable
Monochlorobenzene	10 µg/L	1.0 µg/L
Monochlorotoluenes	10 µg/L	1.0 µg/L
Monochlorobenzotrifluorides	10 µg/L	1.0 µg/L

7.3 REPORTING

The soil air sample results and hydraulic monitoring results will continue to be submitted to the EPA/State on a quarterly basis. The annual groundwater sampling results will be submitted concurrent with the appropriate quarterly report.

7.4 ASSESSMENTS

If a Community Early Warning Parameter is detected during monitoring, OCC shall take the following steps:

- if a parameter is detected in the overburden, a confirmatory sample from the overburden location where such parameter was detected shall promptly be taken;

- analytical results of the confirmatory sampling will be submitted to EPA/State as soon as possible, but not later than two weeks after collection of the confirmatory sample, unless a longer period is necessary to adequately assure the accuracy of the analytical data; and

- if the confirmatory sampling reveals the presence of the previously detected parameter, there will be a rebuttable presumption that such chemicals migrated from the Hyde Park Landfill Site. At that time, EPA/State will notify the public and the Court of these results and, unless such presumption has been rebutted, OCC will take the following actions at any well where such parameter was identified:

  - wells shall be sampled and analyzed for Community Early Warning Parameters:

    * monthly for four months;
    * bi-monthly for eight months; and
    * quarterly thereafter, unless EPA/State demonstrates the need for more frequent monitoring.

  - undertake remedial action pursuant to Section 8.5.2 of the RRT Stipulation.

7.5 TERMINATION

The RRT Stipulation does not present specific requirements for termination of the Residential Community Monitoring Program. OCC intends to continue the monitoring programs detailed above until operation of the bedrock remedial systems has been terminated (i.e., NAPL and APL Plume Containment Systems).

8.0 BLOODY RUN MONITORING PROGRAM (ADDENDUM II, PARAGRAPHS M-P OF SETTLEMENT AGREEMENT)

8.1 PERFORMANCE CRITERIA

The purpose of the Bloody Run Monitoring Program is to determine if Hyde Park chemicals previously migrating along the Bloody Run basin are present in the upper 15 feet of bedrock at concentrations above the Bloody Run Monitoring Levels.

8.2 DATA COLLECTION

The installed Bloody Run Monitoring Wells (BRs) are identified below and their respective locations are presented on Figure 8.1:

BR-1
BR-2
BR-3
BR-4

The data collection activities required for the Bloody Run Monitoring Program are as follows:

a) collect groundwater samples semi-annually during 1996 and annually thereafter; and
b) analyze groundwater samples for the following parameters:

Parameter	*Bloody Run Monitoring Level*
Monochlorobenzene	10 µg/L
Monochlorotoluenes	10 µg/L
2,4,5-Trichlorophenol	10 µg/L
Hexachlorobenzene	10 µg/L

8.3 REPORTING

The sampling results will be reported to the EPA/State following each sampling event (i.e., semi-annually for 1996 and annually commencing in 1997). The annual sampling will be conducted in August of each year.

8.4 ASSESSMENTS

If the Bloody Run monitoring data reveals that the chemical concentrations exceed the Bloody Run Monitoring Levels (BRMLs), OCC is required to recommence sampling and analysis on a quarterly basis. This quarterly sampling will continue until the parameters are observed below the BRMLs for four consecutive periods. Annual sampling will then be resumed. If chemicals migrating from the Bloody Run basin are observed at concentrations above the BRMLs for four consecutive sampling rounds, OCC is required to advise the EPA/State within seven days after the last such sample is analyzed. The Bloody Run Monitoring Program will be subject to the reassessment provisions of Section 10.0.

8.5 TERMINATION

Termination of the Bloody Run monitoring activities will occur three years following the date on which operation and maintenance activities at the Hyde Park Landfill Site are terminated.

iii) RRT OBCS (Off-Site System)

One sample shall be taken from the OBCS semi-annually in 1996, and annually thereafter, and analyzed for the CLMP.

iv) SC System

The volume of collected liquids shall be monitored as described in Section 2.2.

v) Decanters

A representative sample of APL shall be collected from the three decanters monthly and analyzed for the CLMP. Samples will also be collected and analyzed for benzoic acid, monochlorobenzoic acids (sum of o,p,m-isomers detected), and chlorendic acid at monitoring levels of 100, 100, and 250 µg/L, respectively and at the same frequency as the APL Plume Containment System sampling described above.

9.2.2 Reporting

The data collected will be used by OCC to monitor trends in the level of parameters found in the APL and to assist in preparation of System assessments.

9.3 COLLECTED NAPL MONITORING

The collected NAPL will be analyzed pursuant to the permit requirements of the Liquid Hazardous Waste Incinerator at the OCC Niagara Plant. The data is to be submitted to EPA/State annually.

9.4 APL TREATMENT SYSTEM

9.4.1 Data Collection

The effluent from the APL Treatment System shall be analyzed for the parameters, treatment levels, and at the frequency described below:

Parameter	*Treatment Level*	*Sampling Frequency*
pH	between 5 and 10	Daily Composite
Phenol	10 mg/L (1 mg/L two years after effective date of Judgment)	Daily Composite
Total Organic Carbon	300 mg/L corrected for methanol or 1000 mg/L uncorrected	Daily Composite
Trichloroethylene	10 µg/L	Weekly Composite
Tetrachloroethylene	10 µg/L	Weekly Composite
Monochlorotoluenes	10 µg/L	Weekly Composite
Monochlorobenzene	10 µg/L	Weekly Composite
Trichlorobenzenes	10 µg/L	Monthly Composite
Tetrachlorobenzenes	10 µg/L	Monthly Composite
Monochlorobenzotrifluorides	10 µg/L	Monthly Composite
Hexachlorobutadiene	10 µg/L	Monthly Composite
Hexachlorocyclopentadiene	10 µg/L	Monthly Composite
Hexchlorocyclohexanes	10 µg/L	Monthly Composite
2,4,5-Trichlorophenol	10 µg/L	Monthly Composite

The discharge from the initial carbon treatment bed will be analyzed daily for the appropriate parameter(s) to determine when such bed should be replaced.

9.4.2 Reporting

The results of both the effluent and mid-point analyses shall be reported quarterly.

9.4.3 Assessment

If the effluent analysis reveals any parameter which is sampled at a daily or weekly frequency in excess of the treatment levels for two consecutive weeks, OCC shall so notify EPA/State within seven working days.

If such analysis reveals any parameter, which is sampled on a monthly frequency, in excess of the treatment levels, OCC shall so notify EPA/State within seven working days and shall commence sampling weekly. Such weekly sampling may cease, and monthly sampling shall resume, when the aforementioned treatment level is not exceeded for any parameter for four consecutive weekly samples.

If analysis reveals any parameter in excess of the aforementioned treatment levels, OCC shall initiate action to correct operating deficiencies incident thereto. If the measurements for a given parameter exceed the aforementioned treatment levels for four consecutive sampling periods (or for four consecutive weeks in the case of any parameter sampled on a daily basis), OCC shall submit a study to EPA/State describing what Requisite Remedial Technology (RRT), if any, is required to address the situation. Thereafter, the parties shall proceed as described in subparagraph C(9) of the Settlement Agreement.

10.0 MONITORING PROGRAM REASSESSMENT (SECTION 10.0 OF RRT STIPULATION)

10.1 FREQUENCY AND SCOPE

Based on all available data, an assessment of the monitoring programs referenced in Sections 2.0 to 8.0 shall be made one year after initiation of the remediated APL plume monitoring (first assessment is estimated to occur in 1998) and a reassessment shall be made once every five years thereafter to evaluate the following: the number and location of monitoring sampling points referenced in Sections 2.0 through 8.0, the frequency of such sampling, the parameters to be analyzed, the levels related to such parameters, and the frequency of future reassessments per this Section. A reassessment as to monitoring referenced in Sections 4.0 and 5.0 shall also be made in the course of any RRT study concerning bedrock remedial programs per Sections 4.0 and 5.0. An unscheduled reassessment shall be undertaken if the party seeking the reassessment demonstrates that such reassessment is necessary.

10.2 ADDITIONAL DATA

In order to provide an adequate basis for the addition or subtraction of chemicals from the parameter lists referenced in Sections 4.0 and 5.0, OCC shall perform two complete GC/MS surveys. Each GC/MS survey shall be performed by taking a composite sample at the time and from the wells as described below:

(a) after the initiation of the APL Plume purge well monitoring per Section 4.2.2, sampling from wells in the APL plume selected by EPA/State; and;

(b) in the course of the first five-year reassessment per Section 10.1, sampling from wells in the APL plume selected by EPA/State.

EPA/State shall conduct two GC/MS surveys from wells selected by the EPA/State in the years between the GC/MS survey conducted per (a) and such survey conducted per (c). EPA shall pay for such sampling.

10.3 CONSIDERATIONS

(a) Each reassessment shall consider, within the context of all available information relating to endangerment caused by Hyde Park chemicals, whether there has been any significant change in the data, other factual information or statutory or regulatory requirements utilized by the parties in determining the levels and parameters contained in the monitoring programs, including, without limitation, data developed as a result of the study per Section 4.4.3.2 of the RRT Stipulation.

(b) Notwithstanding the preceding subparagraph, for the purposes of reassessing the levels and parameters referenced in Sections 4.0 and 5.0, endangerment to the environment shall be defined as occurring only when the flux of Hyde Park chemicals to the Niagara River, as calculated per Section 5.4 after installation of all bedrock remedial programs, exceeds, or significantly contributes to the total flux from all sources which exceeds, a numerical standard for any parameter established by, or otherwise violates or significantly contributes to the violation of, the following: a federal or state statute, an international treaty or agreement having the legal effect of a statute, or a regulation promulgated thereunder, which is generally applicable to the Niagara River or Lake Ontario and which would be otherwise enforceable against OCC. The foregoing shall include, without limitation, the violation of water quality regulations promulgated by the State Department of Environmental Conservation where the calculated flux of Hyde Park chemicals causes or significantly contributes to a significant impairment of the Niagara River or Lake Ontario for any best usage, as defined by such regulations, which would otherwise be enforceable against OCC. If no parameter or level has yet been established or EPA/State or OCC seeks to revise an existing parameter or level per Section 10.1, the burden shall be upon such moving party

to demonstrate that the requirements described in this subparagraph have been satisfied.

(c) In considering the revision or establishment of the magnitude of any level, the reassessment shall take appropriate account of the extent of the contribution of Hyde Park chemicals to the total flux from all sources which exceeded the numerical standard or to any other violation or significant contribution to a violation as described in subparagraph (b). Furthermore, if the reassessment is founded on provisions of federal or state statutes, international treaties or agreements having the legal effect of a statute, or regulations promulgated thereunder, which were not in effect as of the effective date of this stipulation, appropriate account shall be taken of such circumstances, including the extent to which remedial technology has already been implemented to address Hyde Park chemicals. Appropriate account shall also be taken of the extent to which remedial action has been undertaken to address other sources which contributed to the total flux from all sources which resulted in the exceedance of the numerical standard or any other violation described in subparagraph (b).

10.4 MODIFICATIONS

Following any reassessment per this Section 10.0, appropriate modifications of this Stipulation may be made by agreement of EPA/State and OCC or by order of the Court.

11.0 MAINTENANCE PROGRAM

The maintenance program will consist of the following physical and mechanical maintenance:

11.1 PHYSICAL MAINTENANCE

Maintenance of the integrity, slope, vegetation, and drainage structures on the Landfill Site, including at least weekly inspections of:

i) area along the inside and outside of the Site fence;
ii) perimeter caps and culverts; and
iii) culverts and storm sewers in the Bloody Run area.

11.2 MECHANICAL MAINTENANCE

Mechanical maintenance will include inspections of:

i) all facilities within OCC control, including facilities on property for which OCC has obtained an easement;
ii) surveyed Site benchmark (top of bolt on SW leg of NYPA power tower at NW corner of landfill site);
iii) Site security fence; and
iv) advisory signs.

12.0 SUMMARY

This document describes the monitoring and reporting requirements for future operations of the Hyde Park Remedial Program. In order to minimize the number of reports submitted to EPA/State and still fulfill the requirements of the two Agreements, two types of quarterly reports and one annual report will be submitted to the EPA/State. The monitoring data to be included in each of the three reports are as follows:

A. Quarterly Overburden Report

- Overburden Barrier Collection System
- Community Monitoring Program
- APL Treatment System

B. Quarterly Bedrock Report

- NAPL Plume Containment System
- APL Plume Containment System

C. Annual Report

- Source Control System
- Intermediate Formations
- Gorge Face Seep Survey
- Bloody Run Monitoring
- Collected Liquids Monitoring
  - Existing System and OBCS APL
  - APL Purge Wells
  - monthly decanter APL analyses

Tables 12.1, 12.2, 12.3, 12.4, and 12.5 present the Hyde Park Remedial Program data collection and reporting requirements for 1996, 1997, 1998, 1999, and 2000 on until termination, assuming no changes due to reassessment.

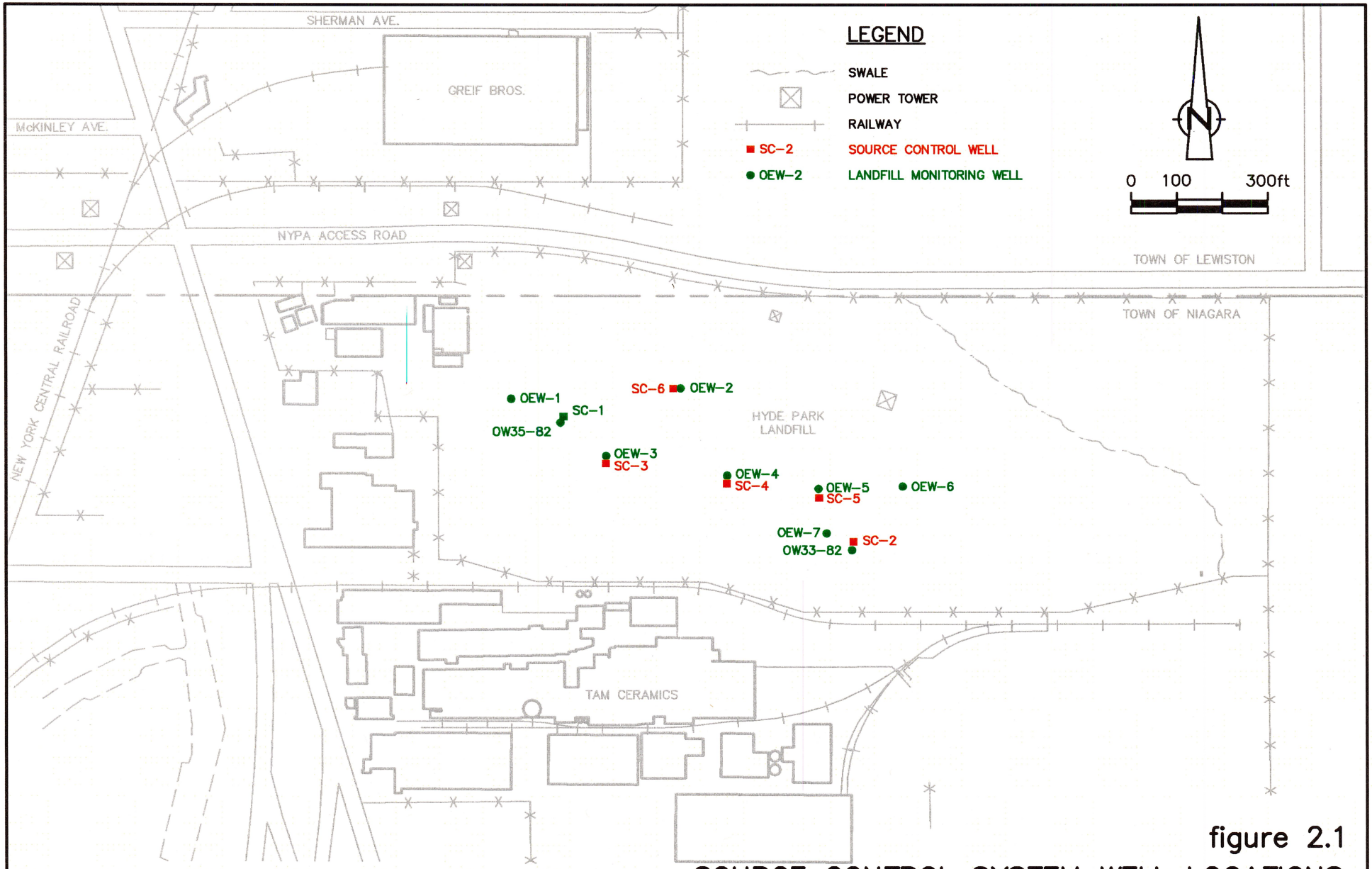


figure 2.1

SOURCE CONTROL SYSTEM WELL LOCATIONS HYDE PARK LANDFILL SITE

Occidental Chemical Corporation

NOTES:

1.) SITE BENCHMARK IS A P.K. NAIL SET IN THE EAST FACE OF A POWER POLE LOCATED AT THE WEST END OF THE EXISTING HYDE PARK LANDFILL, ELEVATION = 612.77. DATUM NOT VERIFIED.

CRA

1069 (205) APR 23/96(W) REV.0 (P322)

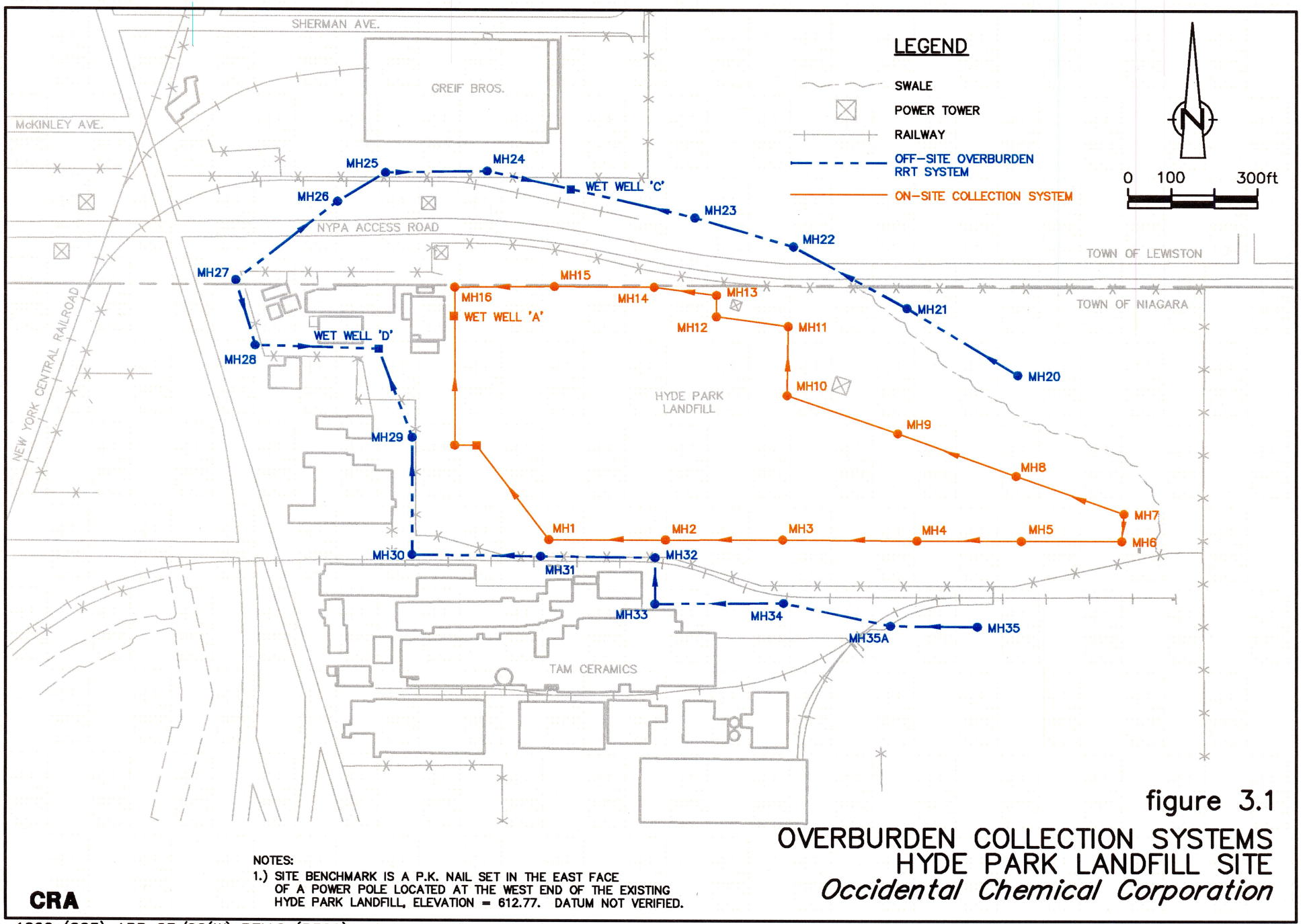


figure 3.1

OVERBURDEN COLLECTION SYSTEMS
HYDE PARK LANDFILL SITE
Occidental Chemical Corporation

NOTES:
1.) SITE BENCHMARK IS A P.K. NAIL SET IN THE EAST FACE OF A POWER POLE LOCATED AT THE WEST END OF THE EXISTING HYDE PARK LANDFILL. ELEVATION = 612.77. DATUM NOT VERIFIED.

CRA

1069 (205) APR 23/96(W) REV.0 (P399)

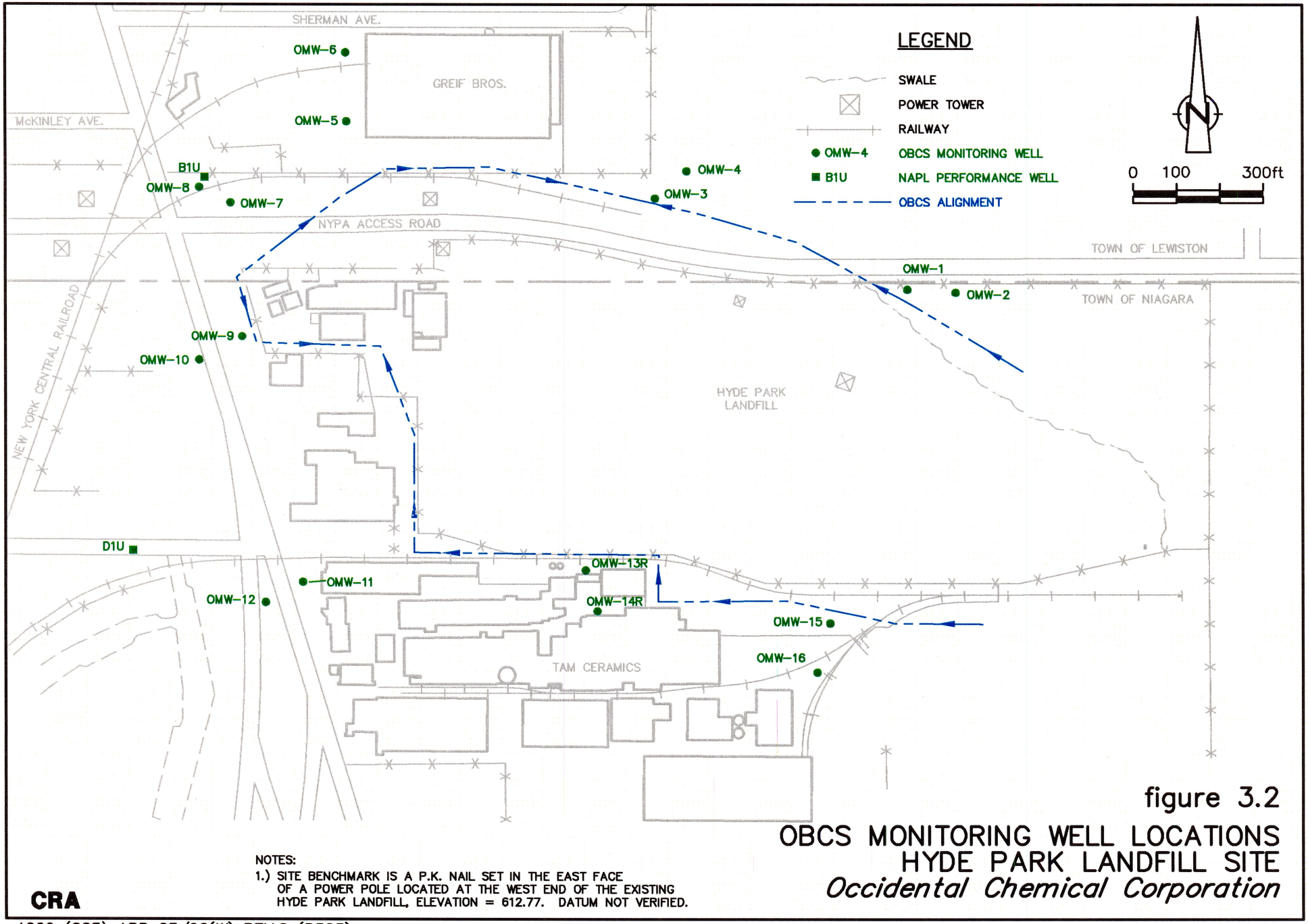


figure 3.2

OBCS MONITORING WELL LOCATIONS
HYDE PARK LANDFILL SITE
Occidental Chemical Corporation

NOTES:
1.) SITE BENCHMARK IS A P.K. NAIL SET IN THE EAST FACE OF A POWER POLE LOCATED AT THE WEST END OF THE EXISTING HYDE PARK LANDFILL, ELEVATION = 612.77. DATUM NOT VERIFIED.

CRA

1069 (205) APR 23/96(W) REV.0 (P323)

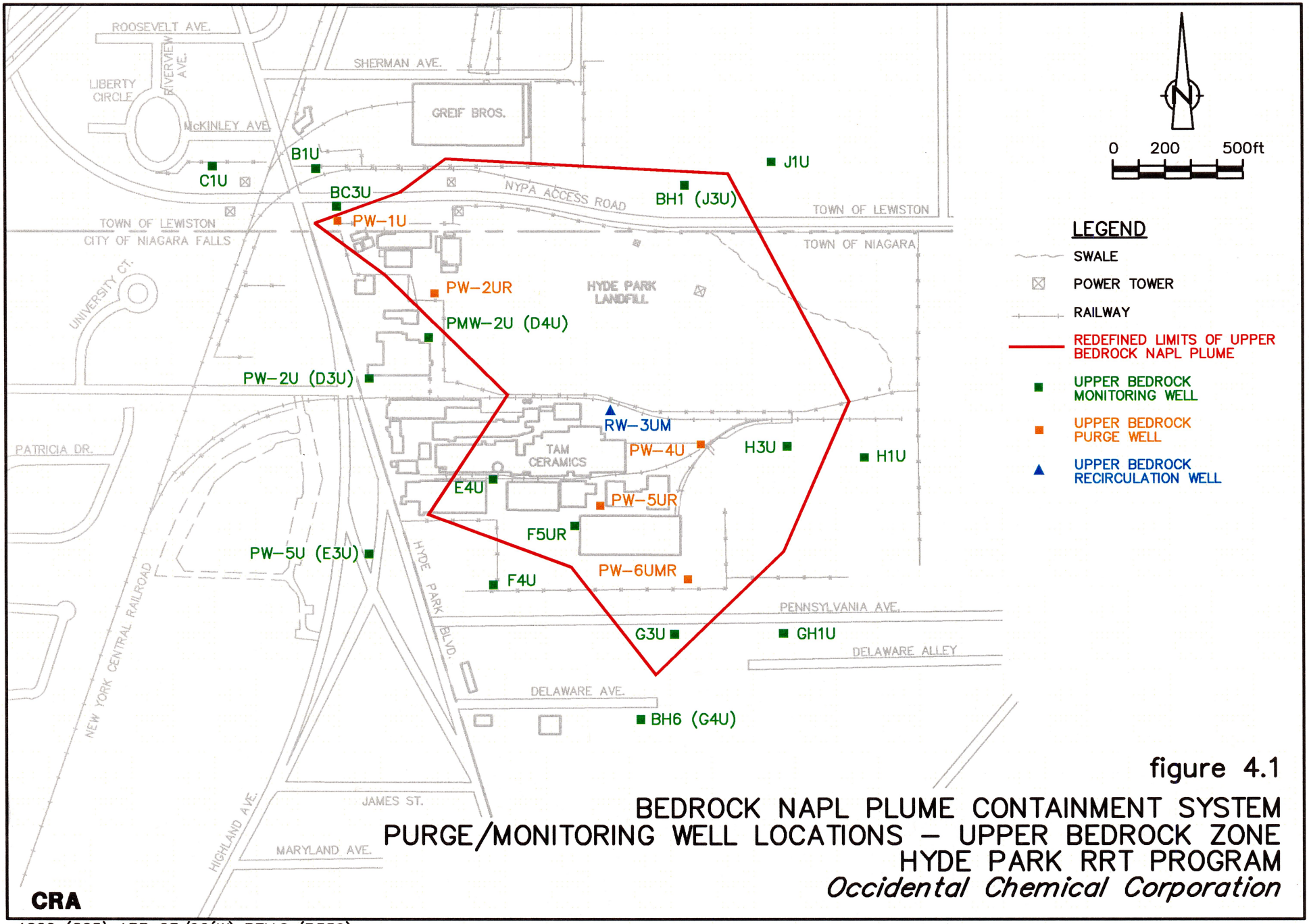


figure 4.1

BEDROCK NAPL PLUME CONTAINMENT SYSTEM
PURGE/MONITORING WELL LOCATIONS – UPPER BEDROCK ZONE
HYDE PARK RRT PROGRAM

Occidental Chemical Corporation

CRA

1069 (205) APR 23/96(W) REV.0 (P359)

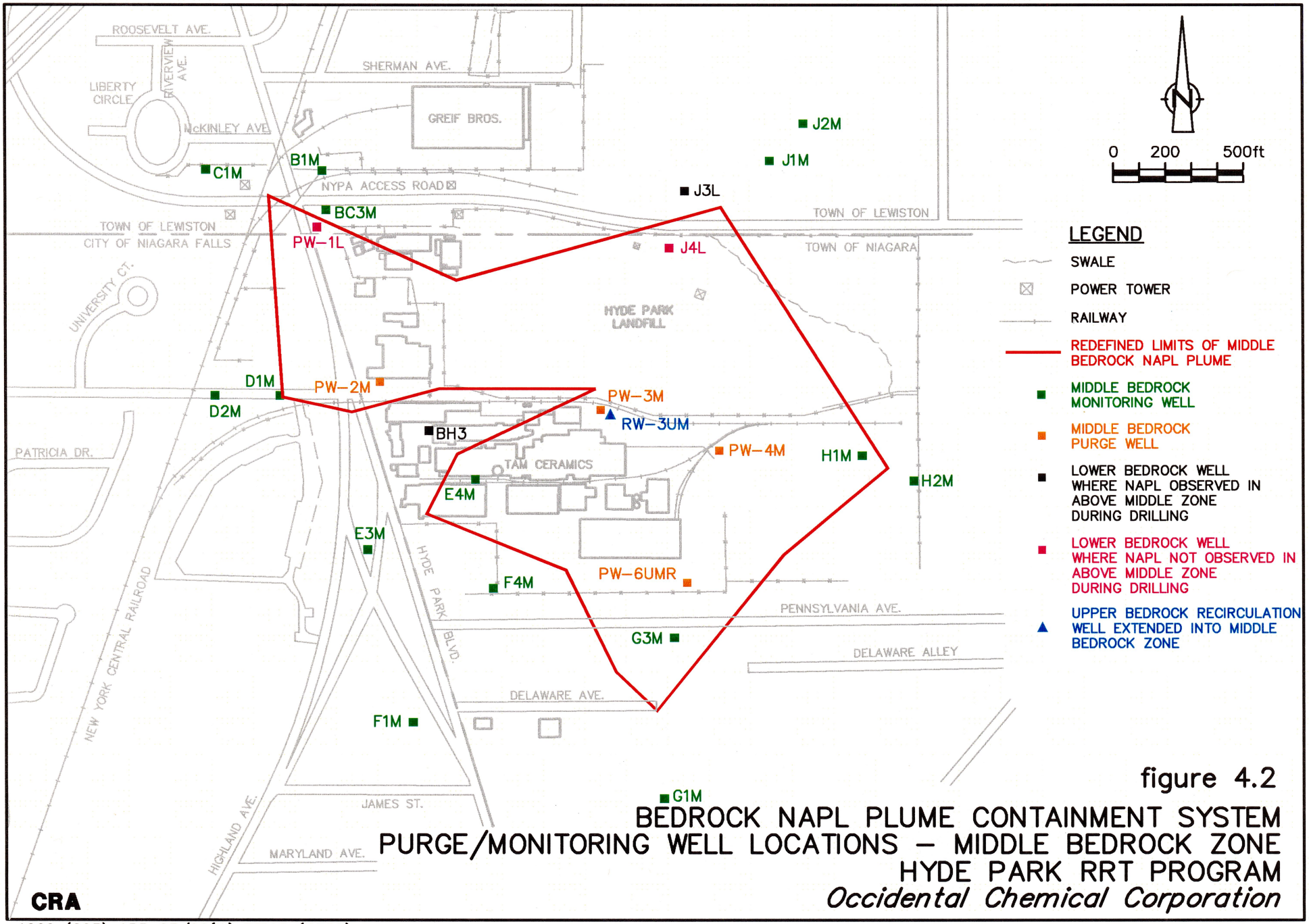


figure 4.2

BEDROCK NAPL PLUME CONTAINMENT SYSTEM
PURGE/MONITORING WELL LOCATIONS – MIDDLE BEDROCK ZONE
HYDE PARK RRT PROGRAM
Occidental Chemical Corporation

CRA

1069 (205) APR 23/96(W) REV.0 (P360)

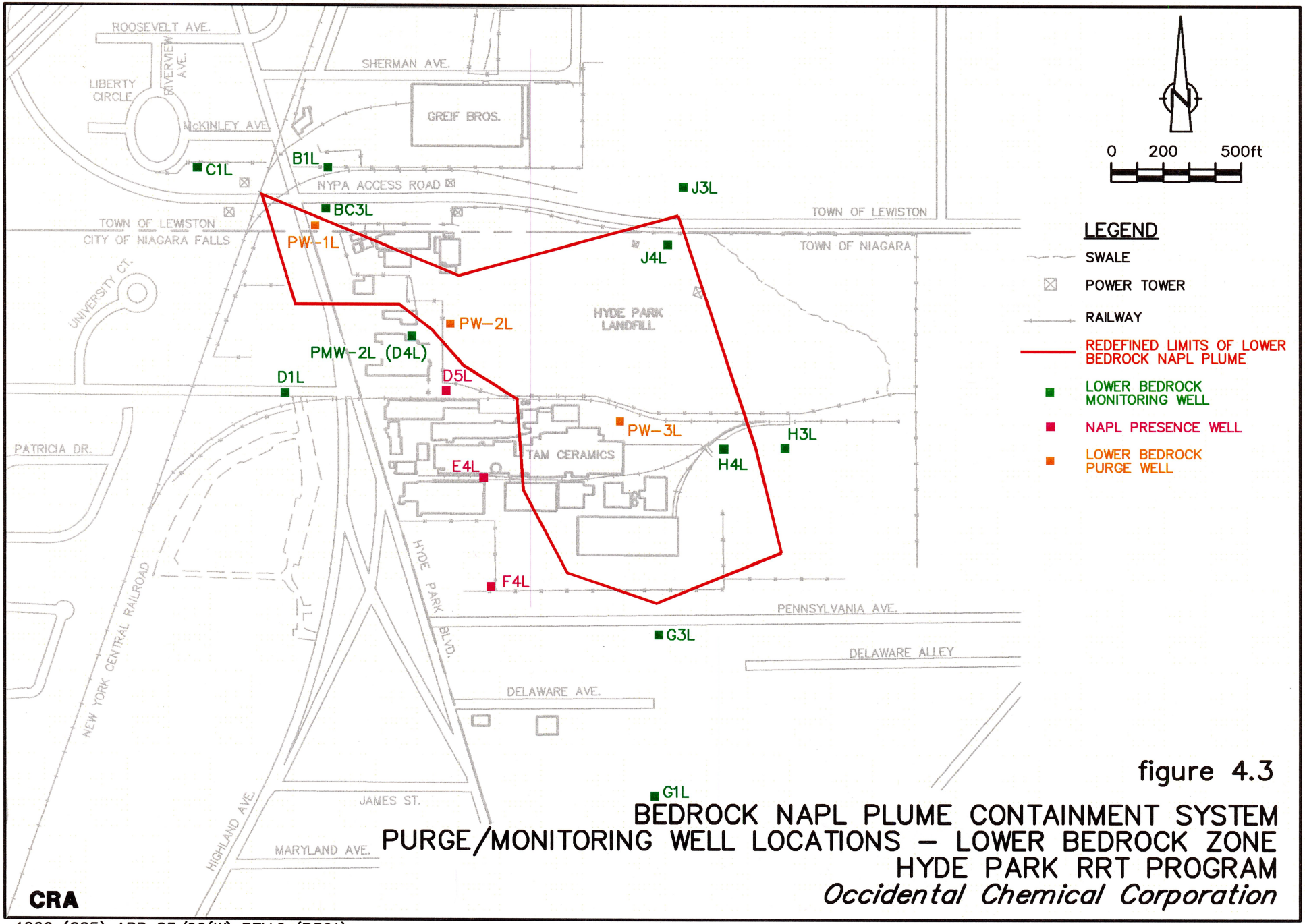


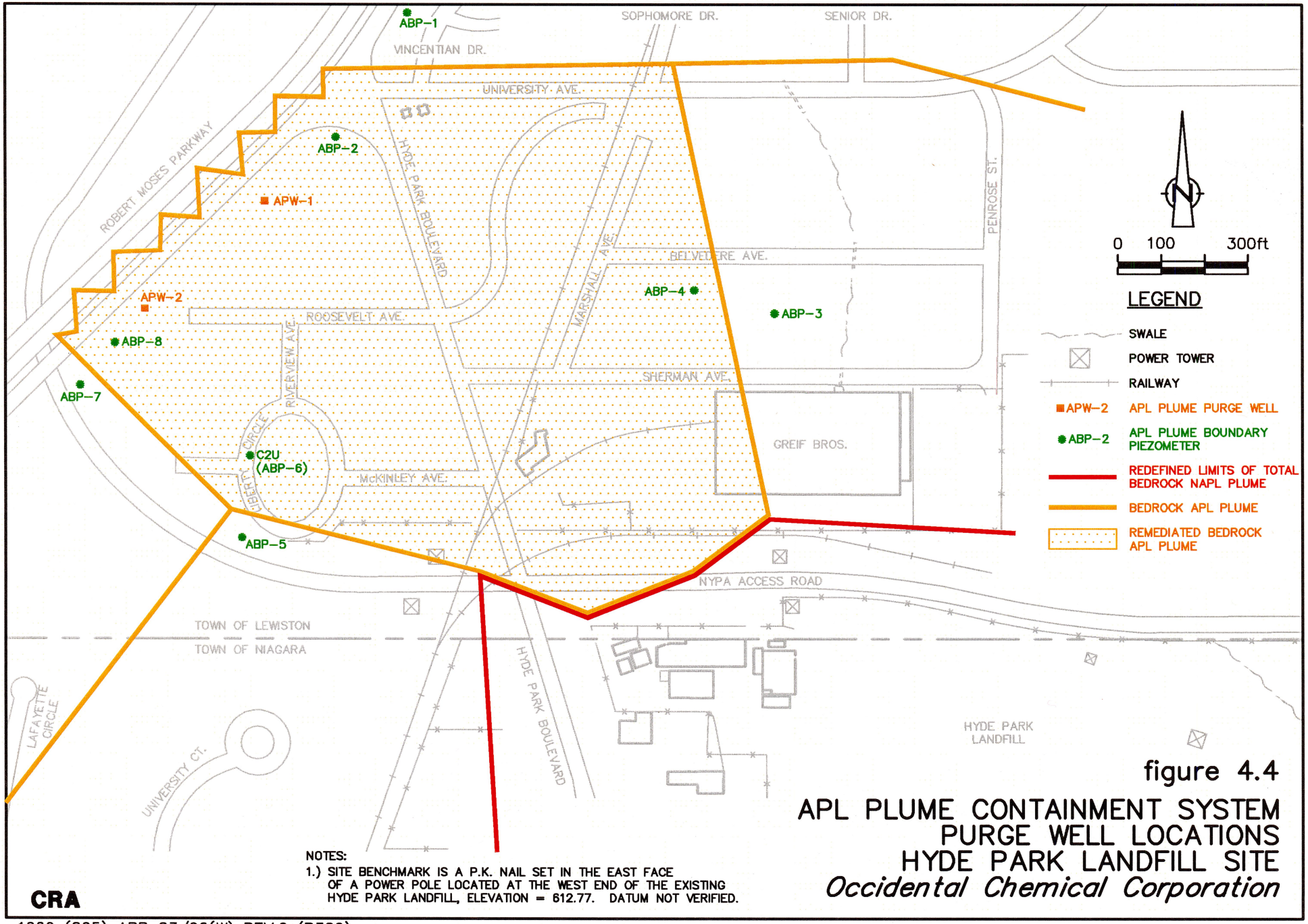
figure 4.3

BEDROCK NAPL PLUME CONTAINMENT SYSTEM
PURGE/MONITORING WELL LOCATIONS – LOWER BEDROCK ZONE
HYDE PARK RRT PROGRAM

Occidental Chemical Corporation

CRA

1069 (205) APR 23/96(W) REV.0 (P361)



NOTES:
1.) SITE BENCHMARK IS A P.K. NAIL SET IN THE EAST FACE OF A POWER POLE LOCATED AT THE WEST END OF THE EXISTING HYDE PARK LANDFILL, ELEVATION = 612.77. DATUM NOT VERIFIED.

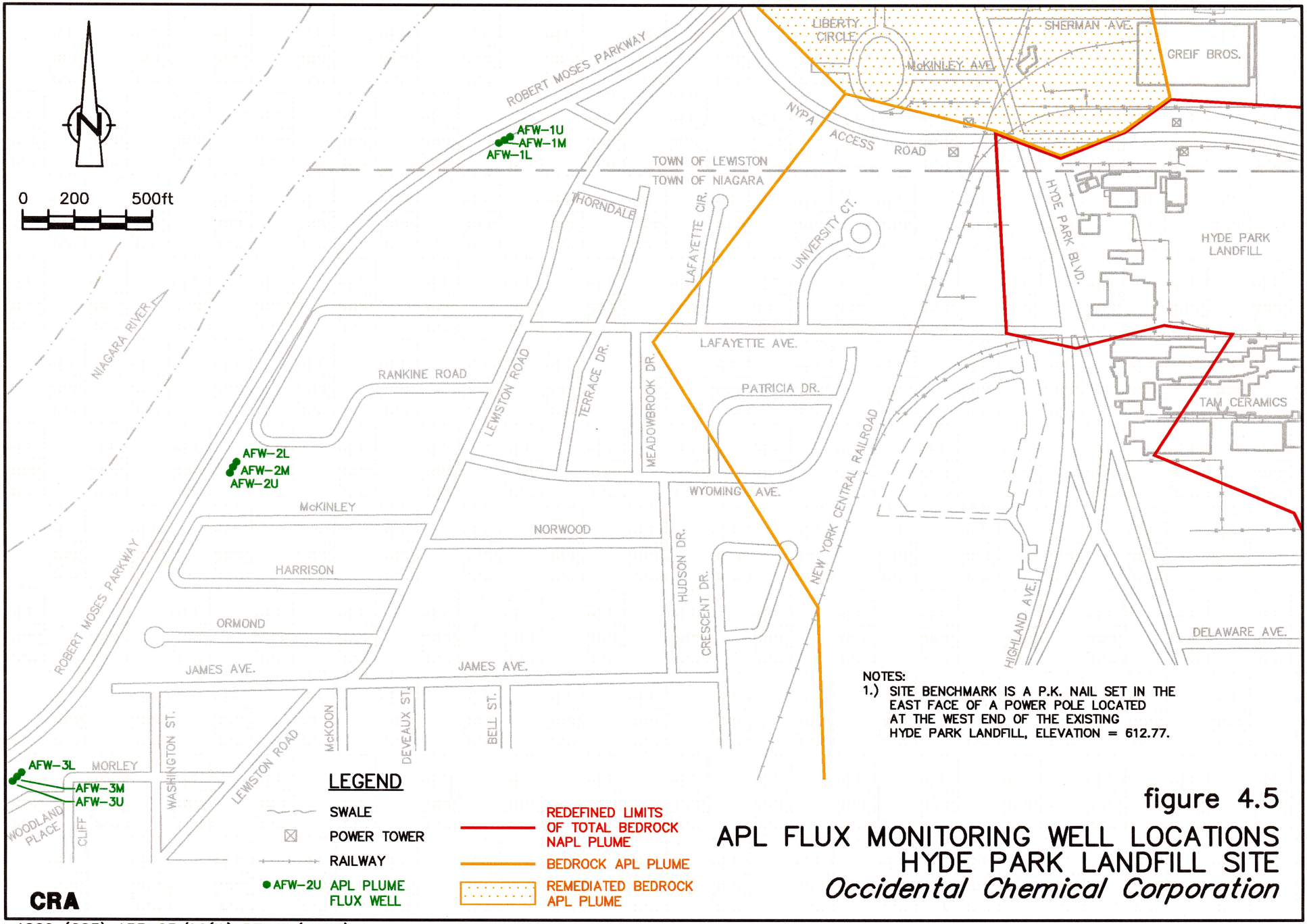
CRA

figure 4.4

APL PLUME CONTAINMENT SYSTEM PURGE WELL LOCATIONS HYDE PARK LANDFILL SITE

Occidental Chemical Corporation

1069 (205) APR 23/96(W) REV.0 (P326)



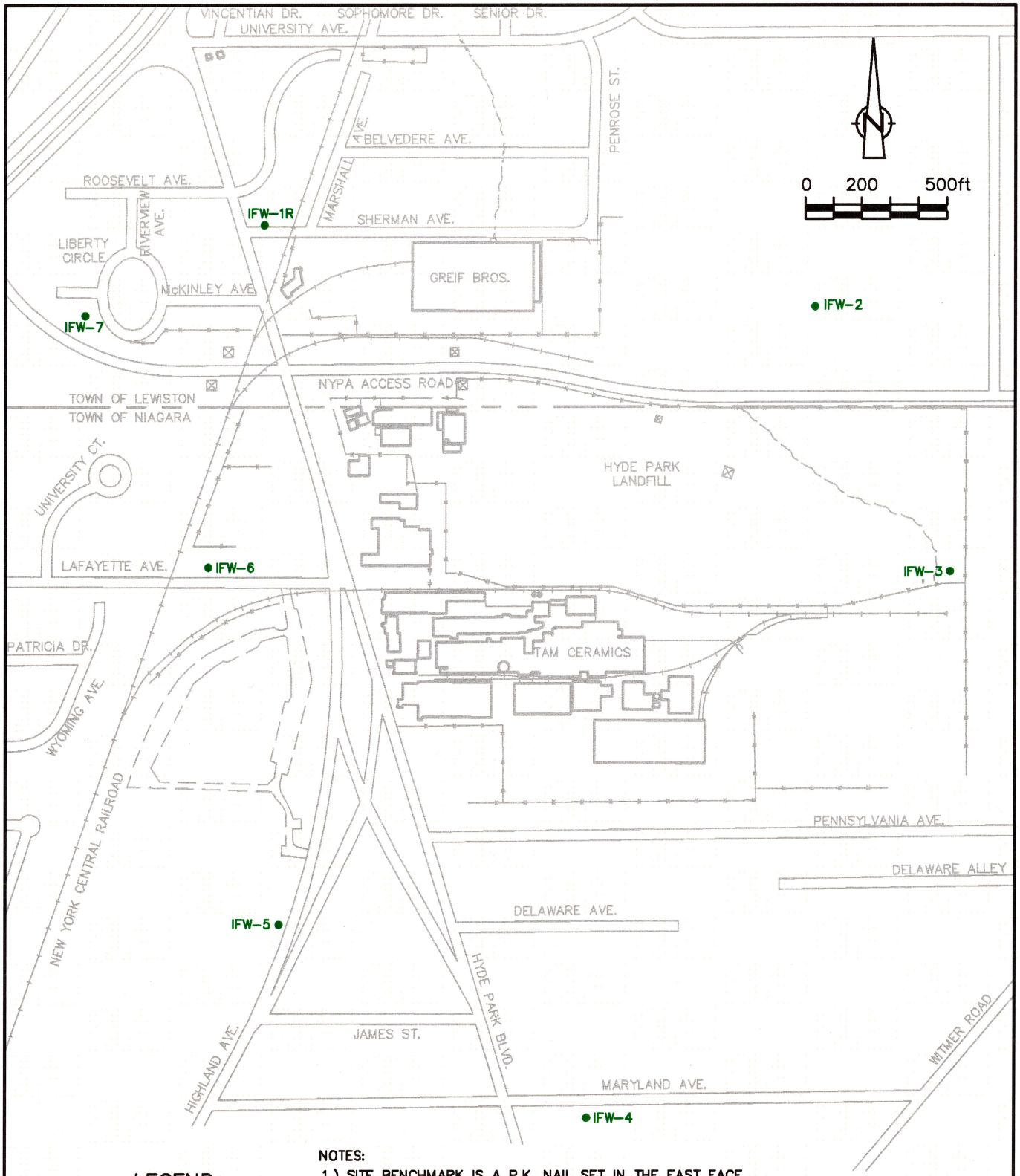
NOTES:
1.) SITE BENCHMARK IS A P.K. NAIL SET IN THE EAST FACE OF A POWER POLE LOCATED AT THE WEST END OF THE EXISTING HYDE PARK LANDFILL, ELEVATION = 612.77.

figure 4.5

APL FLUX MONITORING WELL LOCATIONS HYDE PARK LANDFILL SITE

Occidental Chemical Corporation

1069 (205) APR 23/96(W) REV.0 (P327)



NOTES:

1.) SITE BENCHMARK IS A P.K. NAIL SET IN THE EAST FACE OF A POWER POLE LOCATED AT THE WEST END OF THE EXISTING HYDE PARK LANDFILL, ELEVATION = 612.77. DATUM NOT VERIFIED.

LEGEND

- SWALE
- POWER TOWER
- RAILWAY
- IFW-2 — INTERMEDIATE FORMATIONS WELL

figure 5.1

IFW MONITORING WELL LOCATIONS MONITORING PROGRAM STATUS HYDE PARK LANDFILL SITE

Occidental Chemical Corporation

CRA

1069 (205) APR 23/96(W) REV.0 (P329)

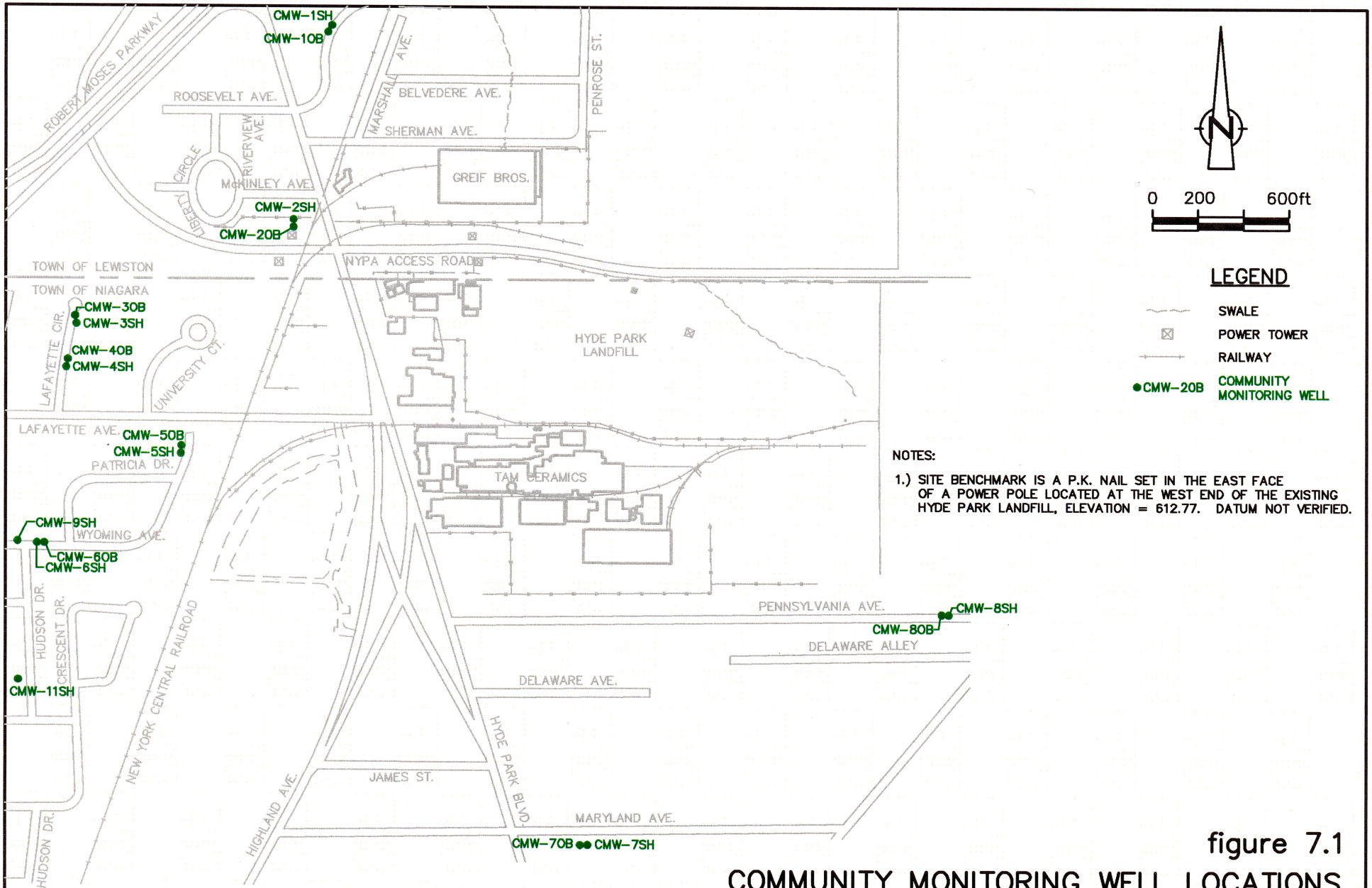


figure 7.1

COMMUNITY MONITORING WELL LOCATIONS
HYDE PARK LANDFILL SITE
Occidental Chemical Corporation

CRA

1069 (205) APR 23/96(W) REV.0 (P330)

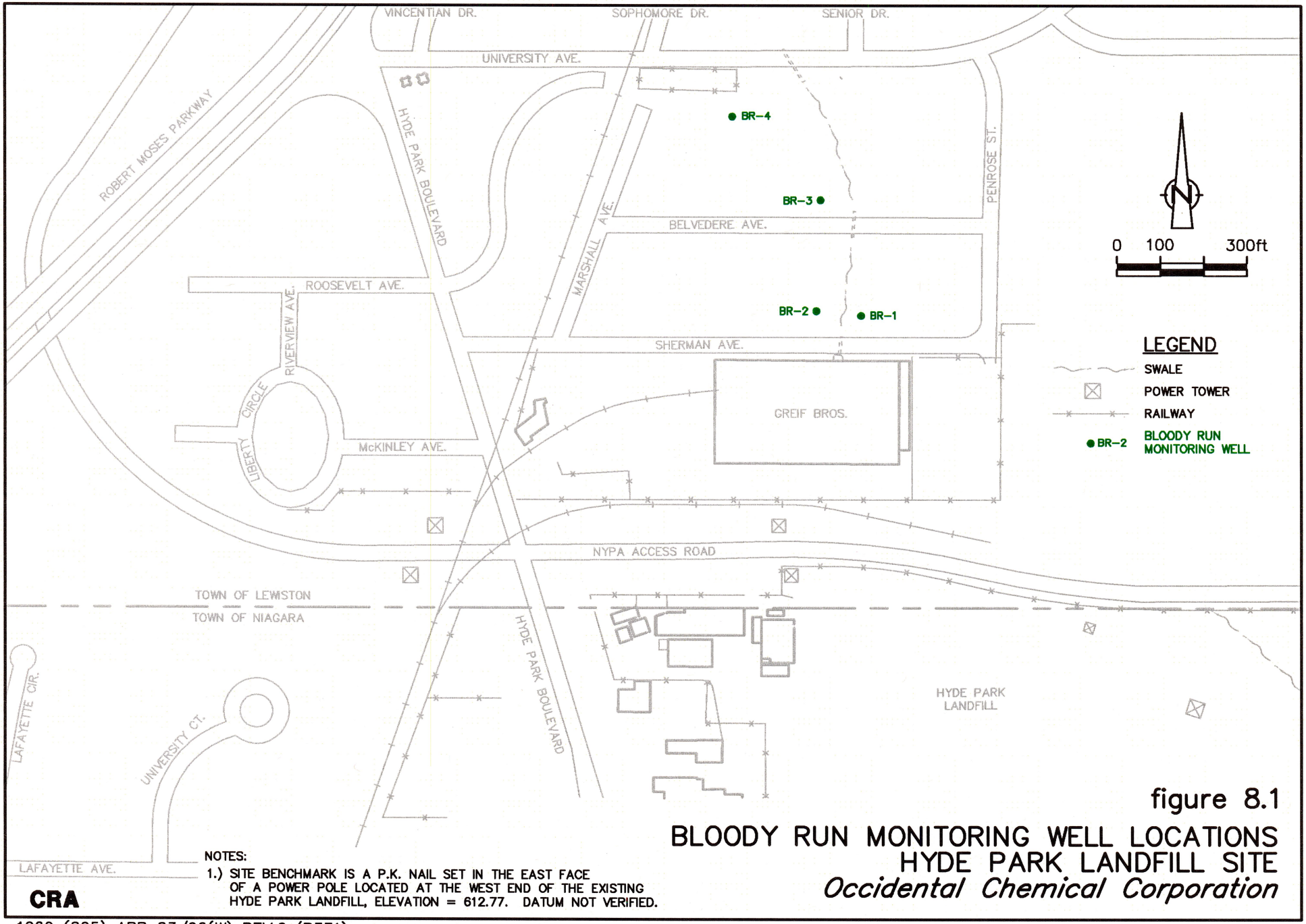


figure 8.1

BLOODY RUN MONITORING WELL LOCATIONS
HYDE PARK LANDFILL SITE
Occidental Chemical Corporation

NOTES:
1.) SITE BENCHMARK IS A P.K. NAIL SET IN THE EAST FACE OF A POWER POLE LOCATED AT THE WEST END OF THE EXISTING HYDE PARK LANDFILL, ELEVATION = 612.77. DATUM NOT VERIFIED.

CRA

1069 (205) APR 23/96(W) REV.0 (P331)

TABLE 12.1

FUTURE DATA COLLECTION REQUIREMENTS - 1996
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Source Control System												
• water levels (monitoring wells)	√	√	√	√	√	√	√	√	√ R	√	√	√
• continuous water level recorder									R			
• extraction well NAPL/APL ratios								√	R			
Overburden RRT System												
• water levels	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• NAPL presence checks		√	R					√	R			
Bedrock RRT System												
A. NAPL Plume Containment System												
(i) Performance Monitoring Wells												
• water levels	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• continuous water level recorders			R			R			R			R
• inner ring NAPL presence check		√	R		√	R		√	R		√	R
• outer ring groundwater sampling		√	R		√	R		√	R		√	R
(ii) Purge/Recirculation Wells												
• purge well NAPL/APL ratio								√	R			
B. APL Plume Containment System												
(i) Remediated APL Plume												
• water levels (APWs/ABPs)												
• seep survey												
(ii) Unremediated APL Plume												
• water levels (AFWs)		√	R		√	R		√	R		√	R
• composite flux sampling (APW/AFW)												

TABLE 12.1

FUTURE DATA COLLECTION REQUIREMENTS - 1996
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Intermediate Formations												
• composite/individual IFW groundwater samples								√	R			
Gorge Face Seeps												
• seep survey								√	R			
Community Monitoring												
• water levels		√	R		√	R		√	R		√	R
• air sampling		√	R		√	R		√	R		√	R
• groundwater sampling								√	R			
Bloody Run Monitoring												
• water levels/groundwater sampling		√						√	R			
Collected Liquids/Treatment Plant												
A. Collected Liquids Monitoring												
(i) Overburden RRT System												
• drain system APL sample								√	R			
• OBCS APL sample		√	R					√	R			
• decanter APL sample (CLMP)	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• decanter APL sample (acid analysis)		√	R					√	R			
(ii) Bedrock RRT System - APL Plume Containment System												
• APW sample (also acid analysis)												

TABLE 12.1

FUTURE DATA COLLECTION REQUIREMENTS - 1996
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Collected Liquids/Treatment Plant (cont'd)												
B. Treatment Plant Data												
(i) Source Control												
• extraction wells water levels	√	√	√	√	√	√	√	√	√ R	√	√	√
• NAPL volume in Decanter No. 3	√	√	√	√	√	√	√	√	√ R	√	√	√
• NAPL volume pumped daily									R			
• extraction well pumping times/ flow rates									R			
(ii) Bedrock RRT System - NAPL Plume Containment System												
• purge well water levels	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• purge/recirculation well flow rates	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• total system NAPL/APL ratio		√	R		√	R		√	R		√	R

Notes:

√ - Activity Required

R - Report Required

TABLE 12.2

FUTURE DATA COLLECTION REQUIREMENTS - 1997
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Source Control System												
• water levels (monitoring wells)	√	√	√	√	√	√	√	√	√ R	√	√	√
• continuous water level recorder									R			
• extraction well NAPL/APL ratios								√	R			
Overburden RRT System												
• water levels	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• NAPL presence checks		√	R					√	R			
Bedrock RRT System												
A. NAPL Plume Containment System												
(i) Performance Monitoring Wells												
• water levels		√	R		√	R		√	R		√	R
• continuous water level recorders			R			R			R			R
• inner ring NAPL presence check		√	R		√	R		√	R		√	R
• outer ring groundwater sampling		√	R		√	R		√	R		√	R
(ii) Purge/Recirculation Wells												
• purge well NAPL/APL ratio								√	R			
B. APL Plume Containment System												
(i) Remediated APL Plume												
• water levels (APWs/ABPs)												
• seep survey												
(ii) Unremediated APL Plume												
• water levels (AFWs)		√	R		√	R		√	R		√	R
• composite flux sampling (APW/AFW)												

TABLE 12.2

FUTURE DATA COLLECTION REQUIREMENTS - 1997
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Intermediate Formations												
• composite/individual IFW groundwater samples								√	R			
Gorge Face Seeps												
• seep survey								√	R			
Community Monitoring												
• water levels												
• air sampling		√	R		√	R		√	R		√	R
• groundwater sampling		√	R		√	R		√	R		√	R
								√	R			
Bloody Run Monitoring												
• water levels/groundwater sampling								√	R			
Collected Liquids/Treatment Plant												
A. Collected Liquids Monitoring												
(i) Overburden RRT System												
• drain system APL sample								√	R			
• OBCS APL sample								√	R			
• decanter APL sample (CLMP)	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• decanter APL sample (acid analysis)		√	R					√	R			
(ii) Bedrock RRT System - APL Plume Containment System												
• APW sample (also acid analysis)		√						√	R			

TABLE 12.2

FUTURE DATA COLLECTION REQUIREMENTS - 1997
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Collected Liquids/Treatment Plant (cont'd)												
B. Treatment Plant Data												
(i) Source Control												
• extraction wells water levels												
• NAPL volume in Decanter No. 3	√	√	√	√	√	√	√	√	√ R	√	√	√
• NAPL volume pumped daily	√	√	√	√	√	√	√	√	√ R	√	√	√
• extraction well pumping times/ flow rates									R			
(ii) Bedrock RRT System - NAPL Plume Containment System									R			
• purge well water levels	√	√	√ R	√		√ R	√	√	√ R	√	√	√ R
• purge/recirculation well flow rates	√	√	√ R	√		√ R	√	√	√ R	√	√	√ R
• total system NAPL/APL ratio		√	R			R		√	R		√	R

Notes:

√ - Activity Required

R - Report Required

TABLE 12.3

FUTURE DATA COLLECTION REQUIREMENTS - 1998
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Source Control System												
• water levels (monitoring wells)	√	√	√	√	√	√	√	√	√ R	√	√	√
• continuous water level recorder									R			
• extraction well NAPL/APL ratios								√	R			
Overburden RRT System												
• water levels	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• NAPL presence checks		√	R					√	R			
Bedrock RRT System												
A. NAPL Plume Containment System												
(i) Performance Monitoring Wells												
• water levels		√	R		√	R		√	R		√	R
• continuous water level recorders			R			R			R			R
• inner ring NAPL presence check		√	R		√	R		√	R		√	R
• outer ring groundwater sampling		√	R		√	R		√	R		√	R
(ii) Purge/Recirculation Wells												
• purge well NAPL/APL ratio								√	R			
B. APL Plume Containment System												
(i) Remediated APL Plume												
• water levels (APWs/ABPs)	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• seep survey		√	R		√	R		√	R		√	R
(ii) Unremediated APL Plume												
• water levels (AFWs)		√	R		√	R		√	R		√	R
• composite flux sampling (APW/AFW)		√	R		√	R		√	R		√	R

TABLE 12.3

FUTURE DATA COLLECTION REQUIREMENTS - 1998
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Intermediate Formations												
• composite/individual IFW groundwater samples								√	R			
Gorge Face Seeps												
• seep survey								√	R			
Community Monitoring												
• water levels		√	R		√	R		√	R		√	R
• air sampling		√	R		√	R		√	R		√	R
• groundwater sampling								√	R			
Bloody Run Monitoring												
• water levels/groundwater sampling								√	R			
Collected Liquids/Treatment Plant												
A. Collected Liquids Monitoring												
(i) Overburden RRT System												
• drain system APL sample								√	R			
• OBCS APL sample								√	R			
• decanter APL sample (CLMP)	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• decanter APL sample (acid analysis)		√	R					√	R			
(ii) Bedrock RRT System - APL Plume Containment System												
• APW sample (also acid analysis)		√						√	R			

TABLE 12.3

FUTURE DATA COLLECTION REQUIREMENTS - 1998
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Collected Liquids/Treatment Plant (cont'd)												
B. Treatment Plant Data												
(i) Source Control												
• extraction wells water levels	√	√	√	√	√	√	√	√	√ R	√	√	√
• NAPL volume in Decanter No. 3	√	√	√	√	√	√	√	√	√ R	√	√	√
• NAPL volume pumped daily									R			
• extraction well pumping times/ flow rates									R			
(ii) Bedrock RRT System - NAPL Plume Containment System												
• purge well water levels	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• purge/recirculation well flow rates	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• total system NAPL/APL ratio		√	R		√	R		√	R		√	R

Notes:

√ - Activity Required

R - Report Required

TABLE 12.4

FUTURE DATA COLLECTION REQUIREMENTS - 1999
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Source Control System												
• water levels (monitoring wells)	√	√	√	√	√	√	√	√	√ R	√	√	√
• continuous water level recorder									R			
• extraction well NAPL/APL ratios								√	R			
Overburden RRT System												
• water levels	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• NAPL presence checks		√	R					√	R			
Bedrock RRT System												
A. NAPL Plume Containment System												
(i) Performance Monitoring Wells												
• water levels		√	R		√	R		√	R		√	R
• continuous water level recorders			R			R			R			R
• inner ring NAPL presence check		√	R		√	R		√	R		√	R
• outer ring groundwater sampling		√	R		√	R		√	R		√	R
(ii) Purge/Recirculation Wells												
• purge well NAPL/APL ratio								√	R			
B. APL Plume Containment System												
(i) Remediated APL Plume												
• water levels (APWs/ABPs)		√	R		√	R		√	R		√	R
• seep survey		√	R		√	R		√	R		√	R
(ii) Unremediated APL Plume												
• water levels (AFWs)		√	R		√	R		√	R		√	R
• composite flux sampling (APW/AFW)		√	R		√	R		√	R		√	R

TABLE 12.4

FUTURE DATA COLLECTION REQUIREMENTS - 1999
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Intermediate Formations												
• composite/individual IFW groundwater samples								√	R			
Gorge Face Seeps												
• seep survey								√	R			
Community Monitoring												
• water levels		√	R		√	R		√	R		√	R
• air sampling		√	R		√	R		√	R		√	R
• groundwater sampling								√	R			
Bloody Run Monitoring												
• water levels/groundwater sampling								√	R			
Collected Liquids/Treatment Plant												
A. Collected Liquids Monitoring												
(i) Overburden RRT System												
• drain system APL sample								√	R			
• OBCS APL sample								√	R			
• decanter APL sample (CLMP)	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• decanter APL sample (acid analysis)								√	R			
(ii) Bedrock RRT System - APL Plume Containment System												
• APW sample (also acid analysis)		√						√	R			

TABLE 12.4

FUTURE DATA COLLECTION REQUIREMENTS - 1999
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Collected Liquids/Treatment Plant (cont'd)												
B. Treatment Plant Data												
(i) Source Control												
• extraction wells water levels	√	√	√	√	√	√	√	√	√ R	√	√	√
• NAPL volume in Decanter No. 3	√	√	√	√	√	√	√	√	√ R	√	√	√
• NAPL volume pumped daily									R			
• extraction well pumping times/ flow rates									R			
(ii) Bedrock RRT System - NAPL Plume Containment System												
• purge well water levels	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• purge/recirculation well flow rates	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• total system NAPL/APL ratio		√	R		√	R		√	R		√	R

Notes:

√ - Activity Required

R - Report Required

TABLE 12.5

FUTURE DATA COLLECTION REQUIREMENTS - 2000 TO TERMINATION
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Source Control System												
• water levels (monitoring wells)	√	√	√	√	√	√	√	√	√ R	√	√	√
• continuous water level recorder									R			
• extraction well NAPL/APL ratios								√	R			
Overburden RRT System												
• water levels	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• NAPL presence checks		√	R					√	R			
Bedrock RRT System												
A. NAPL Plume Containment System												
(i) Performance Monitoring Wells												
• water levels		√	R		√	R		√	R		√	R
• continuous water level recorders			R			R			R			R
• inner ring NAPL presence check		√	R		√	R		√	R		√	R
• outer ring groundwater sampling		√	R		√	R		√	R		√	R
(ii) Purge/Recirculation Wells												
• purge well NAPL/APL ratio								√	R			
B. APL Plume Containment System												
(i) Remediated APL Plume												
• water levels (APWs/ABPs)		√	R		√	R		√	R		√	R
• seep survey								√	R			
(ii) Unremediated APL Plume												
• water levels (AFWs)		√	R		√	R		√	R		√	R
• composite flux sampling (APW/AFW)		√	R		√	R		√	R		√	R

TABLE 12.5

FUTURE DATA COLLECTION REQUIREMENTS - 2000 TO TERMINATION
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Intermediate Formations												
• composite/individual IFW groundwater samples								√	R			
Gorge Face Seeps												
• seep survey								√	R			
Community Monitoring												
• water levels		√	R		√	R		√	R		√	R
• air sampling		√	R		√	R		√	R		√	R
• groundwater sampling								√	R			
Bloody Run Monitoring												
• water levels/groundwater sampling								√	R			
Collected Liquids/Treatment Plant												
A. Collected Liquids Monitoring												
(i) Overburden RRT System												
• drain system APL sample								√	R			
• OBCS APL sample								√	R			
• decanter APL sample (CLMP)	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• decanter APL sample (acid analysis)								√	R			
(ii) Bedrock RRT System - APL Plume Containment System												
• APW sample (also acid analysis)								√	R			

TABLE 12.5

FUTURE DATA COLLECTION REQUIREMENTS - 2000 TO TERMINATION
HYDE PARK RRT PROGRAM
OCCIDENTAL CHEMICAL CORPORATION

Program/Task	*JAN*	*FEB*	*MAR*	*APR*	*MAY*	*JUN*	*JUL*	*AUG*	*SEP*	*OCT*	*NOV*	*DEC*
Collected Liquids/Treatment Plant (cont'd)												
B. Treatment Plant Data												
(i) Source Control												
• extraction wells water levels	√	√	√	√	√	√	√	√	√ R	√	√	√
• NAPL volume in Decanter No. 3	√	√	√	√	√	√	√	√	√ R	√	√	√
• NAPL volume pumped daily									R			
• extraction well pumping times/ flow rates									R			
(ii) Bedrock RRT System - NAPL Plume Containment System												
• purge well water levels	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• purge/recirculation well flow rates	√	√	√ R	√	√	√ R	√	√	√ R	√	√	√ R
• total system NAPL/APL ratio		√	R		√	R		√	R		√	R

Notes:

√ - Activity Required

R - Report Required