DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: **Occidental Chemical - Durez Division, Niagara Plant**
Facility Address: **5000 Packard Road, Niagara Falls, New York**
Facility EPA ID #: **NYD002103216**

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

__✓__ If yes - check here and continue with #2 below.

_____ If no - re-evaluate existing data, or

_____ if data are not available, skip to #8 and enter"IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Migration of Contaminated Groundwater Under Control" EI

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or

final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses.

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information).

2. Is **groundwater** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective "levels" (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

__✓__ If yes - continue after identifying key contaminants, citing appropriate "levels," and referencing supporting documentation.

_____ If no - skip to #8 and enter "YE" status code, after citing appropriate "levels," and referencing supporting documentation to demonstrate that groundwater is not "contaminated."

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):_____

FACILITY BACKGROUND/DESCRIPTION

The Occidental Chemical Corporation (OCC), Durez Division, Niagara Plant is a phenol-formaldehyde resin manufacturing plant.

Location

The plant is located in the City of Niagara Falls, New York, approximately 2 miles north of the Niagara River (**Figure 1**). The plant property consists of 4.6 acres which are dedicated to manufacturing operations. The area surrounding the plant is industrial. To the north, the site is bordered by Niagara Mohawk Power Corporation (NIMO) transmission lines and right-of-way, and Frontier Roadway Maintenance Corporation. To the east, are Conrail railroad tracks and NIMO transmission lines. To the south, the site is bordered by Packard Road. CECOS International is located southeast of the site across Packard Road. International Bag Company (formerly Frontier Bronze Corporation) is located to the west. The closest residential area is approximately three quarters of a mile to the west of the site.

History of Owner/Operators

The plant was owned and operated by Reichold Chemicals from the 1920s to 1986. BTL Specialty Resins Corporation was the owner/operator from 1986 to 1989. OCC has been owner/operator since 1989.

Facility Hazardous Wastes

The hazardous wastes generated at this facility are ignitable and/or toxic solvent washings from reactor vessels, spilled raw materials and small amounts of laboratory samples. The wastes include F003 and F005 (spent non-halogenated solvents), U122 (formaldehyde), U188 (phenol), and D001 (ignitable). These wastes are stored and treated on site in the RCRA-regulated hazardous waste container storage area, hazardous waste tank 63 and incinerator.

CORRECTIVE ACTION ACTIVITIES

Nineteen Solid Waste Management Units (SWMUs) have been identified at the facility (**Figure 2**). OCC has completed the "RCRA Facility Investigation" (RFI) (January 1991), and the "Corrective Measures Study, Groundwater Remediation" (April 1993), to identify the extent of releases of hazardous waste constituents from the SWMUs and to evaluate possible remedial measures that could be employed to address those releases. As a result of the investigation, OCC has concluded that although hazardous waste constituents have been released to the fill/soil and groundwater beneath the facility, releases from the SWMUs are no longer significant sources of contamination. Therefore, all SWMUS at the facility are being addressed through implementation of a site-wide corrective measures program.

A list of the principle hazardous waste constituents which have been released to the groundwater, and the "groundwater protection standard" for the constituents is included in Table 1.

TABLE 1

PARAMETER	CAS#	GROUNDWATER PROTECTION STANDARD (µ/L)
Organic Compounds		
Acetone	67-64-1	5.0×10^1
Xylene (total)	1330-20-7	5.0
Ethylbenzene	100-41-4	5.0
Phenol	108-95-2	5.0 x 10
o-Dichlorobenzene	95-50-1	4.7
p-Dichlorobenzene	106-46-7	4.7

Aqueous phase contamination has been observed in the soils and unconsolidated sediments (overburden) at the facility and in the bedrock. The extent of the aqueous phase plume in the overburden appears to be primarily limited to the facility property. The extent of the aqueous phase bedrock plume is somewhat greater; but the concentration of the contaminants decreases substantially in the off-site areas. The stratigraphic extent of the contamination is limited to the upper 65 feet of the bedrock. The geographic distribution of the contaminant plumes is represented on Figures 3 and 4. A

depiction of the pumping intervals and representative potentiometric surface maps are portrayed on Figures 5 through 8.

Corrective Measures Implementation

Prior to the selection of Final Corrective Measures, OCC implemented a number of "Interim Corrective Measures to address the soil and groundwater contamination at the facility. These measures have included:

1. Excavation and removal of a former lagoon;
2. Improvements and replacements to the tank farms;
3. Excavation and removal of contaminated soils in the area of former Tank Farm A;
4. Elimination of a part of the on-site sewer system;
5. Construction of an asphalt cap over all exposed ground surfaces at the facility;
6. Installation of an overburden drain tile collection system; and,
7. Installation of a bedrock groundwater collection system.

The Department determined that these Interim Corrective Measures, in conjunction with long-term operation of the bedrock and overburden groundwater remedial systems, have been successful in reducing the potential threat to human health and the environment and are capable of achieving the remedial goals. The "Corrective Measures Implementation Program" specified in Module III of the 6 NYCRR Part 373-2 Permit(September 1995) is based upon continued operation of the interim groundwater remedial programs and serves as the "Final Remedy" for the facility.

Effectiveness Monitoring

Subsequent to issuance of the Permit, OCC has been performing hydraulic and chemical monitoring at the facility to demonstrate that the remedial goals are being achieved. The monitoring data are summarized in annual reports to the NYSDEC. Based upon the information in those reports, the NYSDEC has determined that the remedial program is meeting its design objectives. The magnitude of groundwater contamination at the facility has been decreasing as expected (Table2). The groundwater capture zone meets the design objectives. See the "Annual Review of Groundwater Extraction System, July 1,1998 through June 30, 1999" and the "Annual Review of Groundwater Extraction System, July 1,1999 through June 30, 2000" for details regarding the performance of the remedial program..

Footnotes:

[1]"Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"[2] as defined by the monitoring locations designated at the time of this determination)?

__✓__ If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the "existing area of groundwater contamination"[2]).

_____ If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"[2]) - skip to #8 and enter "NO" status code, after providing an explanation.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):**See discussion above. Groundwater recovery systems are functioning as designed.**

[2] "existing area of contaminated groundwater" is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of "contamination" that can and will be sampled/tested in the future to physically verify that all "contaminated" groundwater remains within this area, and that the further migration of "contaminated" groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

4. Does "contaminated" groundwater **discharge** into **surface water** bodies?

_____ If yes - continue after identifying potentially affected surface water bodies.

__✓__ If no - skip to #7 (and enter a "YE" status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater "contamination" does not enter surface water bodies.

_____ If unknown - skip to #8 and enter "IN" status code.

Rationale and Reference(s):**See discussion above. Groundwater recovery systems are functioning as designed.**

5. Is the **discharge** of "contaminated" groundwater into surface water likely to be **"insignificant"** (i.e., the maximum concentration[3] of each contaminant discharging into surface water is less than 10 times their appropriate groundwater "level," and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations)? NA

_____ If yes - skip to #7 (and enter "YE" status code in #8 if #7 = yes), after documenting: 1) the maximum known or reasonably suspected concentration[3] of key contaminants discharged above their groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.

_____ If no - (the discharge of "contaminated" groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration[3] of each contaminant discharged above its groundwater "level," the value of the appropriate "level(s)," and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations[3] greater than 100 times their appropriate groundwater "levels," the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s):_____

[3] As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

6. Can the **discharge** of "contaminated" groundwater into surface water be shown to be "**currently acceptable**" (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented[4])? **NA**

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site's surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR
2) providing or referencing an interim-assessment,[5] appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment "levels," as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of "contaminated" groundwater can not be shown to be "**currently acceptable**") - skip to #8 and enter "NO" status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter "IN" status code.

Rationale and Reference(s):_____

[4] Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

[5] The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the "existing area of contaminated groundwater?"

__✓___ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the "existing area of groundwater contamination."

_____ If no - enter "NO" status code in #8.

_____ If unknown - enter "IN" status code in #8.

Rationale and Reference(s) **See discussion above.**

Monitored Zone	Well Number
Overburden	W-1
	W-2
	OW-15
	OW-17R
	OW-33
	Ow-35
	Tile Collection System
Zone A	OW-31
Zone A & B	OW-20
	OW-21
	OW-24
	OW-25
	PW-27
	PW-30A
	OW-36
Zone C	OW-14
	OW-18R
	OW-22
	OW-29
	OW-32
	Ow-37
Zone C & D	PW-28
Zone D	OW-26

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

__✓__ YE - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the **_Occidental__Packard Road** facility, EPA ID #**NYD002103216**, located at **5000 Packard Road, Niagara Falls, New York**. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

_____ IN - More information is needed to make a determination.

Completed by (signature) William E Wertz

Date 9/22/2000

(print) William E. Wertz, Ph.D.
(title) Senior Engineering Geologist

Supervisor (signature) Paul J. Merges

Date 9/22 /2000

(print) Paul J. Merges, Ph.D.
(title) Director, Bureau of Radiation & Hazardous Site Management
(EPA Region or State) NYSDEC

Locations where References may be found:

NYSDEC
Division of Solid and Hazardous Materials
50 wolf Road
Albany NY 12233

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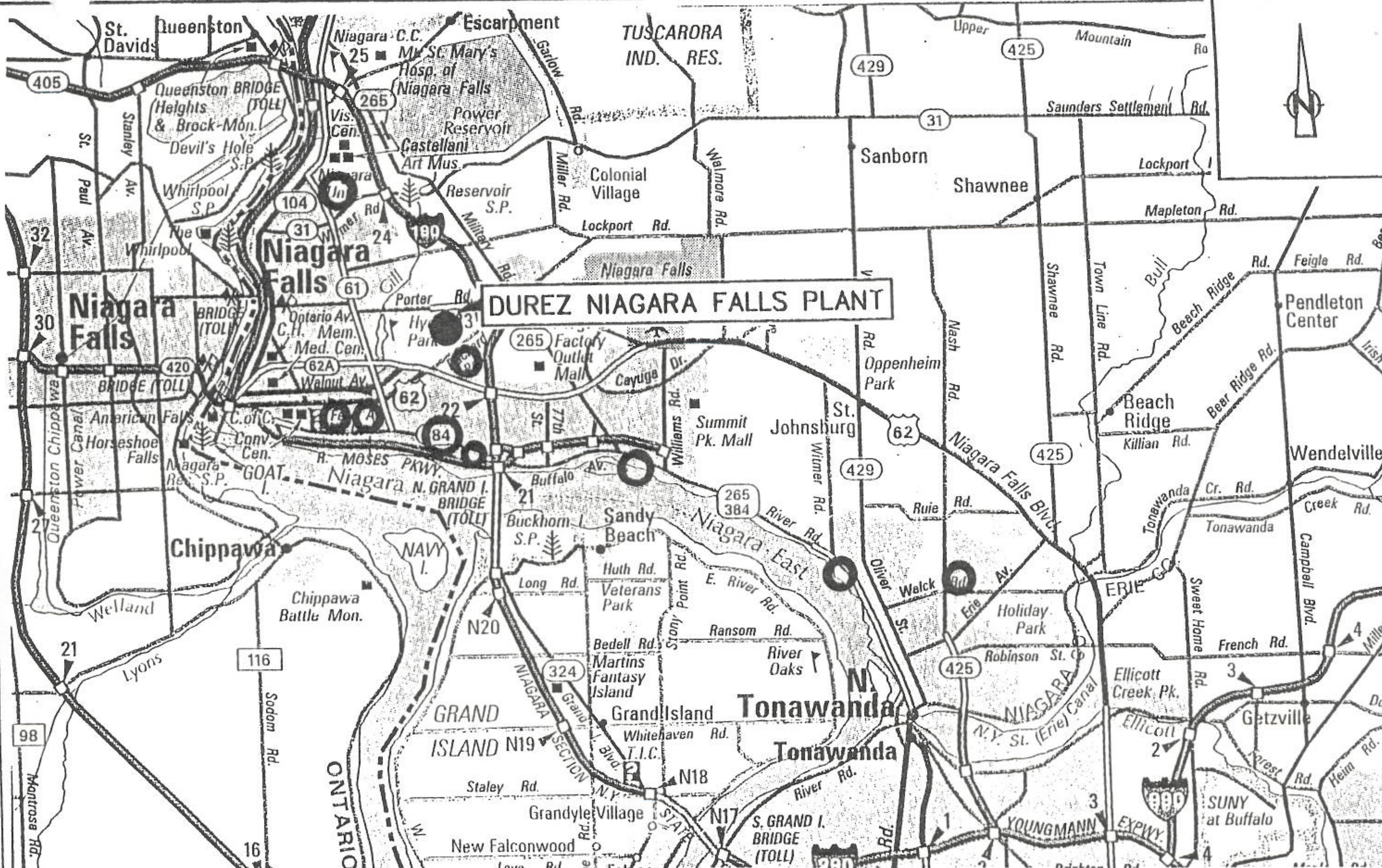
Note: Figures are attached as a separate file: **OCCEIFig**..pdf



SOURCE: RAND McNALLY ROAD ATLAS,–1996

figure 1

SITE LOCATION

Durez Engineering Materials – Niagara Falls Plant Site

CRA

9855 (1) APR 24/97 (W) REV.0

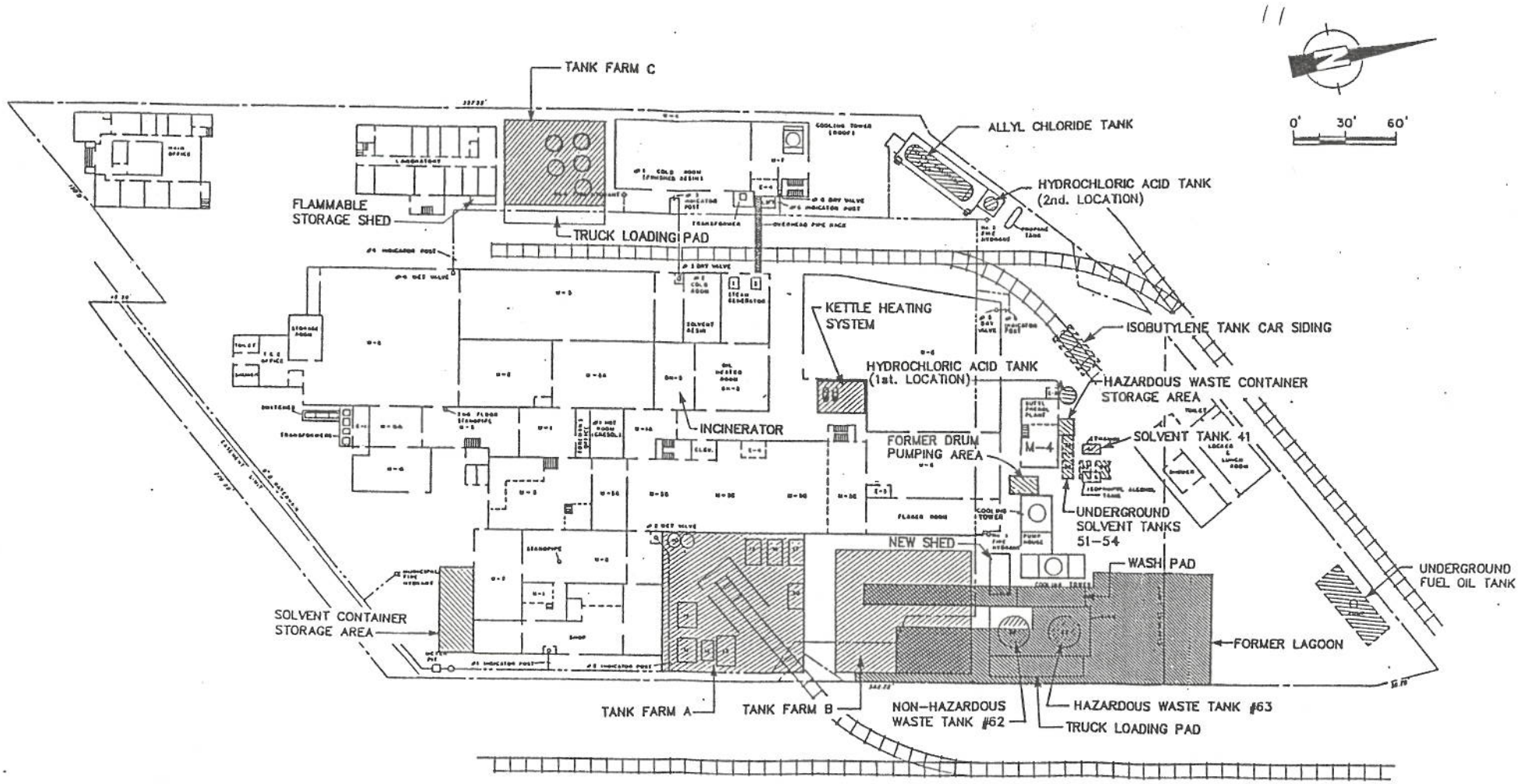


figure 2.

FORMER AND CURRENT SOLID WASTE MANAGEMENT UNIT LOCATIONS
RCRA FACILITY INVESTIGATION
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

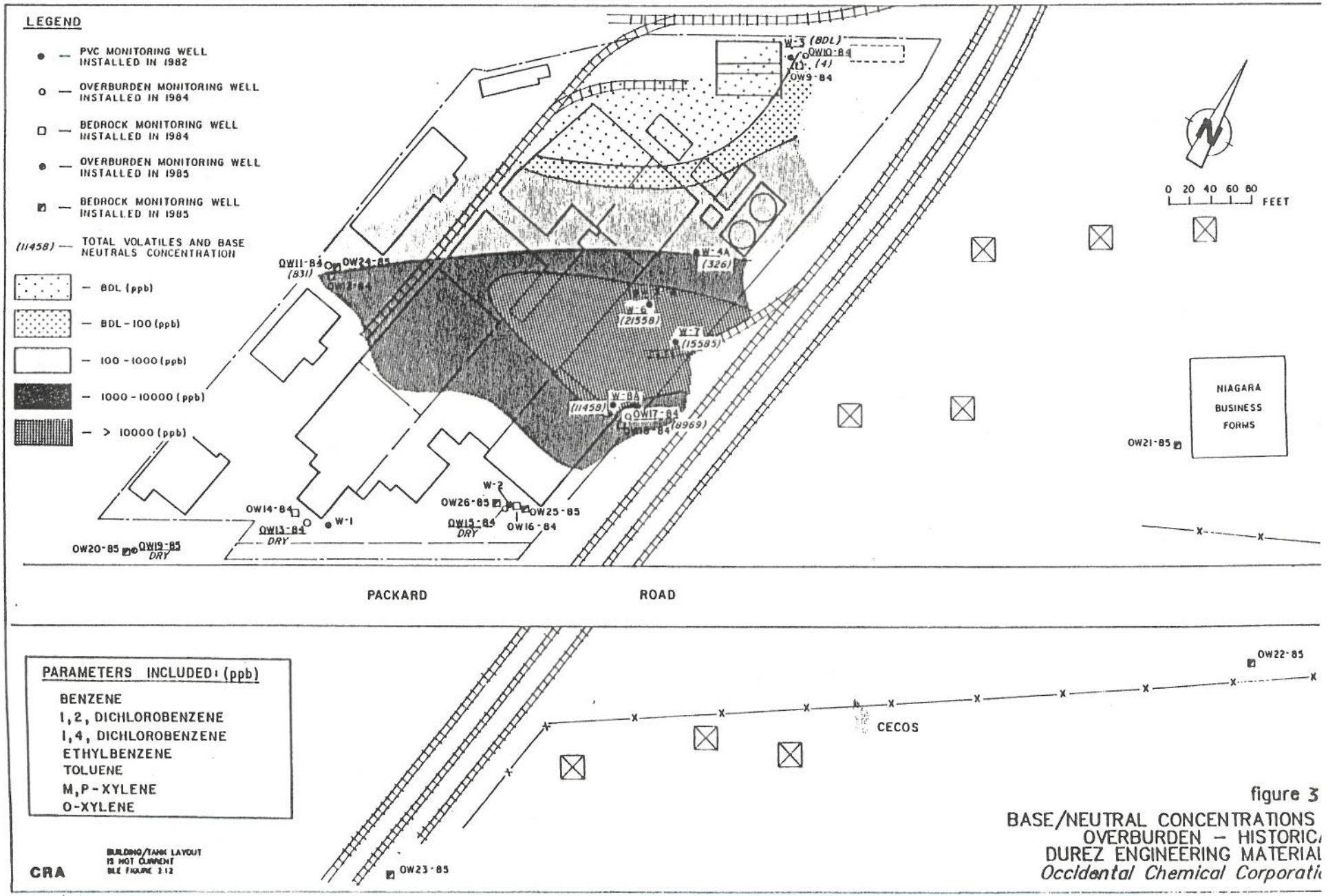


figure 3
BASE/NEUTRAL CONCENTRATIONS
OVERBURDEN – HISTORIC
DUREZ ENGINEERING MATERIAL
Occidental Chemical Corporati

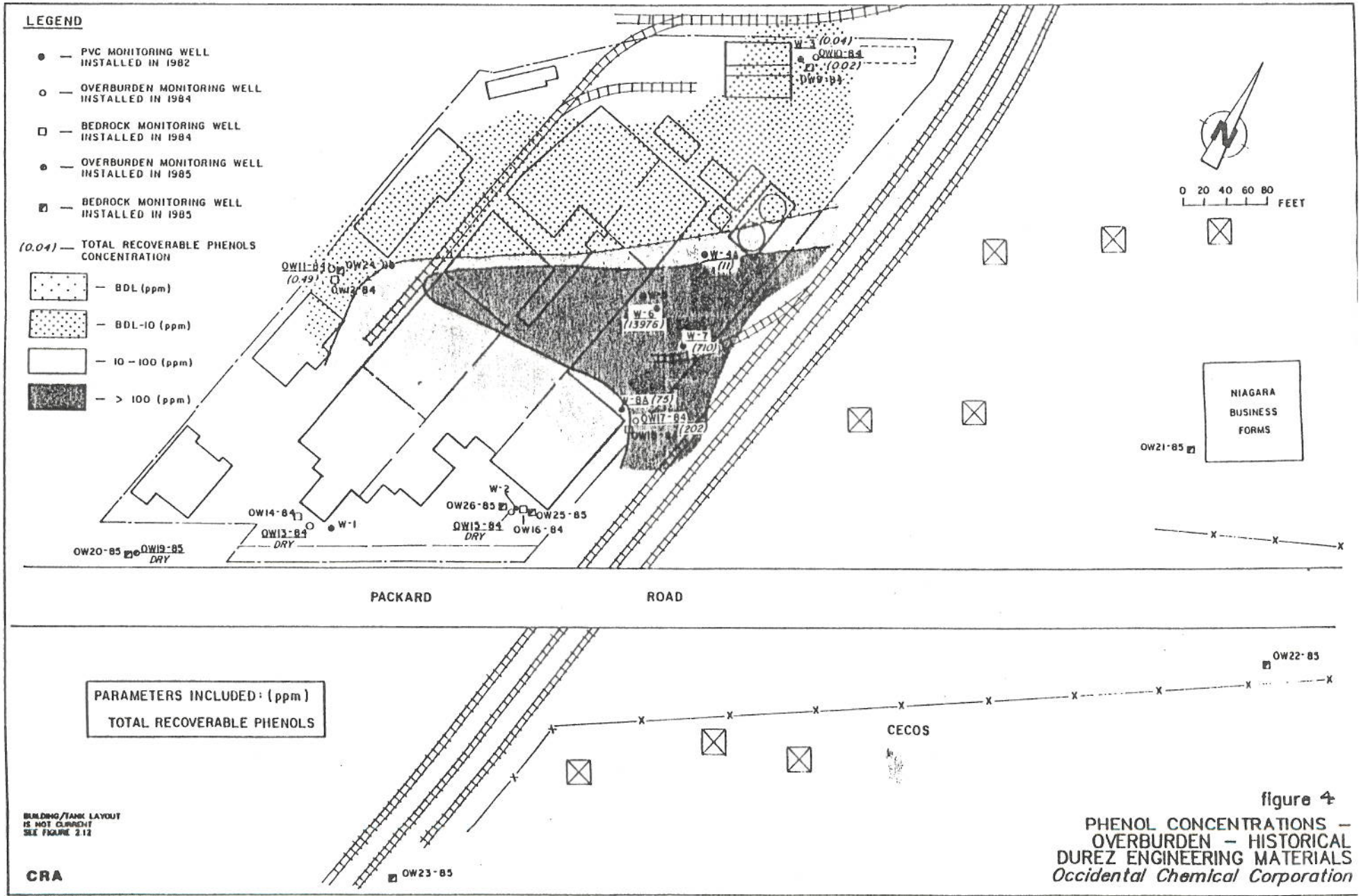


figure 4

PHENOL CONCENTRATIONS – OVERBURDEN – HISTORICAL
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

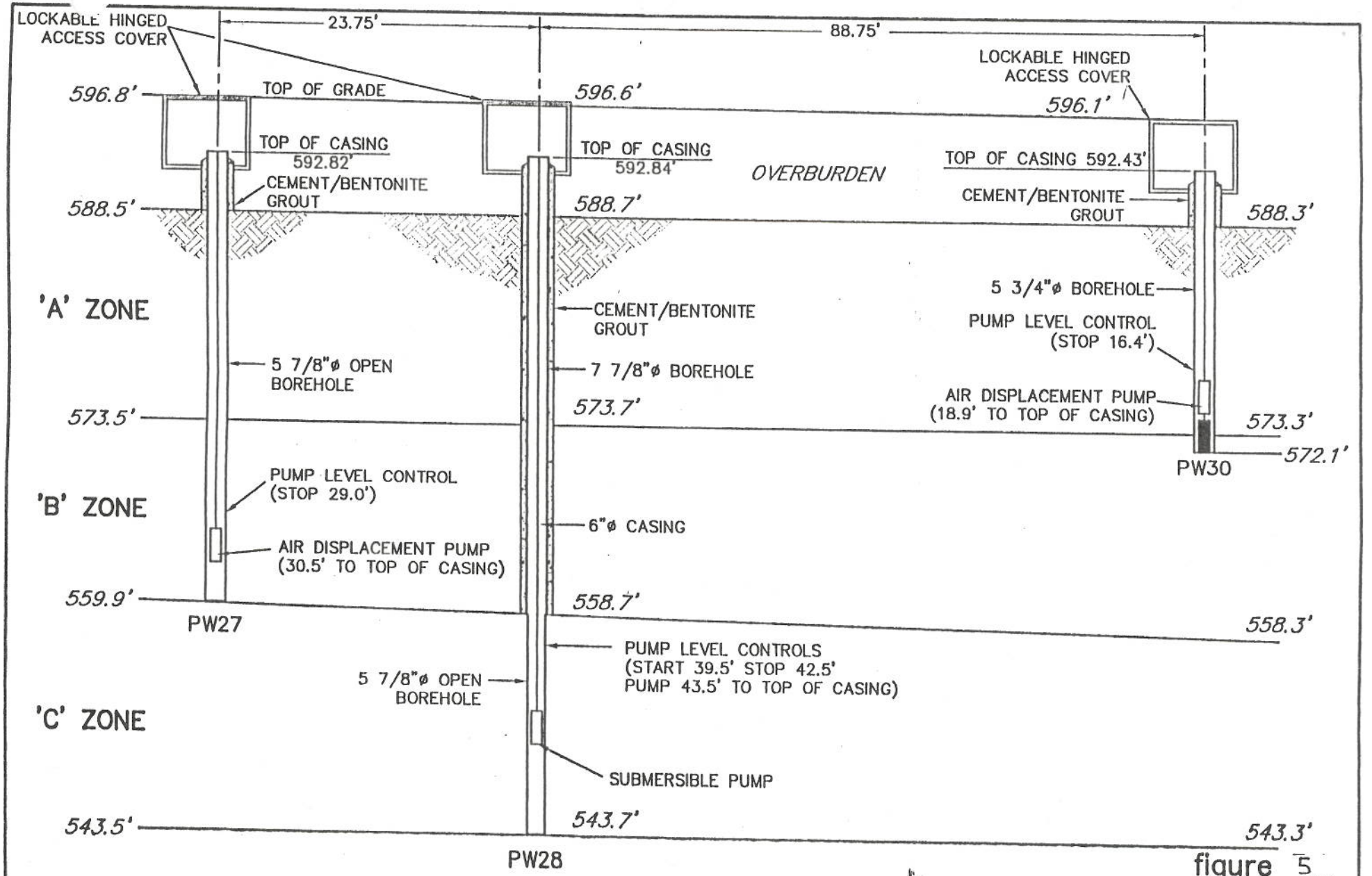


figure 5

VERTICAL SCALE: 1"=10'

PURGE WELLS CROSS SECTION
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

CRA

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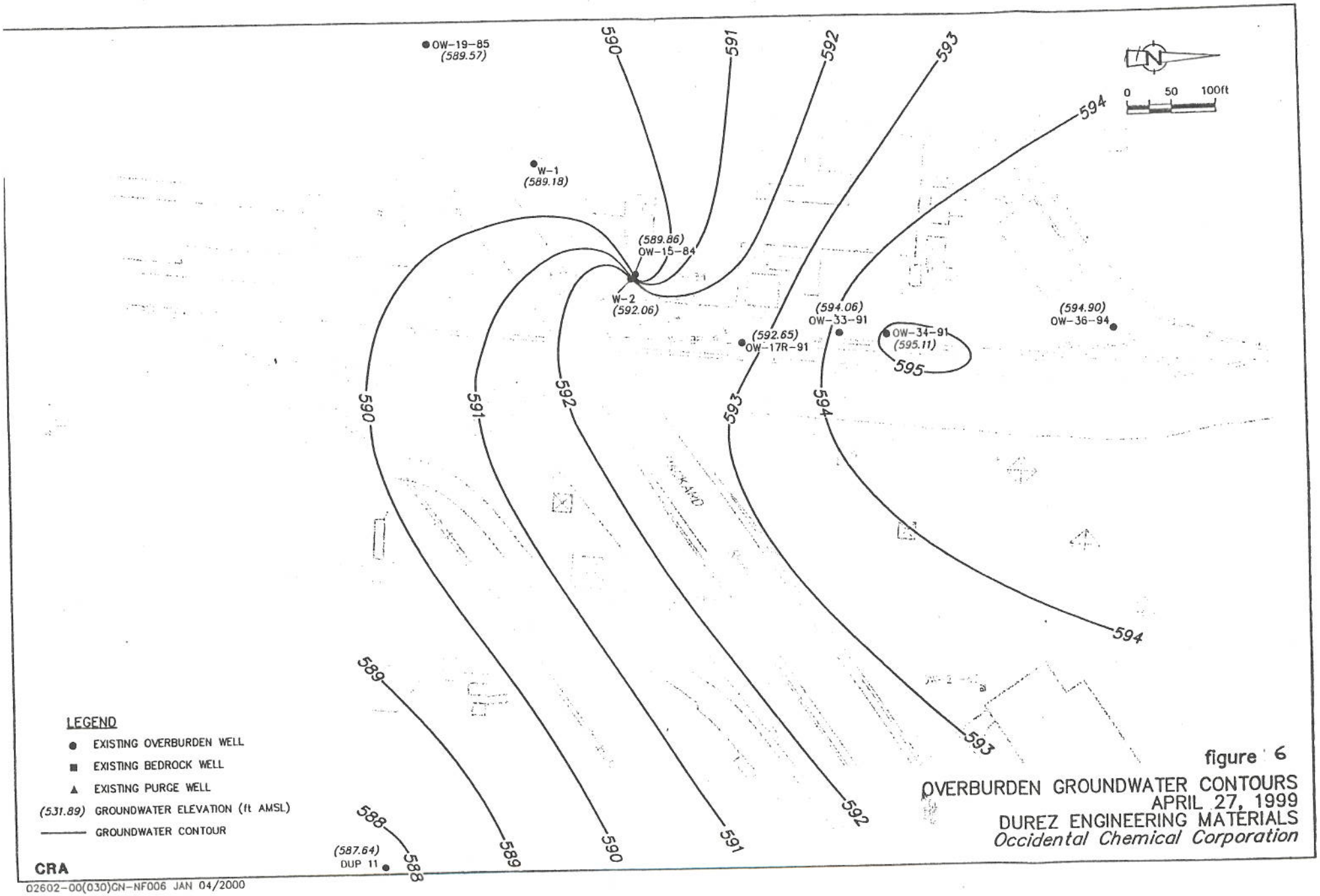

figure 6

OVERBURDEN GROUNDWATER CONTOURS
APRIL 27, 1999
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

CRA

02602-00(030)GN-NF006 JAN 04/2000

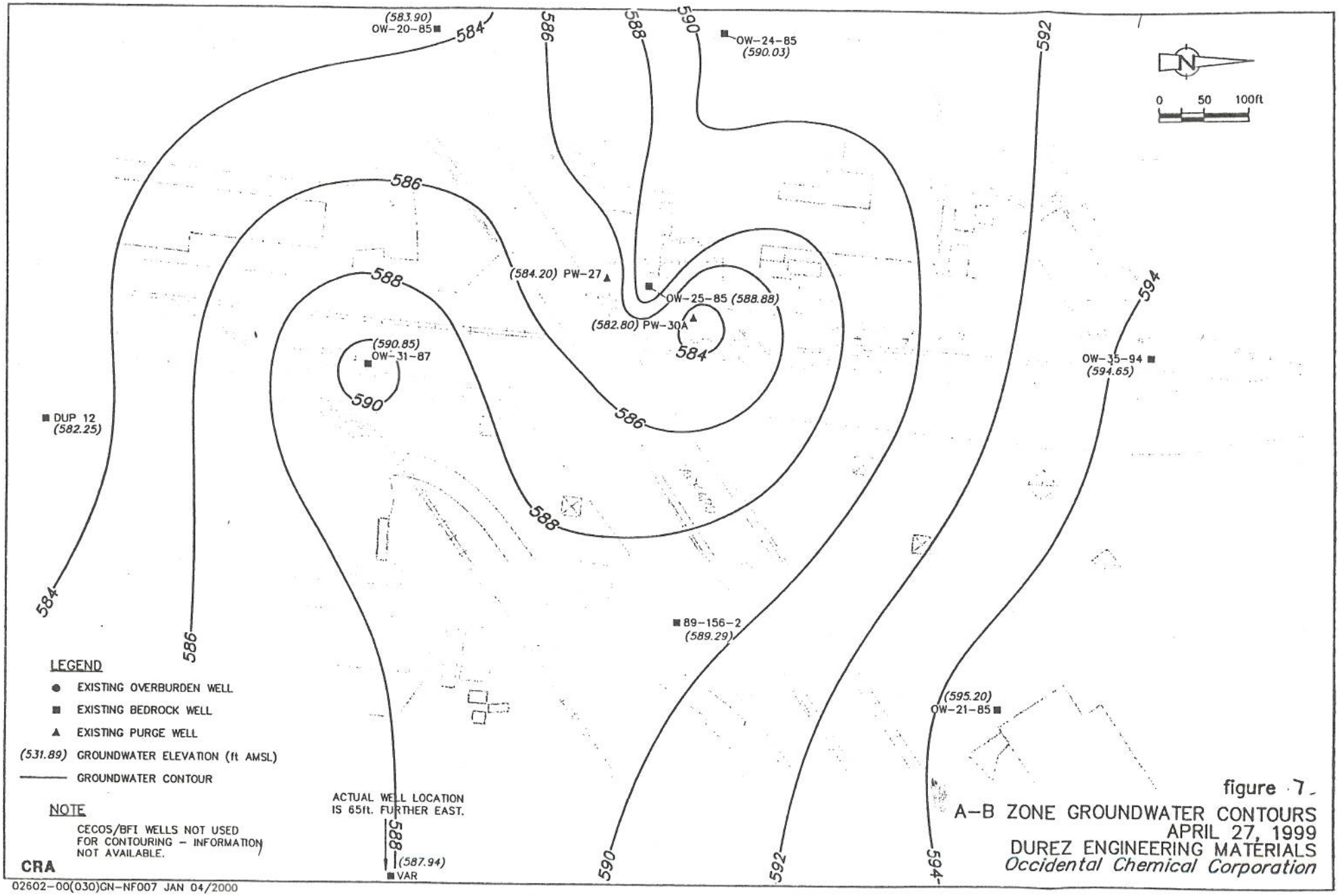

figure 7

A-B ZONE GROUNDWATER CONTOURS
APRIL 27, 1999
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

02602-00(030)GN-NF007 JAN 04/2000

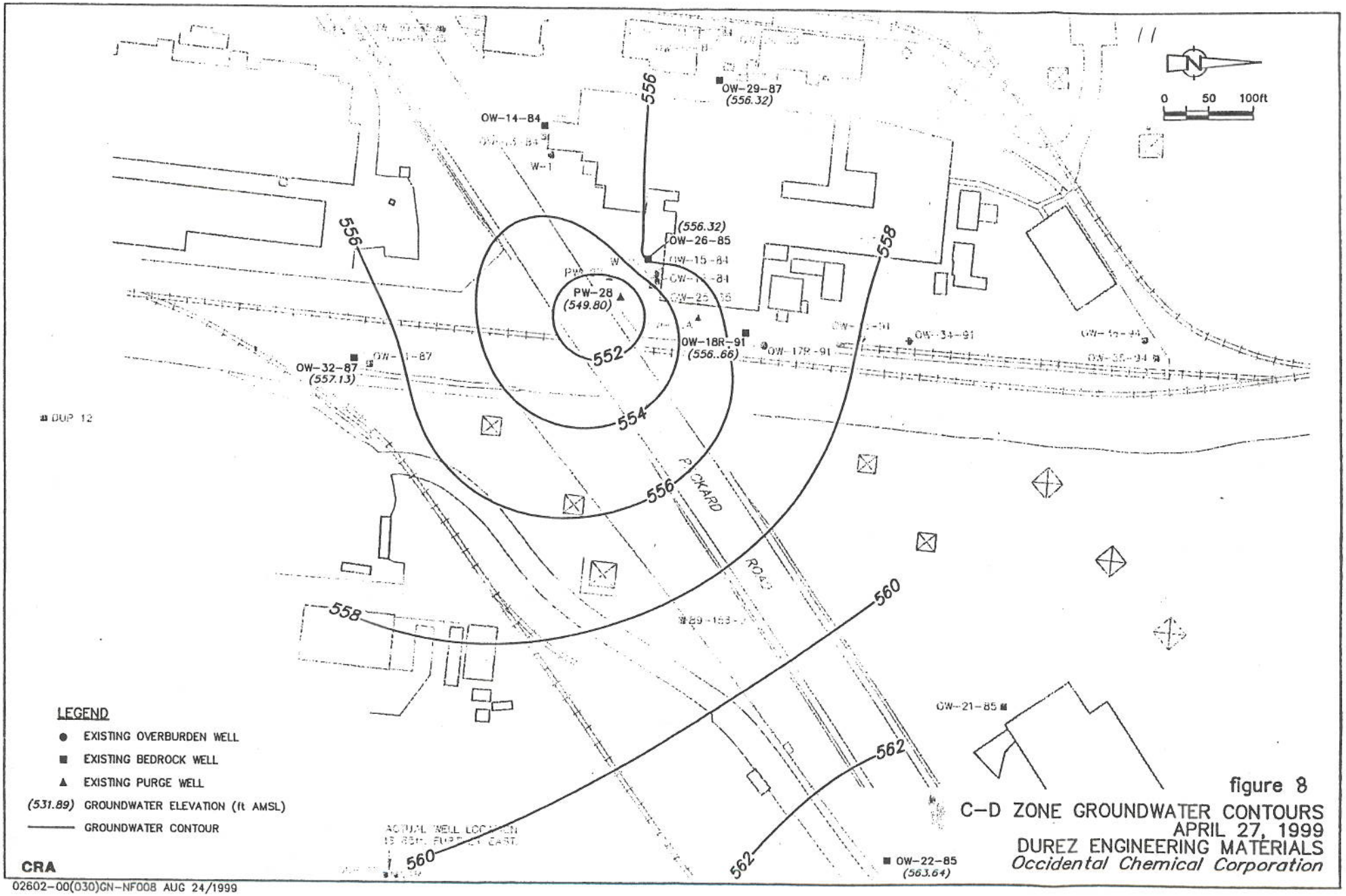

figure 8

C-D ZONE GROUNDWATER CONTOURS
APRIL 27, 1999
DUREZ ENGINEERING MATERIALS
Occidental Chemical Corporation

02602-00(030)GN-NF008 AUG 24/1999

TABLE 2.

SUMMARY OF PHENOLICS LOADINGS AND FLOWS BY WELL
OCCIDENTAL CHEMICAL CORPORATION
DUREZ ENGINEERING MATERIALS

Time Start	Period End	PW-27 Flow (gal)	Phenol Conc[1] (ppm)	Phenol Loading[2] (lbs)	Phenol Loading[3] (lbs.)(Avg.)	PW-28 Flow (gal)	Phenol Conc[1] (ppm)	Phenol Loading[2] (lbs)	Phenol Loading[3] (lbs.)(Avg.)	PW-30 Flow (gal)	Phenol Conc[1] (ppm)	Phenol Loading[2] (lbs)	Phenol Loading[3] (lbs.)(Avg.)	Manhole Flow (gal)	Phenol Conc[1] (ppm)	Phenol Loading[2] (lbs)	Phenol Loading[3] (lbs.)(Avg.)
Mar-89	Feb-90	306,296	*38.9*	99.4	*133.7*	1,275,938	*10.18*	108.33	*250.40*	936,418	*0.00*	0.00	*0.00*				
Mar-90	Mar-91	94,755	*19.0*	15.0	*65.2*	1,128,592	*71.23*	670.45	*1752.06*	203,038	*327.48*	554.53	*1933.61*				
Apr-91	Mar-92	325,694	190.00	516.09	*652.89*	2,173,132	2.90	52.56	*71.33*	556,794	170.00	789.42	*1003.77*				
Apr-92	Mar-93	338,688	*0.3245*	0.92	*1.12*	1,572,480	*202.5*	2655.68	*4980.93*	483,840	*119.76*	483.26	*707.12*				
Apr-93	Mar-94	160,559	0.005	0.01	*0.02*	2,428,934	4.6	93.18	*113.15*	881,957	190.00	1397.55	*1121.86*	180,165	65	97.67	*47.72*
Apr-94	Mar-95	622,337	0.071	0.37	*0.24*	3,453,141	0.54	15.55	*13.28*	946,337	100.00	789.25	*590.45*	129,791	70	75.77	*51.39*
Apr-95	Jul-96	845,412	*0.0275*	0.50	*0.24*	5,157,472	*176.4*	7587.55	*4338.94*	1,277,107	*16.95*	180.54	*100.08*	105,279	70	61.46	*51.39*
Aug-96	Jun-97	664,683	0.015	0.08	*0.05*	4,183,914	180	6280.89	*4427.49*	643,187	13.00	69.73	*76.76*	35,300	235	69.18	*172.52*
Jul-97	Jun-98	433,292	0.005	0.02	*0.02*	4,109,484	1.90	65.12	*46.73*	656,562	20.00	109.51	*118.09*	36,225	50.5	15.26	*37.07*
Jul-98	Jun-99	328,475	0.025	0.07	*0.09*	4,009,933	1.20	40.13	*29.52*	494,511	24.00	98.98	*141.71*	41,400	49	16.92	*35.97*
	Total:	4,120,191		632.45	*853.58*	29,493,020		17569.45	*16023.83*	7,079,751		4472.78	*5793.45*	528,160		336.26	*396.07*
	Avg.	*412,019.10*	*24.84*		*85.36*	*2,949,302.00*	*65.15*		*1,602.38*	*707,975.10*	*98.12*		*579.34*	*88,026.67*	*89.92*		*66.01*

Notes:

1 Phenol concentration is average if multiple analyses are available for a time period or actual if only one analyses was performed for that time period.

2 Phenol loading is calculated using the calculated flow for each time period and the phenol concentration for each time period.

3 Average phenol loading is calculated using the average flow for the nine time periods and the phenol concentration for each time period.

Italics indicates number is an average value.

Calculation for loading is (8.34 x flow/1,000,000) x conc.

ppm Parts Per Million.