OCCIDENTAL CHEMICAL CORPORATION OLIN CORPORATION

ENGINEERING REPORT

FINAL

VOLUME III

APPENDIX B

TECHNICAL SPECIFICATIONS ATTACHMENT A

Niagara River Borehole Drilling Program, Rev. 1 May 1988 Bathymetric Survey of the Niagara River, July 1988 Monitoring Well/Borehole Stratigraphic and Instrumentation Log, April 1987

> 102nd STREET LANDFILL SITE NIAGARA FALLS, NEW YORK

SEPTEMBER 9, 1995 Revised: FEBRUARY 5, 1996

FLUOR DANIEL, INC. MARLTON, NEW JERSEY

Occidental Chemical Corporation



NIAGARA RIVER BOREHOLE DRILLING PROGRAM

102nd Street Landfill Niagara Falls, New York

REVISION 1

bcc: A. Young, B. Morrissey, J. Kay, A. Weston, D. Cummings, M. Wasser, A. Hirsch, K. Rubin FILE COPY

RECEIVED

MAY 1 1 1988

D. L. CUMMINGS

Cccidental Chemical Corporation

May 6, 1988

Paul J. Olivo Project Manager U.S. Environmental Protection Agency Region II 26 Federal Plaza New York, New York 10278

Thomas R. Christoffel, P.E. Bureau of Remedial Actions N.Y.S. Dept. of Environmental Conservation 50 Wolf Road - Room 222 Albany, New York 12233

Dear Messrs. Olivo and Christoffel:

Enclosed are five copies for each of you of Revision 1 of the Niagara River Borehole Drilling Program.

David L. Cummings

OLIN CORPORATION

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OCCIDENTAL CHEMICAL CORPORATION

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Special Environmental Programs Occidental Chemical Center 360 Rainbow Boulevard South, Box 728, Niagara Falls, New York 14302 716/286-3000

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JUN 1 5 1989

D. L. CUMMINGS



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

FILE COPY

REGION II JACOB K. JAVITS FEDERAL BULDING NEW YORK, NEW YORK 10278

JUN 1 4 (PR)

(EXPRESS MAIL)

(EXPRESS MAIL)

Alan F. Weston, Ph.D. Occidental Chemical Corporation 360 Rainbow Boulevard Niagara Falls, NY 14302

David L. Cummings Olin Corporation P.O. Box 248 Charleston, TN 37310

Re: 102nd Street Landfill; Niagara Falls, New York

Gentlemen:

The U.S. Environmental Protection Agency and N.Y. State (the "Governments") have completed their review of the following submittals, and have found them to be acceptable. These documents are accordingly approved as written.

- Niagara River Borehole Investigation, Revision No. 1.

- Assessment Chemical Monitoring Program, Revision No. 2.

If you have any questions regarding either document, please contact one of the undersigned.

Sincerely yours,

Paul J. Olivo Project Manager U.S. Environmental Protection Agency

Murray E. Sharkey, 'P.E.' Project Engineer N.Y. State Department of Environmental Conservation

cc: A. Wakeman, NYSDOH N. Spiegel, NYSDOL D. Payne, USEPA M. Giuliani, USDOJ MBH B Franks LMM JCB





CHEMICALS GROUP

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NIAGARA RIVER BOREHOLE DRILLING PROGRAM

102nd Street Landfill Niagara Falls, New York

REVISION 1

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April 1988 Ref. No. 1431

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In order to supplement existing information and to define the geologic stratigraphy beneath the Niagara River adjacent to the Occidental Chemical Corporation/Olin Corporation (OCC/Olin) 102nd Street Landfill Site, a drilling program was conducted in the Niagara River between the eastern and western boundaries of the Landfill. This program took place during the period December 18 - 22, 1987. As an additional benefit of the drilling program, the completion of the borings provided valuable information with regards to defining the areal limit of NAPL presence and the factors influencing NAPL migration at the Site.

The purpose of this report is to present the results of the drilling program.

2.0 PURPOSE

The primary purpose of this drilling program was to gather additional information regarding the elevation of the top of the clay/till stratum off-shore and adjacent to the OCC/Olin 102nd Street Landfill Site. The main area of concern is in the vicinity of the clay/till depression in the lowland area of the Site. The extent of the clay/till depression has been a topic of discussion for several years. The only way to resolve the issue was through investigation of overburden stratigraphy beneath the Niagara River in close proximity to the shoreline.

In addition, the off-shore drilling program was designed to provide essential stratigraphic and physical property data necessary for future evaluation of potential remedial alternatives for the southern Site boundary.

In accordance with the Site Operations Plan, all soil samples recovered during drilling were examined by visual and olfactory means for the presence of NAPL and chemical contamination. This was of particular interest due to the fact that NAPL had been previously observed in certain boreholes in close proximity to the Niagara River shoreline.

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3.0 PROCEDURES

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To drill the boreholes in the River, a river barge was used to bring a drill rig to the Site. On Friday, December 18, 1987, a 100x50 ft. flat deck spud barge was brought to the Site. Mounted on the back of this barge was a Diedrich D-50 truck-mounted drill rig. All equipment and supplies were also located on the barge. The barge was equipped with a rowboat to gain access to and from the Site for field personnel.

Prior to commencing the drilling, buoys were set in the River to mark the proposed drilling locations. A total of seven buoys were set to mark the initially proposed drilling locations with the understanding that the need for subsequent drilling locations would be based upon the findings of the initial seven borings.

The initial seven locations were set along primary vectors of the sediment survey and at distances from shore that ensured that the borehole locations would be beyond the identified limits of chemical presence in the sediment as defined by the sediment survey. This precaution ensured that no sediment containing site specific chemicals was disturbed during the course of drilling the boreholes.

Depending upon River conditions, the barge was maneuvered into position as close as possible to each of the initial buoys by use of a tugboat. In cases where the markers could not be reached due to the barge draft and shallow water conditions, alternate locations were chosen which were as close to the proposed position as possible and still along the vector line. This was accomplished by sighting from the barge to a preset baseline marker on the shoreline using the buoy as an intermediate point of alignment.

Based upon the information collected from the initial seven boreholes, it was determined that three additional boreholes would be drilled. The locations of all ten boreholes are presented in Figure 1.

The drill rig was situated on a platform which extended off the back of the barge. Prior to commencement of each borehole, the distance from the top of this platform to the top of the water surface and the depth of the water were measured. At the same time, the water level elevation was measured at the stilling basin located at the sewer discharge headwall on-site. Using these measurements, the elevation of the River bottom at the drilling location was calculated.



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Drilling was accomplished using hollow stem augers (8-inch OD, 4 1/4-inch ID). Continuous split spoon samples were collected in advance of the augering operation. These samples were logged for geologic stratigraphy and examined for visual and olfactory evidence of chemical presence. Soil record samples were retained and are presently stored at the OCC Niagara Plant.

Typically, each borehole extended 4 to 6 feet into the clay or till stratum, whichever was first encountered. None of the boreholes extended to the top of the bedrock surface. Upon completion, each borehole was backfilled with cement/bentonite grout before the augers were removed.

Before proceeding to the next drilling location, a buoy was placed at the completed borehole. These completed locations were later surveyed by a licensed New York State Surveyor to obtain accurate Site grid coordinates. A complete list of location information is presented in Table 1.

At four locations (A-252, E-286, G-257 and I-136) undisturbed Shelby tube samples of the fine grained stratigraphic units were collected. The four samples were submitted to Woodward Clyde Consultants (WCC) for physical testing including grain size distribution analysis, natural

BOREHOLE SUMMARY

BOREHOLE NUMBER	DATE COMPLETED	ELEVATION TOP OF SEDIMENT	GRID COORDINATE	LOCATION EAST
A-252	Dec. 21/87	561.3	762.329	19 2 9.098
C-283	Dec. 18/87	560.8	802.624	1572.609
C-357	Dec. 22/87	560.4	875.950	1585.784
D-275	Dec. 21/87	561.4	776.431	1391.996
D-426	Dec. 22/87	560.0	924.790	1420.432
E-286	Dec. 18/87	561.6	821.096	1223.205
E-371	Dec. 22/87	560.7	907.050	1226.88
F-287	Dec. 22/87	560.8	926.627	1053.357
G-257	Déc. 19/87	560.8	967.830	874.445
I-136	Dec. 21/87	561.2	901.514	498.274

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water content, unit dry weight, specific gravity, Atterburg Limits and laboratory permeability. In addition, each sample was described and classified according to the Unified Soil Classification System.

During the period while the Niagara River Borehole Drilling Program was taking place, the U.S. Army Corps of Engineers was conducting an erosion control study on Lake Erie. As part of their study, the water level of the Niagara River was to be varied from one foot above its normal elevation of 563 ft. AMSL (as measured at the Grass Island Pool) to one foot below this normal elevation. Water levels measured at the site during the drilling program ranged from 563.59 ft. AMSL to 565.11 ft. AMSL (based on USGS datum). То the extent practicable, efforts were made to drill the boreholes in shallower water while the River was highest. As previously mentioned, even with the high water levels, the draft of the barge precluded reaching all of the desired drilling locations. Consequently most drilling locations are further from shore than originally desired.

In general, the natural geologic stratigraphy beneath the Niagara River and adjacent to the Site was consistent with the observed on-site geologic stratigraphy in terms of composition, depth and thickness of each unit present. The fill unit is absent from the offshore stratigraphy. Stratigraphic and Instrumentation Logs for each borehole are included in Appendix A.

A summary of each of the stratigraphic units encountered is presented in the following sections.

5.1 ALLUVIAL RIVER SEDIMENTS

The uppermost overburden unit observed consists of alluvial river sediments. These alluvial river sediments typically consist of gray silty fine sand. This stratum ranges in thickness from approximately 4 feet to 17 feet. As observed on-site, these sediments are thickest in the central area of the site in the vicinity of vectors D and E. Along these two vectors, it also appears that the thickness of the alluvial material decreases as the distance from shore increases.

Underlying the alluvial river sediments is the glaciolacustrine clay. The glaciolacustrine clay is generally a soft, red-brown and gray silty clay. The observed thickness of the clay varies from not present to greater than six feet. It is thinnest at the east and west ends of the site in the vicinity of vectors A and I. In fact, there was no clay present at the I-136 drilling location. The thickest clay layer was observed along vectors F and G and at the furthest boreholes from shore along vectors D and E. Throughout this central area, the clay was in excess of 5 feet in thickness.

Figures 2 and 3 illustrate the elevation of the top of the clay stratum and an isopach map of clay thickness respectively.

5.3 GLACIAL TILL

The glacial till which underlies the glaciolacustrine clay was encountered in six of the ten boreholes completed. Four of the boreholes were terminated in the clay without encountering the till. The till is comprised of a red-brown to brown sandy silt with clay and gravel. Although no information was collected regarding the





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thickness of the till regime, the contours of the top of the glacial till (Figure 4) closely resemble those seen on site. Figure 5 presents an isopach map of the thickness of the till stratum as it is now defined. It is to be noted that since the top of bedrock was not defined under the River, it was necessary to extrapolate the on-site top of bedrock contours out into the River for the purpose of estimating the thickness of the till layer along the shoreline.

Review of the top of bedrock contours beneath the Site and the extrapolation thereof into the River identified one probable interpretation error in the historical data. One of the initial boreholes installed in 1977 (BL2-77) encountered refusal at 32 feet below ground resulting in a bedrock elevation of approximately 537.6. This information does not appear consistent with the top of bedrock elevation (approximately 532) encountered at OW24-79 and confirmed at OW44-86 and OW45-86 which are located in the same vicinity. In fact, the stratigraphy at all of the 1977 well installations identifies slight but consistent differences with adjacent wells and boreholes. Consequently, the stratigraphy from these borings was not included in the contour maps generated.

Using the combined maps of clay and till, the top elevation of the low permeable layer underlying the Site has been generated and is presented in Figure 6. Similarly,



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an isopach map identifying the combined thickness of the clay and till strata is presented in Figure 7.

Table 2 summarizes the stratigraphic details of each of the Niagara River boreholes. To better conceptualize the stratigraphy beneath the Site, three north-south geologic cross-sections have been prepared through the alignments shown on Figure 8. The cross-sections are presented in Figures 9, 10 and 11. TABLE 2 STRATIGRAPHIC SUMMARY NIAGARA RIVER BOREHOLES

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Thickness (ft.) >0.8 >6.0 >2.5 >0.5 >3.0 >3.0 ľ 1 I Till 552.3 551.8 551.9 544.9 542.6 549.2 Elev. AMSL) (ft. ł 1 ł 1 Depth (ft. 9.0 9.0 8.5 16.5 19.0 12.0 BG) 1 Thickness (ft.) 0.5 3.0 1.5 2.5 >5.5 2.0 2.0 >5.0 >5.0 I Clay 557.0 555.8 544.6 Elev. 552.8 554.8 553.4 547.4 554.5 554.7 AMSL) (ft. ! Depth (ft. 14.0 5.5 17.0 6.0 8.5 7.0 3.8 BG) 6.0 Thickness (ft.) 8.5 6.0 7.0 7.0 7.0 7.0 5.5 5.5 5.5 6.0 6.0 8.8 8.8 8.3 8.8 8.8 72.0 Alluvium Elev. (ft. 560.8 561.2 560.0 561.6 561.3 560.8 561.4 560.8 560.4 560.7 AMSL) Depth (ft. BG) 0000000000 Depth (ft. BG) Sampled 9.8 115.0 111.0 222.0 222.0 111.0 115.0 Borehole No. C-283 C-357 D-275 D-426 E-286 E-371 G-257 F-287 I-136 A-252

All elevations are based on USGS datum.



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SYN BORING	SAMPLE	DEPTH	DESCRIPTION	W(=)	W (_)	W (-)
D A-250 .	A-229	9,65	BROWN FLORAVELLY CO.TO FL.SANDY SHITY CLAYTON	100	1	
				10.5	120	23
J					<u>+</u>	{───┥
h					 	
					╉╼───	t

SAMPLE NUMBER : A SAMPLE DEPTH, FT. : S SPECIFIC GRAVITY : INIT. W.C X : TOTAL DENSITY PCF : DRY DENSITY PCF : INIT. VOID RATIO : INIT. SATURATION, X :	2250 3.651 2.75 18.48974 148.4205 134.3297 .2768681 184.1896				
EFFECT. ARESS., TSF: FINAL VOID RATIO : FINAL SATURATION X: TOTAL DENSITY PCF : 1 DRY DENSITY PCF : 1	. 36 3. 533444 46. 8186 148. 8186 135. 7984				17.5
8 24 RUN NG. : 1 INIT. GRAD. : 26.22921 FINAL GRAD. : 21.1068 PERM. AT TEMP 24 DEG PERM. AT 20 DEG. CEN.	78 - CEN. : 7.0469 : 5.4127165- A A	48.75 9416-08 CH/SEC	19.5	38	20.9
8 24 RUN NO. : 2 INIT. BRAD. : 27.58696 FINAL BRAD. : 21.34735 FERM. AT TEMS 24 DES. FERM. AT 24 DES. DEN. :	96 - 12N: E.1853 - 5.6318132-06-	41.5 255-&6 D*/852 C*/SEC	- 19.15	38.4	28.7
8 24 RUM NG. : 3 INIT. SRAD. : 27.89323 INAL GRAD. : 19.1319 ERM. AT TEMP 24 DEG. ERM. AT 20 DEG. CEN. :	152 CEN. : 5.91401 5.381754E-08	41.3 52-08 CM/SEC CM/SEC	:9.35	36. 95	2:.45
8 24 UN ND. : 4 NIT. GRAD. : 25.66122 INAL GRAD. : 21.90911 ERM. AT TEMP 24 DEG. ERM. AT 20 DEG. CEN. :	89 CEN. : 5.63825 5.185234E-28	41 9€-08 Cn/Sec Cn/Sec	19.4	38. 4	28.65 ACKPRESSURE AL SAMPLE MEASUREME EIGHT 1009.2 INGTH 4.013 RCUMFERENCE
YERAGE PERM. DF 4 TRI	ALS : 5.65288E	-03			Mi (801

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CRA/WCC 1431-3/03/88-44-D-1 (X-25) ELEVATION IN FEET ASL 520 540-550-560. 570ő 510 530 580--Β E-528 ο. 8-120 BHE-371 **18**-240 BHE-286 ы Зоо GLACIAL TILL affosits <u>ю</u>. ANOLACUSTRINE QUY 420 **1**8-LEGEND MONITORING INTERVAL HORIZONTAL DISTANCE (FEET) 540 NIAGARA RIVER OW3-79 8-660 720 BH42-88 \int 0W42-88 0W41-85 HOLE @ 350.91eet ASL HOLE @ 350.91eet ASL MONITORING INTERVAL 404.9 -- 350.91eet ASL 8 GLACIAL TILL DEPOSITS 8 10 BEDROCK - DOLOMITE C 800 PIL 960 0W6-79 0W28-80 \Box 1020 1080 1140 1200 1260 B-1 GLACIOLACUSTRINE NORTH FENCE LINE ALLUMAL DEPOSITS ľ BUFFALO AVENUE figure 10 CROSS-SECTION B-B' *102nd Street Landfill Site* Ċ 96A,B 1320 1380 ₽_ ſ $\left[\right]$





6.0 PHYSICAL TESTING OF SHELBY TUBE SAMPLES

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The four Shelby Tube samples of clay/till collected during the borehole program were tested for physical characteristics by WCC. The results of these tests are presented in Table 3. As can be seen on the Table, all of the permeabilities are on the order of 6×10^{-8} cm/sec. Although three of the samples (A-252, E-286 and I-136) contained coarser material, suggesting that they are samples of till rather than clay, the fine-grained nature of the samples is evident from the fact that in excess of 54 percent of the soils from all tested samples pass the #200 sieve. While there is a large range in density (75 to 137 lb/cf) this does not appear to have affected the permeabilities although as expected, the moisture content values are inversely proportionate to the densities (47 to 9 percent). The testing results are presented in Appendix B.

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TABLE 3

PHYSICAL CHARACTERISTICS - SHELBY TUBE SAMPLES

S Borehole No.	ample Depth Tested (feet)	Specific Gravity	Moisture Content (%)	Density (1b/cf)	Plastic Limit	Liquid Limit	Laboratory Permeability (cm/sec)
A-252	0.6	2.75	10.5	134.2	23	50	5.65 x 10 ⁻⁸
E-286	19.9	2.85	35	88 .2	16	29	7.42×10^{-8}
G-257	7.8	2.75	46.6	74.8	22	36	6.97 x 10 ⁻⁸
I-136	13.5	2.74	9.4	136.5	14	17	5.96 x 10 ⁻⁸

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As previously mentioned, the installation of the ten Niagara River borings provided the Companies with an opportunity to learn more about the presence and migration of NAPL and chemical contamination emanating from the 102nd Street Landfill. Each split spoon sample of soil was carefully examined for visual and olfactory evidence of NAPL/chemical presence. NAPL was not identified in any sample collected, nor was there even the slightest trace of chemical odor.

This finding is significant in that it shows that NAPL has not migrated along the top of the clay/till stratum or any other low permeability stratum as far as the river boring locations. While there may be some potential that NAPL is migrating past the shoreline, the extent of this migration is limited. This is consistent with the findings of the on-site boreholes in which the presence of NAPL in the borings along the River shoreline has indicated that either NAPL was not present at all or there was only a small thickness of NAPL presence as was evident at BH9N-87. This is also consistent with the NAPL migration theories and clay/till basin postulations discussed in previous Milestone Report No. 14 and other NAPL reports.
8.0 SUMMARY

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The completion of the ten boreholes in the Niagara River provided two major pieces of information for the 102nd Street Remedial Investigation. These pieces are:

- that the top of clay/till in the south-central section of the site and area immediately off shore is, in fact, a bowl-shaped depression and will influence the migration of HNAPL;
- 2) that neither NAPL nor any chemical presence are evident in the sediment underlying the River at the sampled distance from shore.

APPENDIX A

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STRATIGRAPHIC AND INSTRUMENTATION LOGS

PRCVECT NAME: 102ND STREET LANDFILL JOB NO: 9-1431 HOLE NO: A-252 CLIENT: OCCIDENTAL CHEMICAL CORPORATION DATE COMPLETED: DECEMBER 21, 1987

LOCATION: NIAGARA RIVER HULE TYPE: HOLLOW STEM AUGER

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P. SMTTH GROUND ELEVATION: * 561.3 TOP OF PIPE ELEVATION: * N/A

	PROFILE	MONITOR INSTALLATION	8	AMPL	E.	PEI	TEST	101
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	8L(40 60	>>
-	AUGERS ADVANCED TO 1.0' Gray silty fine SAND (NATIVE) Wet	561.3 	1 2 3	ss ss ss	13 18 10 7 3			
-	Gray silty fine SAND - some coarse Wet to medium sand Red silty CLAY - plastic Moist SHELBY TUBE (TILL) Borehole terminated at 9.75'.	551.5	4	SS U	92	•		

▼ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

JOB NE: _____HOLE NE: _____C-283 PROJECT NAME: 102ND STREET LANDFILL

DATE COMPLETED: ______ DECEMBER 18, 1987___ • CLIENT: OCCIDENTAL CHEMICAL CORPORATION

HOLE TYPE: HOLLOW STEM AUGER

*

LOCATION : NIAGARA RIVER

*

PROFILE	MONITOR INSTALLATION	SAMPLE			PENETRAT
STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	BLOWS / FOOT	BLOWS / F
STRATIGRAPHY DESCRIPTION & REMARKS AUCERS ADVANCED TO 1.0'	560.79	1 2 3 4 5 6 7	8 8 8 8 8 8 1 TYPE	1001/5M078 10 12 8 20 27 6 WOR 5 1 10 8 27 10 8 27 10 8 27 10 5 9	

* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS

igvee water found ∇ static water level (37) grain size analysis



▼ WATER FOUND V STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

DATE COMPLETED: DECEMBER 21, 1987

	PROFILE	INSTALLATION	S S	AMPL	.Ε	PE	NETR/	ATION
DEPTH (ELEVATION)	STRATIGRAPHY Description & Remarks		NUMBER	TYPE	BLOWS / FOOT	8L 21	TES OWS /	FDOT
	AMERS ADVANCED TO 1.0' Gray silty fine SAND - trace shells, Wet trace plant fibers (NATIVE) Gray silty fine SAND Wet Gray silty fine SAND - trace coarse to Wet fine gravel, trace sand Gray silty fine SAND - coarse sand Wet lense at 12.5'-12.9'. Gray silty coarse to fine SAND Wet Red silty CLAY Red sandy silt - some clay, trace - coarse to fine gravel (TILL) Borehole terminated at 17.0'	561.4 	2 3 4 5 6 7 8		7 11 3 7 19 17 17 32 9 3 7 17 22 85 6 3	in the second of		

igvee water found $\,\,
abla$ static water level (37) grain size analysis

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PROJECT NAME: 102ND STREET LANDFILL JOB NE: 9-1431 HOLE NE: D-426

CLIENT: OCCIDENTAL CHEMICAL CORPORATION DATE COMPLETED: DECEMBER 22, 1987

HOLE TYPE: HOLLOW STEM AUGER

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LOCATION: NIAGARA RIVER

		INSTALLATION	\vdash		_	TES	5T
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	347T	BLOWS / FOOT	8LOWS /	•••
DEPTH	AUGERS ADVANCED TO 1.0' AUGERS ADVANCED TO 1.0' Gray silty medium to fine SAND - Wet Gray silty medium to fine SAND Wet Red-gray silty CLAY Moist Borehole terminated at 11.0'.	560.0 -8" Ø BH CEM/BEN BKTL 549.0	1 2 3 4 5	8 K K K K K K	12 9 16 9 WOR WOR 4	20 40	
	ι.						

♥ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

561,6

DATE COMPLETED: DECEMBER 18. 1987

SAMPLE

N/A

_ TOP OF PIPE ELEVATION:

MONITOR INSTALLATION



PENETRATION TEST BLOWS / FOOT BLOWS / FOOT NUMBER TYPE 20 40 60 60 . 561.6 8" Ø BH SS 6 1 11 Wet 2 SS 3 36 SS 17 3 Wet 24 4 SS 12 CEM/BEN Wet 29 BKFL SS 16 5 26 6 SS 5 Wet 15 SS 17 7 24 8 SS 22 Wet . 32 SS 7 9 15 10 U 11 SS 100+ Moist I -542.6 Moist-Dry



▼ WATER FOUND ∇ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

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PROJECT	NAME: 102ND STREET LANDFILL	JOB NE: 9-1431	HOLE NS.		F-25	7		
	OCCIDENTAL CHEMICAL CORPORATION		DATE CONPLE	TED:_	DE	CEMBI	<u>er 22,</u>	1987_
HOLE TYP	E: HOLLOW STEM AUGER		A RIVER					
GEOLOGIST	/ENGINEER: P. SMITH GROUND EL	EVATION: 560.8	TOP OF PIPE	ELE	OITAN	e*	N/A	·
	PROFILE		MONITOR	s			PENETI	RATION
			MSIALLATION			5	TE	ST / FOOT
PTH	STRATIGRAPHY			MBER	YPE	5		
	DESCRIPTION & REMARKS			₹.	►	BLOW	20 40	60 60
		······································						
0 -			560.8					
-	AUGERS ADVANCED TO 1.0'		8" Ø BH	1	ss	7	•	
-	Gray silty fine SAND (NATIVE)	Wet		ł		3	$\langle $	
-				2	ss	18	YI	
-						6	<i>•</i>	
5 -	Red cilty (TAV	Noist	BATL	3	ss	WOF		
-		rbist				WOR		
-				4	ss	WOR		
-						WOR		
-		····	551.8					
10 -	Borehole terminated at 9.0'.			ļ				
						1		

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* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS W WATER FOUND \bigtriangledown STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

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▼ WATER FOUND V STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

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LIVE HOLLOW STEM AUGER LOGIST/ENGINEER: P. SMITH	INT	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLET	ED:	Dŧ	CEM	345R 21,	19
DOUST/ENGINEER: P. SMITH GROUND ELEVATION: 561.2 TOP OF PPE ELEVATION: N/A PROFILE MONITOR INSTALLATION SAMPLE PENTTRATIGNAPHY DESCRIPTION & REMARKS PENTTRATIC 0 561.2 4 7 0 6 55 0 561.2 5 5 7 0 7 0 0 SHELBY TUBE (TILL) 546.2 7 0 546.2 7 0	E TYPI	E HOLLOW STEM AUGER LOCATION : NIAGAR	ARIVER					
PROFILE MONITOR INSTALLATION SAMPLE STRATIGRAPHY DESCRIPTION & REMARKS F F AUGERS ADVANCED TO 1.0' 561.2 AUGERS ADVANCED TO 1.0' BH Gray silty fine SAND (NATIVE) Wet Gray silty fine SAND - trace clay Wet Gray silty fine SAND - trace clay Met Red medium to fine sandy SILT - some clay, trace fine gravel, plastic (TILL) Moist clay, trace fine gravel, plastic (TILL) Borehole terminated at 15.0'. State 15.0'.	LOGIST	/ENGINEER: P. SMITH GROUND ELEVATION: 561.2	TOP OF PIPE	ELE	VATIO	N: <u>*</u>	N/A	
TEST TEST STRATIGRAPHY DESCRIPTION & REMARKS AUGERS ADVANCED TO 1.0' 561.2 AUGERS ADVANCED TO 1.0' 561.2 Gray silty fine SAND (NATIVE) Wet Gray silty fine SAND (NATIVE) Wet Gray silty fine SAND - trace clay Wet Gray silty fine SAND - trace clay Wet - CEM/BEN BRFL - - -<		PROFILE	MONITOR INSTALLATION	s	AMPL	E	PENETR	AT
Set 1.2 Set 1.2 AUGERS ADVANCED TO 1.0' Bit Gray silty fine SAND (NATIVE) Wet Gray silty fine SAND (NATIVE) Wet Gray silty fine SAND - trace clay Wet Gray silty fine SAND - trace clay Wet Red medium to fine sandy SHIT - some clay, trace fine gravel, plastic (THL) Moist SHELBY TUBE (THL) Stelley TUBE (THL) Borehole terminated at 15.0'. 546.2	ELE VATION)	STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	TYPE	-0WS / FOOT	TES BLOWS /	5T / F(
		AUGERS ADVANCED TO 1.0' Gray silty fine SAND (NATIVE) Wet Gray silty fine SAND - trace clay Wet Red medium to fine sandy STLT - some Moist clay, trace fine gravel, plastic (TILL) SHELBY TURE (TILL) Borehole terminated at 15.0'.	561.2 -8" Ø BH -CEM/BEN BKFL	₹ 1 2 3 4 5 6 7	۲ ۲ ۲ ۲	4 4 2 5 2 2 3 3 8 2		

* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
 ▼ WATER FOUND ♥ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

APPENDIX B

PHYSICAL TESTING RESULTS

Woodward Clyde Hydrometer Test Results

8702758

E-286

19-21

2.75

Project Number

Boring Number

Sample Number

Specific Gravity

Total Weight Grams 75

· 162 V

74

31

4.59

11, -0

5

20

40

60

100

CAL A	ANALYS	IS	A-28
E-226 SAMP	LE No 19-21	DEPTH 19.60' DISH NO	0-55
		WI SOIL(oven dry) _606.	4
ı_ <u>H</u>		OVEN DET(Wo) 75	<u> </u>
$\frac{\mathbf{G}}{\mathbf{i}-\mathbf{G}_{i}} = ($)(R-G,)	SPICIFIC GRAVITY 2.75	(c)

 #	Elapsed	Teno.	Hydro.	Particle	Per Cent
-1	E1 me	Degrees	Reading	Size	Finer
	(Hin)	(CEN.)	(CC/gr)	(MH)	0
	1.0	24.8	1.03600	8. 8349	61.861
1	2.8	24.0	1.03850	8. 1 269	51.528
_	5. 8	24.3	1.02758	8. 8177	45, 968
	15.8	24.8	1.02250	0.0106	36. 782
1	30.0	24.7	1. 82898	8.0079	31.988
,	50.0	24.5	1.01700	0.8058	26, 291
	250.0	24.5	1.01350	8. 8829	19.715
-1	1448.8	23.2	1.01000	8.8813	12.885

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88.3 84.3 84.1

79.2

75.0

C°	HYDR. READ.	CORREC.	CORRECTED HYDR. READING (R)	R - G ₁	PARTIC SIZE (mm)	% FINER (P)
24	1.0360					
24-	1.0305			· · · · · · · · · · · · · · · · · · ·		
24.8	1.0275		•.			
147	1.0200					
45	1.0170					
32	1.6100					
		····				









8762758-76 Summery of puncali sity Tools Depth M.C. ~E 8d Te Met Tet ie S0 sf k · k emlere no. pef Ľ - FE F-286 19.9 35.9 88.Z 100 - 6.60 30.6 7.42×108 0.001 U I - 136 x 96×10 13.5 9.4 136.5 85 100 -0.42 100. -G - 257 7.8 46.6 74.8 99.3 6.40 AT-1 99.6 6.97 KIO M.C = Znitral og final water andene Sq = Zvitral dres devuites S = Initial on final deque as saturation K = coeffecteut as permeability corrected to 20°C

Π	[6 <u>2</u> -			П	Π		Π					U	П	U		
_		ENGINEER DATE ASSIG	KARC - 1/22/88				12758	102m	, Ė		DATE	NS (814) NS (814)				
			N								A5516 Page	No.	IEC. DY			
										DATE						
			LABORATOR	Y TESI	A DNI	SSIGNMEI	NT AND	DATA S	UMMAR	۲		F	B	لیلہ		
	BORING SAMPE N	DEPTH - I	CLASSIFICATION	SPECIAL TESTS	NATURAL WATER CONTENT	ATTERBERG I LIQUID	ASTIC ST IMIT	CON COMPRI	N 10 N 1	T SPECIFI GI SPECIFI	16A6	Z HOA	GIIOSNO	0 C	TRIAXI	AL BACK
	A-250	9.0 - 9.75		Ý	i v	d U	40		<u> </u>	2,2	5 7		2	+	(in) S=0	(i) 0.8.i
			AL ABOVE K		1	6			•					+	<u>,</u>	
			K=1 21 X10 CM/24C										1	+		
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	* 5 7.	ut Curves	7 1851 C	OMP and	CHECKEE					•	N 12	ROGE	2	┦		Τ

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CHEMICALS GROUP



Industrial & Specialty Chemicals

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BATHYMETRIC SURVEY OF THE NIAGARA RIVER 102 nd Street Landfill Site

July 1986 Ref. No. 1431



JUL 1 6 1986

BATHYMETRIC SURVEY OF THE NIAGARA RIVER

- 102ND STREET LANDFILL SITE

July 1986

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3.0	NIAGARA RIVER BATHYMETRIC SURVEY	5
4.0	SUMMARY	6

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The Work Plan detailing the remedial investigation programs to be performed at the 102nd Street Landfill Site include a sediment survey of the Niagara River along the shoreline of the Site. The Work Plan description of this survey specifies the sampling methodology to be employed in water depths of less than five feet. However, due to the cyclic nature of the River level, the reference to the five foot water depth is ambiguous as it will vary with the River cycle. As a result, CRA has undertaken the task of establishing an appropriate reference elevation to be used in determining the five foot depth of water at the Site.

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In addition, a bathymetric survey of the sediment level of the Niagara River adjacent to the Site has been undertaken to determine the approximate alignment of the five foot water depth contour.

This report presents the results of the study of the five foot water depth contour and the bathymetric survey.

To determine the 102nd Street mean water level elevation, local water level data from the past 21 years was obtained from the "US Department of Commerce - NOAA - National Ocean Survey - Lake Survey Center - Monthly and Annual Mean Elevations of Niagara River." One of the recording stations included in the Niagara River monitoring program is the Lasalle Gage which is located approximately 2.0 miles downstream of the 102nd Street Site. Table 1 presents the water level data from the Lasalle Gage. Figure 1 presents the location of the Niagara River Gage Stations.

Utilizing the available data in Table 1, it is determined that the mean water level at the Lasalle Gage for the past 21 years is 561.89. (SUM OF YEARLY MEANS ÷ 21) It should be noted that this elevation is based on the International Great Lakes Datum (IGLD - 1955), and that the 102nd Street surveys utilize USGS established benchmarks. In order to compare elevation data, it is necessary to add 1.22 feet to the IGLD to match USGS Datum. This conversion factor has been confirmed by three different sources in the Niagara Falls area. The sources contacted were:

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i) US Army Corps of EngineersBuffalo Office (+1.22 Ft);



TABLE 1

MONTHLY AND ANNUAL MEAN ELEVATIONS OF NIAGARA RIVER LASALLE GAGE

MEAN	561.03*	561.42*	561.60*	561.94*	562.22	561.92*	562.06	562.49*	562.30*	562.08*	561.92*	561.94*	561.87*	561.84	561.71*	561.83*	561.76*	561.81*	561.81*	561.94*	562.22*
DEC	561.04	561.34*	561.51*	561.79*	561.79	561.86	561.82	562.87	561.90	561.82	561.52*	561.41*	561.90	561.57	561.68*	561.75	561.68	561.20*	562.71	561.86*	562.81*
NON	560.96	561.04	561.65	561.55	561.94	561.83*	561.78	562.57*	562.04	561.64	562.84	561.29	561.67	*62.1 65	561.80	561.60	561.52	561.49	561.83	561.87	562.01*
OCI	561.06*	561.26*	561.63	561.86*	562.26	561.93	561.99	562.64	561.93	562.00*	561.77	561.72	561.84*	561.57	561.74	561.91	561.89	561.72	561.85*	561.66	561.82
SEP	560.97	561.48	561.70	561.95	562.44	562.05	562.09	562.70	562.05	561.96	561.96*	561.83*	562.05*	561.62*	561.76	561.90	561.93	561.73	561.18*	561.89*	561.80
AUG	561.08	561.77	561.93	562.17	562.83	562.26	562.28	562.79*	562.34	561.95	561.90*	561.88*	562.00	561.82	561.92	562.02	562.03	561.85	562.04	562.04*	561.80
JUL	561.17*	561.87*	561.98	562.14	562.76	562.35	562.37	562.86	562.33	562.08	561.91	1	561.96*	561.82	561.95	561.91*	561.97	561.87	562.14*	562.11	561.97
NUL	561.41*	561.96	561.89	562.15	562.72	562.12	562.34	562.67	562.41	562.14	561.98	561.95*	561.83*	561.77*	561.81*	561.93	561.97	561.84*	1	562.40	562.04
MAY	561.35*	561.58	561.76*	561.87	562.48	562.02	562.19	562.59	562.28*	562.21	561.71	562.08	561.91*	562.39	561.64*	561.75*	561.86	562.06	561.97	562.03	562.02*
APR	561.00	561.46	561.51*	562.00*	562.10	561.87	562.17	562.27	562.32	562.37*	561.90*	562.27	561.93	561.84	ł	561.89	561.91*	562.33*	561.77*	562.02	562.68*
MAR	560.80	561.20	561.12	;	561.74	561.48	561.95	561.98	562.31	562.33	562.42	562.56*	561.59*	561.55*	561.49	561.64	561.25*	561,80*	561.45	561.95*	562.26*
PEB	560.48*	561.07*	561.26	!	561.71	561.47	561.70	561.80	562.61	562.29	562.20*	561.99	\$61.89*	561.73	561.22	561.74	561.52	561.30*	561.47	561.55*	562.97*
JAN		561.01*	561.28*	!	561.82	561.75	562.10	562.13	563.05	562.13	561.95*	562.40*	561.86*	562.87*	561.81*	561.97*	561.62*	562.57*	561,53*	561.95	562.40*
YEAR	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1961	1982	1983	1934	1985

Remarks:

Elevations are in feet above mean water level at Father Point, Quebec, International Great Lakes Datum (1955). Station Number 3013

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* Partial Record Not Available Source - US Department of Commerce - NOAA - National Ocean Survey - Lake Survey Centre

ii) Occidental Chemical Corporation
Niagara Plant survey datum
conversions (+1.22 Ft.);

iii) McIntosh & McIntosh-Land Surveyor (+1.22 Ft.)

Based on this information, the mean water level at Lasalle Station is 563.11 based on the USGS datum. (561.89 + 1.22 Ft. = 563.11 USGS)

Once the Lasalle Gage mean water level was determined (563.11 USGS) concurrent river stage readings at the Lasalle Gage and the 102nd Street Site, were collected to determine the elevation difference between the Landfill an the Lasalle Gage. The results of these concurrent measurements indicate that the 102nd Street Landfill water level (as measured at the stilling basin attached to the 100 Street Storm Sewer Headwall) is 0.73 feet above the water level at the Lasalle Gage. The concurrent readings were taken on a "calm" day to minimize wind effects which can influence local water levels along the Niagara River.

Based on the measured difference between the Gage Station and the Site Stilling Basin, the Mean 102nd Street Water Level is 563.84 USGS. (563.11 + 0.73 = 563.84 USGS)

In addition to the "measured" determination of elevation difference between the Lasalle Gage and the 102nd Street Site, it was also possible to calculate the mean 102nd Street water level by extrapolating between the Lasalle Gage and the next station upstream of the 102nd Street Landfill; the Tonawanda Island Gage. Using the recorded 21 yearly water levels for the Tonawanda Island Gage, the mean water level at this gage was calculated and found to be 565.58 USGS. Based on these mean elevations, the difference between the two gage stations is 2.47 feet. The straight line distance (per USGS Topographical Mapping - Tonawanda West) from the gage stations is as follows:

Lasalle Gage to 102nd Street = 2.0 miles 102nd Street to Tonawanda Gage = 4.5 miles TOTAL = 6.5 miles

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Using a linear interpolation between the Gage Stations, the mean water level at the Landfill would be 0.76 feet above the Lasalle Gage mean water level. This compares favorably with the "measured" determination of elevation difference (0.73 feet).

It is therefore established that the mean water level at the 102nd Street Landfill for the past 21 years is approximately 563.84 USGS.

Having established the 102nd Street mean water level, it is now possible to calculate the elevation at which the Niagara River bottom is five feet below the mean water level. This elevation is 558.84 USGS.

In order to determine the alignment of the 558.8 elevation contour, a bathymetric survey of the top of sediment elevation was undertaken on May 28, 1986.

To complete the survey, instruments (i.e. level and distomat) were positioned along the shoreline with the survey rod/reflector handled by personnel operating from a motor boat. Control points locating each primary vector location were previously placed along the river bank to provide a line of sight to direct the personnel collecting the elevation information. Along each sediment survey primary vector, (A-thru H) shots were taken to "zero" in the 558.8 contours. Primary vector I, and the first + 290 ft. of vector H, was manually sounded. Once the 558.8 elevation was determined, a white marker (buoy) was placed at this point along vectors A, B, C, E and F. Plan 1 presents the survey points and river bottom contours generated from the survey information. It should be noted that the contours in the area of vector H and vector I are tentative pending additional survey shots to evaluate the east bank of the "Little River" channel. This will be completed during the sediment survey program if required.

 $\sum_{i=1}^{n}$ $\left(\right)$ C

The investigation undertaken has identified that the mean water level at the 102nd Street Landfill Site is approximately at elevation 563.8 USGS and therefore the elevation of the top of sediment at the five foot depth of water is approximately 558.8 USGS.

The bathymetric survey indicates that the sediment surface gradually slopes away from the shoreline at an approximate slope of 0.01 feet per foot. The alignment of the five foot depth of water is approximately 500 feet from shore, with the exception of along the Little Niagara River where a navigable channel is present and the sediment surface slopes away from the shoreline at a much steeper angle.

All of which is respectfully submitted,

CONESTOGA-ROVERS & ASSOCIATES LIMITED

David C. Millard, C.E.T.

James K. Kay, P. Eng.



Occidental Chemical Corporation



Industrial & Specialty Chemicais

MONITORING WELL / BOREHOLE STRATIGRAPHIC & INSTRUMENTATION LOGS

102nd Street Landfill Remedial Investigation Niagara Falls, New York

CONESTOGA-ROVERS &

651 Colby Drive, Waterloo, Ontario, Canada N2V 1C2 (519) 884-0510

Reference No. 1431

RECEIVED

APR 2 0 1987

D. L. CUMMINGS

Mr. Alan A. Fuchs Bureau of Remedial Action NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION 50 Wolf Road Room 414 Albany, NY 12233

Mr. Kevin J. Lynch U.S. ENVIRONMENTAL PROTECTION AGENCY Region II 26 Federal Plaza New York, NY 10278

Dear Messrs. Fuchs and Lynch:

On behalf of the Occidental Chemical Corporation and the Olin Chemicals Group we are submitting to you five copies of the report entitled "Monitoring Well/Borehole Stratigraphic & Instrumentation Logs, 102nd Street Landfill, Remedial Investigation, Niagara Falls, New York".

Should you have any questions regarding this report please do not hesitate to contact me.

Yours very truly,

CONESTOGA-ROVERS & ASSOCIATES

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James K. Kay, P. Eng.

JKK:jd Enclosures cc: J. Cull, OCC D. Cummings, Olin A. Hirsch, WCC B. Morrissey, OCC K A C R ごうし

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CHEMICALS GROUP



Industrial & Specialty Chemicals

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MONITORING WELL / BOREHOLE STRATIGRAPHIC & INSTRUMENTATION LOGS

102nd Street Landfill Remedial Investigation Niagara Falls, New York

April 1987 Ref. No. 1431

CRA / WCC

1.0 INTRODUCTION

This report represents all of the borehole and monitoring well installations undertaken in conjunction with the Remedial Investigation for the 102nd Street Landfill Site. Stratigraphic and instrumentation logs for both the Olin Corporation and the Occidental Chemical Corporation portions of the landfill are enclosed herein.

102ND STREET LANDFILL STRATIGRAPHIC AND INSTRUMENTATION LOGS REMEDIAL INVESTIGATION OCCIDENTAL CHEMICAL CORPORATION

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STRATIGRAPHIC	AND	INSTRUMENTATION	LOG

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PROJECT	NAME: JOB NR: JOR	9-1431	HOLE NO.:	TED.			(BUREHULE)	
CLIENT	OCCIDENTAL CHEMICAL CORPORATION	NEND WET	DATE COMPLE	AT. AS		TE S		
HOLE 1	YPE: HOLLOW STEM AUGER	_NEAR_BELL		FL EV		*		
CRA S	UPERVISOR GROUND ELEVATION							
	PROFILE		INSTALLATION	S		5	PENETRATION TEST	
DEPTH	STRATIGRAPHY DESCRIPTION & REMARKS			NUMBER	TYPE	BLOWS / FOO	20 40 60 80	
5 -	 Light brown silty CLAY - much vegetation, Moist some pebbles (FILL) Red-brown silty CLAY - much vegetation, Moist grading to sandy clay (FILL) Brown silty SAND - some plastic, pebbles Moist increasing with depth (FILL) Black silty CLAY - some white flyash (FILL) Moist Brown silty SAND - some flyash, many large Moist stones, 2" pocket of white waste material at 5.5' (FILL) Gray-black sandy SILT - much flyash, many Wet pebbles & stones, some white waste material, trace vegetation, white ceramic material at 7.5', trace wood, trace newspaper, trace glass, becoming saturated with depth (FILL) 		- 4 3/4" Ø EH - CEM/BEN BKFL	- 4 3/4" Ø BH 	-4 3/4" Ø BH 2 5 3 5 CEM/BEN 4 5 6 4 7 5	ss ss ss ss ss	S 7 14 S 11 S 22 S 2 S 2 S 5 S 7 10 S 5 c	
15	- Gray-brown CLAY - some silt, trace Wet vegetation (NATIVE) - Gray-brown silty SAND - trace clay, Wet trace vegetation, some black staining 14.0'-16.0'			8	ss	6 5 5	•	
20 -	NOTES: - Borehole grouted to surface.							

* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIO ▼ WATER FOUND ▽ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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	102ND STREET LANDETLL	.00 .00:	9-1431	HOLE MO:		BH	12-86	
PROJECT	OCCIDENTAL CHEMICAL ODEFORATION			DATE COM	LETED	NC	VEME	ER 26, 1986
HOLE TYP	★: HOLLOW STEM AUGER (4-3/4" DIAMETER)	LOCATION :	TOP OF	EMBANKMENT WEST	OFO	147-8	5	
CPA SIR	PERVISOO : C. PADGINION GROUND ELEVATION	- * *		TOP OF P	IPE ELE	VATIO	* N:	
					- <u>r</u>			r
ļ	PROFILE			INSTALLATION		SAMPL	.E	PENETRATION
DEPTH (FEET)	STRATIGRAPHY DESCRIPTION & REMARKS				NUMBER	TYPE	BLOWS / FOO'	E0 40 60 80
0 -	Red-brown silty CLAY - some vegetation, some gravel, becoming siltier with depth,	Wet			- 1	ss	20 13	
-	brown & black mottling 2.0'-4.0' (FILL)			-4 3/4" BH	Ø 2	ss	5 7	
- 5 -	Gray-brown clayey, sandy SILT - some gravel (FILL)	Wet			3	SS	52 17	
-	Black-gray sandy SILT - some clay, some crushed red stone (FILL)	Wet			4 N E	SS	15 33 17	
-	Black SILT - some vegetation (FILL)	Wet		BALL		33	65	
10 -	Black sandy SILT - some crushed pink stone, some white waste material (FILL)				6	ss	4	\mathbf{T}
-	Black SILT - some vegetation, crushed pink stone, orange brick pieces, small white stones & large stones (FILL)	Wet			8	ss	20 4 9	
-	Dark gray-black silty CLAY - some vegetation (NATIVE) Brown sandy SILT - trace vegetation, trace black clay	· · ·		14.0'				
-	NOTES: - Auger refusal at 10.8', move rig & auge to 10.0'; second refusal, repeat twice. - Borehole grouted to surface.	r						
20 -								
							-	

₩ WATER FOUND ♥ STATIC WATER LEVEL 3 GRAIN SIZE ANALYSIS
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	OTTOENTAL CHEMICAL ORPORATION		DATE COMPLET	TED:	N	OVEM	BER 25, 19
JENT:	HOLLOW STEM AKER (4-3/4" DIAMETER)	OCATION: NORTH	OF OW10-79 (WEST \$	SIDE	OF	STTE)
		.*		-	VATIC	*	
CRA SUP	ERVISOR : GROUND ELEVATION	·					
	PROFILE		MONITOR INSTALLATION	S	AMPL	.ε	PENETRATI
				~		001	BLOWS / FO
Ŧ	STRATIGRAPHY			MBE	Ä	3 / F	
8	DESCRIPTION & REMARKS			ž	-	MOTIC	20 40 60 1
o _				1	ss	4	
_	Dark brown sandy SILT - some clay, some vegetation, trace gravel, rock in end	Wet				4	
	of spoon (FILL)		-4 3/4" Ø BH	2	ss	70	
-						21	
-	Gray gravelly SAND (FILL)	DLY				12	
-				3			
5 -						10	
-	Notel of this house black mean t	Wot		4	SS	8	
-	gray FLYASH - some white waste material,	nee				7	
_	some gravel, some brick, becoming saturated with depth (FILL)		BKFL	5	SS	9	
_						6	+
10				6	se	3	
·• -						3	
-			•	,		4	
· -	Green-black clayey SLT - some vegetation some wood pieces, plastic (FILL)	wet _		ľ	1		
-	Green-black clayey SILT - some vegetation many fine roots (NATIVE)	Wet		8	s	3	
15 -	Gray fine silty SAND	Wet	16.01			7	7
-			10.0				
-	NOTES:						
-	- Borehole grouted to surface.						
-							
20 -							
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* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS ▼ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

_____ JOB NR: ______ HOLE NR: ______ OW31-85 (FILL WELL)

DATE COMPLETED:____OCTOBER 17, 1985___

OLE TI	PE: HOLLOW STEM AUGER LOCATION: NORTH	WEST CORNER OF SIT	Е			
CRA SU	PERVISOR : D. MILLARD GROUND ELEVATION: * 575.8	TOP OF PIPE	ELEVAT	ion:*	79.13	
	PROFILE	MONITOR	SAMP	LΕ	PENETR	ATION
DEPTH	STRATIGRAPHY DESCRIPTION & REMARKS	579.13 Locking	NUMBER TYPE	BLOWS / FOOT	TES BLOWS /	FOOT
Hay 0 - - - - - - - - - - - - - - - - - - -	PROFILE STRATORAPHY DESCRIPTION & REMARKS Dark brown TOFSOLL - trace vegetation Moist Prown SILT - some clay, some fine sand, (FILL) Moist Gray FLYASH/CINDER material - occasional stone (FILL) Dry Gray-black CINDERS & FLYASH - occasional gravel, occasional fibrous material (FILL) Dry Black CINDER/FLYASH - some hardened tar, gravel, occasional fibrous material (FILL) Dry Black CINDER/FLYASH - some fibrous Dry-moist material (FILL) Dlack CINDER/FLYASH - some fibrous Dry-moist Black CINDER/FLYASH - some fibrous Dry-moist material (FILL) Black CINDER/FLYASH - some fibrous Dry-moist Black CINDER/FLYASH - irridescent sheen on water (FILL) Moist-wet Black TUYASH - irridescent sheen on water (FILL) Moist wet Black TUYASH - irridescent sheen on water (FILL) Moist occasional vegetation Gray very fine SAND - some silt, come wet water (FILL) NOTES: 2" diameter black steel Moist cocasional vegetation NOTES: 2" diameter black steel Well Pipe: 2" diameter black steel Well Streen: 2" diameter black steel Sand Pack: Special coarse bland Ottawa sand	579.13 Locking 575.8 13" EH CEM/BEN seal 3.0' BEN seal 5.0' BS pipe Sand pack Well screen 11.5' 12.5' BEN seal 14.0'	SAMP MALE 1 S 2 S 3 S 4 S 5 S 6 S 7 S	LE LOGY SWOTA	PENETR TES BLOWS /	ATION T FOOT
			-			

★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
★ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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ECT	NAME: 102ND STREET LANDFILL JOB NE: 9-1431	HOLE NO .: OW3	2-85	(FI	LL W	ELL)		
NT:	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED:_	œ	TOBE	<u>r</u> 2	1, 1	985	_
ET	YPE: HOLLOW STEM AUGER LOCATION: NORTHWE	ST BOUNDARY OF SIT	E						
RA S	SUPERVISOR : GROUND ELEVATION: * 576.6	TOP OF PIPE	ELEV	ATIO	N: <u>* 5</u>	<u>79.</u>	46		
	PROFILE	MONITOR	s	AMPL	E	PE	NETR	ATIO	N
			æ		00T	BL	OWS /	/ FOC	ν τ
	STRATIGRAPHY DESCRIPTION & REMARKS	579.46 Locking	NMBE	TYPE	W S / F				
)		cap			BLO) 40 i		
	Dark brown TOPSOIL - trace vegetation Moist		1	ss	8	٦			
	Mottled red-brown & brown silty CLAY - Moist				18	Ì			
	Yellow-brown SILT & fine SAND (FILL) Moist-dry	CEM/BEN seal	2	SS	16	1			
	- Black FLYASH - some cinders, occasional Dry				13				
	- stone, trace fibrous material, trace brick, trace slag (FILL)		3	SS	13	Ī			
	-	H 5.0'	4	ss	4				
	Black FLYASH & CINDERS - occasional slag, Dry				6				
	(FILL)	- Sand	5	ss	10				
	Black FLYASH & CINDERS - occasional slag, Dry-moist occasional brick, some cinders, trace	pack			3				
	fibrous material (FILL)	screen	6	ss	1				
	Black FLYASH - trace glass, occasional Wet - vegetation (FILL)				z				
	Dark may clausy STUT - some fine sand. Wet-moist	12.1'	7	ss	4				
	- <u>occasional vegetation (NATIVE)</u> Mottled gray & dark gray fine SAND - Moist	13.5'			6	1			
	- some silt, occasional vegetation	$\frac{14.0'}{14.0'}$	8	SS	1				
	- Gray fine SAND - some silt, occasional Moist-wet vegetation	seal 16.0			د				
	Well Pipe: 2" diameter black steel Well Screen: 2" diameter, 5' length,								
	#6 slot. stainless steel Sand Pack: Special coarse blend								
	Ottawa sand								

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	STRATIONALTIC AND INSTRUMENT			
PROJECT	NAME:JOB NE:JOB NE:JOB	HOLE NO.: OW3	3-85 (FILL W	ELL)
CLIENT:	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED: OCTOBE	2R 12, 1985
HOLE TYP	E: HOLLOW STEM AUGER LOCATION: SOUTHW	EST CORNER OF SITE		
GEOLOGIST	/ENGINEER: GROUND ELEVATION: 575.4	TOP OF PIPE	ELEVATION:	579.53
	PROFILE	MONITOR INSTALLATION	SAMPLE	PENETRATION
EPTH (VATION)		Locking cap	UMBER LYPE IS / FOOT	BLOWS / FOOT
ELE D		579.53	ar o z	PO 40 80 80
a a 0 - - - 5 - - - 10 - - - 110 - - - 115 -	Dark brown TOPSOIL & VECETATION (FILL) Moist-dry Brown TOPSOIL & Silty SND - occasional Moist-dry stone, occasional cinder (FILL) Moist Black & white FLVASH (FILL) Moist blue discoloration (FILL) Moist blue discoloration (FILL) Moist light gray FLVASH - occasional stone, Moist Moist fissile red-brown rock fragments in tip (FILL) Moist Mottled black & white WASTE MATERIAL - Moist Moist FLYASH (FILL) Moist (FILL) Mottled black & white WASTE MATERIAL - Moist Moist becoming wet at 8.0' (FILL) Moist Black fibrous VECETATION & silty TOPSOIL - Moist black wood fragment at 11.5' (NATIVE) Dark gray SILT with fibrous roots Moist NOTES: 2' diameter black steel Well Pipe: 2'' diameter, 5' length, #5 slot, stainless steel Sand Pack: Special coarse blend Ottawa Sand	579.53 575.4 13" Ø BH CEM/BEN seal 3.9' BEN seal 5.9' Sand pack Well screen 10.9' 11.5' 12.0' BEN seal 14.0'	x y 1 SS 5 1 SS 17 2 SS 19 2 SS 23 3 SS 23 4 SS 5 5 SS 7 6 SS 4 7 SS 3 12 4 10 5 SS 7 6 SS 4 7 SS 3 12 12	

▼ WATER FOUND ♥ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

PROJECT NAME: 102ND STREET LANDFILL JOB NO: 9-1431 HOLE NO: OW34-85 (FILL WELL)

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CLIENT	COCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED: OCTOB	ER 24, 1985
HOLE	TYPE: HOLLOW STEM AUGER	FRIVER BANK - WEST	SIDE	
CRA	SUPERVISOR : GROUND ELEVATION : 577.4		ELEVATION :	580.23
<u> </u>	PROFILE	MONITOR	SAMPLE	PENETRATION
				TEST BLOWS / FOOT
DEPTH	STRATIGRAPHY DESCRIPTION & REMARKS	580.23 Locking	NUMBER TYPE BLOWS / FC	20 40 60 60
10 15	STRATUGRAPHY DESCRIPTION & MEMARKS DESCRIPTION & MEMARKS DESCRIPTION & MEMARKS DESCRIPTION & MEMARKS STORE OF DOUBLES STORE, Moist Red-Drown & black silty CLAY - some store, Moist accessional brick (FILL) Stone or boulder at 1.5', hard augering to 2.1' Brown silty CLAY with black CINDERS - Moist occasional store, trace fine sand (FILL) Black FLYASH - occasional brown silty Moist clay, occasional cinder (FILL) Black FLYASH - occasional brown of the Moist clay, occasional cinder, Moist CLAY, & CINDERS - occasional store (FILL) Black FLYASH - occasional store (FILL) Black FLYASH - occasional store (FILL) Black FLYASH - occasional cinder, occasional Moist store, occasional brown clayey lense, piece of wood (FILL) Black FLYASH - some sand, occasional hown Moist cinder, occasional brown, trace clay, some gravel at 11.8' (FILL) Augered through to 13.0' Dark gray SILT - some fine sand Wet NOTES: Split spoon bouncing at 11.8' and 12.0', augered to 13.0'. NOTES: Split spoon bouncing at 11.8' and 12.0', augered to 13.0'.	580.23 Locking cap 577,4 BH CEM/BEN seal 3.1' BEN seal 5.0' BS pipe Well screen Sand pack 12.0' 12.5' 13.0' BEN seal 15.0'	aaAL 1 SS 20 1 SS 20 14+ 2 SS 6 13 3 SS 5 9 4 SS 13 16 5 SS 5 7 6 SS 7 8+ 7 SS 5 8 8 8	

★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
▼ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

JOB N2: 9-1431

PROJECT NAME: 102ND STREET LANDFILL

HOLE NO .: OW35-85 (FILL WELL)

	T:	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED:_	œ	TOBE	r 28,	1985	
HOLE	TYF	PE: HOLLOW STEM AUGER LOCATION : TOP OF	RIVER BANK - CENT	RAL	AREA				
CRA	su	PERVISOR : GROUND ELEVATION .* 575.9	TOP OF PIPE	ELE	VATION	ı: <u>*57</u>	8.38		
	_	PROFILE	MONITOR INSTALLATION	s		Ε	PENET	TRATION	4
Ţ				SER.		FOOT	BLOW	5 / F00'	r
DEPTI		DESCRIPTION & REMARKS	578.38 Locking cap	MUM	TYP	BLOWS /	20 4	0 60 80	
0 5 10		DESCRIPTION & REMARKS Brown fine sandy SILT - some vegetation, Moist-dry trace clay (FILL) Black FLXASH - occasional stone (FILL) Moist-dry Brown sandy SILT - some vegetation (FILL) Moist-dry Black FLXASH, occasional cinder (FILL) Dry Black fLXASH, coccasional cinder, (FILL) Black fLXASH (FILL) Dry Black & rust colored FLYASH & hardened Dry tarlike WASTE MATERIAL - occasional cinder, trace yellow powder (FILL) Black & red-brown FLYASH - occasional Moist stone, occasional brick fragment, wood & plastic in tip of spoon (FILL) Black CINDERS & FLYASH - some wood, some Moist tarlike waste material, white waxlike waste material at 9.5' (FILL) Black CINDERS & FLYASH - some wood, some Moist tarlike waste material, white waxlike waste material at 9.5' (FILL) Black FLYASH, WOOD & VEGETATION Wet - occasional stone (FILL) Dark gray Sing (CLAY - occasional Wet-moist wegetation, (NATIVE) Dark gray fine sandy SILT - occasional Moist regetation, irridescent sheen on water NOTES: Resampled 10.0-12.0' at EPA request; 1" recovery of stone and flyash. Well Fipe: 2" diameter black steel Well Screen: 2" diameter, 5' length, #6 slot, stainless steel Sand Pack: Special coarse blend Ottawa sand	578.38 Locking cap 575.9 BH CEM/BEN seal 2.5' BS pipe Sand pack Well screen 12.5' 13.0' 13.5' BEN seal 14.0'	1 2 3 4 5 6 7		5M018 13 21 9 9 10 11 6 7 12 8 3 8			
						-			

* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS ▼ WATER FOUND ♡ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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CLEAR CONTROL CONCENTER CONTROL CONTROL OF CONTROL CONTROL CONCENTED CONTROL C	CLIENT: <u>OCCIDENTAL CHEMICAL CORFERATION</u> CLIENT: <u>OCCIDENTAL CHEMICAL CORFERENTION</u> NOLE TYPE: <u>HULLON STEM AUGER</u> LOCATION: <u>TOP OF BIMER BANK</u> . CRA SUPERVISOR : <u>D. MILLARD</u> PROFILE PROFILE PROFILE PROFILE STRATORAPHY DESCRIPTION & REMARKS O Brown sandy TOPSOIL - some vegetation, Moist-dry CRA SUPERVISOR SILT: CORPORATION & MOIST-dry CRASHDROWN SILTY CLAY - some sand, some store Moist-dry CRASHDROWN SILTY CLAY - some sand, some store Moist-dry CRASHDROWN SILTY CLAY - some vegetation, Moist-dry CRASHDROWN SILTY CLAY - some vegetation, Moist-dry CRASHDROWN SILTY CLAY - some sand, some store Moist-dry CRASHDROWN SILTY CLAY - some vegetation, trace Store (FILL) Brown-Dick & white corglomerate of Store (FILL) CRASHDROWN SILT - cocasional white Weste material, trace vegetation, trace store (FILL) Black FLYASH - occasional store, occasional Wet paper, trace oily globules, irridescent store (FILL) Black FLYASH - occasional store, occasional Wet paper, trace (FILL) Bark gray Clayey SILT with vegetation - Wet trace NAPL in soil partings (NATIVE) NOTES: Apparent void from 4.0-10.0'; recovered 1" Apparent void from 4.0-10.0	OMPLETED:	AREA	579.45
Note Tree_HILDM STEP ADER LORATON LORATON TOP OF APPE LEWATON LORATON GA SUPERVISOR : D. NILARD GROUND ELEVATON 373.4 TOP OF APPE LEWATON 123.4.5 F PROFILE STRATSRAPHY DESCRIPTION & REMARKS STRATSRAPHY DESCRIPTION & REMARKS 10 TERM TATION 0 - STRATSRAPHY DESCRIPTION & REMARKS 77.45 LOCKING 12 10 0 - STRATSRAPHY DESCRIPTION & REMARKS 77.45 LOCKING 12 12 0 - STRATSRAPHY DESCRIPTION & REMARKS 77.45 LOCKING 12 12 0 - STRATSRAPHY DESCRIPTION & REMARKS 77.45 LOCKING 12 12 0 - STRATSRAPHY DESCRIPTION & REMARKS 77.45 LOCKING 12 12 0 - STRATSRAPHY DESCRIPTION & STRATSRAPHY DESCRIPTION	NOLE TYPE: HULDM STEM AUGER LOCATION:TOP OF BIVER BANK. CRA SUPERVISOR :D, MILLARDGROUNG ELEVATION:SJ5_4TOP OF OF SILE TOP OF OF SILE PROFILE MONITORNONTOR	N SAP	AREA .vation:* SAMPLE	579.45
CRA SUPERVISOR :	CRA SUPERVISOR :			579.45
PROFILE Mediation same term tool 2 STATURARMY DESCRIPTION E. REMARKS 79,45 Locking 1 SS 1 SS 1 SS 10 0 0 0 1 SS 10 0 <td>PROFILE MONITOR Z STRATIGRAPHY DESCRIPTION & REMARKS 779,45 0 - Coccasional stone FILL) Brown sulty CLAY - some sand, some stone Moist-dry - Gray-brown fine SAND & SILT - trace Moist-dry - Gray-brown fine SAND & SILT - trace Moist-dry - Brown sulty CLAY - some sand, some stone Moist-dry - Brown-Black & white conglomerate of Moist-dry - Brown-Dlack & White conglomerate of Moist-dry - Brown-Dlack & White conglomerate of Moist-dry - Brown-Dlack & White conglomerate of Moist-dry - Weste material, trace vegetation, trace Sc - Grinding during augering at 3.0-4.0'. 4.5 - No recovery Sand - No recovery Sand - Dark gray clayey SILT with vegetation - Wet - Dark gray clayey SILT with vegetation - Wet - NOTES: Apparent void from 4.0-10.0'; recovered 1" - Well Screen: 2" diameter black steel Well Pipe: 2" diameter black steel Well Pipe: 2" diameter black steel Sand Pack: Special coarse blend</td> <td></td> <td></td> <td></td>	PROFILE MONITOR Z STRATIGRAPHY DESCRIPTION & REMARKS 779,45 0 - Coccasional stone FILL) Brown sulty CLAY - some sand, some stone Moist-dry - Gray-brown fine SAND & SILT - trace Moist-dry - Gray-brown fine SAND & SILT - trace Moist-dry - Brown sulty CLAY - some sand, some stone Moist-dry - Brown-Black & white conglomerate of Moist-dry - Brown-Dlack & White conglomerate of Moist-dry - Brown-Dlack & White conglomerate of Moist-dry - Brown-Dlack & White conglomerate of Moist-dry - Weste material, trace vegetation, trace Sc - Grinding during augering at 3.0-4.0'. 4.5 - No recovery Sand - No recovery Sand - Dark gray clayey SILT with vegetation - Wet - Dark gray clayey SILT with vegetation - Wet - NOTES: Apparent void from 4.0-10.0'; recovered 1" - Well Screen: 2" diameter black steel Well Pipe: 2" diameter black steel Well Pipe: 2" diameter black steel Sand Pack: Special coarse blend			
End STATUBRAPHY DESCRIPTION & REMARKS To are so cap Status 0 - Brown Banky 7009017 - score vegetation, mon alty CLAP score sand, some store Montalty CLAP score sand, some store Montalty CLAP score sand, some store Wegetation (FILL) To are so record and the sand some store Montalty CLAP score sand, some store Montalty CLAP score sand, some store Wegetation (FILL) To are so record and the sand some store Montalty CLAP score source Montalty CLAP. - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - <td>The second store STRATIGRAPHY DESCRIPTION & REMARKS 779,45 Locd cap 0 Brown sandy TOPSOIL - some vegetation, Moist-dry 779,45 Locd cap 0 Brown sandy TOPSOIL - some vegetation, Moist-dry 78,45 Locd cap 0 Brown silty CLAY - some sand, some store Moist-dry 78,45 Locd cap 0 Brown-black & white complomerate of Moist-dry Moist-dry 882 2.0 10 Brown-black & white complomerate of Moist-dry Moist-dry 862 2.0 5 Grinnling during augering at 3.0-4.0'. 85 90 90 10 Black FL/ASH - occasional stone, occasional Wet paper, trace oly globules, irridescent sheen on water surface (FILL) 85 90 10 Black FL/ASH - occasional stone, occasional Wet paper, trace oly globules, irridescent sheen on water surface (FILL) 85 90 10 Black flyash at 9.5'. During well placement began losing sand at 4.6', installed 14" 0 90 90 11 Dark gray clayey SILT with vegetation - Wet inside large casing. 90 90 11 Well kinge casing - Unring well placement began losing sand at 4.6', installed 14" 0 90 90 11<td>e l</td><td></td><td>TEST</td></td>	The second store STRATIGRAPHY DESCRIPTION & REMARKS 779,45 Locd cap 0 Brown sandy TOPSOIL - some vegetation, Moist-dry 779,45 Locd cap 0 Brown sandy TOPSOIL - some vegetation, Moist-dry 78,45 Locd cap 0 Brown silty CLAY - some sand, some store Moist-dry 78,45 Locd cap 0 Brown-black & white complomerate of Moist-dry Moist-dry 882 2.0 10 Brown-black & white complomerate of Moist-dry Moist-dry 862 2.0 5 Grinnling during augering at 3.0-4.0'. 85 90 90 10 Black FL/ASH - occasional stone, occasional Wet paper, trace oly globules, irridescent sheen on water surface (FILL) 85 90 10 Black FL/ASH - occasional stone, occasional Wet paper, trace oly globules, irridescent sheen on water surface (FILL) 85 90 10 Black flyash at 9.5'. During well placement began losing sand at 4.6', installed 14" 0 90 90 11 Dark gray clayey SILT with vegetation - Wet inside large casing. 90 90 11 Well kinge casing - Unring well placement began losing sand at 4.6', installed 14" 0 90 90 11 <td>e l</td> <td></td> <td>TEST</td>	e l		TEST
0 - Brown sandy TORSOIL - some vegetation, Moist-dry Coccasional store (FIL) - Brown slity CAV - some sand, some store Moist-dry (FIL) - Grangen - Gr	 Brown sandy TOPSOIL - some vegetation, Moist-dry Cocasional stone (FILL) Brown silty CLAY - some sand, some stone Moist-dry (FILL) Brown-black & white conglomerate of Moist-dry Vegetation (FILL) Brown-black & white conglomerate of Moist-dry FLASH, CLAY & SLIT - occasional white waste material, trace vegetation, trace stone (FILL) Black FLYASH - occasional stone, occasional Wet paper, trace oily globules, irridescent sheen on water surface (FILL) Dark gray clayey SLIT with vegetation - Wet trace NAPL in soil partings (NATIVE) NOTES: Apparent void from 4.0-10.0'; recovered 1" wet black flyash at 9.5'. During well placement began losing 6" into sand pack, installed well inside large casing. Well Pipe: 2" diameter black steel Well Screen: 2" diameter, 5' length, #6 slot, stalled steel Sand Pack: Special coarse blend Ottawa sand 		TYPE BLOWS / FOO	8LOWS / FOOT
		2 Ø 1 BEN 2 Ø 3 4 4 4 4 5)' 5')' L	SS 10 SS 9 SS WOR SS WOR SS 2 4	

★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
★ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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PROJECT N	NAME: 102ND STREET LANDFILL	DB N9.:9-14	31	HOLE NO.: OW3	7-85	5 (FI	LL WI	:LL)	
CLIENT:	OCCIDENTAL CHEMICAL CORPORATION			DATE COMPLE	TED:_	α	TOBE	R 31, 1985	5
HOLE TYP	E: HOLLOW STEM AUGER	DCATION : ALON	g top of	BANK AT SOU	THEA	ST C	ORNE	R OF SITE	
GEOLOGIST	/ENGINEER: D. MILLARD GROUND ELEVATION:	* 573.7		TOP OF PIPE	ELE	VATIO	N: <u>*</u>	576.77	
	PROFILE			MONITOR	s		E	PENETRATI	ON
2				Locking			ot	TEST BLOWS / FO	от
OEPTH Elevatio	STRATIGRAPHY DESCRIPTION & REMARKS			cap 576.77	NUMBER	TYPE	LOWS / FO	20 40 60	
		<u></u>	-1	573.7	 1		•		Η
0 - -	Dark gray SILT - some gravel, some flyash, trace vegetation (FILL)	Moist		BH CEM/BEN seal 2.0'	2	ss	13 12		
-	Black CINDERS & FLYASH (FILL)	Moist		BEN seal 3.0' BS	3	SS	87 53		þ
5 -	Black FLYASH & CINDERS - piece of plastic, 1/4" lense of gray material at 5.9' (FILL)	Moist		pipe Sand pack	4	SS	26 28		
-	Black FLYASH & CINDERS - occasional stone, trace gray material at 6.8', 3" wood at 7.6' (FILL)	Wet		Well screen	5	ss	65 33		
-	Dark gray FLYASH & fine SAND - trace fine gravel, wood fibers & steel fragments at 8.0-8.2', 3" concrete at 9.8' (FILL)	Mojet		-10.0'	6	55	2		
10 -	VEGETATION (NATIVE)	MOISL	7 -	-10.0	Ű	Ĩ	8		
	Dark gray sandy SILT	Moist		-11.5'					
	NOTES: Well Pipe: 2" diameter black steel Well Screen: 2" diameter, 5' length, #6 slot, stainless steel Sand Pack: Special coarse blend Ottawa S	and		vag(
* REFER	TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE	ELEVATIONS			.		I		-

▼ WATER FOUND ♥ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

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T:	OCCIDENTAL CHEMICAL CORPORATION		DATE COMPLE	TED:	N)VEM	<u>BER 1, 198</u>
TYPE	: HOLLOW STEM AUGER	OCATION : SOUTH	CENTRAL AREA OF SI	TE ("FO	RMER	DITCH")
SUPE	ERVISOR : D. MILLARD GROUND ELEVATION	* 576.2	TOP OF PIPE	ELE	VATIO	N:*	579.34
_			MONITOR		AMD		
<u> </u>	PROFILE		INSTALLATION				TEST
	STRATIGRAPHY Description & Remarks		579.34 Locking	NUMBER	TYPE	WS / F00	82043710
						ы Б	20 40 60
	Red-brown silty CLAY - trace vegetation, trace topsoil (FILL)	Moist		1	ss	8 19)
	Mottled brown & gray-brown clayey SILT & fine SAND - occasional stone (FILL) Gray SILT - occasional cinder, occasional	Moist Moist	seal	2	ss	6 19	
-	coal pieces, occasional medium stone (FIIL	.)	pipe 4.5'	3	ss	3	
- -	Black FLYASH (FILL)	Dry Wet	BEN seal	4	ss	1	
-	trace stone (FILL)			5	ss	1 18	
	Black & red-brown FLYASH - occasional piece of glass, occasional paper (FILL)	Wet	- Sand pack	c		10	
-	Black FLYASH - occasional piece of glass, trace irridescent sheen on water (FILL)	Wet	Well screen	· · 7	SS	2	
-	Black FLYASH - piece of plastic (FILL)					5	
- -	 Black clayey SILT - some fine sand, occasional vegetation (NATIVE) 	Moist ~	14.5'	ð	55	5	
- [Black fine SAND - some silt	Moist	BEN seal	9	ss	4	
-	Black fine SAND & SILT - occasional vegetation, occasional minor lense of saturated coarse sand	Wet	.18.0'	10	55	10	
-	Black fine SAND & SILT - becoming gray at tip, occasional vegetation, occasional saturated lense, irridescent sheen on water	Wet	20.0'			4	•
	NOTES: 14.0-16.0' split spoon sample lost before E examination; made two unsuccessful attempts resample.	PA 5 to					
	Well Pipe: 2" diameter black steel Well Screen: 2" diameter, 5' length. #6 slot, stainless steel Sand Pack: Special coarse blend Ottawa sand						

* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS ▼ WATER FOUND ▽ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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	PROFILE	INS	MONITOR	s	AMPL	.E	PEI	NETR	
DEPTH	STRATIGRAPHY DESCRIPTION & REMARKS	677.22	Locking	NUMBER	TYPE	SLOWS / FOOT	BL(TES DWS /	F001
0	Brown silty TOPSOIL - occasional vegetation Moist piece of concrete, piece red clay tile (FILL) White soft MASTE MATERIAL (FILL) Moist Gray-brown coarse to medium SAND - Moist some store (FILL) Mottled red-brown silty CLAY - trace Moist cinders (FILL) Oray coarse to medium SAND & CINDERS - Wet trace gravel, trace sand (FILL) Gray-white soft WASTE MATERIAL - piece Wet of wood (FILL) Black sandy TOPSOIL - occasional Moist wegetation (NATIVE) Gray silty fine SAND Moist Mottled red-brown silty CLAY Moist Mottled red-brown silty CLAY Moist NOTES: Well Pipe: 2" diameter black steel Well Screen: 2" diameter black steel Well Screen: 2" diameter black steel Sand Pack: Special coarse blend Ottawa sand		574.1 -13"-Ø BH CCM/BEN seal 2.0' BEN seal 2.5' BS pipe Sand pack Well screen 6.5' 9.0' BEN seal 10.5'	1 2 3 4 5	SS SS SS SS	25 6 1 2 1 2 5 10 4 7			

★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
 ▼ WATER FOUNO ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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OJECT N	AME: 102ND STREET LANDFILL JOB NO: 9-143	1 HOLE NO .: OW40-85 (ALLUVIUM WELL)
IENT:	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLETED: NOVEMBER 13, 198
LE TYP	E: HOLLOW STEM AUGER (8-1/4" ID/13" OD) LOCATION: ALONG	TOP OF BANK AT SOUTHEAST CORNER OF SITE
OLOGIST	ENGINEER : D. MILLARD GROUND ELEVATION . 573.7	TOP OF PIPE ELEVATION: 576.76
	PROFILE	MONITOR SAMPLE PENETRATIO
H NOI L	STRATIGRAPHY	Locking
DEPT (ELEVA	DESCRIPTION & REMARKS	
		573.7
-	Dark gray SILT - some gravel, some flyash, Moist trace vegetation (FILL)	BS pipe
-	Black CINDERS & FLYASH (FILL) Moist	- CEM/BEN BKFL
	Black FLYASH & CINDERS - piece of plastic, Moist 1/4" lense of gray material at 5.9' (FILL)	
 -	Black FLYASH & CINDERS - occasional stone, Wet trace gray material at 6.8', 3" wood at	
-	/lo (FILL) - Dark gray FLYASH & fine SAND - trace fine	
-	gravel Mottled brown-black TOPSOIL & VECETATION, Moist	BEN 1 SS 3 •
-	Decoming clayey silt (NATIVE) - Mottled brown & dark gray SAND & SILT Moist	
-	Mottled brown & dark gray fine sandy SILT Moist-wet	11.0' 2 SS 6
-	Gray-brown fine sandy SILT with vegetation Moist-Wet throughout, occasional fine sandy lense	3 SS 2
-	Gray fine SAND & SILT -some vegetation Moist-wet throughout, occasional shell fragment	6 SD pack
-	Dark gray fine SAND & SILT with occasional Wet black layering	4 55 1
-}		5 SS WOR
-	Gray & dark gray fine SAND & SILT -small Wet	5
-	stone, trace shell, trace silt	6 SS 2
-		
-	Gray medium to coarse SAND & GRAVEL - Wet	
-	occasional white shell, trace silt	
-		Screen 11 11
-		9 55 6
-		
-	✓ Dark gray coarse SAND & GRAVEL - Wet occasional white shell	
-		
-	sheen on water at clay contact	29.0'
) -	NOIES: Well Pipe: 2" diameter black steel Well Screen: 2" diameter, 5' length, #6 slot, stainless steel	
	Sand Pack: Special coarse blend Ottawa Sand	
	Stratigraphy 0-9.0' from OW37-85.	

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★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
 ▼ WATER FOUND STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

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			1-85 (SHALLC	W BETROCK)
PROJECT N	IAME: 102/10 STRUET FAULT THE JOB NG: 5-1401	HOLE NO.: OHT	APRIL	2. 1986
UCIENT:	- HOLIOW STEM AUGER (6-1/4" TD/11" OD)	TOP OF BANK AT SOU	THEAST CORNE	R OF SITE
	/ENCINEER: D. MILLARD CONIND ELEVATION: * 573.7	TOP OF PIPE	FLEVATION:	576.16
	PROFILE	INSTALLATION	SANPLE	PENE TRATION TEST
OEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	576.16	NUMBER TYPE LOWS / FOOT	BLOWS / FOOT
0	Dark gray SILT - some gravel, some flyash, Moist trace vegetation (FILL)	573.7		
-	Black CINDERS & FLYASH (FILL) Moist	-CEM/BEN BKFL		
5 -	Black FLYASH & CINDERS - piece of plastic, Moist 1/4" lense of gray material at 5.9' (FILL)			
-	Black FLYASH & CINDERS - occasional stone, Wet trace gray material at 6.8', 3" wood at 7.6' (FILL) — Dark gray FLYASH & fine SAND - trace fine gravel (FILL)			
- 10 -	Mottled brown-black TOPSOIL & VEGETATION, Moist becoming clayey silt (NATIVE) Mottled brown & dark gray SAND & SILT Moist	-13" d BH		
-	Mottled brown & dark gray fine sandy SILT Moist-wet with vegetation throughout Gray-brown fine sandy SILT with vegetation Moist-wet throughout - occasional fine sandy lense			
-	Gray fine SAND & SILT -some vegetation Moist-wet throughout, occasional shell fragment			
15 -	Dark gray fine SAND & SILT with occasional Wet black layering			
- - 20 -	Gray & dark gray fine SAND & SILT -small Wet stone, trace shell, trace silt			
-	Gray medium to coarse SAND & GRAVEL - Wet occasional white shell, trace silt			
25 - -				
-	Dark gray coarse SAND & GRAVEL - Wet _ occasional white shell		1 SS 42	
- 30 -	Red_brown_CLAY Wet		2 SS WOR	
	Red-brown CLAY -occasional silty lenses Wet increasing with depth, occasional small stone		3 SS WOR WOR	

★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
★ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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PROJECT	NAME: 102ND STREET LANDFILL JOB NO: 9-143	1 HOLE NO.: _ OF	¥41-85	Page	2. of 3
CLIENT:	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED:	NOVEN	BER 25, 1985
HOLE TY	PE:HOLLOW STEM AUGER (6-1/4" ID/11" OD) LOCATION :ALONG	TOP OF BANK AT SC	UTHEAS		ER OF STIE
GEOLOGIST	T/ENGINEER:D, MILLARD GROUND ELEVATION:573.7	TOP OF PIPE	ELEVAT	ION :*	576.16
	PROFILE	MONITOR INSTALLATION	SAMF	LE	PENETRATION
			æ	1001	BLOWS / FOOT
EPTH	STRATIGRAPHY Description & Remarks		UMBE TYPE	MS/F	
		A	Ĺ	BLO	20 40 60 80
	Red-brown CLAY - occasional silty lenses Wet increasing with depth, occasional small stone	-13" Ø	4 5	SS WOF	
. 56	Red-brown SAND, SILT & CLAY -some gravel (TILL) Wet		5	66	
-	Brown SAND, SILT & GRAVEL -trace clay Wet	BKFL 5" Ø SC	6 5	73 8 36	
40 -	NOTES: Stratigraphy 0-28.0' from OW40-85.	⊥LJ⊥-39.5'			
	Well Pipe: 5" diameter black steel				

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* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS ▼ WATER FOUND ▽ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL

PROJECT NO.: 9-1431

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: TOP OF BANK AT SOUTHEAST CORNER OF SITE

HOLE DESIGNATION: 041-85 PAGE 3 OF 3 DATE COMPLETED: APRIL 2, 1986 DRILLING METHOD: 3" Ø NX CORE

CRA SUPERVISOR: D. MILLARD/C. PADGINION

DEPTH	DESCRIPTION OF SIRATA	R U N N	I N T E R V A L	R E C C O O R V E E R Y	R Q D	D R R IWE LAT LTU IER NRN G	WATER PRESSURE TEST	E L E V A T I O N	MONITOR INSTALLATION
ft BG				8	8	8	CIII/S	ft AMSL	
- 40 - -		1	39.7	100	48.6	18		534.0	-13" Ø BH 5" Ø SC CEM/BEN BKTL
- 45 - -	DOLOMITE (LOCKPORT GROUP - OAK ORCHARD FORMATION): gray, fine to medium grained, thinly bedded, numerous shaly & carbonaceous partings, vuggy and pitted with some secondary gypsum replacement	2	45.7	91	20.3	12		528.0	— 3" Ø ВН
- - 50 - -		3	49.0	110	43.0	75		524.7	
- - 55 -	- bioherm from 54.1'-54.3'	4	53.3 55.3	96	28.9	83		520.4 518.4	

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

WATER FOUND STATIC WATER LEVEL

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ROJECT #	NAME: 102ND STREET LANDFILL JOB NS: 9-1431	HOLE N9.:		Bł	142-8	6		
LIENT:	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED:_	MA	RCH	<u>10, 1</u>	1986	
DLE TYP	E: HOLLOW STEM AUGER (8-1/4" ID/13" OD) LOCATION: RIPRAP	TERRACE, SOUTHEAS	st œ	RNER	* OF	SITE		
EOLOGIST	/ENGINEER : GROUND ELEVATION : 570.4	TOP OF PIPE	ELE	VATIO	N :			
	PROFILE	MONITOR INSTALLATION	3	AMPL	E	PEN	ETRAT	FION
DEPTH (ELEVATION)	STRATIGRAPHY Description & Remarks		NUMBER	TYPE	BLOWS / FOOT	BLOW 20	40 40	100 •••
_		570.4						
-	Augered through							
- -	Red-brown & dark brown SILT - some Wet vegetation, some fine sand, some gravel (FILL)		1	ss	44 81			
-	Gray-green SIDNE & ROCK -occasional white Moist shell, becoming gray-white at 6.0' (FILL) Black FLYASH & VEGETATIVE MATTER - Moist		2	ss	100+ 23		\parallel	+
-	rotting organic odor (FILL) Dark brown SILT & VEGETATIVE MATTER - Moist strong rotting vegetation odor (NATIVE)	13"Ø BH	3	ss	17 4	1		
-	Gray fine SAND & SILT - vegetation Moist-wet throughout, black mottling decreasing with depth		4	ss	3			
-	Gray SILT & fine SAND - occasional Wet vegetation decreasing with depth.	CEM/BEN BKFL			6 5			
-	occasional pebble		5	ss	WOR WOH			
-			6	ss	2			
-	Gray fine to medium SAND - some silt, Wet occasional pebble, trace vegetation (roots)		,	55	- 7 WOR			
-	No recovery			5	WOR			
-			ů	30	17			
-	Dark gray coarse to medium SAND - some Wet sub-rounded gravel, occasional white shell fragment		9	ss	34 7	ł		
-	Gray, brown & black fine sub-rounded Wet GRAVEL - some coarse sand, occasional		10	ss	7			
-	white shell fragment Gray & brown-gray medium SAND & sub- rounded GRAVEL - some silt, some white shell fragments, brown-gray fine gravel & coarse sand lense at 27.5', NAPL present in lense only (0.15' depth), chemical odor		11	ss	37 67 100+		\mathbb{N}	
-	NOTES: Auger refusal at 28.0'; grinding slow augering to 29.0'. Abandoned borehole and grouted to surface.	29.0 ⁷						

▼ WATER FOUND ♥ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

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CLIENT:OCC HOLE TYPE: GEOLOGIST / ENG GEOLOGIST / ENG HLAG G G C C HLAG G C C C C C C C C C C C C C	CIDENTAL CHEMICAL CORPORATION HOLLOW STEM AUGER SINEER: D. MILLARD GROUND ELEVATION PROFILE STRATIGRAPHY DESCRIPTION & REMARKS ark gray SILT - some gravel, some flyash, race vegetation (FILL) lack CINDERS & FLYASH (FILL) lack FLYASH & CINDERS - piece of plastic, /4" lense of gray material at 5.9' (FILL) lack FLYASH & CINDERS - piece of plastic, /4" lense of gray material at 5.9' (FILL) lack FLYASH & CINDERS - occasional stone, race gray material at 6.8', 3" wood at .6' (FILL) ark gray FLYASH & fine SAND - trace fine ravel (FILL) ottled brown-black TOPSOIL & VESETATION, ecomion clausey site (NATURE)	Moist Moist Wet		DATE COMPLET DATE COMPLET DA	TED:_ THEA ELE	JJ ST (VATIO	BLOWS / FOOT	Y 15, 1 R OF SI 577. PENETF BLOWS;	1987 TTE .04 .04 .04 .04 .04 .04 .04 .04
HOLE TYPE: GEOLOGIST / ENG H_{LG30} H_{LG30} 0 - D_{C} $ D_{I}$ $ D_{I}$	HOLLOW STEM AUGER SINEER: D. MILLARD GROUND ELEVATION PROFILE STRATIGRAPHY DESCRIPTION & REMARKS ark gray SILT - some gravel, some flyash, race vegetation (FILL) lack CINDERS & FLYASH (FILL) lack FLYASH & CINDERS - piece of plastic, /4" lense of gray material at 5.9' (FILL) lack FLYASH & CINDERS - piece of plastic, /4" lense of gray material at 5.9' (FILL) lack FLYASH & CINDERS - occasional stone, race gray material at 6.8', 3" wood at .6' (FILL) ark gray FLYASH & fine SAND - trace fine ravel (FILL) ottled brown-black TOPSOIL & VESETATION, ecomion clavey silt (MATERIAN)	Moist Woist Wet		577.04 577.04 573.6 CEM/BEN EKFL	ELE	ST (VATIO	DRNE LE	R OF SI 577, PENETR TE BLOWS, E0 40	04 ATION ST / FOOT
6EOLOGIST / ENG (NOLLAN 313) 0 - Da - L1 - B: - Constant - B: - Constant - B: - Constant - B: - Constant - B: - Constant - Constan	SINCER: D. MILLARD GROUND ELEVATION PROFILE STRATIGRAPHY DESCRIPTION & REMARKS Mark gray SILT - some gravel, some flyash, race vegetation (FILL) lack CINDERS & FLYASH (FILL) lack FLYASH & CINDERS - piece of plastic, /4" lense of gray material at 5.9' (FILL) lack FLYASH & CINDERS - piece of plastic, /4" lense of gray material at 5.9' (FILL) lack FLYASH & CINDERS - occasional stone, race gray material at 6.8', 3" wood at .6' (FILL) ark gray FLYASH & fine SAND - trace fine ravel (FILL) ottled brown-black TOPSOIL & VESETATION, ecomion clavey silt (NATURE)	* 573.6 Moist Moist Wet		TOP OF PIPE	ELE"		BLOWS / FOOT H K	577 . PENETF TE: BLOWS , to 40	.04 RATION ST / FOOT
Hudge 0 -	PROFILE STRATIGRAPHY DESCRIPTION & REMARKS Eark gray SILT - some gravel, some flyash, race vegetation (FILL) lack CINDERS & FLYASH (FILL) lack FLYASH & CINDERS - piece of plastic, /4" lense of gray material at 5.9' (FILL) lack FLYASH & CINDERS - occasional stone, race gray material at 6.8', 3" wood at .6' (FILL) ark gray FLYASH & fine SAND - trace fine ravel (FILL) ottled brown-black TOPSOIL & VESETATION, ecomion clause silt (NATURE)	Moist Moist Moist Wet		-577.04 -573.6 -CEM/BEN BKFL	NUMBER	AMPL Ud + L	BLOWS / FOOT	PENETF TE: BLOWS /	**************************************
(HOLLAN JUNE) 0 - DEL - B: - B:	STRATIGRAPHY DESCRIPTION & REMARKS ark gray SLLT - some gravel, some flyash, race vegetation (FILL) lack CINDERS & FLYASH (FILL) lack FLYASH & CINDERS - piece of plastic, /4" lense of gray material at 5.9' (FILL) lack FLYASH & CINDERS - occasional stone, race gray material at 6.8', 3" wood at .6' (FILL) ark gray FLYASH & fine SAND - trace fine ravel (FILL) ottled brown-black TOPSOIL & VESETATION, ecoming clause silt (NATURE)	Moist Moist Moist Wet		-577.04 -573.6 -CEM/BEN BKFL	NUMBER	TYPE	BLOWS / FOOT	8LOWS ,	✓ FD01
0 - bi - bi - bi - bi - bi - bi - bi - bi	ark gray SILT - some gravel, some flyash, race vegetation (FILL) lack CINDERS & FLYASH (FILL) lack FLYASH & CINDERS - piece of plastic, /4" lense of gray material at 5.9' (FILL) lack FLYASH & CINDERS - occasional stone, race gray material at 6.8', 3" wood at .6' (FILL) ark gray FLYASH & fine SAND - trace fine ravel (FILL) ottled brown-black TOPSOIL & VESETATION, ecomion claway silt (NATIVE)	Moist Moist Wet		CEM/BEN BKFL					
$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	lack CINDERS & FLYASH (FILL) lack FLYASH & CINDERS - piece of plastic, /4" lense of gray material at 5.9' (FILL) lack FLYASH & CINDERS - occasional stone, race gray material at 6.8', 3" wood at .6' (FILL) ark gray FLYASH & fine SAND - trace fine ravel (FILL) ottled brown-black TOPSOIL & VESETATION, ecoming clavey silt (NATURE)	Moist Moist Wet		CEM/BEN BKFL					
5 - 1, - 3, -	<pre>lack FLYASH & CINDERS - piece of plastic, /4" lense of gray material at 5.9' (FILL) lack FLYASH & CINDERS - occasional stone, race gray material at 6.8', 3" wood at .6' (FILL) ark gray FLYASH & fine SAND - trace fine ravel (FILL) ottled brown-black TOPSOIL & VEGETATION, ecomping clausey silt (NATTIVE)</pre>	Moist Wet							
- 7. - 7. - 7. - 7. - 7. - 7. - 7. - 7.	<pre>lack FLYASH & CINDERS - occasional stone, race gray material at 6.8', 3" wood at .6' (FILL) ark gray FLYASH & fine SAND - trace fine ravel (FILL) ottled brown-black TOPSOIL & VEGETATION, ecomping clausey silt (NATIVE)</pre>	Wet.							
- Mx - Mx - Gr - Gr - Gr - Gr - Gr - Gr - Gr - Gr	ottled brown-black TOPSOIL & VEGETATION,			6*¢ SC					
	ottled brown & dark gray SAND & SILT ith vegetation	Moist Moist		1.1.1° d					
- tr 5 - b] 	ith vegetation throughout ray-brown fine sandy SLIT with vegetation hroughout - occasional fine sandy lense	Moist-wet		BH					
- bl	ray fine SAND & SILT, some vegetation hroughout - occasional shell fragment	Moist-wet							
	ark gray fine SAND & SILT with occasional lack layering	Wet							
- Gr - St	ray & dark gray fine SAND & SILT, small tone, trace shell, trace silt	Wet							
-				-4"Ø SC					
- oc	ray medium to coarse SAND & GRAVEL, ccasional white shell, trace silt	Wet							
5 - -									
	ark gray coarse SAND & GRAVEL, ccasional white shell	Wet							
	gered through	met	-						
- in - st	ed-brown CLAY, occasional silty lense acreasing with depth, occasional small tone	Wet							

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* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS WATER FOUND ∇ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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PROJECT N	NAME: JOB NO: JOB NO: 9-143	1	HOLE NO.: OW	42-8	5 P	age 2	2 of	6	
CLIENT:	OCCIDENTAL CHEMICAL CORPORATION		DATE COMPLE	TED:_	JAI	NUAR	<u>x 1</u> :	<u>i. 19</u>	87
HOLE TYP	E: HOLLOW STEM AUGER LOCATION: _ALONG	TOP O	F BANK AT SO	0/11/10/2	ST (TR. OF	STT	<u>`</u>
CRA SU	PERVISOR : GROUND ELEVATION : 573.6		TOP OF PIPE	ELE	VATIO)N:		577.04	<u> </u>
	PROFILE	111	MONITOR STALLATION	s		.E	PEN	ETRAT	ION
DEPTH	STRATIGRAPHY Description & Remarks	F	7	NUMBER	TYPE	ILOWS / FOOT	8L0 20	40 60	ют •0
-	Red-brown CLAY - occasional silty lenses Wet increasing with depth, occasional small stone	1				8		\dagger	\square
35 -	Red-brown SAND, SILT & CLAY, some gravel (TILL) Wet		—13"0/ BH						
-	Brown SAND, SILT & GRAVEL, trace clay Wet		EKFL						
-	·		- 6" Ø SC						
40 -	NOTES: Stratigraphy from OW41-85.		39.3' 39.9' 40.2'						
								•	
	· · · · · · · · · · · · · · · · · · ·								
		I	+						┙

* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS WATER FOUND ∇ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL

PROJECT NO.: 9-1431

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: SOUTHEAST AREA OF SITE

HOLE DESIGNATION: OW42-86 PAGE 3 OF 6 DATE COMPLETED: JANUARY 15, 1987 DRILLING METHOD: 3" DIA. NX CORE CRA SUPERVISOR: R HOEKSTRA/C PADGINTON

ft BG e e e e e e e e e e e ft AMSL -40 DLOMITE (LOCKDORT GROUP-OAK ORCHAER TORMATION): medium to dark gray, aphanitic to medium grained; some banding, medium grained	DEPTH	DESCRIPTION OF STRATA	R U N N O.	I N T R V A L	R E C C O O R V E E R Y	R Q D	D R R IWE LAT LTU IER NRN G	WATER PRESSURE TEST	E L V A T I O N	MONIFI INSTALL	OR ATION
40 DOLOMITE (LOCKPORT GROUP-OAK ORCHARD FORMATION): medium to dark gray, aphanitic to medium grained; some banding, medium graine; some banding, m	ft BG	·			8	. 8		cm/s	ft AMSL		
40 DOLOHITE (LOCKPORT GROUP-OAK ORCIAND FORMATION): medium to graduati, pre backing, medium to graduati, pre backing, medium to graduati, pre backing, medium to graduati, pre backing, medium pathing, fossiliferous 2 40.6 74 533.4 533.4 533.4 - 45 because, opperm filled, trace- partings, fossiliferous 2 40.6 74 525.0 525.0 - 50 - trace weathered fractures 3 55.1 131 100 60 518.5 - bighly fractured 62.9' to 60.75' 4 62.9 100 29 22 510.7 - several yypour masses, stromatolites 5 70.2 102 100 37 503.4 - calcite & sphialerite filled vugs at 01.25' 6 78.3 91 100 23 495.3 - 90 - - 65.0 110 100 96 408.6			1	39.3	9Ò	72			534.3		
- 50 - trace weathered fractures 2 48.6 74 525.0 525.0 - 55 - trace weathered fractures 3 55.1 131 100 60 518.5 - 60 - highly fractured 62.9' 4 62.9 100 29 22 510.7 - 65 - trace weathered fractures 5 70.2 102 100 37 503.4 - 70 - several gypsum masses, stromatolites 5 70.2 102 100 37 503.4 - 63 - calcite 4 sphlalerite filled 6 78.3 91 100 23 495.3 - 65 - calcite 4 sphlalerite filled 7 85.0 110 100 98 468.6	- 40 - - - - - - - - - - - - - - - - - - -	DOLOMITE (LOCKPORT GROUP-OAK ORCHARD FORMATION): medium to dark gray, aphanitic to medium grained; some banding, medium bedding, bituminous, few frac- tures, gypsum filled, trace partings, fossiliferous				•			533.4		13"0 BH 6"0 SC CEM/ BEN BKFL
$ \begin{array}{c} 30' \\ - \\ 55' \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ - \\ $	-		2	48.6	74				525.0		
- 55 - highly fractured, slight 3 55.1 131 100 60 518.5 518.5 - 0 - highly fractured 62.9' to 68.75' 4 62.9 100 29 22 510.7 - 4"% - 66 - trace weathered fractures 5 70.2 102 100 37 503.4 - 4"% - 70 - several yypsum masses, stromatolites 5 70.2 102 100 37 503.4 - 75 - calcite & sphlalerite filled vugs at 81.25' 6 78.3 91 100 23 495.3 - 80 - calcite & sphlalerite filled vugs at 81.25' 7 85.0 110 100 98 488.6	- 50 - - -	- trace weathered fractures									-5-3/4" Ø BH
- highly fractured, slight weathering - 60 - highly fractured 62.9' to 68.75' - 65 - trace weathered fractures - 70 - 70 - several gypsum masses, - 75 - 75 - 66 - calcite & sphialerite filled vugs at 81.25' - 85 - 7 85.0 110 100 98 - 6 78.3 91 100 23 - 7 85.0 110 100 98 - 6 78.6 110 100 98	- 55 -		3	55.1	131	100	60		518.5		
$ \begin{array}{c ccccccccccccccccccccccccccccccccccc$	-	- highly fractured, slight weathering									
- highly fractured 62.9' to 68.75' - trace weathered fractures - trace weathered fractures	- 60 -										
- 65 - trace weathered fractures - 70 - 70 - several gypsum masses, - stromatolites - 75 		- highly fractured 62.9' to 68.75'	4	62.9	100	29	22		510.7		
- 70 - several gypsum masses, - 75 - 76 - 78.3 91 100 23 495.3 - calcite & sphlalerite filled - vugs at 81.25' - 85 - 7 85.0 110 100 98 488.6	- 65 - - -	- trace weathered fractures									+4"Ø SC
- several gypsum masses, - stromatolites - 75 - 75 - 75 calcite & sphlalerite filled - vugs at 81.25' - 85	- - 70	,	5	70.2	102	100	37		503.4		
- 75 - 80 - 80 - 0 - calcite & sphlalerite filled - vugs at 81.25' - 85 - 90 	-	- several gypsum masses, stromatolites									
- calcite & sphlalerite filled - calcite & sphlalerite filled - vugs at 81.25' - 85	- 75 -										
- 80 - calcite & sphlalerite filled - vugs at 81.25' - 85 - 85 - 90 	-		6	78.3	91	100	23		495.3		
- calcite & sphlalerite filled vugs at 81.25' - 85 - 85 - 90 - 90	- 80 -										
- 85 - 85.0 110 100 98 488.6 - 90 - 90	-	- calcite & sphlalerite filled vugs at 81.25'									
	- 85		7	85.0	110	100	98		488.6		
- - 90 -	-										
	- - 90										
	-										

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

WATER FOUND

STATIC WATER LEVEL

(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL PROJECT NO.: 9-1431 CLIENT: OCCIDENTAL CHEMICAL CORPORATION LOCATION: SOUTHEAST AREA OF SITE HOLE DESIGNATION: OW42-86 PAGE 4 OF 6 DATE COMPLETED: JANUARY 15, 1987 DRILLING METHOD: 3" DIA. NX CORE CRA SUPERVISOR: R HOEKSTRA/C PADGINTON

DEPTH	description of strata	R U N N O	I N T R V A L	R E C C O O R V E E R Y	R Q D	D R R IWE LAT LTU IER NRN G	WATER PRESSURE TEST	E L V A T I O N	MONITOF	tion (
ft BG				8	8	8	can/s	ft AMSL		
- 90 - - - - - - - - - 95	Dolomite (as above)	8	93.3	99	100	93		480.3		5-3/4"Ø
- - - - 100 - -		9	100.0	95	92	97		473.6		sn
- - 105 - - - - - - - 110		10	108.4	102	100	94		465.2	-(CEM/BEN SKFL
- - - - 115 - -		11	115.0	98	99	87		458.6	-4	"Ø SC
- - 120 - - - - - - - - - - - 125		12	123.3	101	100	93		450.3		
- - - 130 - -	DOLOMITE (LOCKPORT GROUP - ERAMOSA FORMATION): light to olive gray, fine to medium	13	130.0 130.5	98	70	65		443.6 443.5		
- 135 - - - - - 140 -	grained, very thin to medium bedding, frequent carbonaceous partings, trace weathered fractures	14	139.3	107	100	86		434.3		, , ,
- 145	- cherty	15	145.0	83	100	67		428.6		

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

STATIC WATER LEVEL

WATER FOUND

NM - NOT MEASURED

r

(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL

PROJECT NO .: 9-1431

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: SOUTHEAST AREA OF SITE

HOLE DESIGNATION: OW42-86 PAGE 5 OF 6 DATE COMPLETED: JANUARY 15, 1987 DRILLING METHOD: 3" DIA. NX CORE CRA SUPERVISOR: R HOEKSTRA/C PADGINTON

E I R R D WATER L N T E R R IWE R Е Q D PRESSURE Е сс DEPTH DESCRIPTION OF STRATA U TEST v MONITOR LAT INSTALLATION 00 N A RV RV т ΕE N IER Ι 0. NRN ō A R L Y G N ft BG cm/s ft AMSL - 145 cherty; 5-3/4 ØВН ~ 150 - massive chert nodules 4" Ø SC 152.5 421.1 DOLOMITE (LOCKPORT GROUP -16 154.0 120 100 99 419.6 - 155 GOAT ISLAND FORMATION): light to medium gray, fine to medium CEM/ grained, thick bedded, BEN stylolitic, cherty, vuggy with 113 BKFL ~ 160 gypsum or carbonate or 17 160.0 88 96 413.6 limonite coatings, frequent 4 shaly partings 162.0 411.6 - sharp conformable contact DOLOMITE (LOCKPORT GROUP -GASPORT FORMATION): gray to -165 olive gray, fine to medium grained, thin to thick bedding bituminous, fossiliferous, A pitted; few fractures DULOMITIC SHALE: black, very fine to fine grained, thin to 169.3 -- 170 93 52 86 404.3 170.0 403.6 3"Ø NX thick bedding, vugs with gypsum &/or sphalerite, trace - 175 weathering on fractures _ _ 19 178.9 75 72 394.7 - 180 20 179.3 106 86 100 394.3 -184.3 21 96 100 100 389.3 - 185 186.0 387.6 DOLOMITE: as above, coarse _ grained, some porosity, banded ~ 190 trace limonitic staining 22 194.3 40 30 100 379.3 - 195 - weathered fracture at -194.75' 23 195.9 112 100 86 377.7 200

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

WATER FOUND

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STATIC WATER LEVEL

STRATIGRAPHIC	AND INST	RUMENTATIO)N LOG
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(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL

PROJECT NO.: 9-1431

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: SOUTHEAST AREA OF SITE

HOLE DESIGNATION: OW42-86 PAGE 6 OF 6 DATE COMPLETED: JANUARY 15, 1987 DRILLING METHOD: 3" DIA. NX CORE CRA SUPERVISOR: R HOEKSTRA/C PADGINTON

DEPTH	DESCRIPTION OF STRATA	R U N N O.	I N T R V A L	R E C C O O R V E E R Y	R Q D	D R R IWE LAT LTU IER NRN G	WATER PRESSURE TEST	E L E V A T I O N	MONI INSTAL	TOR LATION
ft BG				8	8	8	CEL/S	ft AMSL		
- 200 -	Dolomite (as above)									
-										
-	- conformable, gradational		204.8					368.8		-з"Ø мх
- 205 -	DOLOMITE (CLINTON GROUP -									
-	DECEW FORMATION): gray to									
-	grained, argillaceous,	25	209.3	192	100	85		364.3		
- 210 -	- few carbonaceous partings									
-	from 209.3', occasional vug,									
-	- clay seam		213.8					359.8		
- 215 -										
-	- clay seam contact SHALE (CLINTON GROUP -	1	216.8					356.8		
-	ROCHESTER FORMATION): black								ļ	
- 220	massive bedding. several									
-	fractured & weathered zones		223.3					350.3		
-										
- 225										
									1	
										1
1										
i										}
i										
		1								

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

WATER FOUND STATIC WATER LEVEL

PROJECT	NAME: 102ND STREET LANDFILL JOB NO: 9-1431	HOLE N9.:		BH43-	85
CLIENT	OCCIDENTAL CHEMICAL CORPORATION	DATE CONPLE	TED:	DECEM	BER 4, 1985
HOLE T	PE: HOLLOW STEM AUGER (3-3/4" ID, 8" OD) LOCATION: ALONG	TOP OF BANK AT SOU	/hidas	T CORNI	ER OF STITE
GEOLOGI	T/ENGINEER: D. MILLARD GROUND ELEVATION: 577,2	TOP OF PIPE	ELEV	атюн:*	
	PROFIL F	MONITOR	SA	MPLE	PENETRATION
<u> </u>		MSTALLATION		15	TEST BLOWS / FOOT
ATION	STRATIGRAPHY		ABEA	Lo Fo	
ELEV	DESCRIPTION & REMARKS		ž	L OWS	20 40 60 60
<u> </u>			\vdash		╏╎╎┼┼┼
ο.	Brown TOPSOIL - some vegetation (FILL) Moist	577.2			
	Red-brown & black silty CLAY - some stone, Moist some cinders, occasional vegetation,	-8" Ø		[
	occasional brick (FILL)	BH			
	Brown silty CLAY with black CINDERS - Moist				
	occasional stone, trace fine sand (FILL)				
5 .	Black FLYASH - occasional brown silty clay, Moist				
Ι.					
	Brown, dark brown & black FLYASH, SILT, Wet				
	Black FLYASH - occasional yellow notile, Moist	BKFL			
	piece of wood (FILL)				
	stone, occasional brown clayey lense, piece				
	Black FLYASH - some sand, occasional brown Moist				
-	gravel at 11.8' (FILL)	-			
1 .	Augered through to 13.0'				
-	(NATIVE)				
1	Dark gray silty fine SAND with vegetation Moist Dark gray SILT - some fine sand Wet				
15 -	Gray clayey SILT - vegetation throughout Moist-wet		1	SS 7	
1	Gray fine sandy SILT - vegetation Moist-wet throughout			11	
·	Gray silty fine SAND - occasional pebble, Moist		2	SS 11	
-	vegetation throughout			13	
-			3	SS 6	
20 -	Gray fine SAND - trace silt, trace Wet vegetation			5	11
-			4	SS 14	
•	Gray medium to coarse SAND & GRAVEL - Wet			11	
•	Gray SAND - trace silt Wet		5	SS 12	
•				17	
25 -	Gray fine SAND & SILT Wet		6	SS 8	
-				16	
.			7	SS 11	
·				14	
.			8	ss 10	
30 -	Gray medium SAND - Some Shells Wet			8	
	Brown clayey SILT - trace fine gravel Wet		9	SS 47	
				B 0	
	Red-brown SAND, SILT & CLAY - Wet		10	SS 17	
L	fine gravel throughout (TILL)				

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★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
 ▼ WATER FOUND ♥ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

STRATIGRAPHIC AND INSTRUMENTATION LOG PROJECT NAME: _____ 102ND STREET LANDFILL ____ JOB N2: _____9-1431 ____ HOLE N2.: ____ BH43-85 Page 2 of 2 CLIENT: ____OCCIDENTAL CHEMICAL CORPORATION DATE COMPLETED: _____DECEMBER 4. 1985___ HOLE TYPE: HOLLOW STEM ALKER (3-3/4" ID, 8" OD) LOCATION: ALCING TOP OF BANK AT SOUTHEAST CORNER OF STTE CRA SUPERVISOR : D. MILLARD GROUND ELEVATION:* _ TOP OF PIPE ELEVATION: 577.2 MONITOR SAMPLE PENETRATION PROFILE TEST BLOWS / FOOT BLOWS / FOOT NUMBER TYPE DEPTH STRATIGRAPHY DESCRIPTION & REMARKS 20 40 60 ... 28 35 · 8" Ø 11 SS 15 Red-brown SAND, SILT & CLAY - fine Wet gravel throughout (TILL) BH 30 12 SS 42 96 CEM/BEN BKFL 13 55 49 40 Gray-brown silty CLAY - trace fine sand, 28 Wet trace small pebbles Gray medium to fine SAND 14 59 26 Moist è Gray silty, sandy CLAY Gray SILT, fine to medium SAND & STONE Gray GRAVEL & medium SAND Moist 63 Moist-wet Wet 43.8' 15 SS 100 Wet Gray fine to medium SAND & GRAVEL 44.3 45 NOTES: Stratigraphy 0-15.0' from OW34-85. Grouted borehole to surface. * REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS

★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS ▼ WATER FOUND ▼ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS



▼ WATER FOUND 🛛 STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

STRATIGRAPHIC	AND	INSTRUMENTATION	LOG
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JOB N9.: ____

9-1431

HOLE NR.

DATE COMPLETED:__

OW43-86 Page 2 of 2

JANUARY 30, 1986

Π	PROJECT	NAME: 102ND STREET LANDFILL
	HOLE TYP	E: HOLLOW STEM AUGER
Π	CRA SUP	ERVISOR : D. MILLARD GRO
		PROFILE
	DEPTH	STRATIGRAPH Description & Ri
		NOTES: Well Pipe: 2" diameter blac
		Well Screen: 2" diameter, 5' stainless steel Sand Pack: Special coarse b
		Stratigraphy 0-29.0 from bits.
0	* REFER ♥ WATER	TO WATER ELEVATIONS TABLE FOR CURI FOUND ♥ STATIC WATER LEVEL 37

AA SUPERVISOR <u>D. MILLARO</u> GROUND ELEWITON: <u>577.2</u> TOP OF PIPE ELEWITON: <u>577.2</u> TOP OF PIPE ELEWITON: <u>577.2</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>OESCOPTON 2. REMARKS</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPHY</u> <u>STRATORAPH</u>	.E	TYPE	HOLLOW STEM AUGER LOCATH	DN: ALONG	TOP OF BANK AT SOL	JTHE	ST	CORNI	RO	F S1	ΠE	
PROFILE MENTALLATION SAMPLE PENTER STRATORAMY DESCRIPTION & REMARKS MULTIPLE: 2" diameter black steel Well Excess 2" diameter black steel Well Screen 2" diameter black steel Sand Pack: Special Course bland Ottaes aand Stratigraphy 0-29.0' from BH43-85.	RA	SUPERV	ISOR : GROUND ELEVATION:	577.2	TOP OF PIPE	ELEN	OITAV	N:*		58	30.2	20
STRATGRAPHY OESCREPTION & REMARKS StratGRAPHY OESCREPTION & REMARKS NUTES: Wall Spreen: 2" diameter black steel wall Screen: 2" diameter, 5" length, #6 slot. staniess steel Sand Pack: Special coarse black Otawa sand Stratigraphy 0-29.0" from BH43-85.			PROFILE		MONITOR INSTALLATION	S	AMPL	E	PEN	IETR.	ATIC)N
NOTES: Well Screen: 2" diameter black steel Well Screen: stalless steel Sand Pack: Special Coarse blend Ottawa sand Stratigraphy 0-29.0' from BH43-85.	DEPTH		STRATIGRAPHY Description & Remarks			NUMBER	TYPE	BLOWS / FOOT	8L0	40 1	FO(л Д
			NOTES: Well Pipe: 2" diameter black steel Well Screen: 2" diameter, 5' length, #6 slot, stainless steel Sand Pack: Special coarse blend Ottawa sand Stratigraphy 0-29.0' from BH43-85.									

R ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS

PROFIL E	MONITOR INSTALLATION	SAN	PLE
THE STRATIGRAPHY DESCRIPTION & REMARKS		NUMBER	
0 - Brown TOPSOIL - some vegetation (FILL) Moist Red-brown & black silty CLAY - some stone, Moist - some cinders, occasional vegetation, occasional brick (FILL)	579.93 577.2 -13" Ø BH		
- Brown silty CLAY with black CINDERS - Moist occasional stone, trace fine sand (FILL)			
Black FLYASH - occasional brown silty clay, Moist 5 - occasional cinder (FILL)	6" Ø SC		
Brown, dark brown & black FLYASH, SILT, Wet - CLAY, & CINDERS - occasional stone (FILL) - Black FLYASH - occasional yellow nodule, Moist - occasional gray lense of soft waste material, piece of wood (FILL) - Black FLYASH - occasional airdor occasional Moist			
 Black FLYASH - Occasional cluber, occasional Holst stone, occasional brown clayey lense, piece of wood (FILL) Black FLYASH - some sand, occasional brown Moist cinder, occasional stone, trace clay, some gravel at 11.8' (FILL) 			
Augered through to 13.0' Dark gray silty CLAY with vegetation Moist (NATIVE) Dark gray silty fine SAND with vegetation Moist			
- Dark gray SILT - some fine sand Wet 15 - Gray clayey SILT - vegetation throughout Moist-wet - Gray fine sandy SILT - vegetation Moist-wet			
Gray silty fine SAND - occasional pebble, Moist - vegetation throughout			
20 - Gray fine SAND - trace silt, trace Wet vegetation			
- Gray medium to coarse SAND & GRAVEL - Wet trace silt - Gray SAND - trace silt Wet			
- 25 - Gray fine SAND & SILT Wet			
-			
Gray medium SAND - some shells Wet			
- Brown clayey SILT - trace fine gravel Wet			

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* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS

▼ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL

PROJECT NO.: 9-1431

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: TOP OF EMBANIMENT, SOUTHWEST QUADRANT

HOLE DESIGNATION: OW44-86 PAGE 3 OF 6 DATE COMPLETED: OCTOBER 27, 1986 DRILLING METHOD: 3" DIA. NX CORE CRA SUPERVISOR: C PADGINTON

DEPTH	description of Strata	R U N N O	I N E R V A	R E C C O O R V E E R	R Q D	D R R I W E L A T L T U I E R N R N	WATER PRESSURE TEST	L E V A T I O	MONITA	IR ATION
ft BG			L	¥ 8	8	G	cn./s	N ft AMSL		· · ·
-		1	44.4	97		32		533.2 532.8	Ц]	H7
- 45 - - - - - - 50 - -	DOLOMITE (LOCKPORT GROUP - OAK ORCHARD FORMATION): dark gray & brown-gray, some banding, weathers light gray, very fine to fine grained, thick bedding, carbonaceous, occasional weathered zone,									/13" Ø BH -6" Ø SC -CEM/ BEN BKFL
- - - 55 -	very close spacing, fracture surfaces weathered or with calcareous coatings, slightly pitted, fossiliferous	2	53.7	113	6	O		523.5		
- - 60 - - - - - 65	- becomes shaly, argillaceous shaly partings, calcite & gypsum coatings, close to very close spacing	3	59.4	93	68	43		517.8		-5-3/4" Ø вн
- - - - - 70	- weathered fractures - fine to medium grained inclined medium bedding	4	67.2	102	75	O		510.0		
- - - 75 - - - - - 80	- bituminous, saccharoidal stylolitic, thick to massive bedding, banded, fewer fractures, close to moderate spacing	5	74.4	97	97	03		502.8		-4"Ø SC
- - - - - - - - - -	- secondary galena, fluorite in cavities, highly fossili- ferous - less vugs & pitting at 87'	6	83.7	104	100	0		493.5		
- 90 - - - - - - 95 -	- vuys a picting return		07.4	102	100	100		407.0		

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

WATER FOUND STATIC WATER LEVEL

(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL

PROJECT NO.: 9-1431

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: TOP OF EMBANKMENT, SOUTHWEST QUADRANT

HOLE DESIGNATION: OW44-86 PAGE 4 OF 6 DATE COMPLETED: OCTOBER 27, 1986 DRILLING METHOD: 3" DIA, NX CORE CRA SUPERVISOR: C PADGINION

DEPTH	DESCRIPTION OF STRATA	R U N N	I N T E R V A	R E C O O V E E R Y	.R Q D	D R R IWE LAT LTU IER NRN G	WATER PRESSURE TEST	L E V A T I O N	MONITOR	
ft BG				8	8	· 8	can/s	ft AMSL		Ť
-	DOLOMITE (as above)									T
-		8	98.7	70	100	97		478.5		
- 100	- vugs, fossils decrease with								5-3/4	"
-	depth								BH	
-								172.0		
-		9	104.4	115	100	100		472.8		
- 105										
-										
-										
- 110										
-										
-		10	113.3	110	100	96		463.9	:	
- 115						1				
- 115						1]		
-	unation) fractum/inint								() () () () () () () () () ()	
-	open, secondary calcite	11	119.4	102	100	96		457.8	BEN	
- 120	coatings (117'-122')							}	BKFL	
-										
-										
- - 125	- calcite filled voids				Į					
- 125]			
-										
-	- calcite & sphalerite									
- 130	deposits 128.4'-140.0'		•							
-										
-										
- 135		13	134.4	91	95	92		442.8	sc	
-	- occasional stromatolites									
-										
-										
- 140	- lower unit contact, sharp,		140.0			· ·		437.2		
-	DOLOMITE (LOCKPORT GROUP -	14	142.7	108	100	94		434.5		
-	ERAMOSA FORMATION): dark gray									
- 145	fine grained, thin to medium							ļ		
-	bituminous, frequent shaley					1]			
- ·	partings. occasional galena						1	ļ		
-	IntrefatIzación	15	149.4	98	91	97		427.8		
- 150	1				ļ			1		1
-	1									

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

WATER FOUND STATIC WATER LEVEL

(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL

PROJECT NO.: 9-1431

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: TOP OF EMBANKMENT, SOUTHWEST QUADRANT

DEPTH	DESCRIPTION OF STRATA	R U N N O.	I N T E R V A L	R E C C O O V E E R Y	R Q D	D R R IWE LAT LTU IER NRN G	WATER PRESSURE TEST	E L V A T I O N	MOI INST	VITOR ALLATION	
ft BG				8	8	8	Cm/s	ft AMSL			Ī
- 150 - 155 - 155 - 155 - 160 - 165 - 165 - 170 - 175 - 175 - 175 - 180 	DOLOMITE (as above) DOLOMITE (LOCKPORT GROUP - GOAT ISLAND FORMATION): dark gray, fine to medium grained, thin to medium bedded, saccharoidal, carbonaceous, shaly partings, fossiliferous, oolitic - gradational contact DOLOMITE (LOCKPORT GROUP - GASPORT FORMATION): light to medium gray, fine to medium grained, medium to thick bedded LIMESTONE: medium gray, thin to medium bedding, aphanitic, some gypsum, biohermic DOLOMITE: olive gray, fine grained to aphanitic, shaly partings & fractures, stylo- lites, gypsum seams, bioherm	16 17 18	152.1 158.7 163.7 166.4 167.9 173.3 174.2 179.4	101 97 61 144	99 86 57 100	84 96 96 82		425.1 418.5 413.5 410.8 409.3 403.9 403.0 397.8		S-3/4 Ø BH -CEM/ BEN BKFL -4" Ø SC	
- 185 - 185 - 190 	DOLOMITE: medium to dark gray to brown-gray medium to coarse grained, medium to thick bedding, some pitting, no evidence of fossils, banded - fossiliferous, gypsum replacement (198')	20	186.9 192.7 196.7 201.7	100 99 100	85 99 100	88 92 87		390.3 384.5 380.5 375.5			
-		1			ŀ		1				

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

WATER FOUND

STATIC WATER LEVEL

(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL

PROJECT NO .: 9-1431

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: TOP OF EMBANKMENT, SOUTHWEST QUADRANT

HOLE DESIGNATION: OW44-86 PAGE 6 OF 6 DATE COMPLETED: OCTOBER 27, 1986 DRILLING METHOD: 3" DIA. NX CORE CRA SUPERVISOR: C. PADGINTON

Т

DEPTH	description of strata	R U N N	I N T E R V A	R E C C O O R V E E R	R Q D	D R R IWE LAT LTU IER NRN C	WATER PRESSURE TEST	L E V A T I O N	MONITO	DR ATION
ft BG		-	<u>ц</u>		8	*	cm/s	ft AMSL		
- 205 - - -	DOLOMITE (as above)									
- - 210 - - -	- conformable, sharp contact DOLOMITE (CLINTON GROUP-DECEW FORMATION): medium to dark gray, thick to massive bedding	23	210.0 211.7	60	100	· 87		367.2 365.5		— 3" Ø NX
- - 215 - - -	fine to medium grained, few partings, trace fossils	24	216.7	124	100	71		360.5		
- - 220 - -	- void with gypsum & sphalerite	25	221.7	91	79	90	-	355.5		
- - 225 - - - - - - 230	- gradational contact SHALE (CLINTON GROUP - ROCHESTER FORMATION): black, fine grained, dolomitic. massive bedding, several fractured & weathered zones		224.0					353.2		
- - - - - 235			230.7					10.0		
- 233										

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

WATER FOUND

STATIC WATER LEVEL

NM - NOT MEASURED

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PROJECT NAME: 102ND STREET LANDFILL

_____ JOB NQ: ______ 9-1431 HOLE NQ.: _____ OW45-86 (SHALLOW BEDROCK)

	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED: APRIL	1, 1986
HOLE TYP	E: HOLLOW STEM AUGER (6-1/4" ID/11" OD) LOCATION: ALONG	TOP OF BANK AT SOU	THEAST CORNE	R OF SITE
SEOLOGIST	/ENGINEER : D. MILLARD GROUND ELEVATION : 577.2	TOP OF PIPE	ELEVATION:	579.10
	PROFILE	MONITOR INSTALLATION	SAMPLE	PENETRATION
DEPTH (ELEVATION)	STRATIGRAPHY Description & Remarks	579.10	NUMBER TYPE BLOWS / FOOT	BLOWS / FOOT
0 - - -	Brown TOPSOIL - some vegetation (FILL) Moist Red-brown & black silty CLAY - some stone, Moist some cinders, occasional vegetation, occasional brick (FILL)	577.2 -11"¢ BH		
- 5 -	Brown silty CLAY with black CINDERS - Moist occasional stone, trace fine sand (FILL) Black FLYASH - occasional brown silty clay, Moist occasional cinder (FILL)	5"ØSC		
-	Brown, dark brown & black FLYASH, SILT, Wet CLAY, & CINDERS - occasional stone (FILL) Black FLYASH - occasional yellow nodule, Moist occasional gray lense of soft waste material, piece of wood (FILL) Black FLYASH - occasional cinder, occasional Moist stone, occasional brown clayey lense, piece			
10 – – –	of wood (FILL) Black FLYASH - some sand, occasional brown Moist cinder, occasional stone, trace clay, some gravel at 11.8' (FILL) Augered through to 13.0' Dark gray silty CLAY with vegetation Moist			
- 15 - -	(NATIVE) Dark gray silty fine SAND with vegetation Moist Dark gray SILT - some fine sand Wet Gray clayey SILT - vegetation throughout Moist-wet Gray fine sandy SILT - vegetation Moist-wet throughout	CEM/BEN BKFL		
-	Gray silty fine SAND - occasional pebble, Moist vegetation throughout			
20 – –	Gray fine SAND - trace silt, trace Wet vegetation			
-	Gray medium to coarse SAND & GRAVEL - Wet trace silt Gray SAND - trace silt Wet			
25 - - -	Gray fine SAND & SILT Wet			
- 30 -	Gray medium SAND - some shells Wet			
-	Brown clayey SILT - trace fine gravel Wet			
-	Red-brown SAND, SILT & CLAY - fine Wet gravel throughout (TILL)			

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ENT:	OCCIDENTAL CHEMICAL CORPORATION		DATE COMPLE	TED:	FERR	JARY 5.	198
E TYP	≈e:HOLLOW STEM AUGERLO	CATION : <u>ALO</u>	NG TOP OF BANK AT SC	UTHEAS	<u>r corr</u> *	ER OF SI	CTE.
RA SUF	PERVISOR : D. MILLARD GROUND ELEVATION:	577.2	TOP OF PIPE	ELEVAI	10N:	579,	.10
	PROFILE		MONITOR INSTALLATION	SAM	PLE	PENETR	ATIO
				æ	1001	BLOWS /	F00
HI				UMBE	1		
ō				Z.	BLOV	20 40 4	10 BC
			79	\square			Π
-							
5 -	Red-brown SAND, SILT & CLAY - fine	Wet	11"Ø BH				
-	gravel throughout (TILL)						
-							
-			+-5" ∅ SC				
-							
0 -	Gray-brown silty CLAY - trace fine sand,	Wet					
-	trace small pebbles Gray medium to fine SAND	Moist	BKFL				
-	Gray silty, sandy CLAY Gray SILT, fine to medium SAND & STONE MA	Moist					
-	Gray GRAVEL & medium SAND	Wet					
-	Gray fine to medium SAND & GRAVEL	Wet					
5 -		·····	45.0'				
	NOTES: Well Casing: 6" diameter black steel						
	Stratigraphy from BH43-85						
	4.						
					1		

▼ WATER FOUND ▼ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL

PROJECT NO .: 9-1431

CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: TOP OF BANK AT SOUTHEAST CORNER OF SITE

HOLE DESIGNATION: OW45-86 PAGE 3 OF 3 DATE COMPLETED: APRIL 1, 1986 DRILLING METHOD: 3" Ø NX CORE

CRA SUPERVISOR: D. MILLARD/C. PADGINTON

DEPTH	description of Strata	R U N N O.	I N T E R V A L	R E C O O V E E R Y	RQD	D R R IWE LAT LTU IER NRN G	WATER PRESSURE TEST	E L E V A T I O N	MONITOR INSTALLATION
ft BG			-	•		v			
- - 45 -	DOLOWITE (LOCKPORT CROUP	1	45.7	93	0	o		531.5	
- 50 - -	 OAK ORCHARD FORMATION): brown-gray, medium grained, thinly bedded, numerous weathered partings, few shaly laminations, few vugs, occasional thin zones with weathered dolostone or 	2	47.4	93	15.6	0		529 . 8	BKFL
-	stromatolite fragments	3	52.4	95	13.3	o		524.8	
55 - - -		4	57.4	87.5	12.6	0		519.8	— 3" Ø ВН
 60 			60.9					516.3	
- 65					-				
	· · · · ·								

NOTES: MEASURING POINT ELEVATIONS MAY CHANCE; REFER TO CURRENT ELEVATION TABLE

WATER FOUND STATIC WATER LEVEL

PROJECT	NAME :	102ND STREET LANDFILL	JO8	N9.:	9-1431	HOLE N9.:
	-					-

OW46-85 (SHALLOW BEDROCK)

CLIENT: OCCIDENTAL CHEMICAL CORPORATION DATE COMPLETED: DECEMBER 7, 1985

HOLE TYPE: HOLLOW STEM AUGER (8-1/4" ID/13" OD) LOCATION: NORTHWEST CORNER OF SITE

GEOLOGIST / ENGINEER : _____ MILLARD _____ GROUND ELEVATION * 575.6 TOP OF PIPE ELEVATION * 578.89

		PROFILE STRATIGRAPHY DESCRIPTION & REMARKS			MONI	TOR ATION	SAMPLE			PENETRATI			
EPTH VATION)		STRATIGRAPHY					UMBER	YPE	S / FOOT	BL	OWS	EST S / F	00 T
	נברב	DESCRIPTION & REMARKS	-		<u>/</u>	578.89	Ŧ	-	BLOW	-	•	• •	**
				T		575.6							
0	-	/ Dark brown TOPSOIL - trace vegetation (FILL)	Moist	Π	Ĭ-ī	13" Ø							
	-	Brown SILT - some clay, some fine sand, gray stone in spoon tip (FILL)	Moist		F	BH							
	-	Gray FLYASH/CINDER material - occasional stone (FILL)	Dry										
5	-	Gray-black CINDERS & FLYASH - occasional gravel, occasional fibrous material (FILL)	Dry										
	-	Black CINDER/FLYASH - some hardened tar, trace fibrous material (FILL)	Dry										
	-	Black CINDER/FLYASH - some fibrous material (FILL)	Dry-moist										
10	-	Black FLYASH - irridescent sheen on water	Moist-wet		_ ∐_	5"øsc							
	-	Black TOPSOIL - some silt, some vegetation	Wet										
	-	Dark gray SILT - some clay, some fine sand, some clay, occasional vegetation	Moist										
	-	Gray fine SAND - some silt, occasional vegetation	Moist				1	SS	WOR 8	K			
15	_	Gray SILT & fine SAND	Wet				2	ss	8				
	-	Gray SILT & fine SAND - becoming black, occasional vegetation decreasing with depth	Wet			JEM/BEN BKFL	3	ss	7 3				
	-								7				
	-						4	ss	5				
20	-								5				
	-						5	ss	WOR	ł			
	-	Red-brown CLAY - highly plastic, occasional gray silty lense	Wet						WOR				
	-						°	55	wor				
25	_						7	ss	WOR	ļ			
1	-	Brown & red-brown CLAY	Wet						6	Ņ			
	-						8	ss	WOR	K			
	-	,							35	`	N		
	-	Red-brown SILT, fine SAND & GRAVEL, trace clay (TILL)	Moist				9	ss	47			Y	
30	-								87				7
	-						10	SS	72				\$
	-						11	ss	91 40			$\left \right $	1

* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS WATER FOUND V STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

T:OCCIDENTAL CHEMICAL CORPORATION	LDCATION :	NORTHW	EST CORN	ER OF SIT	TED:_ E	Ł		OF	SITE		
SUPERVISOR : D. MILLARD GROUND EL	EVATION : * 575.	6	TC	OP OF PIPE	ELE	VATIO	N:*	578.8	39		
PROFILE			MONITOR INSTALLATION			SAMPLE			PENETRATION		
STRATIGRAPHY Description & Remarks					NUMBER	TYPE	BLOWS / FOOT	8LOW	40 60 80		
Red-brown & brown-gray SILT, fine S GRAVEL - trace clay (TILL) Augered to 37.0' Brown-gray silty SAND Augered to 37.6' Gray angular GRAVEL (Dolomite) Augered to 38.6' NOTES: Well Casing: 5" diameter black stee Stratigraphy 0-13.0' from OW31-85.	AND & Moist Wet			36.2'	12	SS	44 41 1004				

* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS ▼ WATER FOUND ▽ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS
(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL PROJECT NO.: 9-1431 CLIENT: OCCIDENTAL CHEMICAL CORPORATION

LOCATION: NORTHWEST CORNER OF SITE

HOLE DESIGNATION: 0W46-85 PAGE 3 OF 3 DATE COMPLETED: APRIL 4, 1986 DRILLING METHOD: 3" Ø NX CORE CRA SUPERVISOR: D. MILLARD/C. PADGINTON

DEPTH	description of strata	R U N N O.	I N T R V A L	R E C C O O V E E E R Y	R Q D	D R R IWE LAT LTU IER NRN G	WATER PRESSURE TEST	E L V A T I O N	MONITOR INSTALLATION
ft BG				8	8	8	cm/s	ft AMSL	
35 -	· ·								-13" Ø BH
-		1	38.0	90	0	100		537.6	
40 - - - -	DOLOMITE (LOCKPORT GROUP - OAK ORCHARD FORMATION): medium gray, thinly bedded, shaly laminations & partings, occasional calcereous shale pebbles	2	39.2	100	48.5			4 ەدر	
- 45 - -	- becomes brown-gray, fine to medium grained								3" Ф ВН
- - 50 - -		3	49.2	94.2	10.4	100		526.4	
- - -			53 .2					522.4	
55 -									

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

WATER FOUND STATIC WATER LEVEL

NM - NOT MEASURED

.IENT:	DE: HOLLOW STEM AUGER (8-1/4" ID/13" OD) LOCATION	N: SOUTHE	AST		NER OF STT	. (ED:_ C		11-11-11		<u>. , </u>	1903
OLOGIST	VENGINEER:	575.4			TOP OF PIPE	ELE	VATIC)N: <u>*</u> 5	578.	14	
<u> </u>	PROFILE			M NST/	ONITOR ALLATION	5	AMPL	.E	PE	NETR	ATION
EPTH VATION)	STRATIGRAPHY					UMBER	TYPE	S / FOOT	BL	TE: DWS /	57 / FO01
<u> </u>	DESURIPTION & REMARKS			/	Locking cap 578.14	ž		BLOW		40	••• ••
-				╡	575.4						
-	Augered through				—13"Ø ВН						
-					+BS pipe	1	ss	10	•		
-	Dark gray CINDERS & FLYASH - wood chips Moist- brick fragments (FILL)	wet		-	+ CEM/BEN BKFL	2	ss	8 17	ł		
-	Dark gray CINDERS & SLAG - some flyash, Wet white brine sludge (FILL)					3	ss	9 5	Ĺ		
-	Dark gray CINDERS, SAND & GRAVEL (FILL) Wet							50+		≯	·
- 0	Dark gray CINDERS - fibrous waste material Wet (FILL) Dark gray to black SILT - vegetation Wet			-	10.0' BEN seal	4	SS	5 10	Ţ		
-	Dark grav to block fine to modium SAND - Net	/			12.0'	5	ss	6 10			
- 5 -	same silt			-	-SD pack	6	ss	7 13			
-						7	ss	8 14			
-						8	ss	1	K		
0 - -	Dark gray to black SILT & fine to medium Mois SAND - trace vegetation	it				9	ss	6 17	Ļ		
-						10	ss	2 11	K		
- 5 -	Gray fine to medium SAND - some silt, Wet trace vegetation					11	ss	15 18			
-						12	ss	12 21			
-	Gray medium SAND - some fine sand Wet					13	ss	3	K		
0 -	Gray medium to coarse SAND & GRAVEL - Wet				SS screen	14	ss	15			
-	trace brown oily liquid, strong chemical odor (NAPL)					15	ss	43			
-	Red-brown CLAY Wet		11 '		-33.0'	1		¹⁷			

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* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS ▼ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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PROJECT N	AME: JOB NO: JOB NO: 9-14	31 HOLE NO.:		0	W47-	85 Page 2 of
CLIENT:	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED:_		ECEM	BER 14, 1985
HOLE TYPE	E: HOLLOW STEM AUGER (8-1/4" ID/13" OD) LOCATION: SOUTH	EAST CORNER OF SIT	E			·····
CRA SUP	ERVISOR : D. MILLARD GROUND ELEVATION 575.4	TOP OF PIPE	ELEY	VATIO	N:	578.14
	PROFILE	MONITOR	s		.E	PENETRATION
┝──┮		INSTALLATION			5	TEST BLOWS / FOOT
Ξ	STRATIGRAPHY		BER	w	/Fo	
OEP	DESCRIPTION & REMARKS		NUN	τx	SMO	
		4			B	
	Red-brown CLAY Wet	-13" Ø				
		35.5'				
-	NOTES: Well Pipe: 2" diameter black steel Well Screen: 2" diameter, 5' length, #6 slot, stainless steel Sand Pack: Special coarse blend Ottawa sand					
	· · ·					

▼ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

STRATIGRAPHIC	AND	INSTRI	JMENTATION	LOG
LANDFILL		08 N2:	9-1431	HOLE NO.:

102ND STREET LANDFILL

HOLE NO .: BH47B-86 (BOREHOLE)



PROJECT			TED:	<u>А</u>	PRIL	30. 1	1986	_
CLIENT	HOLICE CHARLES CARONALIST	ST OF OW47-86						
HOLE 1	THE HOLLOW STEM ALGER (3-5/4 LD) COMING	TOP OF BIRE	E1 E		". *			
CRA	SUPERVISOR: GROUND ELEVATION				··			
	PROFILE	MONITOR INSTALLATION	s	AMPL	.E	PENE	TRATIC	ЭN
			æ		1001	BLOW	S / FO	οτ
EPTH	STRATIGRAPHY Description & Remarks		UMB	TYPE	NS / 1			
°			ž		BLOI	20 4	10 60 6	10
0	- Red-brown silty CLAY, VEGETATION & GRAVEL Moist		1	ss	13	٩		
]	- (FILL) Dark gray & white FLYASH - some sand, Moist				22	X		
					30	•		
	Clay, some sand, occasional gravel (FIIL) Dry		2	ss	12	Å		
1	piece of slag or steel in tip of spoon (FILL)				6			
	brown flyash, some dark brown sand (FILL)	-13" 0	2	~				l
5		BH	5	35				
	- No recovery							
	- Water level encountered at approximately 5.0', irridescent sheen on water surface				2	i		
	-		4	SS	WOR			
	-				WOF.			ĺ
10	- Black & gray FLYASH & white WASTE MATERIAL Wet		5	SS	6			
	- Dark gray mat of ROOTS & LEAVES decreasing Moist				12			
1	- clay (NATIVE)				22			
	- pebble, occasional root fiber		6	ss	4			
	- Mottled golden brown & gray-brown fine Moist				7			
15	SAND & SILT, vegetation throughout		7	ss	10			
	Gray fine SAND - some silt, occasional Wet - rounded & sub-rounded pebble, occasional				10	•		
	root fibers decreasing with depth				15			
			8	ss	5	//		
Ì	- Grav fine SAND - trace silt Wet	CEM/BEN BKFL			3			
20			9	ss	7			ł
20					6			
			10	35				
	- Gray fine SAND - trace silt, white shell Wet				14			
25	- fragments (23-25'), occasional fine gravel lense (25-28'), occasional pebble (28-30')		11	SS	16			
	-				29			
	-	-8"¢			39	$ \rangle$	1	
	-		12	ss	14	1		
	-				36		1	
30			13	ss	12	1		
ļ	- occasional fine gravel lense, occasional				54	`		
	white shell fragments, trace NAPL at tip, - trace red-brown silt				100	┫		
	- Coarse SAND & GRAVEL - occasional white Wet		14	ss	12	1+	11	
ļ	- Red-brown CLAY - some silt, highly plastic Wet				13			
35		35.0'		1				ł

★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
▼ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

JOB NO: 9-1431 HOLE NO: BH47B-86 Page 2 of 2 PROJECT NAME: ______ 102ND STREET LANDFILL

DATE COMPLETED: APRIL 30, 1986 CLIENT: OCCIDENTAL CHEMICAL CORPORATION

HOLE TYPE: HOLLOW STEM AUGER (3-3/4" ID) LOCATION: 50' WEST OF OW47-86

CRA SUPERVISOR : D. MILLARD GROUND ELEVATION : 574.7 TOP OF PIPE ELEVATION :

	PROFILE	MONITOR INSTALLATION	s	AMPL	E	PE	NETR	ATIO	N
_			ŝ		FOOT	BL	ows ,	/ F00	<i>π</i>
DEPTH	STRATIGRAPHY Description & Remarks		MUMB	TYPI	/ SMC				_
			L		BLC	20			
	NOTES: Remobule terminated at 35.0' grouted to								
	surface.								
:									
			l		1				
			ļ						
					ļ				
			1						
				1		l			
	· ·								
* REFER	TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS		4	<u></u>	·	_	<u> </u>		<u> </u>

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·	OCCIDENTAL CHEMICAL CORPORATION	(ATE COMPLET	ED:	М	AY 2	, 1986	
TYPE	HOLLOW STEM AUGER (3-3/4" ID) LOCATION:_	50' EAST OF O	N47-86					
GIST .	/ENGINEER: D. MILLARD ARDIND ELEVATION * 5	75.1		FLF	VATIO	* N:		
	PROFILE	INSTA	LLATION	S		.E	PENET	RAT
ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS			NUMBER	TYPE	LOWS / FOOT	BLOWS	/F
-			,575.1		┢	•	┝╌┼╌┽	+
-	Brown & red-brown CLAY - vegetation & silty Moist topsoil at surface, occasional stone & brick fragment, some fine sand (FILL)		8"Ø BH	1	SS	16 31		
_	Gray FLYASH - occasional stone (FILL) Dry		<u>.</u>	2	ss	6	X	
-						4		
-	Gray & dark gray FLYASH &/or FOUNDRY SAND Wet - occasional small stone, light brown		- CEM/BEN	3	ss	2 2		
-	NAPL (10-13') similar to hydraulic fluid		BKFL			2		
-				4	ss	2		
-						3	NI	
-				5	ss	28		
-						10 16		
₋┟	*******			6	ss	7		
-	Gray fine SAND - some silt, occasional Moist yellow & dark gray mottling, some root fibers, occasional rounded pebble (NATIVE)		15.0'			11		
	NOTES: Borehole terminated at 15.0', grouted to surface.							
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					1			

▼ WATER FOUND
▼ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

MALET NARE: 12200 JUNIOR LINEARLY AND			HOLE NO:	OW4	8-86	(F	ILL WEI	LL)
BLACK TYPE ALGER (84*10, 17*00) LOATON: EXTENSION CORRECT OF GUITON PARK CRA SUPERVISOR : D. MILADD GROWING LIANTON: 572.6 TOP OF PARE LLANTON: 572.23 TOP OF PARE LLANTON: 572.24 TOP OF PARE LLANTON: 572.24	PROJEC	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLET	TED:_	FE	BRUA	RY 12,	1986
OrA SUPERVISE: D. MILAND ORAND REWITOR: 122.6 TOP OF PRE ELEWIDN: 322.20 PROFILE PROFILE MENTOR SAMPLE PROVIDE TATAON 5 TTAINERAPHY DESCRIPTION & ARMANS PROVIDE TATAON SAMPLE PROVIDE TATAON 6 Method brown SUE, trace clay, trace wegetation Bry TOP OF PRE ELEWIDN: SS 17 0 7 Black, troom & shick SUE & CONDES, some Dry 2 SS 25 35 0 9 Black, tack dark grav CHRESS & CONDES, some Condition, some slap, trace coal (FILL) Dry 2 SS 25 35 0 9 Black, tack dark grav CHRESS & FILLS, constant, wet at 3.6 10 SS 17 0 0 9 Black, tack dark grav CHRESS & FILLS, constant, trace 10 SS 17 0 10 9 Black, tack dark grav CHRESS & FILLS, constant, trace 10 10 10 10 10 10 Black FILLSS, some store, trace class, trace Methods 10 10 10 10 10 10 Black FILLSS, tack toel Methods 10 10 10 10 10 10 Black FILLSS, tack toel Methods 10 10 10 10 10 Dark grav, trace	HOLE	TYPE: HOLLOW STEM AUGER (84"ID, 13"OD) LOCATION: NORTHE	AST CORNER OF GRIF	FON	PARK	•		
PROFILE MENTOR International Statistics LAMPLE PROFILE Protective Statistics 5 STATREADARY DESCRIPTION & REMARKS Protective Statistics Statistics 0 - Rettlad brown SILT, trace clay, trace wegetation Bry Grass, trace statistics Top Statistics 1 SS, trace statistics Statistics Statistics 2 SS (LI) SS (LI) SS (LI) 3 SS (SL) SS (SL) SS (SL) 4 SS (SL) SS (SL) SS (SL) 5 SS (SL) SS (SL) SS (SL) 6 SS (SL) SS (SL) SS (SL) 70 Wettide lown is gray-brow siter statistics steal, #S slot, SS (CRA	SUPERVISOR : GROUND ELEVATION: 572.6	TOP OF PIPE	ELE	VATION	: * _	572.2	8
B TTAINBAPY DESCRIPTION & AREARNS Protocoling B B Nome / Foot so so so 0		PROFILE	MONITOR INSTALLATION	s	AMPLE	:	PENET	RATION
0 Mottled hrown SILT, trace clay, trace wegetation Bry 372, 6 1 SS 17 Black, brown & white FLVASH & CDDERS, some Dry 372, 6 1 SS 17 green glass, some lag, trace coal (FLL) Dry 6 37 2 SS 25 glass, brown is black SILT & CHODES, some Dry 6 35 2 SS 25 glass, trace coal (FLL) Dry 4 10 SS 6 1 SS 6 glass, trace size sand, wet a 10 ⁴ (FLL) Cessional Moist Dry 3 SS 6 2 SS 5 glass, trace size rest. Green file sand, some stone, trace glass, trace Wet 3 SS 6 1 3 SS 6 glass, trace size rest. Green file sand, SULT, trace stone, trace glass, trace Wet 3 SS 5 13 Black FL/ASH, trace stone, trace glass, trace Wet 10 Storeen 5 SS 5 13 NOTES: Mottled mom 6 greg-trown silty CLAY, plastic Wet 10 10 10 NOTES: Wetled mom 6 greg-trown silty CLAY, plastic Wet 10 10 10 NOTES: Sopcial co	DEPTH	STRATIGRAPHY Description & Remarks	Protective cover	NUMBER	TYPE	BLOWS / FOOT	8LOWS	✓ FOOT ●0 ●0
* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS	a 0	DESCRIPTION & REMARKS Mottled brown SILT, trace clay, trace vegetation RTY Black, brown & white FLYASH & CINDERS, some Dry green glass, trace fine sand, state CONDERS, slag Dry & flyash throughout, occasional store, some glass, trace fine sand, wet at 3.8' (FILL) Black & dark gray CINDERS & FLYASH, occasional Moist brown silt, some fine sand, some store, trace glass (FILL) Black FLYASH, some store, piece red clay tile, Wet trace irridescent sheen on water (FILL) Dark gray fine sandy SILT, trace vegetation Moist (NATIVE) Mottled brown & gray-brown silty CLAY, plastic Moist stiff NOTES: Well Pipe: 2" diameter black steel Well Screen: 2" diameter stainless steel, #6 slot, 5' length Sand Pack: Special coarse blend Ottawa sand	Locking cap 572.6 -572.28 	1 2 3 4 5		SM018 17 6 25 35 6 2 1 3 5 13		
	* REF	ER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS	1	L,				

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E:HOLLOW STEM AUGERU	CATION : EAST	CENTRAL AREA OF GRI	IFFON PARK	
/ENGINEER : D. MILLARD GROUND ELEVATION :	572.4	TOP OF PIPE	ELEVATION	572
PROFILE	• • •	MONITOR	SANPLE	PENET
STRATIGRAPHY DESCRIPTION & REMARKS		Protectiv cover Locking cap	NUMBER TYPE BLOWS / FOOT	20 40
 Brown SILT - some fine sand, some gray rock, red clay tile fragments, trace vegetation Black, dark gray, brown, & white FLYASH & CINDERS - some glass, silt, wood fragments, piece of concrete in tip (FILL) Red-brown, white, gray, & black FLYASH & CINDERS - some glass, occasional wood fragments, cocasional piece of rusted metal, moist at 4 (FILL) Black CINDERS & FLYASH - some glass & wood fragments, irridescent sheen on water, asphalt color (FILL) Dark gray SILT - fibrous roots & vegetation, rotting color (NATIVE) Gray SILT - dark gray discoloration along some root channels, some fine sand, root fibers & occasional small store NOTES: Well Pipe: 2" diameter black steel Well Pipe: 2" diameter black steel Well Pack: Special coarse blend Ottawa Sa 	TILL) Dry Dry Dry 0' Wet Wet Slot, d	cap 572.4 572.4 572.28 CEM/BEN BKFL 2.6' BEN seal 3.7' BS pipe -13" Ø BH SS screen 9.5' 10.0' 12.0'	I SS 39 1 SS 30 2 SS 10 4 7 3 SS 4 3 SS 4 4 SS 4 5 11	

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PROJECT	NAME: 102ND STREET LANDFILL JOB NO: 9-1431	HOLE NO.: OW50-86 (ALLUVIUM WELL)
CLIENT:_	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLETED: FEBRUARY 20, 1986
HOLE TY	PE: HOLLOW STEM AUGER LOCATION: EAST C	CENTRAL AREA OF GRIFFON PARK
GEOLOGIS	T/ENGINEER: D. MILLARD GROUND ELEVATION: 572.4	TOP OF PIPE ELEVATION: 572.19
	PROFILE	MONITOR SAMPLE PENETRATION INSTALLATION TEST
DEPTH (ELEVATION)	STRATIGRAPHY DESCRIPTION & REMARKS	Protective er u b BLOWS / FOOT cover u b b BLOWS / FOOT Locking 2 b b b b b b b b b b b b b b b b b b
		,572.4
-	Brown SILT - some fine sand, some gray rock, Dry red clay tile fragments, trace vegetation (FILL)	+ + +-13" Ø H H-13" Ø
- - 5 -	Black, dark gray, brown, & white FLYASH & Dry CINDERS - some glass, silt, wood fragments, piece of porcelain, rusty metal fragments, piece of concrete in tip (FILL) Red-brown, white, gray, & black FLYASH & Dry CINDERS - some glass, occasional wood fragments occasional piece of rusted metal, moist at 4.0' (FILL)	CEN/BEN BKFL BS pipe
-	Black CINDERS & FLYASH - some glass & wood Wet fragments, irridescent sheen on water asphalt odor (FILL)	7.3'
-	Dark gray SILT - fibrous roots & vegetation, Wet rotting odor (NATIVE)	- BEN seal
10 – –	Gray SILT - dark gray discoloration along Wet some root channels, some fine sand, root fibers & occasional small stone	10.0'
-	Dark gray SILT - root fibers throughout with Wet slight yellow mottling along root fibers to 13.0', fine sand & silt occasional pebble	
	Dark gray fine SAND & SILT - occasional darker Wet gray lenses, occasional small pebble, trace root fibers, increasing sand with depth, irridescent sheen on water	2 SS 4 5 5 5 3 SS 5 6 8 6 2 7
20 -	Dark gray coarse SILT & fine SAND - some gravel Wet at 21.0', trace red-brown silt & sand (TILL) at tip, alluvium/till contact at ± 21.5' based on increasing blow counts	4 SS 2 0+
	NOTES: - Sampled 20.0-22.0' interval twice; once with 2' spoon and once with 3' spoon. - Stratigraphy 0-12.0' from OW49-86. - Stainless steel tape weight was lost in the well installation during sand placement. Well Pipe: 2" diameter black steel Well Screen: 2" diameter stainless steel, #6 slot, 5' length Sand Pack: Special coarse blend Ottawa Sand	

* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS ▼ WATER FOUND ♥ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

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NAME: 102ND STREET LANDFILL JOB NR: JOB NR:	HOLE N9.:	OW5	1-86 (F	ILL WELL)
OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED:_	FEBRU	ARY 20. 1986
PE: HOLLOW STEM AUGER (84"ID, 13"0D) LOCATION: SOUTH	EAST SECTOR OF GRUE	FON	PARK	
UPERVISOR : D. MILLARD GROUND ELEVATION : 572.2	TOP OF PIPE	ELEV	ATION:	572.00
PROFILE	MONITOR INSTALLATION	S	AMPLE	PENETRATION
STRATIGRAPHY DESCRIPTION & REMARKS	Protectiv cover Locking	0 NUMBER	TYPE BLOWS / FOOT	BLOWS / FOOT
DESCRIPTION & REMARKS Brown & red-brown SILT, some sand, some Moist clay, some vegetation, occasional pebble, metal fragments, cinders (FILL) Red-brown SILT, cinders, some stone, Wet piece of glass (FILL) Gray, black & brown FLYASH, PAPER, & SILT, Wet piece of tinfoil (FILL) Black FAPER, multilayered & very thin, Dry piece of wood (FILL) Black SILT, flyash, some wood, some paper, Wet some glass fragments, trace irridescent sheen odor (asphalt) (FILL) Dark brown sandy SILT, vegetation (NATIVE) Moist NOTES: - Augers became entangled in steel cable at 5.0', moved ahead 3.0'; resampled 2.0-4.0' interval. Well Pipe: 2" diameter stainless steel, #6 slot, 5' length Sand Pack: Special coarse blend Ottawa sand.	Protectiv cover Locking cap 572.2 	e 72 1 2 3 4 5	smoote stress 16 SS 16 11 SS 5 3 SS 4 6 SS 6 3 4 5 3 4 5 3 4 5 1	
	NAME: 102ND STREET LANDFILL	NAME: 102RD STREET LANEFILL .00 NS: 9-1431 NOLE NS: OCTIONTAL GRENCAL CORRECTION DATE COMPLE DATE COMPLE NUMERYISOR: D. MILLAND GROUND ELEVATION: SUTTREATS STATES (C GL) NPERVISOR: D. MILLAND GROUND ELEVATION: SUTTREATS STATES (C GL) NPERVISOR: D. MILLAND GROUND ELEVATION: SUTTREATS STATES (C GL) NPERVISOR: D. MILLAND GROUND ELEVATION: SUTTREATS STATES (C GL) NOTOR STRATIGRAPHY DESCRETION E REMAINS DOTOR GRAY, BACK & BOON SILT, some sand, some Moist DOTOR GRAY, BACK & BOON SILT, concessional pabble, metal fragments, cinders (FILL) TOP of PRE Red-brown SILT, cinders, some stone, Met Dice of glass (FILL) CCM/BEN Dice of glass (FILL) CT/ASH, PAPER, & SILT, Met SS piece of wood (FILL) SS SS SCREEN Black FMPER, multilayered & wery thin, Dry Dice SS Black SILT, flyash, some wood, some paper, Met SS SS Some glass fragments, cinders trainess theel, Moist SS SS Obsert became entargled in steel cable at 5.0', moved abaad 3.0'; recampled 2.0-4.0' interval. NO.0' Well Fipe: 2' diameter, black steel Met stand. Sand Pack: Special c	NAME: 102RD STREET LANEFILL .00 MB: 9-1431 MOLE MS: OME OCCIDENTAL GENERALTIN DATE COMPLETED: DATE COMPLETED: DATE COMPLETED: ME: HOLLOW STEM AUGEN (84"1D, 13"00) LOCATION: SUTHEAST SECTOR OF GUITYN UPERVISOR: D. MILLAND GROUND ELEVATION: SUTHEAST SECTOR OF FUE LEV INFERTION & REMAINS DESCRIPTION & REMAINS PROFILE MORNOR INFERTION & REMAINS DESCRIPTION & REMAINS PROTOCOLORING SUTHEAST SECTOR Into Magnetics, cinders, Some stone, Met Disc dings 2.7" 1 Red-brown SILT, cinders, Some stone, Met Disc dings 2.7" 1 Piece of und (FILL) RETURE, FURCH FURCH, METER, METER, METER, SOLD, SOME SECON, SOME SEC	NAME: 10200 STREET LAVEFILL JOB NEOIL NO. CHENE:OKI-06.(F COCHEMPAL CHENCHLO CHENERATIONDATE COMMETER:DERE TO CHEMPAL CHENERATIONDATE COMMETER:DATE COMMETER:DERE PROFILENONTONDATE COMMETER:DOT OF OF PRE LLANTON: PROFILENONTONNONTO

▼ REFER TO WATER ELEVATIONS TABLE FOR CORRENT REFERENCE ELEVATIONS ▼ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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PROJECT N	AME: 102ND STREET LANDFILL JOB NO	.: 9-1431	HOLE N?.:	OW52-86 (AI	LUVIUM WELL)
CLIENT:	OCCIDENTAL CHEMICAL CORPORATION		DATE COMPLET	TED:FEBRUA	ARY 21, 1986
OLE TYP	E: HOLLOW STEM AUGER (81"ID, 13"OD) LOCATK	ON : SOUTHE	AST SECTOR OF GRIF	FON PARK	
CRA SUF	PERVISOR : D. MILLARD GROUND ELEVATION:	572.2	TOP OF PIPE	ELEVATION:	571.97
	PROFILE		MONITOR INSTALLATION	SAMPLE	PENETRATION
DEPTH	STRATIGRAPHY Description & Remarks		Protectiv casing	NUMBER TYPE BLOWS / FOOT	8LOWS / FOOT
0	Brown & red-brown SILT, some sand, some clay, some vegetation, occasional pebble, metal fragments, cinders (FILL) Red-brown SILT, cinders, some stone, piece of glass (FILL) Gray, black & brown FLYASH, PAPER & SILT, Wet piece of tinfoil (FILL)	.st : :	Cap _{572.2} 571.97 13" Ø BH BS pipe CEM/BEN BKFL		
- - - 10 - - -	Black PAPER, multilayered & very thin, Dry piece of glass, piece of wood (FILL) Black SILT, flyash, some wood, some paper, Wet some glass fragments, trace irridescent sheen odor_(asphalt)(FILL) Dark brown SulT & fine sand increasing Wet with depth, vegetation throughout, occasional small pebble, irridescent sheen on wa	st	9.0' - BEN seal	1 SS 3 11 2 SS 15	
- - 15 - - -	Gray-brown medium-coarse SAND & silt, Wet occasional root fiber, shell fragment Gray fine to medium SAND & silt, occasional Wet pebble, occasional black coarse sand lense	: . 	SD pack	30 47 3 SS 4 6 4 SS 12	
- - 20 - - -	Dark brown coarse SAND & gravel, some silt Wet occasional shell fragment Red-brown sandy SILT, occasional gravel Wet (TILL)	· · · · · · · · · · · · · · · · · · ·	20.5' 21.0' 22.0'	45 55 5 SS 18 7	
	<pre>NOTES: - Stratigraphy 0-10.0' from well OW51-86. Auger 10.0' and began split spoon sampling. - At [±] 17.0' a steel pipe wrench was lost in the borehole, recovery attempts were unsuccess Well Pipe: 2" diameter black steel Well Screen: 2" diameter stainless steel, #6 sl 5' length Sand Pack: Special coarse blend Ottawa sand</pre>	ed to ful. ot,			

★ REFER TO "WATER ELEVATIONS TABLE FOR CURRENT REFERENCE ELEVATIONS ▼ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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		STRATIONAPHIC AND INSTRUMENT		_			
PROJE	СТ	NAME: 102ND STREET LANDFILL JOB NO: 9-1431	HOLE N9.:	OW5	3-86	(BE	DROCK WELL)
CLIEN	T:	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED:_		NUAR	<u>Y 31, 1986</u>
HOLE	TYP	PE: HOLLOW STEM AUGER LOCATION: SOUTH]	SECTOR OF GRIFFON	PARK		*	
GEOLO	GIST	PENGINEER: DMILLARD/DOSCAR GROUND ELEVATION: 571.6	TOP OF PIPE	ELE	VATIO	N:	571.10
		PROFILE	MONITOR INSTALLATION	s	AMPL	E	PENETRATION
DEPTH	(ELEVATION)	STRATIGRAPHY Description & Remarks	Protectiv cover Locking	NUMBER	TYPE	BLOWS / FOOT	BLOWS / FOOT
0	-	- Dark gray SILT - some sand, some vegetation Moist	571.6	1	ss	39	
	-	(FILL) Orange & dark gray SILT & FLYASH - Moist some slag (FILL)	-11" Ø BH			30 16	
	-	Dark gray & orange SILT & flyash, trace Moist-wet gravel (FILL)		2	89	4	
5	-	Black & dark gray SILT, sand & gravel, some clay, cloth (FILL)		3	55	19	
	-	Black & dark gray coarse SAND & GRAVEL, Wet some silt, some concrete fragments, some paper (FILL)		4	ss	20 6	1
10	-	Dark gray-brown SILT, some sand, trace Wet vegetation, increasing sand with depth, trace gravel, occasional dropstone (NATIVE)		5	8	5 11 12	
	-			6	ss	3 6	
15	-	Dark gray fine to medium SAND, some silt, Wet some gravel, trace shell fragments	- CEM/BEN BKFL	7	SS	6 8 12	
	-			8	ss	23 5	
20	-	Dark gray medium to coarse SAND & fine Wet gravel, trace white shell fragments		9	ss	8 13	•
	-			10	ss	9 20	
25	-			11	ss	39 64	
	-	Red-brown fine sandy SILT, some gravel Moist trace clay, increasing gravel with depth (TILL)		12	ss	94 30	
30	-	Large stone blocking spoon at 31.3', auger to 31.5', becoming dry at 31.5'		13	ss	62 100+	
	-			14	ss	100+ 100+	
	-			15	ss	100+ 100+	

 PROJECT NAME:
 102ND STREET LANDFILL
 JOB NQ:
 9-1431
 HOLE NQ:
 OW53-86
 Page 2 of 3

 CLIENT:
 OCCIDENTAL CHEMICAL CORPORATION
 DATE COMPLETED:
 JANUARY 31, 1986

 HOLE TYPE:
 HOLLOW STEM ALKER
 (61"ID, 11"OD)
 LOCATION:
 SOUTH SECTOR OF GRIFFON PARK

 CRA SUPERVI SOR :
 D MILLARD/D OSCAR
 GROUND ELEVATION:
 571.6
 TOP OF PIPE ELEVATION:
 571.10

 PROFILE
 INSTALLATION
 SAMPLE
 PENETRATION

▼ WATER FOUND V STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

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(BEDROCK)

PROJECT NAME: 102ND STREET LANDFILL PROJECT NO.: 9-1431 CLIENT: OCCIDENTAL CHEMICAL CORPORATION LOCATION: SOUTH SECTOR OF GRIFFON PARK HOLE DESIGNATION: OW53-86 Page 3 of 3 DATE COMPLETED: APRIL 8, 1986 DRILLING METHOD: 3" DIAMETER NX CORE CRA SUPERVISOR: D OSCAR/C PADGINTON

DEPŢH	description of strata	R U N N O	I N Terval	R E C C O O R V E E R Y	R Q D	D R R IWE LAT LTU IER NRN G	WATER PRESSURE TEST	E L V A T I O N	MONITOR INSTALLATION
ft BG				8	8	8	Cm/s	ft AMSL	
40 -		1	41.3	100	0.76	0		530.3	-13" Ø BH 5" Ø SC CEM/BEN BKFL
- 45 - - -	DOLOMITE (LOCKPORT GROUP - OAK ORCHARD FORMATION): brownish-gray, medium grained argillaceous, numerous shaly partings, very thin to medium bedding, few thin gypsum seams								3'' Ø ВН
50 - - - -		2	50.0	100	0.46	0			
55 – – – –			57.3					514.3	
60 –									

NOTES: MEASURING POINT ELEVATIONS MAY CHANGE; REFER TO CURRENT ELEVATION TABLE

WATER FOUND STATIC WATER LEVEL

NM - NOT MEASURED

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		HOLE NO.	OW5	4-86	(FILL WELL)
CLIENT:	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED:_	FEB	RUARY 17, 1986
HOLE TYP	E: HOLLOW STEM AUGER (81"ID, 13"DD) LOCATION: SOUTHW	EST SECTOR OF GRIF	FON	PARK	
CRA SU	PERVISOR : D BLACK/D MILLARD GROUND ELEVATION: 571.0	TOP OF PIPE	ELE	VATION	* 570.71
	PROFILE	MONITOR INSTALLATION	s	AMPLE	PENETRATION
DEPTH	STRATIGRAPHY Description & Remarks	Protectiv cover Locking	NUMBER	TYPE	BLOWS / FOOT
0	Brown silty TOPSOIL, some vegetation, Dry some pebbles (FILL) Brown SILT, some slag, some orange coloring, Dry some cinders, some wood, becoming wet (FILL)	CEM/BEN BKFL 3.0' EEN seal 4.0' BS pipe	1 2 3	SS 11 14 SS SS	5 • 4 • 5 • 3 •
-	Black burned PAPER, some ashes, some silt Wet (FILL) Black CINDERS & silt, some pebbles, Wet some wood (FILL)	SD pack	4 5	ss 1	3 5 2
- 10 -	Brown fine sandy SILT, some vegetation Wet (NATIVE)	9.5' 10.0'			5
	Well Spreen: 2" diameter black steel Well Spreen: 2" diameter stainless steel, #6 slot, 5 ' length Sand Pack: Special coarse blend Ottawa sand				

▼ WATER FOUND ▼ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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		AT WELL
PROJECT I		DATE COMPLETED: FEBRUARY 19, 1986
HOLE TYP	F: HOLLOW STEM AUGER	INWEST SECTOR OF GRIFFON PARK
GEOLOGIST	/ENGINEER: D. MILLARD GROUND ELEVATION: 571.1	TOP OF PIPE ELEVATION: 570.88
	PROFILE	MONITOR SAMPLE PENETRATION
DEPTH (ELEVATION)	STRATIGRAPHY Description & Remarks	Protective W 4 5 500T Casing 2 50 40 60 60 50 50 50 50 50 50 50 50 50 50 50 50 50
0 – –	Brown silty TOPSOIL - some vegetation, Dry some pebbles (FILL)	571.1 570.88 13" Ø BH
-	Brown SILT - some slag, some orange Dry coloring, some cinders, some wood, becoming wet with depth (FILL)	
5 -	Black burned PAPER - some ashes, some Wet silt (FILL)	
-	Black CINDERS & SILT - some pebbles, Wet some wood (FILL)	7.7'
- 10 -	Brown fine sandy SILT - some vegetation Wet (NATIVE)	BEN seal
- - - 15 - - -	Dark gray SILT & fine SAND - Wet occasional root fiber	2 SS 2 8 3 SS 7 6 4 SS 6 6
-	Dark gray fine to medium SAND - some silt Wet	
20	Dark gray coarse to medium SAND - some Wet silt, occasional shell fragment, occasional pebble Light gray fine to medium SAND - some Wet silt, some small pebbles, occasional shell fragment Dark gray fine to medium SAND & SILT Wet Red-brown SILT - some fine sand, trace Wet pebbles, trace clay (TILL)	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
25 -	NOTES: - Stratigraphy 0-10.0' from well OW54-86. Well Pipe: 2" diameter black steel Well Screen: 2" diameter stainless steel, #6 slot, 5' length Sand Pack: Special coarse blend Ottawa Sand	

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JECT NAME: 102ND S ENT: OCCIDENTAL CH	EMICAL CORPORATION	JOB NO:	DATE COMPLE	TED:]	FEBRUA	ARX 14. 1986
E TYPE: HOLLOW STE	MAUGER (81"ID, 13"0D)	LOCATION: <u>WEST S</u>	IDE GRIFFON PARK		*	
RA SUPERVISOR :	MILLARD GROUND ELEVATIO	N:5/3.0	MONITOR	CAM		
	PROFILE		INSTALLATION			TEST BLOWS / FOO
DEPTH	STRATIGRAPHY DESCRIPTION & REMARKS		Protectiv casing	NUMBE	BLOWS / FI	20 40 60 80
 Brown & darl vegetation, some flyash Brown & russ sand & silt at 2.6' (F Brown SILT, piece of ne Piece of gr. some flyash Black & darl some glass, some blue p Dark gray f vegetation NOTES: Stratigraph Well Pipe: Well Screen Sand Pack: 	<pre>k brown SILT & fine SAND, some some glass, occasional stone , some cinders (FILL) t-brown CINDERS, flyash, fine , increasing flyash & cinder ILL) gray plastic, some glass, t fabric, some stone (FILL) ay PLASTIC, some CINDERS, (FILL) k gray FLYASH & cinders, some wood, some plastic, aper (FILL) ine sandy SILT, occasional (NATIVE) y from OW57-86. 2" diameter black steel : 2" diameter, 5' long, #6 sk stainless steel Special coarse blend Ottawa</pre>	Dry Dry Dry Wet Wet Moist ot, sand	Locking cap 573.0 572.65 13" Ø BH CEM/BEN seal 4.0' BS pipe SD pack SS screen 9.5' 10.0'	1 S 2 S 3 S 5 S	5 39 26 28 5 8 3 5 5 5 5 5	

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JOB NO: 9-1431 HOLE NO .: OW57-86 (ALLUVIUM WELL) PROJECT NAME: 102ND STREET LANDFILL DATE COMPLETED: FEBRUARY 14, 1986 CLIENT: OCCIDENTAL CHEMICAL CORPORATION HOLE TYPE: HOLLOW STEM AUGER (81"ID, 13"0D) LOCATION: WEST SIDE GRIFFON PARK

573.05

CRA SUPERVISOR : D_MILLARD/C DUNNIGANGROUND ELEVATION: * 573,1 TOP OF PIPE ELEVATION:

	PROFILE	MONITOR INSTALLATION	3	AMPL	.E	PENETRATI	ON
DEPTH	STRATIGRAPHY Description & Remarks	Protectiv casing	n NUMBER	TYPE	BLOWS / FOOT	BLOWS / FO	101
o	 Brown & dark brown SILT & fine SAND, some Dry vegetation, some glass, occasional stone some flyash, some cinders (FILL) Brown & rust-brown CINDERS, flyash, fine Dry sand & silt, increasing flyash & cinder at 2.6' (FILL) 	Locking cap 573.1 573.05 13" Ø BH -CEM/BEN BKT.	1	ss ss	39 26 28 8		
5	- piece of gray PLASTIC, some cinders, biy - Piece of gray PLASTIC, some cinders, Wet some flyash (FILL)		3	ss	3 8 5		
	Black & dark gray FLYASH & CINDERS, Wet some glass, some wood, some plastic, some blue paper (FILL)	BS pipe	4	ss	3 5 5		
10	- Dark gray sandy SILT, increasing fine sand Wet trace small pebbles, trace root fibers - (NATIVE)	10.5' 	5	ss	1 3 WOH		
15	- - - Gray fine SAND & silt, trace vegetation Wet	SD pack	7 8 9	8 8 8	WOR 3 WOR 3 WOR 3		
		SS Screen	10 11	ss ss	1 2 4 25		
25	Gray coarse to medium SAND, some shell, Wet - occasional pebble - Red-brown SILT, occasional pebble, Wet - trace fine sand (TILL)	27.0'	12	ss	8 2 WOR WOR		
30	NOTES: - Well Pipe: 2" diameter black steel Well Screen: 2" diameter stainless steel, #6 slot, 5' length Sand Pack: Special coarse blend Ottawa sand	29.0'					

★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
▼ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

JOB N2: 9-1431 HOLE N2: OW58-86 (ALLUVIUM WELL)

CLIENT: OCCIDENTAL CHEMICAL CORPORATION DATE COMPLETED: _____ FEBRUARY 5, 1986____

HOLE TYPE: HOLLOW STEM AUGER (8-1/4" ID/13" OD) LOCATION: SOUTH SIDE BUFFALO AVENUE

PROJECT NAME: 102ND STREET LANDFILL

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CRA SI	PERVISOR : D. MILLARD GROUND ELEVATION : 573.7	TOP OF PIPE	ELE	VATIO	N: <u>*</u>	57	3.56	
	PROFILE	MONITOR INSTALLATION	s		ε	PENE	TRATI	ON
DEPTH	STRATIGRAPHY DESCRIPTION & REMARKS	Protec- tive cover	NUMBER	TYPE	BLOWS / FOOT	8LOW	5 / FO	•0
0	Dark brown SILT - some fine sand, trace - Moist-dry red-brown clay, occasional vegetation, trace wood fragments (FILL) Black & dark gray FLVASH - some slag, Moist occasional red brick fragment, piece of glass (FILL) White WASTE MATERIALchunky, Loose (FILL) Moist Vellow-brown & red-brown & yellow CLAY - Moist slight mottling, some fine sand, occasional roots. (NATIVE) Mottled brown, red-brown & yellow CLAY - Moist occasional thin silt lense Red-brown silty CLAY - occasional gray Moist silty lense Red-brown silty CLAY - occasional gray Moist silty lense, occasional pebble, becoming more plastic with depth NOTES: Well Pipe: 2" diameter black steel Well Screen: 2" diameter, 5' long, #6 slot, stainless steel Sand Pack: Special coarse blend Ottawa sand	cap 573.7	1 2 3 4 5	SS SS SS SS	9 14 18 25 8 24 23 50 21 39			

★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
 ▼ WATER FOUND ♥ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS



▼ WATER FOUNO ♥ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

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INT:	OCIDENIAL CHEMICAL CORPORATION	<u> </u>		DATE COMPLET	red:_	F	BRU	ARY 5	, 198	<u>;</u>
E TYPE:_	HOLLOW STEM AUGER (8-1/4" ID, 13" OD)	LOCATION : _	SOUTH	SIDE BUFFALO AVENU	JE					
SUPERV	I SOR : GROUND ELEVATION	: <u>* 57</u>	3.4	TOP OF PIPE	ELEV	/АТЮ	N:*	5	73.18	
	PROFILE			MONITOR INSTALLATION	s	AMPL	E	PEN	TEST	Эн
	STRATIGRAPHY Description & Remarks			Protec- tive - cover	NUMBER	TYPE	BLOWS / FOOT	8LOV	40 60 1	
	Dark brown SILT & CINDENS - some slag, cocasional piece of glass & stone, trace root fibers (FILL) Gray-brown SILT & STONE - some cinders, cocasional wood fragment, (FILL) Mottled prown & yellow-brown clayey SILT - layering, Cocasional vegetation (FILL) Mottled brown & yellow-brown clayey SILT - cocasional root fiber (NATIVE) Brown & red-brown silty CLAY - cocasional silty nobule Red-brown CLAY, very stiff - some silt, moisture & plasticity increasing with depth NOTES: Well Pipe: 2" diameter black steel Well Screen: 2" diameter, 5' length, #6 stainless steel Sand Pack: Special coarse blend Ottawa	Moist Moist Moist Moist Moist		Locking cap 573.18 573.18 CEM/BEN BKTL 2.0' 2.5' BEN seal BS pipe SD pack 13" Ø BH SS screen 9.5' 10.0'	1 2 3 4 5	SS SS SS SS	7 6 17 22 6 30 60 21 43			

♥ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

PROJECT	NAME: 102ND STREET LANDFILL JOB NO: 9-1431	HOLE Nº.:		OW61-	86 (ALLUVIUM WELL
CLIENT:	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED:_	FEBR	UARY 11, 1986
HOLE TY	PE: HOLLOW STEM AUGER (8-1/4" ID, 13" OD) LOCATION: NORTHE	AST SECTOR OF LAND	FILI	 	
CRA SU	PERVISOR : D. MILLARD GROUND ELEVATION: 573.6	TOP OF PIPE	ELE	VATION:	576.95
	PROFILE	MONITOR INSTALLATION	s	AMPLE	PENETRATION
Ŧ	STRATIGRAPHY		BER	۲ Foot	BLOWS / FOOT
DEP	DESCRIPTION & REMARKS	576.95 Locking cap	NUN	BLOWS	20 40 60 60
0 -	- Dark brown sandy SILT & VEGETATION - Dry-moist	573.6	1	SS 13	•
-	occasional pebble (FILL) White WASTE MATERIAL - silt size (FILL) Dry Red-brown fine SAND & SILT - occasional Dry	⊢13"ØBH −CEM/BEN BKFL		17	•
-	<pre>\pebble & cinder (FILL) White WASTE MATERIAL - occasional black, Moist-dry vellow & brown color, trace silt, trace</pre>	2.5' BEN seal	2	SS 2	
-	fine sand, occasional root fiber, becoming wet (FILL)		3	SS 3	-
5 -	Gray CINDERS & FLYASH - occasional red Wet brick fragment (FILL)	- SD pack		2	
-	waste material (FILL) Gray-brown silty CLAY - trace root fibers, Dry-moist		-	13	
-	increasing plasticity with depth (NATIVE)	screen	5	SS 14	
- 10 -	Brown silty CLAY, plastic Moist	9.5'		38	
	NOTES: Mell Pipe: 2" diameter black steel Mell Screen: 2" diameter, 5' length, #6 slot, Erainleess steel Sand Rack: Special coarse blend Ottawa sand Nell could not be installed in original borehole due to repeated bridging of sand in augers. Moved approximately 5' south, reaugered and installed well. Grouted original borehole.				

▼ WATER FOUND ♥ STATIC WATER LEVEL (37) GRAIN SIZE ANALYSIS

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____JOB NQ:____9-1431_____HOLE NQ.:____

CLIMM DOCUMPAND. CHEMICAL CORPORATION INST SIDE OF AMETRIC NATE THE NATE THE NATE THE NATE THE CONTRACT NATE THE NATE THE CONTRACT NATE THE CONTRACT NATE THE NATE THE NATE THE SAME THE NATE THE THE THE THE THE THE THE THE THE T	PROJE	CT	NAME: 102ND STREET LANDFILL JO	B N9.:	9-1431		HOLE NO .:		0	162-8	J 7				
LOCATION: INST SIDE OF LANSTILL CONTON: INST SIDE OF LANSTILL Second Line Colspan="2">Control: Instanting Line Colspan="2">Control: Instantinstanting Line Colspan="2" <td< td=""><td>CLIEN</td><td>T:</td><td>OCCIDENTAL CHEMICAL CORPORATION</td><td></td><td></td><td></td><td>DATE COMPLE</td><td>TED:_</td><td>MZ</td><td>IRCH</td><td>16,</td><td>198</td><td>37</td><td></td></td<>	CLIEN	T:	OCCIDENTAL CHEMICAL CORPORATION				DATE COMPLE	TED:_	MZ	IRCH	16,	198	37		
Back FLASE LOCOM SPOULD ELEVATION* PROFILE PROFILE PROFILE PROFILE PROFILE PROFILE PROFILE PROFILE <			F: HOLLOW STEM AUGER LO	CATION :	WEST S	DEOF	LANDFILL								
Genues: / Finance Monute Monute Monute Strangeanvi Descention & newards Descention & newards Descention & newards Colspan="2">Descention & newards Colspan="2">Descention & newards Colspan="2">Descention & newards Descention & new regetation Descention & newards Descention & newards <th colspa<="" td=""><td>HULL</td><td></td><td>****</td><td>_</td><td></td><td></td><td>TOD OF 0105</td><td></td><td></td><td>*</td><td></td><td></td><td></td><td></td></th>	<td>HULL</td> <td></td> <td>****</td> <td>_</td> <td></td> <td></td> <td>TOD OF 0105</td> <td></td> <td></td> <td>*</td> <td></td> <td></td> <td></td> <td></td>	HULL		****	_			TOD OF 0105			*				
MONTLE MONTRE SAMPLE SAMPLE<	GEOLO	GIST	/ENGINEER: GROUND ELEVATION:					ELE	VATIO	··					
Solution Statuseamy Besommer of a mean 0 Carpy firm to control GNVEL - some sand, Black SIL colling and solution and solution of the some solut, Black SIL colling pathies (FILL) Multicled red-brown CLAY - some silt, trace woist-wet fires man, gravel, pathies (FILL) Black FLOASH - trace brick fragments, fragment, brick fragment (FILL) Black FLOASH - trace gravel for fragment, brick fragment, pathies (FILL) Black FLOASH - trace gravel (FILL) Black FLOASH - some vegetation, trace fragments, trace of gravel, brick fragments (FILL) Black FLOASH - trace gravel (FILL) Black FLOASH - trace gravel, brick fragments (FILL) Black FLOASH - trace sand, wegetation (THL) Wet fragments (FILL) Black FLOASH - trace sand, wegetation (THL) Black FLOASH - trace sand, wegetation (THL) Bl			PROFILE	_		INST	INITOR	s	AMPL	.E	PE	NETF		ж	
B STRATMARKY 0 - Gray fire to coarse GANEL - some sand, wet Trace sitt		ç								5	BL	TE: OWS,	ST / F0(т	
8 3 DESCRIPTION 6 REMARKS 0 - 0 - 1 SS 1 <td>Ŧ</td> <td>ATIO</td> <td>STRATIGRAPHY</td> <td></td> <td></td> <td></td> <td></td> <td>ABER</td> <td>w.</td> <td>/ F0</td> <td></td> <td></td> <td></td> <td>-</td>	Ŧ	ATIO	STRATIGRAPHY					ABER	w.	/ F0				-	
0 Corp fire to coarse GNME - some sand, Net Locking 0 Corp fire to coarse GNME - some sand, trace green, Most 13" 0 13 Black SIL cools [FIL] Black SIL cools [FIL] 14 Some sand, green, publics [FIL] 15 Black FLASH - trace green Most 16 Black FLASH - trace green Most 17 Solar Flash - trace green Most 18 Solar Flash - trace green Most 19 Black FLASH - trace green Most 10 Black FLASH - trace green Most 10 Black FLASH - trace green Most 10 Black FLASH - trace green (FIL) 11 Black FLASH - trace green (FIL) 11 Black FLASH - trace green (FIL) 11 Black FLASH - trace green (FIL) 12 Black FLASH - trace green (FIL) 13 Black FLASH - trace green (FIL) 14 SS 1 15 Black FLASH - trace green (FIL) 16 SS 1 17 SS 1 18 Corp fire bo coarse SAD 1 fire bo modium Met 19 SS 2 11 Corp fire bo coarse SAD 1 fire bo modium Met 13 SS 22 14 SS 2 15 Corp fire bo coarse SAD 1 fire bo modium Met 16	E E	LEV.	DESCRIPTION & REMARKS					Ñ	12	OWS	2	40		0	
0 - Cray fine to coarse GAWEL - some said, Net <pre> Frace silt _ [FIL]</pre> Fine and, frace gravel, Moist Mode (FIL) Mode (FIL) Frace mode (FIL) Fine and, gravel, pabbles (FIL) Fine and, gravel, gravel, moist Fine and, gravel, gravel, moist Fine and, gravel, gravel, gravel, moist Fine and, gravel, gravel, moist Fine and, gravel, gravel, fragments, fragment, brick fragments, gravel (FIL) Black FINASH - trace gravel, frick fragments, trace fragment (FIL) Black FINASH - trace gravel, frick fragments (FIL) Black FINASH - trace sand, vegetation (FIL) Net fragments (FIL) Black FINASH - trace sand, vegetation (FIL) Net fragments (FIL) fragments (FIL)		<u> </u>				д	Locking		\vdash	ē	H	Ŧ	Ŧ	H	
0 Cray line to control caval Bone Bail, vect 12 Intermediation - Section - Sec				11-4			cap	1	ee	•					
black SLT - some fine sand, trade gravel, Moist 12 wortlad red-brown CLA' - some silt, trade Moist-wet 12 fine sand, gravel, pables (FTLL) 13 Black FLYASH - trade gravel, form Dry execution, gravel, (FTLL) 3 Light brown WASTE MATERIAL - trade gravel, Moist 6 firegrant, frick fragments, paper (FTLL) 10 Black FLYASH - trade gravel, stone Noist fragment, brick fragments, paper (FTLL) 10 Black FLYASH - trade gravel, brick Wet fragments, trade vegetation, gravel (FTLL) 10 Black FLYASH - trade gravel, brick Wet fragments, trade vegetation (FTLL) 10 Black VEXENTION - some soud, flyash, wet 7 fragments (FTL) 8 Black VEXENTION - some sailt, trade pables at 2 core stone fragment (FTLL) 8 Black VEXENTION - some sailt, trade shells fragments, gravel is and 10 some silt, trade wegetation (NMTVE) 3 core score signer (FTLL) 11 Black FUXASH - trade gravel is abell 12 core score silt, trade shells is shell 11 core score silt, trade shells i	°	-	Gray fine to coarse GRAVEL - some sand, trace silt (FILL)	wet	Ā	ΠΓ	-13" Ø	•	33	3					
Wortlad rad-brown CLAY - some silt, trace Woist-wet Ine sand, gravel, pables (FILL) Black FLMSN: - trace pravel, gravel Month to form gravel, (FILL) Black FLMSN: - trace gravel, store Particle provide (FILL) Black FLMSN: - some vegetation, trace No regover, brick fragment, pick rose store Black FLMSN: - some vegetation, trace No regovery No recovery Cray fine to madium SMD - some silt, trace store Restrict on a some fragment, frick rose store Restrict on a some silt, trace shall a shell Cray fine to coarse SND 4 fine to medium Wet Gray fine to medium SMD - some silt, wet Restrict on a some fragment, frick of the medium sand India to rownob one coar, fire to medium sand India to rownob one coar, fire to medium sand India to rownob one coar, fire to medium sand India to rownob one coar, fire to medium sand India to rownob one coar, fire to medium sand India to rownob one coar, fire to medium sand Increasing with depth Increasing with depth Increasing with depth Increasing with depth Increasing with conson fire to medium sand, rownob at 33.2'		-	Black SILT - some fine sand, trace gravel,	Moist			BH			12	1				
Image Sum, Grover, Delives (Fills) Image Sum (FILX) VegetAlion, gravel. (FILL) VegetAlion, gravel. (FILL) Disk (FILX) Black FLXSH trace gravel, stone Year (FILX) Black FLXSH trace gravel, stone Year (FILX) Black FLXSH trace gravel, stone Year (FILX) Black FLXSH trace gravel, brick (FILL) Start (FILL) Black FLXSH trace gravel, brick (FILL) Start (FILL) Black FLXSH trace gravel, brick (FILL) Start (FILL)		-	Mottled red-brown CLAY - some silt, trace	Moist-v	et _			2	SS	4	It I				
Black FLXBS: - trace trick fragments, Dry - weeketing, draw [LIL] Light brown MASE W(FLL) - trace gravel, stone - fragment, brick fragment (FIL) - Black FLXBS: - scne vegetation, trace - gravel, brick fragment, paper (FIL) - Black FLXBS: - scne vegetation, trace - gravel, brick fragment, paper (FIL) - Black FLXBS: - trace gravel, prick - gravel, brick fragments, paper (FIL) - Black FLXBS: - trace gravel, brick - fragments, trace vegetation, gravel (FIL) - Black FLXBS: - trace gravel, brick - fragments (FIL) - Black FLXBS: - trace sand, vegetation (FIL) - So receivery - So receivery - Cavy fine to medium SAND - some silt, trace shells & shell - Gray fine to medium SAND - some silt, wet - Gray fine to medium SAND - some silt, wet - Receivers fragments, gravel is ancelly, fine to medium sand, met		` _	Tine sain, graver, percies (ring)		/.					7					
S Light brown WASTE MUTERAL - trace gravel Moist Black FLYASH - trace gravel, stone Moist Black FLYASH - trace gravel, stone Moist Black FLYASH - some vegetation, trace Net Black FLYASH - some vegetation, gravel (FILL) S Black FLYASH - trace gravel, brick Wet - fragment, brick fragment (FILL) 6 Black FLYASH - trace gravel, brick Wet - fragments, trace vegetation (FILL) 6 - Black FLYASH - trace gravel, brick Wet - Black FLYASH - trace sand, vegetation (FILL) 6 - Black FLYASH - trace sand, vegetation (FILL) Wet - Black FLYASH - trace sand, vegetation (FILL) Wet - Black FLYASH - trace sand, vegetation (FILL) Wet - Black FLYASH - trace sand, vegetation (FILL) Wet - Some silt, trace vegetation (NUTYE) 9 - No recovery 10 - Cray fine to medium SAND - some silt, Wet 11 - Cray fine to coarse SAND & fine to medium Wet - Gray fine to coarse SAND & fine to medium Wet - Gray fine to coarse SAND & fine to medium Wet - Gray fine to coarse fragment. So <	1	_	Black FLYASH - trace brick fragments, vegetation, gravel (FILL)	Dry				3	ss	8					
Black FLXASH - trace gravel, stone Moist - fragment, Drick fragment (FILL) - Black FLXASH - some vegetation, trace Wet - gravel, Drick fragments, paper (FILL) 3 - Black fLXASH - trace gravel, brick Wet - fragments, trace vegetation, gravel (FILL) 6 10 - Black fLXASH - trace gravel, brick Wet - fragments (FILL) - 6 - Black FLXASH - trace gravel, brick Wet - - fragment (FILL) - - - Black FLXASH - trace sand, wegetation (FILL) - - - Black FLXASH - trace sand, wegetation (FILL) - - - Black FLXASH - trace sand, wegetation (NUTVE) - - - - Motild gray & olive-gray fine SND - some silt, wet - - - - - - - - - - - - - - - - - - - - - - - <td>5</td> <td>_</td> <td>Light brown WASTE MATERIAL - trace gravel</td> <td>Moist</td> <td>Г</td> <td></td> <td></td> <td></td> <td></td> <td>6</td> <td></td> <td></td> <td></td> <td></td>	5	_	Light brown WASTE MATERIAL - trace gravel	Moist	Г					6					
- Integrett, Brick fragment, paper (FILL) Black fIXASH - some some vogetation, trace Net gravel, brick fragments, paper (FILL) Black fLXASH - trace gravel, brick Net fragments (FILL) Black fLXASH - trace sand, vegetation (FILL) Black fLXASH - trace sand, vegetation (FILL) Black fLXASH - trace sand, vegetation (NNTVE) Black fLXASH - trace sand, vegetation (NNTVE) Black fLXASH - trace sand, vegetation (NNTVE) State vegetation, trace pebbles at 22.0'-24.0' Cray fine to medium SAND - some silt, Net trace vegetation, trace pebbles at 22.0'-24.0' State vegetation, trace salls & shell manular to counted increasing with depth Dack gray fine to medium SAND - some silt, Net manular to counted increasing with depth Dack gray fine to medium SAND - some silt, Net manular to counted is 0.0'-33.2', layer of stome fragments at 22.2'-32.3' Spoon refusal - 33.2'; avger refusal - 33.3'	ľ		Black FLYASH - trace gravel, stone	Moist											
Black FL/XSH - some vegetation, trace Wet gravel, brick fragments, paper (FILL) Black & dark brown FL/XSH - some store Wet - fragments, trace vegetation, gravel (FILL) 10 - Black FL/XSH - trace gravel, brick Wet - fragments, trace vegetation (FILL) 10 - Black FL/XSH - trace gravel, brick Wet - fragments (FILL) Black FL/XSH - trace sand, vegetation (FILL) Wet - Black FL/XSH - trace sand, vegetation (FILL) - BACK FL/XSH - trace sand, vegetation (FILL) - - - -		-	Iragment, brick fragment (Fill)												
Black & dark brown FLVASH - some stone Wet fragments, trace vegetation, gravel (FILL) Black FLVASH - trace gravel, brick Wet fragments (FILL) Black VOGEDATION - some wood, flyash, Wet cone stone fragment (FILL) Black FLVASH - trace gravel, brick Wet fragments (FILL) Black FLVASH - trace sand, vegetation (FILL) Wet Back FLVASH - trace sand, vegetation (FILL) Wet Converse A trace vegetation, trace pebbles at 20 - trace vegetation, trace pebbles at 22.0'-24.0' Cray fine to coarse SAND & fine to medium Wet GRAVEL - some silt, trace shells & shell fragments, stone fragments, gravel is arguel, trace fine to medium sand increasing with depth 23 - drade provided Red-brown SILT - some fine to medium sand increasing with depth 30 - stone fragments, trace Lay, fine to medium sand gravel, stone fragments, trace lay, fine to medium sand increasing with depth 30 - stone fragments at 32.2'-32.3' - spoon refusal - 33.2'; auger refusal - 33.3' - spoon refusal -		-	Black FLYASH - some vegetation, trace gravel, brick fragments, paper (FILL)	Wet			-BS pipe		i I	3					
Diack e Gaix Dickin Julion - Gaixe vegetation, gravel (FILL) Net 10 Black FLYASH - trace vegetation (FILL) 11 Black VEGETATION - some wood, flyash, Wet 12 Black FLYASH - trace sand, vegetation (FILL) 13 Black FLYASH - trace sand, vegetation (FILL) 14 Black FLYASH - trace sand, vegetation (FILL) 15 Mottled grav & Olive-grav fine SAND - some silt, trace vegetation (NMTVE) 15 Mottled grav & Olive-grav fine SAND - some silt, trace vegetation (NMTVE) 16 SS 2 17 SS 4 18 SS 2 19 SS 4 10 SS 3 20 Cray fine to medium SAND - some silt, Wet 12 SS 1 21 SS 1 22 SS 1 22 SS 1 23 Gray fine to coarse SAND 4 fine to medium Wet 34 SS 22 35 SS 22 36 Red-brown SILT - some clay, fine to medium wet 37 SS 44 38 SS 22 39 SS 44 41 SS 22 13 SS		-		Wat				5	SS	1	k I				
10 Black FLYASH - trace gravel, brick Wet 6 SS 1 10 Black VEXETNTION - some wood, flyash, wet 7 11 Black VEXETNTION - some wood, flyash, wet 8 12 Black FLYASH - trace sand, vegetation (FILL) Wet 8 15 Mottled gray & olive-gray fine SAND - some silt, trace vegetation (NATIVE) 9 15 Mottled gray & olive-gray fine SAND - some silt, trace vegetation, trace pebbles at 22.0'-24.0' 9 20 Gray fine to medium SAND - some silt, trace vegetation, trace pebbles at 22.0'-24.0' 11 21 Gray fine to coarse SAND & fine to medium Wet GRAVEL - some silt, trace shells & shell argumat to rounded at angular to rounded at angular gravel, trace fine to medium sand increasing with depth 25.0' 25 Gray fine to medium SAND - some silt, Wet trace gravel, trace fine to medium sand increasing with depth 25.0' 25 Altorow SILT - some clay, fine to medium sand increasing with depth 27.1' 26 Fragments, trace Clay, fine to medium sand increasing with depth 27.1' 30 gravel, stone & gravel ranges from angular to rounded at 30.0'-33.2', layer of stone fragments at 32.2'-32.3' 33.3' 30 Spoon refusal - 33.2'; auger refusal - 33.3' 33.3'		-	fragments, trace vegetation, gravel (FILL)	me c			,			10					
Black FLXASH - trace gravel, brick Wet fragments (FILL) File Black VEXEMATION - some wood, flyash, wet 7 SS 1 - Black VEXEMATION - some wood, flyash, wet 8 SS 2 - Black VEXEMATION - some sand, vegetation (FILL) Wet 8 SS 2 - Black TLASH - trace sand, vegetation (FILL) Wet 9 SS 4 - Some silt, trace vegetation (NATIVE) 9 SS 4 - No recovery 10 SS 3 - Gray fine to medium SAND - some silt, wet 11 SS 1 - Cary fine to coarse SAND & fine to medium Wet - Gray fine to coarse SAND & fine to medium Wet - Gray fine to coarse SAND & fine to medium Wet - Gray fine to coarse SAND & fine to medium Wet - Gray fine to coarse SAND & fine to medium Wet - Gray fine to coarse file to medium sand Is annular to rounded - Red-forwm SILT - some clay, fine to medium sand Is annular to rounded - Red-forwm SILT - some clay, fine to medium sand Is annular to rounded - Red-forwm SILT - some clay, fine to medium sand Is an elements, trace clay, fine to medium - Red-forwm SILT - some fine to medium sand, wet Is an elements, trace clay, fine to medium - Red-forwm SILT - some fine to medium sand, twet <td>10</td> <td>_ :</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>6</td> <td>ss</td> <td>1</td> <td></td> <td></td> <td></td> <td></td>	10	_ :						6	ss	1					
Imaginities (Fills) Fills) Black VEGETATION - some wood, flyash, wet 7 SS 1 Black FLYASH - trace sand, vegetation (FILL) Wet 8 SS 2 Interpretation (NATIVE) 9 SS 4 Interpretation (NATIVE) 10 SS 3 Interpretation (NATIVE) 10 SS 3 Interpretation (NATIVE) 11 SS 1 Interpretation (NATIVE)			Black FLYASH - trace gravel, brick	Wet						1					
 Black VDGETNTION - some wood, flyash, Wet one stone fragment (FILL) Black TDVASH - trace sand, vegetation (FILL) Wet Black TDVASH - trace sand, vegetation (FILL) Wet Mottled gray & olive-gray fine SND - Noist-wet some silt, trace vegetation (NATIVE) No recovery Gray fine to medium SAND - some silt, Wet trace vegetation, trace pebbles at 22.0'-24.0' Gray fine to coarse SND & fine to medium Wet gRVLL - some silt, trace shells & shell Red-brown SILT - some clay, fine to medium sand increasing with depth Dark gray fine to medium SAND - some silt, Wet trace structure trace fine to medium sand increasing with depth Dark gray fine to medium SAND - some silt, Wet strace gravel & shell fragments, trace clay, fine to medium sand increasing with depth Dark gray fine to medium SAND - some silt, Wet trace fragments, trace clay, fine to medium sand increasing with depth Spoon refusal - 33.2'; auger refusal - 33.3' 		-						_							
- One stone fragment (FILL) - Black FLXASH - trace sand, vegetation (FILL) Wet - Mottled gray & olive-gray fine SAND - Moist-wet - more still, trace vegetation (NATIVE) - more covery - More covery - Gray fine to medium SAND - some silt, Wet - Gray fine to coarse SAND & fine to medium Wet - GRAVEL - some silt, trace shells & shell - Gray fine to coarse SAND & fine to medium Wet - GRAVEL - some silt, trace fine to medium Wet - GRAVEL - some silt, trace fine to medium Wet - Stone fragments, store fragments, gravel is - Red-brown SILT - some clay, fine to medium Wet - Stone fragments, trace fine to medium sand - Red-brown SILT - some fine to medium sand - Red-brown SILT - some fine to medium sand - Red-brown SILT - some fine to medium sand - Stone fragments, trace fine to medium sand - Red-brown SILT - some fine to medium sand - Red brown SILT - some fine to medium sand - Red brown SILT - some fine to medium sand - Red brown SILT - some fine to medium sand - Red brown SILT - some fine to medium sand - Red brown SILT - some fine to medium sand - Red brown SILT - some fine to medium sand - Red brown SILT - some fine to medium sand - Red brown SILT - some fine to medium sand - Red brown SILT - some fine to medium sand - Red brown SILT - some fine to medium sand - Red brown SILT - some fine to medium sand - Red brown SILT - so		-	Black VEGETATION - some wood, flyash,	Wet				(35						
 Black FLYASH - trace sand, vegetation (FILL) Wet Black FLYASH - trace sand, vegetation (NATVE) Mottled gray & olive-gray fine SAND - Moist-wet some silt, trace vegetation (NATVE) No recovery Gray fine to medium SAND - some silt, Wet trace vegetation, trace pebbles at 22.0'-24.0' Gray fine to coarse SAND & fine to medium Wet GRAVEL - some silt, trace shells & shell fragments, stone fragments, gravel is angular to rounded Red-brown SILT - some fine to medium sand increasing with depth Dark gray fine to medium SAND - some silt, Wet stone fragments, trace clay, fine to medium sand increasing with depth Dark gray fine to medium SAND - some silt, Wet stone fragments, trace clay, fine to medium sand, Wet stone fragments at 32.2'-32.3' Spoon refusal - 33.2'; awger refusal - 33.3' 	ſ	-	one stone fragment (FILL)				- CEM/BEN BKFL			3					
15 Mottled gray & olive-gray fine SAND - Moist-wet some silt, trace vegetation (NATIVE) 9 SS 4 - No recovery 10 SS 3 - - - 10 SS 3 - - - - - 11 SS 1 -		-	Black FLYASH - trace sand, vegetation (FILL)	Wet	\sim			8	SS	2					
Sole Sile, under vegetation (unitity) 9 SS 4 No recovery 10 SS 3 Gray fine to medium SAND - some silt, trace pebbles at 11 SS 12 20 Gray fine to coarse SAND & fine to medium Wet 11 SS 11 21 SS 11 SS 11 22 Gray fine to coarse SAND & fine to medium Wet 12 SS 11 25 Gray fine to coarse SAND & fine to medium Wet 13 SS 22 4 RAVEL - some silt, trace shells & shell 8 12 25 11 25 Red-brown SILT - some clay, fine to medium sand Wet SS 2 4 25 Dark gray fine to medium SAND - some silt, Wet SS 8 67 15 30 gravel, stome fine to medium sand, Wet SS 63 63 63 30 gray gravel, stome fine to medium sand, Wet 58 88 63 63 30 gray fine to 33.2'; auger refusal - 33.3' 33.3' 33.3' 100	15	-	Mottled gray & olive-gray fine SAND -	Moist-w	æt					5					
 No recovery Gray fine to medium SAND - some silt, Wet trace vegetation, trace pebbles at 22.0'-24.0' Gray fine to coarse SAND & fine to medium Wet GRAVEL - some silt, trace shells & shell fragments, stone fragments, gravel is angular to rounded Red-brown SLLT - some clay, fine to medium sand, Wet stone fragments, trace clay, fine to medium sand, Wet stone fragments, trace clay, fine to medium Back brown SLLT - some fine to medium sand, Wet stone fragments, at 32.2'-32.3' Spoon refusal - 33.2'; auger refusal - 33.3' 		-						9	ss	4	•				
Image: Second state of the second s		-	No recovery							4					
Gray fine to medium SAND - some silt, Wet trace vegetation, trace pebbles at 22.0'-24.0' Gray fine to coarse SAND & fine to medium Wet GRAVEL - some silt, trace shells & shell fragments, store fragments, gravel is angular to rounded Red-brown SILT - some fine to medium sand increasing with depth Dark gray fine to medium SAND - some silt, Wet store fragments, trace clay, fine to medium gravel, store & fine to medium gravel, store & fine to medium sand, Wet store fragments, trace clay, fine to medium gravel, store & fine to medium sand, Wet store fragments, trace clay, fine to medium gravel, store & gravel rages from angular to rounded at 30.0'-33.2', layer of stone fragments at 32.2'-32.3' Spoon refusal - 33.2'; auger refusal - 33.3' Spoon refusal - 33.2'; auger refusal - 33.3'		-						10	ss	3					
20 Gray fine to medium SAND - some silt, trace pebbles at 22.0'-24.0' 11 SS 1 21 SS 1 2 2 22.0'-24.0' 12 SS 1 22 12 SS 1 25 Gray fine to coarse SAND & fine to medium Wet GRAVEL - some silt, trace shells & shell 13 SS 22 25 Fragments, stone fragments, gravel is angular to rounded 25.0' 4 25 26 Red-brown SLIT - some clay, fine to medium Wet subangular gravel, trace fine to medium sand increasing with depth 27.1' 19 26 Dark gray fine to medium SAND - some silt, Wet trace gravel & shell fragments SS 55 67 30 gravel, stone & gravel ravel ray, fine to medium sand, Wet stone fragments, trace clay, fine to medium sand, Wet screen fragments at 32.2'-32.3' 16 55 29 30 gravel, a stone fragments at 32.2'-32.3' 63 63 63 30 Spcon refusal - 33.2'; auger refusal - 33.3' 33.3' 33.3' 100		_								2					
20 - Frace vegetation, trace peoples at 22.0'-24.0' 11 SS 1 - - 12 SS 1 2 - - 12 SS 1 25 - - - 25 - 13 SS 22 25 - fragments, stone fragments, gravel is angular to rounded - 4 SS 2 - - - - - - 4 - - - - - - - - - - -			Gray fine to medium SAND - some silt,	Wet											
Gray fine to coarse SAND & fine to medium Wet GRAVEL - some silt, trace shells & shell fragments, stone fragments, gravel is angular to rounded Red-brown SILT - some clay, fine to medium Wet subangular gravel, trace fine to medium sand increasing with depth Dark gray fine to medium SAND - some silt, Wet trace gravel & shell fragments Red-brown SILT - some fine to medium sand, Wet stone fragments, trace clay, fine to medium gravel, stone & gravel ranges from angular to rounded at 30.0'-33.2', layer of stone fragments at 32.2'-32.3' Spoon refusal - 33.2'; auger refusal - 33.3' Spoon refusal - 33.2'; auger refusal - 33.3' Red-brown SILT - some fusal - 33.3' Spoon refusal - 33.2'; auger refusal - 33.3' Spoon refusal - 33.2'; auger refusal - 33.3'	20	-	22.0'-24.0'					''	35						
- - Gray fine to coarse SAND & fine to medium Wet GRAVEL - some silt, trace shells & shell - fragments, stone fragments, gravel is angular to rounded - Red-brown SILT - some clay, fine to medium Wet subangular gravel, trace fine to medium sand - Increasing with depth - Dark gray fine to medium SAND - some silt, Wet trace gravel & shell fragments - Red-brown SILT - some fine to medium sand, Wet stone fragments, trace clay, fine to medium - gravel, stone & gravel ranges from angular to rounded at 30.0'-33.2', layer of stone - fragments at 32.2'-32.3' - Spoon refusal - 33.2'; auger refusal - 33.3' - Spoon refusal - 33.2'; auger refusal - 33.3' - Contended at 30.0'-33.2'; auger refusal - 33.3' - C		-								2	[]				
- Gray fine to coarse SAND & fine to medium Wet GRAVEL - some silt, trace shells & shell fragments, stone fragments, gravel is angular to rounded - Red-brown SILT - some clay, fine to medium wet subangular gravel, trace fine to medium sand increasing with depth - Dark gray fine to medium SAND - some silt, Wet trace gravel & shell fragments - Red-brown SILT - some fine to medium sand, Wet stone fragments, trace clay, fine to medium gravel, stone & gravel ranges from angular to rounded at 30.0'-33.2', layer of stone - fragments at 32.2'-32.3' - Spoon refusal - 33.2'; auger refusal - 33.3' - Spoon refusal - 33.5' - Spoon refusal - 33		-						12	SS	1	Ν				
- Gray fine to coarse SAND & fine to medium Wet 13 SS 22 25 - fragments, stone fragments, gravel is - 25.0' 4 26 - Red-brown SILT - some clay, fine to medium Wet seal 14 SS 2 26 - Red-brown SILT - some clay, fine to medium sand - 19 19 27 - - 15 SS 44 27.1' 19 - 14 SS 2 27.1' - - - - 67 28 - - - - - - 29 - - - - - - 20 - - - - - - - 30 - - - - - - - - 30 - - - - - - - - - 30 - - - - - - - - <t< td=""><td></td><td>-</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>25</td><td></td><td></td><td></td><td></td></t<>		-								25					
25 - GRAVEL - some silt, trace shells & shell 25 - fragments, stone fragments, gravel is angular to rounded - BEN - Red-brown SILT - some clay, fine to medium wet seal 14 - Increasing with depth - 19 - Dark gray fine to medium SAND - some silt, Wet - 15 SS - Dark gray fine to medium SAND - some silt, Wet - - 67 - Dark gray fine to medium sand, Wet - - - - Ben - - - - Dark gray fine to medium SAND - some silt, Wet - - - - Ben - - - - - Ben - - - - - Ben - - - - - - - - - - - - - - - - - - - - - - - - -	1	+	Gray fine to coarse SAND & fine to medium	Wet	$\neg \downarrow$			13	ss	22					
angular to rounded Red-brown SILT - some clay, fine to medium Wet subangular gravel, trace fine to medium sand increasing with depth Dark gray fine to medium SAND - some silt, Wet 15 Example of trage gravel & shell fragments 15 Red-brown SILT - some fine to medium sand, Wet 15 Stone fragments, trace clay, fine to medium 8 gravel, stone & gravel as gravel ranges from angular 16 stone fragments at 32.2'-32.3' 18 Spoon refusal - 33.2'; auger refusal - 33.3' 33.3'	25	-	GRAVEL - some silt, trace shells & shell fragments, stone fragments, gravel is		Ч	┝┥┝	25.0'			4	/				
 subangular gravel, trace fine to medium sand increasing with depth Dark gray fine to medium SAND - some silt, Wet trace gravel & shell fragments Red-brown SILT - some fine to medium sand, Wet stone fragments, trace clay, fine to medium gravel, stone & gravel ranges from angular to rounded at 30.0'-33.2', layer of stone fragments at 32.2'-32.3' Spoon refusal - 33.2'; auger refusal - 33.3' 	ł	-	Angular to rounded Red-brown SILT - some clay, fine to medium	Wet			BEN seal	14	SS	2					
 Dark gray fine to medium SAND - some silt, Wet Dark gray fine to medium SAND - some silt, Wet Red-brown SILT - some fine to medium sand, Wet stone fragments, trace clay, fine to medium gravel, stone & gravel ranges from angular to rounded at 30.0'-33.2', layer of stone fragments at 32.2'-32.3' Spoon refusal - 33.2'; auger refusal - 33.3' 			subangular gravel, trace fine to medium sand				27.11			10	Ν				
- Dark gray fine to medium SAND - some silt, Wet trace gravel & shell fragments Red-brown SILT - some fine to medium sand, Wet stone fragments, trace clay, fine to medium gravel, stone & gravel ranges from angular to rounded at 30.0'-33.2', layer of stone fragments at 32.2'-32.3' - Spoon refusal - 33.2'; auger refusal - 33.3' Spoon refusal - 33.2'; auger refusal - 33.3' - - - - - - - - - - - - -		-					2/.1		_	15		N			
- Red-brown SILT - some fine to medium sand, Wet stone fragments, trace clay, fine to medium gravel, stone & gravel ranges from angular to rounded at 30.0'-33.2', layer of stone - fragments at 32.2'-32.3' - Spoon refusal - 33.2'; auger refusal - 33.3' - Spoon refusal - 33.2'; auger refusal - 33.3' - Spoon refusal - 33.2'; auger refusal - 33.3'	1	-	 Dark gray fine to medium SAND - some silt, <u>trace gravel & shell fragments</u> 	wet	۳		ss	15	SS	44					
30 - gravel, stone & gravel ranges from angular to rounded at 30.0'-33.2', layer of stone fragments at 32.2'-32.3' 16 SS 29 63 - - - - - 63 100 - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - </td <td>1</td> <td>-</td> <td>Red-brown SILT - some fine to medium sand, stone fragments, trace clay, fine to medium</td> <td>Wet</td> <td></td> <td> 日</td> <td>screen</td> <td></td> <td></td> <td>67</td> <td></td> <td></td> <td> </td> <td></td>	1	-	Red-brown SILT - some fine to medium sand, stone fragments, trace clay, fine to medium	Wet		日	screen			67					
- fragments at 32.2'-32.3' - Spoon refusal - 33.2'; auger refusal - 33.3'	30	-	gravel, stone & gravel ranges from angular			日		16	SS	29		\triangleleft			
- - - - - Spoon refusal - 33.2'; auger refusal - 33.3' - - - - - - - - - - - - - - - - - - -	1	-	fragments at 32.2'-32.3'			日	pack			63			X		
- Spoon refusal - 33.2'; auger refusal - 33.3' 33.3'	1	-				日		18	ss	88					
Spoon refusal - 33.2'; auger refusal - 33.3'		-	·			旧	l l			100				N	
		_	Spoon refusal - 33.2'; auger refusal - 33.3'				`33.3'								

★ REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS
▼ WATER FOUND ♥ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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JECT N	AME:JOB NQ:JOB NQ:	31 HOLE NR.:		0W62-	87 Page 2.
ENT :	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPL	ETED:	-secon	10, 1507
E TYPE	: HOLLOW STEM AUGER LOCATION : WEST	SIDE OF LANDFILL			
LOGIST	ENGINEER: D. OSCAR GROUND ELEVATION:	TOP OF PIP	E ELEVAT	ION:*	
	PROFILE		SAMP	٦E	PENETRATIO
		IN SIACLATION		5	TEST BLOWS / FOO
ATIO	STRATIGRAPHY		MBER /PE	18	
EEE	DESCRIPTION & REMARKS		P	TOWS	20 40 40 4
		4		† °	╏┼┼┼╌
	NOTES:				
	Well Screen: 2" diameter stainless steel, #6 slot,				
	Sand Pack: Special coarse blend Ottawa sand				
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* REFER TO "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS WATER FOUND ∇ STATIC WATER LEVEL 37 GRAIN SIZE ANALYSIS

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Π	PROJECT	NAME: 102ND STREET LANDFILL JOB NO: 9-1431	HOLE N9.:	OW63-	-87
U	CLIENT:	OCCIDENTAL CHEMICAL CORPORATION	DATE COMPLE	TED: MARCI	1 18, 1987
Π	GEOLOGIS	T/ENGINEER: D. OSCAR GROUND ELEVATION:	TOP OF PIPE	ELEVATION:	
U		PROFILE	MONITOR	SAMPLE	PENETRAT
	DEPTH ELEVATION)	STRATIGRAPHY Description & Remarks		NUMBER TYPE LOWS / FOOT	EDWS / F1
О Л	0 -	Gray fine to coarse GRAVEL - some sand, Wet trace silt (FILL) Black SILT - some fine sand, trace gravel, Moist occasional sand & silt noclule (FILL) Mottled red-brown CLAY - some silt, trace Moist-wet	Locking cap -13" Ø BH BH BS		
	- - 5 -	fine sand, gravel, pebbles (FILL) Black FLYASH - trace brick fragments, Dry vegetation, gravel (FILL) Light brown WASTE MATERIAL - trace gravel Moist Ceramic fragments (FILL) Black FLYASH - trace gravel, stone Moist fragment, brick fragment (FILL)	pipe 		
0	-	Black FLYASH - some vegetation, trace Wet gravel, brick fragments, paper (FILL)	- SD pack		
0	 10 -	Black & Oark brown FLIASS - Some Scone wet fragments, trace vegetation, gravel (FILL) Black FLYASH - trace gravel, brick Wet fragments (FILL)	SS screen		
0	-	Black VEGETATION - some wood, flyash, Wet one stone fragment (FILL)			
0	- 15 -	- Black FLYASH - trace sand, vegetation (FILL) Wet	H 14.4' 14.5'		
0		NOTES: Stratigraphy from OW62-87 Well Pipe: 2" diameter black steel			
0		Well Screen: 2" diameter stainless steel, #6 slot, 5' length Sand Pack: Special coarse blend Ottawa sand			
0					
0					
0.			•		
0					
0					
0	* REFER ▼ WATER	TD "WATER ELEVATIONS" TABLE FOR CURRENT REFERENCE ELEVATIONS FOUND ∇ static water level (37) grain size analysis			

PENETRATION TEST BLDWS / FDOT

20 40 60 80

102ND STREET LANDFILL STRATIGRAPHIC AND INSTRUMENTATION LOGS REMEDIAL INVESTIGATION

184

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184

OLIN CORPORATION

Key to Symbols

FILL



FILL, WITH RUBBLE



CHEMICAL WASTE FILL



SEWER BEDDING MATERIAL



ALLUVIUM WITH VEGATIVE MATTER



ALLUVIUM - POORLY GRADED SAND AND GRAVELLY SAND



ALLUVIUM - SAND/SILT MIXTURES



GLACIAL TILL

GLACIOLUCUSTRINE CLAY



LOCKPORT DOLOMITE



WATER ELEVATION AT TIME OF DRILLING





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	LOG of BORING No. MW-3							
	DATE <u>12/16/85</u> SURFACE ELEVATION <u>576.07</u> LOCATION New York							
	DEPTH, 11.	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRA- PHIC LOG			
	۲ ۲	20	Stiff, dark red-brown SILTY CLAY with brick chips, moist. low to medium plastic (CL CLAY CAP FILL)	574				
	-	14	Firm to stiff, dark red-brown to dark brown SILTY CLAY With abundant 1 to 2 cm angular mach elected must deal					
	5	7	plactic, Brick chips and cement fragments, moist, low plastic (CL DEMOLITION DEBRIS FILL)					
		6		547 0				
	10-	10	Firm dark gray to black SLAG (chemical waste), moist	∇ 566.0				
	-	71	Hard, dark gray to black very fine grained FLY AND with	563 5	Ħ			
	-	3	Firm, medium gray-brown to medium gray, fine SILTY SAND		EST.			
	15	13	with trace clay, wet, low plastic, abundant vegative matter in upper 2 feet (SM ALLIVIIM)					
		9						
	20	4		556.0	[[]			
	-	39	Medium dense, dark gray fine to coarse SAND with rounded fine gravel, saturated (SP/SW ALLUVIUM)	555.2	<u>~_~</u>			
2	- 25	4. 4	Firm to stiff, salmon, SANDY SILTY CLAY with 1 mm to 2 mm angular to sub-angular gravel, saturated, low to medium plastic (CL, GLACIAL TILL)					
	Ţ							
	-1							
	긔							
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	귀							
	1							
	1							
С	Completion Depth 549.5 Feet Water Depth 566.0 Feet Date							
P	Project Name Olin 102nd Street Landfill Project Number 84C2136							
	Woodward-Civde Consultants							

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	LOG of BORING No. MW-4 Niagara Falls								
DATE 12-17-85 SURFACE ELEVATION 575.19 LOCATION New York									
o DEPTH, ft.	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG					
	<u>37</u> 90	Hard, dark gray CLAYEY SILT with fly ash intermixed and rock fragments, moist, low plastic (CL CLAY CAP FILL)	571.9						
5	5	Firm, dark gray to black CLAYEY SILT with fly ash, rounded pebbles, concrete fragments, brick fragments, moist, low plastic, oily sheen (FILL)	∇ ^{568.2}	$\langle \chi \chi \chi \rangle$					
 10	1	Soft, black oily SLUDGE with concrete and paper fragments, wet, strong odor (FILL)	564.2	;;;;					
	6 3	Firm, brown to red brown organic SILTY CLAY with trace fine sand, wet, low plastic (CL/OL ALLUVIUM)							
Completion Depth <u>561.20</u> Feet Water Depth <u>568.2</u> Feet ATO Date									
Project	Project Name Olin 102nd Street Landfill Project Number <u>84C2136</u>								

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FIELD ROCK DESCRIPTION LOC

Sheet <u>10</u> of <u>17</u>

Π	<u> </u>												
U	0	GROUND W	ATER O	BSERVATION	V	JOB	102nd Street NO. 84C2136	BORING NUMBER	MW-8				
n	A		_Ft. at (Completion .		DRILLI	NG R/G Acker AD3	BORING OFFSET	BORING OFFSET				
\Box	A		_ F t. arti	er hr:	s.	OPERATOR Russell Waddel - PA Drlg. SURFACE ELEVA				TION 576.5			
	~	•		er nr:	s.	INSPEC	TOR Tim Giles	DATE START 12/	5/86 INISH 1/20				
Π					3. 0 .	et lu s							
Ч	5	RUN	RQD	RECOVERY	Typ	TAT.	FIELD IDENTIFICATION, TYPE AI	ND COLOR	FRACTU	IRES	BEC		
Π	2	From To	inch %	Inch %	N N N N N N	STF CHJ DE	WEATHERING, SEAMS IN ROCK, et		No./Ft.	DIP	DIP		
L						-			-				
п	136					b F			-				
	130					Ē			-				
_									2				
Π	1.31					F			-				
L									2		15°		
Π	:38					-			<u>-</u>				
U									- 0				
	-39				ļ	E	thick bedded mottled Dolomite	vith					
		Run 1 139.0'-	72.5"	7.0'		-	stylolites		- 1				
_	.40	145.5'	78.0"	6.5		-	Oak Orchard						
		Interva	=93%	=108%					1	ļ	-		
L	.41	G	[ł	–	Medium to light grey, medium gr	rained	-				
Π							medium bedded, sparsely Crynoid	ial Dolomite	- 3		1		
L	42					E	with stromatoliteo and carbonad	ceous seams					
П						-	_		-				
	43					E	Eramosa		- 1				
						-			-				
	44					- -			- 2				
ات ا						-			-	\square	15° 45'		
Π						-			3		45		
U	43					-			-				
		Run 16	99 . 2"	7.9					- 1				
	46	145.5	102"	8.5				ļ	-				
_		154.0' Interva	=98%	=93%		Ē			0				
	47	Н	-			-			-				
لنا						-			: o				
Γ	48							ł	-				
L	NE	RAL NOTE	ES:						 ł	<u> </u>			
F	eda	iing dir	b hori:	zontal	less	other	wise noted.		Total Der	oth			
L					00				'ROCK' Drilling				
										5	_		
	000	rtions used	: trace ()-10%, little	10-20	k, some	20-35%, and 35-50%		HOLE NO	Σ.			

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FIELD ROCK DESCRIPTION LOG

Sheet <u>11</u> of <u>17</u>

\sim								Sneet	07			
Ω	6	ROUND W	ATER O	BSERVATION	V	JOB	102nd Street NO. 84C2136	BORING NUMBER				
П	~	"		compretion		DRILLI	NG RIG Acker AD3	BORING OFFSET				
Л	~	•		er nr:	s.	OPERA	SURFACE ELEVA	TION 576.5				
с С	~	•		er nr:	s.	INSPEC	TOR Tim Giles	DATE START12/	DATE START 12/5/86 FINISH 1/20			
		·		9r ///:								
ي مي		RUN	RQD	RECOVERY	Typ	NGH	FIELD IDENTIFICATION, TYPE AN	ID COLOR	FRACTURES		BED	
\square		From To	Inch %	Inch %	B Rec	STR CHA	WEATHERING, SEAMS IN ROCK, etc		No./Ft.	DIP	DIP	
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	3								-			
									1			
م	4								-			
Λ		Run 17	<u>84''</u>	7.0'		-	Light to medium grey, medium g	rained, thick	1		i	
U,	5	150.51	/8'' =108%	6.5' =108%		E	to massive bedded gypsum and cl	nerty				
n	-	Interva	100%	-100%			bolomite with stylolites		1			
		н				-			-			
، مي ا	ь					-	Goat Island		-			
n												
П	7								-			
								1	- 2			
	8								-			
			1					ł	1			
Π	9								-			
J									1			
	٦								-			
\mathbf{U}	<u> </u>											
	VE	RAL NOTE	s:									
eacing dip horizontal unless other wise noted										oth		
Ц									ROCK D	rilling		
\cap												
Ц.					10.00	<u> </u>	0.054 05 500					
1	portions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%).		

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FIELD ROCK DESCRIPTION LOG

Sheet _____ of ____

\wedge								Sheet	01				
U	- (GROUND W	ATER OL	BSERVATION	V	JOB 10	2nd Street NO. 84C2136	BORING NUMBER	MW-	8			
П		•• • /	Et. alti	er br		DRILLI	VG R/G Acker AD3	BORING OFFSET					
\square		At	Ft. aft	er br	s.	OPERA	TOR Russell Waddel - PA Drlg	SURFACE ELEVA	ATION 576.5				
n	4	At	Ft. afte	er hr:	5.	INSPEC	TOR Tim Giles	DATE START12/	2/5/86 FINISH _ 1/20				
Ų	:	CORE	RQD	RECOVERY	Type sist.	ATA VGE VTH	FIELD IDENTIFICATION. TYPE AN		FRACTURES BE				
\wedge	i	From To	Inch %	Inch %	8 8 8 8 8 8 8	STR CHAI	WEATHERING, SEAMS IN ROCK, etc		No./Ft.	DIP	DIP		
\mathcal{V}	-					-							
~						E			•				
11	50					E			-				
Ŷ		Run 18	98.4'	8.5'		E			1				
\cap	; 1	160.5'-	102"	8.5'	-	F			-				
٩Ţ		169.0'	=96%	=100%		Ē			2				
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						F			- ,				
Y	'3					Ē			- 4				
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\square						E			1				
	5					-			-				
	•						·		1				
~	Ö						Light brown, medium brown, th	ick bedded	-				
						E	porous Dolomite with		0				
L.J	7								_				
П									1				
U	8		•			-	Goat Island		-				
Δ						E			1				
	9												
L.		Run 19	42"	4.3'									
Π	0	173.3	51.6" =81%	9.3" =100%		Εl	. ·	F					
Ų		Interva	1	100%									
\wedge	,	I				k	Black, medium to fine grained	medium	3				
	1			•		E	bedaea rossile ferous cherty I	DIOMITE					
						E			3				
1	2						Gasport						
1	NE	RAL NOTE	s:			L			I				
Ц	ed	ding di	o hori	zontal ur	less	s other	wise noted		Total Der	oth			
Ц									ROCK' Drilling				
\sim													
$\{ \}$													
portions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50%							HOLE NO	.					

LOG of BORING No. MW-5 Niagara Falls											
DAT	E <u>12-</u>	19-86 SURFACE ELEVATION LOCATION	New York								
o DEPTH, fl. SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG							
	22	Hard, red brown to orange, sandy SILTY CLAY with brick, coal and rock fragments, moist, low plastic (CL CLAY CAP FILL)	573.4	X							
- 5	10	Firm, dark gray to black fine grained FLY ASH with coal brick fragments and cinders intermixed with black sludge, moist, normlastic (FILL)	569.9								
	42	Hard, dark gray very fine grained FLY ASH with brick,									
10-	37	coal and cinder fragments, dry (Fibb)	565.9 又	17							
	17	Wood fragments, clay tile fragments, brick chips and gravel (SEWER BEDDING MATERIAL)	564.91	XXX							
	4	Soft, black SILTY SAND with vegative matter, wet, low plastic, NAPL present in upper 1 to 1.5 feet (SM) } }							
15		ALLUVIUM)									
			•								
-											
		•		:							
-											
Comple	Completion Depth <u>561.9</u> Feet Water Depth <u>565.9</u> FeetATD Date										
Project	t Name	Ulin 102nd Street Landfill Project Number	<u>84C2136</u>								

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578.06 - Elev. of top of well casing Ground Elevation 574.91 「小川」 0.17 ft. I.D. of well casing ____ Type of well casing Black steel ___pipe Diameter of borehole _____1.1 ft. Type of backfill <u>Cement/Bentonite</u> Grout Type of seal ___ Bentonite Elev. of top of seal 568.9 Elev. of top of sand pack 566.9 Elev. of top of screen 564.9 Type of screened section _ #6 Superslot stainless steel I.D. of screened section ____0.17 ft. Length of screened section 2.0 ft. Elev. of tip of screen 562.9 Elev. of tip of sand pack 562.4 Type of backfill Bentonite Elev. of bottom of borehole 561.9 **REPORT OF MONITORING WELL NO. MW-6** DRAWN BY: D.B. CHECKED BY: R.K.

PROJECT NO: 84C2136-10

DATE: 8/15/86

FIGURE NO:



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FIELD ROCK DESCRIPTION LOC

Sheet <u>1</u> of <u>3</u>

	(,4 ,4	ROUND W	ATER OL Ft. at (5Ft. atte	BSERVATIO Completion ar 18 hr	v s.	JOB DRILLI	<u>Olin 102nd St.</u> NO ⁸ 4C2136-5 BORING NUMB NG RIG <u>CME 55 w/10'NX Barrel</u> BORING OFFSE	er <u>MW-7</u>			
	A	t	_ Ft. afte	or hr	s.	OPERA	TOR Darryl Altrogge SURFACE ELE	VATION 57	TION 576.30		
\Box	A	f	_ Ft. afte	or hr	s.	INSPEC	TOR <u>R. Karr</u> DATE START	- <u>16-86</u> FINI	sн4 <u>-</u>	16-8	
n	PTH LOW	CORE RUN	RQD	RECOVERY	Type esist.	RATA NNGE FTH	FIELD IDENTIFICATION, TYPE AND COLOR	FRACT	JRES	BEL	
U	Sas	From To	Inch %	Inch %	0.4	CH ST	WEATHERING, SEAMS IN ROCK, etc.	No./Ft.	DIP	DIF	
0	- - - - -					- - 39.6'	Airspace in casing				
[]	-40	39.6/ 44.6	43%	96%	NX						
0	-				13 min. /ft.		Grout at casing bottom	E N/A			
	-41					41.4'					
	-42				7	•	Dolomite, medium gray to dark gray brown, slight weathering in first 18 inches, thi to very thin bedding, numerous solution				
	-				min. /ft.		crystalline structure	- 8 -			
	•43				17	42.9'	Becoming light to olive-gray, fewer frac- tures, solution vugs and gypsum crystals				
					min. /ft.	-	absent, bedding thin, non-weathered				
	·44							E 2.6			
U	•,	44 61	50 59	009	17	-	Medium gray, thin bedded non-weathered				
0	.45	54.6	59.5%	90%	min. /ft.		fracture surfaces are oxidized, a very fine crystalline texture, gypsum lining some fractures.	- 5			
Π	45					-					
U	GENE	RAL NOTE	s:					<u></u>			
		H	Fractur	ce and be	ddin	ıg dip	is near horizontal or very slight	Total De 'ROCK' D	oth Irilling		
0	Propo	rtions used	: trace 0	-10%, iittie	10-209	b, some :	20-35%, and 35-50%	HOLE NO).		

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Sheet _____ of ____

Π									Sheet <u>2</u>	_ of <u></u>				
U		GROUND W	ATER O	BSERVA	TION	1								
Π	[′]	At	_Ft. at (Complet	lon			11n 102nd St. NO.84(2136	BORING NUMBER	<u>MW-7</u>		—		
U	'	At	_ Ft. afte	er	hrs	.		TOP Derryl Altrages	BORING OFFSET	1 <u>N/A</u>				
~	/	At	_ Ft. afte	ər	hrs	s.	UPERA	TOP P Karr	SURFACE ELEVA	FACE ELEVATION				
		At	Ft. afte	ər	hrs				DATE START 41	<u>10/00</u> F/NI	SH4 <u>7</u> 1	<u>.</u> 0/.		
<u>ب</u>	PTH LOW	CORE RUN	RQD	RECO	VERY	Type	NATA NGE PTH	FIELD IDENTIFICATION, TYPE AN	ID COLOR	FRACTU	TURES			
\prod	DE BE SUF	From To	Inch %	Inch	%	Core & Re	STR	WEATHERING, SEAMS IN ROCK, etc		No./Ft.	DIP	Di		
U	Ē					NX	h			Ę		Γ		
Π	E-46						Ē			Ē				
U	Ē						- -							
П	E					·	E			Ē				
П	Ē						F			F				
Ċ	E ₄₇									Ē				
U	Ē						È			F				
<u></u>	F						E	Some very small solution pits	or whee at	Ε,				
\prod	È						F	fracture boundaries	or vugs at					
	-48						Ē			E				
Π	Ē									F				
U :	E.						E			Ē,				
n	E						-	• • • • •		-				
U	- 49									-				
Л							-			-				
U	-									E,				
										╞╴╵	—			
	-50					•	-			E				
\Box	-						-							
	-													
ſ	-51							Massive, with		E				
U	-							-Solution pits and vugs through	nout	E				
п	-						-			E5				
U	:									E l				
~~ 1	- 52						-							
	GENF	BAL NOTE	S:			1			· - · · · · · · · · · · · · · · · · · ·	Ļl		_		
_										Total Des	th			
\bigcap		4								ROCK' D	rillina			
Ľ														
	Deere	etiona			11441					ļ				
U.	-ropo	rcions used.	trace 0	-10%, 1	ittie	10-209	b , some :	20-35%, and 35-50%		HOLE NO).	_		
			•											

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FIELD ROCK DESCRIPTION LO

Sheet 3 of 3

		GROUND V At	VATER O	BSERVATIC Completion	N	ЈОВ	01in 102nd St. NO.84C	2136	ORING NUMÅFR	MW-7			
U		At	 Ft. aft	erh	r s .	DRILLI	IG RIG CME 55W/10' NX		ORING OFFSET	N/A			
6		At	Ft. aft	er h	rs.	OPERA	TOR Darryl Attrogge	s	URFACE ELEVAT	ION 576	5.30		
Π		At	Ft. att	er h	·s.	INSPEC	TOR <u>R. Karr</u>		ATE START 4/16		sн <u>4</u> /	/16	
	7 2 U	CORE	000		8.:	1				1 1			
n	DEPTH BELON	RUN	MOD	RECOVER		TRAT IANG	FIELD IDENTIFICATION, T WEATHERING, SEAMS IN BO	TYPE AND	COLOR	FRACTUR		BEi	
טן	2.0		inch %	Inch %	8.	520				No./Ft.	DIP	Dli	
$\overline{\mathbf{n}}$	-				NX				F			:	
U	-					-			E				
	-					Ē			· -				
\prod	-					E			Ē	. 4			
2	-					-			-	-			
n:	- 53								Ē				
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n						Ē	•		Ē	5			
\mathbf{U}_{i}					NX	-			Ę		ĺ		
n:	- 55	54.6/	39%	120%		-			F	— [
U				I					Ē		}		
	-					-			F	7			
[]:	56								Ē				
-	00					-			·				
\square							Bottom of core at	t 56.1	feet				
\cup	-					.				3			
n									F				
2	•					-			- F				
-									Ę				
\bigcup	•	-							Ē				
									Ę				
\prod	•	-							Ē				
$ $	ENE	RAL NOTE	S:				£		Γ _Γ				
Π										Fotal Dept	th_		
U									•	ROCK" Dr	illing _		
\bigcup	Prom	rtions used	trace 0	1/104 11++1-	10-200		1-25% and 25.50%						
•					10-207					IOLE NO.	•		

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		1	of 17								
DAT	E <u>1/</u>	LOG OF BORING NO. MW-8 Niaga	ra Falls York								
DEPTH, ft.	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG							
		Clean crushed limestone GRAVEL (DRILLING PLATFORM BERM FILL)	572.3								
- 5 - - - - - - - -		Firm to stiff, medium red-brown SILTY CLAY with demoli- tion debris and large riprap rock intermixed, moist, low plastic (LEVY FILL)									
			▽ 563.3								
- 15 - - - -		Soft to firm, dark gray to olive gray very fine SANDY SILT, wet, low plastic, abundant vegative matter in upper postions (SM ALLUVIUM)									
-		Loose, dark gray fine SAND and fine to medium well	<u>554.8</u> 553.8	///							
- 25 - - - - - - - -		rounded gravel with trace silt, wet (SP ALLUVIUM) Firm, red-brown to salmon, sandy SILTY CLAY with 1 to 5cm subangular gravel, wet, low plastic (CL GLACIAL TILL)									
-		-Becoming firm to stiff at 29 feet									
35											
40	×	Lockport Dolomite	536.0								
-			:								
Comple	Project Name Olin 102nd Street Landfill Broker Number 84C2136										
Project Name Project Number O402136											
		Woodward-Clyde Consultants									

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FIELD ROCK DESCRIPTION LOG

Sheet _____ of ____17

\Box	G	ROUND W	TER OF	SERVA	TION	1		102pd Street NO 8/C2136		MU-8		
C	A		_Ft. at C	Completi	on			VG RIG Acker AD3	BORING OFFSET	MW-0		
Π	A	it	_Ft. afte	er	hrs	s.	OPFRA	TOR Russell Waddel - PA Drlg	SURFACE ELEVA	TION 576.5		
U	A	.t	Ft. afte	·	hrs	8.	INSPEC	TOR Tim Giles	DATE START 12/	5/86 FINISH 1/20		
\mathbf{n}		r	_ Ft. 8716	ř		3.	(7.10 S					
U		CORE RUN	RQD	RECOV	ERY	Typ ssist.	PTH	FIELD IDENTIFICATION, TYPE AND	D COLOR	FRACTU	RES	
	7	From To	Inch %	Inch	%	A Re	STR	WEATHERING, SEAMS IN ROCK, etc.		No./Ft.	DIP	DIP
U										-		
_							-					
\prod	0						-			-		
C		Run 1			_	ł				-		
	1	40.5'	5.6'	8.7'		4 3/4	•	Light to medium gray, medium to	fine	-		
υ			8.7'	8.7'				grained, thin to thick bedded un mite with some gypsum healed fra	actures and	4		
n	2	- 49.2'	= 64%	·= 100%			-	occasional stylolites		-		
		1212					╞╸			3		
	3	Interval								-		
Π		A					-			_ 4		
U.	4						-	Oak Orchard		 		
Π										9		
U	5						-			-		150
П								· · · · · · · · · · · · · · · · · · ·		2		
U	5						-			-		
	Ĩ						-			- 1		
Π	-									-		
U	1									- 1		
Π					•		-			-		
U	3									- 6		
п										-		
U	7	Pup 2					•			-		
		10 21	2 211	5 11					Ĩ	-		
)	47•4	$\frac{2.2}{6.3"}$	<u>5.2</u> 6.3'						-		
U		-	=	=						5		
Π	1	22.2	35%	83%	•					-		
U		Interval A								- 1		
Л	2				:				ł	-		
U	VE	RAL NOTE	:S:							1	L	l
Tot											oth	
	: D :	arug ail	nor12	201118	ar u	intes	s othe	rwise noted		ROCK' Drilling		
U												
Π												
portions used: trace 0-10%, little 10-20%, some 20-35%, and 35-50% HOI									HOLE N	0.		

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FIELD ROCK DESCRIPTION LOC

Sheet ______ of _____

	GROUND WATER OBSERVATION At Ft. at Completion At Ft. after hrs. At Ft. after hrs. At Ft. after hrs.							JOB DRILLII OPĘRA INSPEC	02nd Street NO.83C2136 BORING NUMBER NG RIG Acker AD3 BORING OFFSET TOR Russell Waddel-PA Drlg. SURFACE ELEVAT TOR Tim Giles DATE START 12/5	DRING NUMBERMW 8 DRING OFFSET IRFACE ELEVATION576.5 ATE START 12/5/86 FINISH 1/20			
	TH ×	CORE	T	, Ft., afte RQD	RECO	VERY	Type	NTA VGE	FIELD IDENTIFICATION, TYPE AND COLOR	FRACTU	RES	BEC	
П	DEP	From	го	Inch %	Inch	%	Core & Res	STR/ CHAI	WEATHERING, SEAMS IN ROCK, etc.	No./Ft.	DIP	DIF	
	52						4 3/4			. 1	-		
	5 3									5			
	54								Oak Orchard	- 3			
Π	55	Bup						- - -		- 4			
	56	55.5		<u>31.5"</u> 72"	<u>5.6</u>	1 17 ⁻				6			
	57	_ 61.5	•	= 44%	- 93%					-			
U	58	Interv: B	1										
	59									-			
	60									3			
C	51									2			
	52	Run 61.5	4	48''	9.6	•		• • • •		3			
ſ	53	_ 70.5		108" = 44%	9.0 = 107	7				4		15°	
	54	Interv B	a1							4		15°	
	:NE 3ec	ERAL NC	di,	s: p hori	.zont	al u	nles	s othe	rwise noted	Total De 'ROCK' L	oth)rilling	 1	
[ope	ortions u	sed	; trace (0-10%,	littie	10-20	% , some	20-35%, and 35-50%	HOLE N	0		

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FIELD ROCK DESCRIPTION LOG

Sheet 4 of 17

	GROUND WA At At At At	ATER OE _Ft. at (_Ft. afte _Ft. afte _Ft. afte	3SERVATIC Completion Prh Prh	DN Drs. Drs.	JOB DRILLII OPERA INSPEC	102nd StreetNO.84C2136NG RIGAcker AD3TORRussell Waddel-PA Drlg.TORTim Giles	BORING NUMBER BORING OFFSET SURFACE ELEVA DATE START <u>12</u> /	MW 8 TION 57 (5/86 FINIS	76.5 SH _1/	20
	CORE RUN From To	RQD Inch %	RECOVER	Core Type & Resist.	STRATA CHANGE DEPTH	FIELD IDENTIFICATION, TYPE AN WEATHERING, SEAMS IN ROCK, 01	ND COLOR c.	FRACTU No./Fi.	RES DIP	BED DIP
$\begin{bmatrix} & - & \\ & & \\ $	Run 5 70.5' - 79.0' Interval C	<u>102"</u> 102" 100%	8.5' 8.5' = 100%	4 3/4	s other	Light to medium gray, fine to grained, thinly bedded stromat mite with gypsum and carbonace Oak Orchard Light gray, medium grained, th uniform Dolomite with minor st Oak Orchard Dark gray to black, coarse gra bedded, uniform Dolomite with and gypsum filled fractures. L areas of stromatolites Oak Orchard	medium olitic Dolo- ous partings inly bedded romatolites ined massive stylolites ocally some	5 3 5 1 5 3 1 1 1 1 1 1 1 1 1 1 1 1 1	pth	15° 15° 15° 15°
	ortions used	t: trace	0-10%, tt	le 10-20	D%, some	20-35%, and 35-50%		HOLE N	0.	:

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FIELD ROCK DESCRIPTION LOG

Sheet <u>5</u> of <u>17</u>

		BOUND	ATER OF	SFAV	TION	<u>, I</u>	· · · · · · · · · · · · · · · · · · ·	Π				
Ļ	A	t	Ft. at (Complei	ion	-	ЈОВ	102nd Street NO. 84C2136 BO	RING NUMBER	MW 8		
П	A	.t	– Ft. afr		hr	s.	DRILLI	NG RIG Acker AD3 BO	RING OFFSET			
U	A	t	Ft. afte			s.	OPERA	TOR Russell Waddel-PA Drlg. SU	RFACE ELEVA	TION5	76.5	
0	A	t	_Ft. afte	ər	 hr:	s.	INSPEC	TOR Tim Giles DA	TE START <u>12/</u>	5/86 FINIS	ън <u>1/</u>	21
U	, п.	CORE RUN	RQD	RECO	VERY	Type sist.	ATA NGE TH	FIELD IDENTIFICATION, TYPE AND C	COLOR	FRACTU	RES	BED
П	UEA	From To	Inch %	Inch	%	6 Re	STR CHA	WEATHERING, SEAMS IN ROCK, etc.		No./Ft.	DIP	DIP
U		k					-					
Π	76					,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				_		
υ	,,,					4 3/4				0.		
Π	77											
U										0		
Π	78						- - r			-		
U									Ì	1		
П	79	Run 6					-			-		15°
U		79.0'	36"	3.2	י ר		-	Oak Orchard		2		15°
Π	30	-	38.4"	3.2						-		
U	31	82.2'	94%	100%	~					-		30°
Π		Interval C								2		
IJ	32						-		-	-		
Π		Run 7								1		
U	33	82.2'	$\frac{31.2"}{39.6"}$	$\frac{3.3}{3.3}$, ,					-		
Π		-	=	=	,					4		
Ŀ	34	oo.o	19%	1007	6		-			-		
Π		C					-			2		
U	35											
Π	36	Run 8								- 4	-	
U		85.5'	99.6"	$\frac{8.6}{8.3}$	-					0		
Π	37	-	=	=	,			Medium gray fine to medium graine	d, massi-	-		
U		73.0 Intorval	100%	1047	•			lites and calcite crystals in vug	S 5	0		
Π	38	D					-	•		-		
U	ENE	RAL NOTI	ES:					· · · · · · · · · · · · · · · · · · ·				
Π	зed	lding di	p hori	zonta	il u	nless	other	wise noted		Total Dep	oth	
U										ROCK D	rilling	
П												
U	-000	ortions used	1: trace (0-10%,	littie	10-209	ж. зоте	20-35%, and 35-50%		HOLE NO		
	-										*	

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FIELD ROCK DESCRIPTION LOG

Sheet <u>6</u> of <u>17</u>

IJ	G	ROUND W	ATER OF	SERVA	TION	JOB	102nd Street NO. 84C2136	BORING NUMBER	MW-8		
Г	A A			compieti V	bre	DRILLI	NG RIG Acker AD3	BORING OFFSET			
U	~ _		Ft. afte	" or	_ ""3• hre	OPERA	TOR Russell Waddel-PA Drlg.	SURFACE ELEVA	TION _ 57	76.5	
_	A	.t	Ft. afte	or	hrs.	INSPEC	TOR Tim Giles	DATE START 12/	5/86 FINIS	sн <u>1/</u>	20
	""	CORE	RQD	RECOV		ATA VGE VGE	FIELD IDENTIFICATION, TYPE AND	D COLOR	FRACTU	RES	BED
-	uer	From To	Inch %	Inch	%	STR!	WEATHERING, SEAMS IN ROCK, etc.	•	No./Ft.	DIP	DIP
	38 39 10 11 12 3 3 4 5 3 6 7 8 9 9 - 70	Run 9 93.8' 100.5' Interval D	78'' 80.4'' 97%	6.5' 6.7' 97%	~ 3.	9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9	Oak Orchard Dark gray, medium grained, mass stylolitic Dolomite Oak Orchard Dark gray to brown, medium to c grained porous Dolomite with Fa gypsum, sphalarite and stylolit Oak Orchard Dark gray to black, medium to c grained, thick to massive beddee Dolomite with stylolites, calci vertical fractures and pinhole p Oak Orchard	ive bedded oarse vosites, es oarse d uniform te healed porosity	1 0 0 1 1 0 0 1 0 1		
L		RAL NOT					L		1	l	L
[]ed	ding di	p hori	tzonta	al unl	ess oth	erwise noted		Total De ROCK' D	oth Drilling	
ſ]								HO!		
r		or (10/13 USEC	Traca (J-10%,	11tt/a 10-	2070, 30008	20-35%, END 35-50%		THULE NO	<i>.</i>	

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U	G	ROUND W	ATER OE	SERVATION	1	JOB	102nd Street NO. 83C2136	BORING NUMBER	MW-8		
п	4	••	Et. atte	or hr		DRILLI	NG RIG Acker AD3	BORING OFFSET			
U	۲ ۵	•	_ t. and	n n s		OPERA	TOR Russell Waddel-PA Drlg.	SURFACE ELEVA	TION _ 57	6.5	
		••	Ft affe	n n c		INSPEC	TOR Tim Giles	DATE START 12/	5/86 FINIS	н_1	/20
Π		·	_ / 1. 2/10	""": 	6			<u> </u>			
L	HIO	CORE RUN	RQD	RECOVERY	Typ sist.	NGI PTH	FIELD IDENTIFICATION, TYPE AN	ID COLOR	FRACTU	RES	BEi '
п	DEI	From To	Inch %	Inch %	8 He	STR CHA DE	WEATHERING, SEAMS IN ROCK, etc	o. (No./Ft.	DIP	Dli
U						-			-	-	
						-					
Π	.00			F !		F			-		
U		D = 10				<u> </u>			1		l
П	.01	Run 10				-			-		1
U		100.5'	84"	8.3'		E			0		
	0.0	-	=	=				·	-		
Π	02	108.8'	82%	98%		L			-1		l
Ľ		Interval				–			• ⁻		
n	03	E .							-		
U		· .				F	Light gray, coarse grained, th	inly bedded	-)		
	04					E	uniform Dolomite	· · · · · · · · · · · · · · · · · · ·			
Π						E .			-3	L	
U	05					⊢ ⊢	Oak Orchard		-		
n						F	Medium gray and brown medium	to coarse	-3		
\Box	~					E	grained, thick to massive bedd	led Dolomite	-		
	06	•				E	with locally abundant stromate	lites, car-	-0		
Π			}			È.	conaceous partings, stylolites	, calcite and			
U	07					▶ }	occasional vugs		-,		
]			<u>-</u>					
	08	•	1			Ē	Oak Orehard		-		
					· ·	E	Oak Ofchard		<u>-</u> 0		
	na	Bup 11			ł	Ł					
		100 01	80 /11	6 01		F			Eo ·		
Г		100.0	80.9"	6.7'		Ę					
	10	-	=	=		E			-1		
		115.5'	100%	103%		Ę					1
Γ	11	Interval			}	F			E,		
U		E				Ę					
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L)	BAL NOT				<u> </u>	<u></u>		Ļ		
	:146	HAL NOT	53.						Total De	oth	
ſ	e squ	ding dip	hori:	zontal un	less	other	wise noted		BOCK'		7
L	1										,
Г	}										
L		ortions used	d: trace	0-10%, little	10-20	0%, some	20-35%, and 35-50%		HOLE N	0.	
	<u> </u>	·									

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FIELD ROCK DESCRIPTION LOG

Sheet <u>8</u> of <u>17</u>

Π	UND WA	ATER OF	SERVA	TION						
0		_Ft. át C	Completi	ion		JOB	102nd Street NO.84C2136 BORING NUMBER	MW-8		
Π		_Ft. afte	or	_ hrs		DRILLIN	IG RIG ACKET ADS BORING OFFSET	TION 57	6.5	
U		_ Ft. afte	ж	hrs		INSPEC	TOR TIM Giles	5/86 FINIS	ы 1	/20
Π		_Ft.afte	9r	hrs				· · · · · · · · · · · · · · · · ·		
L		RQD	RECOV	ERY	re Typ Resist.	TRATA IANGE IEPTH	FIELD IDENTIFICATION, TYPE AND COLOR WEATHERING, SEAMS IN ROCK, etc.	FRACTU	RES	BED
Π	m To	Inch %	Inch	%	ប៉ីទ	530		NO./FI.	DIP	DIP
Π						-				
П			•				- -	- 1 - -		
						-				20°
U	m 12									
	5.5' -	99.6" 102" =	8.5 8.5 =			-	Medium gray and white, medium to coarse grained, massive bedded fossiliferous Dolo- mite with calcite	-0		
	4.0' erval F	98%	1005	«						
							Oak Orchard			
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_	. NOTI	ES:		·		0+h	vise noted	Total Da	Dth	
	2 orb	, 1101 1 3	Sourcal	L UII.	1692	Uther	WIGE HOLEY	ROCK' L	orilling	7
٢	ן		,							
L	าร บรอง	d: trace	0-10%,	little	10-20	%, some	20-35%, and 35-50%	HOLE N	0.	

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FIELD ROCK DESCRIPTION LOC

Sheet <u>9</u> of <u>17</u>

ļ		GROUND W	ATER OE	BSERVATIO	N	JOB	102nd Street NO. 86C2136	BORING NUMBER	MW-8		
r	(·····································	Et. afte	sompretion ar hi	•	DRILLI	NG RIG Acker AD3	BORING OFFSET			
	Ĺ	At	Et. afte	n m	s.	OPERA	TOR Russell Waddel - PA Drlg.	SURFACE ELEVA	TION	76.5	
		At	Ft. afte	ar hr	s.	INSPEC	TOR Tim Giles	DATE START 12/	<u>5/86</u> FINIS	ън <u>1/</u>	20
]	CORE	RQD	RECOVER	St. B	TTA IGE TH	EIELD IDENTIFICATION, TYPE AN		FRACTU	RES	BEC
ſ	-1 -1 -1	From To	Inch %	Inch %	Core 7 & Res	STRA CHAN DEP	WEATHERING, SEAMS IN ROCK, etc		No./Ft.	DIP	DIF
						-			-	-	
(24 ך				-	-			-		
Į		Run 13 124.0'-	70.8"	$\frac{6.5'}{6.5'}$					1		
[25	130.5'	=91%	= 100 %			Medium grey, medium to coarse g	grained, thin	0		
ſ	26 r	F				r F	with stylolites, calcite and sp	biomite bhalerite	-		•
l	 27								-		
÷ []						Oak Orchard		1		
. [28 								- 1		
.	₂₉ ل								-		1
. [] 20					F			- 4		
[ק	Pup 14	112"	0.21		F			0		
l	.] 31	130.5'- 139.0'	$\frac{112}{102''}$ =89%	$\frac{8.5}{8.5'}$					- 2		•
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	- :NE	HAL NOTE	:s: p hori	zontal u	nless	s other	wise noted		Total Dep 'ROCK' D	oth prilling	
ſ	-7										
ł	- ope	ortions used	: trace C	0 -10%, little	10-20	% , so me	20-35%, and 35-50%	•	HOLE NO	D	

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DATE	=4/1	LOG of BORING No. MW-13 <u>1/86</u> SURFACE ELEVATION <u>572.5</u> LOCATION <u>Ne</u>	agara Falls w York
DEPTH, ft. SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION STRATIGRA-
0		Soft, dark gray, sandy SILTY CLAY with vegative mat- ter (CL CLAY CAP FILL) Firm to stiff, brown and dark gray SILTY CLAY with coarse gravel; wood, glass, rubber, roofing shingles fragments, and tar debris; low plastic, moist becoming wet and hard at 5 feet (DEMOLITION RUBBLE FILL)	572.0
- - - 10	•	Firm, tan to gray, with brown mottling, fine very SIL? SAND, nonplastic wet	564.5/ ry;/.
- - - 15 -			
- - 20			
- - 25			
30			
35 			
Comple Project	tion Dep	oth <u>564.0</u> Feet Water Depth <u>567.5</u> Feet ATD Olin 102nd Street Landfill Project Num	Date ber <u>84C2136</u>

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	DAT	- 4-11	LOG of BORING No. MW-14	liagara Fa York	alls,
	DAI				
	DEPTH, ft.	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG
	- U		Soft, dark gray, sandy SILLY CLAI with Vegative	572.0	
	- - 5	17 32	Firm to stiff, brown and dark gray SILTY CLAY with coarse gravel; wood, glass, rubber, roofing shingles fragments, and tar debris; low plastic, moist, becoming wet and hard at 5 feet. (DEMOLITION RUBBLE FILL)	<u>⊽ 5</u> 67.5	
	-	54		564.5	
		6	Firm, tan to grey, with brown mottling, fine very SILTY SAND, nonplastic wet. - vegative matter below 9.5 feet		
ļ		6	- becoming more silty with depth (SM, ALLUVIUM)		///
	-	વ		557.3	///
	15		Very stiff, medium red-brown, CLAY with small silty		<u> </u>
	Ĩ	10	pockets, medium to high plastic, wet. (CH GLACIOLACUSTRINE CLAY)	555.3	
	- 20- - -		Firm to stiff, red-brown, SILTY SANDY CLAY with angular medium gravel, low plastic, wet. (SC/CL GLACIAL TILL)		
	- 25 -				
	- - 30				
	- - - 35				
			·		
	Compl	etion Dep	bth <u>554.5</u> Feet Water Depth <u>567.5</u> Feet ATD D	ate	
	Projec	t Name _	Ulin 102nd Street Landrill Project Numbe	r <u>84C2136</u>	<u> </u>
			Woodward-Clyde Consultants		-

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DATE	4/1	LOG OT BORING NO. MW-15	Niag New	ara Fall York	s
DEPTH. ft. SAMPLES	SÁMPLING RESISTANCE	DESCRIPTION		ELEVATION	STRATIGRA-
°][Soft, dark brown, sandy SILTY CLAY with vegative		569.4	I
- - 5		Stiff, medium-dark brown to gray SILTY CLAY with co gravel, wood fragments and vegative matter, low pla moist (CL FILL) -becoming sandy and wet at 4 feet	parse istic,	<u>⊽</u> 565.9	
		Firm, olive gray, fine SILTY SAND with trace coarse gravel and vegative matter, nonplastic, wet			4. 4. 7.
			-		
30		· ·			
35 -					
		· · · · · · · · · · · · · · · · · · ·			
		AL 562 9 5 William 5 545 9 5			
	Nome	Olin 102nd Street Landfill	Ua		6

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DEPTH, II	SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRA- PHIC LOG
U	2	7	Soft, dark brown, sandy SILTY CLAY with vegative mat- <u>ter (CL CLAY CAP FILL)</u> Stiff, medium dark brown to gray SILTY CLAY with coarse	569.4	
5	- 1	0	gravel, wood fragments and vegative matter, low plastic, moist (CL FILL) -becoming sandy and wet at 4 feet		
	- 8		Firm, olive gray, fine SILTY SAND with trace coarse gravel and vegative matter, nonplastic, wet	563.4	22
0	- 2				
			-becoming loose and more silty below 13 feet -becoming fine to medium sand with subrounded gravel		
.5	2		and shell fragments below 16 feet	552.9	
0	-		Stiff, red-brown, fine sandy SILTY CLAY with angular gravel, medium plastic, wet (CL GLACIAL TILL)		
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		LOG of BORING No. MW-17		
DAT	E April	17. 1980SURFACE ELEVATION 373.8 LOCATION 1agar	a falls,	NY
O DEPTH, fl.	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG
-	· · · · · · · · · · · · · · · · · · ·	Stiff, red brown, SILTY CLAY with vegative matter, low	575.3	
	22	Stiff, tan to gray, SILTY CLAY and large angular gravel		/
- 5	16	IOW PLASTIC, dry.		
-	12	- becoming red-brown and slightly moist with gravel absent below 4 feet	568.3	\square
	3	Loose, black, SILTY CLAY with cinders, fly ash, glass		
10		and wood fragments intermixed, low plastic, moist. (FILL)	563.3	
	12	Firm, olive gray with gray brown mottling, fine SILTY	▽ 562.8	588
15	3	SAND with vegative matter, low plastic, wet. (SM/CL ALLUVIUM)		
_	14	- becoming loose below 18 feet		
	5	- becoming firm with some coarse sand below 22 feet.		
20	<u> </u>	- becoming dense, coarse sand and rounded gravel with		
_	6	shell fragments below 25 feet.		
_	18	(SP ALLUVIUM)		
25				///
-1	53		5/6 9	///
30	4			<u>·/·/</u>
		Stiff, medium red-brown, sandy SILTY CLAY with trace		
]		angular gravel, medium plastic, wet.		
35		(CL GLACIAL TILL)		
-				
]				
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_1				2 - -
	etion Dep	th <u>542.3</u> Feet Water Depth <u>562.8</u> Feet Da	ste	
r ojeci	Name _	Origina Screet Banurill Project Number	-0462130	

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578.91 - Elev. of top of well casing 575.80 Ground Elevation 影響 家が 0.17 ft. I.D. of well casing _ Type of well casing <u>Black</u> steel pipe Diameter of borehole <u>1.1 ft.</u> - Type of backfill <u>Cement/Bentonite</u> Grout Type of seal ___ Bentonite 571.8 Elev. of top of seal 569.8 Elev. of top of sand pack 569.3 Elev. of top of screen Type of screened section. #6 Superslot stainless steel I.D. of screened section _0.17 ft. Length of screened section $\frac{5.0 \text{ ft.}}{2}$ 564.3 Elev. of tip of screen 563.8 Elev. of tip of sand pack Type of backfill _____Bentonite 563.3 Elev. of bottom of borehole **REPORT OF MONITORING WELL NO. MW-18** DRAWN BY: D.B. DATE: 8/15/86 FIGURE NO: CHECKED BY: R.K. PROJECT NO: 84C2136-10

DATE							
SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STBATICDA.			
0 _1 = = = = = = =		Stiff, red-brown, SILTY CLAY with vegative matter, low plastic, moist (CL CLAY CAP FILL) Stiff, tan to gray, SILTY CLAY and large angular gravel low plastic, dry (CL FILL with RUBBLE)	.575.3				
5		-becoming red-brown and slightly moist with gravel ab- sent below 4 feet	568.3	V			
	·	Loose, black, SILTY CLAY with cinders, fly ash, glass and wood fragments intermixed, low plastic, moist (FILL)	5(0.0	(())			
		Firm, olive gray with gray brown mottling, fine SILTY SAND with vegative matter, low plastic, wet	<u>563.3</u> <u>▼</u> 562.8	K			
		(SM/CL ALLUVIUM)					
				ŀ			
20							
25							
- -							
30							
35							
	tion Do	15 563 3 Foot Water Death 562-8 Foot D					
Design		Olin 102nd Street Landfill	84C213	6			

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LOG of BORING No. MW-19 Niagara Falls DATE								
DEPTH, ft.	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG				
	76	Hard, red brown, SILTY CLAY with vegative matter, low plastic, dry (CL CLAY CAP FILL) Dense, tan to red-brown, very SILTY SAND and gravel,	574.5					
- 5	10 5	nonplastic, dry. (FILL) Firm, dark gray, SILTY CLAY with white fly ash, cinders, wood chips, low plastic, moist (FILL)	570.5 <u> 5</u> 567.0	122222				
10	2	- Oily black NAPL below 10 feet	563.5					
- - 15-	11	Firm, olive gray with brown mottling SILTY SAND with trace clay and vegative matter, low plastic, wet. (SM/CL ALLUVIUM)						
Ī	7	- becoming loose with shell fragments and vegative matter absent below 14 feet						
20-	4	- becoming firm, coarse sand and rounded gravel interbedded below 26.5 feet.						
	30	- brown, very odorous NAPL below 31 feet.						
25	10 28							
	32		543.5					
	8	Stiff, medium red-brown, sandy SILTY CLAY with subrounded to angular gravel, medium plastic, wet.						
35		(GLACIAL TILL)						
			÷					
Jomple Project	Name	th <u>541.0</u> Feet Water Depth <u>567.0</u> Feet De Olin 102nd Street Landfill Project Number	ate r84C2136	5				

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577.82 - Elev. of top of well casing 575.02 Ground Elevation 0.17 ft. I.D. of well casing _____ Type of well casing <u>Black</u> steel pipe Diameter of borehole 1.1 ft. Type of backfill <u>Cement/Bentonite</u> Grout Bentonite Type of seal _ 571.0 Elev. of top of seal 570.0 Elev. of top of sand pack 569.0 Elev. of top of screen Type of screened section. #6 Superslot stainless steel I.D. of screened section ______ft. Length of screened section 5.0 ft. 564.0 Elev. of tip of screen 563.5 Elev. of tip of sand pack Type of backfill <u>Bentonite</u> 563.0 Elev. of bottom of borehole **REPORT OF MONITORING WELL NO. MW-20** DRAWN BY: D.B. CHECKED BY: R.K. PROJECT NO: 84C2136-10 DATE: 8/15/86 FIGURE NO:

	- 4/2	LOG of BORING No. MW-20 4/86 SURFACE ELEVATION	Niagara Falls New York	s
DEPTH, ft.	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	PHIC LOG
		Hard, red brown, SILTY CLAY with vegative matter, <u>low plastic, dry (CL CLAY CAP FILL)</u> Dense, tan to red-brown, very SILTY SAND and gravel, nonplastic, dry (FILL)	574.5	
5		Firm, dark gray, SILTY CLAY with white fly ash, cin- ders, wood ships, low plastic, moist (FILL)	▼ 567.0	
		- oily black NAPL below 10 feet Firm, olive gray with brown mottling SILTY SAND with	563.5	祖公
- - 15 -		trace clay and vegative matter, low plastic, wet (SM/CL ALLUVIUM)		() () .)
- - 20				
- - - 25				
35				
Comple Projec	etion Dep t Name _	563.0 Feet Water Depth 567.0 Feet Olin 102nd Street Landfill Project Nur	Date nber	

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		LOG of BORING No. MW-21	liagara Fa	alls
DAT	E <u>4-22</u>	-86 SURFACE ELEVATION 575.4 LOCATION New	York	
DEPTH, ft. SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG
		Stiff, red brown, SILTY CLAY with vegative matter,	574.6	
	23 14	Liow plastic, moist. (CL CLAY CAP FILL) Stiff, dark gray, SILTY CLAY with white ash, cinders glass and rubber fragments, low plastic, moist.	∽ 570.4	X
		(FILL)	569.9	<u> </u>
	8	Firm, tan, SILTY SAND with abundant gravel, cinders, fly ash, wood and rubber fragments, nonplastic, wet.		#
10-	2	(FILL)		
	7	Firm, olive gray, SILTY SAND with a trace clay, abundant vegative matter, low plastic, wet	563.6	$\frac{1}{38}$
,		(SM/CL ALLUVIUM)		
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				//
20				
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35-				
Comple	tion Dept	hFeet Water DepthFeet Da	te	
Project	Name	Project Number	<u></u>	

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		LOG of BORING No. MW-22	Niagara F	alls
DAT	E4-:	25-86 SURFACE ELEVATION 575.9 LOCATION New	v York	
DEPTH, ft. SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG
-		Very stiff, gray brown, SILTY CLAY with vegative	574.7	
-	26	Stiff, red brown, sandy SILTY CLAY with gravel, cin- ders, fly ash, brick and glass fragments, low plas-		$\langle \chi \rangle$
5 -	9	- becoming firm (FILL)	569.9	$[\mathcal{F}]$
		Stiff, olive gray with brown mottling, SILTY CLAY		
	23	Firm, dark gray, sandy SILTY CLAY with gravel and	567.2	H_{F}
10	7	cinders, low plastic, moist. (CL FILL)	564.9	\mathcal{A}
		Firm, olive gray with brown mottling, SILTY SAND		558
15-		with vegative matter, low plastic, molst.	,	
		(SM/CL ALLOVIDA)		
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20-				
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25			•	
		· · · · ·		
30-				
35-				
			i	
Comple	tion Dept	th <u>563.9</u> Feet Water Depth <u>none enters</u> Feet ATD Da	ite	
Project	Name	Olin 102nd Street Landfill Project Number	_8402136	<u> </u>

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Image: State of the state	DAT	E1	LOG of BORING No. MW-11 Ni /24/86 SURFACE ELEVATION 574.7 LOCATION Ne	agara Fal w York	1s
Clean crushed limestone GRAVEL over geotextile (DRIVE-576.2 WAY FILL) 17 Red brown to black,CINDER with Fly ash intermixed (FiLL) 7 Firm, medium yellow brown with gray mottling, fine sandy SILTY CLAY, moist, low plastic, contaminated materials at base (CL SEWER BACKFILL) 9 10 9 13 Stiff, red brown with gray mottling, SILTY CLAY varved, moist, high plastic (CH GLACIOLACUSTRINE CLAY) 15 16 17 18 19 19 10 10 10 10 10 10 10 10 10 10	DEPTH, II.	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG
17 Red brown to black, CINDER with Fly ash intermixed 5 7 7 Firm, medium yellow brown with gray mottling, fine sandy SLITY CLAY, moist, low plastic, contaminated 4 materials at base (CL SEWER BACKFILL) 9 563.7 13 Stiff, red brown with gray mottling, SILTY CLAY varved, moist, high plastic (CH GLACIOLACUSTRINE CLAY) 15			Clean crushed limestone GRAVEL over geotextile (DRIVE- WAY FILL)	572.7	
<pre>5 / Sandy SILTY CLAY, moist, low plastic, contaminated materials at base (CL SEWER BACKFILL)</pre>		17	Red brown to black, CINDER with Fly ash intermixed / (FILL)		
10 9 563.7 13 Stiff, red brown with gray mottling, SILTY CLAY varved, moist, high plastic (CH GLACIOLACUSTRINE CLAY)	5—- -	4	sandy SILTY CLAY, moist, low plastic, contaminated materials at base (CL SEWER BACKFILL)	567.7	
10 563.7 13 Stiff, red brown with gray mottling, SILTY CLAY varved, moist, high plastic (CH GLACIOLACUSTRINE CLAY)		0			
13 Stiff, red brown with gray mottling, SILTY CLAY varved, moist, high plastic (CH GLACIOLACUSTRINE CLAY) 15	10	9		563.7	
		13	Stiff, red brown with gray mottling, SILTY CLAY varved, moist, high plastic (CH GLACIOLACUSTRINE CLAY)		
			• • • • • • • • • • • • • • • • • • •		
					-
Project Name Olin 102nd Street Landfill Project Name Olin 102nd Street Landfill Resident Number 84C2136	Projec	etion Dep t Name	Olin 102nd Street Landfill	ate 84C2136	
Project Number	Frojec		Project Numbe	۲ <u> </u>	

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FIELD ROCK DESCRIPTION LOC

Sheet 13 of 17

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U	(ROUND W	ATER OF	BERVATIO	N				_				
	A	\t	_Ft.at(Completion	ļ	JOB	102nd Street NO. <u>84C2136</u>	BORING NUMBER	<u>MW-8</u>				
\cap	A		Ft. afte	er hi	s.	DRILLI	NG RIG _Acker AD3	BORING OFFSET					
L	A		- Ft. afte	er hi	.	OPERA	TOR <u>Russell Waddel - PA Drlg.</u>	SURFACE ELEVA	TION 576	5.5			
5			Et alte		•	INSPEC		зн	/ 20				
1.		···			3. 1 a		· · · · ·						
\sim		CORE RUN	RQD	RECOVER	ar l	AT/ NGE	FIELD IDENTIFICATION, TYPE A	ID COLOR	FRACTU	RES	BEC		
- Î	ĥ	From To	Inch %	Inch %	88	STR	WEATHERING, SEAMS IN ROCK, et	.	No./Ft.	DIP	DIF		
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	73					E							
\sim		Run 20	28.8	2.4'					2				
	74	173.3'-	26.4"	2.2		1.			-		ł		
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\sim	75	Interva	1			F			_]		
	-	I			1	F							
L)		Dup 21	967	83	NY	F			- 0		ł		
n.	/6	175.5'-	102"	$\frac{8.5}{8.5}$	INA	<u> </u>			-		1		
\downarrow		184.0'	=94%	=92%		E	Medium grey, medium grained,	medium to	2	<u> </u>	1		
_	7 7	⁷ Interval				F	thick bedded uniform Dolomite	with	-				
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							· .		Total Depth				
\cap													
U		ortions used	d: trace (0-10%, littl	9 10-20	%, some	20-35%, and 35-50%	· · · · · · · · · · · · · · · · · · ·	HOLEN	o.			
	_												

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FIELD ROCK DESCRIPTION LOC

Sheet <u>14</u> of <u>17</u>

$\left(\right)^{-}$	GROUND W	ATER OF	BSERVATION	/	JOB 10	D2nd Street NO 84C2136	BORING NUMBER			
Ω	At	_Ft.at(Completion		DRILLI	NG RIG _Acker AD3	BORING OFFSET			
\square	At	_Ft. afte	ar hrs	s.	OPERA	TOR Russell Waddel - PA Drlg.	SURFACE ELEVA	TION 576	5.5	
L J	At	 Ft. afte	ər hrs	s	INSPEC	TOR Tim Giles	DATE START ^{12/1}	5/86 FINI	sн <u>1/</u>	20
UE	CORE RUN	RQD	RECOVERY	Type sist.	ATA NGE PTH	FIELD IDENTIFICATION, TYPE A	ND COLOR	FRACTU	RES	BEL
	From To	Inch %	Inch %	Core & Re	STR CHA DE	WEATHERING, SEAMS IN ROCK, et	с.	No./Ft.	DIP	DIF
Ų− ∧										
84	Run 22	79.2"	6.8'			Medium grey and white, medium	grained.			
85	184.0'-	-102%	6.5' =105%			thick to massive bedded fossil Dolomite with stylolites	iferous			
\bigvee	Interva	1			- -			2		
					Ē	Gasport				
⁸⁷ 87	,							-		.
U 88										
$\hat{\mathbb{D}}$								2		
89	H -									
\bigcup_{90}										
\int	Run 23	94.8"	7.9'					1		
	190.5'- 199.0'	102'' =93%	8.5' =93%							
92 ليا	Interva K	1								
93										
11 v								E O		
\bigcup								0		
95			,							
(), 96										
	ERAL NOT	ES:			ſ	· · · · · · · · · · · · · · · · · · ·				
Be	dding di	p hori	zontal u	nles	s other	rwise noted.		Total Dep 'ROCK' D	oth Drilling	 !
ĥ										
	ortions used	l: trace (D-10%, littie	10-20	%, some	20-35%, and 35-50%		HOLE N	0.	

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FIELD ROCK DESCRIPTION LOG

Sheet 15 of 17

	G	ROUND W	ATER OF	BSERVATIO	DN						<u> </u>
~	A	it	_Ft. at (Completion	:	JOB	102nd Street NO. 84C2136	BORING NUMBER	MW-8		
I	A	t	_Ft. afte	er I	irs.	DRILLII	NG RIG ACKET ADS	BORING OFFSET	576	5	
უკ	A	t	_Ft. afte	9r I	rs.	OPERA	TOR <u>RUSSELL WADDEL - PA DIIG.</u>	SURFACE ELEVA	TION	1/	/ 20
Ń.	A	t	_Ft. afte	er I	rs.	INSPEC		DATE STARTIZI -	FINIS	SH <u></u>	
$\langle 0 \rangle$		CORE RUN	RQD	RECOVER	Type sist.	ATA NGE PTH	FIELD IDENTIFICATION, TYPE AN	D COLOR	FRACTU	RES	BED
	2	From To	Inch %	Inch %	B Be	STR CHA DE	WEATHERING, SEAMS IN ROCK, etc	s.	No./Ft.	DIP	DIP
U						-					
Ē.	~ <					F		Í	:		
IJ	96					-			-		
<u>م</u>	~ 7					F			0		
	97					F			-		
V						-	Casport		_ 1		
Π	98					-	Gasport	ł	-		
Ų											.
n	99	Run 24	64.8"	5.4'		 -			-		
U		199.0'-	78''	6.5		F			0		
È.	00	205.5'	=83%	=83%		F			-		
U		Interva		l		F			0		
~	01	K				Ē			-		
						F	· · · · ·		1		
	02					F			- -	-	
\cap				1		Ē			0)	
\mathbf{U}_{i}	03					F			-		
n						Ē			0		
U	:04	:				-			-		
						F			1		
٧):	:05					E			-		
V						ţ			0		
\prod	:06	Run 25	118.8"	9.9		E			• - •,		
U		205.5'-	108"	9,0		F			-		
\cap	207	214.5	-110%	=110%		F			-		
U		Interva	<u>p</u>			F			-		
2	אטי	L				F			_ 0		
						F			-		
-	:NE	RAL NOTE	s:				<u> </u>				<u> </u>
\prod	٥s	t care :	in run	a #24 (2	04.35	to 205	5.5)		Total De	oth	<u> </u>
المسا	ec	overed	in run	#25					ROCK' D	Drilling	7
Ň											
U,		ortions used	i: trace	0-10% litt	In 10-20	. some	20-35%, and 35-50%	· · · · · · · · · · · · · · · · · · ·	HOLEN	<u></u>	
									LUCE M	<i>.</i>	_

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FIELD ROCK DESCRIPTION LOG

Sheet <u>16</u> of <u>17</u>

U	Ģ	GROUND W	ATER OF	BSERVATION	/	JOB	102nd Street NO. 86C2136	BORING NUMBER	MW-8		
ينسح	A 	At	_Ft.at(Completion		DRILLI	NG R/G Acker AD3	BORING OFFSET			
IJ	А А	₩		er <u> </u>	5.	OPERA	ron Russell Waddel - PA Drlg.	SURFACE ELEVA	TION 576	.5	
<u> </u>	A	\t	Ft. afte	n ns		INSPEC	TOR Tim Giles	DATE START 12/	5/86FINIS	зн <u>1</u>	/20
$\{ \mathbf{I} \}$	r	CORE			8	Z W Z					
	1	RUN	RQD	RECOVERY	re Ty Tes/s	RAT ANG	FIELD IDENTIFICATION, TYPE AN WEATHERING, SEAMS IN ROCK and		FRACTU	RES	BED
	3	From To	Inch %	Inch %	0.0	550		•	No./Fl.	DIP	DIP
لالما											
n	80			+ - -		þ þ			-		
U							Medium grey, medium to fine gr	ained,	1		
n	09					-		-	-		
U						-			0		
	10			•		-	DECEN		-		
		-				-	DECEW		- 1		
Å	11					-			-		
									0		
1	12					-			-		
$\hat{\Pi}$							-		0		
U	13					-			-		
Π							· ·		0		
U	14					-			-		
R						-			0		
U	15	Run 26	85.8"	7.15					-		
n		214.5	=119%	=119%					0		
IJ	16	T - 6	1			È			-		
ň		L	1						L o		
$\left\{ \right\}$	17		-			-			-		
V						-			- o		
Π	18								-		
V						-			- 1		
۲Ì	19			•					-		
Υ,									- 1		150
5	20								-	Γ	
الم	SNE	RAL NOTE	<u>s:</u>		L			· · · · · · · · · · · · · · · · · · ·			<u> </u>
ζ1	B	Bedding	dip ho	rizontal	unl	ess otł	erwise noted		Total De	oth	
U									ROCK' D	Drilling	7
ኦ											
\bigcup			1: trace (0-10% little	10-20	Mo. 80me	20-35%, and 35-50%		HOLEN	0.	
								• · · · · · · · · · · · · · · · · · · ·	1		

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FIELD ROCK DESCRIPTION LOG

Sheet 17 of 17

IJ	G	ROUND W	ATER O	BSERVA	TIOI	V	JOB	102nd Street NO. 86C2136	BORING NUMBER	MW-8		·>
ń	A A	ti	_ Ft. at (Ft. aft	Complet er	10n hr.	s.	DRILLI	NG RIG Acker AD3	BORING OFFSET	······		
U	A	t	_Ft. afte	er	hr.	s.	OPĘRA	TORRussell Waddel - PA Drlg.	SURFACE ELEVA	TION	76.5	
n	A	t	_Ft. afte	9r	hr:	s.	INSPEC	TOR Tim Giles	DATE START 12/	5 <u>/86</u> FINI	sн _1	/ 20
\mathcal{U}	:	CORE RUN	RQD	RECO	VERY	Type sist.	ATA NGE PTH	FIELD IDENTIFICATION, TYPE AN	ID COLOR	FRACTU	RES	BED
Π	i	From To	Inch %	Inch	%	Core & Re	STR CHA DEI	WEATHERING. SEAMS IN ROCK, etc	·.	No./Ft.	DIP	DIP
U						NX	-			•		
Ń	20						<u>-</u>			_		
5		Run 27	72"	6	5			Black, fine grained, thinly be dolomite shale	dded	4		
	?1	220.5'- 229.0'	$\frac{72}{102''}$	$\frac{8}{8}$	5		-					
6	:2	T	,						ļ	-		
Ų		Interva M						Rochester Shale		2		
Ĥ	:3	-					-	· · · ·		-		
Ц	.,,						-			3		
ĥ	.4									1		
Ų	:5									-		
$\left[\right]$	6						-			2		
δ.	.0						-			- ,		
Ų	7									• Z •		
ĥ			· .							1		
Ц	:8									-		
\int	9									_		
Fi					•			Bottom of Boring at 229.0		-		
U								· · · · ·		-		
$\hat{\mathbb{D}}$	1									-		
	2									-		
U	NE	RAL NOTE	s:			1		· · · · · · · · · · · · · · · · · · ·		-		l
1	ed	ding di	p hori	zonta	l u	nless	; other	wise noted		Total Del	oth Drilling	
\hat{n}											3	
U	2000	rtions used	: trace (0-10%,	little	10-20	%, some	20-35%, and 35-50%	•	HOLE NO	o.	



DATE	1/	LOG of BORING No. MW-9 22/86 SURFACE ELEVATION 574.3 LOCATION New	ara Falls York	;
DEPTH, ft.	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG
- - - 5 - - - - - - - - - - - - - - - -	55 6 2 7 17	Firm to Stiff, medium red-brown SILTY CLAY with some angular gravel and abundant root debris, moist, low plastic (CL CLAY CAP FILL) Firm, dark gray SANDY GRAVELLY SILT with wood, coal and brick fragments, moist, low plastic (DEMOLITION FILL) Soft, black, silty SLUDGE, saturated, nonplastic, with brick, tar paper fragments and NAPL (FILL) Firm, dark gray to medium olive-gray SILTY SAND with trace clay and organic debris in upper 1 to 2 feet,	573.3 ▽569.8 565.7	
- 15 - - 20 - - - 25 -	3 5 6 18	Wet, low plastic (SM ALLUVIUM) Medium dense medium to dark gray, fine to coarse SAND with subangular fine gravel, wet (SP ALLUVIUM) Stiff, medium red-brown SILTY CLAY with some fine to coarse sand and fine subangular gravel, wet, medium plastic (CL GLACIAL TILL)	<u>554.8</u> 553.8	
Complet Project I	ion Dep Name	th <u>551.3</u> Feet Water Depth <u>569.8</u> Feet Da Olin 102nd Street Landfill Project Number	ate 84C2136	

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DATE	= <u>1/</u>	LOG of BORING No. MW-10 Ni 14/86 SURFACE ELEVATION 575 LOCATION New	agara Fal York	.1s
DEPTH, ft. SAMPLES	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG
	31	Clean crushed limestone GRAVEL (DRIVEWAY FILL) Hard, dark red brown fine sandy SILTY CLAY with abun- dant fine to medium gravel and brick chips, moist, low plastic (DRIVEWAY FILL)	574 573.5 ⊽570	
	17	Stiff, medium yellow brown with orange and light gray mottling, fine sandy SILTY CLAY, moist becoming sat- urated, low plastic (CL ALLUVIUM) Very stiff, red brown with white and yellow brown mot- tling, SILTY CLAY, varved, moist, high plastic (CL/CH GLACIOLACUSTRINE CLAY)	567.5	
Comple Project	etion Dep	bth <u>567</u> Feet Water Depth <u>570</u> Feet ATD D 01in 102nd Street Landfill Project Number	ate	l

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	1/	LOG of BORING No. MW-10A	Niagara F	alls
DATI		SURFACE ELEVATION LOCATION		
DEPTH, ft.	SAMPLING RESISTANCE	DESCRIPTION	ELEVATION	STRATIGRAPHIC LOG
		Clean crushed limestone GRAVEL (DRIVEWAY FILL)	573	
- - 5	41	Hard, dark red brown sandy SILTY CLAY with abundant rock fragments and brick chips, moist, low plastic (CL DRIVEWAY FILL)	572.5	
	14	Stiff, medium yellow brown with gray mottling, fine sandy SILTY CLAY with pockets of silty sand intermixed, moist, medium to high plastic (CL with SM SEWER BACK-		
10-	18		▽ 563.5	
	20	Very stiff, medium red brown SILTY CLAY, varved, moist, medium to high plastic (CL/CH GLACIOLACUSTRINE CLAY)		
15 -	19			
Comple	etion Dep	th <u>561.5</u> Feet Water Depth <u>563.5</u> Feet ATD D	ate	
Project	t Name _	Olin 102nd Street Landfill Project Numbe	r <u>84C2136</u>	<u> </u>

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