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932039

Van De Mark Chemical Co., Inc.

VAN-1987-4-136

RECORD OF CLOSURE ACTIVITIES

Former Landfill Site

November 1987

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Ref. No. 1277

CONESTOGA-ROVERS & ASSOCIATES

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1.0 INTRODUCTION

This report describes the construction activities involved with the closure of a former landfill owned by VanDeMark Chemical Co., Inc. (VDM) of Lockport, New York. The proposed closure plan, as presented in the report entitled "Closure Plan - Former Landfill Site" was approved by the New York State Department of Environmental Conservation (NYSDEC) prior to initiation of closure activities. The cover sheet of the plans enclosed with this report illustrates the location of the former VDM Landfill Site.

On June 19, 1987 the contract to complete the closure activities at the landfill was awarded to Secure Landfill Consultants-Constructors (SLC) of Lockport, New York. Construction activities commenced on June 29, 1987 and were completed during the week of August 10, 1987. The work involved the following:

a. Site preparation including clearing and grubbing of area, pre-grading and proof-rolling.

b. Addition of crushed limestone in surface depressions on-site and surface treatment through the application of powdered lime.

c. Construction of a limestone interceptor trench.

d. Installation of a monitoring well within the interceptor trench.

e. Installation of a pan lysimeter and monitor standpipe.

f. Installation of layers of low permeable clay, a drainage blanket, sandy loam and topsoil over the existing waste and cover material.

g. Hydraulic seeding.

h. Post closure activities including hydrogeologic monitoring and maintenance programs.

As designed by Conestoga-Rovers & Associates (CRA), the construction activities address the site specific conditions of the former landfill area with respect to the local and regional geology, soil and groundwater conditions, topography, and surface drainage patterns.

2.0 CLOSURE ACTIVITIES

The VanDeMark landfill area has been covered with a low permeability cap to reduce precipitation infiltration. The final cover consists of:

- vegetative cover (grass)
- 6-inch thick topsoil layer
- 15-inch thick loam layer
- 3-inch thick drainage layer
- 24-inch thick clay layer
- only imported soils were used for cover construction

The areal extent and final surface elevations of the cover are presented on Plan 7. A typical cross section of the cap is presented on Plan 8. The following sections detail the closure activities:

2.1 PRE-GRADING

The initial step of the closure plan construction involved the clearing and grubbing of the site. Excess vegetation cleared from the site which could not be pulverized and combined with the pre-graded soils was removed from the site. Following clearing and grubbing, the site was pre-graded such that all areas of the site sloped

off site at a minimum grade of approximately 3 percent. Disturbance of existing cover soils over the landfilled areas was minimized to the extent practicable during pre-grading of the site. In fact, rather than cut into the Landfill in certain areas, additional cover material (1100 cubic yards) was imported for pre-grading usage. Plan 1 presents the site conditions prior to closure construction. Plan 2 illustrates the extent of the landfilled areas.

The entire site was proof-rolled using a vibratory drum compactor. Any settlement due to proof-rolling was backfilled, graded and proof-rolled again. The proof-rolling of the site was completed so as to reduce cover settlement following closure. During pre-grading, all significant on-site surface depressions were filled with crushed limestone and compacted. A total of 60 cubic yards of crushed limestone was used for this purpose.

As part of the site grading provisions, the existing iron oxide-stained material was removed from the downstream ditch area adjacent to the landfill site perimeter fence. The area where staining was visible was excavated to a depth of approximately two feet using a backhoe. This excavated material, along with several randomly occurring stained pieces of rock, was deposited inside the limits of the area to be capped. Specifically, the material was scattered along the low-lying area on the southerly edge of

the landfill and in the ditch along the easterly portion of the landfill site. Crushed limestone was used to backfill and cover the entire area outside the perimeter of the landfill site where excavation was necessary. The crushed limestone was then covered with a four to six-inch layer of topsoil and was seeded. Plan 3 illustrates the location of the remediated ditch area.

The toe of the rock face which runs parallel to the entire length of the eastern ditch area was graded. A cut was made with a bulldozer into the fragmented shale and granular materials to promote adhesion of the low permeable clay to the rock face and thus prevent runoff from the rock face from penetrating underneath the clay cover in the ditch. The material generated from this cut was graded evenly into the slope of the entire ditch area prior to the clay capping activities.

The existing slope at the northwest corner of the landfill site was reduced by cutting into the slope. Materials generated from this cut were used as fill in a depression at the centerline of the northerly portion of the landfill site.

The equipment used on site during the closure program is presented in Appendix A.

2.2 INTERCEPTOR TRENCH

On July 7-8, 1987, an interceptor trench and monitoring well were installed in the ditch in the southeast corner of the landfill site. Plan 3 indicates the location of the interceptor trench.

A backhoe was used to excavate the interceptor trench. A 3-foot wide cut was made running perpendicular from the existing rock face and across the ditch for a length of 15 feet. The proposed depth of the interceptor trench was six feet, however, bedrock was encountered approximately 3.3 feet below the existing ground surface and the excavation was terminated at the top of the bedrock.

Once excavated, the interceptor trench was lined with Amaco Propex 4551 filter cloth. The monitoring well, which will be used to monitor groundwater in the interceptor trench, was assembled at this time by welding a 2-foot length of 2-inch diameter stainless steel well screen to a piece of 2-inch diameter Schedule 40 black steel pipe approximately 10.5 feet in length. Once assembled, the monitoring well screen was wrapped with two layers of Amaco Propex 4551 filter cloth and inserted to the bottom of the interceptor trench.

The interceptor trench (including the monitoring well) was backfilled with crushed Lockport dolomite/limestone. The filter cloth lining the trench was overlapped around the limestone backfill and a small amount of crushed limestone was placed over the top fold of the filter cloth to protect the cloth from separating during future site capping activities.

Finally, a length of 4-inch diameter protective casing (approximately seven feet long) was installed over the monitoring well. A locking cap was installed on the protective casing to ensure the security of the well.

2.3 REMEDIATION OF MONITORING WELLS

The increase in elevation of the surface of the landfill site by the addition of four feet of cover materials necessitated the adjustment of elevation of all on-site monitoring wells.

The following wells: VDM-1, VDM-2, VDM-3, VDM-9, VDM-10, VDM-11 and VDM-12 were all adjusted by simply removing the existing protective casings and extending the inner well casing with similar material. Wells VDM-1, VDM-2 and VDM-3 were extended by coupling a 1-inch diameter

piece of PVC pipe (Schedule 80) to the existing inner casings while wells VDM-9, VDM-10 and VDM-11 required lengths of 2-inch diameter Schedule 80 PVC material. The extension of the PVC casings required the use of couplings and PVC joint compound. Care was taken to prevent the introduction of the PVC cement into the inside of the inner casing.

Well VDM-12 required welding pieces of 2-inch diameter black steel pipe onto the existing inner casing. The welds were visually examined for cracks to ensure prevention of infiltration of surface or groundwater into the well.

At each of the above mentioned wells, lengths of either 2-inch or 4-inch diameter protective casings were installed over the inner casings. Lockable caps were included at each well to maintain security. All on-site wells were resurveyed to establish new top of casing elevations. Table 1 lists the revised elevations including the new wells.

Monitoring wells VDM-1 and VDM-4 were affected by construction activities at the landfill site. The casings of both wells were damaged with the inner casing of well VDM-1 being completely severed at the existing ground surface. The integrity of the grout/bentonite seal above the screen of well VDM-4 was questionable. Consequently, the

TABLE 1

MONITORING WELL TOP OF CASING ELEVATIONS

Monitoring Well Number	Top of Casing Elevation (inside casing - feet)
VDM1	451.98
VDM2	451.76
VDM3	449.84
VDM4	Abandoned
VDM5 (off-site)	365.6* (no change)
VDM6 (off-site)	365.6* (no change)
VDM7 (borehole)	--
VDM8 (borehole)	--
VDM9	451.14
VDM10	448.67
VDM11	453.95
VDM12	451.58
VDM13 (lysimeter monitor)	453.27 (new)
VDM14 (trench monitor)	446.31 (new)

*Approximate ground elevation.

well was closed on July 7, 1987. The inner PVC casing and borehole of this well was filled to the existing ground surface with dry bentonite and subsequently wetted down with water. The newly constructed clay cap covers this abandoned well.

Well VDM-1, however, was remediated although some foreign materials had apparently entered the well casing. This does not necessarily preclude the exclusion of this well in future hydrogeological studies as it may be possible to evacuate the foreign material by well development. The well can certainly be included in future hydraulic studies.

2.4 LIME TREATMENT

Prior to the construction of the low permeable clay fill cover, the entire landfill site was treated with powdered lime. The lime was applied at a rate of 0.3 lbs./square foot with a mechanical spreader. The total amount of applied lime, 15,000 lbs., is three times the amount originally specified for the project. The lime application rate was increased at the request of VDM to insure that any precipitation infiltrating the cover had good buffering capacity.

2.5 LOW PERMEABLE CLAY FILL

Prior to construction of the clay cap, clay from each of the two borrow sources proposed by SLC was delivered to the site and used in the construction of a clay test pad. Clay from the Frontier Stone pit was placed and compacted using a sheepsfoot vibratory drum compactor. Following four, six and eight passes of the compactor, density, percent moisture and compaction measurements were made using a nuclear densometer at each of three locations. Shelby tube soil samples were also taken after four, six and eight passes at the test location which exhibited the median compaction value. The Shelby tube samples were then tested for permeability using the constant head triaxial method. The test results, as illustrated by Table 2, indicate that a compaction value of 90 percent results in a permeability value less than $1x10^{-7}$ cm/sec.

The clay from the alternate source, the Summit Park Lake, was also field tested in a similar manner, complete with laboratory permeability testing. From the testing it was determined that a compaction value of 90 percent results in an 'in-situ' permeability of less than $1x10^{-7}$ cm/sec.

Based upon the results of the testing completed in conjunction with the clay test pad construction,

TABLE 2

CLAY TEST PAD RESULTS

Test Pad 1:

Clay Source - Frontier Stone

No. of Passes	Moisture Content (%)	Percent Compaction	Permeability cm/sec
4	22.5	89.0	-
4	19.9	91.3	-
4	20.4	89.3	0.73×10^{-7}
6	19.1	93.1	-
6	21.8	91.9	0.22×10^{-7}
6	19.6	90.7	-
8	18.2	94.9	-
8	22.3	91.1	-
8	19.8	90.8	0.47×10^{-7}

Test Pad 2:

Clay Source - Summit Park Lake

No. of Passes	Moisture Content (%)	Percent Compaction	Permeability cm/sec
6	21.6	86.0	0.11×10^{-7}
6	20.2	86.2	-
6	21.5	84.1	-
8	20.3	84.1	-
8	21.3	89.9	-
8	21.1	86.4	0.12×10^{-7}

both clay sources were approved as suitable for the VDM Site Closure. It was determined that the clay would be compacted to a minimum of 90 percent. All of the clay used during the construction of the landfill cover originated from the approved Frontier Stone site in Lockport.

The application of the low permeable clay cover commenced on July 7, 1987 and continued through July 23, 1987. The prevailing weather conditions for this period, hot and dry, were ideal for construction of this nature.

In general, the clay capping process consisted of the importation of material, levelling to grade, and compaction.

The clay was placed in 6-inch thick lifts at all times during the construction project. The establishment of a 50-foot grid pattern during the pre-grade survey and the use of lift lines on the grid stakes assured that the 6-inch limit was not exceeded. Each lift was compacted with a sheepsfoot roller until the percent compaction and percent moisture values necessary to achieve a maximum permeability of 1.0×10^{-7} cm/sec were achieved.

Testing of the in-place compacted clay was performed by representatives of Glynn Geotechnical Engineers (GGE) to assure field quality control. The following details the testing conducted and indicates the testing frequency required (in parenthesis):

A. One remolded permeability test of the clay used at the VDM site was completed plus four permeability tests were completed on 'in-situ' clay samples collected during the construction of the clay test pad. Three samples from the clay test pad exhibited permeabilities of less than $1x10^{-7}$ cm/sec while the remolded sample was tested to have a permeability of $4.12x10^{-7}$ cm/sec. However, a review of the field permeability test results presented by Table 3 indicates that the use of the Frontier Stone clay material is suitable (remolded permeability required once every 5,000 cubic yards, i.e. two required in total).

B. Twelve permeability tests plus one retest were completed on 'in-situ' samples using the triaxial permeability method with confining pressure and back pressure. All tests indicated a permeability value of $1x10^{-7}$ cm/sec or less with the exception of one sample (11B = $2.20x10^{-7}$ cm/sec) plus the retest of that sample ($4.96x10^{-7}$ cm/sec). However, these two permeability values are of the same order of magnitude

TABLE 3

SUMMARY OF CLAY TEST RESULTS

Sample No.	Permeability Rate x10^{-7} cm/sec	Cylinder Dry Density	Moisture Content	Percent Compaction	Atterberg Liquid Limit	Atterberg Plastic Limit
Test Pad	0.729	108.6	19.5	94.8	37	23
Test Pad	0.221	108.9	20.1	95.1	39	22
Test Pad	0.471	107.3	19.3	93.7	--	--
1B	0.176	110.2	16.5	96.2	43	22
2B	0.510	105.7	19.5	92.3	37	20
3A	0.200	107.8	15.8	94.1	39	20
4A	0.440	110.7	17.7	96.7	38	20
5B	0.248	108.7	18.5	94.9	34	19
6A	0.569	109.2	19.8	95.4	36	17
7A	0.461	110.5	14.9	96.5	45	24
8B	0.418	109.8	17.0	95.9	36	19
9A	1.09	105.0	18.2	91.7	48	26
10B	0.336	103.2	15.6	90.1	38	19
11B	2.201	101.9	18.2	89.0	38	20
11R2	4.96	102.4	13.3	89.4	32	19
12A	0.574	108.5	17.9	94.8	48	25
Bag #2	4.12	107.1	19.1	93.5	35	18
Avg. 1-12	0.60	107.6	----	----	--	--

as required and are not significantly greater than $1x10^{-7}$ cm/sec (in-place permeability, one test per acre per lift required, i.e. 10 in total).

C. 16 grain size distribution curves were produced regarding samples of the clay used in the cap construction. A grain size distribution analysis was also completed with each permeability test. These samples were collected randomly over the Site including three from the test pad construction (grain size distribution analysis required once per 1,000 cubic yards, i.e. eight required in total).

D. Also, in conjunction with all 16 of the permeability tests completed on the clay used to cover the VDM site, laboratory moisture content tests were completed (moisture content determination required once per 1,000 cubic yards, i.e. eight required in total).

E. Two moisture density curves were calculated for the clay placed at the VDM site using ASTM D1557 Method 'A' (see "Compaction Test Data" presented in Appendix B). The results of testing of the sample collected during the test pad construction, which was completed just prior to cover construction, indicated a maximum dry density of 114.5 pounds per cubic foot at an optimum moisture content of 14.5 percent. The results of testing of the

second sample, which was collected approximately midway during clay placement, indicated a maximum dry density of 116.5 pounds per cubic foot at an optimum moisture content of 15.0 percent (moisture density curve required once per 5,000 cubic yards, i.e. two required in total).

F. Sixteen liquid limit and plasticity index determinations were made regarding clay placed at the VDM site. This testing was undertaken in conjunction with each of the permeability tests completed. As indicated by GGE, Atterberg limit values were less consistent than the proctor and grain size results but were indicative of suitable material for clay cap construction. As indicated by Table 3, the liquid limit ranged between 32 and 48, within the recommended limits of 30 to 50 maximum, while the plastic limit ranged between 17 and 26, compared to a recommended plastic index of 20 to 50 (liquid limit and plasticity index determinations required once every 5,000 cubic yards, i.e. two required in total).

G. A soils technician was present during essentially all of the clay placement activity. Approximately 170 measurements of 'in-situ' density, percent moisture and percent compaction were made using a nuclear densometer. Eight measurements of the same parameters were made

using the 'sand cone method'. This testing included a number of retests completed to ensure that areas which had originally been tested to be below the required compaction had been recompacted adequately. The test results illustrated on Plan 4 and detailed in Appendix B indicate that essentially all of the clay was compacted to in excess of 90 percent of the modified proctor compaction value, which corresponds to a permeability value of less than $1x10^{-7}$ cm/sec (in place moisture/density tests, nine per acre per lift required, i.e. 90 required in total).

Results of the field and laboratory analysis are presented in Appendix B of this report. Plans 4 and 5 summarize the testing results and illustrate the location of each test.

A representative of CRA was present for field observation during the placement of most of the low permeable clay material. Special attention was focused upon the quality of the clay material and its placement. It should be noted that unsuitable materials in the clay (i.e. large rock, roots, sands and gravel etc.) were very seldom observed and were rejected when observed. Proper bonding between the clay lift layers was accomplished by treatment of surfaces with the sheepsfoot roller and occasionally wetting of the surface before the addition of the next clay lift.

Several areas of the landfill site required special attention with respect to the placement of the clay material. Greater than 24 inches of clay material was placed over a large area of the southerly portion of the landfill area to attain the minimum 3 percent slope requirement for the final cover. Extra clay material was also deposited along the length of the rock face/ditch interface. This material was then wrapped up the rock face by running the sheepsfoot roller on a perpendicular axis to the rock face. This treatment will enhance the adhesion of the clay material to the rock face and reduce introduction of surface water runoff from the rock face below the clay cover of the ditch.

Eight split spoon soil samples were taken at random locations at the landfill site to verify the thickness of the low permeable clay layer. The locations of the random sampling are presented in Plan 5. The results of this sampling are tabulated in Table 4. All split spoon samples were within the 1-inch tolerance for the final grade of clay material. A survey of the entire grid area was also ordered to verify the thickness of the clay cover material. The results of this survey are presented in tabular form in Table 4. During the course of the closure program, approximately 8,140 cubic yards of clay was placed on the site as cover material. This volume was determined by Ivan R. Klettke, Licensed Land Surveyor.

TABLE 4

CLAY LAYER THICKNESS VERIFICATION

Split Spoon Data:

Sample Number	Clay Thickness
1	2.2
2	2.1
3	2.1
4	2.0
5	2.0
6	2.1
7	2.1
8	2.1

Survey Data:*

Station	Line B	Line C	Line D	Head of Ditch	Toe of Ditch	Line E	Line F
0+00	-	-	3.3	-	-	-	-
0+50	2.4	3.1	3.5	-	-	3.3	2.8
1+00	1.9	3.3	3.5	1.9	1.3**	2.3	2.5
1+50	1.7	3.3	2.3	2.3	1.2**	2.3	-
2+00	-	2.0	2.2	2.2	3.1	2.8	-
2+50	-	1.6**	2.5	1.6**	2.2	2.5	2.1
3+00	-	2.0	2.2	2.4	2.1	2.0	1.5
3+50	-	2.5	2.7	2.4	2.2	1.9	2.6
4+00	-	2.6	2.4	1.4	2.5	2.3	1.7
4+50	-	3.0	1.7	1.7	0.9	2.0	-

Note:

Above clay thicknesses are in feet.

* Elevation of top of clay minus elevation of pre-graded surface, based upon topographic surveys completed by Ivan R. Klettke, Neal R. Klettke, Licensed Land Surveyors.

** These measurements have been determined to be inaccurate for either of two reasons:
1. due to proximity of edge of cap
2. due to difficulty in relocating a survey point precisely on a sloping surface.

2.6 PAN LYSIMETER INSTALLATION

The pan lysimeter, designed to monitor the effectiveness of the low permeable clay cover over the landfill site, was installed on July 31 and August 1, 1987. Record details illustrating the pan lysimeter installation have been prepared and are presented on Plan 8.

The pan lysimeter had been originally proposed to be located roughly midway along the north-south midline of the landfill site. However, the pan lysimeter was actually installed at an alternately approved location as presented in Plan 3. At this location, a total area of approximately 625 square feet was excavated through the previously constructed clay cover layer. Using a backhoe, the excavated clay and native materials were segregated and stockpiled in the area for use in the replacement of the clay cap and backfilling operations.

As illustrated in Plan 8, the sections of lateral 2-inch diameter galvanized steel pipe and the riser pipe were assembled with the lysimeter pan section by welding the components together with elbow joints. All welds on the pan lysimeter were visually inspected and judged to be watertight. Once assembled, the pan lysimeter, minus the riser pipe, was lowered onto a stone bedding of 1B stone lining the excavation. This 1-foot thick stone bedding will

prevent any detrimental events associated with possible settling of the pan lysimeter unit. In order to function properly, the pan lysimeter must remain level at all times. To assure this, the pan lysimeter was levelled using a survey instrument to an elevation of 444.56 feet at the perforated plate of the pan section. The lateral extension pipe was levelled in a similar fashion. Caution was taken during the installation and levelling activities to prevent the inclusion of any water or solid materials into the pan section or the lateral extension pipe of the pan lysimeter unit. The vertical riser pipe was welded to the installed unit after it was placed in the excavation.

A double layer of filter cloth was placed over the perforated plate of the lysimeter with extra material running up the sides to prevent solid material from entering the pan between the sidewall and the filter cloth. The section of lysimeter above the perforated plate was then filled to two inches from the top with 1B stone. The area around the pan unit was also backfilled to this level with native material and compacted with a hydraulic jumping jack.

Once backfilled, the entire area over the pan lysimeter was capped by two feet of clay material in 6-inch lifts. The edges of the excavation were regraded to ensure adequate bonding between the pre-existing clay cover and the newly constructed cover over the lysimeter. The first two

lifts were hand compacted using a Bomag Compactor and the hydraulic jumping jack. For the compaction of the third and final clay lifts, the sheepsfoot roller was used without the hydraulic vibrator running. Also, the clay material was wetted down with water during the second, third and final lifts to enhance proper "knitting" between clay layers. Soils testing was performed on the lysimeter area for compaction, moisture and density by GGE.

2.7 DRAINAGE LAYER

A 3-inch thick drainage layer was placed on the low permeable clay cap over the entire landfill site. The drainage layer consisted of 1B stone, an approved substitute material for the specified sand. The stone material was visually inspected in the field and found to be uniform, free of debris, slightly moist and free of large lumps and stones. The 1B stone was supplied to SLC by Niagara Stone. Previous testing has shown that the 1B stone has a hydraulic conductivity of 2.68×10^{-2} cm/sec. Results of testing of the 1B stone are presented in Appendix C.

The stone material was hauled to the site in tandem axle dump trucks, deposited, rough graded with a bulldozer and brought to finish grade using a blade grader.

Confirmation of the 3-inch drainage layer was obtained by taking four randomly located split spoon samples at the landfill site. The results of the split spoon samples and the locations of the samples are presented in Table 5 and Plan 5 respectively.

2.8 LOAM LAYER

A 15-inch thick layer of loam was installed over the underlying drainage and low permeable clay cover layers over the entire area of the landfill site.

The loam was hauled to the site in tamdem axle dump trucks, deposited and brought to final grade using a bulldozer and blade grader.

All of the loam was obtained from the Coulson Pit located at Ewings Road and Chestnut Street in the Town of Newfane. The loam was inspected and approved by the Site Engineer prior to being imported to the site and was visually examined in the field during placement. The loam was moist, free of lumps, stones, vegetation and debris.

Confirmation of the 15-inch loam layer was obtained by taking four randomly located split spoon samples at the landfill site. The results of the split spoon samples

TABLE 5

COVER LAYER THICKNESS VERIFICATION

Split Spoon Data:

Sample Number	Cover Thickness	1B Stone	Loam	Topsoil
A	2.1	0.3	1.2	0.6
B	1.9	0.3	1.1	0.5
C	2.0	0.3	0.9	0.8
D	1.9	0.3	0.9	0.7

Survey Data:*

Station	Line B	Line C	Line D	Head of Ditch	Toe of Ditch	Line E	Line F
0+00	-	-	-	-	-	-	-
0+50	2.4	2.5	2.1	-	-	2.3	1.8
1+00	2.6	2.5	2.2	2.5	1.9	2.7	2.2
1+50	1.9	1.9	2.3	2.4	2.0	2.5	-
2+00	-	2.7	2.5	2.4	2.4	2.0	-
2+50	-	2.9	2.1	2.8	2.6	2.2	4.0
3+00	-	2.7	2.6	1.9	2.2	2.4	4.4
3+50	-	2.4	2.1	2.0	2.6	2.4	3.3
4+00	-	1.9	1.9	1.7	1.8	2.1	2.4
4+50	-	-	1.7	1.7	1.9	-	-

Note:

Above cover thicknesses are in feet.

* Elevation of final grade minus elevation of top of clay based upon topographic surveys completed by Ivan R. Klettke, Neal R. Klettke, Licensed Land Surveyors.

and the locations of the samples are presented in Table 5 and Plan 5 respectively.

2.9 TOPSOIL LAYER

A 6-inch layer of topsoil was installed over the underlying loam, drainage and low permeable clay cover layers over the entire area of the landfill site.

The topsoil material was hauled to the site in tamdem axle dump trucks, deposited and brought to final grade using a bulldozer and blade grader.

All of the topsoil was obtained from the Shevlin-Manning Pit in the Town of Wheatfield which was inspected and approved by the Site Engineer prior to being imported to the Site and was visually examined in the field during placement. The topsoil material was moist, free of large stones and debris, and free of roots, weeds and other vegetation.

Confirmation of the 6-inch topsoil layer was obtained by taking four randomly located split spoon samples at the landfill site. The results of the split spoon samples and the locations of the samples are presented in Table 5 and Plan 5 respectively.

A final grade survey was taken on top of the topsoil cover layer on August 14, 1987. The results of the field survey are presented in Plan 7.

The surface of the final cover has a minimum slope of approximately 3 percent. This low slope minimizes erosion due to runoff while still allowing adequate drainage so as to reduce infiltration. It is also expected that due to proof-rolling of the site prior to cap construction and adequate compaction during construction of the cap, that settlement of cover soils will be minimal. The cover as placed will also minimize the effects of freeze-thaw cycles due to frost on the clay cover. Since the typical depth of frost penetration in the area is approximately 36 inches, 12 inches of clay remains below the depth of potential frost penetration.

Prior to seeding, fertilizer with a nitrogen/phosphoric acid/pot ash rating of 10/20/20 was applied to the topsoil for purposes of soil enhancement. The fertilizer application rate was 300 lb./acre.

To reduce infiltration and erosion from rainfall, the following seed mix has been planted over the cover:

Name	Variety	Weight/Acre
Red Fescue	Commercial	50 lb.
Kentucky Bluegrass	Commercial	10 lb.
Perennial Ryegrass	Commercial	40 lb.
White Clover	Commercial	10 lb.
Maximum 25 percent hard seed		5-10 lb.
Total		105-110 lb.

Mulch was applied uniformly in a continuous blanket sufficiently thick enough to reasonably cover the soil.

2.10 ADDITIONAL REMEDIATION OF DITCH AREA

During the period between the time the site was seeded and the grass had sprouted to a reasonable height, the Lockport area experienced some extremely heavy rainfall events. The surface water runoff from these storms resulted in the erosion of some of the cover material that had been placed off-site, downstream of the ditch outfall in the southeastern corner of the site. In the week following the storms it was noted that the some iron oxide staining was appearing in the eroded ditch area. Additional limestone was placed on the surface in the area where staining was observed. Areas of topsoil erosion in the remediated ditch area have been repaired and sodded as required to maintain overland flow of surface water coming off the former landfill

via the ditch line. A second interceptor trench has also been constructed in an attempt to reconnect the groundwater flow in the crushed limestone back into the subsurface regime in the newly capped ditch area. The shallow trench constructed was approximately three feet wide by 22 feet long and backfilled with limestone which had been wrapped in filter fabric material. It is intended that this trench will direct groundwater flowing underneath the topsoil from below the clay lining of the ditch to a depressed area of course boulders where the original ditch line flowed. The groundwater flow entering the depressed area re-enters the subsurface flow regime through the coarse rock material, thereby minimizing oxidation potential.

3.0 MAINTENANCE PROGRAM

Following site closure, the site will be inspected semi-annually. The site will be inspected with regards to:

a. cover integrity;
b. ditch lining integrity and presence of iron staining;
c. condition of vegetation over the cover;
d. drainage conditions
e. condition of the fence surrounding the site;
f. pan lysimeter and
g. monitoring wells and water quality monitoring locations

A log will be maintained of the inspections for a minimum of six years from the date of inspection. The log will indicate the name of the inspector, item of inspection, date and time of inspection, observations and date and nature of remedial action(s).

Any deficiencies noted during inspection will be addressed immediately. Any damage or inaccessibility to the monitoring wells will be rectified within 14 days and the NYSDEC will be notified within 20 days of the inspection. The notification to the NYSDEC will include the following:

i) description of the problem associated with the well;

ii) a description of the repairs made; or

iii) a schedule for the rehabilitation or replacement of the well.

If a problem with a well prevents collection of a scheduled sample, a sample will be obtained within 14 days after rehabilitation or replacement of the well. It is to be noted that should the off-site upgradient well D-55 be damaged or otherwise become inaccessible thereby preventing collection of a sample from that well, an alternate upgradient well will be selected and sampled upon approval by the NYSDEC.

Any settlement of the cover, should it occur, in excess of 12 inches will be remedied by removal of the topsoil, loam and drainage layer and subsequent backfilling with additional clay to the top of clay grade. The drainage layer, loam and topsoil layers will then be replaced. Any erosion of the cover will be repaired by reconstruction of the cover in the eroded area. If necessary sod will be used to re-establish vegetative cover.

3.1 SITE SECURITY AND ACCESS

Security for the VanDeMark Landfill Site will be maintained by the existing 6-foot high chain link fence. The fence was inspected at the conclusion of capping construction and was repaired as necessary.

The existing gates will be maintained and kept locked at all times when the site is not being supervised by VanDeMark personnel.

The existing site access road shall be maintained in reasonable condition to provide vehicular access to the site. No on-site access road will be constructed.

4.0 POST-CLOSURE MONITORING PROGRAM

The purpose of the post-closure monitoring program is to monitor the effectiveness of the closure construction for containing the migration of the contaminants within the landfilled area. The program consists of the collection and analysis of a series of groundwater and stream samples at regular intervals. The samples will be analyzed for the site specific parameters which include the following:

- pH (measured in the field)
- purgeable halocarbons (method 601)
- chlorides (method 407B)
- total recoverable phenolics (method 430)
- soluble metals:
  - arsenic (method 206.2)
  - chromium (method 218.2)
  - copper (method 220.1)
  - iron (method 236.1)
  - lead (method 239.2)
  - mercury (method 245.1)
  - zinc (method 289.1)

The sampling locations will include:

- monitoring wells VDM9, VDM10, VDM11, VDM12 and D-55;
- ditch interceptor trench monitor - VDM14;
- the seep in the area of the southwest corner of the landfill (if flowing); and
- upstream and downstream locations of Eighteen Mile Creek.

Protocols are outlined in Appendix D.

Samples will be collected according to the following schedule:

Initial 18 months following closure	- quarterly
18 months to end of year 3 following closure	- semi-annually
Years 4 and 5 following closure	- annually
Years 5 to 30 following closure	- every 5 years

Prior to each sampling round, one complete set of groundwater elevation measurements will be made using all of the wells that have been installed on the landfill site proper.

The results of each sampling event will be submitted to the NYSDEC within one week of receipt of the analytical data.

In order to evaluate the performance of the clay cap, a lysimeter has been installed on the site. During the regular sampling events outlined for the post-closure program, the water level in the lysimeter will be measured. The water accumulated in the lysimeter and lysimeter monitor will then be pumped out (i.e. using a peristaltic pump) and the total volume of water will be measured. This measurement will be converted into an estimated infiltration rate of the clay cap, compared to the required cap permeability of $1x10^{-7}$ cm/sec and reported along with the analytical results to the NYSDEC. A volume change of 40 gallons is approximately equal to an infiltration rate of $1x10^{-7}$ cm/sec over a six month period.

At the end of 18 months, VDM will submit to the NYSDEC a report which evaluates the performance of the cover system. The following data will be included in the Performance Evaluation Report:

1. All available historic water quality data from each monitoring point and all data collected during the performance period. Supporting QA/QC results will be submitted for data collected during the performance monitoring period.

2. All available groundwater level data presented in a spreadsheet showing monitoring point and water level for each sampling event.

3. Lysimeter data and calculations used to determine permeability/performance of the cap.

The report will discuss this data, evaluate the effectiveness of the cover system and include a proposal for future monitoring or additional remedial measures at the landfill. Until that proposal is approved by the Department and implemented, VanDeMark will continue monitoring as specified in the Post-Closure Monitoring Program.

5.0 CONTINGENCY PROGRAM

Following each post-closure monitoring event, the analytical data will be reviewed for accuracy and evaluated to determine whether there have been any significant changes in the landfill conditions. The purpose of the contingency program is to outline the required remedial actions to be taken, where appropriate, based on observations made during post-closure monitoring program activities.

The mechanism which will trigger the implementation of the contingency program will be a significant impact measured in the stream. This will be done by monitoring water quality trends in the stream. Should this monitoring identify a significant increase in chemical parameter resulting from the former landfill, a reassessment of the remedial action will be undertaken. The indication that cap permeability exceeds 1×10^{-7} cm/sec shall also trigger the implementation of the contingency program.

The initial step of the contingency plan is to immediately notify the NYSDEC representative assigned to the site. The second step is to verify the increase by taking two additional samples at the sample location(s) in question, and analyzing for the particular parameter(s). This must be done within two weeks of receipt of the suspect

analytical data. If the increase is verified, a study will be initiated to determine the cause of the increase and the potential consequences. Within eight weeks of the initial receipt of analytical data which triggered the contingency program, a report must be submitted to the NYSDEC which details these causes and consequences as well as the recommended remedial action and proposed schedule. Likewise, should an indication that the cap permeability exceeds $1x10^{-7}$ cm/sec then this must be confirmed within two weeks and an evaluation, complete with proposed remedial action and schedule, will be submitted to the NYSDEC within eight weeks.

6.0 SUMMARY

In summary, the former Van De Mark Landfill Site was closed in accordance with the approved plan entitled "Closure Plan - Former Landfill Site" with the minor exceptions as noted within the text of this report.

All of Which is Respectfully Submitted,

CONESTOGA-ROVERS & ASSOCIATES

Donald J. Miller, P.E.

James K. Kay, P. Eng.

APPENDIX A

EQUIPMENT USED DURING CONSTRUCTION ACTIVITIES

EQUIPMENT USED DURING CONSTRUCTION ACTIVITIES
VAN DEMARK CHEMICAL COMPANY LANDFILL
LOCKPORT, NEW YORK

1. Hauling Vehicles:

Tandem dump trucks used to haul impervious clay, stone material for drainage layer, sandy loam and topsoil cover material. A maximum of 10 vehicles used at one time with various types and models, including:

Autocar, Brockway, International, Kenworth and Mack

2. Heavy Equipment:

A.	Bulldozer	- John Deere 750
B.	Flat Roller	- Ingersoll Rand SPF-56
C.	Sheepsfoot Roller	- Ingersoll Rand SPF-56
D.	Flat Roller	- Pull behind hydraulic compactor Hyster C-200
E.	Grader	- Caterpillar 120
F.	Backhoe	- Ford 450

3. Hand Operated Equipment:

A. Compactors - Bomag Hydraulic Roller and Wacker Jumping Jack
B. Chainsaw, arc welder, Agrotech water sprayer

APPENDIX B

CLAY TESTING RESULTS

Glynn Geotechnical Engineering

BY W.W. GLYNN DATE 8-19-87 SHEET 1 OF 1

CHKD. BY _____ DATE _____ PROJECT NO. 87-0125

CLIENT CONESTOGA ROVERS

PROJECT VAN DE MARK CHEMICAL

SUBJECT SUMMARY OF TEST DATA

PERMEABILITY TEST TABLE

SAMPLE NO.	PERMEABILITY RATE x 10^{-7} CM/SEC	CYLINDER DRY DENSITY	MOISTURE CONTENT		PERCENT COMPACTION		ATTERBERG'S		VOID RATIO	
			FIELD	CYL.	FIELD	CYL.	LIQUID LIMIT	PLASTIC LIMIT	BEFORE TEST	AFTER TEST
TEST PAD	0.729	108.6	20.4	19.5	89.3	94.8	37	23	.592	.501
TEST PAD	0.221	108.9	21.8	20.1	91.9	95.1	39	22	.494	.478
TEST PAD	0.471	107.3	19.8	19.3	90.8	93.7	—	—	.569	.577
1E	0.176	110.2	17.4	16.5	94.2	96.2	42	22	.489	.505
2B	0.510	105.7	24.1	19.5	88.9	92.3	37	20	.623	.619
3A	0.200	107.8	18.7	15.8	90.8	94.1	39	20	.563	.560
4A	0.440	110.7	18.1	17.7	93.2	96.7	38	20	.505	.454
5B	0.248	108.7	19.4	18.5	92.7	94.9	34	19	.573	.572
6A	0.569	109.2	19.9	19.8	92.8	95.4	36	17	.571	.559
7A	0.460	110.5	18.1	14.9	91.6	96.5	45	24	.468	.479
8E	0.418	109.8	21.9	17.0	90.9	95.9	36	19	.562	.552
9A	1.09	105.0	18.5	18.2	93.0	91.7	48	26	.670	.707
10B	0.336	102.2	16.9	15.6	90.2	90.1	36	19	.608	.579
11B	2.201	101.9	17.7	18.2	90.7	89.0	38	20	.709	.630
11R2	4.96	102.4	N.A.	13.3	90.7	89.4	32	19	.656	.600
12A	0.574	108.5	18.5	17.8	90.1	94.8	48	25	.599	.653
BAG #2	4.12	107.1 (RECOMPACT)	N.A.	19.1 (REMOLD)	N.A.	93.5 (REMOLD)	35	18	.608	.617
AVG. 1-12	0.60	107.6	—	—	—	—				

PERMEABILITY BY STRATA

LIFT	NORTH SECTOR	MIDDLE SECTOR	SOUTH SECTOR
4th	0.34	2.20	0.57
3RD	0.46	0.42	1.09
2ND	0.44	0.25	0.57
1ST	0.18	0.51	0.20
AVG.	0.36	0.85	0.61

BUFFALO TESTING LABORATORIES. INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 1

PROJECT: Van De Mark Chemical. Lockport

CLIENT: Glynn Geotechnical

PROJECT NO.: 85.984

CONTRACTOR: SLC Consultants-Constructors. Inc.

DATE: June 29. 1987

TECHNICAN: Alan R. Hopkins

TIME: 8:30 - 7:00

Glynn Geotechnical Engrng. 6437 Loust St. Extn. Lockport, NY 14094

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
1	0	8"	126.9	7.1	N/A	On site material-uncompacted for information only (outsice test pad)
2	0	8"	124.6	7.5	N/A	On site material compacted for subbase of test pad area
3	0	4"	87.2	18.6	N/A	Off site fill - as received
4	0	4"	82.4	17.7	N/A	Off site fill - as received
5	0	4"	78.1	18.9	N/A	Off site fill - as received
6	0	4"	100.8	17.9	N/A	Off site fill - as received
7	1	6"	104.8	20.0	~~83.4~~ 91.5	Test pad 2 passes
8	1	6"	94.9	22.4	~~75.6~~ 82.9	Test pad 2 passes
9	1	6"	95.8	19.8	~~76.3~~ 83.7	Test pad 2 passes
10	1	6"	101.9	22.5	~~81.1~~ 89.0	Test pad 4 passes
11	1	6"	104.6	19.9	~~83.3~~ 91.3	Test pad 4 passes
12	1	6"	102.2	20.4	~~81.3~~ 89.3	Test pad 4 passes
13	1	6"	106.6	19.1	~~84.7~~ 93.1	Test pad 6 passes
14	1	6"	105.2	21.8	~~83.7~~ 91.9	Test pad 6 passes

MAXIMUM DENSITY (PCF)
1: 125.7
2: 112.5

OPTIMUM MOISTURE (%)
: 12.1
:

MATERIAL TYPE AND SOURCE
Niagara Stone Overburden
Shevlin Manning - River Road

REMARKS:
:
:

FROM EMPIRE SOILS DATA. GGE DATA = 114.5 PCF @ 14.5%

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

PROCTOR "0" BASE LEVEL FOR TEST PAD

Alan R Hopkins
: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount equal to the fee.

GGE

BUFFALO TESTING LABORATORIES, INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 1

CLIENT: Glynn Geotechnical

CONTRACTOR: SLC Consultants-Constructors, Inc.

TECHNICAN: Alan R. Hookins

PROJECT: Van De Mark Chemical, Lockport

PROJECT NO.: 85.984

DATE: June 29, 1987

TIME: 8:30 - 7:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
15	1	6"	103.8	19.6	~~86.6~~ 90.7	Test pad 6 passes
16	1	6"	108.7	18.2	~~86.4~~ 94.9	Test pad 8 passes
17	1	6"	104.3	22.3	~~82.9~~ 91.1	Test pad 8 passes
18	1	6"	104.0	19.8	~~82.7~~ 90.8	Test pad 8 passes
19	1	6"	109.6	18.5	~~87.1~~ 95.7	Test pad lifted with dry material 4 passes
20	2	6"	98.7	19.0	87.7	2nd test pad 2 passes
21	2	6"	93.0	22.1	82.7	2nd test pad 2 passes
22	2	6"	96.5	20.4	85.8	2nd test pad 2 passes
23	2	6"	94.6	22.1	84.1	2nd test pad 4 passes
24	2	6"	100.1	19.2	89.0	Retest #23
25	2	6"	89.9	27.4	79.9	2nd test pad 4 passes
26	2	6"	96.4	23.3	85.7	Retest #25
27	2	6"	88.8	27.5	79.0	2nd test pad 4 passes
28	2	6"	95.7	21.9	85.1	Retest #27
29	2	6"	96.7	21.6	86.0	2nd test pad 6 passes
30	2	6"	97.0	20.2	86.2	2nd test pad 6 passes
31	2	6"	94.6	21.5	84.1	2nd test pad 6 passes

MAXIMUM DENSITY (PCF)
1: ~~125.7~~
2: 112.5

OPTIMUM MOISTURE (%)
: ~~12.1~~
:

MATERIAL TYPE AND SOURCE
Niagara Stone Overburden
Shevlin Manning - River Road

REMARKS:
:
:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

Alan R Hopkins

: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount equal to the fee.

Mark W. Glynn GGE

02

BUFFALO TESTING LABORATORIES. INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 1

PROJECT: Van De Mark Chemical, Lockport

CLIENT: Glynn Geotechnical

PROJECT NO.: 85,984

CONTRACTOR: SLC Consultants-Constructors, Inc.

DATE: June 29, 1987

TECHNICAN: Alan R. Hopkins

TIME: 8:30 - 7:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
32	2	6"	103.2	20.3	84.1	2nd test pad 8 passes
33	2	6"	101.1	21.3	89.9	2nd test pad 8 passes
34	2	6"	97.2	21.1	86.4	2nd test pad 8 passes

MAXIMUM DENSITY (PCF)
1: ~~125.7~~
2: 112.5

OPTIMUM MOISTURE (%)
: ~~12.1~~
:

MATERIAL TYPE AND SOURCE
Niagara Stone Overburden
Shevlin Manning - River Road

REMARKS:
:
:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

Alan R Hopkins

: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount equal to the fee.

2

BUFFALO TESTING LABORATORIES, INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 2

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85,984

CONTRACTOR: SLC Consultants-Contructors, Inc.

DATE: July 6, 1987

TECHNICAN: Alan R. Hookins

TIME: 7:30 - 10:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
1	2	6"	100.9	14.2	89.7	2nd Test Pad 10 passes
2	2	6"	102.4	14.1	91.0	2nd Test Pad 10 passes
3	2	6"	104.3	14.7	92.7	2nd Test Pad 10 passes
	---	----	102.5	14.3	91.1	Average of tests 1, 2, & 3

MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)
1:	:
2: 112.5	:

MATERIAL TYPE AND SOURCE

Shevlin Manning - River Road
SUMMIT MALL LAKE

REMARKS:
:
:

Glynn Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED,
BUFFALO TESTING LABORATORIES, INC.

Alan R. Hopkins

: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount equal to the fee.

BUFFALO TESTING LABORATORIES, INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 3

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85.984

CONTRACTOR: SLC Consultants - Constructors, Inc.

DATE: July 8, 1987

TECHNICAN: Alan R. Hookins

TIME: 7:00 - 6:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
1	----	12"	----	14.0	----	Fill moisture check as received
2	3	4"	107.6	15.0	93.9	35' E - 20' N of VDM 9 (Fill Area)
3	3	4"	100.9	17.1	88.1	55' W - 25' N of VDM 10
4	3	4"	102.9	16.6	89.8	15' E - 30' N OF VDM 9
5	3	4"	106.3	15.4	92.8	Retest of #4 after retamping
6	3	4"	108.7	17.1	94.9	Retest of #3 after retamping
7	3	4"	105.4	16.0	92.0	50' E - 0' N of VDM 12
8	3	4"	108.9	15.7	95.1	0' E - 40' S of VDM 12
9	3	4"	105.3	16.2	91.9	5' E - 70' N of VDM 9

MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)
1:	:
2:	:
3: 114.5	: 14.5

MATERIAL TYPE AND SOURCE

Frontier Stone - CLAY OVERBURDEN

REMARKS:
:
:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

Alan R. Hopkins

: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount ecual to the fee.

BUFFALO TESTING LABORATORIES, INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 4

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85,984

CONTRACTOR: SLC Consultants - Contructors. Inc.

DATE: July 9, 1987

TECHNICAN: Alan R. Hookins

TIME: 8:00 - 3:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
1	3	4"	107.9	17.4	94.2	45' W - 0' N of VDM 11
2	---	--	---	-----	----	Perm Cylincers 1A + 1B taken at location #1
3	3	6"	106.8	18.1	93.2	50' ~~X~~E - 15' N of VDM 10, 2nd lift
4	---	--	---	----	-----	Per Cylincers 4A + 4B taken at location #3
5	3	6"	97.8	18.5	85.1	30' E - 25' N of VDM 9, 2nd lift
6	3	6"	106.1	17.4	92.6	45' W - 10' N of VDM 3
7	3	6"	105.3	18.9	91.9	Retest #5 after retamping
8	3	6"	103.9	19.4	90.7	15' E - 35' S of VDM 12, 2nd lift
9	3	6"	104.1	20.2	90.9	30' W - 30' S of VDM 12, 2nd lift
10	3	6"	104.3	14.7	91.9	10' E - 40' N of VDM 3, 2nd lift

MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
1:	:	
2:	:	
3: 114.5	: 14.5	Frontier Stone -CLAY OVERBURDEN

REMARKS:
:
:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

Alan R Hopkins

: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount equal to the fee.

02

BUFFALO TESTING LABORATORIES, INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 4

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85.984

CONTRACTOR: SLC Consultants - Contructors, Inc.

DATE: July 9, 1987

TECHNICAN: Alan R. Hopkins

TIME: 8:00 - 3:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
11	3	6"	105.0	18.1	91.6	15' E - 25' N of VDM 10, 3rd lift
12	---	--	---	----	----	Perm Cylincers 7A + 7B taken at location #11
13	3	6"	107.8	17.9	94.1	10' E - 40' N of VDM 9, 3rd lift
14	3	6"	108.9	16.3	95.0	30' W - 25' N of VDM 3, 3rd lift
15	3	6"	107.8	18.2	94.1	40' E - 55' N of VDM 10, 3rd lift
16	3	6"	108.8	17.6	95.0	35' E - 30' S of VDM 12, 3rd lift
17	3	6"	100.7	19.7	87.9	10' W - 50' N of VDM 3, 3rd lift
18	3	6"	103.8	20.1	90.6	Retest #17

MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
1:	:	
2:	:	
3: 114.5	: 14.5	Frontier Stone - CLAY OVERBURDEN

REMARKS:
:
:

Glynn Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

Alan R. Hopkins

: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount equal to the fee.

BUFFALO TESTING LABORATORIES, INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 5

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85.984

CONTRACTOR: SLC Consultants - Constructors, Inc.

DATE: July 10, 1987

TECHNICAN: Alan R. Hookins

TIME: 8:00 - 6:30

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
1	3	6"	105.6	20.5	92.2	40'E - 10'N of VDM 12. 1st Lift
2	3	6"	104.8	19.9	91.5	10'E - 10'N of VDM 12. 1st Lift
3	3	6"	100.8	21.5	88.0	20'W - 15'N of VDM 12. 1st Lift
4	3	6"	104.2	20.5	91.0	25'E - 70'S of VDM 11. 1st Lift
5	3	6"	103.3	23.6	90.2	5'E - 65'N of VDM 12. 1st Lift
6	3	6"	101.8	24.1	88.9	40'E - 65'N of VDM 12. 1st Lift
7	---	----	---	----	----	Perm Cylinders 2A - 2B taken location 5
8	3	6"	103.9	20.8	90.7	Retest #3 after retamping
9	3	6"	101.5	23.6	88.6	Retest #6 after retamping
10	3	6"	99.1	23.3	86.5	Retest #9 after retamping

MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
1:	:	
2:	:	
3: 114.5	: 14.5	Frontier Stone

REMARKS:
:
:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

Alan R. Hopkins

: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount equal to the fee.

02

BUFFALO TESTING LABORATORIES. INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 5

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85.984

CONTRACTOR: SLC Consultants - Constructors, Inc.

DATE: July 10, 1987

TECHNICAN: Alan R. Hopkins

TIME: 8:00 - 6:30

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
11	3	6"	106.7	21.4	93.2	30'W - 50'S of VDM 2. 1st Lift
12	3	6"	106.0	20.5	92.5	55'E - 25'S of VDM 11. 1st Lift
13	3	6"	104.4	21.5	91.1	Retest #9 after retamping
14	3	6"	106.3	18.7	92.8	Retest #10 after retamping
15	3	6"	100.0	22.3	87.2	25'E - 20'S of VDM 11. 1st Lift
16	3	6"	105.4	16.7	92.0	Retest #15 after retamping
17	3	6"	106.8	19.1	93.2	20'E - 15'N of VDM 10. 4th Lift
18	3	6"	107.3	18.1	93.7	65'W - 20'N of VDM 9, 4th Lift
19	3	6"	106.6	19.7	93.1	0'W - 20'N of VDM 9, 4th Lift
20	3	6"	105.4	21.0	92.0	60'E - 20'N of VDM 3. 4th Lift
21	3	6"	105.4	21.1	92.0	25'W - 45'N of VDM 3, 4th Lift

MAXIMUM DENSITY (PCF)

1:
2:
3: 114.5

OPTIMUM MOISTURE (%)

:
:
: 14.5

MATERIAL TYPE AND SOURCE

Frontier Stone - CLAY OVERBURDEN

REMARKS:

:
:

Glynn
Geotechnical Engmg.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

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902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 5

CLIENT: Glynn Geotechnical

CONTRACTOR: SLC Consultants - Constructors, Inc.

TECHNICAN: Alan R. Hopkins

PROJECT: Van De Mark Chemical

PROJECT NO.: 85,984

DATE: July 10, 1987

TIME: 8:00 - 6:30

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
22	3	6"	106.3	21.0	92.8	25'E - 35'S of VDM 12, 4th Lift
23	3	6"	103.8	19.1	90.6	40'E - 10'N of VDM 12, 2nd Lift
24	3	6"	100.2	23.2	87.5	10'E - 10'N of VDM 12, 2nd Lift
25	3	6"	100.9	19.9	88.1	20'W - 10'N of VDM 12, 2nd Lift
26	3	6"	102.7	22.3	89.6	Retest #24 after retamping
27	3	6"	104.4	21.2	91.1	Retest #25 after retamping
28	3	6"	106.2	19.4	92.7	25'W - 25'N of VDM 12, 2nd Lift
29	3	6"	102.0	24.0	89.0	45'E - 25'N of VDM 12, 2nd Lift
30	3	6"	99.3	17.7	86.7	15'E - 25'N of VDM 12, 2nd Lift
31	---	--	---	----	----	Perm Cylinders 5A & 5B taken on location 28

MAXIMUM DENSITY (PCF): 114.5

OPTIMUM MOISTURE (%): 14.5

MATERIAL TYPE AND SOURCE: Frontier Stone - CLAY OVERBURDEN

REMARKS:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

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BUFFALO TESTING LABORATORIES, INC.

Alan R. Hopkins

: ALAN R. HOPKINS

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BUFFALO TESTING LABORATORIES, INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 5

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85,984

CONTRACTOR: SLC Consultants - Constructors, Inc.

DATE: July 10, 1987

TECHNICAN: Alan R. Hopkins

TIME: 8:00 - 6:30

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
32	3	6"	104.1	18.6	90.9	Retest #30 after retamping
33	3	6"	102.0	19.5	89.1	Retest #29 after retamping
34	3	6"	100.5	20.4	87.7	Retest #33 after retamping
35	3	6"	103.8	20.5	90.6	Retest #33 after retamping
36	3	6"	104.6	21.1	91.3	50'W - 15'N of VDM 12, 3rd Lift
37	3	6"	102.0	20.4	89.0	Taken at VDM 12 - 3rd Lift
38	3	6"	95.9	20.0	83.7	20'E - 30'N of VDM 12, 3rd Lift
39	3	6"	104.6	21.5	91.3	50'E - 15'N of VDM 12, 3rd Lift
40	3	6"	99.3	18.9	86.7	Retest #38 after retamping
41	3	6"	102.6	19.8	89.6	Retest #37 after retamping
42	3	6"	101.0	21.0	88.1	Retest #40 after retamping
43	3	6"	99.6	20.7	87.0	Retest #42 after retamping
44	3	6"	104.1	21.9	90.9	30'W - 30'N of VDM 12, 3rd Lift

MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)
1:	:
2:	:
3: 114.5	: 14.5

MATERIAL TYPE AND SOURCE

Frontier Stone - CLAY OVERBURDEN

REMARKS:
:
:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED,
BUFFALO TESTING LABORATORIES, INC.

Alan R. Hopkins
: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount equal to the fee.

02

BUFFALO TESTING LABORATORIES. INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 5

CLIENT: Glynn Geotechnical

CONTRACTOR: SLC Consultants - Constructors, Inc.

TECHNICAN: Alan R. Hookins

PROJECT: Van De Mark Chemical

PROJECT NO.: 85.984

DATE: July 10, 1987

TIME: 8:00 - 6:30

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
45	---	--	---	----	----	Perm Cylinders 8A & 8B taken on location #44
46	3	6"	102.6	21.1	89.6	20'E - 20'S of VDM 11, 3rd Lift
47	3	6"	97.7	21.8	85.3	70'E - 15'S of VDM 11, 3rd Lift
48	3	6"	95.8	22.7	83.6	Retest #47

MAXIMUM DENSITY (PCF)
1:
2:
3: 114.5

OPTIMUM MOISTURE (%)
:
:
: 14.5

REMARKS:
:

MATERIAL TYPE AND SOURCE

Frontier Stone - CLAY OVERBURDEN

Glynn Geotechnical Engrng. 6437 Locust St. Extn. Lockport, NY 14094

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BUFFALO TESTING LABORATORIES, INC.

Alan R. Hopkins

: ALAN R. HOPKINS

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02

BUFFALO TESTING LABORATORIES. INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 6

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85,984

CONTRACTOR: SLC Consultants - Constructors, Inc.

DATE: July 13, 1987

TECHNICAN: Alan R. Hopkins

TIME: 8:00 - 5:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
1	3	6"	113.5	11.5	99.1	80'E - 10'S of VDM 11, 3rd Lift
2	3	6"	110.3	10.5	96.3	60'E - 25'S of VDM 11, 3rd Lift
3	3	6"	105.0	13.5	91.6	20'E - 30'N of VDM 12, 3rd Lift
4	3	6"	103.3	16.9	90.2	75'E - 10'N of VDM 10, 4th (Cap) Lift
5	---	--	---	----	----	Perm Cylinder 10A & 10B taken location #4
6	3	6"	105.2	16.1	91.9	20'W - 20'N of VDM 9, 4th (Cap) Lift
7	3	6"	105.3	17.4	91.9	20'W - 10'N of VDM 3, 4th (Cap) Lift
8	3	6"	102.1	19.4	89.2	20'W - 65'N of VDM 9, 4th (Cap) Lift
9	3	6"	99.8	18.1	87.1	70'W - 60'N of VDM 9, 4th (Cap) Lift

	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
1:			
2:			
3:	114.5	14.5	Frontier Stone - CLAY OVERBURDEN

REMARKS: Tests #1 - #3 were retested areas from report #5

Glynn Geotechnical Engrng. 6437 Locust St. Extn. Lockport, NY 14094

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Alan R Hopkins

: ALAN R. HOPKINS

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BUFFALO TESTING LABORATORIES, INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 6

CLIENT: Glynn Geotechnical

CONTRACTOR: SLC Consultants - Constructors, Inc.

TECHNICAN: Alan R. Hopkins

PROJECT: Van De Mark Chemical

PROJECT NO.: 85,984

DATE: July 13, 1987

TIME: 8:00 - 5:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
10	3	6"	104.2	15.9	91.0	Retest #9
11	3	6"	106.1	16.4	92.6	20'W - 20'N of VDM 12, 4th (Cap) Lift
12	3	6"	105.4	18.5	92.0	15'W - 0'N of VDM 12, 4th (Cap) Lift
13	3	6"	98.4	19.1	85.9	5'W - 15'N of VDM 12, 4th (Cap) Lift
14	3	6"	102.7	19.4	89.7	0'W - 30'N of VDM 12, 4th (Cap) Lift
15	3	6"	104.0	17.7	90.7	10'W - 25'N of VDM 12, 4th (Cap) Lift
16	3	6"	106.8	15.8	93.3	15'W - 80'N of VDM 12, 4th (Cap) Lift
17	3	6"	105.1	17.9	91.7	5'E - 85'N of VDM 12, 4th (Cap) Lift
18	---	--	---	----	----	Perm Cylinders 11A & 11B taken at location #15
19	3	6"	104.8	16.5	91.5	Retest #13 after retamping

MAXIMUM DENSITY (PCF): 114.5

OPTIMUM MOISTURE (%): 14.5

MATERIAL TYPE AND SOURCE

Frontier Stone - CLAY OVERBURDEN

REMARKS:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

Alan R. Hopkins

: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount equal to the fee.

02

BUFFALO TESTING LABORATORIES. INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 6

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85,984

CONTRACTOR: SLC Consultants - Constructors, Inc.

DATE: July 13, 1987

TECHNICAN: Alan R. Hopkins

TIME: 8:00 - 5:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
20	3	6"	91.3	15.2	91.3	110'N of VDM 2, ditch area. 1st Lift
21	3	6"	109.0	16.6	95.1	90'N of VDM 2, ditch area. 1st Lift
22	3	6"	105.8	17.9	92.3	20'N of VDM 2, ditch area. 1st Lift
23	3	6"	107.1	16.3	93.5	10'S of VDM 2, ditch area. 1st Lift
24	3	6"	110.2	8.3	96.2	80'S of VDM 2, ditch area. 1st Lift
25	3	6"	101.4	19.7	88.5	110'S of VDM 2, ditch area. 1st Lift
26	3	6"	103.4	17.5	90.3	150'S of VDM 2, ditch area. 1st Lift
27	3	6"	102.8	15.8	89.7	75'S - 25'W of VDM 1, 1st Lift

MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)
1:	:
2:	:
3: 114.5	: 14.5

MATERIAL TYPE AND SOURCE

Frontier Stone - CLAY OVERBURDEN

REMARKS:
:
:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

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BUFFALO TESTING LABORATORIES, INC.

Alan R Hopkins

: ALAN R. HOPKINS

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Glynn Geotechnical Engineering

FIELD OBSERVATION REPORT

6437 LOCUST STREET EXTN. • LOCKPORT, NEW YORK 14094 (716) 434-7118

PROJECT NO. 87-0125 REPORT NO. _____ PAGE 1 OF 1

PROJECT: VAN DE MARK CHEM. DAY TUESDAY DATE JULY 14, 1987

SUBJECT: DAILY REPORT TIME 8 AM. - 10 AM

WEATHER: HEAVY RAIN PHOTOS-YES ___ NO ✓

ALL CONSTRUCTION ACTIVITY HALTED DO TO WET CONDITIONS.

ITEMS REQUIRING FURTHER ATTENTION: _____

PERSONNEL CONTACTED: DISTRIBUTION:

REPORT BY: M. ALQUITH

02

BUFFALO TESTING LABORATORIES, INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 7

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85.984

CONTRACTOR: SLC Consultants - Constructors, Inc.

DATE: July 15, 1987

TECHNICAN: Alan R. Hopkins

TIME: 8:00 - 5:30

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
1	3	6"	100.1	19.1	87.3	90'S - 35'W of VDM 1. 1st Lift
2	3	6"	115.3	15.6	100+	80'S - 5'E of VDM 1, 1st Lif
3	3	6"	101.2	21.8	88.3	65'S - 25'E of VDM 1. 1st Lift
4	3	4"	113.7	14.5	99.2	Retest #2 (Verification)
5	3	6"	104.0	18.7	90.8	Retest #1 after retamping
6	3	6"	112.4	14.9	98.1	Retest #3 after retamping
7	---	--	---	-----	----	Perm cylinders 3A & 3B taken at location #5
8	3	6"	106.2	17.7	92.7	50'S - 10'W of VDM 1. 2nd Lift
9	3	6"	102.0	18.2	89.0	40'S - 20'E of VDM 1, 2nd Lift
10	3	6"	106.3	19.9	92.8	5'S - 0'E of VDM 1, 2nd Lift
11	---	--	---	-----	----	Perm cylinders 6A & 6B taken at location #10
12	3	6"	105.1	19.9	91.7	Retest #9 after retamping

	MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)
1:		
2:		
3:	114.5	14.5

MATERIAL TYPE AND SOURCE

Frontier Stone - CLAY OVERBURDEN

REMARKS:

Glynn Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

Alan R. Hopkins

: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount equal to the fee.

02

BUFFALO TESTING LABORATORIES. INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 7

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85.984

CONTRACTOR: SLC Consultants - Constructors. Inc.

DATE: July 15. 1987

TECHNICAN: Alan R. Hookins

TIME: 8:00 - 5:30

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
13	3	6"	103.1	21.2	90.0	20'S - 30'E of VDM 1. 2nd Lift
14	3	6"	105.8	19.7	92.4	70'N - 30'W of VDM 2. 2nd Lift
15	3	6"	104.6	20.2	91.3	70'N - 60'W of VDM 2. 2nd Lift
16	3	6"	108.7	19.3	94.9	70'N - 25'E of VDM 11. 2nd Lift
17	3	6"	102.6	20.1	89.5	110'N - 25'E of VDM 11. 2nd Lift
18	3	6"	98.6	20.2	86.1	50'S - 40'W of VDM 1. 2nd Lift
19	3	6"	102.7	19.8	89.6	Retest #18
20	3	6"	106.6	18.6	93.0	60'S - 10'W of VDM 1. 2nd Lift
21	3	6"	108.2	18.5	94.5	25'S - 0'W of VDM 1, 3rd Lift

MAXIMUM DENSITY (PCF)
1:
2:
3: 114.5

OPTIMUM MOISTURE (%)
:
:
: 14.5

MATERIAL TYPE AND SOURCE

Frontier Stone - CLAY OVERBURDEN

REMARKS:
:
:

Glynn Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
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Alan R Hopkins

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(716)-873-2302

EPORT NO.: 7

PROJECT: Van De Mark Chemical

_IENT: Glynn Geotechnical

PROJECT NO.: 85,984

ONTRACTOR: SLC Consultants - Constructors. Inc.

DATE: July 15, 1987

ECHNICAN: Alan R. Hookins

TIME: 8:00 - 5:30

FIELD IN-PLACE DENSITY TEST REPORT

EST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
2	3	6"	106.2	16.4	92.7	40'S - 35'E of VDM 1. 3rd Lift
3	3	6"	106.6	18.5	93.0	50'S - 0'W of VDM 1, 3rd Lift
4	3	6"	104.2	16.9	91.0	30'S - 15'W of VDM 1. 3rd Lift
5	---	--	---	----	----	Perm cylinders 9A & 9B taken at location #23
6	3	6"	100.0	19.4	87.3	50'S - 25'W of VDM 1, 3rd Lift
7	3	6"	101.1	22.0	88.2	30'S - 25'W of VDM 1, 3rd Lift
8	3	6"	104.8	19.4	91.5	15'S - 25'W of VDM 1, 3rd Lift
9	3	6"	101.6	20.2	88.7	40'S - 35'W of VDM 1, 3rd Lift
10	3	6"	103.5	18.8	90.3	5'S - 45'W of VDM 1, 3rd Lift
11	3	6"	105.2	19.3	91.8	0'N - 10'W of VDM 1. 3rd Lift
12	3	6"	106.1	19.3	92.6	Retest #27 after retamping

XIMUM NSITY (PCF) | OPTIMUM MOISTURE (%) | MATERIAL TYPE AND SOURCE

114.5 | 14.5 | Frontier Stone - CLAY OVERBURDEN

MARKS:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

Alan R Hopkins

: ALAN R. HOPKINS

MITATION OF LIABILITY - The amount of liability will be limited to an amount ual to the fee.

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902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 7

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85,984

CONTRACTOR: SLC Consultants - Constructors, Inc.

DATE: July 15, 1987

TECHNICAN: Alan R. Hopkins

TIME: 8:00 - 5:30

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
33	3	6"	103.4	19.1	90.3	Retest #29 after retamoing
34	3	6"	107.4	18.3	93.8	Retest #26 after retamoing
35	3	6"	107.2	19.4	93.6	90'N - 30'E of VDM 11, 3rd Lift
36	3	6"	102.6	20.6	89.5	80'N - 40'E of VDM 11, 3rd Lift
37	3	6"	102.8	20.7	89.7	30'N - 30'E of VDM 11, 3rd Lift
38	3	6"	107.1	19.3	93.5	70'S of VDM 2, 2nd Lift, Ditch Area
39	3	6"	102.8	18.4	89.8	100'S of VDM 2, 2nd Lift, Ditch Area
40	3	6"	102.2	18.0	89.2	150'S of VDM 2, 2nd Lift, Ditch Area
41	3	6"	101.2	21.0	88.3	Retest #40 after retamoing
42	3	6"	103.4	20.5	90.3	Retest #40 after retamoing

MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
1:	:	
2:	:	
3: 114.5	: 14.5	Frontier Stone - CLAY OVERBURDEN

REMARKS:
:
:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

Alan R Hopkins

: ALAN R. HOPKINS

LIMITATION OF LIABILITY - The amount of liability will be limited to an amount equal to the fee.

02

BUFFALO TESTING LABORATORIES. INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 8

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85.984

CONTRACTOR: SLC Consultants - Constructors, Inc.

DATE: July 16, 1987

TECHNICAN: Alan R. Hopkins

TIME: 8:00 - 5:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
1	3	6"	107.1	19.1	93.5	15'E - 70'S of VDM 1, 4th (cap) Lift
2	3	6"	103.2	18.5	90.1	15'E - 40'S of VDM 1, 4th (cap) Lift
3	3	6"	109.3	18.3	95.4	10'E - 15'S of VDM 1, 4th (cap) Lift
4	3	6"	105.4	18.2	92.0	20'W - 20'S of VDM 1, 4th (cap) Lift
5	3	6"	107.6	19.0	93.9	15'W - 30'S of VDM 1, 4th (cap) Lift
6	3	6"	108.0	18.5	94.3	20'W - 80'S of VDM 1, 4th (cap) Lift
7	3	6"	108.8	18.5	95.0	65'W - 90'S of VDM 1, 4th (cap) Lift
8	3	6"	107.3	17.8	93.7	70'W - 45'S of VDM 1, 4th (cap) Lift
9	3	6"	107.3	19.2	93.7	95'W - 20'S of VDM 1, 4th (cap) Lift

MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
1:	:	
2:	:	
3: 114.5	: 14.5	Frontier Stone - CLAY OVERBURDEN

REMARKS:
:
:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
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TIME: 8:00 - 5:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
10	---	--	---	----	----	Perm cylincers 12a & 12b taken at location #2
11	3	6"	105.1	18.9	91.7	40'N of VDM 1, 3rd Lift, Ditch area
12	3	6"	101.2	21.7	88.3	90'N of VDM 2, 3rd Lift, Ditch area
13	3	6"	103.9	20.3	90.7	Retest #12
14	3	6"	101.0	21.9	88.2	50'N of VDM 2, 3rd Lift, Ditch area
15	3	6"	103.1	21.1	90.0	20'N of VDM 2, 3rd Lift, Ditch area
16	3	6"	108.5	17.0	94.7	30'S of VDM 2, 3rd Lift, Ditch area
17	3	6"	104.0	18.7	90.8	100'S of VDM 2, 3rd Lift, Ditch area
18	3	6"	105.7	19.0	92.3	150'S of VDM 2, 3rd Lift, Ditch area

MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)	MATERIAL TYPE AND SOURCE
1:	:	
2:	:	
3: 114.5	: 14.5	Frontier Stone - CLAY OVERBURDEN

REMARKS:
:
:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED.
BUFFALO TESTING LABORATORIES, INC.

Alan R Hopkins

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02

BUFFALO TESTING LABORATORIES, INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 8

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85.984

CONTRACTOR: SLC Consultants - Constructors, Inc.

DATE: July 16, 1987

TECHNICAN: Alan R. Hookins

TIME: 8:00 - 5:00

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
19	3	6"	105.7	19.1	92.3	200'S of VDM 2, 3rd Lift Ditch area
20	3	6"	104.6	20.6	91.3	Retest #14 after retamping

AXIMUM ENSITY (PCF)	OPTIMUM MOISTURE (%)
:	:
:	:
: 114.5	: 14.5

EMARKS:

MATERIAL TYPE AND SOURCE

Frontier Stone - CLAY OVERBURDEN

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

RESPECTFULLY SUBMITTED,
BUFFALO TESTING LABORATORIES, INC.

Alan R. Hopkins

: ALAN R. HOPKINS

IMITATION OF LIABILITY - The amount of liability will be limited to an amount qual to the fee.

02

BUFFALO TESTING LABORATORIES. INC.
902 KENMORE AVE
BUFFALO N.Y. 14216
(716)-873-2302

REPORT NO.: 9

PROJECT: Van De Mark Chemical

CLIENT: Glynn Geotechnical

PROJECT NO.: 85.984

CONTRACTOR: SLC Consultants - Constructors, Inc.

DATE: July 17. 1987

TECHNICAN: Alan R. Hopkins

TIME: 9:00 - 11:30

FIELD IN-PLACE DENSITY TEST REPORT

TEST NO.	PROCTOR NO.	ELEV. (-DEPTH)	DENSITY (PCF)	PERCENT MOISTURE	PERCENT COMPACTION	LOCATION
1	3	6"	108.8	18.2	94.9	200'S of VDM 2, 4th Lift, Ditch Area
2	3	6"	104.0	17.3	90.8	150'S of VDM 2, 4th Lift, Ditch Area
3	3	6"	105.0	18.4	91.7	100'S of VDM 2, 4th Lift, Ditch Area
4	3	6"	104.8	20.0	91.5	40'S of VDM 2, 4th Lift, Ditch Area
5	3	6"	104.5	18.5	91.2	40'N of VDM 2, 4th Lift, Ditch Area

MAXIMUM DENSITY (PCF)	OPTIMUM MOISTURE (%)
1:	:
2:	:
3: 114.5	: 14.5

MATERIAL TYPE AND SOURCE

Frontier Stone - CLAY OVERBURDEN

REMARKS:
:
:

Glynn
Geotechnical Engrng.
6437 Locust St. Extn.
Lockport, NY 14094

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Alan R Hopkins

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Glynn Geotechnical Engineering

FIELD OBSERVATION REPORT

6437 LOCUST STREET EXTN. • LOCKPORT, NEW YORK 14094 (716) 434-7118

PROJECT NO. 87-0125 REPORT NO. _____ PAGE 1 OF 1

PROJECT: VDM CHEM. LANDFILL DAY tuesday DATE 7-28-87

SUBJECT: DAILY REPORT TIME 1 1/2 hr.

WEATHER: SUNNY 70'S (AM) PHOTOS-YES ___ NO ✓

Due to the overload on final lysimeter location, MATERIAL placement was ABORTED. Placement to resume on Wednesday once information is clarified

ITEMS REQUIRING FURTHER ATTENTION: _____

PERSONNEL CONTACTED:

ROGER (SLC)

DISTRIBUTION:

REPORT BY: T. SQUITTI

Glynn Geotechnical Engineering

FIELD OBSERVATION REPORT

6437 LOCUST STREET EXTN. • LOCKPORT, NEW YORK 14094 (716) 434-7118

PROJECT NO. 87-0125 REPORT NO. _____ PAGE 1 OF 1

PROJECT: VDM CHEM. LANDFILL DAY Wednesday DATE 7-29-87

SUBJECT: Daily Report TIME 6½ hr

WEATHER: Sunny, Dry PHOTOS-YES ___ NO ✓

Clay was placed at or near the optimum moisture content. Subgrade was scarified and watered prior to placement. Clay fill was also watered in stockpile and during placement. Four 6" lifts of material were placed. Each lift was compacted, scarified, and tied into existing clay. Fill material had been stockpiled at an earlier date.

Returned to site in afternoon to collect permeability samples. Samples were tested to replace failing test.

ITEMS REQUIRING FURTHER ATTENTION: _____

PERSONNEL CONTACTED:

Roger SLC

DISTRIBUTION:

REPORT BY: [illegible]

Glynn Geotechnical Engineering

6437 LOCUST STREET EXTN. • LOCKPORT, NEW YORK 14094 (716) 434-7118

SAND CONE DENSITY TESTING

Technician: ASMITH Date: 7-29-87

	Sequential Test Number	7-29-1	7-29-2	7-29-3	7-29-4		
	Liner Layer/Lift	LIFT #1	LIFT #2	LIFT #3	LIFT #4		
1	Wt. Sand & Bottle Before	6601	6761	6536	6606		
2	Wt. Sand & Bottle After	3238	2647	2479	2235		
3	Wt. Sand Used (1-2)	3363	4114	4057	4371		
4	Grams to lbs. ÷ 454	7.41	9.06	8.94	9.63		
5	Density of Sand in PCF	83.92	83.92	83.92	83.92		
6	Volume of Sand (4 ÷ 5)	.088	.108	.107	.115		
7	Volume of Cone in CF	.041	.041	.041	.041		
8	Volume of Hole (6-7)	.047	.067	.066	.074		
9	Weight of Wet Soil	2938	4168	3893	4488		
10	Grams to lbs. ÷ 454	6.47	9.18	8.57	9.89		
11	Wet Density (10 ÷ 8)	137.7	137.0	129.8	133.6		
12	% Speedy Moisture	14.5	15.5	15.3	14.8		
13	Corrected Moisture w%	16.5	17.2	17.0	16.8		
14	Dry Density (11÷1 + w%)	118.2	116.9	110.9	114.4		
15	Maximum Proctor Density	114.5	114.5	114.5	114.5		
16	% Compaction (14 ÷ 15)	100+	100+	96.9	99.9		
17	Location N/S	25' EAST	30' EAST	40' EAST	15' EAST		
18	Location E/W	OF C 2+75	OF C 2+65	OF C 2+85	OF C 2+75		
19	Elevation						

COMMENTS/ACTIONS

TESTS TAKEN AT VAN DE MARK CHEMICAL LANDFILL (cap). CLAY PLACEMENT AT ORIGINAL LYSIMETER LOCATION.

Two Term Samples taken: 10' EAST OF C 2+80 (11-R1)
20' EAST OF C 2+60 (11-R2)

Glynn Geotechnical Engineering

FIELD OBSERVATION REPORT

6437 LOCUST STREET EXTN. • LOCKPORT, NEW YORK 14094 (716) 434-7118

PROJECT NO. 87-0125 REPORT NO. _____ PAGE 1 OF 1

PROJECT: YDM. CHEM. LANDFILL DAY FRIDAY DATE 7-31-87

SUBJECT: DAILY REPORT TIME 3 hrs.

WEATHER: SUNNY 80'S PHOTOS-YES ✓ NO _____

ARRIVED ON SITE IN AM AND AT NOON. TESTING DELAYED DUE TO UNFORESEEN DIFFICULTIES IN PLACING LYSIMETER. SLC HAD PROBLEMS PLACING TEST EQUIPMENT TO AN EXACT LEVEL POSITION RETURNED IN AFTERNOON, AS REQUESTED BUT AREA WAS STILL UNPREPARED TOOK PHOTOS OF EXCAVATION OPERATION.

ITEMS REQUIRING FURTHER ATTENTION: _____

PERSONNEL CONTACTED:

ROGER SLC

REPORT BY: ASQUITH

DISTRIBUTION:

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FIELD OBSERVATION REPORT

6437 LOCUST STREET EXTN. • LOCKPORT, NEW YORK 14094 (716) 434-7118

PROJECT NO. 87-0125 REPORT NO. _____ PAGE 1 OF 1

PROJECT: VDM CHEMICAL DAY Saturday DATE 8-1-87

SUBJECT: DAILY REPORT TIME 7:00 - 3:30

WEATHER: SUNNY 80's PHOTOS-YES ✓ NO _____

+ Clay placed around the top of Lysimeter. Sandcone tests were performed on each lift. Agreed with MARK Becker that permeability samples need not be taken due to uniformity of material, compaction and moisture. Photos taken of Lysimeter in place.

+ TESTS TAKEN ON FIRST THREE LIFTS OF CLAY MATL. ALL LIFTS PASSED. CLAY MATERIAL WAS STOCKPILED FOR FILL. Additional material WAS taken from PREVIOUSLY PLACED liner at construction limits.

+ HAND TAMPERS USED on first two clay LIFTS. SHEEPSFOOT (WITHOUT VIBRATION) WAS used on 3rd lift.

ITEMS REQUIRING FURTHER ATTENTION: ONE additional LIFT MUST be placed. No tests will be needed as per MARK BECKER

PERSONNEL CONTACTED:

MARK BECKER

ROGER [illegible]

DISTRIBUTION:

REPORT BY: [illegible]

Glynn Geotechnical Engineering

6437 LOCUST STREET EXTN. • LOCKPORT, NEW YORK 14094 (716) 434-7118

SAND CONE DENSITY TESTING

Technician: Asquith Date: 8-1-87

Sequential Test Number	8-1-1	8-1-2	8-1-3	8-1-4		
Liner Layer/Lift	LIFT #1	→ RETEST	LIFT 2	LIFT 3		
1 Wt. Sand & Bottle Before	6151	6502	6330	6153		
2 Wt. Sand & Bottle After	2346	3068	2775	2392		
3 Wt. Sand Used (1-2)	3805	3514	3555	3761		
4 Grams to lbs. ÷ 454	8.38	7.74	7.83	8.28		
5 Density of Sand in PCF	83.92	83.92	83.92	83.92		
6 Volume of Sand (4 ÷ 5)	.100	.092	.093	.098		
7 Volume of Cone in CF	.041	.041	.041	.041		
8 Volume of Hole (6-7)	.059	.051	.052	.057		
9 Weight of Wet Soil	3195	3042	3224	3465		
10 Grams to lbs. ÷ 454	7.04	6.70	7.10	7.63		
11 Wet Density (10 ÷ 8)	119.3	131.4	136.5	133.9		
12 % Speedy Moisture	14.8	15.0	15.6	13.9		
13 Corrected Moisture w%	16.1	16.5	17.5	15.8		
14 Dry Density (11÷1 + w%)	102.8	112.8	116.2	115.6		
15 Maximum Proctor Density	114.5	114.5	114.5	114.5		
16 % Compaction (14 ÷ 15)	89.8	98.5	100+	100+		
17 Location N/S	S.W. →		CENTER OF	CENTER		
18 Location E/W	QUAD. →		FILL	OF FILL		
19 Elevation						

COMMENTS/ACTIONS

COMPACTION TESTS TAKEN AT LYSIMETER LOCATION

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL
PROJECT LOCATION:CONASTOGA ROVERS
SAMPLE NO.:TEST PAD 1
DESCRIPTION:4 PASSES
COMPACTED FILL
CLAY

DATE:JULY 8 1987
JOB No.:87C165-01

CELL NO.:8 FLUID:WATER B-Parameter:1.0

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	3.121	in	FINAL HEIGHT:	3.108	in
INITIAL DIAMETER:	2.8330	in	FINAL DIAMETER:	2.8140	in
INITIAL WET WEIGHT:	670.8	gm	FINAL WET WEIGHT:	690.6	gm
WET DENSITY =	129.8	pcf	WET DENSITY :	136.0	pcf
MOISTURE CONTENT:	19.5	%	MOISTURE CONTENT:	18.1	%
DRY DENSITY:	108.6	pcf	DRY DENSITY:	115.1	pcf
INITIAL SATURATION:	91.4	%	FINAL SATURATION:	100.1	%
INITIAL VOID RATIO:	.591844		FINAL VOID RATIO:	.501258	

TEST PARAMETERS.....

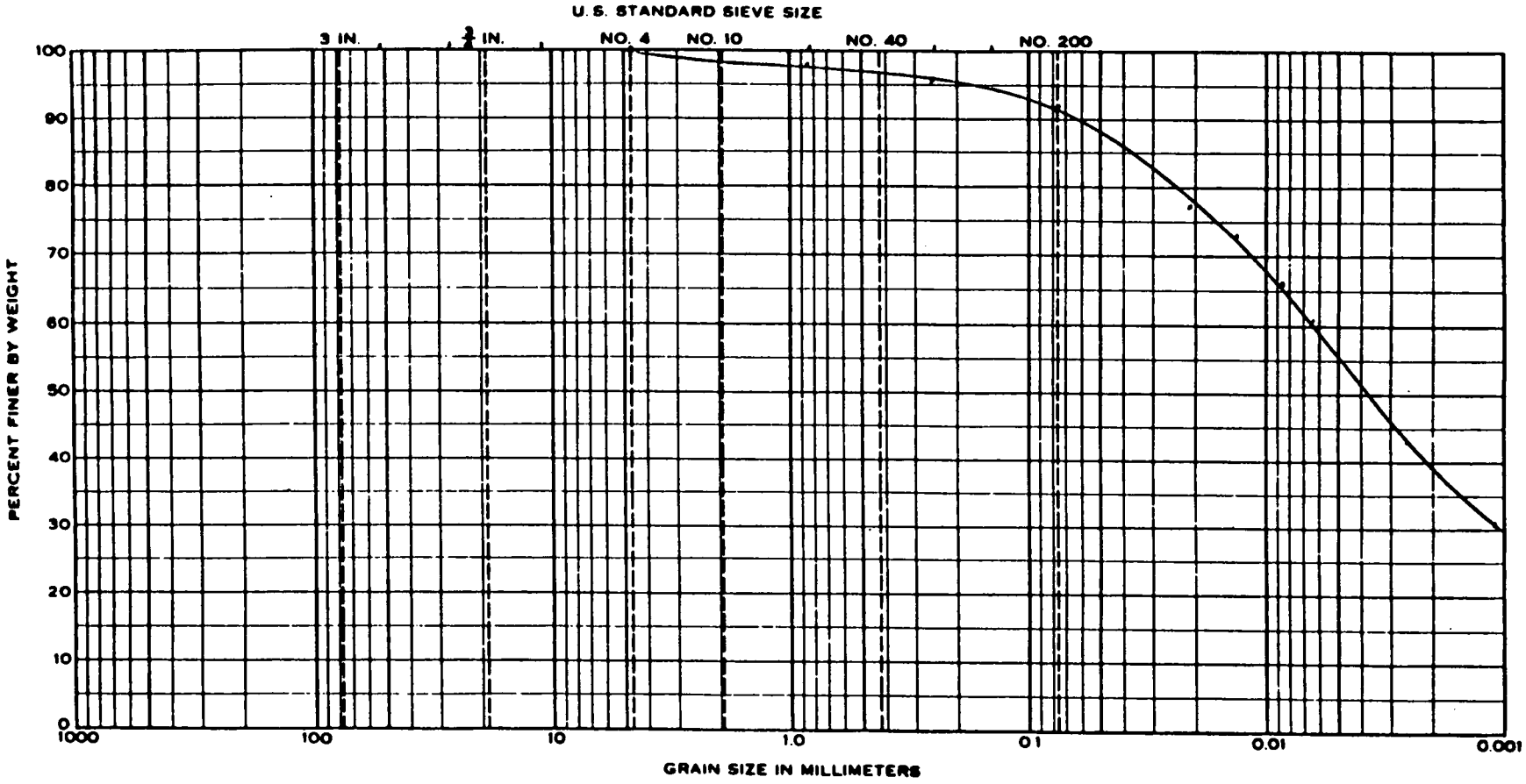
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	7.50	.00	.00	.00	cc
LENGTH (L):	3.11	.00	.00	.00	in
AREA (A):	6.22	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	600.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	7.286E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI
Test Pad #1	4 Passes	Compacted Fill	19.5	37	23	14

GRADATION CURVES

Project Glynn Geotechnical
Conastoga Rovers Association

Date J-ly 8, 1987 JOB NO. 87C165-01

J & L TESTING COMPANY, INC.

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT: GLYNN GEOTECHNICAL
PROJECT LOCATION: CONASTOGA ROVERS
SAMPLE NO.: TEST PAD 1
DESCRIPTION: 6 PASSES
COMPACTED FILL
CLAY

DATE: JULY 8 1987
JOB No.: 87C165-01

CELL NO.: 5 FLUID: WATER B-Parameter: 1.0

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	3.094	in	FINAL HEIGHT:	3.080	in
INITIAL DIAMETER:	2.8450	in	FINAL DIAMETER:	2.8800	in
INITIAL WET WEIGHT:	676.2	gm	FINAL WET WEIGHT:	687.3	gm
WET DENSITY =	130.9	pcf	WET DENSITY :	130.4	pcf
MOISTURE CONTENT:	20.1	%	MOISTURE CONTENT:	18.3	%
DRY DENSITY:	108.9	pcf	DRY DENSITY:	110.2	pcf
INITIAL SATURATION:	106.1	%	FINAL SATURATION:	99.9	%
INITIAL VOID RATIO:	.494912		FINAL VOID RATIO:	.477500	

TEST PARAMETERS.....

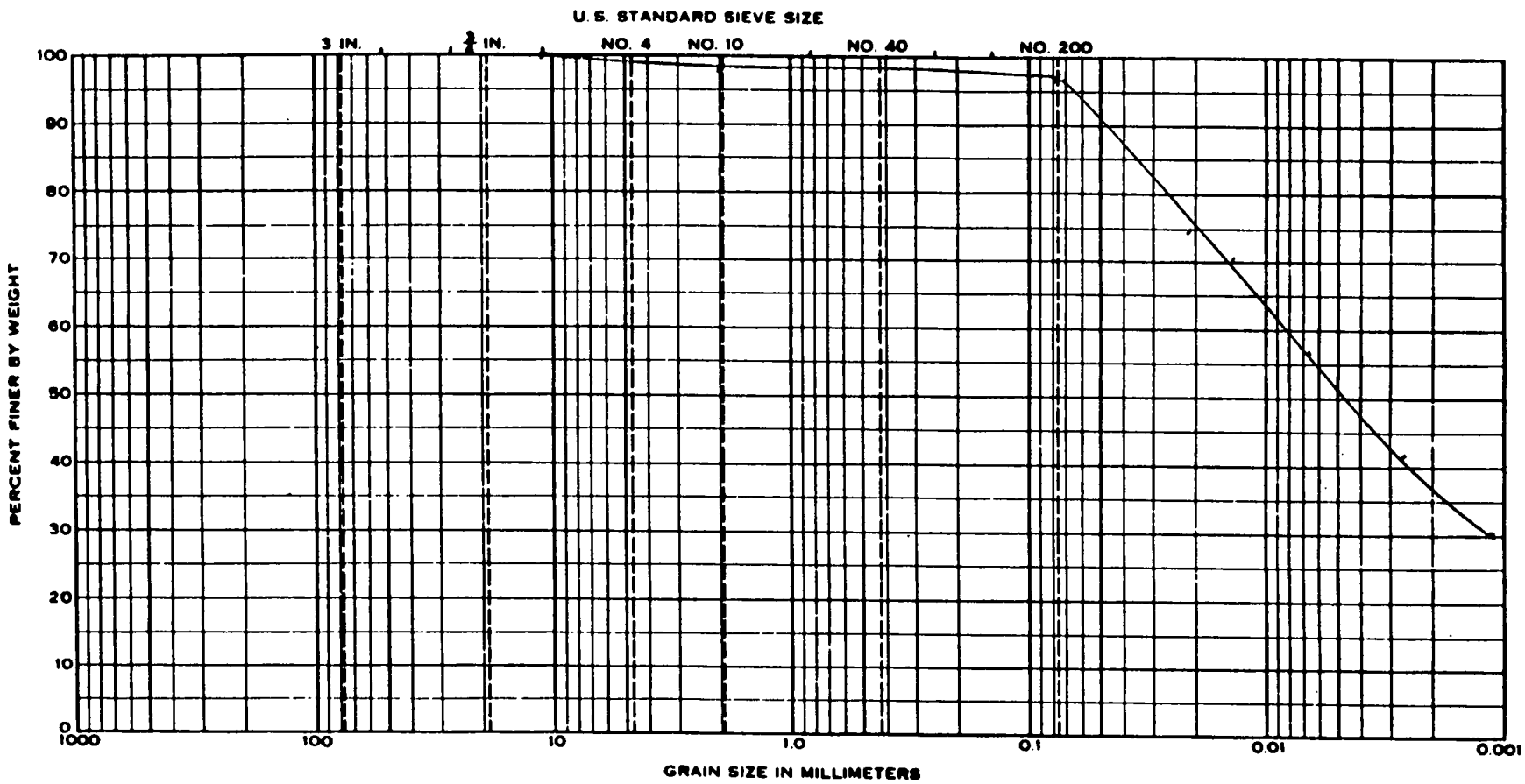
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	3.20	.00	.00	.00	cc
LENGTH (L):	3.08	.00	.00	.00	in
AREA (A):	6.51	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	800.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	2.206E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI	
Test Pad #1	6 Passes	Compacted Fill	20.1	39	22	17	

GRADATION CURVES

Project Glynn Geotechnical

Conastoga Rovers Association

Date July 8, 1987 JOB No. 87C165-01

J & L TESTING COMPANY, INC.

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL
PROJECT LOCATION:CONASTOGA ROVERS
SAMPLE NO.:TEST PAD 2
DESCRIPTION:6 PASSES
COMPACTED FILL
CLAY

DATE:JULY 8 1987
JOB No.:87C165-01

CELL NO.:6 FLUID:WATER B-Parameter:1.0

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	2.543	in	FINAL HEIGHT:	2.530	in
INITIAL DIAMETER:	2.8350	in	FINAL DIAMETER:	2.8500	in
INITIAL WET WEIGHT:	510.0	gm	FINAL WET WEIGHT:	541.0	gm
WET DENSITY =	120.9	pcf	WET DENSITY :	127.6	pcf
MOISTURE CONTENT:	18.3	%	MOISTURE CONTENT:	23.8	%
DRY DENSITY:	102.2	pcf	DRY DENSITY:	103.1	pcf
INITIAL SATURATION:	75.5	%	FINAL SATURATION:	100.0	%
INITIAL VOID RATIO:	.660998		FINAL VOID RATIO:	.646849	

TEST PARAMETERS.....

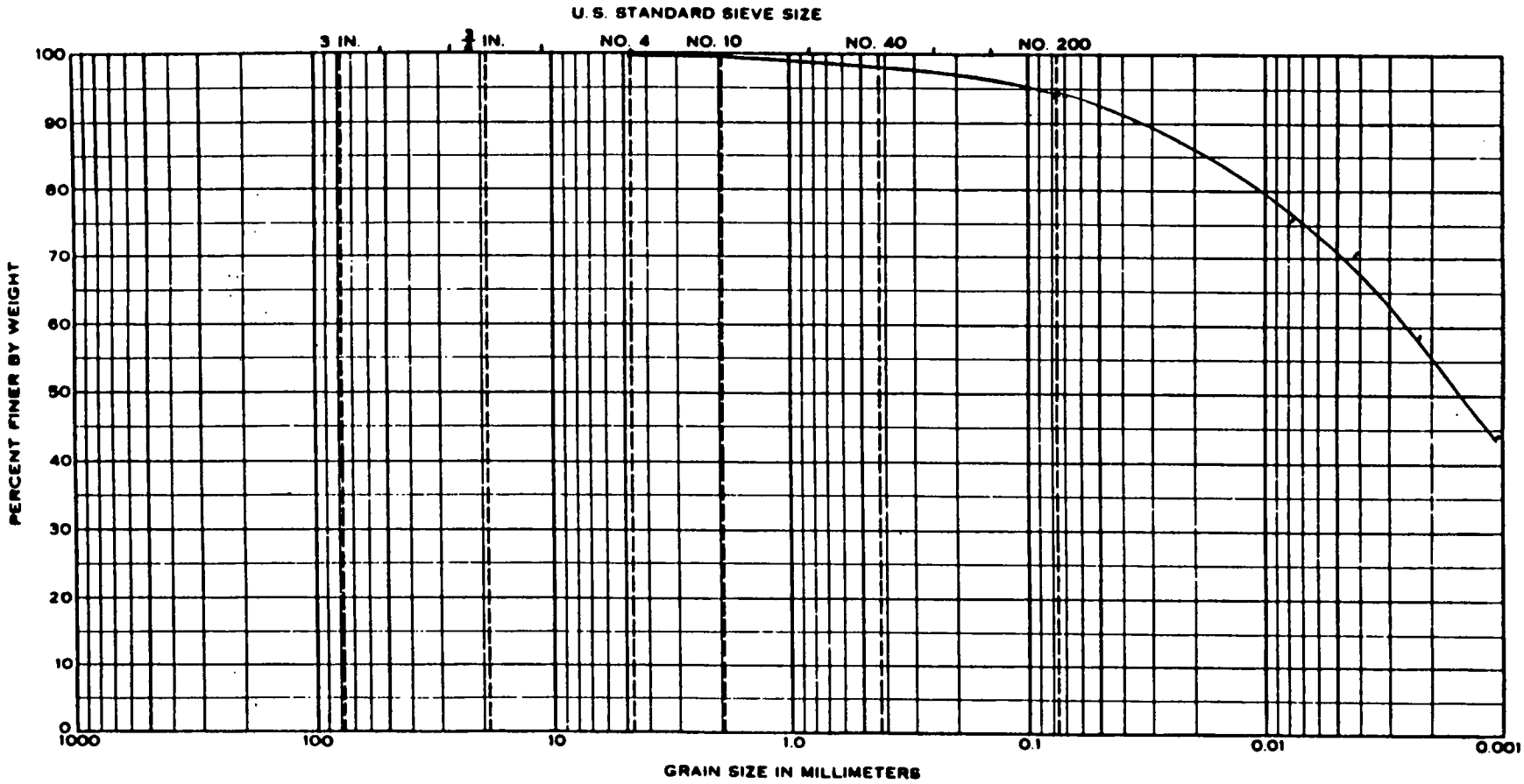
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	1.90	.00	.00	.00	cc
LENGTH (L):	2.53	.00	.00	.00	in
AREA (A):	6.38	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	800.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	1.099E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Elev or Depth	Classification	NatWC	LL	PL	PI
Test Pad #2	6 Passes	Compacted Fill	18.3	44	22	22

GRADATION CURVES

Project Glynn Geotechnical
Conastoga Rovers Association

Date July 8, 1987 JOB No. 87C165-01

J & L TESTING COMPANY, INC.

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT: GLYNN GEOTECHNICAL
PROJECT LOCATION: CONASTOGA ROVERS
SAMPLE NO.: TEST PAD 2
DESCRIPTION: 8 PASSES
COMPACTED FILL
CLAY

DATE: JULY 8 1987
JOB No.: 87C165-01

CELL NO.: 7 FLUID: WATER B-Parameter: 1.0

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	3.529	in	FINAL HEIGHT:	3.496	in
INITIAL DIAMETER:	2.8310	in	FINAL DIAMETER:	2.8300	in
INITIAL WET WEIGHT:	719.5	gm	FINAL WET WEIGHT:	747.1	gm
WET DENSITY =	123.3	pcf	WET DENSITY :	129.3	pcf
MOISTURE CONTENT:	20.4	%	MOISTURE CONTENT:	20.4	%
DRY DENSITY:	102.4	pcf	DRY DENSITY:	107.4	pcf
INITIAL SATURATION:	87.3	%	FINAL SATURATION:	99.5	%
INITIAL VOID RATIO:	.620775		FINAL VOID RATIO:	.545724	

TEST PARAMETERS.....

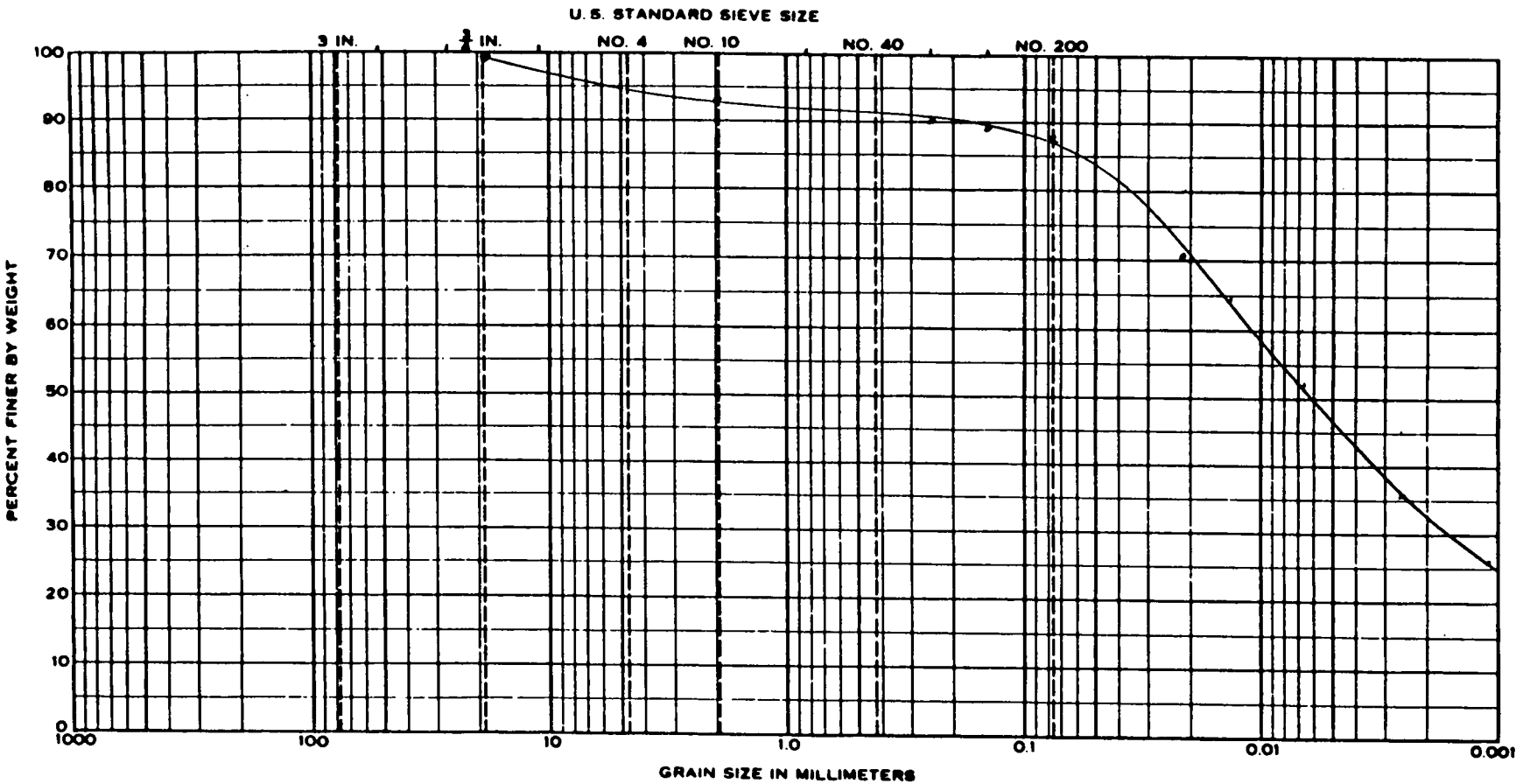
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	1.50	.00	.00	.00	cc
LENGTH (L):	3.50	.00	.00	.00	in
AREA (A):	6.29	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	800.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	1.216E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI
Test Pad #2	8 Passes	Compacted Fill	20.4	37	21	16

GRADATION CURVES

Project Glynn Geotechnical

Conastoga Rovers Association

Date July 8, 1987 JOB No. 87C165-01

J & L TESTING COMPANY, INC.

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL
PROJECT LOCATION:CONASTOGA ROVERS
SAMPLE NO.:1B
DESCRIPTION:COMPACTED FILL

DATE:JULY 19 1987
JOB No.:87C165-02

CELL NO.:7 FLUID:WATER B-Parameter:1.0

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	2.900	in	FINAL HEIGHT:	2.890	in
INITIAL DIAMETER:	2.8700	in	FINAL DIAMETER:	2.9000	in
INITIAL WET WEIGHT:	632.5	gm	FINAL WET WEIGHT:	652.0	gm
WET DENSITY =	128.3	pcf	WET DENSITY :	130.0	pcf
MOISTURE CONTENT:	16.5	%	MOISTURE CONTENT:	19.2	%
DRY DENSITY:	110.2	pcf	DRY DENSITY:	109.1	pcf
INITIAL SATURATION:	88.4	%	FINAL SATURATION:	100.0	%
INITIAL VOID RATIO:	.489302		FINAL VOID RATIO:	.504750	

TEST PARAMETERS.....

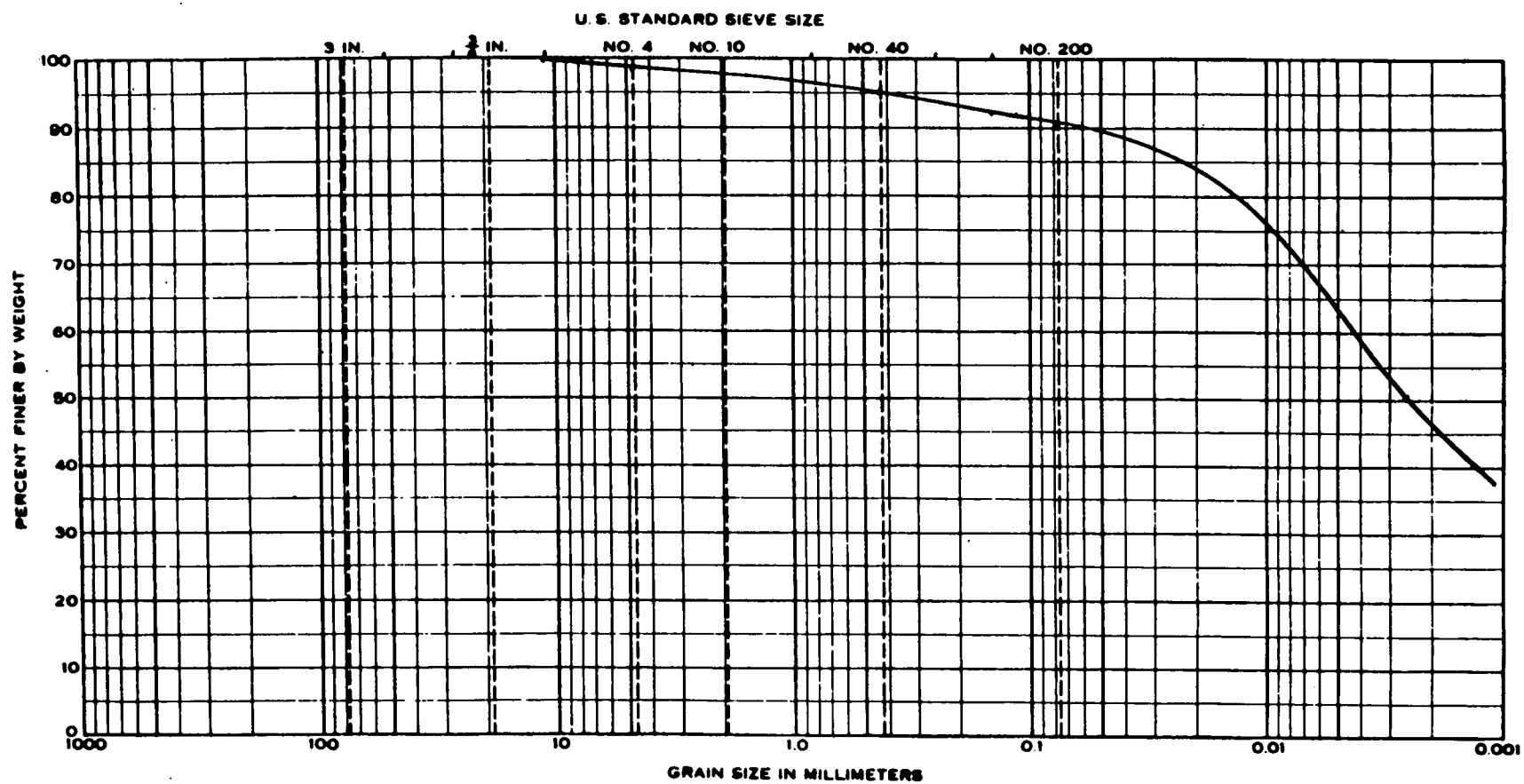
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	.69	.00	.00	.00	cc
LENGTH (L):	2.89	.00	.00	.00	in
AREA (A):	6.61	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	200.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	1.761E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



COBBLES	GRAVEL		SAND			SILT OR CLAY
	Coarse	Fine	Coarse	Medium	Fine	

Sample No.	Elev or Depth	Classification	NatWC	LL	PL	PI
1B	Tube		16.5	43	22	21

GRADATION CURVES

Project Glynn Geotechnical

Ⅴ Chem.

Conastoga Rovers

Date July 23 1987 JOB No. 87C165-02

J & L TESTING COMPANY, INC.
Materials Testing

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL
PROJECT LOCATION:V M CHEM
SAMPLE NO.:2B
DESCRIPTION:COMPACTED FILL
TUBE SAMPLE

DATE:JULY 26 1987
JOB No.:87C165-03

CELL NO.:29 FLUID:WATER B-Parameter:0.98

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	4.341	in	FINAL HEIGHT:	4.340	in
INITIAL DIAMETER:	2.8460	in	FINAL DIAMETER:	2.8450	in
INITIAL WET WEIGHT:	916.5	gm	FINAL WET WEIGHT:	941.2	gm
WET DENSITY =	126.3	pcf	WET DENSITY :	129.8	pcf
MOISTURE CONTENT:	19.5	%	MOISTURE CONTENT:	22.5	%
DRY DENSITY:	105.7	pcf	DRY DENSITY:	106.0	pcf
INITIAL SATURATION:	86.0	%	FINAL SATURATION:	100.0	%
INITIAL VOID RATIO:	.623357		FINAL VOID RATIO:	.618927	

TEST PARAMETERS.....

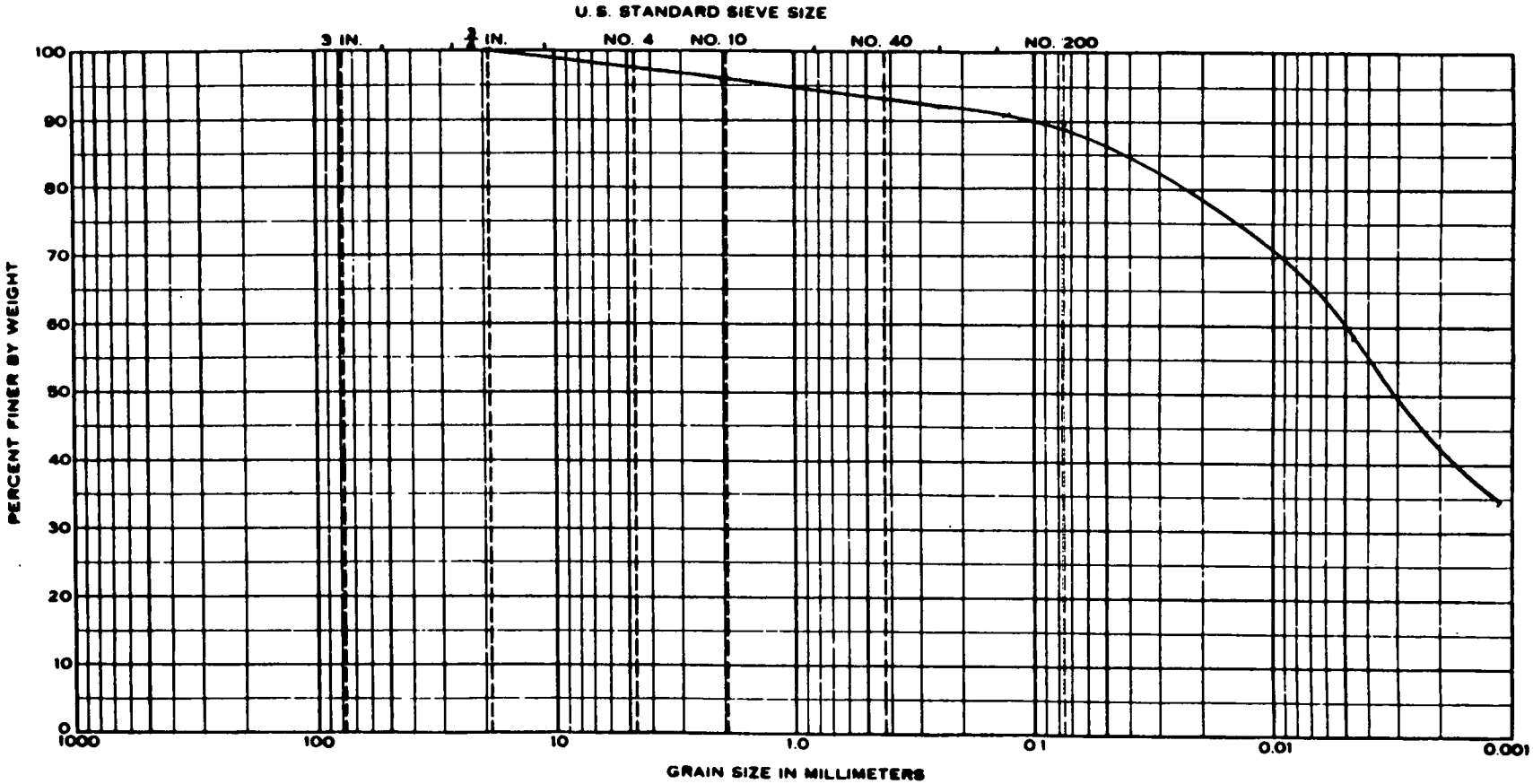
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	3.20	.00	.00	.00	cc
LENGTH (L):	4.34	.00	.00	.00	in
AREA (A):	6.36	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	500.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	5.097E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec.



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI
2B	Tube	Br. Silty CLAY w/ Little F. Sand CL	19.5	37	20	17

GRADATION CURVES

Project Glynn Geotechnical Engrg
V. M. Chemical

Date July 30, 1987 JOB No. 87C165-03

J & L TESTING COMPANY, INC.
Materials Testing

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL
PROJECT LOCATION:V M CHEM
SAMPLE NO.:3A
DESCRIPTION:COMPACTED FILL
TUBE SAMPLE

DATE:JULY 26 1987
JOB No.:87C165-04

CELL NO.:27 FLUID:WATER B-Parameter:.98

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	3.295	in	FINAL HEIGHT:	3.289	in
INITIAL DIAMETER:	2.8850	in	FINAL DIAMETER:	2.8800	in
INITIAL WET WEIGHT:	706.4	gm	FINAL WET WEIGHT:	734.6	gm
WET DENSITY =	124.8	pcf	WET DENSITY :	130.5	pcf
MOISTURE CONTENT:	15.8	%	MOISTURE CONTENT:	20.8	%
DRY DENSITY:	107.8	pcf	DRY DENSITY:	108.0	pcf
INITIAL SATURATION:	75.8	%	FINAL SATURATION:	100.4	%
INITIAL VOID RATIO:	.562985		FINAL VOID RATIO:	.559606	

TEST PARAMETERS.....

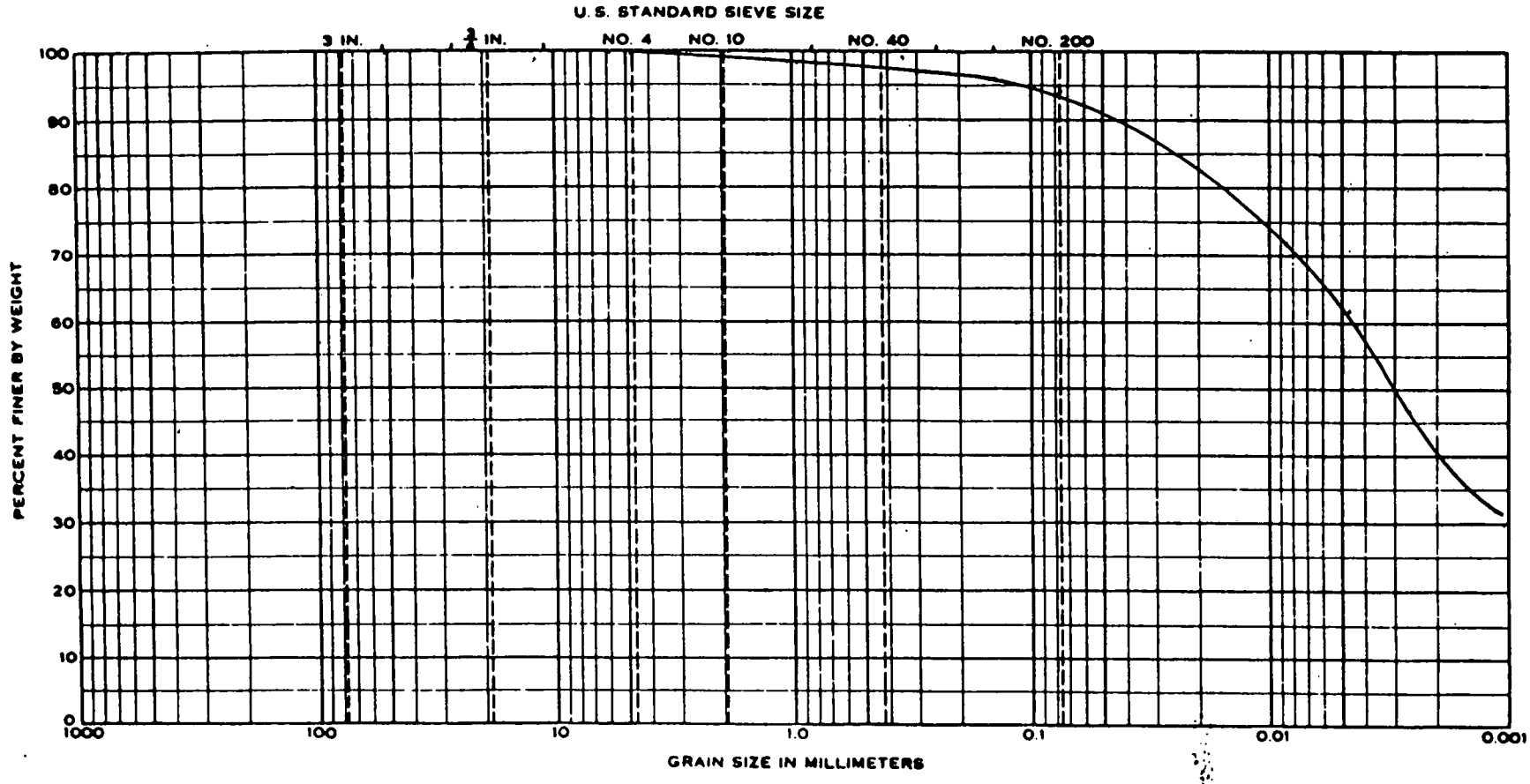
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	1.70	.00	.00	.00	cc
LENGTH (L):	3.29	.00	.00	.00	in
AREA (A):	6.51	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	500.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	2.003E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI	
3A	TUBE	CL	15.8	39	20	19	

GRADATION CURVES

Project Glynn Geotechnical Engineering

V. M. Chemicals

Date july 26, 1987 JOB No. 87C165-04

J & L TESTING COMPANY, INC.

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL
PROJECT LOCATION:CONASTOGA ROVERS
SAMPLE NO.:4A
DESCRIPTION:COMPACTED FILL

DATE:JULY 19 1987
JOB No.:87C165-02

CELL NO.:6 FLUID:WATER B-Parameter:.99

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	4.100	in	FINAL HEIGHT:	4.077	in
INITIAL DIAMETER:	2.8760	in	FINAL DIAMETER:	2.8750	in
INITIAL WET WEIGHT:	911.4	gm	FINAL WET WEIGHT:	932.5	gm
WET DENSITY =	130.2	pcf	WET DENSITY :	134.1	pcf
MOISTURE CONTENT:	17.7	%	MOISTURE CONTENT:	17.0	%
DRY DENSITY:	110.7	pcf	DRY DENSITY:	114.6	pcf
INITIAL SATURATION:	93.3	%	FINAL SATURATION:	100.1	%
INITIAL VOID RATIO:	.505147		FINAL VOID RATIO:	.453620	

TEST PARAMETERS.....

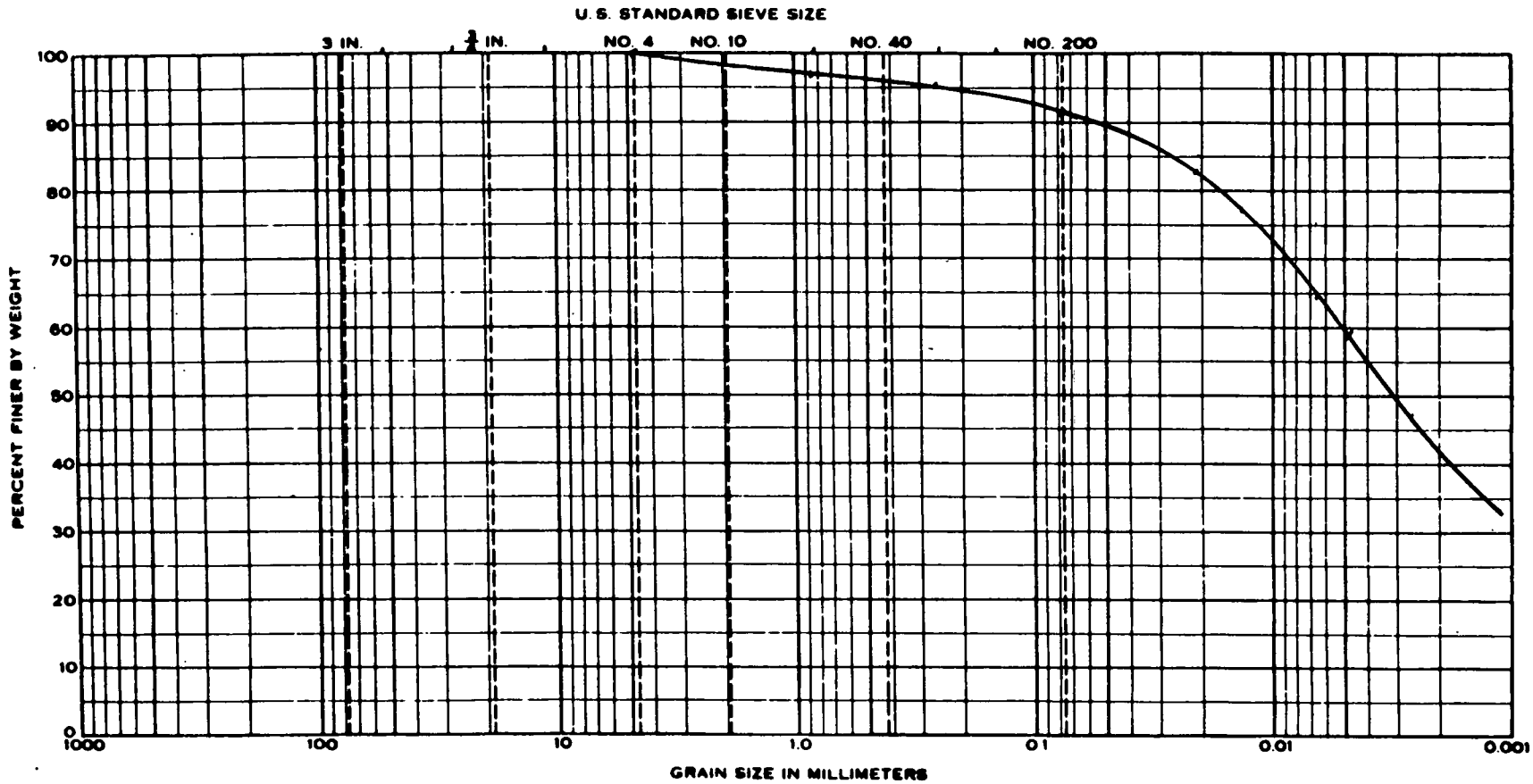
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	1.20	.00	.00	.00	cc
LENGTH (L):	4.08	.00	.00	.00	in
AREA (A):	6.49	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	200.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	4.395E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI	
4A	Tube		17.7	38	20	18	

GRADATION CURVES

Project Glynn Geotechnical

V Chem

Conastoga Rovers

Date July 23 1987 JOB No. 87C165-02

J & L TESTING COMPANY, INC.
Materials Testing

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL
PROJECT LOCATION:V M CHEM
SAMPLE NO.:5B
DESCRIPTION:COMPACTED FILL
TUBE SAMPLE

DATE:JULY 26 1987
JOB No.:87C165-03

CELL NO.:30 FLUID:WATER B-Parameter:0.98

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	3.148	in.	FINAL HEIGHT:	3.145	in
INITIAL DIAMETER:	2.8470	in	FINAL DIAMETER:	2.8460	in
INITIAL WET WEIGHT:	678.2	gm	FINAL WET WEIGHT:	690.7	gm
WET DENSITY =	128.8	pcf	WET DENSITY :	131.4	pcf
MOISTURE CONTENT:	18.5	%	MOISTURE CONTENT:	20.8	%
DRY DENSITY:	108.7	pcf	DRY DENSITY:	108.8	pcf
INITIAL SATURATION:	88.5	%	FINAL SATURATION:	99.7	%
INITIAL VOID RATIO:	.572921		FINAL VOID RATIO:	.571827	

TEST PARAMETERS.....

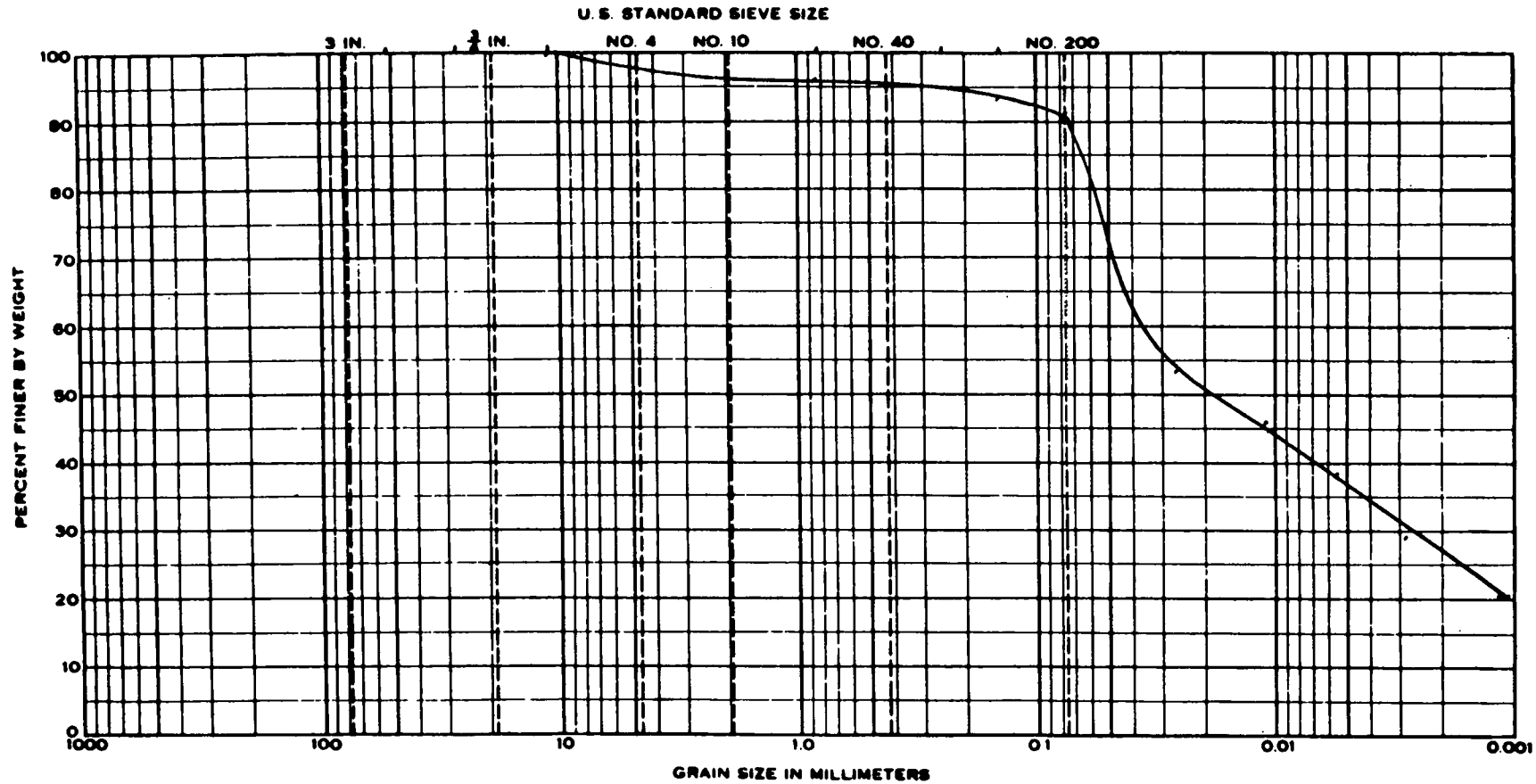
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	2.15	.00	.00	.00	cc
LENGTH (L):	3.15	.00	.00	.00	in
AREA (A):	6.36	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	500.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	2.480E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI
B	Tube	Br. Silty CLAY w/ Littel Sand CL	18.5	34	19	15

GRADATION CURVES

Project: Glynn Geotechnical Engrg
V.M. Chemical

Date: July 30, 1987 JOB No. 87C165-03

J & L TESTING COMPANY, INC.
Materials Testing

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL
PROJECT LOCATION:V M CHEM
SAMPLE NO.:6A
DESCRIPTION:COMPACTED FILL
TUBE SAMPLE

DATE:JULY 26 1987
JOB No.:87C165-04

CELL NO.:28 FLUID:WATER B-Parameter:.99

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	4.305	in	FINAL HEIGHT:	4.300	in
INITIAL DIAMETER:	2.8440	in	FINAL DIAMETER:	2.8430	in
INITIAL WET WEIGHT:	940.1	gm	FINAL WET WEIGHT:	951.0	gm
WET DENSITY =	130.8	pcf	WET DENSITY :	132.6	pcf
MOISTURE CONTENT:	19.8	%	MOISTURE CONTENT:	20.5	%
DRY DENSITY:	109.2	pcf	DRY DENSITY:	110.0	pcf
INITIAL SATURATION:	95.3	%	FINAL SATURATION:	100.8	%
INITIAL VOID RATIO:	.571209		FINAL VOID RATIO:	.559364	

TEST PARAMETERS.....

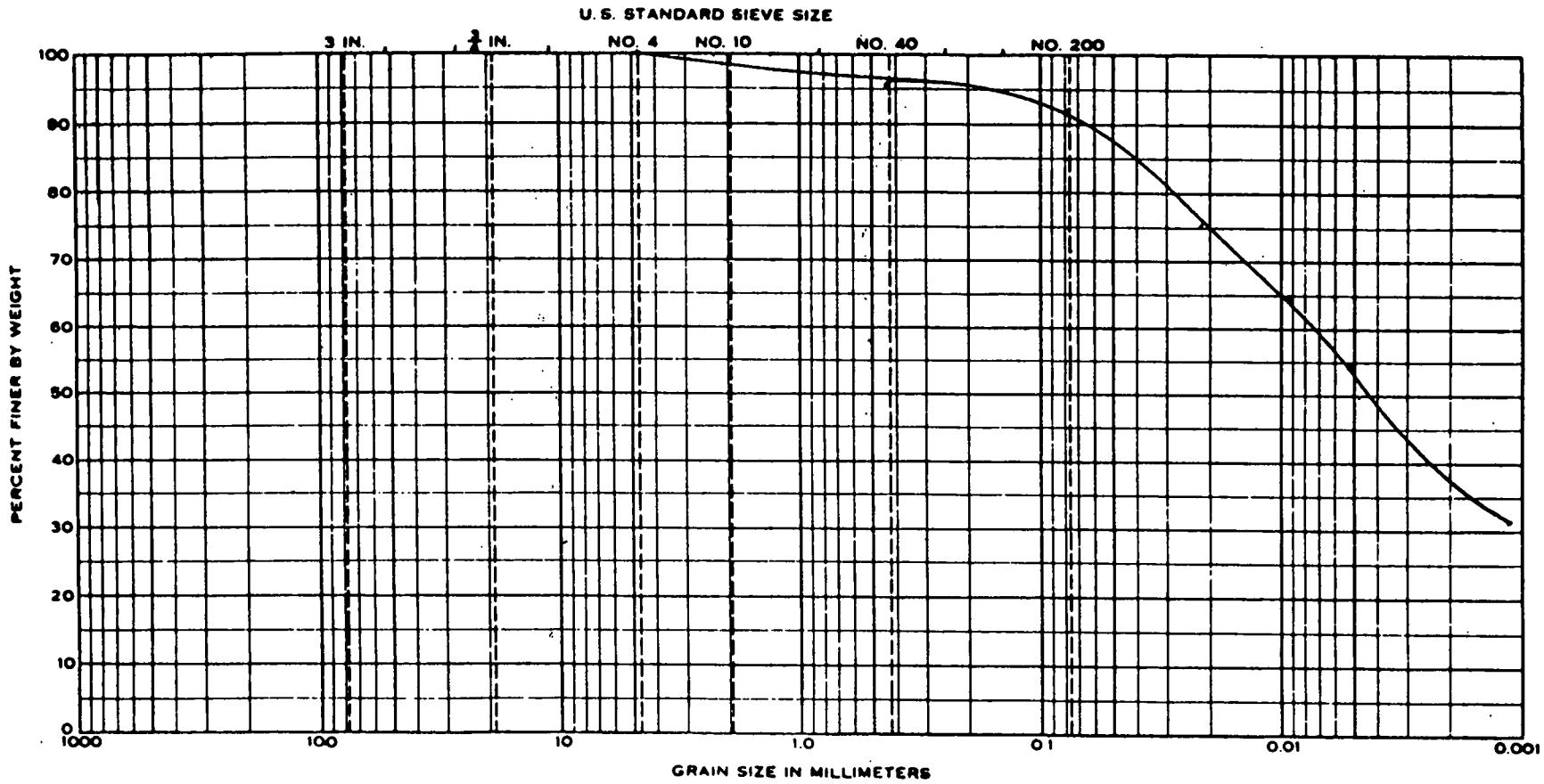
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	3.60	.00	.00	.00	cc
LENGTH (L):	4.30	.00	.00	.00	in
AREA (A):	6.35	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	500.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	5.689E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI	
6A	TUBE	CL	19.8	36	17	19	

Project Glynn Geotechnical Engineering

V. M. Chemicals

GRADATION CURVES

Date July 26, 1987 Job No. 87C165-04

J & L TESTING COMPANY, INC.

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL
PROJECT LOCATION:CONASTOGA ROVERS
SAMPLE NO.:7A
DESCRIPTION:COMPACTED FILL

DATE:JULY 19 1987
JOB No.:87C165-02

CELL NO.:5 FLUID:WATER B-Parameter:0.99

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	4.200	in	FINAL HEIGHT:	4.199	in
INITIAL DIAMETER:	2.8600	in	FINAL DIAMETER:	2.8600	in
INITIAL WET WEIGHT:	900.2	gm	FINAL WET WEIGHT:	938.4	gm
WET DENSITY =	127.0	pcf	WET DENSITY :	132.4	pcf
MOISTURE CONTENT:	14.9	%	MOISTURE CONTENT:	16.7	%
DRY DENSITY:	110.5	pcf	DRY DENSITY:	113.5	pcf
INITIAL SATURATION:	82.8	%	FINAL SATURATION:	100.9	%
INITIAL VOID RATIO:	.467986		FINAL VOID RATIO:	.429458	

TEST PARAMETERS.....

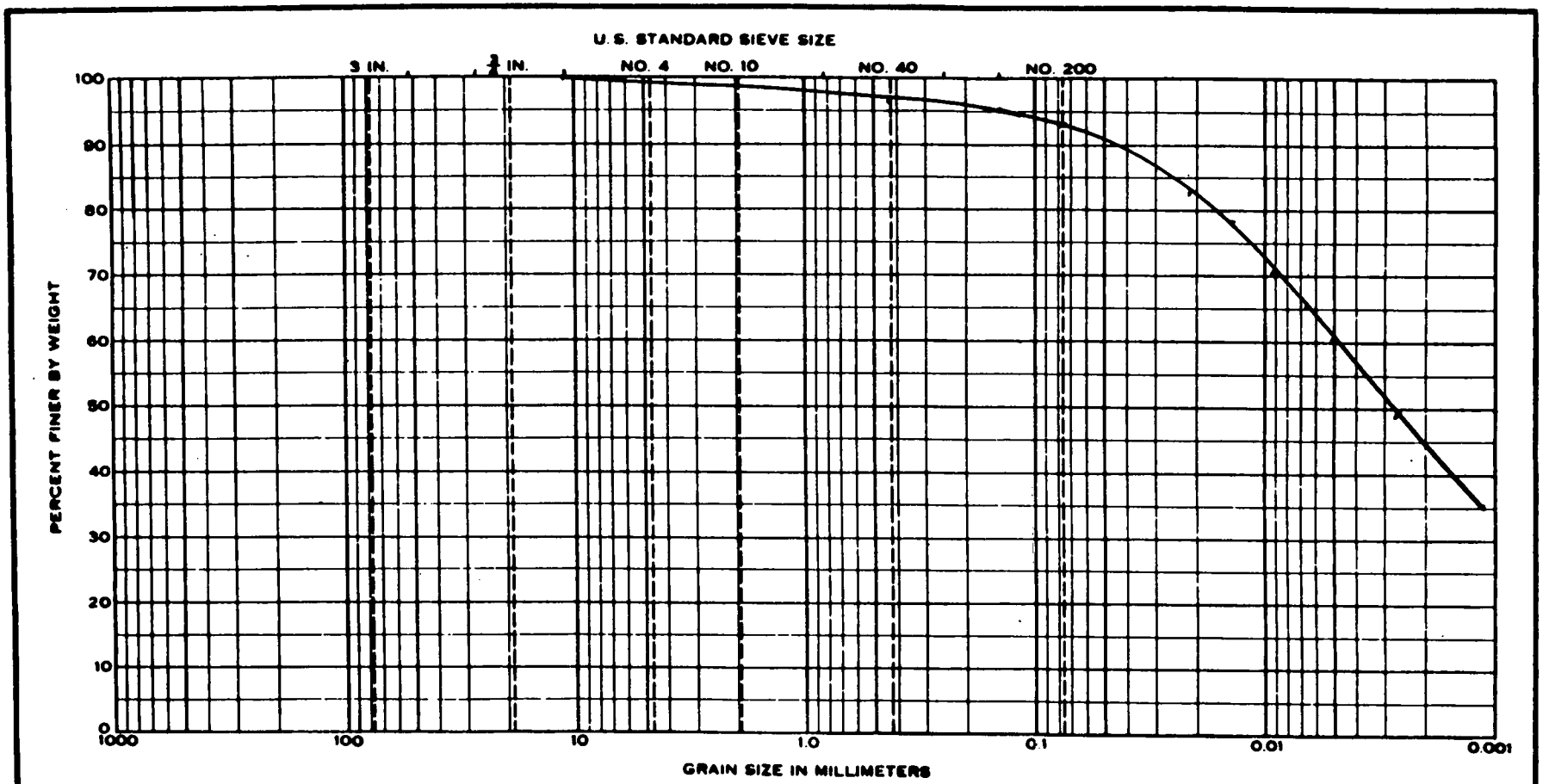
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	1.21	.00	.00	.00	cc
LENGTH (L):	4.20	.00	.00	.00	in
AREA (A):	6.42	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	200.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	4.613E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	NatWC	LL	PL	PI	
7A	Tube		14.9	45	24	21	

GRADATION CURVES

Project Glynn Geotechnical

V Chem

Conastoga Rovers

Date July 23 1987 JOB No. 87C165-02

J & L TESTING COMPANY, INC.
Materials Testing

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL ENGINEERING
PROJECT LOCATION:V M CHEMICAL
SAMPLE NO.:8B
DESCRIPTION:COMPACTED FILL
TUBE SAMPLE
CL

DATE:JULY 28 1987
JOB No.:87C165-03

CELL NO.:1 FLUID:WATER B-Parameter:0.99

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	3.246	in	FINAL HEIGHT:	3.195	in
INITIAL DIAMETER:	2.8450	in	FINAL DIAMETER:	2.8440	in
INITIAL WET WEIGHT:	696.9	gm	FINAL WET WEIGHT:	708.5	gm
WET DENSITY =	128.5	pcf	WET DENSITY :	132.9	pcf
MOISTURE CONTENT:	17.0	%	MOISTURE CONTENT:	20.2	%
DRY DENSITY:	109.8	pcf	DRY DENSITY:	110.6	pcf
INITIAL SATURATION:	83.3	%	FINAL SATURATION:	100.4	%
INITIAL VOID RATIO:	.562279		FINAL VOID RATIO:	.551790	

TEST PARAMETERS.....

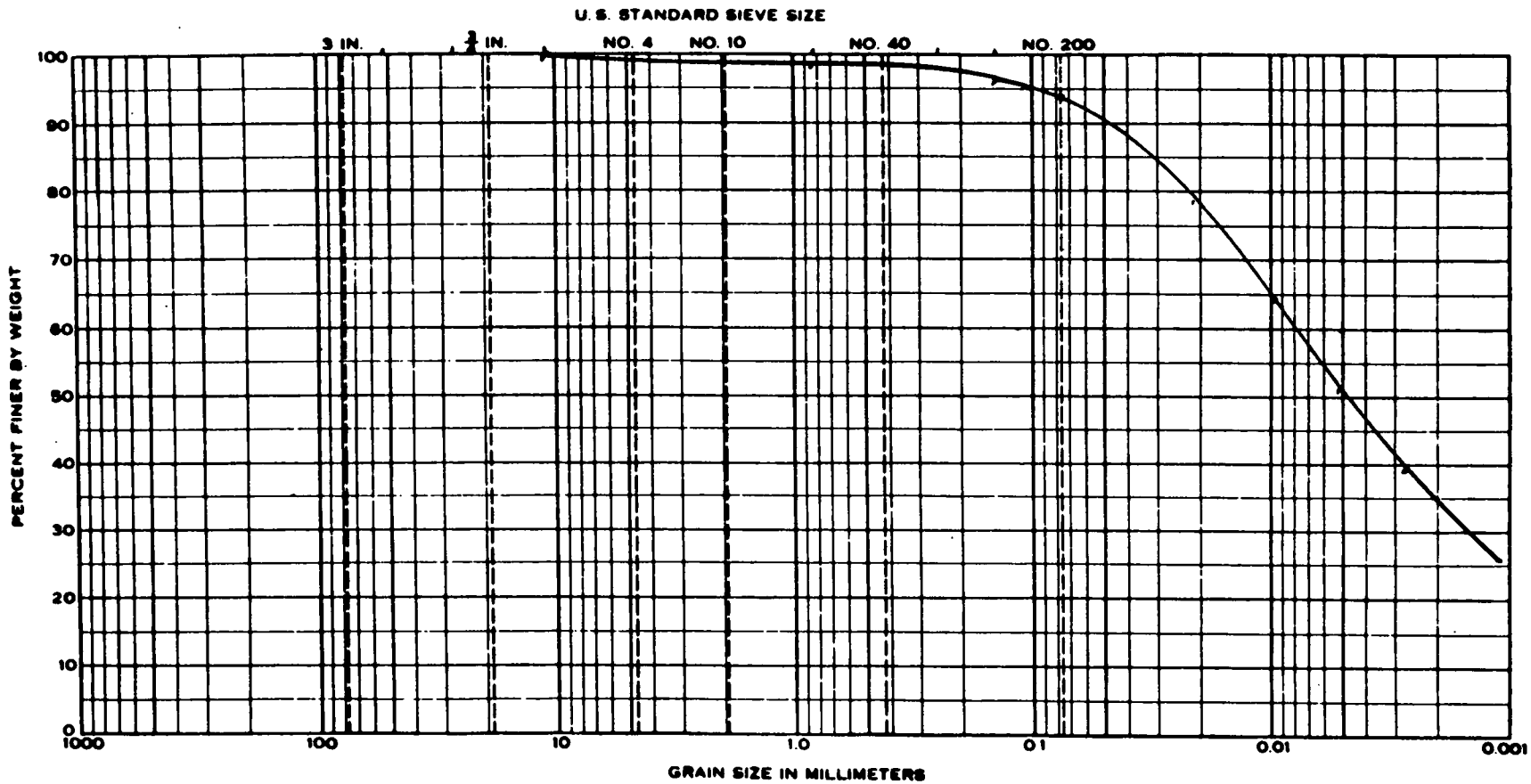
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	5.70	.00	.00	.00	cc
LENGTH (L):	3.20	.00	.00	.00	in
AREA (A):	6.35	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	800.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	4.180E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI
8B	Tube	Br. Silty CLAY CL	17.0	36	19	17

GRADATION CURVES

Project Glynn Geotechnical Engrg
V. M. Chemical

Date July 30, 1987 JOB No. 87C165-03

J & L TESTING COMPANY, INC.
Modernize Testing

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT: GLYNN GEOTECHNICAL
PROJECT LOCATION: V M CHEM
SAMPLE NO.: 9A
DESCRIPTION: COMPACTED FILL
PLASTIC SOIL
TUBE SAMPLE

DATE: JULY 29 1987
JOB No.: 87C165-04A

CELL NO.: 7 FLUID: WATER B-Parameter: 0.99

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	3.210	in	FINAL HEIGHT:	3.179	in
INITIAL DIAMETER:	2.8680	in	FINAL DIAMETER:	2.8700	in
INITIAL WET WEIGHT:	676.2	gm	FINAL WET WEIGHT:	696.1	gm
WET DENSITY =	124.1	pcf	WET DENSITY :	128.8	pcf
MOISTURE CONTENT:	18.2	%	MOISTURE CONTENT:	25.4	%
DRY DENSITY:	105.0	pcf	DRY DENSITY:	102.7	pcf
INITIAL SATURATION:	76.3	%	FINAL SATURATION:	101.0	%
INITIAL VOID RATIO:	.669930		FINAL VOID RATIO:	.706761	

TEST PARAMETERS.....

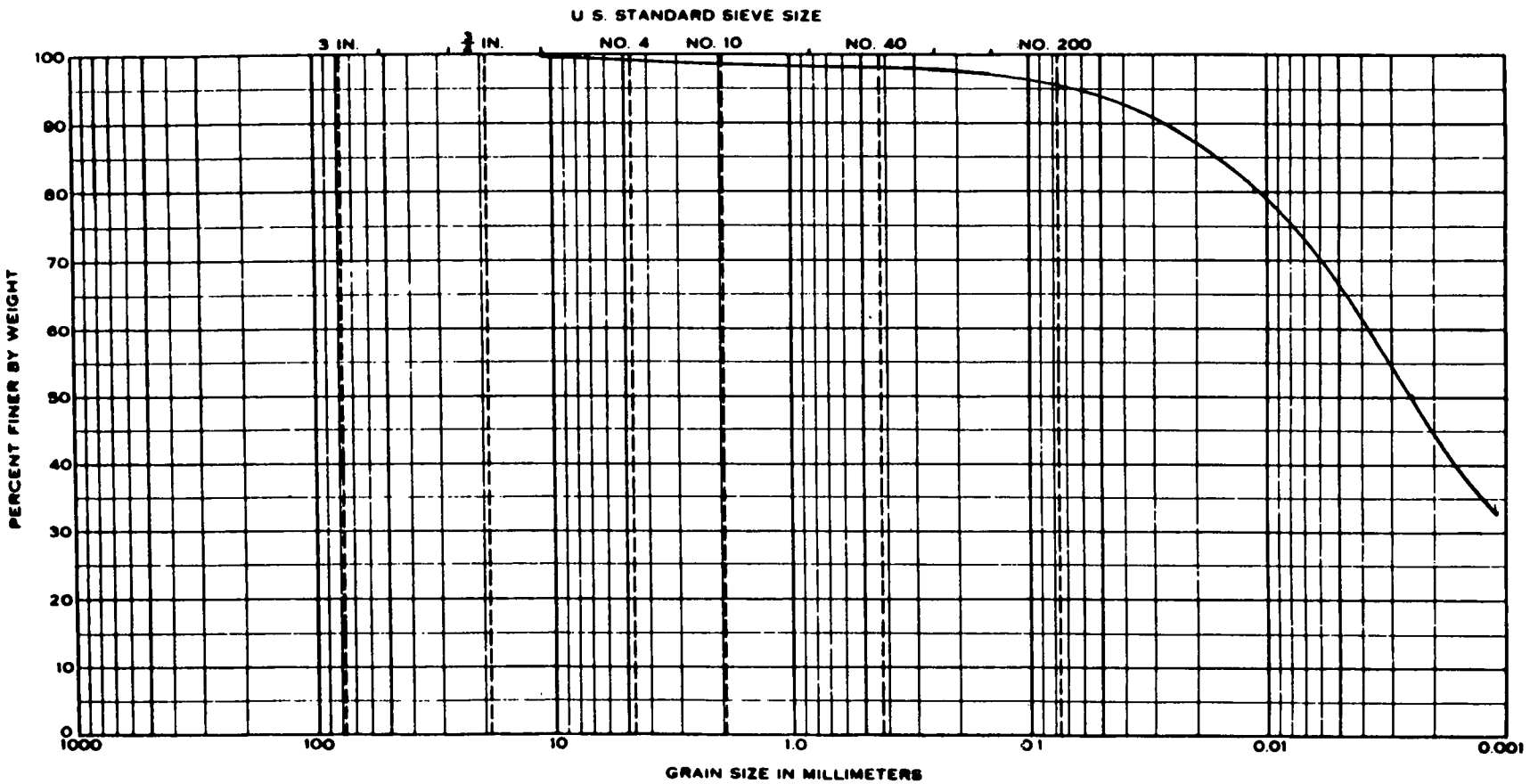
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	9.50	.00	.00	.00	cc
LENGTH (L):	3.18	.00	.00	.00	in
AREA (A):	6.47	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	500.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	1.089E-007	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI	
9A	Tube	Brown Plastic Silty CLAY CL	18.2	48	26	23	

GRADATION CURVES

Project Glynn Geotechnical Engrg

V.M. Chemical

Date July 29, 1987 JOB No. 87C165-04A

J & L TESTING COMPANY, INC.
Materials Testing

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL ENGINEERING
PROJECT LOCATION:V M CHEMICAL
SAMPLE NO.:10B
DESCRIPTION:COMPACTED FILL
TUBE SAMPLE
CL

DATE:JULY 28 1987
JOB No.:87C165-03

CELL NO.:8 FLUID:WATER B-Parameter:0.99

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	2.595	in	FINAL HEIGHT:	2.521	in
INITIAL DIAMETER:	2.8400	in	FINAL DIAMETER:	2.8290	in
INITIAL WET WEIGHT:	515.6	gm	FINAL WET WEIGHT:	532.7	gm
WET DENSITY =	119.4	pcf	WET DENSITY :	128.0	pcf
MOISTURE CONTENT:	15.6	%	MOISTURE CONTENT:	21.7	%
DRY DENSITY:	103.2	pcf	DRY DENSITY:	105.1	pcf
INITIAL SATURATION:	68.4	%	FINAL SATURATION:	99.8	%
INITIAL VOID RATIO:	.607819		FINAL VOID RATIO:	.578884	

TEST PARAMETERS.....

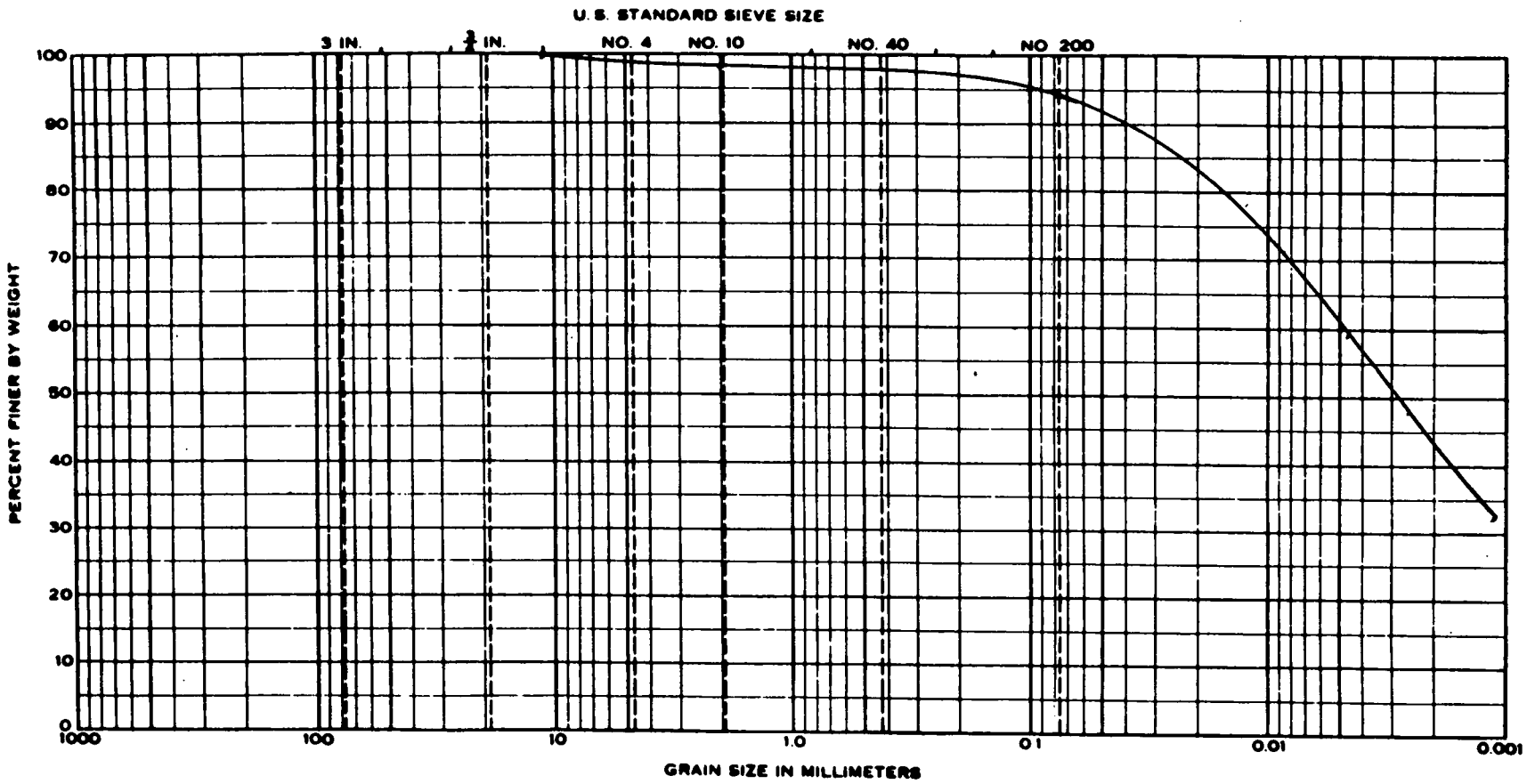
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	5.75	.00	.00	.00	cc
LENGTH (L):	2.52	.00	.00	.00	in
AREA (A):	6.29	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	800.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	3.362E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	NatWC	LL	PL	PI	
10B	Tube	Br. Silty CLAY CL	15.6	38	19	19	

GRADATION CURVES

Project Glynn Geotechnical Engrg
V.M. Chemical

Date July 30, 1987 JOB No. 87C165-03

J & L TESTING COMPANY, INC.
Materials Testing

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL ENGINEERING
PROJECT LOCATION:V M CHEMICAL
SAMPLE NO.:11B
DESCRIPTION:COMPACTED FILL
TUBE SAMPLE

DATE:JULY 28 1987
JOB No.:87C165-03

CELL NO.:5 FLUID:WATER B-Parameter:0.99

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	3.091	in	FINAL HEIGHT:	3.024	in
INITIAL DIAMETER:	2.8600	in	FINAL DIAMETER:	2.8120	in
INITIAL WET WEIGHT:	628.2	gm	FINAL WET WEIGHT:	643.3	gm
WET DENSITY =	120.4	pcf	WET DENSITY :	130.4	pcf
MOISTURE CONTENT:	18.2	%	MOISTURE CONTENT:	22.1	%
DRY DENSITY:	101.9	pcf	DRY DENSITY:	106.8	pcf
INITIAL SATURATION:	71.5	%	FINAL SATURATION:	97.8	%
INITIAL VOID RATIO:	.708562		FINAL VOID RATIO:	.630440	

TEST PARAMETERS.....

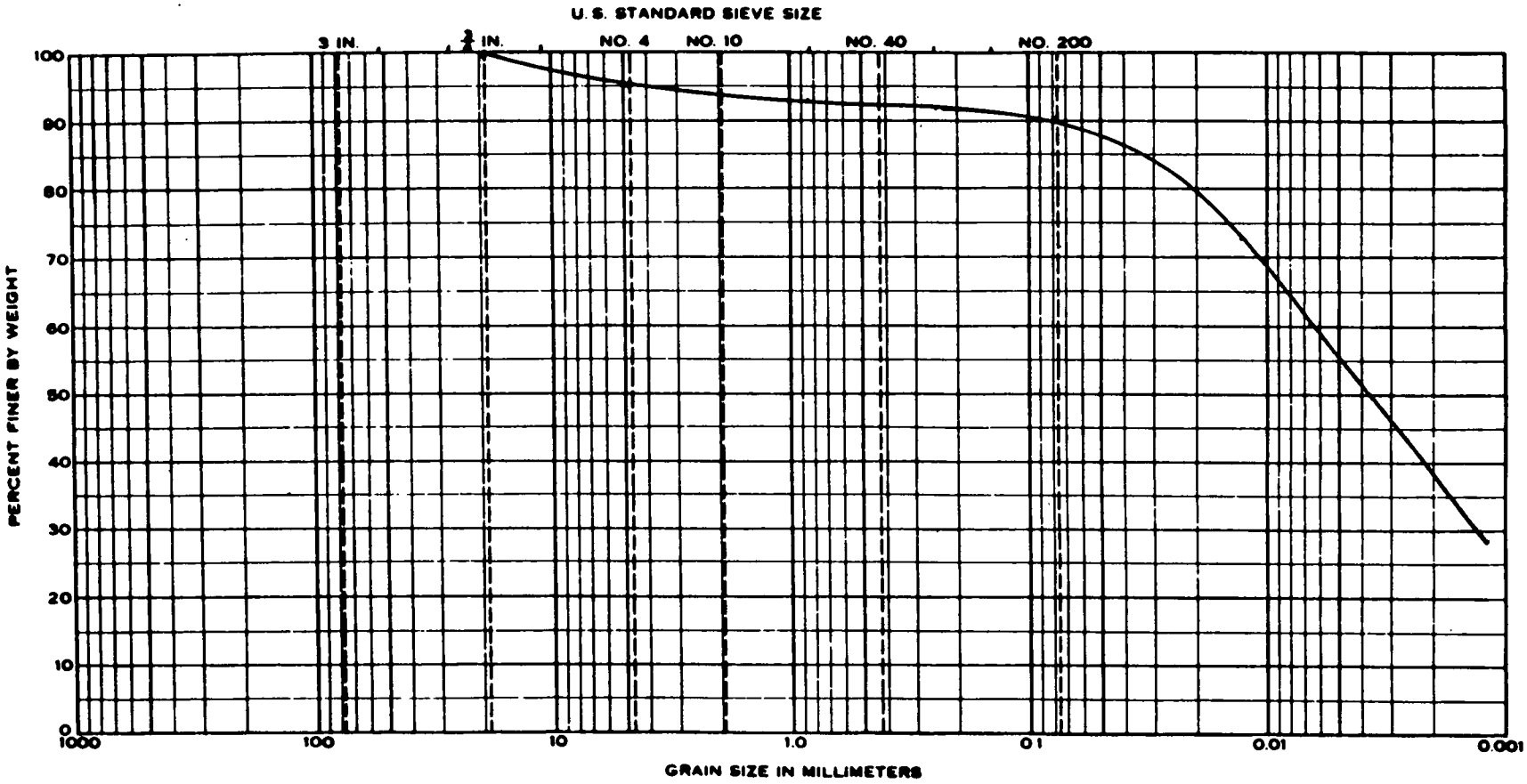
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	15.50	.00	.00	.00	cc
LENGTH (L):	3.02	.00	.00	.00	in
AREA (A):	6.21	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	400.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	2.201E-007	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI
11B	Tube	Br. Silty CLAY w/ Little F Sand CL	18.2	38	20	18

GRADATION CURVES

Project Glynn Geotechnical Engrg

V.M. Chemical

Date July 30, 1987 JOB No. 87C165-03

J & L TESTING COMPANY, INC.
Materials Testing

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT: GLYNN GEOTECHNICAL
PROJECT LOCATION: VAN DER MARK CHEMICAL
SAMPLE NO.: 10'E
DESCRIPTION: C2+80TUBE SAMPLE
COMPACTED FILL

DATE: AUG 10 1987
JOB No.: 87C165-05

CELL NO.: 3 FLUID: DEAIRED WATER B-Parameter: 1.0

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	4.240	in	FINAL HEIGHT:	4.163	in
INITIAL DIAMETER:	2.8100	in	FINAL DIAMETER:	2.7960	in
INITIAL WET WEIGHT:	801.2	gm	FINAL WET WEIGHT:	864.1	gm
WET DENSITY =	116.0	pcf	WET DENSITY :	128.7	pcf
MOISTURE CONTENT:	13.3	%	MOISTURE CONTENT:	22.2	%
DRY DENSITY:	102.4	pcf	DRY DENSITY:	105.3	pcf
INITIAL SATURATION:	55.6	%	FINAL SATURATION:	99.9	%
INITIAL VOID RATIO:	.645953		FINAL VOID RATIO:	.600066	

TEST PARAMETERS.....

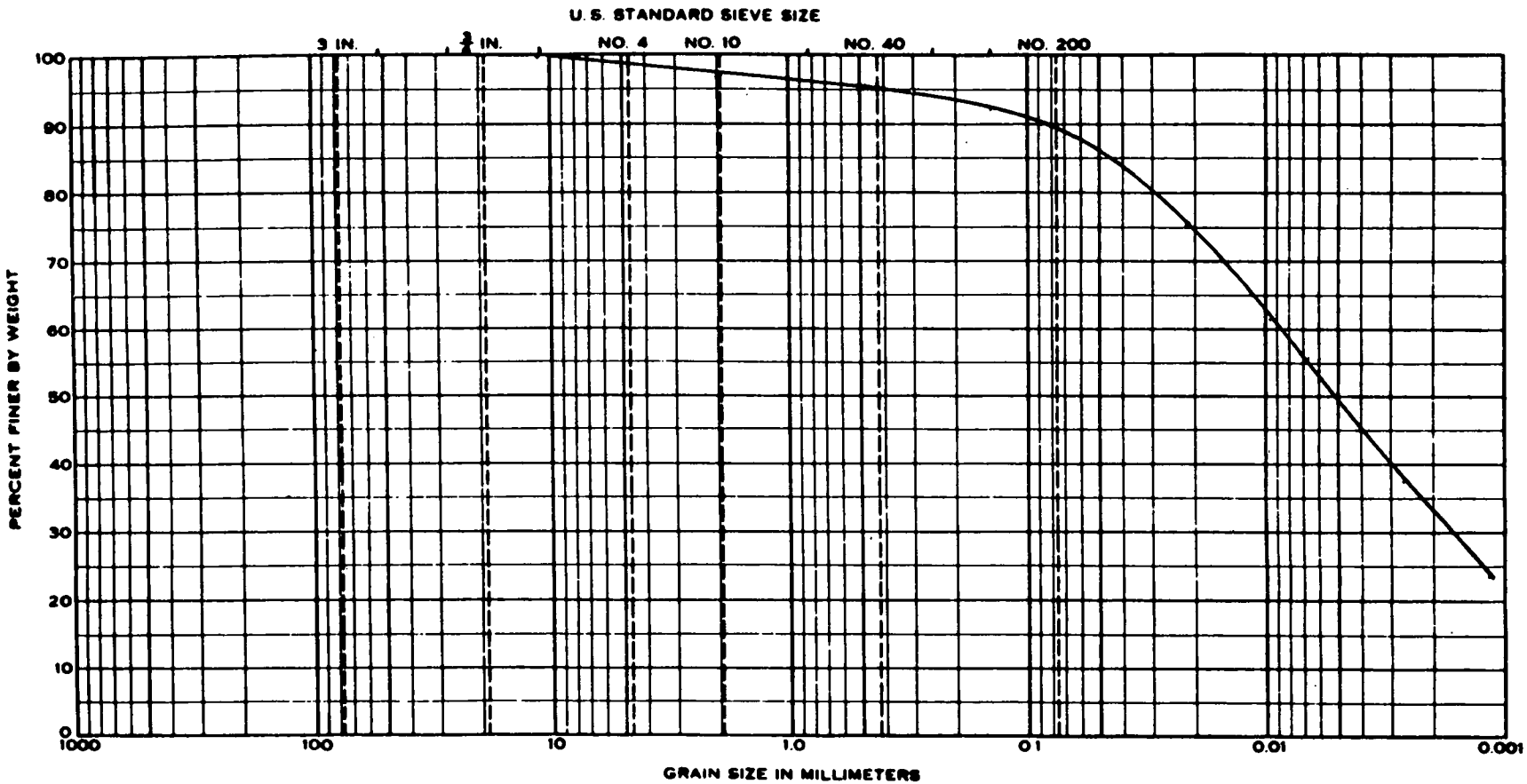
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	18.80	.00	.00	.00	cc
LENGTH (L):	4.16	.00	.00	.00	in
AREA (A):	6.14	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	300.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	4.956E-007	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI	
11-R2	10'E C 2+80	Brown sandy CLAY CL	13.3	32	19	13	

GRADATION CURVES

Project Glynn Geotechnical Engineering

Van der Mark Chemical Company

Date August 11, 1987 No. 87C165-05

J & L TESTING COMPANY, INC.
Materials Testing

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL
PROJECT LOCATION:V M CHEM
SAMPLE NO.:12A
DESCRIPTION:COMPACTED FILL
PLASTIC SOIL
TUBE SAMPLE

DATE:JULY 29 1987
JOB No.:87C165-04A

CELL NO.:6 FLUID:WATER B-Parameter:0.99

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	2.468	in	FINAL HEIGHT:	2.484	in
INITIAL DIAMETER:	2.8410	in	FINAL DIAMETER:	2.8690	in
INITIAL WET WEIGHT:	525.4	gm	FINAL WET WEIGHT:	546.7	gm
WET DENSITY =	127.8	pcf	WET DENSITY :	129.6	pcf
MOISTURE CONTENT:	17.9	%	MOISTURE CONTENT:	23.5	%
DRY DENSITY:	108.5	pcf	DRY DENSITY:	104.9	pcf
INITIAL SATURATION:	82.8	%	FINAL SATURATION:	100.0	%
INITIAL VOID RATIO:	.599404		FINAL VOID RATIO:	.653338	

TEST PARAMETERS.....

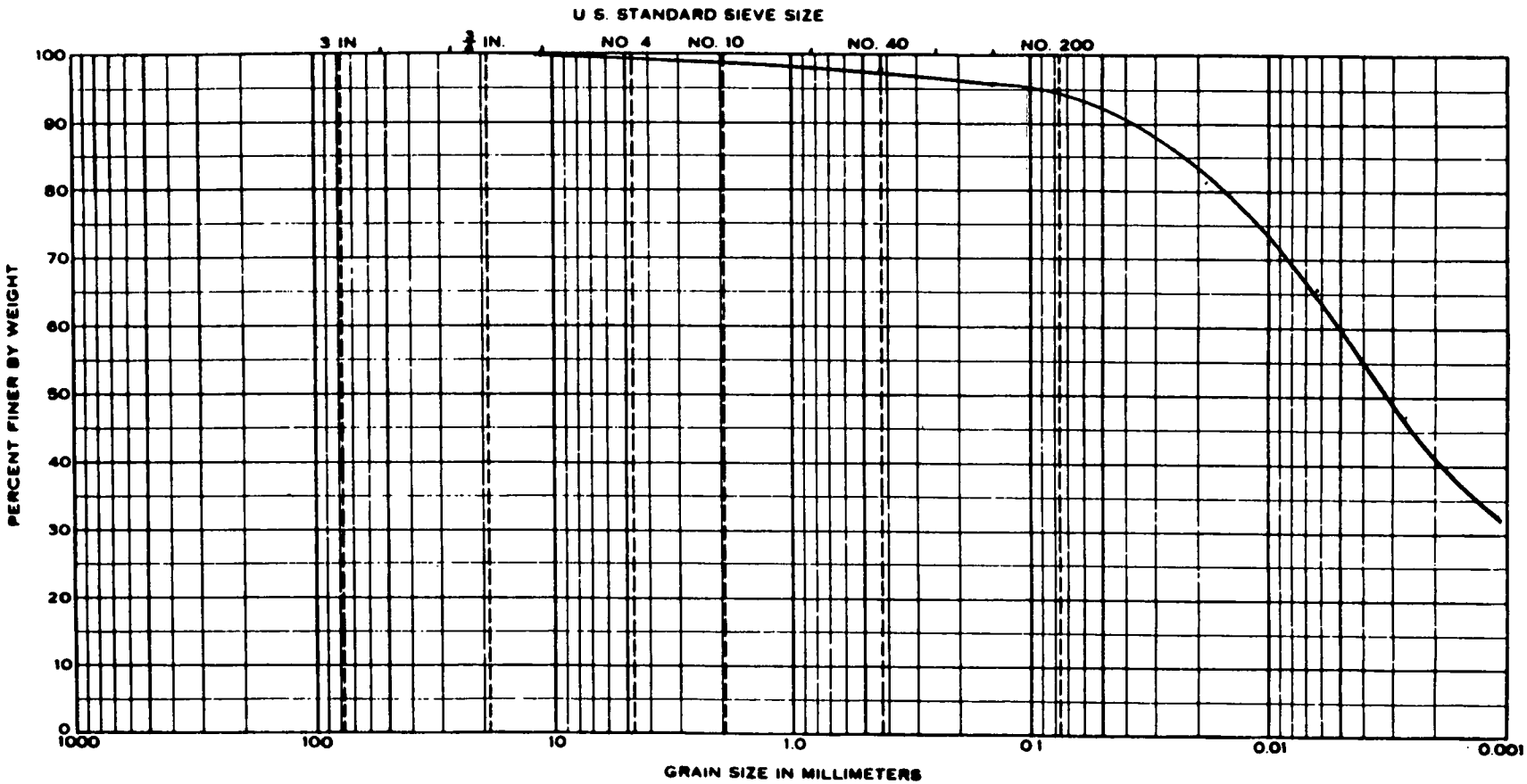
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	6.40	.00	.00	.00	cc
LENGTH (L):	2.48	.00	.00	.00	in
AREA (A):	6.46	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	500.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	5.737E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI
12A	Tube	Br. plastic silty CLAY CL	17.9	48	25	23

Project Glynn Geotechnical Engrg
V.M. Chemical

GRADATION CURVES

Date July 29 1987 JOB No. 87C165-04A

J & L TESTING COMPANY, INC.
Materials Testing

SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT:GLYNN GEOTECHNICAL
PROJECT LOCATION:VAN DER MARK CHEMICAL
SAMPLE NO.:#2
DESCRIPTION:FRONTIER CLAY
LAB COMPACTED SAMPLE
91% OF PROCTOR TEST

DATE:AUG 9 1987
JOB No.:87C165-03

CELL NO.:8 FLUID:DEAIRED WATER B-Parameter:1.0

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	4.000	in	FINAL HEIGHT:	4.077	in
INITIAL DIAMETER:	2.8000	in	FINAL DIAMETER:	2.7910	in
INITIAL WET WEIGHT:	825.9	gm	FINAL WET WEIGHT:	854.9	gm
WET DENSITY =	127.6	pcf	WET DENSITY :	130.5	pcf
MOISTURE CONTENT:	19.1	%	MOISTURE CONTENT:	22.5	%
DRY DENSITY:	107.1	pcf	DRY DENSITY:	106.5	pcf
INITIAL SATURATION:	86.9	%	FINAL SATURATION:	100.6	%
INITIAL VOID RATIO:	.607687		FINAL VOID RATIO:	.616983	

TEST PARAMETERS.....

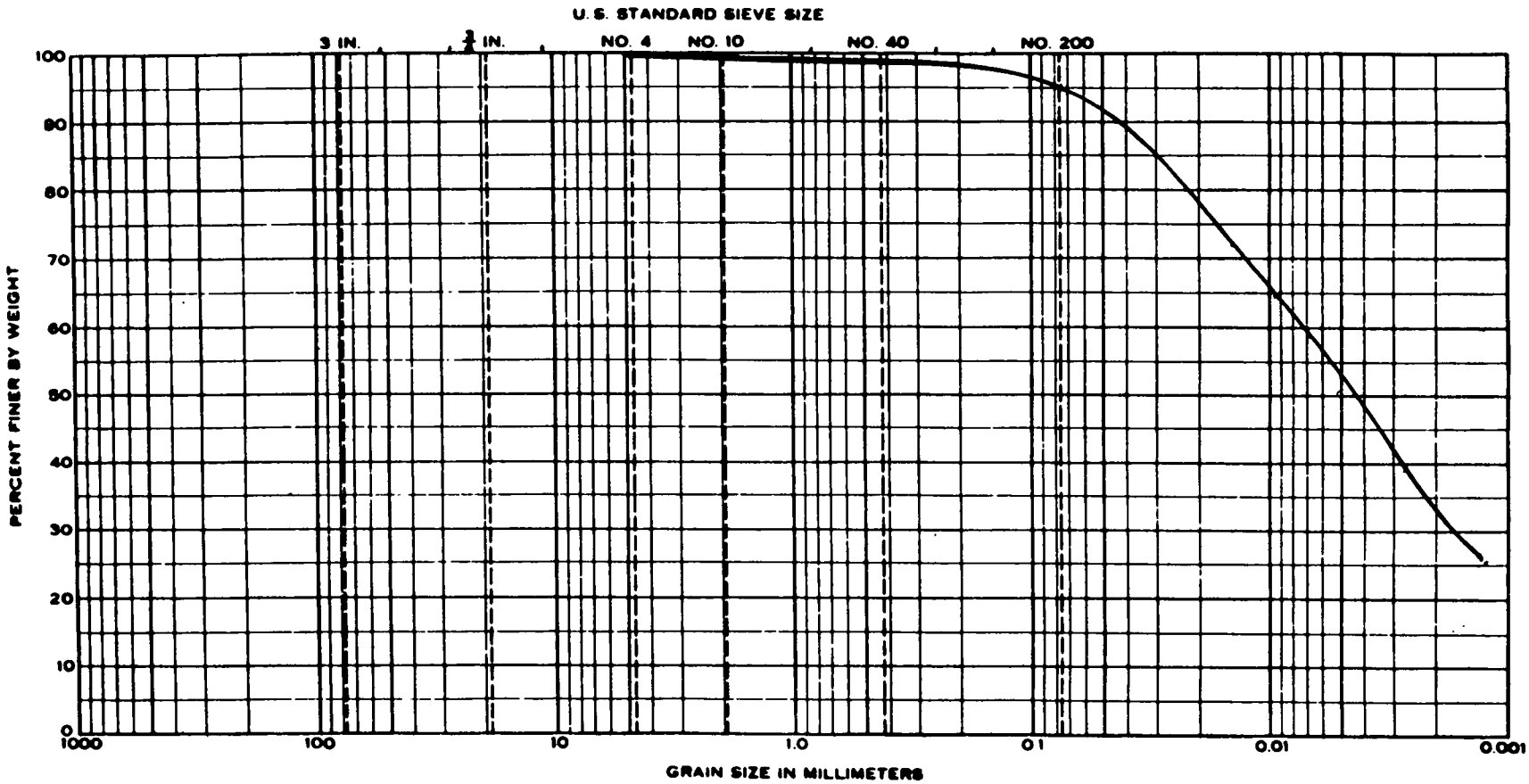
CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

FLOW (Q):	15.90	.00	.00	.00	cc
LENGTH (L):	4.08	.00	.00	.00	in
AREA (A):	6.12	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	300.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	4.120E-007	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec



Sample No.	Elev or Depth	Classification	Nat WC	LL	PL	PI	
Bag Sample #2		Br. Silty CLAY - CL	18.5	35	18	17	

GRADATION CURVES

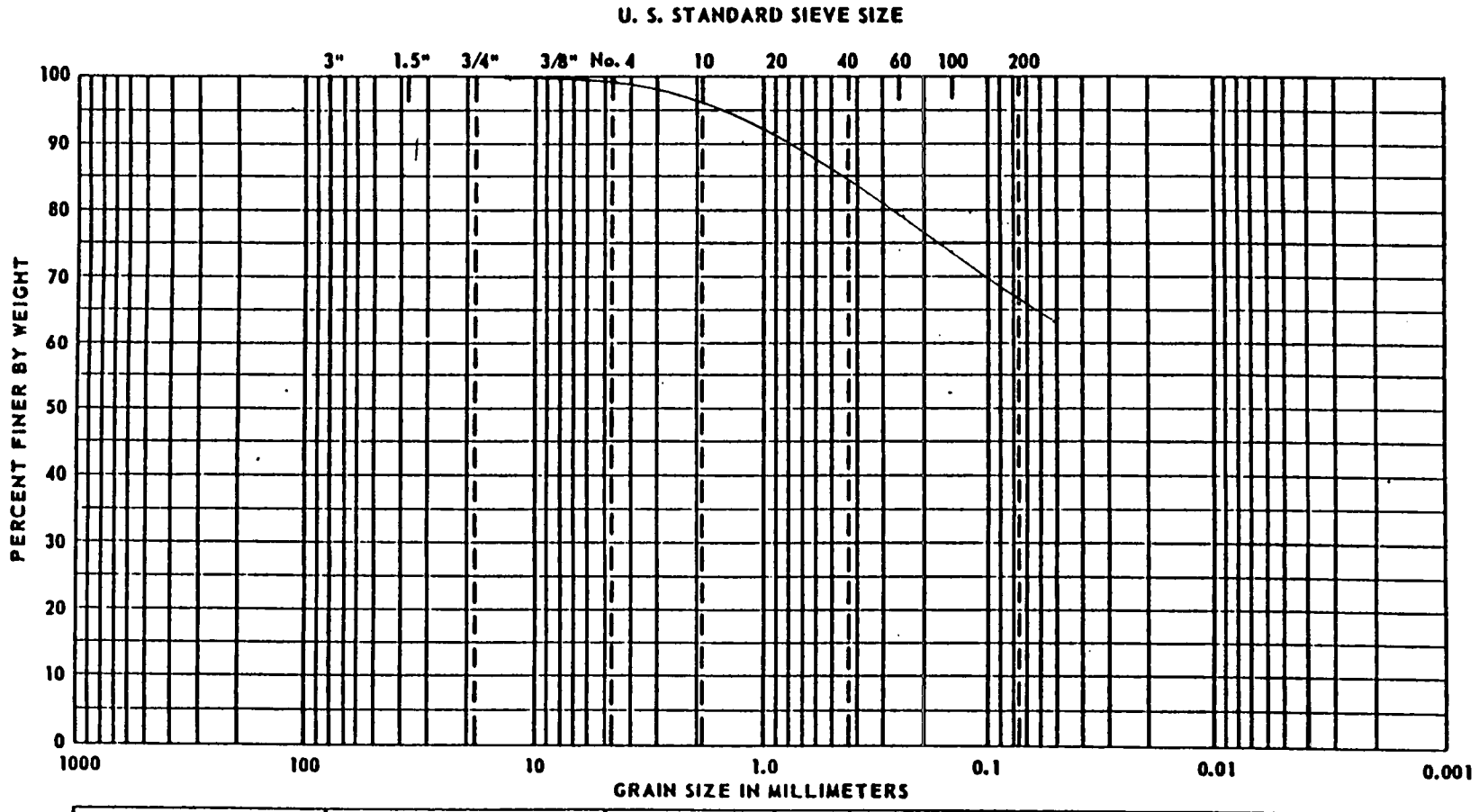
Project Glynn Geotechnical Engrg

V.M. Chemical

Date July 30, 1987 JOB No. 87C165-03

J & L TESTING COMPANY, INC.
Materials Testing

GRAIN SIZE DISTRIBUTION CURVE



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	BORING	DEPTH	LINE	CLASSIFICATION		NAT. WC	LL	PL	PI	REMARKS	PLOTTED BY:
—	—	—	—	ML	FINE SAND & SILT	—	—	—	—	WASH & SIEVE, SLC. Co.	MDA.
			— —		REDDISH BROWN					FRONTIER STONE MTN.	
			—·—							AT V.D.M. CHEM.	
			—··—							7-2-87	

Glynn Geotechnical Engineering

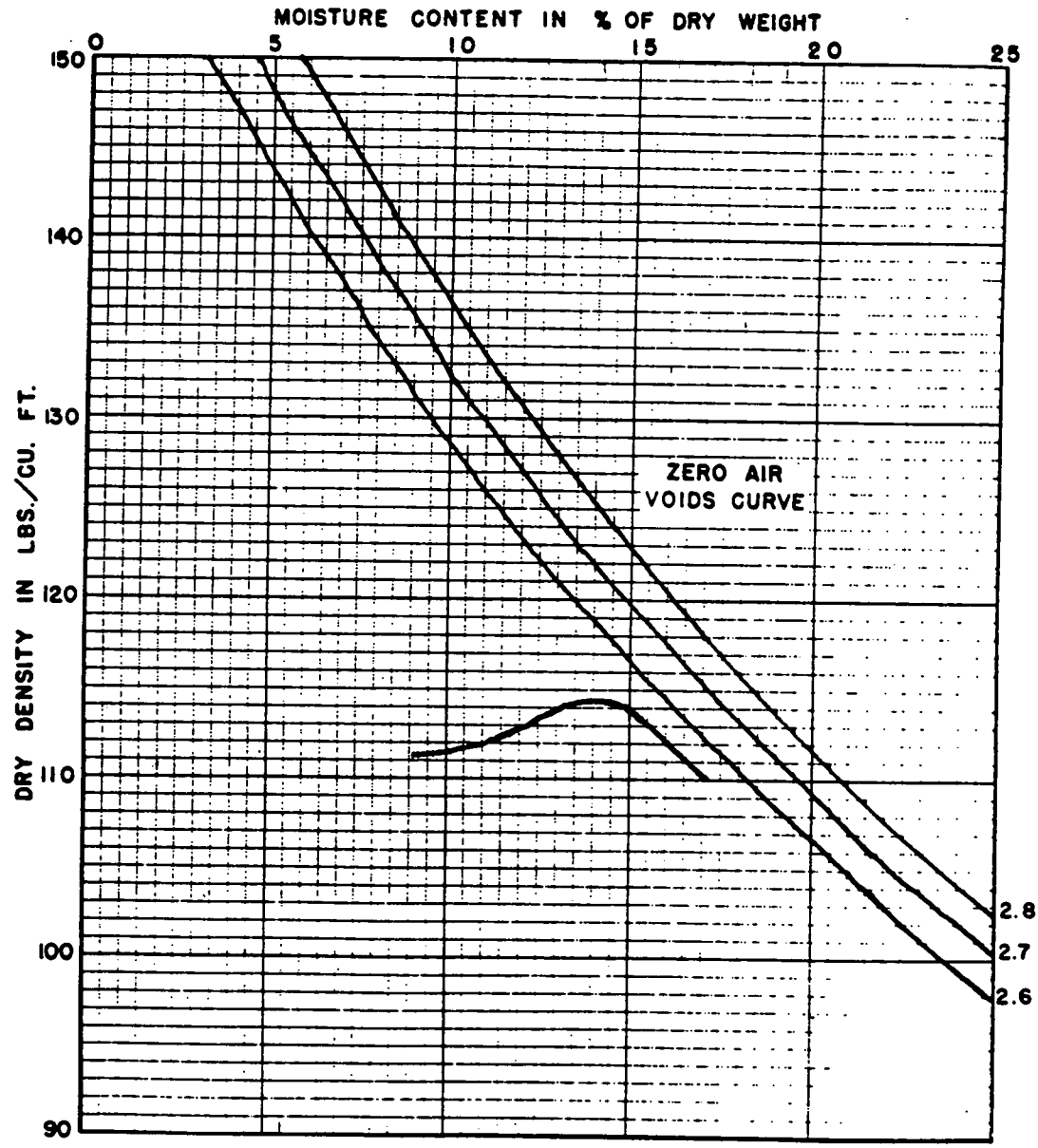
CHECKED BY MWB DATE 7/6/87

Project VAN DE MARK CHEMICAL Job No. 87-0125 CRA.

Location of Project LOCKPORT, N.Y. Boring No. ——— Sample No. ———

Description of Soil SILTY CLAY, TRACE GRAVEL CL (FRONTIER STONE OVERBURDEN)

Depth of Sample ——— Tested By ASQUITH Date 7-1-87



COMPACTION TEST DATA

OPTIMUM MOISTURE CONTENT 14.5 %

MAXIMUM DRY DENSITY 114.5

METHOD OF COMPACTION ASTM D1557 METHOD A'

J & L TESTING COMPANY
Geotechnical Testing

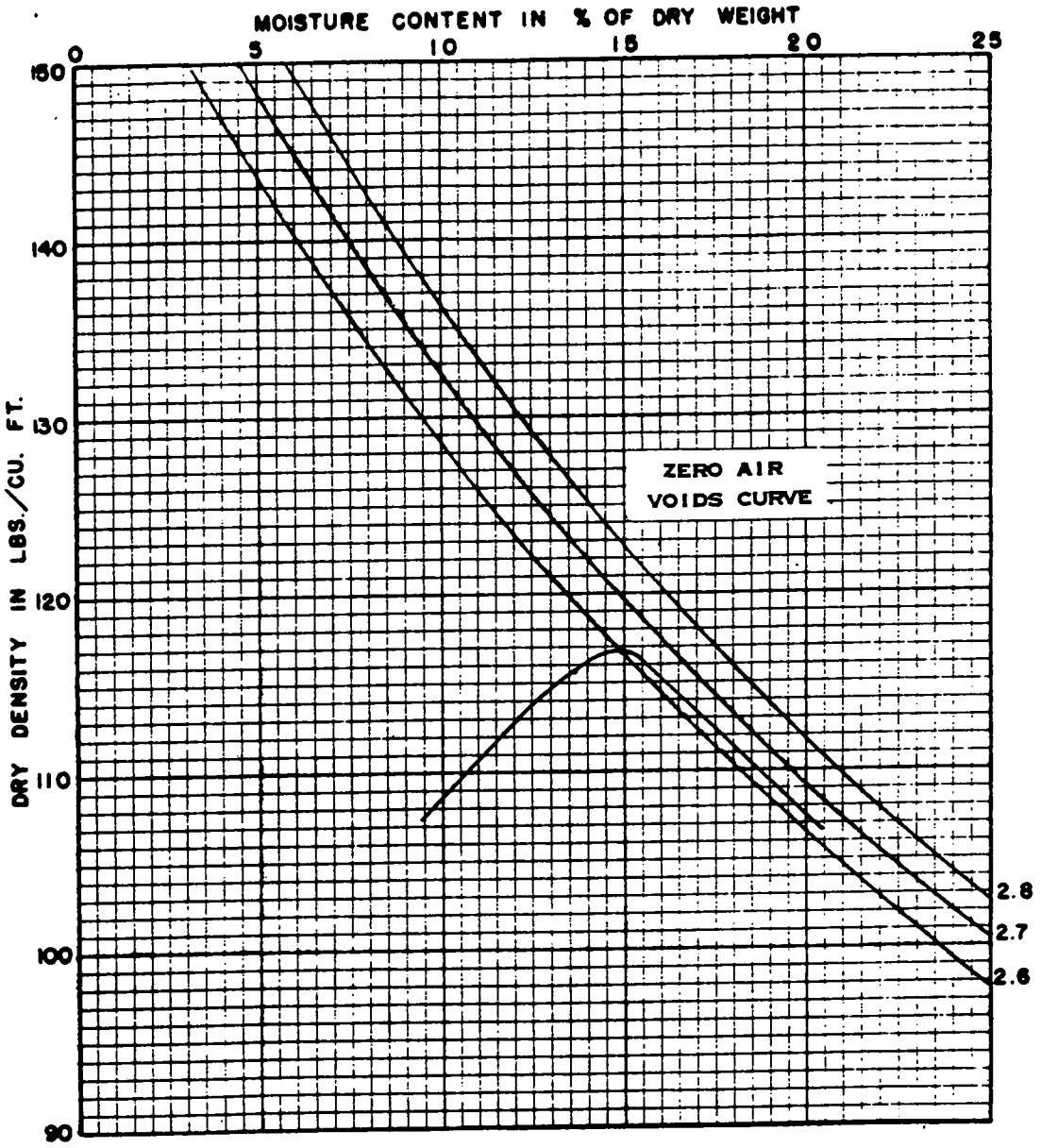
Project Glynn Geotechnical Engineering Job No. 87C165-03

Location of Project V.M. Chemical Boring No. Bag Sample No. 1

Description of Soil Brown Silty CLAY-CL

Depth of Sample Unk. Tested By RAL Date 7/25/87

CHECKED BY MLL DATE 8/1/87



COMPACTION TEST DATA

OPTIMUM MOISTURE CONTENT 15.0 %

MAXIMUM DRY DENSITY 116.5 pcf

METHOD OF COMPACTION MODIFIED

Glynn Geotechnical Engineering

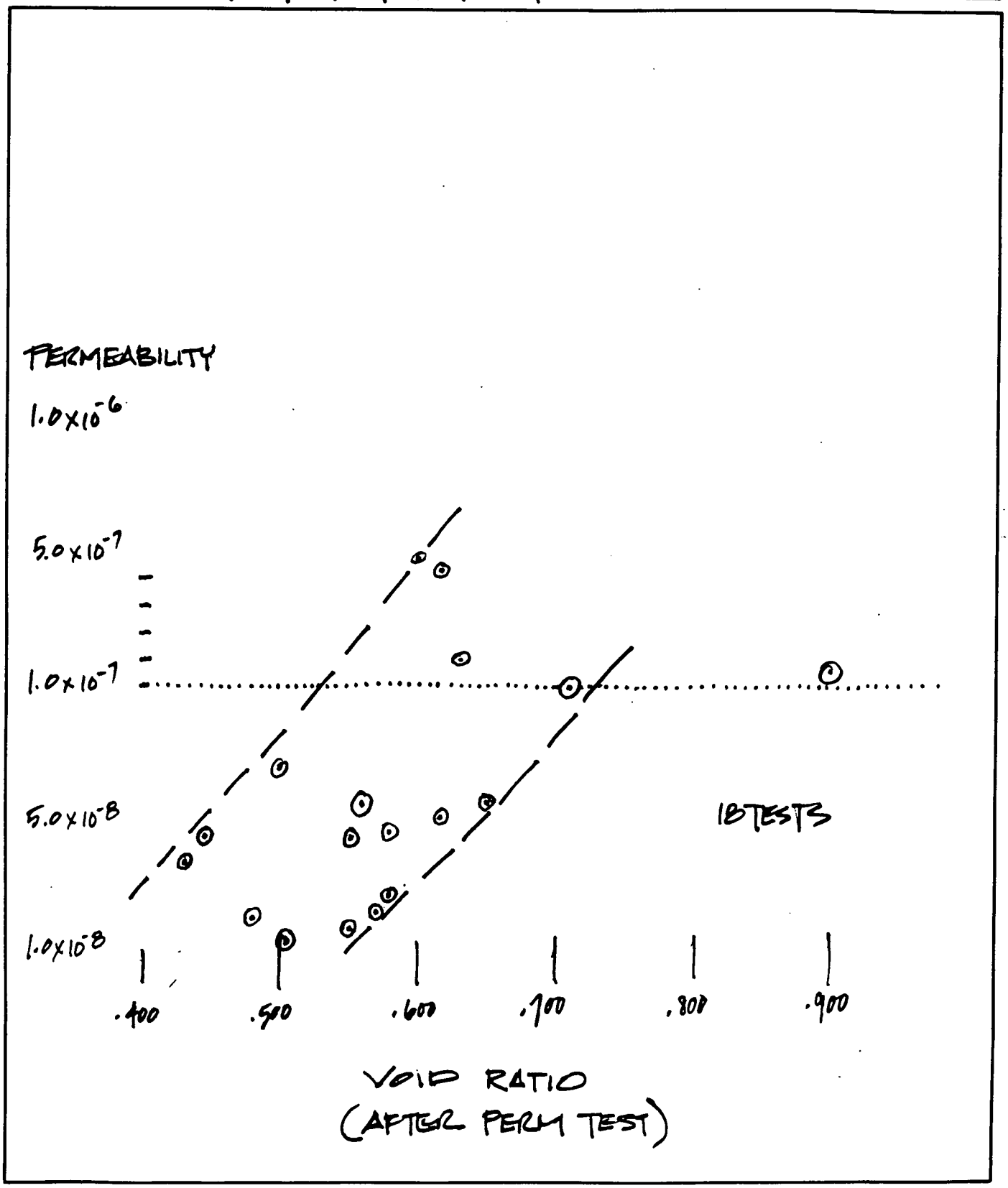
BY M.W. GLYNN DATE 8-17-87 SHEET 1 OF 1

CHKD. BY _____ DATE _____ PROJECT NO. 87-0125

CLIENT CONESTOGA ROVERS

PROJECT VAN DE MARK CHEMICAL

SUBJECT SUMMARY OF TEST DATA - PERMEABILITY VS. VOID RATIO



SUMMARY OF TRIAXIAL PERMEABILITY TEST RESULTS

CLIENT: GLYNN GEOTECHNICAL
PROJECT LOCATION: CONASTOGA ROVERS
SAMPLE NO.: TEST PAD 1
DESCRIPTION: 8 PASSES
COMPACTED FILL
CLAY

DATE: JULY 8 1987
JOB No.: 87C165-01

CELL NO.: 1 FLUID: WATER B-Parameter: 1.0

PHYSICAL PROPERTY DATA.....

INITIAL HEIGHT:	2.909	in	FINAL HEIGHT:	2.910	in
INITIAL DIAMETER:	2.8420	in	FINAL DIAMETER:	2.8740	in
INITIAL WET WEIGHT:	620.9	gm	FINAL WET WEIGHT:	643.0	gm
WET DENSITY =	128.1	pcf	WET DENSITY :	129.6	pcf
MOISTURE CONTENT:	19.3	%	MOISTURE CONTENT:	21.3	%
DRY DENSITY:	107.3	pcf	DRY DENSITY:	106.9	pcf
INITIAL SATURATION:	91.5	%	FINAL SATURATION:	99.8	%
INITIAL VOID RATIO:	.569498		FINAL VOID RATIO:	.576660	

TEST PARAMETERS.....

CELL PRESSURE:	55.00	.00	.00	.00	psi
HEAD WATER:	50.00	.00	.00	.00	psi
TAIL WATER:	42.00	.00	.00	.00	psi

PERMEABILITY INPUT DATA.....

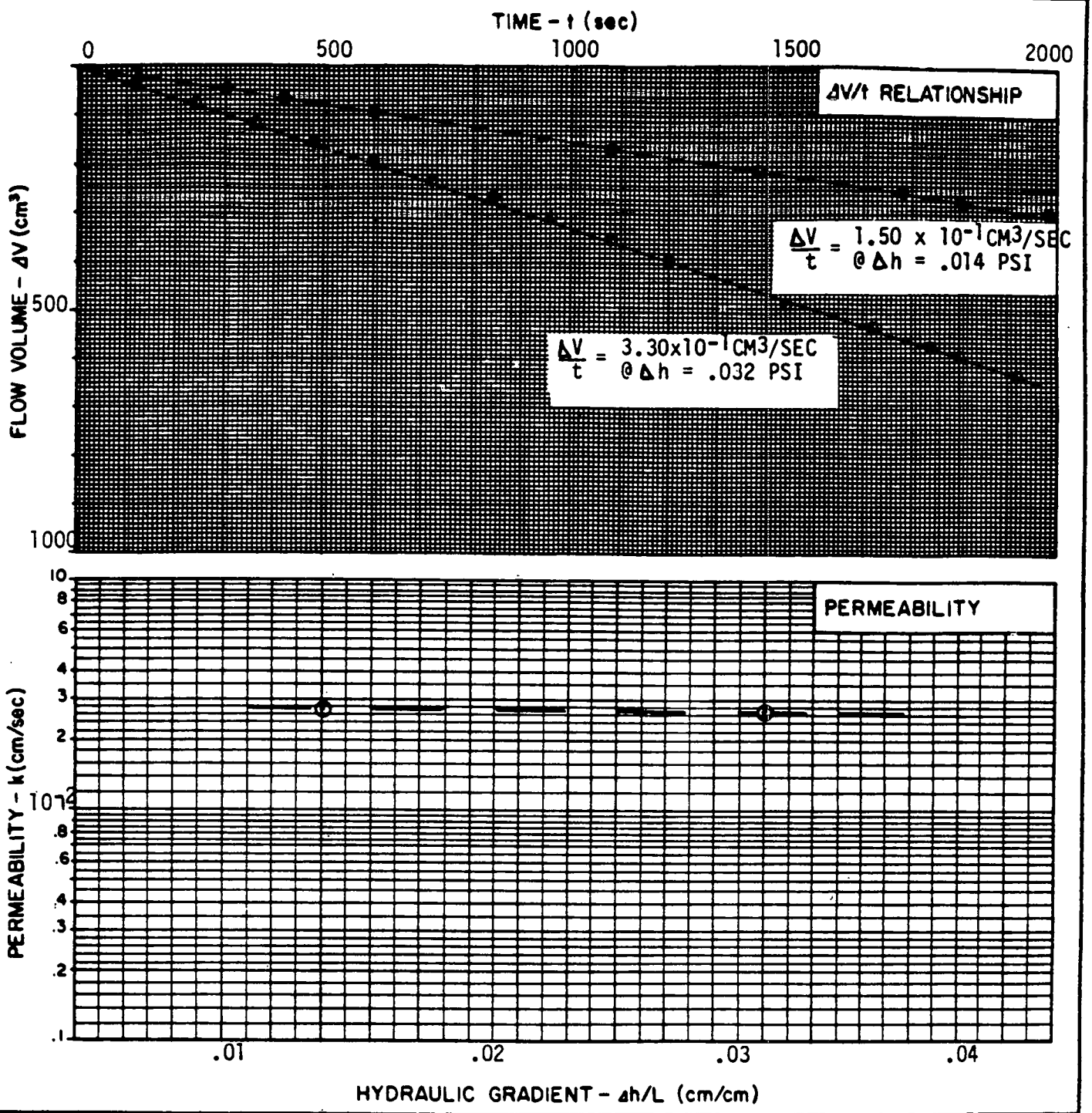
FLOW (Q):	7.20	.00	.00	.00	cc
LENGTH (L):	2.91	.00	.00	.00	in
AREA (A):	6.49	.00	.00	.00	sqin
HEAD (h):	8.00	.00	.00	.00	psi
TIME (t):	800.00	.00	.00	.00	min

COMPUTED PERMEABILITY @ 20 degrees Centigrade.....

TEST NO. 1, k=	4.709E-008	cm/sec
TEST NO. 2, k=	.000E+000	cm/sec
TEST NO. 3, k=	.000E+000	cm/sec
TEST NO. 4, k=	.000E+000	cm/sec

APPENDIX C

1B STONE TEST RESULTS



TEST DATA:

TYPE OF PERMEAMETER	Constant Head Rigid Wall	
SPECIMEN HEIGHT (cm)	11.65	
SPECIMEN DIAMETER (cm)	10.16	
DRY UNIT WEIGHT (pcf)	103.2	
MOISTURE CONTENT BEFORE TEST (%)	13.3	
MOISTURE CONTENT AFTER TEST (%)	17.3	
MAXIMUM DRY DENSITY (ASTM D 698) (pcf)	111.0	
OPTIMUM MOISTURE CONTENT (%)	9.2	
CELL CONFINING PRESSURE (psi)		
TEST PRESSURE (psi)		
BACK PRESSURE (psi)		
DIFFERENTIAL HEAD (psi)	.014	.032
PERMEABILITY (cm/sec)	2.78x10-2	2.68 x 10-2

SAMPLE IDENTIFICATION:
Sample No. UC-GG-870108-4

VISUAL DESCRIPTION:
Brown Sand

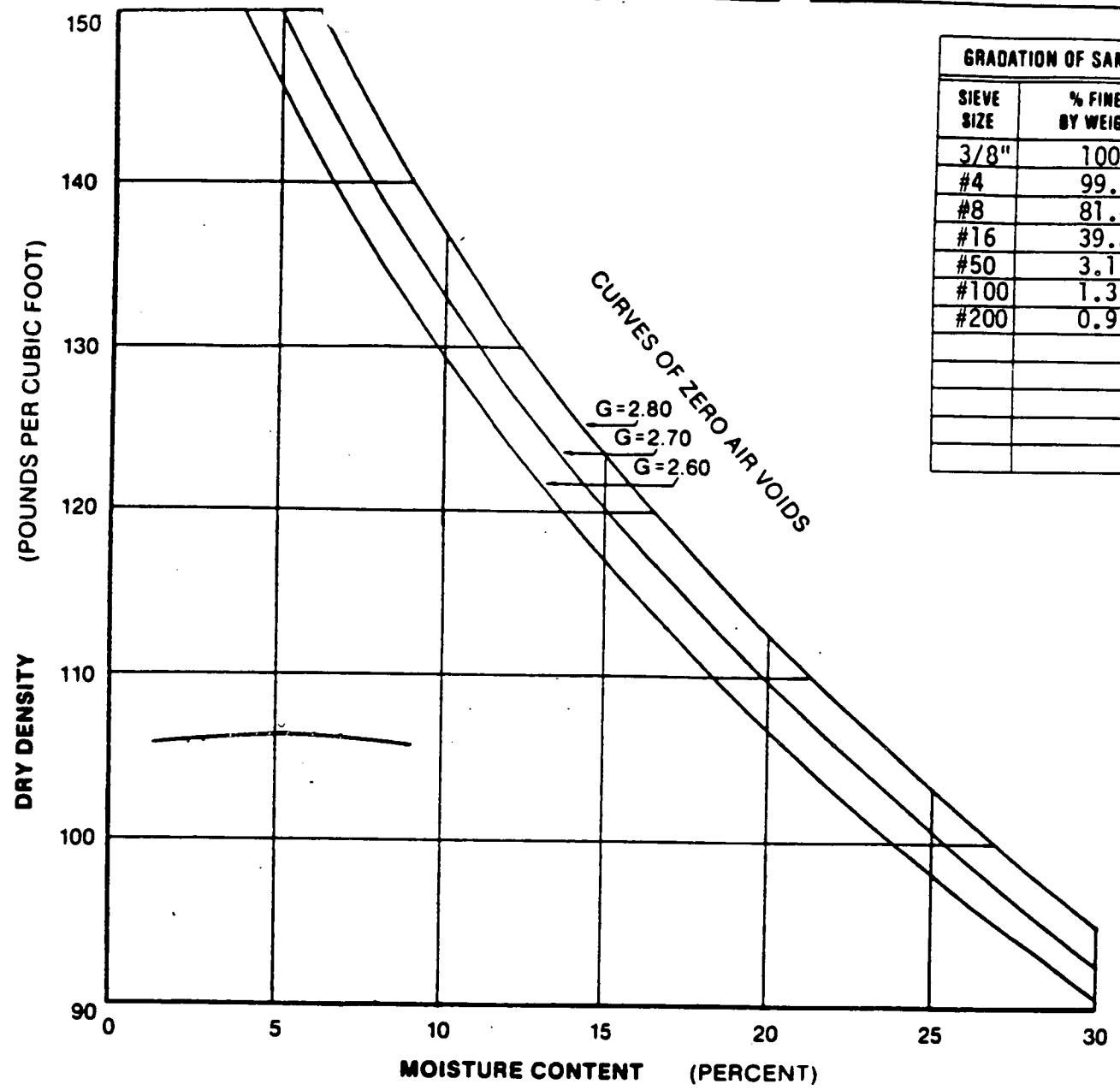
EMPIRE SOILS INVESTIGATIONS, INC.

PERMEABILITY TEST REPORT

Union Carbide
URS Company, Inc.

L-1111

DATE: 2/24/87 | PROJ. NO.: BT-86-6



GRADATION OF SAMPLE	
SIEVE SIZE	% FINER BY WEIGHT
3/8"	100.0
#4	99.9
#8	81.4
#16	39.2
#50	3.1
#100	1.3
#200	0.9

SAMPLE DESCRIPTION

Sample # UC-GG-870108-4

Material Sand

Color Brown Source Unknown

Sampled By Client At Unknown

TEST RESULTS

Maximum Dry Density 106.6 pcf

Optimum Water Content 5.5 %

$C_u = 3.21$

$C_c = 0.90$

METHOD OF TEST	
STANDARD	METHOD
ASTM D698	A
AASHTO	
MILITARY	
OTHER	

EMPIRE LABORATORIES INC.

OPTIMUM MOISTURE—MAXIMUM DENSITY

Union Carbide
URS Company, Inc.

DR. BY: PJA	DATE SAMPLED 1/8/87	PROJ NO. BT-86-6
CK'D BY: CCK	TESTED BY: JK	CURVE NO. L-11D

R-T Form E

APPENDIX D

SAMPLING AND ANALYSIS PROGRAM - MONITORING

SAMPLING AND ANALYSIS PROGRAM
FOR MONITORING THE
VAN DeMARK LANDFILL SITE

AUGUST 1986

1.0 INTRODUCTION

This program will be the procedures manual for the collection of water samples associated with the monitoring of the Van DeMark Landfill Site.

The items of environmental concern are:

Low pH
High chlorides
Low concentrations of chloroform

The Field Supervisor shall be completely responsible for implementing this Program. Any variation, no matter how small, shall be documented.

2.0 PRE-FIELD ACTIVITIES

To assure that no items have been omitted, a "punch list" of office activities will be used as a basis for organizing pre-field activities (Table 1).

2.1 Review the entire Program. Schedule sample collection and inform the Sample Controller. Prepare the Quarterly Schedule and give copies to the Customer Contact and the Sampler Controller.

2.2 The Sample Controller will use her copy of the Bottle Request Forms (Appendix A) so that she can fill the request.

2.3 The Field Supervisor will assemble all necessary equipment. The Equipment Checklist (Table 2) will be completed and signed by the Field Supervisor in preparation for each scheduled sampling.

3.0 ON-SITE ACTIVITIES

3.1 Field Log Book

Information recorded at each sampling site shall, at a minimum, contain the following details:

3.1.1 Sampling date and time

3.1.2 Sampling location and identification number

3.1.3 Names of Field Crew present at the site

3.1.4 Brief description of weather conditions

3.1.5 pH measurements

3.1.6 Sampling remarks/observations

3.1.7 Collection of Quality Assurance/Quality Control samples

3.2 Sampling Procedure

Sample collection shall proceed in the following order:

3.2.1 18 Mile Creek Samples

The upstream sample should be collected first, and the downstream sample second (Figure 1).

The upstream sampling location is approximately 25 feet upstream from the abandoned wooden railroad tressel.

The downstream sampling location is adjacent to the area where vehicles can park off the east side of the road. There is sufficient room to drive the van quite close to 18 Mile Creek. Note that this location is upstream from the Lockport Wastewater Treatment Plant discharge.

The sediment should not be disturbed during the measurement for pH, and the collection of samples for chlorides.

The VOA vials are to be filled directly under the surface of the creek water; that is, the water is not to be scooped into a container and then poured into VOA vials.

During pH measurements of creek water, be sure to thoroughly rinse the probe with deionized water.

3.2.2 Groundwater Seep

Although we have not yet observed sufficient water to sample, this seep should be checked during each monitoring quarter. The seep area to be checked is directly down the embankment from well VDM 10.

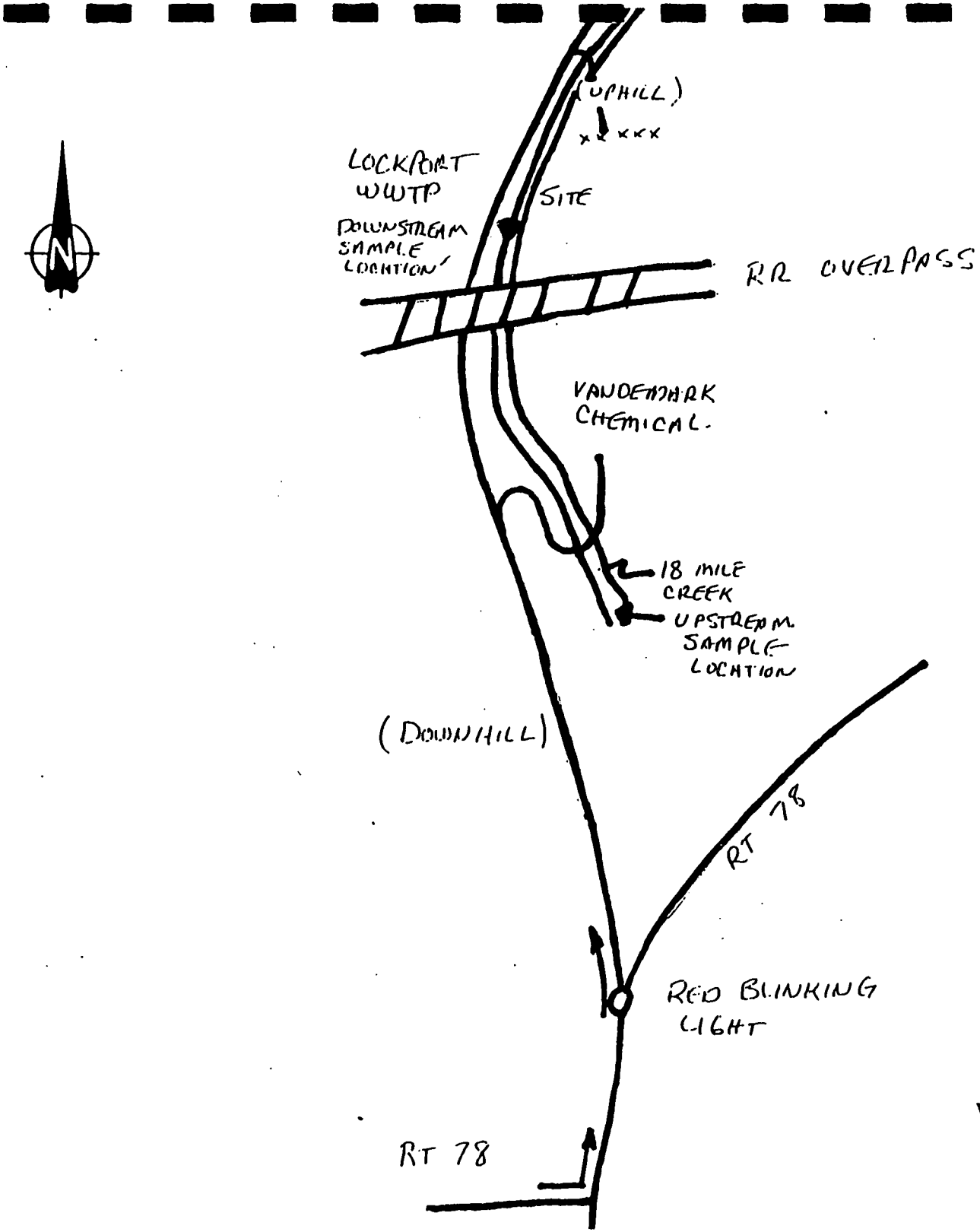


Figure 1

UPSTREAM AND DOWNSTREAM SAMPLE LOCATIONS

VAN DeMARK CHEMICAL CO., INC

If water is flowing from the seep area, position the seep collector. The seep collector is a modified Rubbermaid dust pan. The modification allows collection over a period of time which is funnelled into a sample collection one gallon glass bottle.

The collector shall be left in place while the monitoring wells and ditch are being sampled.

3.2.3 Monitoring Wells - Figure 2

Start in the order of clean wells and work towards more contaminated wells.

The order for purging and sample collection shall be:

D-55, VDM-9, VDM-10, VDM-11, and lastly, VDM-12.

3.2.3.1 Measure the static groundwater level in each monitoring well. The plopper must be thoroughly rinsed with acetone, hexane, acetone, and deionized water after each measurement.

3.2.3.2 Purge each monitoring well to remove stagnant water contained in the well casing. It is acceptable to use a peristallic pump for purging, but not for sampling. The suction tube must not touch the ground, but be placed in a clean plastic pail. The suction tube must be rinsed with deionized water between use in different wells.

Remove 4 well volumes or until dryness. It can be expected that well VDM 9 - 12 will probably be pumped dry. Record the approximate volume purged.

3.2.3.3 Collection of samples from monitoring wells will be accomplished with a rope and stainless steel bailer dedicated to each well. After sample collection, each bailer and rope will be rinsed with deionized water, returned to their labeled case, and transported to AES for secure storage.

VOA vials will be filled first with particular care that no air bubbles are present in the vial.

pH will be measured on a small separate aliquot. Groundwater will be poured into the appropriate containers for the analysis of chlorides and metals. The bottles will

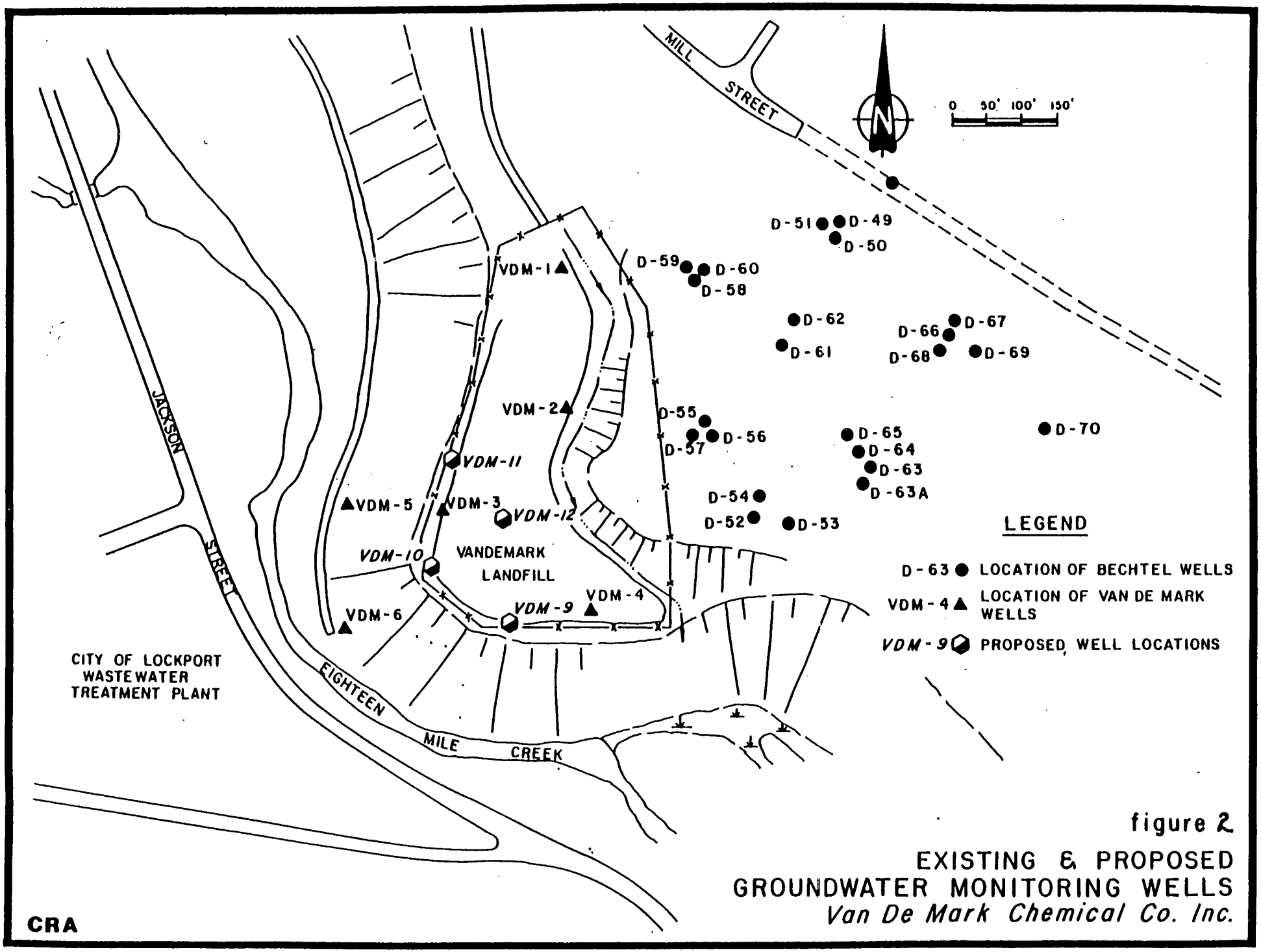


figure 2

EXISTING & PROPOSED
GROUNDWATER MONITORING WELLS
Van De Mark Chemical Co. Inc.

CRA

1277-14/10/83

be placed in an insulated chest with blue ice and transported to the AES laboratory.

3.2.4 Drainage Ditch

As with the collection of 18 Mile Creek samples, try to keep the disturbance of sediment to a minimum.

pH measured directly in the standing water; if sufficient volume is available. The water will be poured into appropriate containers for the analysis. The bottles will be placed in an insulated chest with blue ice and transported to the AES laboratory.

TABLE I

VAN DeMARK LANDFILL SITE
PRE-FIELD ACTIVITY PUNCH LIST

SCHEDULED SAMPLING DATE: _____

	Task	Initials	Date
1.	Notify Sample Controller	_____	_____
2.	Assemble Sampling Equipment and Completed Equipment Checklist	_____	_____
3.	Check the accuracy of the field pH meter against the laboratory pH meter	_____	_____
4.	Check operating condition of the Isco pump	_____	_____
5.	Assemble necessary forms	_____	_____
	a. Field notebook	_____	_____
	b. Field punchlist	_____	_____
	c. Chain of Custody	_____	_____
6.	Receive sample containers from the Sample Controller	_____	_____
7.	Check the accuracy of the labels on the sample containers	_____	_____
8.	Review sampling procedures	_____	_____
9.	Identify Quality Assurance samples and locations	_____	_____

_____ Field
Supervisor Date

TABLE 2

VAN DeMARK LANDFILL SITE

SAMPLING EQUIPMENT CHECKLIST
FOR

_____ SAMPLING

SAMPLING EQUIPMENT AND SUPPLIES

OUT	IN	
___	__	Water Level Plopper with Clean Measuring Tape
___	__	Squeeze Bottles (3 total); Hexane, Acetone, Deionized Water
___	__	Isco Pump, Extra Battery, Extra Fuse, Clean Suction Tubing
___	__	Stainless Steel Bucket, Calibrated
___	__	Deionized Water for Rinsing the Suction Tube between Wells.
___	__	Plastic Garbage Pail
___	__	Dedicated Stainless Steel Bailers and Rope in Labeled Cylindrical Cases
___	__	pH Meter with Spare Batteries and Buffers (1)
___	__	Generator
___	__	Vacuum Pump (1), Vacuum Hose and Fittings
___	__	Filter Apparatus and Whatman 40 Filters (2 boxes)
___	__	Well Keys
___	__	Coveralls
___	__	Rubber Gloves

TABLE 2 (Cont'd.)

OUT	IN	
___	__	Lock-Eze
___	__	Mosquito Repellent
___	__	Calculator
___	__	Rain Gear
___	__	Rubber Boots
___	__	Tools
___	__	Flashlight
___	__	Blue Ice
___	__	Paper Towels
___	__	Sample Bottles, Labelled, and Sealed Ice Chest
___	__	Field Log Book, Basic Information Included (1)
___	__	Field Punch List (1)
___	__	Chain of Custody Forms
___	__	Duct Tape (2 Rolls)
___	__	Project Site Maps
___	__	Plastic Leakproof Bags
___	__	Seep Collector
___	__	One (1) Gallon Glass Container

_____ Field
Supervisor Date

TABLE 3

MAXIMUM HOLDING TIME

Parameters	Holding Time
Purgeable Halocarbons (601)	14 Days
Chloride	28 Days
Mercury (W/HNO3, pH 2)	28 Days
Soluble Metals (W/HNO3, pH 2)	6 Months

APPENDIX A

BOTTLE REQUEST FORMS

7/86

BOTTLE REQUEST FORM

JOB CODE: BQL

DUE DATE: _____

SIZE/TYPE	PRESERVATIVE	LABEL - Parameters	# OF BOTTL
40 ml VOA	None	Method 601 Purgeable Halocarbons	
		Field Blank	2
		Upstream	2
		Downstream	2
		Well D-55	2
		Well 9	2
		Well 10	2
		Well 11	2
		Well 12	2
		Blind Field Duplicate	2
		Ditch	2
		Seep	2
		Extra (Blank Label)	2
		TOTAL	24

PACKING

BOX: _____

CHAIN OF CUSTODY: _____

COOLER: 2

BLUE ICE: In the Extra Cooler Only

OTHER: _____

SPECIAL INSTRUCTIONS:

To facilitate sample collection, please provide two (2) coolers - one with sampl bottles and one (1) empty cooler. As the sample collection progresses, the fill bottles will be placed in the extra cooler.

BOTTLE REQUEST FORM

JOB CODE: BQL DUE DATE: _____

IZE/TYPE	PRESERVATIVE	LABEL -- Parameters	# OF BOTTL
25 ml/glass	None	Chloride	
		Field Blank	1
		Upstream	1
		Downstream	1
		Well D-55	1
		Well 9	1
		Well 10	1
		Well 11	1
		Well 12	1
		Blind Field Duplicate	1
		Ditch	1
		Seep	1
		Extra (Blank Label)	1
		TOTAL	12

PACKING

OX: _____ CHAIN OF CUSTODY: _____

OOLER: _____ BLUE ICE: _____

THER: _____

PECIAL INSTRUCTIONS:
n the same cooler as the VOA vials

BOTTLE REQUEST FORM

JOB CODE: BQL DUE DATE: _____

SIZE/TYPE	PRESERVATIVE	LABEL - Parameters	# OF BOTTLE
250 ml/plastic	None	Metals - (Unfiltered)	
		Field Blank	1
		Upstream	1
		Downstream	1
		Well D-55	1
		Well 9	1
		Well 10	1
		Well 11	1
		Well 12	1
		Blind Field Duplicate	1
		Ditch	1
		Seep	1
		Extra (Blank Label)	1
		TOTAL	12

Field Personnel Note: Each sample is to be field-filtered with number 42 Whatman paper. The filtrate is to be poured into the appropriate bottle labeled "soluble metals" and containing nitric acid preservative.

PACKING

BOX: 1 CHAIN OF CUSTODY: _____

COOLER: _____ BLUE ICE: _____

OTHER: _____

SPECIAL INSTRUCTIONS:
Please prepare one box of 24 bottles, with dividers, and in order - first, a set of 12 "unfiltered" bottles, and then a set of 12 "soluble metals" bottles.

7/86

BOTTLE REQUEST FORM

JOB CODE: BQL DUE DATE: _____

IZE/TYPE	PRESERVATIVE	LABEL - Parameters	# OF BOTTL
ml/plastic	HNO_3	Soluble Metals - As, Cr, Fe, Pb, Hg, Zn	
		Field Blank	1
		Upstream	1
		Downstream	1
		Well D-55	1
		Well 9	1
		Well 10	1
		Well 11	1
		Well 12	1
		Blind Field Duplicate	1
		Ditch	1
		Seep	1
		Extra (Blank Label)	1
		TOTAL	12

PACKING

OX: 1 CHAIN OF CUSTODY: _____

OOLER: _____ BLUE ICE: _____

THER: _____

PECIAL INSTRUCTIONS:

The Following Image(s) are the Best Copy Available

BIEL'S

JOB CONTROL SHEETS WITH METHOD NUMBERS AND DETERMINABLE LIMITS

RECEIVED DATE: _____
DUE DATE: _____

JOB CODE: BQL
AES LAB NO. -
CUSTOMER SAMPLE ID -
DATE SAMPLED -
METHOD OF SAMPLING -
-MAIL DATE: _____

ANALYTICAL PARAMETER	METHOD No.	DET. LIMIT	FIELD BLANK	UPSTREAM	DOWN STREAM	WELL D-55
PURGEABLE HALOCARBONS	601	5./ppb	X	X	X	X
CHLORIDE	407B	1./ppm	X	X	X	X
ARSENIC	206.2	0.005/ppm	X	X	X	X
CHROMIUM	218.2	5./ppb	X	X	X	X
IRON	236.1	0.20/ppm	X	X	X	X
LEAD	239.2	5./ppb	X	X	X	X
MERCURY	245.1	0.001/ppm	X	X	X	X
ZINC	289.1	0.05/ppm	X	X	X	X

STORAGE AREA:

A _____ SUE'S FRIDGE 1 _____

B _____ 2 _____

C _____ 3 _____

D _____

RECEIVED DATE: _____
DUE DATE: _____

JOB CODE: BQL
AES LAB NO. -
CUSTOMER SAMPLE ID -
DATE SAMPLED -
METHOD OF SAMPLING -
MAIL DATE: _____

ANALYTICAL PARAMETER	METHOD No.	DET. LIMIT	WELL 9	WELL 10	WELL 11	WELL 12
RGEABLE HALOCARBONS	601	5./ppb	X	X	X	X
LORIDE	407B	1./ppm	X	X	X	X
SENIC	206.2	0.005/ppm	X	X	X	X
ROMIUM	218.2	5./ppb	X	X	X	X
ON	236.1	0.20/ppm	X	X	X	X
AD	239.2	5./ppb	X	X	X	X
RCURY	245.1	0.001/ppm	X	X	X	X
NC	289.1	0.05/ppm	X	X	X	X

STORAGE AREA:

A _____ SUE'S FRIDGE 1 _____

B _____ 2 _____

C _____ 3 _____

D _____

RECEIVED DATE: _____

DUE DATE: _____

JOB CODE: BQL

AES LAB NO. -

CUSTOMER SAMPLE ID -

DATE SAMPLED -

METHOD OF SAMPLING -

MAIL DATE: _____

ANALYTICAL PARAMETER	METHOD No.	DET. LIMIT	BLIND FIELD DUPLICATE	DITCH	SEEP
PURGEABLE HALOCARBONS	601	5./ppb	X	X	X
CHLORIDE	407B	1./ppm	X	X	X
ARSENIC	206.2	0.005/ppm	X	X	X
CHROMIUM	218.2	5./ppb	X	X	X
IRON	236.1	0.20/ppm	X	X	X
LEAD	239.2	5./ppb	X	X	X
MERCURY	245.1	0.001/ppm	X	X	X
ZINC	289.1	0.05/ppm	X	X	X

STORAGE AREA:

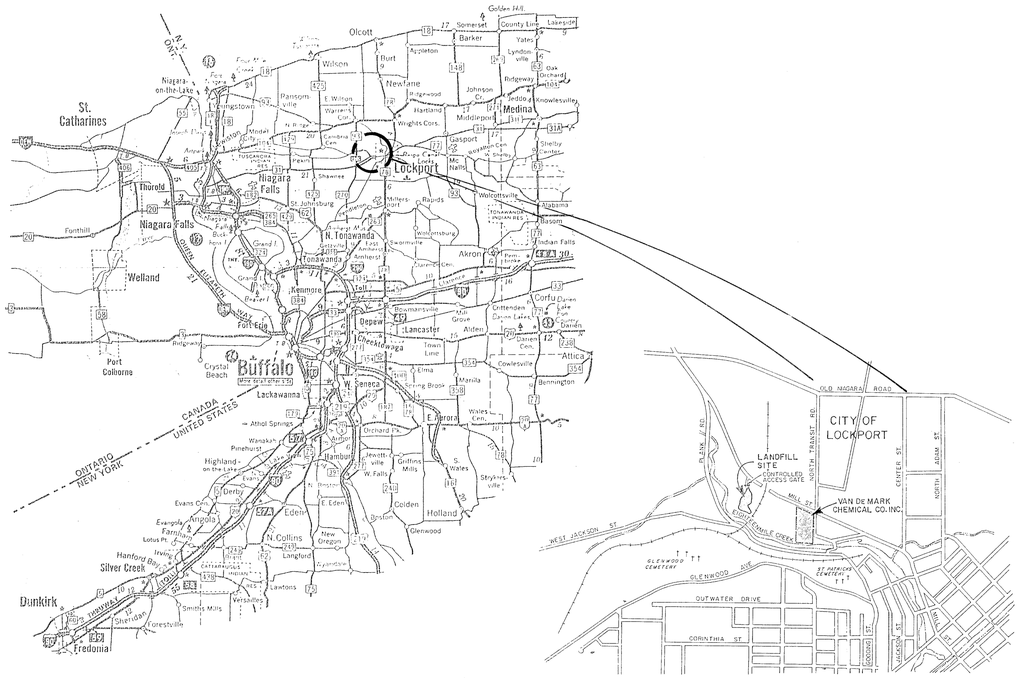
A _____ SUE'S FRIDGE 1 _____

B _____ 2 _____

C _____ 3 _____

D _____

KEY PLAN



LIST OF DRAWINGS

PLAN Nº	TITLE
PLAN 1	PRE-CLOSURE CONDITIONS
PLAN 2	EARLY AND RECENT LANDFILL AREAS
PLAN 3	LOCATION OF VARIOUS SITE FEATURES
PLAN 4	TESTING LOCATIONS - A
PLAN 5	TESTING LOCATIONS - B
PLAN 6	TOP OF CLAY CONTOURS
PLAN 7	FINAL GRADE CONTOURS
PLAN 8	MISCELLANEOUS DETAILS

Van De Mark Chemical Co., Inc.

LANDFILL CLOSURE RECORD PLANS

Former Landfill Lockport New York

Prepared by:

CRA
CONESTOGA-ROVERS & ASSOCIATES

PRINTED
NOV 27 1987

JOB NO. 1277 / FILE 48 / DWG. NO. 08

PRINTED
NOV 27 1987

SURVEY INFORMATION TAKEN FROM:
"CHEMICAL WASTE LANDFILL SITE LOCATION PLAN-CLOSURE"
DWG. No. VDM-2246 BY WILLIAM W WHITMORE, CONSULTING ENGINEERS

LEGEND
- ■ — BECHTEL WELL
- ● — VDM WELL
- ▲ — VDM BORING

No.	Revision	Date	Initial

Approved

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LANDFILL CLOSURE RECORD PLANS

PRE-CLOSURE CONDITIONS

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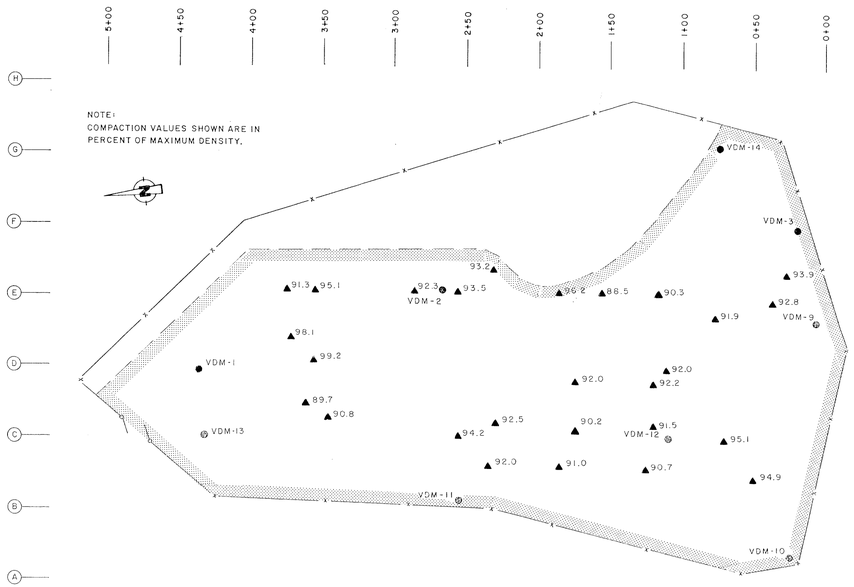
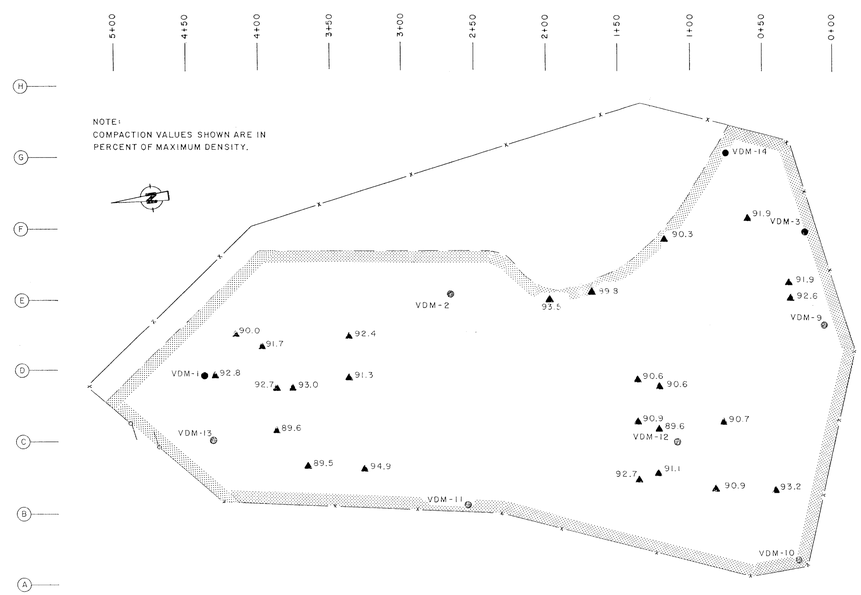
651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

Drawn by: T.J.G.	Scale: 1" = 50'	Date: SEPTEMBER, 1987	File No: 48	Rev. No:
Designed by: D.B.				
Checked by:	Field book:	Project No: 1277 AR	Drawing No: 9 PLAN 1	



LIFT # 1
COMPACTION / MOISTURE SAMPLING LOCATIONS



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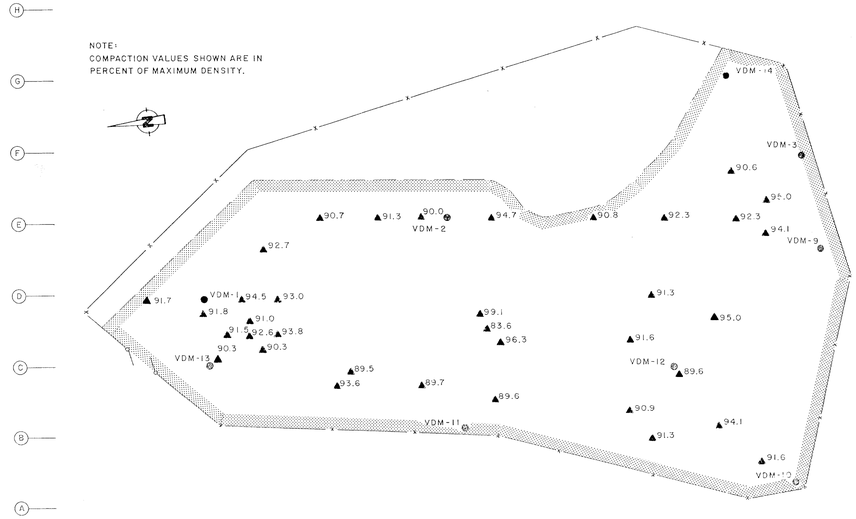

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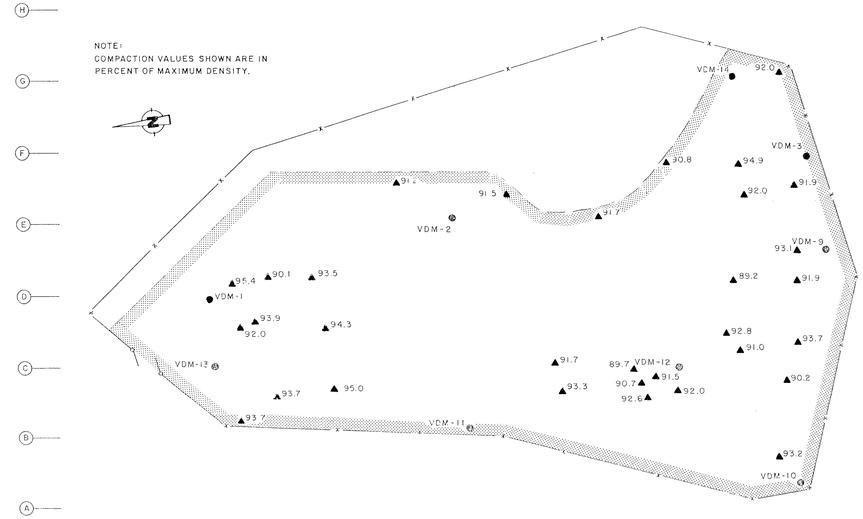
COMPACTION / MOISTURE SAMPLING LOCATIONS



LIFT # 4
COMPACTION / MOISTURE SAMPLING LOCATIONS

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- ● VDM WELLS
- ▲ COMPACTION / MOISTURE SAMPLING LOCATIONS
- ▨ CAPPING LIMIT

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LANDFILL CLOSURE RECORD PLANS

TESTING LOCATIONS - A

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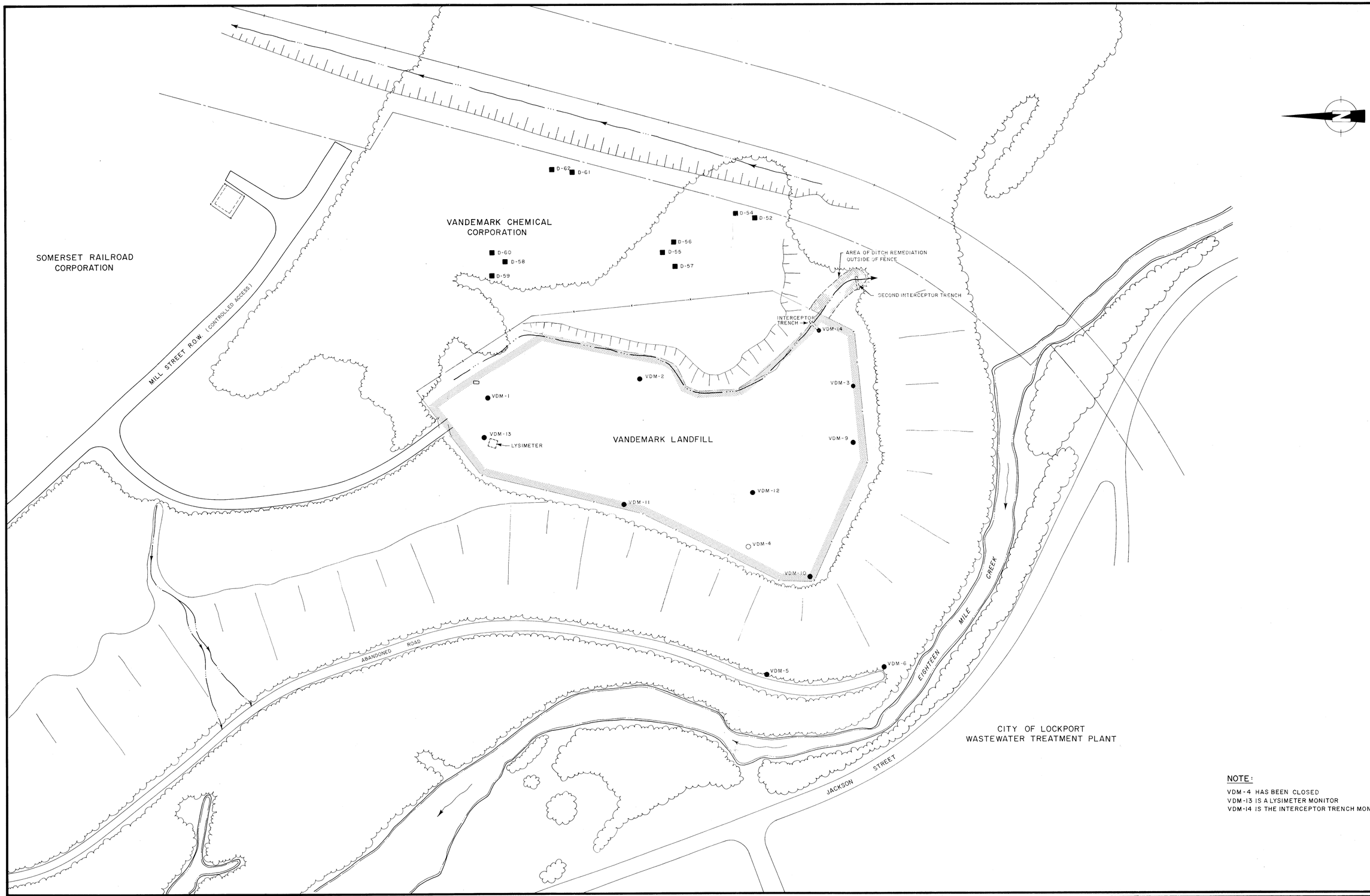

NOTE:

VDM-4 HAS BEEN CLOSED
VDM-13 IS A LYSIMETER MONITOR
VDM-14 IS THE INTERCEPTOR TRENCH MONITOR

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LEGEND

- BECHTEL WELL
- VDM WELL
- CLOSED VDM WELL
- CAPPING LIMIT

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LANDFILL CLOSURE RECORD PLANS

LOCATION OF VARIOUS SITE FEATURES

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Designed by: D.B.	Field book:	Project No.: 1277 AR	Drawing No.: 11 PLAN 3	
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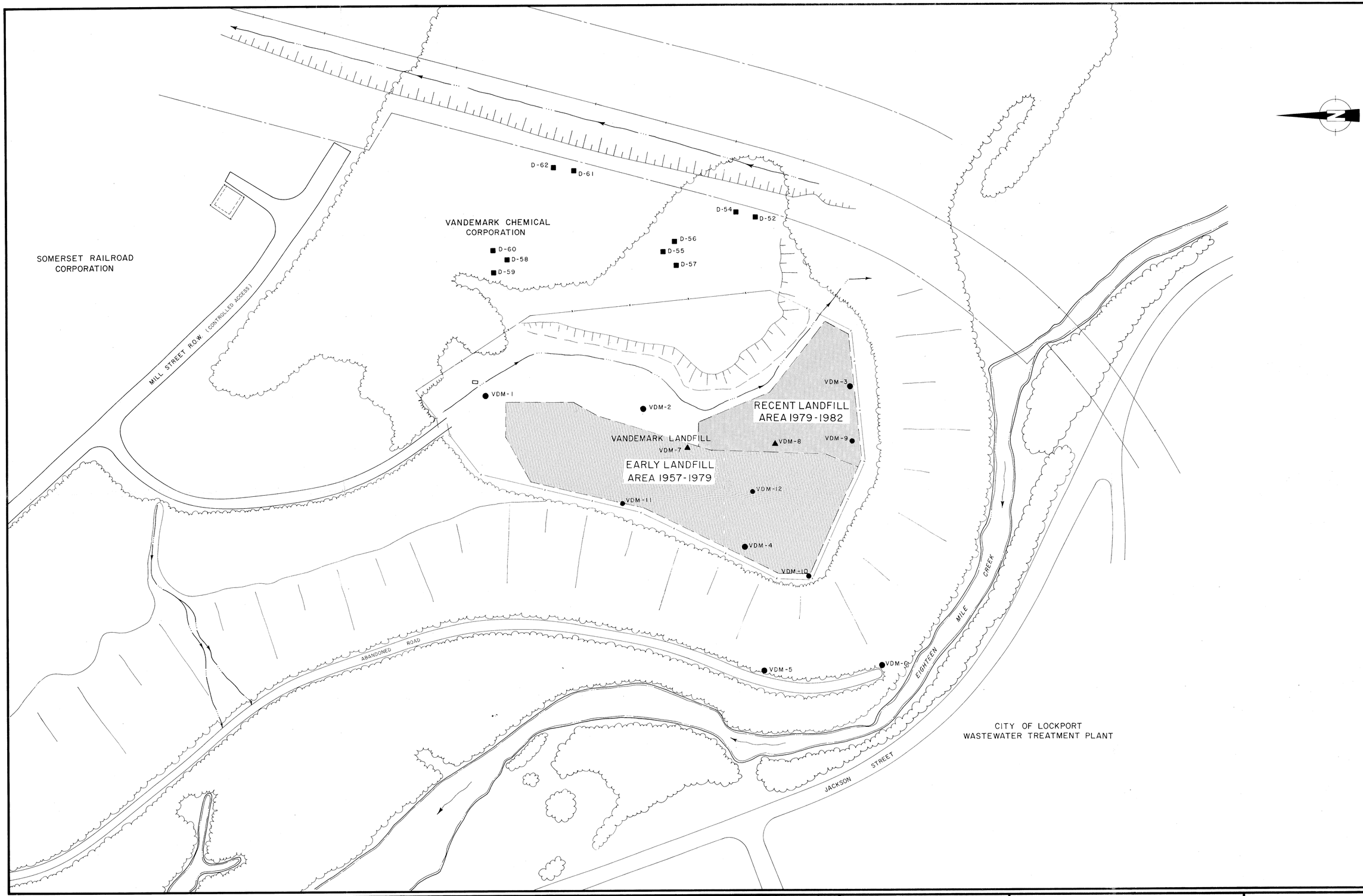

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"CHEMICAL WASTE LANDFILL SITE LOCATION PLAN-CLOSURE" DWG. No. VDM-2246 BY WILLIAM W. WHITMORE, CONSULTING ENGINEERS

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- ● — VDM WELL
- ▲ — VDM BORING

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LANDFILL CLOSURE RECORD PLANS

EARLY AND RECENT LANDFILL AREAS

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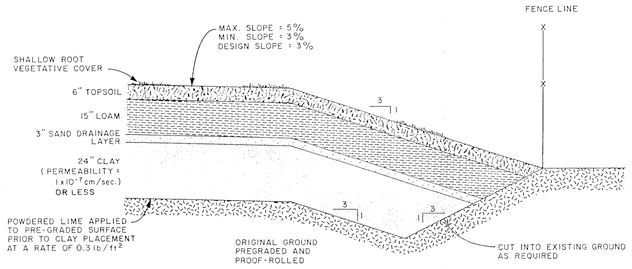
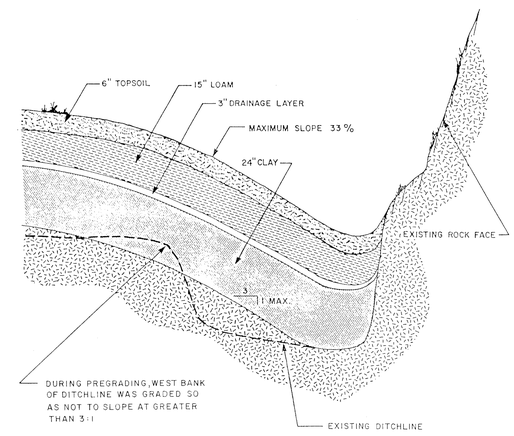


FINAL CAPPING DETAIL

N.T.S.



TYPICAL DITCH LINING DETAIL

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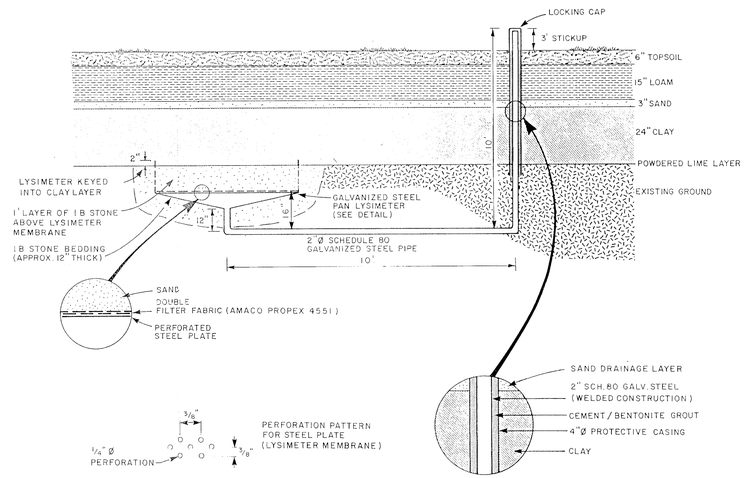
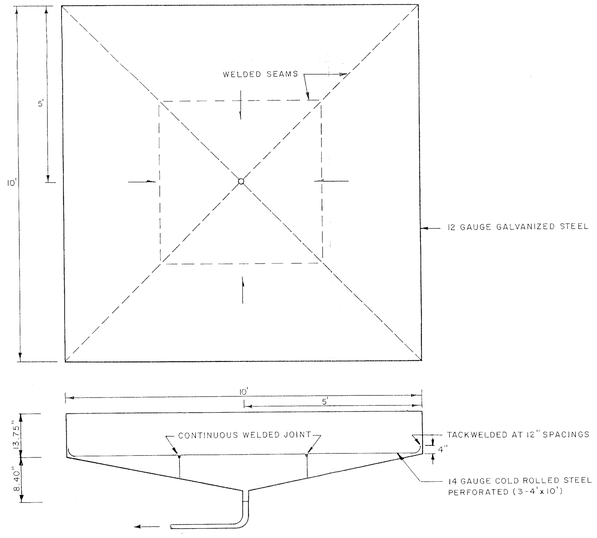


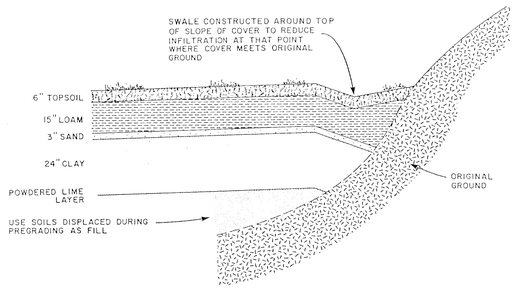
TYPICAL DETAIL - LYSIMETER SYSTEM

N.T.S.



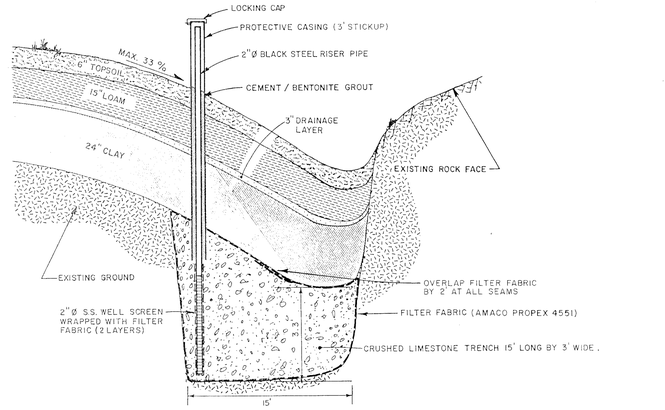
TYPICAL DETAIL PAN LYSIMETER

N.T.S.



TYPICAL DETAIL - EDGE OF CAP AT SLOPE

N.T.S.



TYPICAL DETAIL - INTERCEPTOR TRENCH
AND INTERCEPTOR TRENCH SAMPLE COLLECTION SYSTEM

N.T.S.

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LANDFILL CLOSURE RECORD PLANS

MISCELLANEOUS DETAILS

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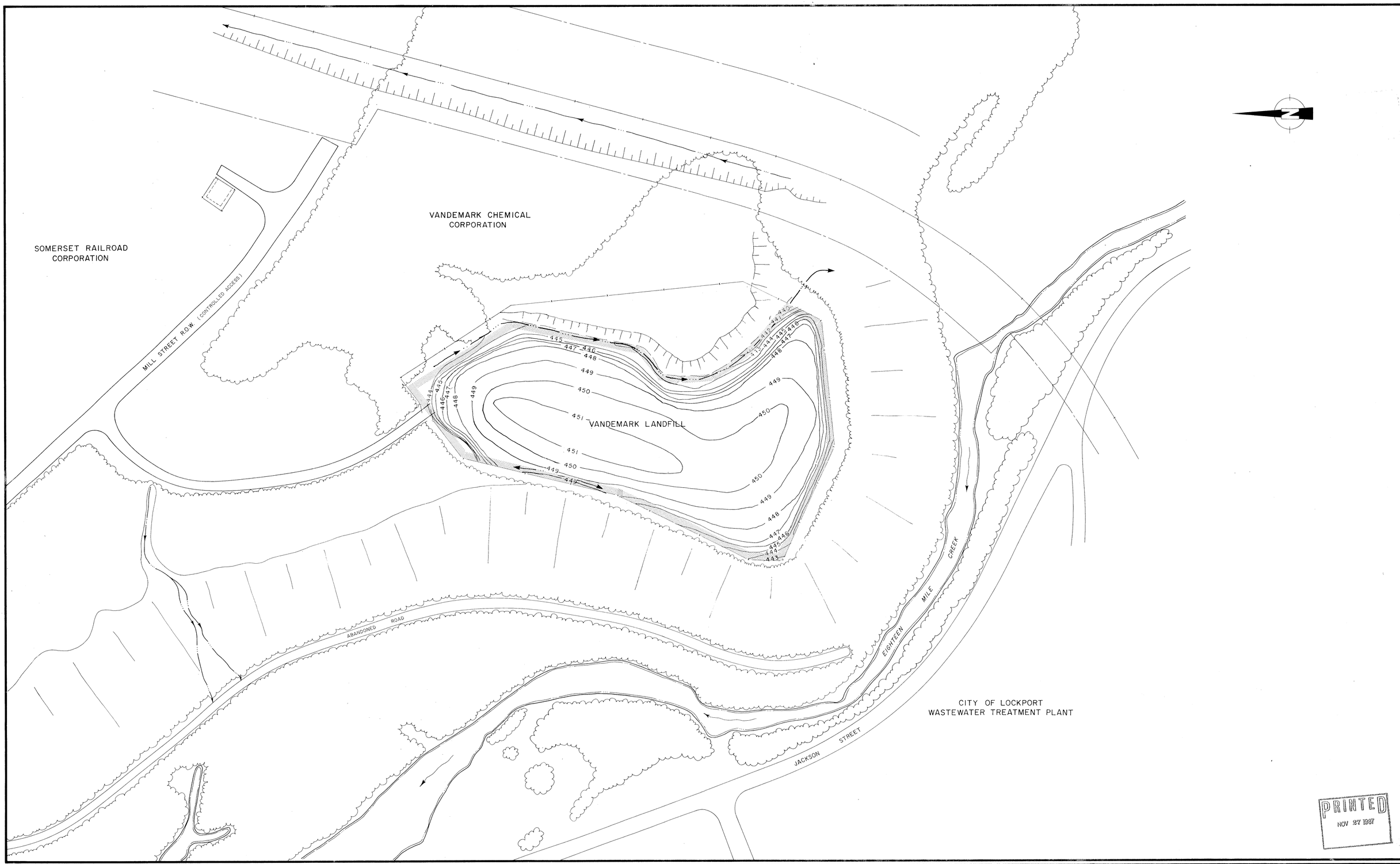
Checked by: J.K.	Field book:	Project No: 1277 AR	Drawing No: 16	PLAN 8



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LICENSED LAND SURVEYORS NIAGARA FALLS, NEW YORK.

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Van De Mark Chemical Co., Inc.

LANDFILL CLOSURE RECORD PLAN

FINAL GRADE CONTOURS

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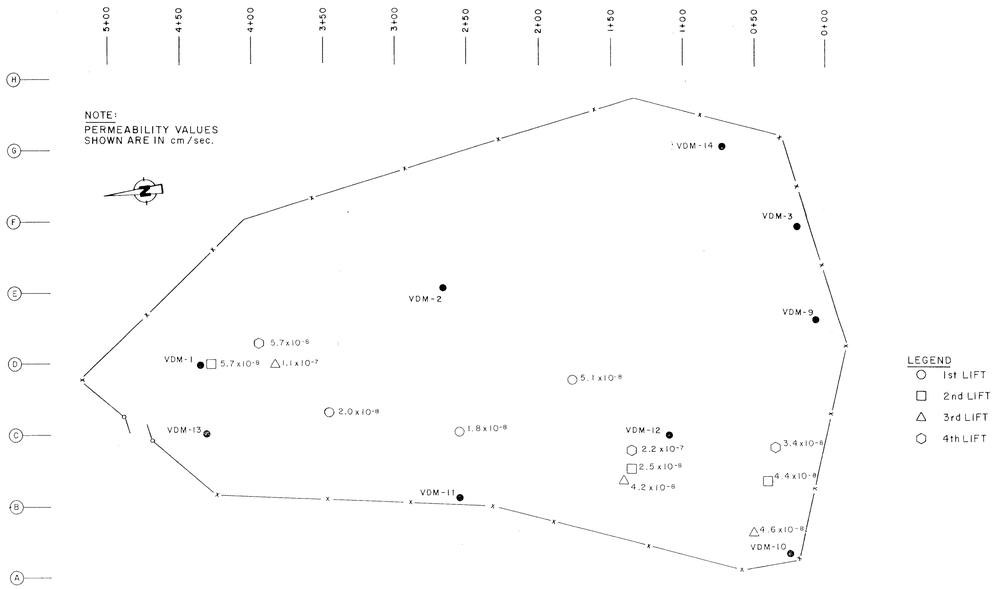
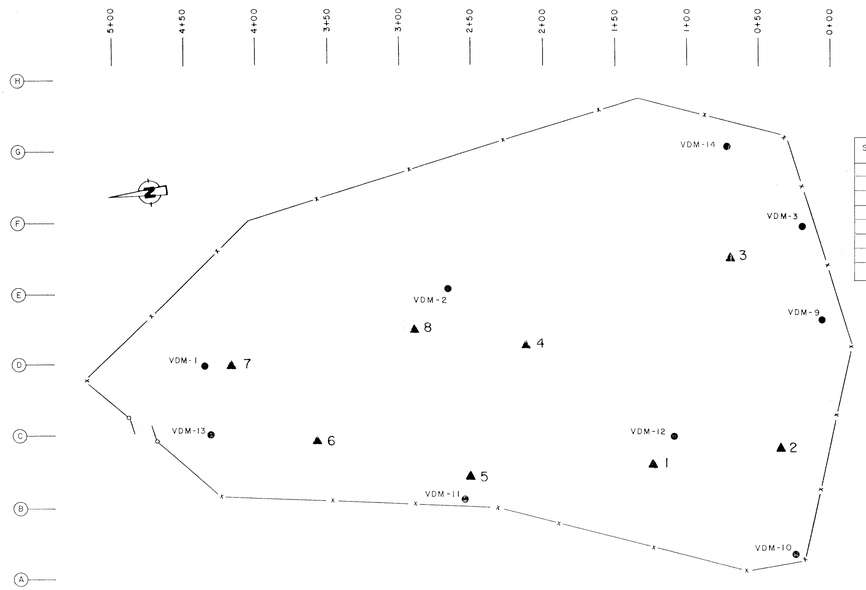
Designed by: D.B.				
Checked by:	Field book:	Project Nº: 1277 AR	Drawing Nº: 15 PLAN 7	

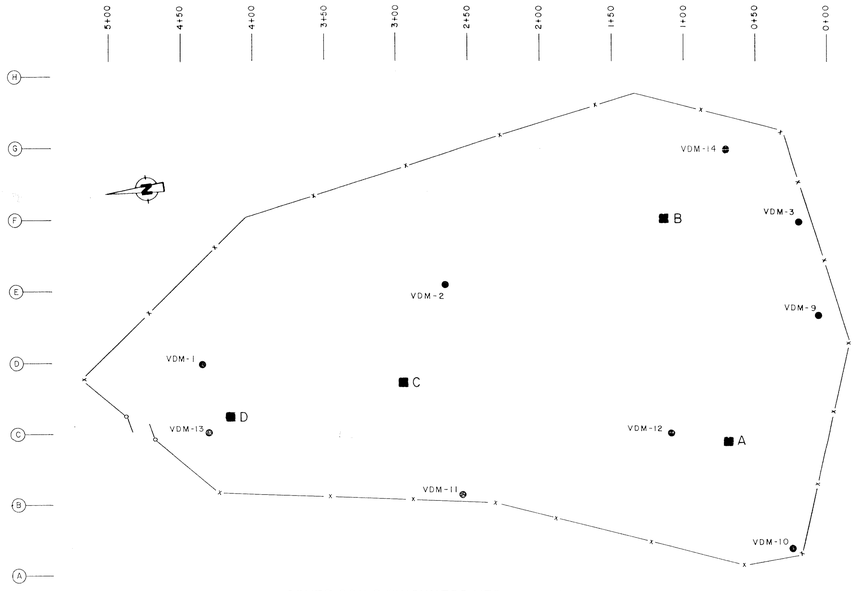


PERMEABILITY CYLINDER SAMPLING LOCATIONS



SPLIT SPOON SAMPLE	CLAY THICKNESS
1	26"
2	25"
3	25.5"
4	23.5"
5	24.5"
6	25.25"
7	25"
8	25"

CLAY THICKNESS VERIFICATION LOCATIONS



SPLIT SPOON SAMPLE	COVER SOILS THICKNESS
A	25.25"
B	22.5"
C	24.5"
D	23.25"

COVER SOILS THICKNESS VERIFICATION LOCATIONS

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LANDFILL CLOSURE RECORD PLANS

TESTING LOCATIONS-B

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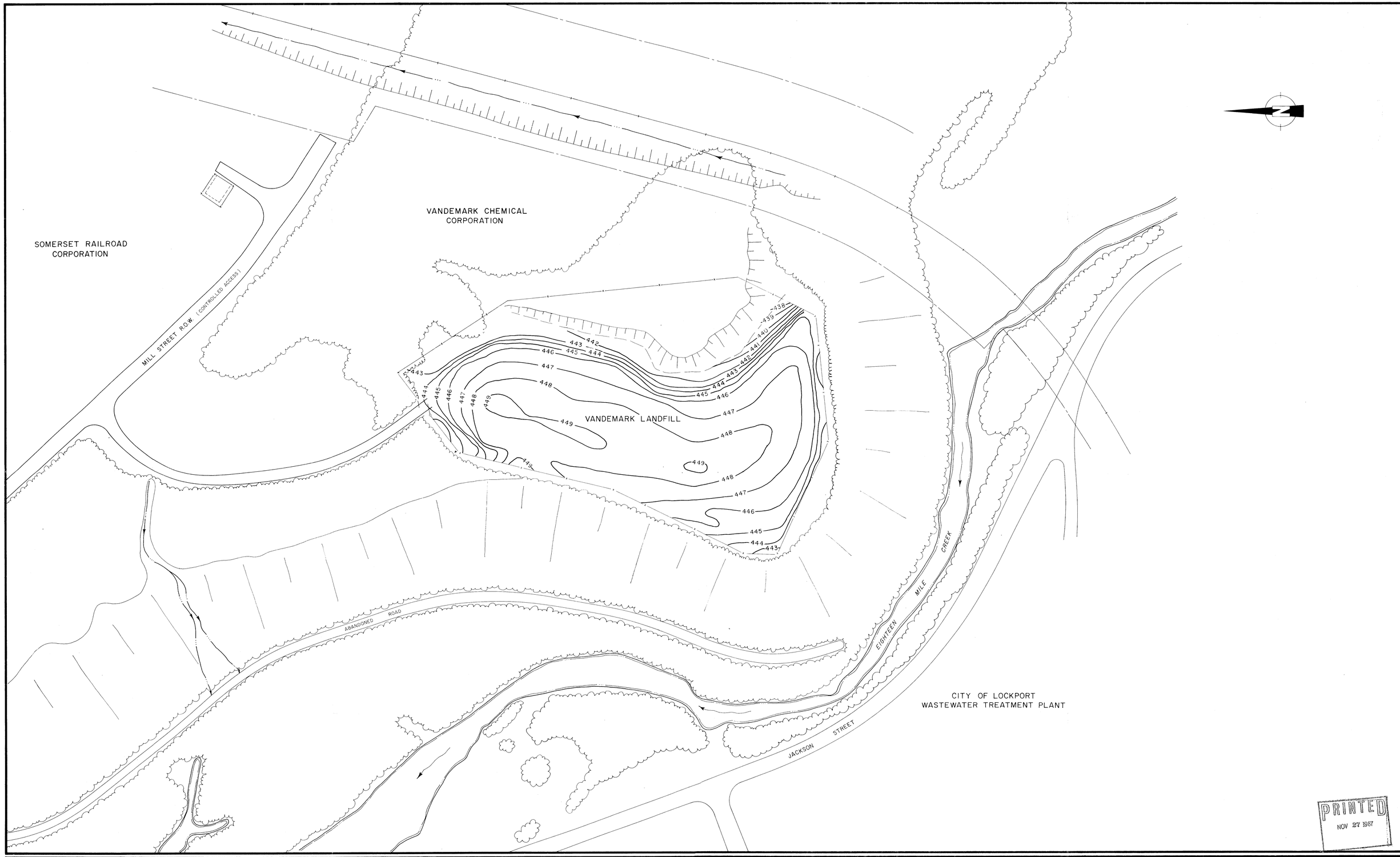
Designed by: D.B.				
Checked by:	Field book:	Project Nº: 1277-AR	Drawing Nº: 13 PLAN 5	



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LICENSED LAND SURVEYORS NIAGARA FALLS, NEW YORK.

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Van De Mark Chemical Co., Inc.

LANDFILL CLOSURE RECORD PLANS

TOP OF CLAY CONTOURS

CRA
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651 Colby Drive, Waterloo, Ontario Canada N2V 1C2

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Designed by: D.B.				
Checked by:	Field book:	Project No: 1277 AR	Drawing No: 14 PLAN 6	