CROSS COUNTY SANITATION/KESSMAN LANDFILL
OPERATION, MAINTENANCE AND MONITORING

OM&M REPORT

Site No. 3-40-011

Prepared for:

DIVISION OF ENVIRONMENTAL REMEDIATION
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 BROADWAY, ALBANY, NY 12233-7012

Prepared by:

Iyer Environmental Group, PLLC
44 Rolling Hills Drive
Orchard Park, NY 14127

Submitted by:

O'Brien & Gere Engineers, Inc
5000 Brittonfield Parkway,
East Syracuse, NY 13057

March 2005

CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M OPERATIONS, MAINTENANCE AND MONITORING
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CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M
OPERATIONS, MAINTENANCE AND MONITORING
OM&M REPORT

O'Brien & Gere Engineers, Inc. (O'Brien & Gere), with Iyer Environmental Group, PLLC (IEG) as a subconsultant, initiated routine operation, maintenance and monitoring(OM&M) of the Cross County Sanitation (a.k.a. Kessman) Landfill located on Cornwall Hill Road in the Town of Patterson in Putnam County, New York (see Figure 1) in February 2002 under a Standby Contract Work Assignment. An initial site visit was made to assess site conditions. This was followed by monthly inspections and field measurements, and sampling and analysis of site groundwater, surface water and leachate seeps. The field work also included a site topographic survey, sediment sampling program, and leachate management with off-site disposal as well as on-site treatment. A tracer study of landfill leachate was also performed to locate seeps, and a groundwater modeling effort was completed to assess groundwater flow through the landfill.

This report presents the field and laboratory data collected from the OM&M work completed to date by OBG/IEG, and also incorporates information from previous monitoring events performed by the New York State Department of Environmental Conservation (Department).

1. LANDFILL BACKGROUND

The 10-acre Kessman Landfill had accepted solid and industrial wastes of unknown types and quantities. This landfill was capped in 1995 following the removal of approximately sixty industrial waste drums and contaminated soils, and restoration of the affected wetlands. The town landfill is located to the west of the Kessman Landfill. The Kessman Landfill is now fenced and has a locked gate at the site entrance to restrict vehicles.

Landfill features are shown on an updated as-built drawing. The passive vents are clearly marked and the landfill has moderate methane generation. During previous NYSDEC monitoring, no H_2S was detected, and oxygen was around 8 ppm in the landfill gas. The leachate collection system needed proper evaluation, including contaminant migration off-site. The leachate collection tank is 12 feet deep and 6 feet in diameter with water at a depth of approximately 6 feet. The laterals have overflow provisions every 100 feet. The site required active leachate pumping due to seepage from the landfill to the adjacent wetland. The swamp was sampled previously by the Department and showed low level PCB contamination. Site photos and additional background information are included in Attachment A.

2. OM&M DATA

Activities during this reporting period included monthly field inspections, well repair, topographic survey update, and sampling and analysis of groundwater, surface water, sediment and leachate at the landfill. To date, OBG/IEG has completed seven rounds of groundwater monitoring, and one separate round of surface water/leachate sampling. In addition, the landfill leachate in the collection sump was sampled during the course of the leachate pumping and analyzed for site specific parameters. A staff gauge was installed in the wetland near MW-20 series wells to monitor the surface water level. The staff gauge was not under water during the second half of this OM&M period due to high water levels in the wetland. The railroad was contacted in 2003/2004 to remove the beaver dam under the railroad bridge northeast of the landfill.

Field data from this reporting period are included as standard forms in Attachment B. Daily field

measurements are transcribed into Form 1s for each inspection and/or monitoring event. Field activities are also summarized as part of the Form 1s. Form 2 tabulates groundwater purging/sampling data, while groundwater elevation data are included in Form 3 along with data from a historical set for comparison. Detected analytical results are tabulated in Form 4s for the seven groundwater and surface water sampling events, and one surface water only sampling event completed by OBG/IEG this year. Previous analytical data from groundwater, surface water and sediment sampling performed by the Department are included in Attachment C. Groundwater contour plots prepared using SURFER software are presented in Attachment D.

In July/August 2002, well MW-3A was repaired to remove a kink in the well by sawing the riser and shortening it. The site was resurveyed in August 2002 to update the topographic map and well details. The revised and updated survey information for the wells is included in Form 5, and the Surveyor's report is included as Attachment E. A checklist of field equipment and supplies used for every OM&M event is provided in Form 6.

Table 1 lists the scheduled analytical parameters for groundwater, surface water and leachate monitoring. Total volatile organic compounds (VOCs) concentrations in the groundwater and surface water/leachate seeps around the site are summarized in Table 2 for the last five years. The trends in the VOC data for selected wells and surface water/leachate seep locations with elevated concentrations are also graphically illustrated on Figures 2A, 2B, and 2C.

3. RESULTS

Water Levels

The two upgradient wells (MW-1A and MW-1B) by the resident house on Cornwall Road show the most variation in groundwater levels, changing by as much as 12.4 feet in MW-1A and 9.9 feet in MW-1B. The groundwater levels in the other wells, which are located along the downgradient side of the landfill, vary between 0.6 and 8.5 feet, paralleling the change in the wetland surface water levels. The wetland water level was high for most of 2003 and early 2004 as a result of busy beavers damming up the drainage under the railroad track to the northeast of the landfill. For the later part of 2004, the wetland water had submerged the staff gauge until the railroad company removed the beaver damn under the bridge.

Groundwater flow appears to be from the west (landfill entrance) to the east, towards the wetland. Groundwater contour plots using SURFER (see Attachment D) show a relatively steady gradient of around 0.03 ft/ft across the landfill in both the shallow and deep aquifers. Well couplets MW-3A/B (southeast boundary) and MW-5A/B (northeast boundary) have nearly the same shallow and deep groundwater elevations. The area around MW-20A/B and the leachate sump show higher localized gradients due to a combination of leachate pumping and changes in the wetland water level.

The water levels around the leachate tank are profiled in Figure 3. The water level within the leachate sump appears to be mostly influenced by the fluctuations in the wetland water level. Without the effect of the wetland, leachate collection in the sump could be relatively small. The presence of leachate seeps is confirmed by the results of the tracer study (see section 8 and Attachment H). The leachate collection rate was evaluated using the water level data and available information about site geology (see Section 5 and Attachment F).

Contaminant Concentrations

Groundwater: Wells MW-1A, MW-1B, MW-3A and MW-3B (see Figure 2A) have shown trace levels of contaminants that are common to laboratories and are not indicative of the presence of any

site related contaminants. In the last four rounds of monitoring from December 2002 to May 2004, a variety of chlorinated and petroleum-based volatile organics compounds (see Form 4As in Attachment B) were detected at trace levels (less than 5 ppb) in the other four wells (MW-5A/B and MW-20A/B). Except for an unusual spike in wells MW-5A and 5B in September 2002, total VOCs have been within the same order of magnitude (less than 18 ppb) in these four wells (MW-5A/B and MW-20A/B) as in previous events. The VOC spikes in MW-A/B is the result of a one time detection of 2-butanone, possibly attributable to laboratory contamination.

In the last few rounds of sampling, only iron, manganese, magnesium, sodium and zinc show exceedances of the groundwater standards in one or more wells. No semivolatile organic compounds (SVOCs) or PCBs were detected in the monitoring wells.

Surface Water: Surface water has been sampled at four locations (see as-built drawing) during the course of this OM&M work assignment. The surface water at the south railroad bridge has been relatively free of VOCs, with only negligible detections (total less than 7 ppb). The wetland water at SW-2 (between MW-5A/B and MW-20A/B) had the highest levels of VOCs, with two consecutive spikes of 1200 and 120 ppm of 1,2-dichloroethene in March and November, 2003 respectively. The levels were back to normal (10 ppb total VOC) in May 2004, with no detection of 1,2-dichloroethene. The 1,2-dichloroethene spike can be attributed to a possible leachate seep in the vicinity of SW-2 as confirmed by the tracer study. Only two SVOCs (naphthalene and caprolactum) were detected at trace levels (less than 2 ppb) in surface water samples.

Leachate: Leachate samples from the collection sump near the MW-20 series wells have shown total VOCs ranging from 12 to 30 ppb, with the same trace to low levels of chlorinated and petroleum VOCs seen in wells MW-5A/B and MW-20A/B. The highest level observed in November 2003 can be attributed to the extensive pumping of leachate (see Form 7 in Attachment B). Based on the level of the VOCs and other contaminants detected in the leachate sump, the leachate was initially disposed in a POTW, and subsequently treated on-site and discharged into the wetland as a pilot study.

4. SITE TOPOGRAPHIC MAP UPDATE

The site was resurveyed in August 2002 to update the as-built drawing (included after the figures) and reestablish monitoring well details. The survey report is included in Attachment E.

5. GROUNDWATER MODELING

A groundwater modeling exercise was completed to assess and estimate ground flow through the site. The results are presented in Attachment F. The model calculations were initially performed with hydrogeological information from the adjacent Town of Patterson landfill, and subsequently updated after copies of previous reports (e.g. RI/FS) were made available by a local citizen. Groundwater extraction rate was estimated by the modeling exercise to be in the range of 1 to 17 gpm . Actual rates will be influenced by wetland water levels and the presence of leachate seeps.

6. SEDIMENT SAMPLING

The wetland sediment was sampled in September/October 2003 for PCB analysis. During the sediment sampling, sample locations were identified with a field GPS unit. Table 4 includes a listing of the samples with the GPS coordinates and PCB results. The site monitoring wells were also identified with the GPS unit and the readings are tabulated on Table 5. A detailed description of the

procedures is provided in Attachment G. Sample locations are shown on the site topographic map in Figure 4A, as well as on Figure 4B using the GPS coordinates.

Trace to low levels of PCBs (less than 2.3 ppm) were found in thirteen of the thirty three locations sampled in the wetlands with only Aroclor 1242 being detected. One location (No. 7 on Figure 4A) had 50 and 57 ppm PCBs at the two depths sampled. This location is near the leachate sump, and is within the area identified as a possible leachate seep during the tracer study. Another location (No. 18) in the same area had 10 ppb PCB. The PCB levels observed in this wetland sediment appears to be residual from past remediation activities and there is no evidence of off-site migration of the PCBs.

At the request of the local Friends of the Frogs (FROGS) organization, sediment samples were collected from an area downstream from the landfill and no PCBs were found. The sampling area is shown on a map included in Attachment G.

7. LEACHATE MANAGEMENT

A leachate management program was initiated in October 2003 with the pumping and off-site disposal of leachate from the landfill. Over a four month period, 127,500 gallons of landfill leachate was removed from the site and hauled to the Town of Kingston Wastewater Treatment plant. Field measurements including daily leachate pumping and water levels in the sump are included on Form 7 in Attachment B.

Subsequently, an on-site leachate treatment program was initiated in May 2004 as a pilot test along with a tracer study of the landfill leachate. The treatment system (see Figure 5) consisted of a submersible pump, a bag filter and two activated carbon drums in parallel. The treated leachate was discharged on site into the adjacent wetland. The treatment system influent and effluent were sampled during each event and analyzed for VOCs and metals. A total of 219,470 gallons of leachate (for a grand total of 346,970 gallons including the off-site disposal) was pumped out of the landfill using the on-site treatment system. Field measurements are shown in Tables 6 and 7, while analytical results are presented in Table 8.

8. LEACHATE TRACER STUDY

A leachate tracer study was completed with assistance from Prof. Donald Siegel of Syracuse University to identify possible locations where landfill leachate might seep into the wetland and vice versa. Five locations (3 in the wetland along the landfill shoreline and two monitoring wells) as shown on Figure 6 and appropriate dyes were selected for the study. A tracer study report prepared by Prof. Siegel is included in Attachment H. The tracer study indicated a possible connection between the landfill and the wetland at two locations, both along the north shoreline - points 2 (near SW-2) and 4 (near leachate sump; see Figure 6). Field observations during the December 2004 OM&M showed warm water in an otherwise frozen landfill at these two locations, confirming the leachate seep.

9. MAINTENANCE

This site did not require extensive maintenance. The cap and gas vents are in good condition. Locks were replaced in some wells, and well MW-3A was repaired.

10. ANTICIPATED ACTIVITIES

Activities in the near future for the Kessman Landfill will include the following:

- Routine inspections
- Environmental sampling as and when requested by the Department
- Continuation of leachate management
- OM&M Manual

11. RECOMMENDATIONS

MONITORING/INSPECTION: Quarterly monitoring over the last three years has shown individual VOCs at low ppb levels in groundwater at the wells. VOC contamination still persists in wetland water, particularly at one location near MW-20A/B. However, there is no evidence of off-site contaminant migration. Therefore it is recommended that only surface water quality be monitored for a year. The need for and frequency of future groundwater sampling should be re-evaluated over the next year.

Site inspection should continue but at a reduced frequency. Instead of monthly inspections, the landfill can be inspected once every two months. During these inspections, surface water should be sampled in the wetland next to the landfill and analyzed for VOCs. The VOC results can be compared with historical data from the last few years to determine the need for further action.

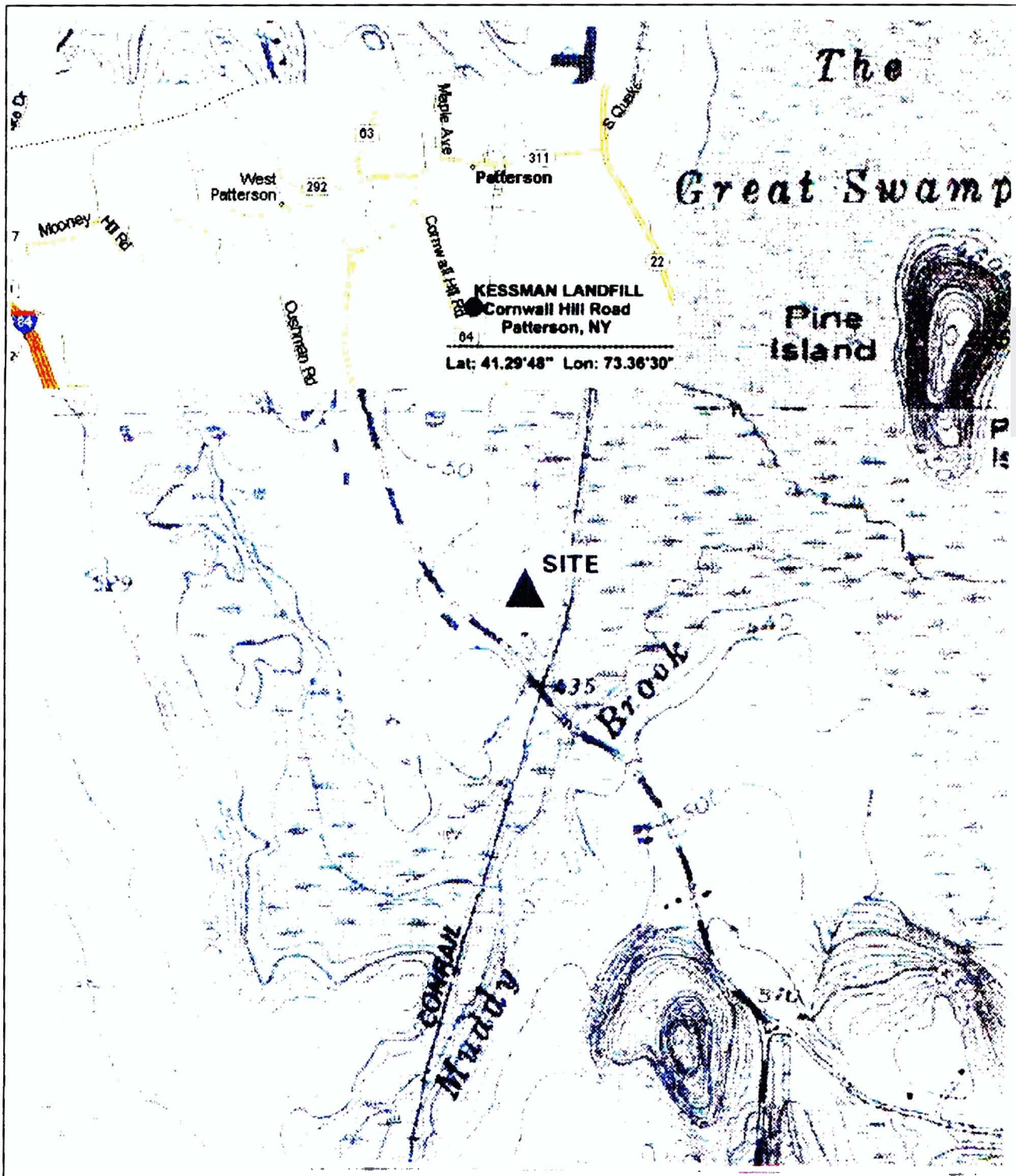
FISH SAMPLING: Sediment sampling in October 2003 showed trace to low level PCBs in the wetland sediments except for two locations (50 ppm) where the tracer study indicated the possible presence of leachate seeps from the landfill. The wetland sediments were remediated as part of the landfill capping in 1995, and at the levels detected, the PCBs should not have any impact. However, to alleviate any concerns, the fish in the wetland water should be sampled for PCBs.

LEACHATE PUMPING: Contaminant levels have been relatively low in landfill leachate. The frequency and rate of Leachate pumping should be established after monitoring of the surface water quality and wetland water levels over the next year.

CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M
OPERATION, MAINTENANCE AND MONITORING

OM&M REPORT

FIGURES



Site Location Map

340[illegible] Cross Co. Sanitary-Kessman L.F.

Map source: USGS 7.24,000-scale topographic quadrangles

Scale 1:12,000

April 1, 2000

CROSS CO. SANITATION/KESSMAN LANDFILL	FIGURE 1
SITE LOCATION MAP	IEG/OBG

FIGURE 2A
CROSS COUNTY SANITATION/KESSMAN LANDFILL
VOCs IN GROUNDWATER

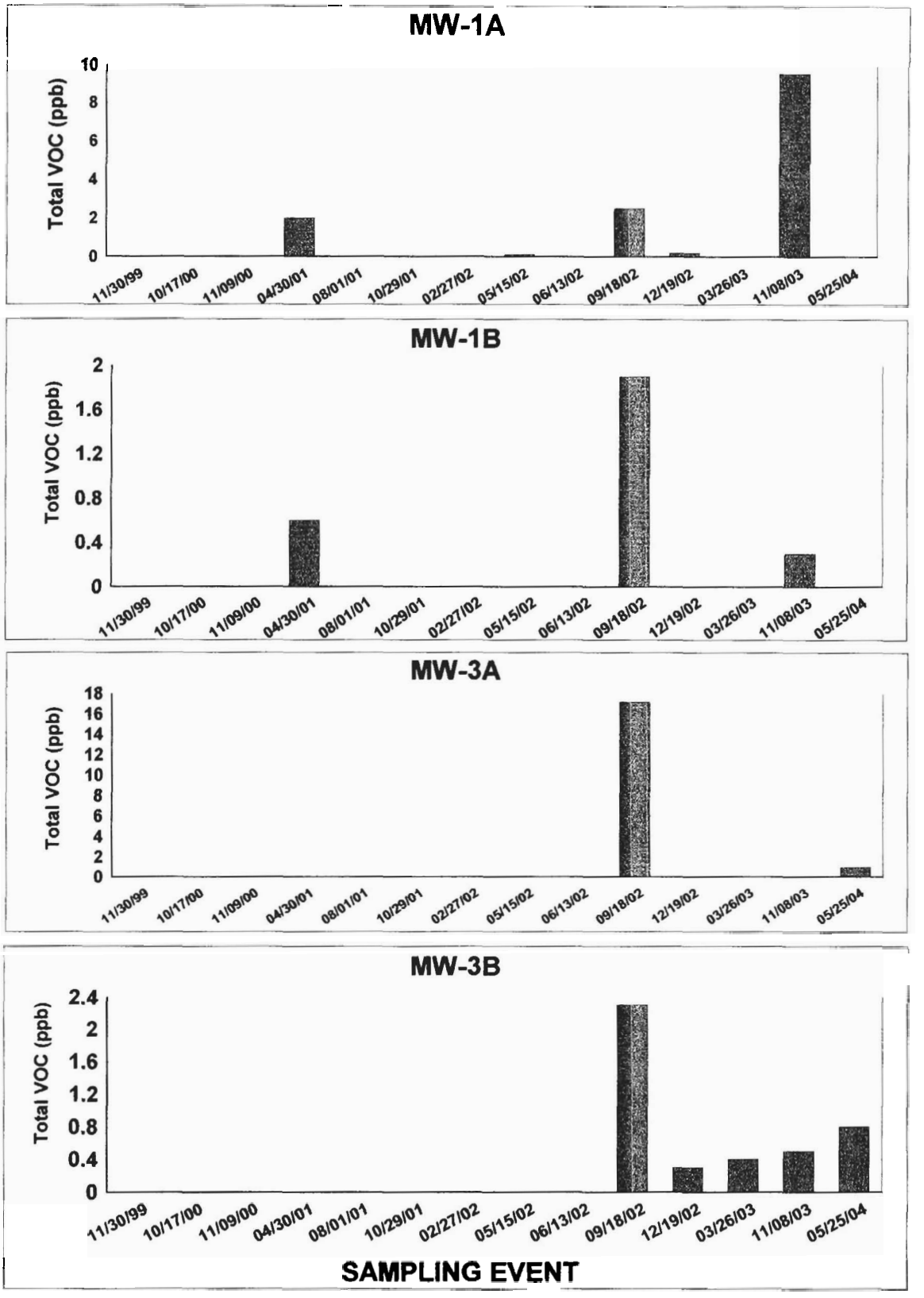


FIGURE 2B
CROSS COUNTY SANITATION/KESSMAN LANDFILL
VOCs IN GROUNDWATER

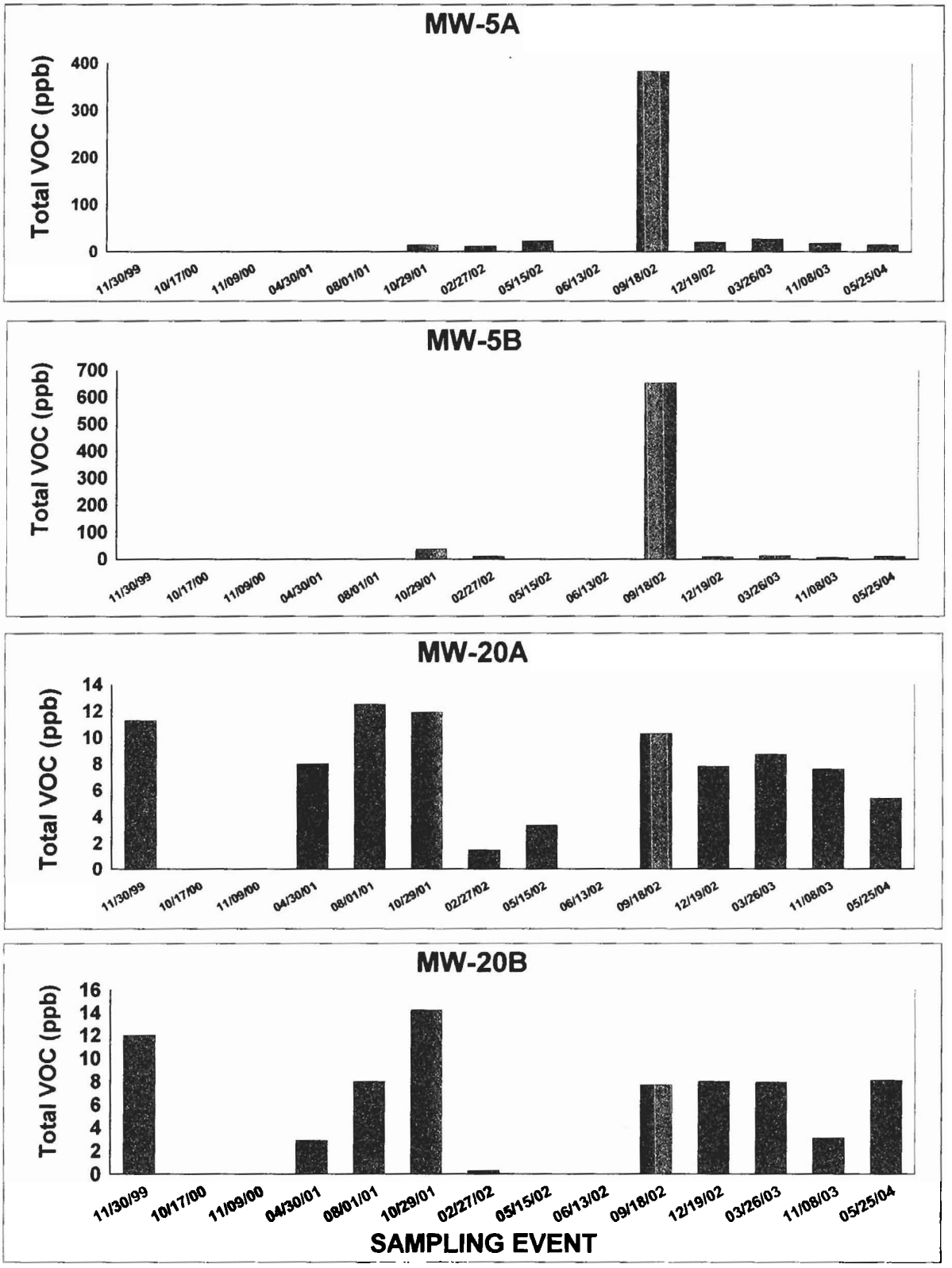
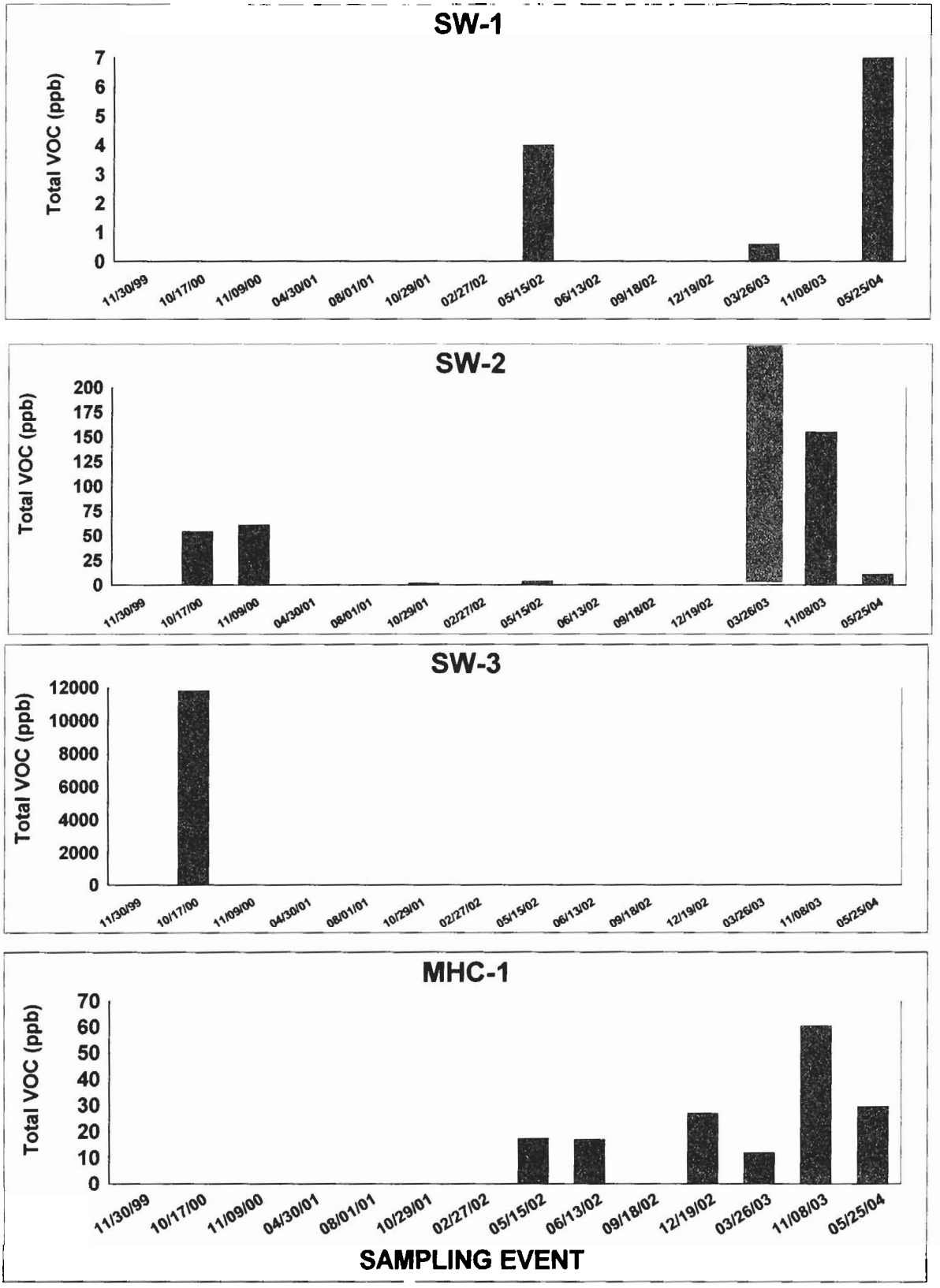
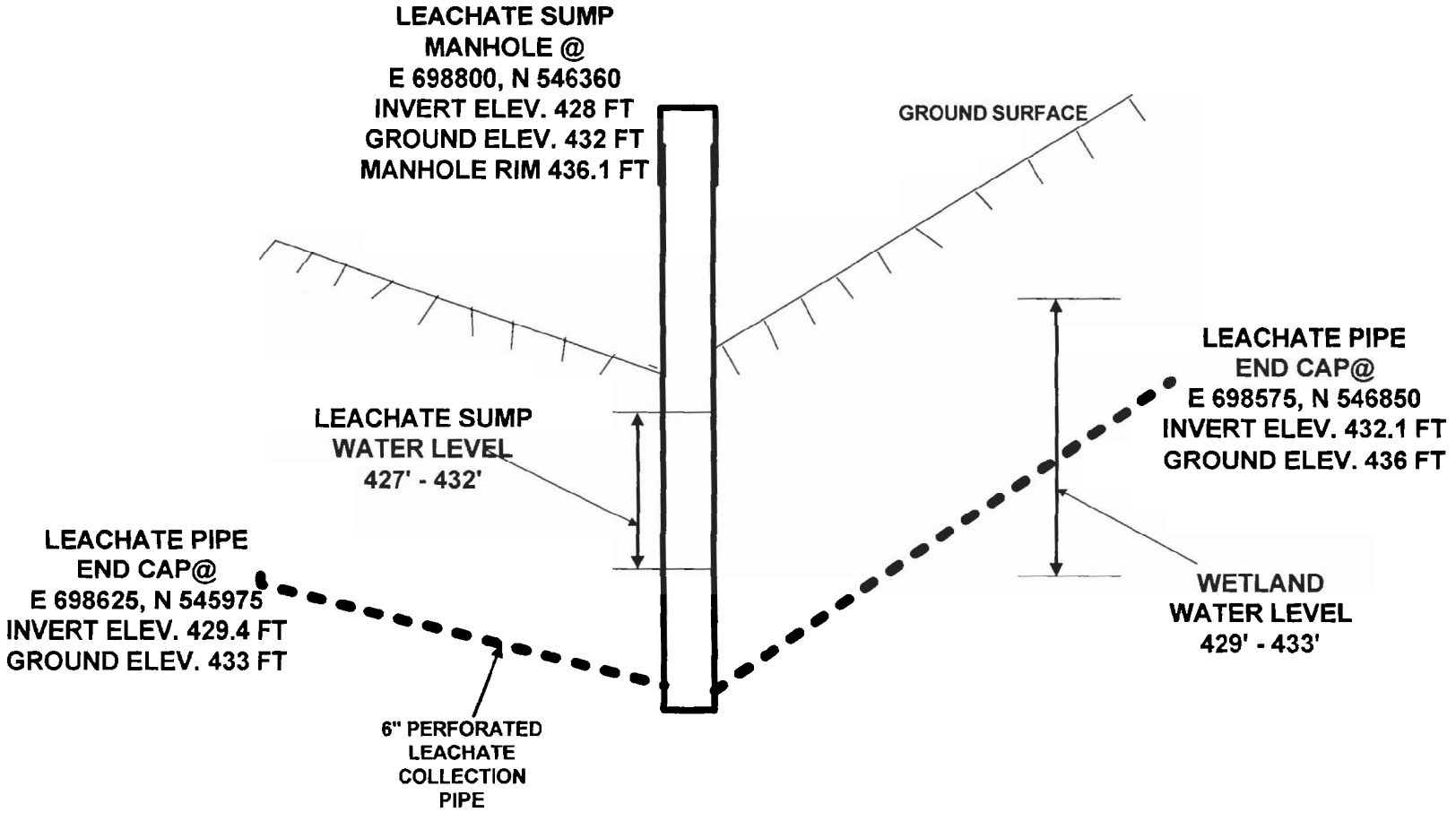


FIGURE 2C
CROSS COUNTY SANITATION/KESSMAN LANDFILL
VOCs IN SURFACE WATER/LEACHATE

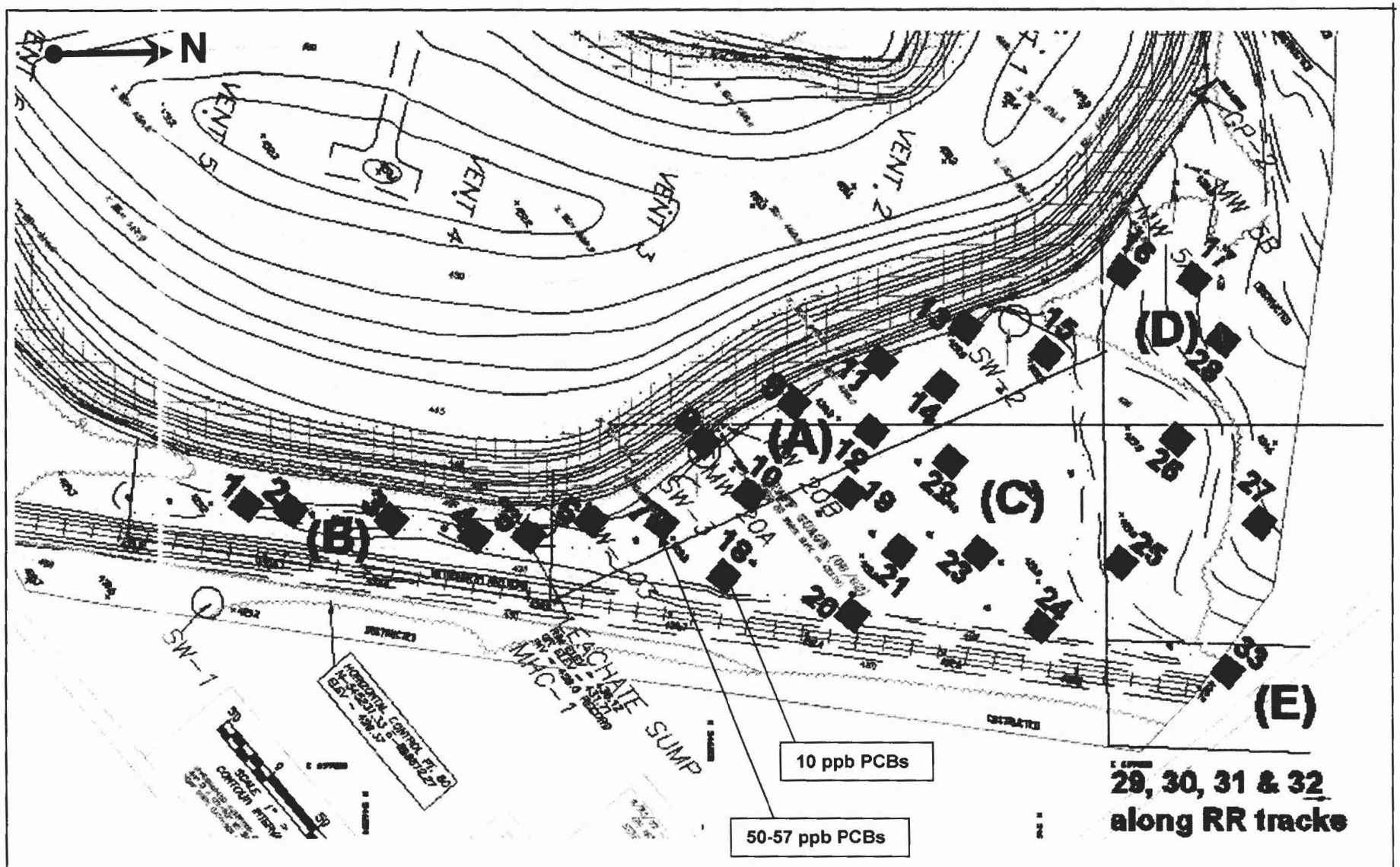




CROSS COUNTY SANITATION/KESSMAN LF
LEACHATE COLLECTION SYSTEM PROFILE

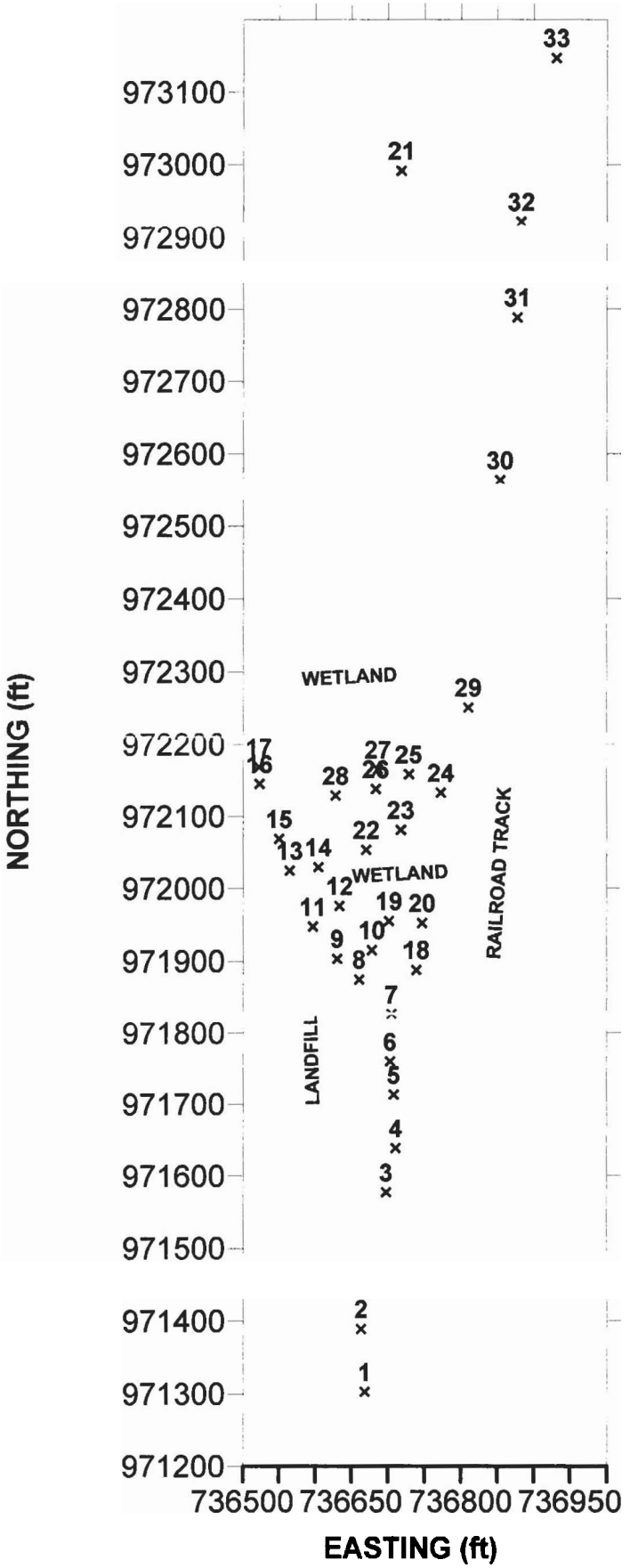
FIGURE 3

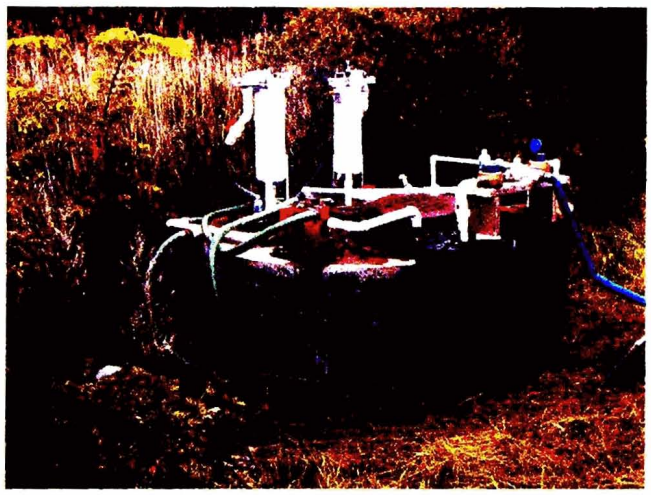
IYER ENVIRONMENTAL GROUP PLLC



KESSMAN LANDFILL OM&M	FIGURE 4A
Sediment Sampling Locations	IEG

FIGURE 4B
KESSMAN LANDFILL OM&M
SEDIMENT SAMPLING LOCATIONS



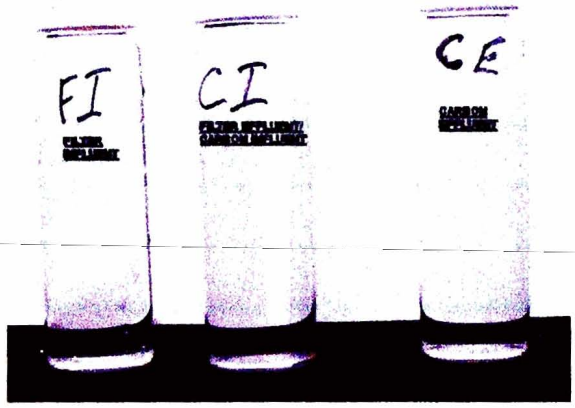


TREATMENT SYSTEM (2 FILTERS/2 CARBON DRUMS IN SERIES) AND DISCHARGE

DYE AT #2 NEAR MW-5

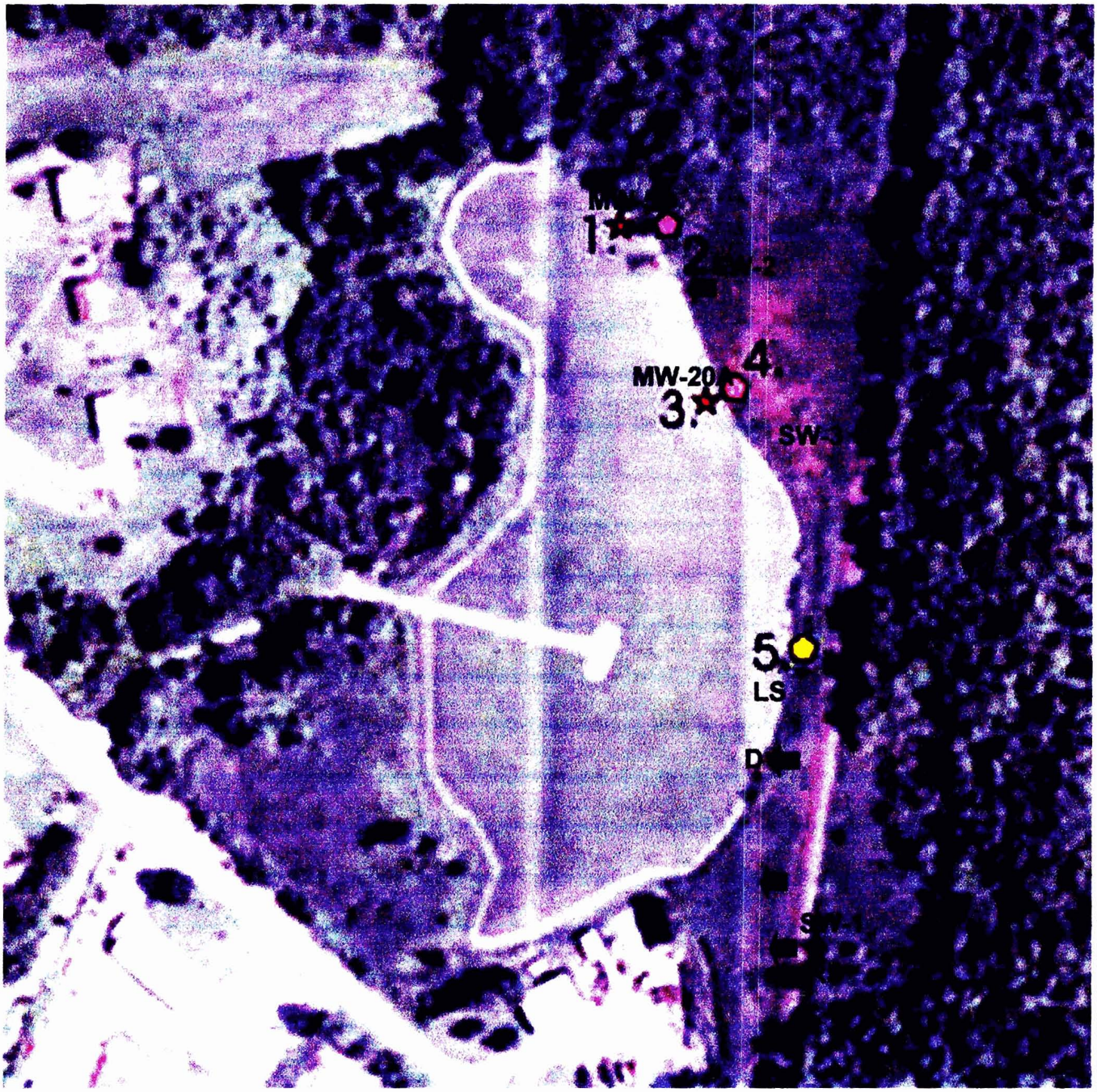
DYE AT #4 NEAR MW-20

DYE AT #5 NEAR SUMP



PROCESS STREAM
FILTER INFLUENT, CARBON INFLUENT, CARBON EFFLUENT

KESSMAN LANDFILL TRACER STUDY	FIGURE 5
SITE PHOTOS	IEG/OBG



ID	DESCRIPTION	DYE
1	MW-5B	200 g sulforhodamine G extra
2	Wetland near MW-5B	2.5 kg Na-Naphtionate
3	MW-20A	200 g eosine
4	Wetland next to MW-20A	200 g sulforhodamine B
5	Wetland near leachate sump	1 kg lissamine FF
LS	Leachate sump	N/A
RN	North culvert under railroad	N/A
RS	South culvert under railroad	N/A
SW	Surface water monitoring locations	N/A
D	Treated leachate discharge	N/A

Iron Staining

KESSMAN LANDFILL TRACER STUDY
DYE INJECTION LOCATIONS

FIGURE 6

IEG/OBG

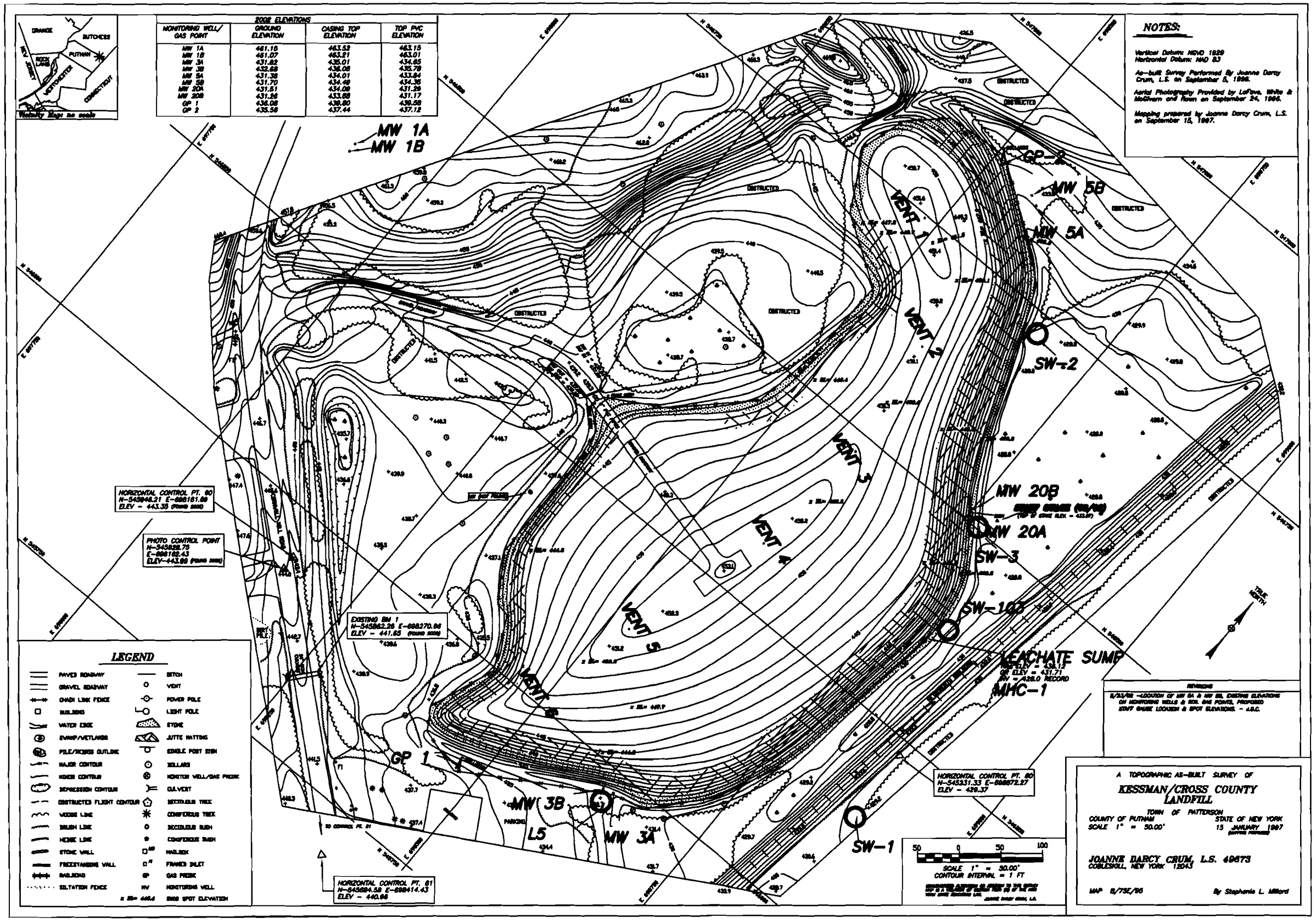

2002E ELEVATIONS
MONITORING WELL/ GAS POINT | GROUND ELEVATION | CASING TOP ELEVATION | TOP PVC ELEVATION
MW 1A | 461.16 | 463.58 | 463.15
MW 1B | 461.07 | 463.21 | 463.01
MW 3A | 431.82 | 435.01 | 434.65
MW 3B | 432.68 | 436.06 | 435.79
MW 5A | 431.38 | 434.01 | 433.64
MW 5B | 431.70 | 434.49 | 434.35
MW 20A | 431.51 | 434.09 | 431.29
MW 20B | 431.56 | 433.98 | 431.17
GP 1 | 436.08 | 436.80 | 436.58
GP 2 | 435.56 | 437.44 | 437.13
Vicinity Map no scale
DRAKE
BUTCHESS
PUTNAM
ROCK LAND
MOTORCITY
CONNECTICUT
NOTES:
Vertical Datum: NGVD 1929
Horizontal Datum: NAD 83
As-built Survey Performed By Joanne Darcy Crum, L.S. on September 5, 1996.
Aerial Photography Provided by LaTave, White & McGhern and flown on September 24, 1996.
Mapping prepared by Joanne Darcy Crum, L.S. on September 15, 1997.
MW 1A
MW 1B
GP 2
MW 5B
MW 5A
VENT 1
VENT 2
VENT 3
VENT 4
VENT 5
VENT 6
SW-2
MW 20B
MW 20A
SW-3
SW-100
LEACHATE SUMP
TOP ELEV = 438.15
GP ELEV = 431.71
INV = 428.0 RECORD
MHC-1
HORIZONTAL CONTROL PT. 60
N-545946.21 E-688161.89
ELEV = 443.35 (FOUND 2002)
PHOTO CONTROL POINT
N-545928.73
E-688182.43
ELEV=443.99 (FOUND 2002)
EXISTING BM 1
N-545862.26 E-688270.96
ELEV = 441.65 (FOUND 2002)
GP 1
MW 3B
L5
MW 3A
SW-1
HORIZONTAL CONTROL PT. 61
N-545694.58 E-688414.43
ELEV = 440.66
HORIZONTAL CONTROL PT. 80
N-545231.33 E-688872.27
ELEV = 429.37
LEGEND
PAVED ROADWAY
GRAVEL ROADWAY
CHAIN LINK FENCE
BUILDING
WATER EDGE
SWAMP/WETLANDS
PILE/DEBRIS OUTLINE
MAJOR CONTOUR
MINOR CONTOUR
DEPRESSION CONTOUR
OBSTRUCTED FLIGHT CONTOUR
WOODS LINE
BRUSH LINE
HEDGE LINE
STONE WALL
FREESTANDING WALL
RAILROAD
SILTATION FENCE
DITCH
VENT
POWER POLE
LIGHT POLE
STONE
JUTTE MATTING
SINGLE POST SIGN
BOLLARD
MONITOR WELL/GAS PROBE
CULVERT
DECIDUOUS TREE
CONIFEROUS TREE
DECIDUOUS BUSH
CONIFEROUS BUSH
MAILBOX
FRAMED INLET
GAS PROBE
MONITORING WELL
SPOT ELEVATION
SCALE 1" = 50.00'
CONTOUR INTERVAL = 1 FT
REVISIONS
8/23/96 -LOCATION OF MW 5A & MW 5B, EXISTING ELEVATIONS ON MONITORING WELLS & NEW GAS POINTS, PROPOSED 2002 GRADE LOCATION & SPOT ELEVATIONS. - J.D.C.
A TOPOGRAPHIC AS-BUILT SURVEY OF
KESSMAN/CROSS COUNTY LANDFILL
TOWN OF PATTERSON
COUNTY OF PUTNAM
STATE OF NEW YORK
SCALE 1" = 50.00'
15 JANUARY 1997
JOANNE DARCY CRUM, L.S. 49673
COBLESKILL, NEW YORK 12043
MAP 8/75E/96
By Stephanie L. Millard

TABLE 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
ANALYTICAL SCHEDULE

PARAMETERS	Sample	ANALYTICAL METHOD
TCL Volatile organics	Groundwater Surface Water Leachate	524.2 (low level) ASP 2000
TCL Semivolatiles	Leachate	ASP 2000
TCL PCBs (low detection limit)	Groundwater Surface water	ASP 2000
TCL Pesticides/PCBs	Leachate	ASP 2000
TAL Metals	Groundwater Surface water Leachate	ASP 2000 (ICP 200.7 CLP-M)
Mercury	Groundwater Surface water Leachate	ASP 2000 (ICP 245.1 CLP-M)
Chlorides	Groundwater	325.2
Total Suspended Solids (TSS)	Groundwater Surface water Leachate	160.2
Total Organic Carbon (TOC)	Groundwater Surface water Leachate	415.1
Biological Oxygen Demand (BOD)	Surface water Leachate	405.1
Chemical Oxygen Demand (COD)	Surface water Leachate	410.4

TABLE 2
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
SUMMARY OF VOCs IN GROUNDWATER/SURFACE WATER/LEACHATE

DATE	SAMPLE LOCATION													
	MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	L-5	MHC-1
11/30/99	ns	ns	ns	0.0	ns	ns	11.3	12.0	ns	ns	ns	ns	ns	ns
10/17/00	0.0	0.0	ns	0.0	ns	ns	nd	nd	ns	54.4	11815	0.0	40.0	ns
11/09/00	ns	ns	ns	ns	ns	ns	ns	ns	ns	61.0	ns	ns	ns	ns
04/30/01	2.0	0.6	0.0	0.0	ns	ns	8.0	2.9	ns	0.0	0.0	0.0	ns	ns
08/01/01	0.0	0.0	0.0	0.0	ns	ns	12.5	8.0	0.0	0.0	0.0	0.0	ns	ns
10/29/01	0.0	0.0	0.0	0.0	14.2	37.3	11.9	14.2	0.0	2.0	0.0	0.0	ns	ns
02/27/02	0.0	0.0	0.0	0.0	11.6	11.4	1.5	0.3	ns	0.0	0.0	4.0	0.0	ns
05/15/02	0.1	0.0	0.0	0.0	23.0	0.0	3.4	0.0	4.0	4.0	4.0	10.0	ns	17.4
06/13/02	ns	ns	ns	ns	ns	ns	ns	ns	0.0	1.0	14.0	0.0	ns	17.0
09/18/02	2.5	1.9	17.2	2.3	382.3	653.3	10.3	7.7	0.0	0.0	0.0	0.0	ns	0.0
12/19/02	0.2	0.0	0.0	0.3	20.6	9.8	7.8	8.0	ns	ns	ns	ns	ns	27.0
03/26/03	0.0	0.0	0.0	0.4	26.7	14.2	8.7	7.9	0.6	1559.8	3.3	2.7	ns	12.0
11/08/03	9.5	0.3	0.0	0.5	18.0	7.5	7.6	3.1	0.0	154.9	8.5	1.0	ns	60.4
05/25/04	0.0	0.0	1.0	0.8	14.7	11.7	5.4	8.1	7.0	11.0	10.0	8.0	ns	29.5

NOTE: 1. Surface water samples previously labeled as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
2. Only detected values are reported; ns = not sampled
3. MW-5A and MW-5B includes Butanone at 360 and 640 ppb respectively; Total VOCs excluding butanone are 22.3 and 13.3 respectively.

TABLE 3A
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
LEACHATE ANALYTICAL RESULTS - ORGANICS

PARAMETER	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE DATES 05/16/02	06/14/02	09/19/02	12/19/02	03/27/03	11/06/03	12/02/03
Vinyl Chloride	ppb	2		ND	ND	ND	ND	ND	3 J	2.4
Methylene chloride	ppb			1J	ND	ND	1J	ND	ND	ND
Acetone	ppb			4J	ND	3J	4J	ND	ND	ND
Chloroethane	ppb	5		ND	ND	ND	ND	ND	1 J	1.4
trans 1,2-Dichloroethene (DCE)	ppb	5	5	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ppb	5	5	ND	ND	ND	ND	ND	ND	ND
cis 1,2-Dichloroethene (DCE)	ppb	5	5	ND	ND	ND	ND	ND	9 J	11
1,2-Dichloroethane	ppb	0.6	0.6	ND	ND	ND	ND	ND	ND	ND
Cyclohexane	ppb			ND	ND	ND	ND	ND	0.6 J	ND
Methylcyclohexane	ppb			ND	ND	ND	ND	ND	1 J	ND
Benzene	ppb	1	1	2J	2J	4J	3J	3J	6 J	5
1,2-Dichloropropane	ppb			ND	ND	ND	ND	ND	ND	ND
Toluene	ppb	5	5	ND	ND	ND	ND	2J	2 J	2.5
Ethylbenzene	ppb			ND	ND	ND	ND	1J	0.6 J	0.54
Chlorobenzene	ppb	5	5	5J	9J	8J	9J	10J	10	10
Xylene	ppb			ND	2J	2J	2J	1J	10 J	8.1
2-Hexanone	ppb			ND	ND	ND	ND	ND	ND	ND
Isopropylbenzene	ppb	5		0.7J	1J	1J	1J	1J	2 J	1.90
n-propylbenzene	ppb			ND	ND	ND	ND	ND	ND	0.74
1,3-Dichlorobenzene	ppb			ND	ND	ND	ND	ND	ND	ND
1,4-Dichlorobenzene	ppb	3	3	0.7J	2J	1J	2J	2J	1 J	1.700
1,2-Dichlorobenzene	ppb			ND	ND	ND	ND	ND	ND	ND
11,2,4-trimethylbenzene	ppb			ND	ND	ND	ND	ND	ND	2.800
1,1,1-Trichloroethane (TCA)	ppb			ND	ND	ND	ND	ND	ND	ND
Carbon disulfide	ppb			ND	ND	ND	ND	ND	ND	ND
Mrthylcyclohexane	ppb			ND	ND	2J	ND	ND	ND	ND
SEMIVOCs										
bis(2-Ethylhexyl)phthalate	ppb			1J	1J	ND	ND	ND	ND	
Napthalene	ppb			2J	ND	5J	4J	ND	3 J	3.5
Caprolactum	ppb			2J	ND	2J	1J	ND	2 J	
Cyclohexane	ppb			ND	ND	ND	ND	ND	ND	
Methylcyclohexane	ppb			ND	ND	ND	ND	ND	ND	
Methyl tert-butyl ether	ppb			ND	ND	ND	ND	ND	ND	
PCBs/ PESTICIDES										
Arochlor -1242	ppb			ND	ND	ND	ND	0.76J	ND	
Arochlor -1232	ppb			ND	ND	ND	ND	ND	14	
Alpha - BHC	ppb			0.0044J	ND	ND	0.0041J	0.0054J	0.016 BJ	
beta-BHC	ppb			ND	ND	0.022J	ND	0.0055J	0.022 BJ	
gamma - BHC	ppb			ND	ND	0.020J	0.0015J	0.0038J	0.095	
4,4' - DDD	ppb			ND	ND	0.033J	0.0038J	ND	0.0047J	
4,4' - DDT	ppb			ND	ND	0.0032J	ND	ND	ND	
Heptachlor	ppb			ND	ND	0.017J	ND	ND	ND	
Heptachlor Expoxide	ppb			ND	ND	0.027J	0.0049J	0.0033J	0.006 J	
Endrin aldehyde	ppb			0.0068J	ND	0.057J	ND	0.012J	0.018 BJ	
gamma-Chlordane	ppb			ND	ND	ND	ND	ND	ND	

NOTES: 1. Only detected values are reported
2. NS = Not Sampled; ND = non-detect; Inst.Er. = Instrument Error

TABLE 3B
KESSMAN LANDFILL OM&M
LEACHATE ANALYSIS - METALS/INDICATORS

PARAMETER (in ppb)	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE DATES 03/27/02	05/16/02	06/14/02	09/19/02	12/19/02	03/27/03	11/06/03
pH (field; s.u.)	s.u.									
Temperature (field)	°F									
Specific Conductivity	umhos									
TSS	ppm			84	52	69	110	NS	84	98
TOC	ppm			<2.0	2	<5	NS	<5.0	2	6.1
BOD	ppm			32	27	28	16	NS	32	25
COD	ppm			27	<10	40	50	33	27	29
Chlorides	ppm			NA	NA	NA	NA	NA	770	NA
Aluminum	ppb		100	ND	ND	ND	ND	ND	45.3 J	ND
Antimony	ppb	30	30	ND	ND	ND	ND	ND	ND	ND
Arsenic	ppb	25	50	ND	ND	ND	ND	ND	2 J	ND
Barium	ppb	1000	1000	ND	ND	373	612	ND	348	495 B
Beryllium	ppb			ND	ND	ND	ND	ND	ND	ND
Cadmium	ppb			ND	ND	ND	ND	ND	ND	ND
Calcium	ppb			121000	137000	117000	130000	121000	121000	130000
Chromium	ppb	50	50	ND	ND	ND	ND	ND	3.8 J	2.1 B
Cobalt	ppb			ND	ND	ND	ND	ND	ND	ND
Copper	ppb			ND	ND	ND	ND	ND	ND	ND
Iron	ppb	300	300	61400	41800	48000	78200	60400	61400	51200
Lead	ppb	25	50	ND	ND	ND	ND	ND	1.1 J	ND
Magnesium	ppb	35000		34500	30000	37400	5250	36700	989	33200
Manganese	ppb	300	300	989	140	816	319	983	34.5	1260
Nickel	ppb	100	100	ND	ND	ND	ND	ND	2.3 J	ND
Potassium	ppb			8890	7230	10300	16600	9420	8890	7920
Selenium	ppb			ND	ND	ND	ND	ND	ND	ND
Silver	ppb			ND	ND	ND	ND	ND	ND	ND
Sodium	ppb	20000		92700	54900	90500	164000	89600	92700	60600
Thallium	ppb			ND	ND	ND	ND	ND	4.9 J	ND
Vanadium	ppb			ND	ND	ND	ND	ND	2.5 J	ND
Zinc	ppb	20		ND	ND	ND	ND	ND	2.6 J	3.6 B
Mercury	ppb			ND	ND	ND	ND	ND	ND	ND

NOTES: 1. Only detected values are reported
2. NS = Not Sampled; Inst.Er. = Instrument Error

TABLE 4
KESSMAN LANDFILL OM&M
SEDIMENT SAMPLING RESULTS

LOCATION NUMBER	LAB SAMPLE NO.	SAMPLE DESCRIPTION	GPS COORDINATES Northing	GPS COORDINATES Easting	PCB-1242 (mg/Kg)	PERCENT SOLIDS	VISUAL OBSERVATIONS
1	B1258	01-0-6-092923	971302.99	73668.22	<1.0	28	0-6" drk brn/blk sand and silt. Very moist. Some organic matter
2	B1261	02-0-6-092903	971389.19	73663.20	<1.1	45	0-6" drk brn silt w/fine roots, slight gravel,moist. 1" brn/gray clay layer @3-4"
3	B1259	03-0-6-092903	971577.31	736697.88	<0.72	69	0-4" moist, lt to med brn silt with some roots rock frags.,4-6" slight moisture, med to drk brown silty clay w/rock frags,roots
4	B1260	04-0-6-092903	971638.72	736710.96	<0.71	70	0-2" very moist,lt to med brn. Silt,some roots,rock frags. 2-4"slight moist med to drk brn silty clay w/trace roots
5	B1262	05-0-6-093003	971713.75	736708.60	0.22 J	67	0-3" saturated, med.grown silt w/trace clay/rock, 3-6" increase clay w/depth.med brn. Silty clay w/10-20% rock frags; 10% organic matter
	B1263	05-6-18-093903	971713.15	736708.60	0.16 J	73	6-18" gray/brown clay and clayey silt w/trace sand. 20 % rock frags and 20 % roots
6	B1264	06-0-6-093003	971760.34	736703.35	0.35 J	71	0-2" very saturated gray brown silt w/tr sand, 10% rock frags, 20% roots. 2-6" brn silty clay with increasing clay with depth, 10% rock frags, 20% organic
7	B1265	07-0-6-093003	971826.98	736705.31	50 J	57	0-2" very saturated drk gray/brown silt w/tr sand & sm rocks, 5% organic. 2-4" drker gray/brn clay silt w/tr sand. 10% rocks, 5-10% organic
	B1266	07-06-18-093003	971826.98	736705.31	57 J	64	6-16" drk brn/gray silty clay w/tr sand,10% rocks. 16-18" varigated clay, tan, med. gray & drk brown, <5% organic, 10% rock frags.
8	B1267	08-0-6-0930-03	971875.25	736660.56	0.69	74	0-1" organic. 1-4" very sat. med brown siltw/tr sand. 20% rocks, and 10% organic. 4-6" same w/ inclreas in clay Note lab results does not show J or U
9	B1268	09-0-6-0930-03	971903.60	736630.41	1.7	60	0-2 very sat. gray brn silt w/ tr sand, 10 % rocks; 2-6" drk gray brown clay silt w/tr sand. Clay increases w/ depth, 10-20%% organic, 10-20% rocks
10	B1269	10-0-6-093003	971915.25	736678.05	0.45 J	71	0-2" very sat dr. gray brn silt,20% organic, 5-10% rocks. 2-6" drk gry brn clay silt w/ tr sand, 10% organic, 10-20% rocks. Increasing clay w/ depth
11	B1270	11-0-6-093003	971947.45	736596.90	0.13 J	75	0-2" saturated drk gry brn silt w/tr sand, 50% organic,. 10% rocks. 2-6" clay silt w/ incresing clay w/ depth/ Tr sand, 5%rocks, 10% organic
12	B1272	12-0-6-093003	971976.07	736633.51	<0.66	76	0-3" moist drk brn clay silt, some rocks and trace roots. 3-6" moist, drk brn clay silt w/ some rocks, no organic matter
	B1352	12-6-18-100203	971976.07	736633.51	<0.63	79	6-14" moist med to drk brn silty clay w/ some rocks and organic roots. Sm wood pieces.

TABLE 4
KESSMAN LANDFILL OM&M
SEDIMENT SAMPLING RESULTS

LOCATION NUMBER	LAB SAMPLE NO.	SAMPLE DESCRIPTION	GPS COORDINATES Northing	GPS COORDINATES Easting	PCB-1242 (mg/Kg)	PERCENT SOLIDS	VISUAL OBSERVATIONS
13	B1273	13-0-6-093003	972024.89	736564.47	<0.83	60	0-3' very sat. drk brn silt w/ some organic leaves/roots/woody material. 3-6" saturated med-drk brown silt w/tr sand, roots and rocks
	B1274	13-6-18-093003	972024.89	736564.47	<0.70	71	6-12" drk brown clay silt w/rocks and fine roots
14	B1275	14-0-6-093003	972029.66	736604.15	0.19 J	67	0-2" sat. med t- drk brn silt w/ tr sand, some organic roots. 2-6" sat brown clay sitl w/ small amount oF roots/rocks
15	B1276	15-0-6-093003	972069.21	736549.93	0.23 J P	72	0-3" sat. med to drk brn silt w/ tr sand, some organic roots. 3-6" sat brown clay silt w/ small amount or roots/rocks
16	B1277	16-0-6-093003	972145.53	736522.78	<1.6	31	0-2" sat. drk brn silt, fine roots. 2-6" moist drk brn clay silt w/ fine roots.
17	B1278	17-0-6-093003	972168.82	736521.87	<1.5	34	0-2" very sat. med to drk brn silt w/ tr sand, some organic roots. 2-6" very sat brown clay sitl w/ small amount or roots and rocks. Tr gray clay @ 6"
18	B1300	18-0-6-100103	971888.04	736738.76	10	58	0-0.5 vry sat. blk silt and organic material. .5-6" sat. Drk brn clay silt. W/some rocks.
19	B1301	19-0-6-100103	971955.09	736701.91	2.3	62	0-2" sat. drk brn/tan mottled silty clay w/tr sand, 10-155 rocks, 5% organic. 2-6" drk gry/brn mottled w/ med brn & Tan silty clay, 10-155 rocks, 20 % organic.
	B1302	19-6-180100103	971955.09	736701.91	<0.64	78	6-18" med. Tan brown silty clay w/ 20% rocks and 15-20% organic
20	B1303	20-0-6-100103	971952.26	736746.73	0.73 J	73	0-5" sat. drk brn silt w/some sand/rocks/organic material. 5-6" sat. drk brn clay silt w/ rocks roots/woody material
21	B1304	21-0-6-100103	972991.63	736717.99	0.67 J P	70	0-1 " sat. drk brn silt w/some sand/rocks/organic material. 1-6" sat. drk brn clay silt w/ rocks roots/woody material
22	B1305	22-0-6-100103	972053.90	736670.20	<0.71	70	0-2" very sat. grey brn, silt w/ 20-30% organic, w/ 5% rock. 2-6" dk gry, brn mottled w/ med brn silty clay, 5% rocks, w/ 20% organic
	B1306	22-6-18-100103	972053.90	736670.20	<0.78	64	6-18" moist mostly med tan brn silty clay w/ rocks, 20% organic material. Mottled w/ grey clay @ 14-18"
23	B1307	23-0-6-100103	972081.32	736717.76	0.33 J	61	0-1" very sat. drk brn silt w/ oprganic matter. 1-6" drk brn silty clay w/ some rocks and tr organic
24	B1308	24-0-6-100103	972133.18	736772.44	1.8	57	0-3" very sat. drk brn silt w/ tr organic and rocks 3-6" moist brn clay silt w/ some rocks and fine roots.

TABLE 4
KESSMAN LANDFILL OM&M
SEDIMENT SAMPLING RESULTS

LOCATION NUMBER	LAB SAMPLE NO.	SAMPLE DESCRIPTION	GPS COORDINATES Northing	GPS COORDINATES Easting	PCB-1242 (mg/Kg)	PERCENT SOLIDS	VISUAL OBSERVATIONS
25	B1309	25-0-6-100103	972158.58	736728.36	<3.3	15	6-18" moist brn clay silt w/ some rocks and fine roots. Some woody material
	B1310	25-6-18-100103	972158.58	736728.36	<2.4	21	0-6" very sat. drk brk silt w/ some fine roots trace woody matter. Moisture content decreases w/ depth
26	B1311	26-0-6-100103	972138.01	736683.43	<2.5	20	0-6" very sat. drk brk silt, some fine roots trace woody matter. Moisture content decreases w/ depth
27	B1312	27-0-6-100103	972165.54	736686.38	<2.6	19	0-4" very sat. drk brn silt w/ organic matter. 4-6" less saturated drk brn silt.
28	B1313	28-0-6-100103	972128.98	736627.91	<3.3	15	0-6" very sat. drk brn/black silt w/ 20% organic material of roots and twigs
	B1314	28-6-18-100103	972128.98	736627.91	<2.6	19	6-18" moist drk brn silty clay w/ 10-29% organic material
29	B1357	29-0-6-100203	972250.60	736810.04	<2.2	23	0-2" Sat. drk brn clay, silt w/trace sand, 10% organic roots and twigs. 2-6 drk brn silty clay w/trace sand 10% organic
30	B1356	30-0-6-100203	972563.37	736854.14	<2.4	21	0-4"drk. Brn. Silt w/20-25% organic. 4-6" silty drk. Brn clay w/10-20%organic roots and twigs.
31	B1355	31-0-6-100203	972788.46	736877.74	<2.3	22	0-3" very sat. drk brn clay silt w/ 20% organic roots. 3-6" drk brn silty clay w/10% roots
32	B1354	32-0-6-100203	972921.47	736882.77	<2.4	21	0-2" very sat. drk brn wilt w/sulfur odor & 10-20% roots/leaves. 2-6" drk. Brn silty clay w/trace sand, 10% sm roots
33	B1353	33-0-6-100203	973147.38	736931.06	<1.4	36	0-2" sat.drk brn silt w/some clay, tr. Rx frags, 5-10% organic.2-6" drk drn silty clay tr.sand

Notes:

1. Only PCB Aroclor 1242 was detected; all others (1016, 1221, 1232, 1248, 1254 and 1260) are non-detects
2. < or U = lab result indicates undetected at the reported level.
3. J = Reported value is an estimated; P = RPD>40% between primary and confirmation.

TABLE 5
KESSMAN LANDFILL OM&M
GPS COORDINATES OF MONITORING WELLS

WELLS	NORTHING	EASTING	# of Satellites	PDOP
3B	97,341.35	736,506.84	6	3.96
3A	971,345.19	736,519.57	6	3.95
20 A	971,876.94	736,636.91	6	3.90
5A	972,200.90	736,464.02	4	4.57
5B	972,206.58	736,451.85	4	4.52
1A	971,728.83	735,780.94	6	2.22
1B	971,720.11	735,782.02	5	3.15

NOTES: # of satelites and PDOP (preferably > 3) indicates accuracy of coordinates

TABLE 6
KESSMAN LANDFILL OM&M
LEACHATE PUMPING/ON-SITE TREATMENT FOR TRACER STUDY
(May 2004)

DATE	TIME	LINE PRESSURE		FLOW RATE (gpm)		CUM. VOLUME (gal)			DEPTH TO	COMMENTS
		FILTER INLET	CARBON INLET	LEFT METER	RIGHT METER	LEFT METER	RIGHT METER	TOTAL	LEACHATE IN SUMP	
5/26/2004	12:00	13	2	0	0	0	0	0		Sample L-0 taken
	13:00			18.0	18.5	1,050	1,080	2,130		Injected dye
	14:03	13	3	17.5	17.5	1,830	1,960	3,790		Sample L-4 taken
	15:21	11	0	17.5	18.5	3,050	3,200	6,250		Sample L-6 taken
	16:00	11	3	18.5	18.5	3,760	3,900	7,660	4.62'	
	17:05	13	3	18.0	18.0	4,640	4,790	9,430		
	18:00	14	3	18.5	18.5	5,670	5,760	11,430	4.74'	
	19:00	13	3	18.5	18.5	6,660	6,860	13,520	4.74'	
	20:05	13	3	18.0	18.0	7,370	7,520	14,890		Filled gas
	allowed to run overnight until generator ran out of gas; 14,890 gallons pumped today									
5/27/2004	8:40			18.0	18.0	7,980	8,140	16,120	4.57'	Samples RN-16 & RS-16 taken
	10:00	13	3	18.0	18.0	9,210	9,370	18,580		Wetland samples taken
	11:00	13	3	17.5	18.0	9,850	10,050	19,900		Changed bag filters
	12:05	13	2			10,930	11,130	22,060		Samples taken
	14:30					13,330	13,550	26,880	4.73'	
	15:00	12	2			13,370	13,990	27,360		
	16:00	13	3	18.0	18.5	14,630	14,870	29,500	4.81'	Sample L-30 taken
	17:00	13	3	18.0	18.5	15,760	15,990	31,750	4.85'	
	18:00	14	3	18.0	18.5	16,690	16,930	33,620		Sample L-36 taken
	19:00	14	3			17,760	18,030	35,790		
	20:00	14	3			18,690	18,960	37,650		Filled gas
	allowed to run overnight until generator ran out of gas; 22,760 gallons pumped today									
5/28/2004	7:40	14	3	18.0	18.0	21,700	22,270	43,970	4.72'	Sample L-44 taken
	9:10	14	3	18.0	19.0	23,060	23,380	46,440	4.83'	
	10:08	14	3	18.0	19.0	24,100	24,430	48,530		
	11:10	14	3	18.0	19.0	25,160	25,506	50,666		
	12:10	14	3	17.5	19.0	26,070	26,420	52,490		
	13:00	14	3	17.5	19.0	26,980	27,340	54,320		Sample L-50 taken
	14:00	14	3	18.0	19.0	28,110	28,480	56,590	4.92'	
	15:05	14	3	19.0	19.0	29,180	29,550	58,730		Sample L-60 taken
	16:00	14	3	19.0	19.0	30,090	30,480	60,570	4.97'	Samples RN-60 & RS-60 taken
	7:45			19.0	19.0	33,370	33,800	67,170	4.98'	Pump ran out of gas, filled gas
	allowed to run overnight until generator ran out of gas; 29,520 gallons pumped today									
5/29/2004	7:40			20.0	20.5	35,540	35,980	71,520		
	8:40	stopped pump		20.0	20.5	36,690	37,140	73,830	4.98'	avg. 46.2 gpm
	demobilized equipment from site; 6,660 gallons pumped today; sample L-64 taken									

TABLE 7
KESSMAN LANDFILL OM&M
LEACHATE PUMPING/ON-SITE TREATMENT
(August/September 2004)

DATE	TIME	PRESSURE (psi)		FLOW RATE (gpm)		CUM. VOLUME (gal)			AIR	DEPTH TO	Fe^{+2} (ferrous) (ppm)			FE TOTAL (ppm)			Ph (s.u.)		TDS (ppm)		COMMENTS
		FILTER INLET	CARBON INLET	LEFT METER	RIGHT METER	LEFT METER	RIGHT METER	TOTAL	(cfm)	LEACHATE IN SUMP	FILTER INF.	CARBON INF.	CARBON EFF.	FILTER INF.	CARBON INF.	CARBON EFF.	FILTER INF.	CARBON EFF.	FILTER INF.	CARBON EFF.	
8/4/2004	14:15	12.0	11.0	18.0	17.0	36,930	37,380	74,310	22	3.9'	60	70	60	10	60	55	6.4	6.4	884	805	Sampled L-1
	15:35	15.0	0.0	10.0	10.0	38,103	38,593	76,696													
	16:00	10.0	10.0	18.0	19.0	38,570	39,080	77,650													
	16:30	11.0	8.0	15.5	17.5	39,090	39,610	78,700	22	4.2'	50	30	30	5	4	4	6.4	6.4	730	734	Sampled L-2
	17:00	13.0	5.8	14.0	14.0	39,560	40,090	79,650													
	17:30	14.0	4.8	20.0	20.0	39,860	40,400	80,260													Changed bags
	18:30	10.0	10.0	21.5	20.0	40,890	41,460	82,350	45	4.2'	7	35	50	60	65	55	6.4	6.4	800	880	Sampled L-3
	19:30	10.0	10.2			41,930	42,540	84,470													
	pump left running till generator ran out of gas										10,160 gallons pumped today										
8/5/2004	8:00	11.0	10.5			42,570	43,180	85,750	37	4.2'	10	50	61	80	75	55	6.5	6.5	850	851	
	9:30	12.0	11.0			43,890	44,530	88,420			5	10	4	55	55	40					Changed bags
	10:30	10.5	10.0			44,930	45,590	90,520	44	4.2'	30	35	30	45	55	50					
	11:30	10.5	10.0			46,010	47,000	93,010													
	12:30	10.1	10.0			47,120	47,830	94,950		4.2'											
	1:30	10.0	10.0			48,200	48,940	97,140	56												
	2:30	9.8	10.5			49,690	50,460	100,150	50	4.3'	25	4	35	50	60	60					
	pump left running during demobilization										15,680 gallons pumped today;			25,840 gallons pumped this event							
9//1/2004	10:00	10.0		19.0	19.0	49,690	50,460	100,150													
	11:00	9.5	9.5			50,750	51,565	102,315		6.3'											Changed bags
	12:05	10.0	9.5	19.5	19.5	51,970	52,840	104,810		6.5'											
	13:05	9.5	9.5			53,090	54,030	107,120	160	6.5'	55	55	35	70	60	55					Lowered sparger
	14:00	9.5	9.0			54,070	55,050	109,120		6.7'											
	15:00	10.0	9.5			55,150	56,200	111,350		6.7'											
	16:00	9.5	9.0			57,300	58,440	115,740	175	6.6'	30	60	30	60	70	65					
	18:00	10.0	10.0			58,550	59,750	118,300		6.9'											
	19:00	9.5	9.5			59,406	60,640	120,046		7.0'											Changed filter bag
	21:00	9.5	9.0			60,370	61,670	122,040		6.8'											Filled gas
	pump left running till generator ran out of gas										21,890 gallons pumped today										
9/2/2004	10:00	10.0	9.0	17.5	17.5	70,280	71,880	142,160	145	7.1'	35	40	7	55	60	40					Changed filter bags
	11:10	10.0	9.0	17.5	17.5	71,570	73,210	144,780		7.3'											
	13:00					73,980	74,490	148,470													
	pump left running during demobilization										26,430 gallons pumped today			48,320 gallons pumped this event							
9//28/2004	12:30	5.0	3.0			73,790	75,554	149,344		6.0'											
	13:30	6.0	5.0	17.5	22.5	74,370	76,170	150,540		6.0'											
	14:30	6.0	5.0			75,260	77,146	152,406		6.2'											
	15:30	9.0	3.0			75,870	77,818	153,688		6.2'	14		8	18		18					Changed bags
	16:30	6.0	5.0			76,590	78,863	155,453		6.3'											
	17:30	7.0	5.0			77,520	79,640	157,160		6.3'							6.2	6.2	594	450	Odor at manhole
	16:30	7.0	5.0			78,210	80,039	158,249		6.4'											Odor at manhole
	19:00					78,521	80,359	158,880													Filled gas
	pump left running till generator ran out of gas										9,536 gallons pumped today										
9/29/2004	9:00	10.0	8.0	20.0	22.0	86,600	89,300	175,900		6.2'											Changed filter bags
	10:00	6.5	5.0			88,460	90,650	179,130		6.3'	7		14	7		14	6.2	6.2	594	557	
	11:00	9.0	7.0			89,380	91,640	181,020		6.3'											
	12:00	9.0	7.5			90,300	92,640	182,940		6.3'											
	13:00	9.0	7.0			91,220	93,650	184,870													
	14:00	9.0	8.0	18.5	24.5	91,930	94,420	186,350		6.5'											
	15:10	9.0	7.5			92,980	95,558	188,538		6.5'											
	16:00	9.0	7.5			93,890	96,560	190,450		6.5'	5		5	30		50					
	17:00	9.0	7.0			94,610	97,350	191,960		6.5'											Sharp, crisp smell in sump
	18:00	8.5	7.0			95,310	98,110	193,420		6.5'											Filled gas
	pump left running till generator ran out of gas										34,540 gallons pumped today										
9/30/2004	8:00	10.0	9.5	17.5	17.5	103,170	106,710	209,880	145	6.2'	10		8	22		16	6.2	6.2	667	594	Changed filter bags
	10:00	15.0	14.0	20.0	22.0	104,910	108,700	213,610		6.3'											
	13:00	10.0	9.0			107,690	111,780	219,470		6.5'	8		10	20		16	7.4	6.2	622	612	
	pump left running during demobilization										26,050 gallons pumped today			70,126 gallons pumped this event							

TABLE 8
KESSMAN LANDFILL OM&M
TRACER STUDY/LEACHATE TREATMENT ON-SITE - ANALYTICAL RESULTS

PARAMETER (in ppb)	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	Sampled 5/26/04 MHC-1	Sampled 5/26/04 TREATED LEACHATE	Sampled 5/26/04 MW-20A	Sampled 8/5/04 MHC-1	Sampled 8/5/04 TREATED LEACHATE	Sampled 9/2/04 MHC-1	Sampled 9/2/04 TREATED LEACHATE	Sampled 9/2/04 WETLAND	Sampled 9/2/04 MHC-1	Sampled 9/2/04 TREATED LEACHATE
pH (field; s.u.)	s.u.			5.8	6.1	6.42							
Temperature (field)	°F			66.3	–	68							
Specific Conductivity	umhos			1.36	–	0.75							
TSS	ppm			100	61	220							
TOC	ppm			5.3	1	4.5							
BOD	ppm			20	17	–							
COD	ppm			30	14	–							
Ammonia Nitrogen	ppm								17	17	13		
Total KjeldahlNitrogen	ppm								21	21	16		
Chloride	ppm			–	–	45							
Aluminum	ppb		100			3740						32.6 B	15500
Antimony	ppb	30	30										
Arsenic	ppb	25	50			6.6 J							
Barium	ppb	1000	1000	393.0	572	123 J						745	420
Calcium	ppb			122000	133000	69600						119000	94400
Chromium	ppb	50	50	1.5 J	2.3 J								17
Copper	ppb					4.7 J							38
Iron	ppb	300	300	59700	60600	7150						48700	39000
Lead	ppb	25	50	1 J	1.6 J								27
Magnesium	ppb	35000		36500	39100	69300						38000	29300
Manganese	ppb	300	300	788	869	182						649	5020
Nickel	ppb	100	100	1.8 J	6	6.7 J							
Potassium	ppb			10100	11400	15400						11000	6130
Sodium	ppb	20000		105000	80600	28800						56600	92000
Vanadium	ppb					6.5 J							
Zinc	ppb	20		28.6	9 J	15.6 J							
Vinyl Chloride	ppb	2											
Methylene chloride	ppb			2 J	2 J							3 J	3 J
Acetone	ppb			4 J	8 J								
Methyl acetate	ppb				1 J								
Chloroethane	ppb	5					2.1	1.2	2.1	1.9		2 J	6 J
trans 1,2-Dichloroethene	ppb	5	5										
1,1-Dichloroethane	ppb	5	5			2							
cis 1,2-Dichloroethene	ppb	5	5									1 J	
1,2-Dichloroethane	ppb	0.6	0.6			1							
Benzene	ppb	1	1	3 J		0.4 J	6.0	0.85	4.2	2.20		6 J	
Toluene	ppb	5	5		1 J		3.7	0.55	3.5	1.70		2 J	3 J
Xylene	ppb	5	5	0.8 J	3 J		15.0		3.7	2.1		7 J	
Ethylbenzene							0.9						4 J
Chlorobenzene	ppb	5	5	10 J			11.0	1.1	5.1	2.6		7 J	
Isopropylbenzene	ppb	5		0.7 J		2.000	1.5	1.9	1.5	0.9		1 J	
1,4-Dichlorobenzene	ppb	3	3	1 J			1.8		0.9			0.8 J	
1,2-Dichlorobenzene	ppb												
2-Butanone	ppb				13.000			2 J					
Methylcyclohexane	ppb											0.7 J	
Napthalene	ppb			5 J	1 J								
4-Nitrophenol	ppb			1 J									
Caprolactum	ppb			3 J									
Aroclor-1016	ppb												3.1
Aroclor-1232	ppb											17.0	

Note: 1. Only detected compounds are listed (Metals not detected: Be, Cd, Se, Ag, Th and Hg)

TABLE 9
KESSMAN LANDFILL OM&M
TRACER STUDY - FIELD MEASUREMENTS/DYE ANALYSIS

ID	CONTAINER	DATE	TIME	CUM. VOL. TREATED (gal)	FIELD			RESULTS				
					pH (s.u.)	TDS (ppm)	ORP (mv)	Dye 1 SRG	Dye 2 NAP	Dye 3 EOS	Dye 4 SRB	Dye 5 LIS
L-0	6 plastic	5/26/2004	11:50	0				background				
W-0	2 plastic				6.5	384	215	background				
1-0	2 vials – 40ml	5/26/2004	12:00	0								
2-0	2 vials – 40ml											
3-0	2 vials – 40ml											
4-0	2 vials – 40ml											
5-0	2 vials – 40ml											
2-20	2 vials – 40ml	5/27/2004	11:00	20000	6.5	298	205		1266.9			
4-20	2 vials – 40ml										9.66	
5-20	2 vials – 40ml											1.45
2-35	2 vials – 40ml	5/27/2004	18:45	35000					146.57		0.05	
4-35	2 vials – 40ml										212.43	
5-35	2 vials – 40ml				6.5	336	210				13.78	
2-45	2 vials – 40ml	5/28/2004	8:00	45000					78.59		0.41	
4-45	2 vials – 40ml								73.19		32.71	
5-45	2 vials – 40ml										21.24	3.81
RN-5	2 vials – 40ml	5/26/2004	17:30	5,000				ND	188.61	ND	1.39	ND
RS-5	2 vials – 40ml							ND	37.53	ND	63.26	ND
RN-15	2 vials – 40ml	5/26/2004	20:20	15,000	7	185	200	ND	28.33	ND	23.39	9.15
RS-15	2 vials – 40ml				7	659	195	ND	ND	ND	ND	ND
RN-27	2 vials – 40ml	5/27/2004	14:50	27,000				ND	ND	ND	ND	ND
RS-27	2 vials – 40ml							ND	ND	ND	ND	0.01
RN-36	2 vials – 40ml	5/27/2004	19:20	36,000				ND	ND	ND	ND	ND
RS-36	2 vials – 40ml							ND	ND	ND	ND	0.02
RN-46	2 vials – 40ml	5/28/2004	8:45	46,000				ND	ND	ND	ND	
RS-46	2 vials – 40ml							ND	ND	ND	ND	0.06
RN-60	2 vials – 40ml	5/28/2004	15:30	60,000				ND	ND	ND	ND	
RS-60	2 vials – 40ml							ND	ND	ND	ND	0.10
F-I	Filter influent	5/27/2004	20:20	15000	7	735	235					
C-I	Carbon influent				6.6	729	235					
C-E	Carbon effluent				6.5	746	270					
L-0	2 vials – 40ml	5/26/2004	12:30	0	6.3	590	215	INJECTED DYE				
L-4	2 vials – 40ml	5/26/2004	14:00	4000				ND	ND	ND	ND	ND
L-6	2 vials – 40ml	5/26/2004	15:21	6000				ND	ND	ND	ND	ND
L-17	2 vials – 40ml	5/27/2004	9:30	17000				ND	ND	ND	ND	ND
L-30	2 vials – 40ml	5/27/2004	16:30	30000				ND	17.36	ND	ND	ND
L-36	2 vials – 40ml	5/27/2004	19:15	36000				ND	17.22	ND	0.06	ND
L-45	2 vials – 40ml	5/28/2004	8:30	45000				ND	7.82	ND	5.26	ND
L-50	2 vials – 40ml	5/28/2004	10:30	50000				ND	13.38	ND	0.79	ND
L-55	2 vials – 40ml	5/28/2004	13:30	55000				ND	10.64	ND	0.42	ND
L-60	2 vials – 40ml	5/28/2004	15:30	60000				ND	12.10	ND	0.49	ND
L-74	2 vials – 40ml	5/29/2004	8:40	74000	6.6	434	205	ND	6.45	ND	0.58	ND
L-1	1 vial – 40ml	8/4/2004	15:05	1000				ND	13.70	ND	0.21	ND
L-2	1 vial – 40ml	8/5/2004	16:30	2000				ND	16.81	ND	0.15	ND
L-3	1 vial – 40ml	8/6/2004	18:30	3000				ND	17.15	ND	0.17	ND
L-5	1 vial – 40ml	8/7/2004	12:00	5000				ND	26.62	ND	0.30	ND
W-1	1 vial – 40ml	8/8/2004	15:00	0				ND	ND	ND	0.20	ND

[ ] Not sampled
ND Not detected

CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M
OPERATION, MAINTENANCE AND MONITORING

OM&M REPORT

ATTACHMENT A

BACKGROUND INFORMATION AND SITE PHOTOS

NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
Division of Environmental Remediation
Inactive Hazardous Waste Disposal Report April 1, 2000

Site Name:	Cross Co. Sanitary-Kessman L.F.			**Site Code:**	340011
Class Code:	4	Region: 3	County: Putnam	EPA Id:	NYD980528491
Address:	Cornwall Hill Road		City: Patterson	Zip:	12563
Latitude:	41 29' 48"	Longitude:	73 36' 30"		
Site Type:	Landfill		Estimated Size: 10	Acres	

Site Owner / Operator Information:

Current Owner(s)	Name:	Albert,Martin and Bernard Kessman		
Current Owner(s)	Address:	Cornwall Hill Road	Patterson	NY 12563
Owner(s) during disposal:		Kessman Brothers & Cross Co. Sanitation		
Operator(s) during disposal:		Kessman Brothers & Cross Co. Sanitat		
Stated Operator(s)	Address:	Cornwall Hill Road	Patterson	NY 12563

Hazardous Waste Disposal Period: From 1975 To 1975

Site Description:
This site is a landfill which accepted solid and industrial wastes of unknown types and quantities. A field investigation revealed the presence of numerous leachate seeps and approximately 40 to 60 partially exposed 55-gallon drums, some of which were leaking and had a strong chemical odor. HNu readings revealed 5.0 to 18.6 ppm total organic vapors in the vicinity of the drums. Phase I and II investigations have been completed. During the Phase II investigation in 1985, a metal detector survey identified a few locations which may contain buried drums or other metallic objects. Leachate seeps were evident and the vegetation was severely stressed. One well downgradient of the site and adjacent to the area where drums were observed indicated volatile organics totalling 209 ppb, acid extractables at 39 ppb and base neutral extractables at 21 ppb. Two other wells downgradient of the site but upgradient of the drum area were clean. Sediment samples from a downstream location indicated contamination with volatile organics. The site was ordered closed and covered; however, cover was incomplete and has washed away in some areas. A State Superfund RI/FS was completed in November 1994 as was a ROD. The ROD called for capping and wetland restoration. An IRM started in 1993 to remove drums and contaminated soils was completed in March 1995. The cap was completed in August 1995. The site is under post-closure O&M. Recent sampling activities reported leachate seeps with organic contamination. The effectiveness of the leachate collection system is being evaluated thru periodic sampling activities.

Confirmed Hazardous Waste Disposal:	Quantity:
Benzene (F005)	unknown
Barrels containing VOCs, PCBs, Pesticides	Approx. 250

Analytical Data Available for: Air Groundwater Surface Water Soil Sediment
Applicable Standards Exceeded in: Groundwater Surface Water
Geotechnical Information:
Soil/Rock Type: Sand-rich silt over marble bedrock. Depth to Groundwater: Range: 5 to 15 feet.

Legal Action: Type: Status:
Remedial Action: Complete Nature of action: Part 360 cap and monitoring

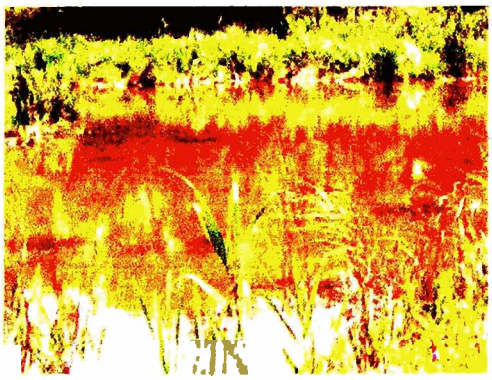
Assessment of Environmental Problems:
Remedial activities have mitigated all tangible environmental problems at this site. Monitoring is underway.

Assessment of Health Problems:
Four upgradient private drinking water wells sampled from 1988 to 1987 did not reveal the presence of any site related contaminants. These wells are to be included in the New York State Department of Environmental Conservation's (NYSDEC) long term monitoring program as part of site remediation. In the past, site leachate drained into the Great Swamp which eventually feeds into the New York City Groton Reservoir system. The landfill cap will reduce the possibility for off-site migration of site contaminants. Long-term monitoring has been recommended at the site. The monitoring will determine the effectiveness of remedial measures. The former landfill area is fenced and a locked gate at the entrance of the site restricts vehicles. Hazardous waste warning signs are posted at the site perimeter.

CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M
OPERATION, MAINTENANCE AND MONITORING
SITE PHOTOS (May 2002)

MW-20A & B

SITE PHOTOS - June 30, 2004



Overall coloration of wetland

30 Ft. south of MW-20 A & B

Clean area north of MW 20

Leachate discharge area

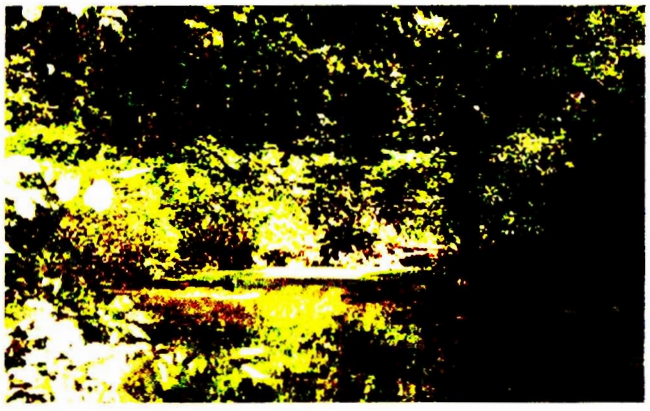
North edge of wetland, where fence starts

Water/beaverdam under west and east side of railroad bridge

KESSMAN LANDFILL OM&M
SITE PHOTOS - August 23, 2004

Looking east under railroad bridge.
Note that beaver dam is starting to be rebuilt.

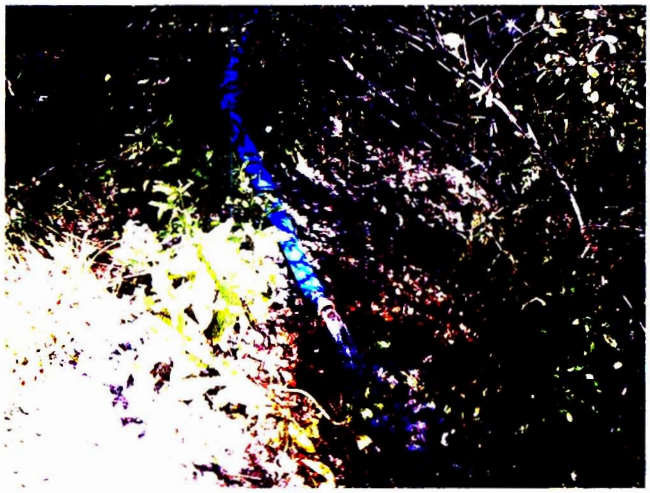
Looking north from east side of railroad bridge.



Area to the east of railroad bridge.
Note "secondary dam" being built in center of photo.

KESSMAN LANDFILL OM&M - LEACHATE TREATMENT
SITE PHOTOS – 9/2 & 9/3/2004

Leachate Pumping & Treatment System



Discharge Pipe

Generator

Cleared Around Wells with Weed Whacker

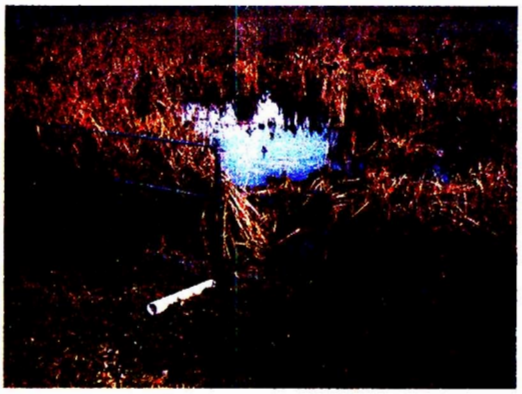
North Gate Being Installed

KESSMAN LANDFILL OM&M
SITE PHOTOS – November 23, 2004

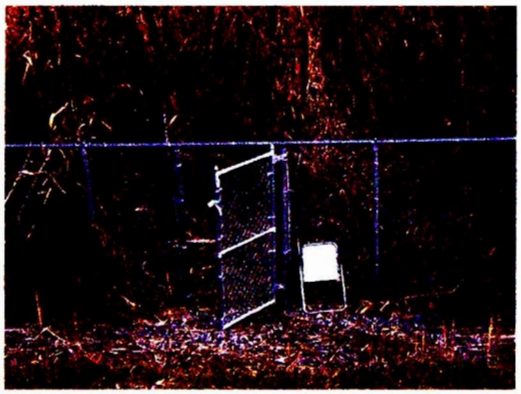
Landfill is Mowed and Well Kept

Treatment System Drums & Piping

Discharge Location



Wetland

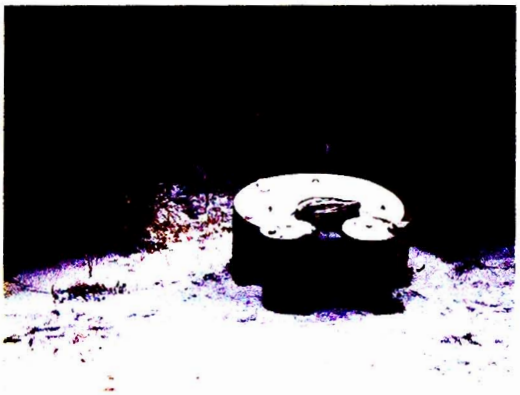


Gate Installed near MW-5A/B

KESSMAN LANDFILL OM&M
SITE PHOTOS – December 28, 2004

Landfill is Trimmed and Covered with Snow

Gates (Inner and at MW-5A/B)



Leachate Sump/Treatment System Drums

Wetland (Frozen/Covered with Snow

Monitoring Wells MW-20A and MW-20B

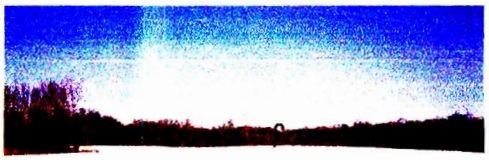
Monitoring Well MW-1A

Gas Point GP-2

Gas Vent V-3

KESSMAN LANDFILL OM&M
SITE PHOTOS – JANUARY 25, 2004

East slope and wetland



Looking North on top of Cap

Leachate sump and carbon drums

There were snow drifts over a yard deep

Warm spot in wetland just north of MW 20 A/B

MW 5B

Measuring level of ice at RR Bridge

View West from RR Bridge

CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M
OPERATION, MAINTENANCE AND MONITORING

OM&M REPORT

ATTACHMENT B
DATA FORMS

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
SUMMARY OF SITE OM&M ACTIVITIES

DATE	DESCRIPTION
2/27/02	Routine inspection; Well MW 3B has kink in PVC riser, could not use bailer in the well;
	purged wells, sampled (Round 1) groundwater, surface water and leachate; made field measurements
3/28/02	Routine inspection; measured water levels and gas vents
4/25/02	Routine inspection; measured water levels and gas vents
5/15/02	Routine inspection; Well MW 3A has kink in PVC riser, could not use bailer in the well;
	purged wells, sampled (Round 2) groundwater, surface water and leachate; made field measurements
06/13/02	Field measurements, inspections; sampled surface water and leachate; installed 2x4 for staff gauge
07/25/02	Field measurements, inspections; repaired well MW-3A and gas points GP-1 and GP-2
08/22/02	Field measurements, inspections; completed topographic survey update
09/18/02	Field measurements, inspections; purged wells; sampled (Round 3) groundwater, surface water and leachate
10/24/02	Field measurements, inspections
11/19/02	Field measurements, inspections
12/17/02	Field measurements, inspections; purged wells; sampled (Round 4) groundwater, surface water and leachate
03/26/03	Field measurements, inspections; purged wells; sampled (Round 5) groundwater, surface water and leachate
04/24/03	Field measurements, inspections
05/29/03	Field measurements, inspections
07/29/03	Field measurements, inspections
08/19/03	Field measurements, inspections
10/01/03	Field measurements, inspections; leachate pumping; sediment sampling
11/26/03	Field measurements, inspections; leachate pumping, sampled (Round 6) groundwater and surface water
12/23/03	Field measurements, inspections; leachate pumping
01/29/04	Field measurements, inspections; leachate pumping
02/27/04	Field measurements, inspections
04/30/04	Field measurements, inspections
05/25/04	Field measurements, inspections; sampled (Round 7) groundwater, leachate and surface water
	dye tracer study
06/30/04	Field measurements, inspections
07/26/04	Field measurements, inspections
08/04/04	Leachate pumping; sampled influent for tracer study
08/23/04	Field measurements, inspections
09/02/04	Leachate pumping; ground water, leachate and sediment sampling
09/22/04	Field measurements, inspections
09/28/04	Leachate pumping
10/30/04	Field measurements, inspections
11/23/04	Field measurements, inspections
12/28/04	Field measurements, inspections; lubricated all locks
01/25/05	Field measurements, inspections

IEG

IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG), Jennifer Warner (IEG)

FROM: Dharma Iyer (IEG)

DATE: August 25, 2003

RE: **OM&M FIELD REPORT – Kessman Landfill**

DATE ON SITE	August 19 and July 29
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Field Form 1s are attached
	Observations: The water in the wetlands area is higher than usual. The drainage to the northeast under the railroad bridge appears to be completely blocked by beaver dams. While the dam under the rail bridge appears to be abandoned, other dams have been built further down stream and apparently are causing the stagnant water conditions. It should also be noted that the extremely thick vegetation to the northwest of the site will impede sediment sampling that is scheduled for September.
	Recommendations: The dams should be removed prior to the sediment sampling effort and, if possible, the heavy vegetation be taken down. IEG/OBG can send a crew to remove the dams prior to sampling. We should discuss the possibility of having DEC operations group remove the heavy vegetation.
PLANNED ACTIVITIES	Ground Water and Sediment sampling (September 3rd week)

IEG

IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG), Jennifer Warner (IEG)

FROM: Dharma Iyer (IEG)

DATE: October 15, 2003

RE: **OM&M FIELD REPORT – Kessman Landfill**

DATE ON SITE	October 1, 2003
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Ground Water Levels and Gas Vents / Initiation of leachate pumping Field Form 1 is attached
	Observations: > East side of landfill cap has tire ruts on the surface that are 8-12" deep in the dirt/mud. These ruts were made by the leachate hauler's vehicles during pipe installation and should be regraded. > Collection of leachate from the manhole started on October 1, 2003. Three 4000-gal loads of leachate were removed for a total of 12,000 gallons. See attached Table with data on the leachate removal. Recommendations: 1) A new access gate should be installed by NYSDEC at MW-5 wells.
PLANNED ACTIVITIES	• Ground water sampling scheduled for October 28-29 • Continued leachate pumping on a weekly basis

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IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO:	Carl Hoffman (NYSDEC), Paul Curran (OBG)
FROM:	Dharma Iyer and Jennifer Warner (IEG)
DATE:	January 15, 2004
RE:	**OM&M FIELD REPORT – Kessman Landfill**

DATE ON SITE	November 26 and December 23, 2003
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Ground Water Levels and Gas Vents / Water levels during leachate pumping Field Form 6 and Field Form1 is attached
	Observations: ➢ Leachate collection continued on a weekly basis through November; and changed to monthly from December 2003; 105,500 pumped through 12/5/03 (see attached Table). ➢ The drainage flow under the railroad bridge appears to be flowing with no blockage. ➢ Met with Ms. Edie Keasby of FROGS (Friends of the Great Swamp). Borrowed RI reports and other site related documents from NYSDEC investigations in the 1990s. Copies of the documentation have been made for NYSDEC, O'Brien and Gere and IEG. ➢ Reviewed possible locations for dye injection as part of a leachate tracer study to be implemented next spring. ➢ Ground water sampling took place on 11/6 and 11/7. ➢ Latch and lock on outside access gate needs repairs. It is almost impossible to open. Inner gate is still broken. Recommendations: 1) Latch on outer gate needs to be removed and repositioned. IEG will bring tools and attempt repair on next trip to site. 2) Install a new access gate at MW-5 wells. 3) Regrade tire ruts from leachate pipe installation.
PLANNED ACTIVITIES	• Continued leachate pumping on a monthly basis

IEG

IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Jennifer Warner (IEG)

DATE: February 9, 2004

RE: **OM&M FIELD REPORT – Kessman Landfill**

DATE ON SITE	January 29, 2004
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Ground Water Levels and Gas Vents / Water Levels during Leachate Pumping Field Form 6 and Field Form1 is attached
	Observations: ➢ Site is snow covered. Access in the MW-5 series is very difficult. ➢ PVC pipe in several wells is blocked by ice. ➢ Leachate collection continues on a monthly basis (see attached Table). ➢ Latch and lock on outside access gate was repaired in early January. Inner gate is still broken. Recommendations: 1) Repair inner access gate. 2) Install a new access gate at MW-5 wells. 3) Regrade tire ruts from leachate pipe installation.
PLANNED ACTIVITIES (Spring 2004)	• Continued leachate pumping on a monthly basis. Access road will be plowed prior to leachate collection on February 12. • Leachate tracer study is planned for April 2004 • Request Region 3 to install gate at MW-5 series

IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Jennifer Warner (IEG)

DATE: March 12, 2004

RE: **OM&M FIELD REPORT – Kessman Landfill**

DATE ON SITE	February 27, 2004
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Inspection, water level measurements Field Form 1 for both sites is attached
	Observations: ➢ Site is partly snow covered. Access into the MW-5 series is very difficult. ➢ PVC pipe in several wells is blocked by ice. ➢ No leachate pumped this month; 127,500 gallons pumped as of Jan. '04; Leachate collection will start back up in March. Recommendations: 1) Repair inner access gate. 2) Install a new access gate at MW-5 wells. 3) Regrade tire ruts from leachate pipe installation.
PLANNED ACTIVITIES (Spring 2004)	• Leachate pumping will be scheduled for late March. If necessary access road will be plowed prior to leachate collection. • Leachate tracer study is planned for April 2004 • Request Region 3 to install gate at MW-5 series wells

IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Jennifer W. Carter (IEG)

DATE: May 20, 2004

RE: **OM&M FIELD REPORT – Kessman Landfill**

DATE ON SITE	April 30, 2004
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Ground Water Levels and Gas Vents Field Form 1 is attached
	Observations: • Water levels are very high. Water is over the top of staff gage in the wetland pond. • Dams have been rebuilt by beavers under the railroad bridge to the northeast of the site. Water west of bridge measured at 5.05 feet from top of bridge girder; and 7.05 feet east of bridge. Dam allows very little clearance beneath bridge for water to flow. • High water levels have started to compromise the railroad bed from the bridge south to Cornwall Hill Road. Evidence of erosion of bed in several places. • Met with Jim from D-Fence Company. He will supply estimate to: 1) install access gate from site to the MW-5 well pair, 2) repair inner access (replace yoke) and 3) repair outer access gate (hinges are bent out and gate is hanging away from fence pole. Rotating latch pole is bent and needs repair). • Met with Cathy Bookless, assistant to Supervisor Mike Griffin. Gave her a copy of proposed tracer study. Recommendations: 1) Repair inner and outer access gates and install a new access gate to the MW-5 wells. Will review estimate from D-Fence company and submit for approval. 2) Metro North should be contacted regarding dam beneath railroad bridge and condition of railroad bed. 3) Follow up letter will be sent to Supervisor Mike Griffin regarding tracer study.
PLANNED ACTIVITIES	➢ Tracer study and GW sampling are scheduled for the last week in May.

IEG

IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Jennifer Warner-Carter (IEG)

DATE: June 8, 2004

RE: **OM&M FIELD REPORT – Kessman Landfill**

DATE ON SITE	May 25 &26, 2004
ACTIVITIES	➢ Monthly OM&M
FIELD MEASUREMENTS	Leachate sampling and dye tracer study Field Form 1 and Field Parameter forms are attached
	Observations: • Water levels continue to be very high. Wetland water is over the top of staff gage • Beaver dams are still under the rail road bridge. Evidence of erosion along rail bed in several places. Erosion appears to be caused by animals burrowing beneath rail bed as well as the high water. • Monitoring well and leachate sampling was completed. • Dye Tracer study was conducted with the introduction of five dyes (2 in wells and three along shoreline of wetland; 73,830 gallons of leachate was pumped from the sump, sampled, treated on-site (bag filter/carbon) and discharged on-site • Town of Patterson had the landfill cap mowed during the dye testing. Recommendations: 1) Seek additional bids for repair of inner and outer access gates and to install a new access gate to the MW-5 wells. D-fence company was not responsive after several attempts to obtain a quote.
PLANNED ACTIVITIES	Follow up of tracer study results and well sample results; Continue with monthly OM&M and leachate pumping

IEG

IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Jennifer W. Carter (IEG)

DATE: July 7, 2004

RE: **OM&M FIELD REPORT –Kessman Landfill, Patterson, NY**

DATE ON SITE	June 30, 2004
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Ground Water Levels and Gas Vents Field Form 1 is attached
KESSMAN:	Observations: • Water levels continue to be very high. Water is over the top of staff gage in the wetland pond on site. • Beaver dams are still under the rail road bridge. Water is within one inch of bridge. We met a Metro North representative at the rail road bridge and we were informed that the dams would be destroyed by July 6th. • Evidence of iron staining at point where leachate discharged during last month's pumping. Iron staining also evident at southern most drainage point and near MW 20 pair. See attached photos and figure. • Recommendations: 1) Follow up with Metro North to make sure that dam beneath railroad bridge has been removed. 2) Continue to actively seek qualified fence repair contractor.
PLANNED ACTIVITIES	> Continue monthly OM&M activities at both sites > Complete compilation of monitoring data > Complete evaluation of tracer study results > Complete Sediment Sampling Report > Continue with leachate removal

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IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Jennifer W. Carter (IEG)

DATE: August 12, 2004

RE: **OM&M FIELD REPORT –Kessman Landfill, Patterson, NY**

DATE ON SITE	July 26, 2004
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Ground Water Levels and Gas Vents Field Form 1 is attached
KESSMAN:	Observations: • Water levels continue to be very high. Water is over the top of staff gage in the wetland pond on site. • Beaver dams are still under the rail road bridge. Water has reached the bottom of the bridge crossing. (note that since site visit, dam was removed during the first week of August by Metro North) • Monitoring wells 3A and 3B are completely overgrown. Recommendations: 1) Have DEC look into permanently removing beavers that are located near the railroad bridge. 2) Weed whack vegetation near monitoring well 3A and 3B. 3) Locks on monitoring wells and gate will be oiled next site visit.
PLANNED ACTIVITIES	> Continue monthly OM&M activities at both sites > Complete compilation of monitoring data > Complete evaluation of tracer study results > Complete Sediment Sampling Report > Continue with leachate removal

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IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Jennifer W. Carter (IEG)

DATE: September 17, 2004

RE: **OM&M FIELD REPORT – Kessman Landfill, Patterson, NY**

DATES ON SITE	Aug.4,5 and 23, 2004 and Sep. 1 - 3, 2004
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Leachate Pumping/Water Level Field Form 1 and site photos are attached
	Observations: • Water levels have dropped. Dam beneath Railroad Bridge was removed this past month. (See attached photos) • Water in wetlands is several feet shallower. Staff gauge longer exists, so cannot get exact reading. • Monitoring wells 5A, 5B, 3A and 3B are completely overgrown Area around wells cleared with weed-whacker during leachate pumping (see attached photos) • All locks were checked and lubed. • Collected water samples at MW 20, leachate tank and near leachate discharge point and field tested for total Iron and Ferrous. Leachate: • Pumped 25,740 gallons of leachate on 8/4 and 8/5 • Pumped 48,320 gallons of leachate on 9/2 & 9/3, treated and discharged (total 275,870 gallons pumped to date) Gate: • Installed gate at MW-5A,B and repaired inner gate (see photos) Recommendations: 1) DEC to look at permanently relocating beavers from railroad bridge 2) Replace staff gauge
PLANNED ACTIVITIES	> Continue monthly OM&M activities > Complete compilation of monitoring data > Complete evaluation of tracer study results > Complete Sediment Sampling Report > Continue with leachate removal > Complete installation of gate at MW-5A,B

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IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Jennifer W. Carter (IEG)

DATE: October 25, 2004

RE: **OM&M FIELD REPORT – Kessman Landfill, Patterson, NY**

DATE ON SITE	September 22, 2004
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Leachate Pumping Field Form 1 is attached
	Observations: • Inner gate at MW-5 A and B has been installed. This saves considerable time for field personnel when taking water levels at MW- 5 A and B. • Water level at RR Bridge is at 6.58" below top railing of bridge. • Beavers have started to rebuild dams beneath bridge. • Staff gauge is still buried in wetland muck. We have been unable to locate it. Leachate Removal: • 70,129 gallons of leachate removed from 9/28 to 9/30 • 345,999 gallons of leachate removed to date Recommendations: 1) Have DEC look into permanently relocating beavers from the railroad bridge. 2) Weed whack vegetation near monitoring well 5A, 5B, 3A and 3B. 3) Replace staff gauge
PLANNED ACTIVITIES	> Continue monthly OM&M activities > Review and comment on draft tracer study report > Repair inner access gate.

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IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Jennifer W. Carter (IEG)

DATE: November 5, 2004

RE: **OM&M FIELD REPORT – Kessman Landfill, Patterson, NY**

DATE ON SITE	October 30, 2004
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Ground Water Levels and Gas Vents Field Form 1 is attached
	Observations: • Inner access gate still broken. • Water in wetland area appears to be at the same level as last month. • Vent stack on vent # 4 is twisted, but still secure in the ground. Recommendations: 1) Replace staff gauge. 2) Repair inner access gate. 3) Purchase lock and heavy chain to secure new gate near Monitoring Well 5 pair. Leachate Treatment • No leachate treatment this month; reviewing treatment plan and possible alternate treatment for iron
PLANNED ACTIVITIES	➢ Continue monthly OM&M activities ➢ Repair inner access gate. ➢ Continue with leachate treatment plan ➢ Prepare SPDES discharge application to Divn. of Water

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IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Jennifer W. Carter (IEG)

DATE: December 3, 2004

RE: **OM&M FIELD REPORT – Kessman Landfill, Patterson, NY**

DATE ON SITE	November 23, 2004
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Ground Water Levels and Gas Vents Field Form 1 and site photos are attached
	Observations: • Outer gate is secure and locked; inner access gate is not locked. • Water in wetland area appears to have receded back. • Vent stack on vent # 4 is twisted, but still secure in the ground. • Screen on Vent #1 had fallen off; was placed back. Recommendations: 1) Replace staff gauge. 2) Repair inner access gate. 3) New gate at Monitoring Well 5A/B is secure; could be locked next time Leachate Treatment • No leachate treatment this month; reviewing treatment plan and possible alternate treatment for iron
PLANNED ACTIVITIES	➢ Continue monthly OM&M activities ➢ Repair inner access gate. ➢ Continue with leachate treatment plan ➢ Prepare SPDES discharge application to Divn. of Water

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IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Dan Tagliento (IEG)

DATE: January 10, 2005

RE: **OM&M FIELD REPORT – Kessman Landfill, Patterson, NY**

DATE ON SITE	December 28, 2004
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Ground Water Levels and Gas Vents Field Form 1 and site photos are attached
	Observations: • Outer gate is secure and locked; inner access gate is not locked. • Locks were frozen; had to use blow torch; lubricated all locks with graphite • Water in wetland frozen 30" from leachate sump. • Carbon drums are frozen to the ground. • PVC caps are broken at wells MW-1A and MW-5B. Recommendations: 1) Replace staff gauge. 2) Add spacer and latch to North access gate. 3) New gate at Monitoring Well 5A/B is secure Leachate Treatment • No leachate treatment this month; reviewing treatment plan and possible alternate treatment for iron
PLANNED ACTIVITIES	➢ Continue monthly OM&M activities ➢ Repair inner access gate. ➢ Continue with leachate treatment plan ➢ Prepare SPDES discharge application to Divn. of Water

IEG

IYER ENVIRONMENTAL GROUP, PLLC

MEMORANDUM

TO: Carl Hoffman (NYSDEC), Paul Curran (OBG)

FROM: Dharma Iyer and Dan Tagliento (IEG)

DATE: February 8, 2005

RE: **OM&M FIELD REPORT – Kessman Landfill, Patterson, NY**

DATE ON SITE	January 25, 2005
ACTIVITIES	Monthly OM&M
FIELD MEASUREMENTS	Ground Water Levels and Gas Vents Field Form 1 and site photos are attached
	Observations: • Outer gate is secure and locked; inner access gate is locked. • Locks were easier to open because they were lubricated the previous visit; lubricated inner and outer gate padlocks with graphite Water in wetland frozen 35' from leachate sump. • Carbon drums are frozen to the ground. • PVC caps are broken at wells MW-1A and MW-5B. • Two warm spots were observed in the wetland near the northern shoreline (see Figure 1): near MW-20AB (see photo) and further north by end of fence. The leachate tracer study indicated possible seepage/infiltration from the same two areas. Recommendations: 1) Replace staff gauge. 2) Add spacer/latch to new gate at Monitoring Well 5A/B Leachate Treatment • No leachate treatment this month; reviewing treatment plan and possible alternate treatment for iron
PLANNED ACTIVITIES	➢ Continue monthly OM&M activities ➢ Finish North gate near MW-5A/B (spacer/latch) ➢ Continue with leachate treatment plan ➢ Prepare SPDES discharge application to Divn. of Water

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: February 27, 2002

ACTIVITIES: Monthly OM&M

OUTSIDE TEMP (°F): 36

WEATHER: Cloudy, rain showers, flurries

PERSONS AT SITE: KLW, JBW, DRI

EQUIPMENT ON SITE: VRAE, water level meter, generator, pH and conductivity meters

SITE OBSERVATIONS: Weather conditions have been very wet lately; lots of surface water present; pond level high

ACCESS GATE: both locked and secure

VEGETATION: mowed

FLARE SYSTEM: N/A

GAS VENTS/PIPING: OK

CAP:

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	(ft) Elev.	TODAY'S READINGS (ft) Depth	(ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	15.35	447.80	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	17.84	445.17	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	4.14	431.93	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.81	431.97	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.13	431.71	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.51	431.84	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.57	428.72	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.97	429.20	
Leachate Tank									
Staff Gauge									

GAS VENTS					MAINTENANCE
VENT	H_2S (ppm)	METHANE (% LEL)	O_2 (%)	CO_2 (%)	
V-1					No gas readings taken
V-2					
V-3					
V-4					
V-5					
V-6					

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: March 28, 2002

ACTIVITIES: Monthly OM&M

OUTSIDE TEMP (°F): low 50s

WEATHER: Sunny, clear, windy

PERSONS AT SITE: KLW, JBW

EQUIPMENT ON SITE: VRAE meter, water level meter

SITE OBSERVATIONS: Weather conditions have been very wet lately; lots of surface water present; pond level high

ACCESS GATE: both locked and secure

VEGETATION:

FLARE SYSTEM: N/A

GAS VENTS/PIPING: V-1 not screened; all others screened

CAP: Soft in areas (did not drive on cap); many animal burrows in vicinity of MW-3 series

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	14.66	448.49	Lock difficult to open;
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	11.02	451.99	needs WD-40
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	3.81	432.26	No key; had to cut lock;
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.50	432.28	replaced with keyed alike locks
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.79	432.05	Well submerged in surface water
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.10	432.25	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.20	429.09	Surrounded by surface water
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.65	429.52	
Leachate Tank									
Staff Gauge									

GAS VENTS					MAINTENANCE
VENT	H_2S (ppm)	METHANE (% LEL)	O_2 (%)	CO_2 (%)	
V-1	0	0	20.8	--	V-1 near MW-5 not screened
V-2	0	92	19.9	--	
V-3	0	78	20.0	--	
V-4	0	>100	18.0	--	
V-5	0	29	20.4	--	
V-6	0	29	20.3	--	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: April 25, 2002

ACTIVITIES: Monthly OM&M

OUTSIDE TEMP (°F): High 40s

WEATHER: Sunny, overcast, windy

PERSONS AT SITE: KLW, JBW

EQUIPMENT ON SITE: VRAE meter, water level meter

SITE OBSERVATIONS: Weather conditions have been very wet lately; lots of surface water present; pond level high

ACCESS GATE: both locked and secure

VEGETATION:

FLARE SYSTEM: N/A

GAS VENTS/PIPING: no new drainage/changes

CAP: Animal burrows, small drainage ruts between MW-3 and MW-20 series

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	14.26	448.89	Needs a new lock
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	10.25	452.76	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	3.82	432.25	Animal burrows nearby;
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.49	432.29	surface water present
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.62	432.22	Surface water nearby
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	1.96	432.39	with an oily sheen
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	1.99	429.30	Surrounded by surface water
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.40	429.77	
Leachate Tank		436.12					4.09	432.03	Measured from lock side,
Staff Gauge									inside of lip

GAS VENTS					MAINTENANCE
VENT	H2S (ppm)	METHANE (% LEL)	O_2 (%)	CO2 (%)	
V-1	--	33	19.8	--	
V-2	--	20	20.0	--	
V-3	--	23	19.9	--	
V-4	--	>100	17.2	--	
V-5	--	0	0.3	--	
V-6	--	>100	18.0	--	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: May 15, 2002, and May 16, 2002

ACTIVITIES: Monthly OM&M

OUTSIDE TEMP (°F): 60s

WEATHER: Sunny, partly cloudy, windy

PERSONS AT SITE: KLW, JBW

EQUIPMENT ON SITE: generator, VRAE meter, water level meter, conductivity/pH meter

SITE OBSERVATIONS: Weather conditions have been very wet lately; lots of surface water present; pond level high

ACCESS GATE: both locked and secure

VEGETATION:

FLARE SYSTEM: N/A

GAS VENTS/PIPING: good

CAP: Several areas where geomembrane fabric is exposed

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	13.33	449.82	pumped 2.5gpm x 5 min
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	9.15	453.86	Hand bailed
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	3.24	432.83	Pump will not fit; Hand bailed
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	2.89	432.89	Pumped 2.5 gpm x 7 min
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.20	432.64	Pumped 2.5 gpm x 6 min
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	1.54	432.81	Pumped 2.5 gpm until dry
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	1.58	429.71	Pumped 2.5 gpm x 8 min
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.04	430.13	Pumped 2.5 gpm x 10 min
Leachate Tank		436.12					6.70	429.42	Neenah Foundry
Staff Gauge		433.06					0.76	430.49	in inches

GAS VENTS					MAINTENANCE
VENT	H2S (ppm)	METHANE (% LEL)	O_2 (%)	CO2 (%)	
V-1	ND	0	19.8	0.0	A. No specific maintenance required
V-2	ND	7	19.6	0.0	B. Well MW-3A has a kink in PVC riser above ground level; needs repair
V-3	ND	0	19.9	0.0	C. Wells, staff guage and leachate tank need to be surveyed
V-4	ND	14	18.8	0.0	D. pH meter did not seem to work correctly for wells MW-5A, 5B and 201A
V-5	ND	30	17.8	0.0	
V-6	ND	97	17.1	2.0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: June 13, 2002

ACTIVITIES: Monthly OM&M

OUTSIDE TEMP (°F): 60s

WEATHER: Cloudy, humid

PERSONS AT SITE: KLW, JBW, DRI, GM

EQUIPMENT ON SITE: Water level meter, fence post

SITE OBSERVATIONS: driver, hammer

ACCESS GATE: Both locked and secure

VEGETATION: overgrown, needs mowing

LEACHATE:

GAS VENTS/PIPING: OK

CAP: Good

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	12.17	450.98	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	7.91	455.10	Ants in well, need to spray
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	3.98	432.09	Repaired in July
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.64	432.14	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.99	431.85	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.31	432.04	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.88	428.41	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	2.15	429.02	
Leachate Tank	-	436.12	-	-	-	-	6.13	429.99	
Staff Gauge	-	433.06	-	-	-	-	-	-	

GAS VENTS				
VENT	H2S (ppm)	METHANE (% LEL)	O_2 (%)	CO2 (%)
V-1	-	-	-	-
V-2	-	-	-	-
V-3	-	-	-	-
V-4	-	-	-	-
V-5	-	-	-	-
V-6	-	-	-	-

MAINTENANCE

Collected surface water & leachate samples

Samples SW-1, SW-2, SW-3 and SW-103

Installed 2x4 for staff gauge

No maintenance work required

No readings from gas vents

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: JULY 25, 2002

ACTIVITIES: Monthly OM&M

OUTSIDE TEMP (°F): low 70's

WEATHER: Breezy, cool, slightly overcast

PERSONS AT SITE: KLW, JBW

EQUIPMENT ON SITE: VRAE Meter, Water level

SITE OBSERVATIONS: Site in good condition, no changes to note except overgrown vegetation

ACCESS GATE: Both locked and secure

VEGETATION: In need of mowing

LEACHATE:

GAS VENTS/PIPING: No changes to note

CAP: No changes to note

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	14.58	448.57	Very overgrown
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	11.22	451.79	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	5.04	431.03	Kink in pipe
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	4.60	431.18	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.96	430.88	Very overgrown
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	3.64	430.71	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	4.09	427.20	Monitoring well area overgrown
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	2.90	428.27	
Leachate Tank	-	436.12	-	-	-	-	6.40	429.72	
Staff Gauge	-	433.06	-	-	-	-	-	-	

GAS VENTS					MAINTENANCE
VENT	H_2S (ppm)	METHANE (% LEL)	O_2 (%)	CO_2 (%)	
V-1	0.00	0	21.1	-	Entire site very overgrown
V-2	0.00	2	21.3	-	Gas point V-1 : No. 4 lock; cannot open, needs to be cut off
V-3	0.00	2	21.3	-	
V-4	0.00	2	21.3	-	
V-5	0.00	3	19.9	-	
V-6	0.00	1	20.8	-	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: August 22,2002

ACTIVITIES: Monthly OM&M

OUTSIDE TEMP (°F): 81

WEATHER: Cloudy, overcast

PERSONS AT SITE: KLW, JBW

EQUIPMENT ON SITE: GA-94, VRAE, Water level meter

SITE OBSERVATIONS: 2 soil/gas points repaired/updated

ACCESS GATE: Locked and secure;

left side of gate needs minor repair

VEGETATION: Mowed Recently

GAS VENTS/PIPING: Wasp nest in vent V-1, blocking vent

LEACHATE:

Other: Metal staff gauge installed

CAP:

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	16.22	446.93	Very overgrown in vicinity
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	12.53	450.48	
MW-3A	431.82	435.01	66.30	368.71	4.80	431.27	4.36	430.65	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	5.51	430.27	Very overgrown
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	3.97	429.87	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	4.50	429.85	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	4.42	426.87	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	3.69	427.48	
Leachate Tank	-	436.12	-	-	-	-	6.61	429.51	
Staff gauge	-	433.06	-	-	-	-	0.96	430.69	

GAS VENTS					MAINTENANCE
VENT	H_2S (ppm)	METHANE (% LEL)	O_2 (%)	CO_2 (%)	
V-1	-	-	-	-	No screen - vent completely blocked by a hornet's nest
V-2	0.00	1	20.9	0.9	
V-3	0.00	0	21.2	0.0	
V-4	0.00	0	21.2	0.0	
V-5	0.00	1	7.9	2.3	
V-6	0.00	2	20.5	1.0	Wetland restoration area: water looks rust colored
SG-1	0.00	0	20.1	-	
SG-2	0.00	0	21.1	-	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: Sep.18, '02, and Sep. 19, '02

ACTIVITIES: Monthly OM&M

OUTSIDE TEMP (°F): 78

WEATHER: Clear, sunny

PERSONS AT SITE: KLW, JBW,GM(9/19)

EQUIPMENT ON SITE: Water level meter, VRAE

SITE OBSERVATIONS: Sampling equipment

ACCESS GATE: Right side still in need of repair

VEGETATION: Good

LEACHATE:

GAS VENTS/PIPING: Many Wasps present near vents

CAP: Good

MONITORING WELLS									REMARKS		
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	pH	Temp (oC)	Sp. Cond. (us/cm)
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	16.40	446.75	6.06	24.3	0.76
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	13.26	449.75	7.31	28.4	0.76
MW-3A	431.82	435.01	66.30	368.71	4.80	431.27	4.04	430.97	6.77	27.0	0.77
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	5.18	430.60	6.53	27.1	0.76
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	3.92	429.92	6.87	19.6	0.76
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	4.41	429.94	6.85	28.0	0.75
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	4.24	427.05	7.25	24.7	0.76
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	3.49	427.68	7.48	26.4	0.76
Leachate Tank	-	436.12	-	-	-	-	6.38	429.74			
Staff Gauge	-	433.06	-	-	-	-	1.18	430.91			

GAS VENTS					MAINTENANCE
VENT	H_2S (ppm)	METHANE (% LEL)	O_2 (%)	CO_2 (%)	
V-1	0.00	2	20.9	-	Several wasps nests in and around vents V-1 through V-6
V-2	0.00	2	20.7	-	
V-3	0.00	12	17.2	-	
V-4	Wasp nest			-	Most nests sprayed with wasp killer
V-5	0.00	4	20.0	-	
V-6	0.00	8	18.8	-	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: October 24, 2002

ACTIVITIES: Monthly OM&M

OUTSIDE TEMP (°F): 32

WEATHER: Clear

PERSONS AT SITE: JBW, ELF

EQUIPMENT ON SITE: Water level meter, VRAE

SITE OBSERVATIONS: East side of wetlands has considerable water

Sampling equipment

ACCESS GATE: Secure, front gates need work

VEGETATION: mowed

LEACHATE:

GAS VENTS/PIPING: No changes

CAP: Looks good

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	15.80	447.35	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	12.28	450.73	
MW-3A	431.82	435.01	66.30	368.71	4.80	431.27	2.90	432.11	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	4.02	431.76	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.36	431.48	Area under water
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.71	431.64	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.66	428.63	Area under water
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	2.12	429.05	
Leachate Tank	-	436.12	Baseline from 08/02		6.60	429.52	4.70	431.42	
Staff Gauge	-	433.06			0.96	432.10	3.20	432.93	

GAS VENTS					MAINTENANCE
VENT	H2S (ppm)	METHANE (% Vol)	O_2 (%)	CO2 (%)	
V-1	0	10	19.6	0	
V-2	0	12	20.2	0	
V-3	0	100	17.6	0	
V-4	0	12	20.3	0	
V-5	0	100	13.1	0	
V-6	0	100	4.4	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: November 19, 2002

ACTIVITIES: Monthly OM&M

OUTSIDE TEMP (°F): 32

WEATHER: Overcast, no wind

PERSONS AT SITE: JBW, ELF

EQUIPMENT ON SITE: Water level meter, VRAE

SITE OBSERVATIONS: Ground saturated throughout

Sampling equipment

ACCESS GATE: Inside gate locking mechanism broke

needs chain

VEGETATION: Good

GAS VENTS/PIPING: No changes

CAP: Looks good

LEACHATE:

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	14.20	448.95	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	10.24	452.77	
MW-3A	431.82	435.01	66.30	368.71	4.80	431.27	2.44	432.57	Area under water
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.58	432.20	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.43	431.41	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.54	431.81	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.90	428.39	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	2.28	428.89	
Leachate Tank	-	436.12	Baseline from 08/02		6.60	429.52	4.70	431.42	
Staff Gauge	-	433.06			0.96	432.10	1.55	431.28	

GAS VENTS					MAINTENANCE
VENT	H_2S (ppm)	METHANE (% Vol)	O_2 (%)	CO_2 (%)	
V-1	0	13	21.0	0	
V-2	0	14	21.0	0	
V-3	0	13	20.7	0	
V-4	0	14	21.0	0	
V-5	0	15	19.6	0	
V-6	0	13	15.4	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: December 17/18, 2002

ACTIVITIES: Monthly OM&M

OUTSIDE TEMP (°F): Tues. 26/ Wed 46

WEATHER: Clear, sunny, cold

PERSONS AT SITE: JW, KW, EF

EQUIPMENT ON SITE: Water level meter, VRAE,Hydac,bailers

SITE OBSERVATIONS: Pond frozen over,leachate collected only at MH1

ACCESS GATE: Inside gate locking mechanism broke needs chain

VEGETATION:

GAS VENTS/PIPING:

CAP: Looks good

LEACHATE:

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	15.35	447.80	ph 6.64, cond 1.08, temp 3.0
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	17.84	445.17	ph 7.25, cond 1.08, temp 3.1
MW-3A	431.82	435.01	66.30	368.71	4.80	431.27	4.14	430.87	ph 6.57, cond ------, temp 3.3
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.81	431.97	ph 6.58, cond1.37, temp3.2
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.13	431.71	ph 6.79, cond1.07, temp 4.5
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.51	431.84	ph 6.73, cond 1.07, temp 4.2
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.57	428.72	ph 7.25, cond 2.51, temp 4.4
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.97	429.20	ph 7.60, cond 2.54, temp 8.4
Leachate Tank	-	436.12	Baseline from 08/02		6.60	429.52	5.70	430.42	ph 6.25, cond1.06, temp 1.7
Staff Gauge	-	433.06			0.96	432.10	1.75	431.48	

GAS VENTS					MAINTENANCE
VENT	H_2S (ppm)	METHANE (% Vol)	O_2 (%)	CO_2 (%)	
V-1	0	0	19.6	0	V-1 screen cover off; was repaired
V-2	0	0	19.7	0	
V-3	0	0	19.8	0	
V-4	0	0	19.9	0	
V-5	0	0	19.6	0	
V-6	0	23	19.9	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: March 26,2003 **ACTIVITIES:** Monthly OM&M

OUTSIDE TEMP (°F): 60 **WEATHER:** Partly cloudy

PERSONS AT SITE: KW,EF,JW **EQUIPMENT ON SITE:** Waterlevel, VRAE, Hydac

SITE OBSERVATIONS:

ACCESS GATE: Outer good; inner no lock-open **VEGETATION:** good

FLARE SYSTEM: N/A **GAS VENTS/PIPING:** Screen on two vents torn; we replaced

CAP: Soft in areas, animal burrows

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	(ft) Elev.	TODAY'S READINGS (ft) Depth	(ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	10.22	452.93	ph 716, cond 1.49, temp 48.4c
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	5.14	457.87	ph 7.7, cond 1.51 temp 49c
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.15	433.92	ph 7.25, cond1.53 temp 55.6
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.16	432.62	ph 7.04 cond1.53, temp 54.2
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.60	432.24	ph 7.06, cond1.52, temp 51
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	1.95	432.40	ph 7.16cond 1.52, temp 52
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.90	428.39	ph 7.76 cond 1.52 temp *
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.79	429.38	ph 7.74 cond 1.52 temp *
Leachate Tank	-	436.12	Baseline from 08/02		6.60	429.52	5.70	430.42	
Staff Gauge	-	433.06			0.96	432.10	1.75	431.31	

GAS VENTS					MAINTENANCE
VENT	H2S (ppm)	METHANE (% LEL)	O_2 (%)	CO2 (%)	
V-1	0	0	20.8		One screen missing from vent, one other was damaged.
V-2	0	0	20.2		Screen replaced on missing vents
V-3	0	0	20.4		
V-4	0	0	20.1		
V-5	0	0	20.2		
V-6	0	0	20.1		

Note: Area in the vicinity of the railroad bridge shows evidence of many beaver dams in place and influencing outlet in this area. Water levels are high in this region and may soon be affecting water levels of surface pond on site.

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: April 24,2003
OUTSIDE TEMP (°F): 45
PERSONS AT SITE: KW,JW
SITE OBSERVATIONS: mesh fabric visible in areas
ACCESS GATE: Outer good; inner no lock-open
FLARE SYSTEM: N/A
CAP: Quite soft in areas

ACTIVITIES: Monthly OM&M
WEATHER: Partly sunny, windy
EQUIPMENT ON SITE: Waterlevel, VRAE
VEGETATION: good
GAS VENTS/PIPING: Screen on two vents torn; we replaced

MONITORING WELLS									
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	(ft) Elev.	TODAY'S READINGS (ft) Depth	(ft) Elev.	REMARKS
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	10.88	452.27	water in drainage ditch has a sheen,
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	6.48	456.53	irridescent
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.51	433.56	mostly on east side of site near
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	4.65	431.13	MW-3A & 3B
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.02	431.82	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.41	431.94	Tall grasses in all wetlands appear to
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	3.38	427.91	have been knocked down
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	2.22	428.95	
Leachate Tank	-	436.12	Baseline from 08/02		6.60	429.52	6.00	430.12	
Staff Gauge	-	433.06			0.96	432.10	1.30	431.76	Cannot get accurate reading due to rust staining on gauge

GAS VENTS					MAINTENANCE
VENT	H2S (ppm)	METHANE (% LEL)	O_2 (%)	CO2 (%)	
V-1	0	0	20.8	0	Evident at vents 2 - 5 are dirt mounds at the base more significant in appearance than noted before. Appears as though vents may have been pushed up due to frost heaving
V-2	0	0	20.2	0	
V-3	0	0	20.4	0	
V-4	0	0	20.1	0	
V-5	0	0	20.2	0	
V-6	0	0	20.1	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: May 29, 2003 **ACTIVITIES:** Monthly OM&M
OUTSIDE TEMP (°F): 60 **WEATHER:** Overcast
PERSONS AT SITE: KW,JW **EQUIPMENT ON SITE:** Waterlevel Meter
SITE OBSERVATIONS: Water level in pond is higher, 2.5, has several muskrat at homes
ACCESS GATE: Outer good; inner no lock-open **VEGETATION:** High; needs mowing
FLARE SYSTEM: N/A **GAS VENTS/PIPING:** Screen on two vents torn; we replaced
CAP: Vegetation is high hard to assess cap **LEACHATE:** Orange discoloration at south half

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to W	Elev.	TODAY'S READINGS (ft) Depth	Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	12.05	451.10	At Railroad Bridge N/E of landfill
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	7.73	455.28	water is higher. Water to the east of bridge
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.60	433.47	is still blocked up. Waterlevel SW
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.75	432.03	side of overpass is 7' deep
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.22	431.62	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.64	431.71	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	3.47	427.82	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	2.26	428.91	
Leachate Tank	-	436.12	Baseline from 08/02		6.60	429.52	6.14	429.98	
Staff Gauge	-	433.06			0.96	432.10	1.30	431.76	

GAS VENTS					MAINTENANCE
VENT	H_2S (ppm)	METHANE (% LEL)	O_2 (%)	CO_2 (%)	
V-1	NA	NA	NA	NA	Screens are all secure on vents
V-2	NA	NA	NA	NA	
V-3	NA	NA	NA	NA	
V-4	NA	NA	NA	NA	
V-5	NA	NA	NA	NA	
V-6	NA	NA	NA	NA	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: June 26,2003 **ACTIVITIES:** Monthly OM&M
OUTSIDE TEMP (°F): 95 **WEATHER:** Hot, clear
PERSONS AT SITE: DI/CH/JW/RC **EQUIPMENT ON SITE:** Waterlevel Meter
SITE OBSERVATIONS: Overgrown, cannot see cap
ACCESS GATE: Outside gate locked; inside gate still broken **VEGETATION:** Overgrown
FLARE SYSTEM: N/A **GAS VENTS/PIPING:** OK
CAP: OK; cannot observe surface of cap **LEACHATE:** OK

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	11.38	451.77	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	6.78	456.23	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.44	433.63	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.56	432.22	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.07	431.77	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.36	431.99	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	3.32	427.97	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	2.07	429.10	
Leachate Tank	-	436.12	Baseline from 08/02		6.60	429.52	6.14	429.98	Key size - 1/2 + 8/10; 1/2 + depth
Staff Gauge	-	433.06			0.96	432.10	1.38	431.68	

GAS VENTS					MAINTENANCE
VENT	H2S (ppm)	METHANE (% LEL)	O_2 (%)	CO2 (%)	
V-1	0	0	21	0	
V-2	0	0	21	0	
V-3	0	1	20	0	
V-4	0	3	20	0	
V-5	0	1	21	0	
V-6	0	7	17.8	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: July 29,2003 **ACTIVITIES:** Monthly OM&M

OUTSIDE TEMP (°F): 77 **WEATHER:** Hot ,clear

PERSONS AT SITE: JW, EF **EQUIPMENT ON SITE:** Water level meter, VRAE

SITE OBSERVATIONS: Mowed

ACCESS GATE: Outer good; inner no lock - open **VEGETATION:** overgrown

FLARE SYSTEM: N/A **GAS VENTS/PIPING:** Good

CAP: Vegetation is high; hard to assess cap **LEACHATE:** Orange discoloration at south half

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	(ft) Elev.	TODAY'S READINGS (ft) Depth	(ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	12.73	450.42	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	8.37	454.64	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.99	433.08	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	4.13	431.65	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.62	431.22	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	3.06	431.29	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	7.01	424.28	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	5.06	426.11	
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	6.21	429.91	
Staff Gauge		433.06			0.96	432.10	1.36	431.70	Numbers are very hard to read

GAS VENTS					MAINTENANCE
VENT	H_2S (ppm)	METHANE (% VOL)	O_2 (%)	CO_2 (%)	
V-1	0	2	21	0	Screens are all secure on vents
V-2	0	24	20	0	
V-3	0	0	21	0	
V-4	0	19	20	0	
V-5	0	0	0	0	
V-6	0	5	20.9	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: August 19, 2003 **ACTIVITIES:** Monthly OM&M

OUTSIDE TEMP (°F): 80 **WEATHER:** Hot ,clear

PERSONS AT SITE: JW, EF **EQUIPMENT ON SITE:** Water level meter, VRAE

SITE OBSERVATIONS: Mowed

ACCESS GATES: Outer gate good; inner has no lock - open **VEGETATION:** Thick at well #5

FLARE SYSTEM: N/A **GAS VENTS/PIPING:** Good

CAP: Mowed **LEACHATE:** Present

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to Water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	12.87	450.28	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	8.56	454.45	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	3.01	433.06	6" of standing water
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	4.14	431.64	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.64	431.20	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	3.03	431.32	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	3.92	427.37	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	2.52	428.65	
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	6.30	429.82	
Staff Gauge		433.06			0.96	432.10	1.35	431.71	Staff gauge rusted; needs to be replaced

GAS VENTS					MAINTENANCE
VENT	H2S (ppm)	METHANE (% VOL)	O_2 (%)	CO2 (%)	
V-1	0	>100	12	0	Screens are all secure on vents
V-2	0	6	17	0	
V-3	0	3	17	0	
V-4	0	10	15	0	
V-5	0	7	17	0	
V-6	0	3	17.5	0	

Notes: Background VRAE readings were 3% LEL and 17.2 % oxygen taken at inner gate; Low Oxygen around perimeter of site
Beaver dam appears the same - water not flowing to east; Must be blocked by another dam further down stream;
Walked railroad track from S-N; Observed a lot of algae in wetlands drainage area along east boundary of landfill
Water stagnant at railbridge in NE drainage from site

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: October 1, 2003
ACTIVITIES: Monthly OM&M
OUTSIDE TEMP (°F): 58
WEATHER: Hazy
PERSONS AT SITE: EF, JW, and JD
EQUIPMENT ON SITE: Water Level Meter and VRAE
SITE OBSERVATIONS: See cap below
ACCESS GATE: secure
VEGETATION: Mowed
FLARE SYSTEM: NA
GAS VENTS/PIPING: OK
CAP: Rutted with tire tracks in places on the east side of Landfill
NYSDEC to install new access gate by MW-5 series
LEACHATE: leachate removal initiated

MONITORING WELLS

WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth to water	TODAY'S READINGS (ft) Elev.	REMARKS
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	11.90	451.25	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	7.19	455.82	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.42	433.65	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.54	432.24	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.96	431.88	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.32	432.03	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	3.19	428.10	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	3.27	427.90	
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	5.98	430.14	
Staff Gauge		433.06			0.96	432.10	1.68	431.38	

GAS VENTS				
VENT	H2S (ppm)	METHANE (% LEL)	O_2 (%)	CO2 (%)
V-1	0	98	21	0
V-2	0	off scale	21	0
V-3	0	100	21	0
V-4	0	32	19	0
V-5	0	0	20	0
V-6	0	52	19.7	0

MAINTENANCE

Note that readings were taken with a VRAE
Plus Model PGM-50

Notes:
Beaver dam appears to be partly removed; water level sufficiently low to perform sediment sampling.
Sediment: OBG/IEG completed a sediment sampling program in the adjacent wetland area during this week.
Leachate: 12,000 gallons of leachate was pumped from the sump and disposed at the Beacon WWTP; will contune weekly

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE:	November 26, 2003	**ACTIVITIES:**	Monthly OM&M; leachate pumping
OUTSIDE TEMP (°F):	40	**WEATHER:**	partly cloudy
PERSONS AT SITE:	JBW	**EQUIPMENT ON SITE:**	Water Level Meter and VRAE
SITE OBSERVATIONS:	animal holes in cap		
ACCESS GATE:	Second gate still broken	**VEGETATION:**	Mowed
FLARE SYSTEM:	NA	**GAS VENTS/PIPING:**	Screen repaired at Vent #6
CAP:	Holes/burrows (8-10" deep) near MW-3 pair	**LEACHATE:**	leachate pumped out weekly

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth to water	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	10.98	452.17	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	6.42	456.59	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.23	433.84	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.34	432.44	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.78	432.06	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.18	432.17	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.89	428.40	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.81	429.36	
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	5.21	430.91	
Staff Gauge		433.06			0.96	432.10	2.20	430.86	

GAS VENTS					MAINTENANCE
VENT	H2S (ppm)	METHANE (% VOL)	O_2 (%)	CO2 (%)	
V-1	0	4	20.9	0	Inner gate needs to be repaired
V-2	0	15	20.4	0	
V-3	0	0	21.0	0	
V-4	0	0	21.0	0	
V-5	0	0	19.8	0	
V-6	0	0	20.8	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE:	December 23, 2003	**ACTIVITIES:**	Monthly OM&M; leachate pumping
OUTSIDE TEMP (°F):	40	**WEATHER:**	overcast
PERSONS AT SITE:	JBW, JD	**EQUIPMENT ON SITE:**	Water Level Meter and VRAE
SITE OBSERVATIONS:	OK		
ACCESS GATE:	Latch/lock needs repair; difficult to open	**VEGETATION:**	snow cover
FLARE SYSTEM:	NA	**GAS VENTS/PIPING:**	OK
CAP:	Some snow cover	**LEACHATE:**	leachate pumped

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth to water	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	10.08	453.07	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	5.54	457.47	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.08	433.99	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.22	432.56	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.69	432.15	ice blockage
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.04	432.31	blocked by ice
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.85	428.44	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.74	429.43	some ice blockage
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	5.27	430.85	
Staff Gauge		433.06			0.96	432.10	2.20	430.86	

GAS VENTS					MAINTENANCE/REMARKS
VENT	H_2S (ppm)	METHANE (% LEL)	O_2 (%)	CO_2 (%)	
V-1	0	4	20.9	0	Inner gate still broken
V-2	0	15	20.4	0	
V-3	0	0	21.0	0	
V-4	0	0	21.0	0	
V-5	0	0	19.8	0	
V-6	0	0	20.8	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE:	January 29, 2004	**ACTIVITIES:**	Monthly OM&M; leachate pumping
OUTSIDE TEMP (°F):	20	**WEATHER:**	sun, wind
PERSONS AT SITE:	JBW, JD	**EQUIPMENT ON SITE:**	Water Level Meter and VRAE
SITE OBSERVATIONS:	good		
ACCESS GATE:	repaired	**VEGETATION:**	snow cover
FLARE SYSTEM:	NA	**GAS VENTS/PIPING:**	OK
CAP:	Snow cover	**LEACHATE:**	measured in tank; leachate hauling rescheduled

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth to water	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	11.50	451.65	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	7.46	455.55	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.56	433.51	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.38	432.40	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34			frozen
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05			frozen
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19			frozen
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57			frozen
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	8.82	427.30	
Staff Gauge		433.06			0.96	432.10	2.20	430.86	wetlands frozen

GAS VENTS					MAINTENANCE/REMARKS
VENT	H_2S (ppm)	METHANE (% VOL)	O_2 (%)	CO_2 (%)	
V-1	0	21	20.8	0	Repair inner gate
V-2	0	14	20.9	0	
V-3	0	22	20.4	0	
V-4	0	4	20.4	0	
V-5	0	4	20.4	0	
V-6	0	4	20.4	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE:	February 27, 2004	**ACTIVITIES:**	Monthly OM&M
OUTSIDE TEMP (°F):	35	**WEATHER:**	Sunny; constant breeze
PERSONS AT SITE:	JBW, DT	**EQUIPMENT ON SITE:**	Water Level Meter and VRAE
SITE OBSERVATIONS:	good		
ACCESS GATE:	Clear, able to open	**VEGETATION:**	Frozen
FLARE SYSTEM:	NA	**GAS VENTS/PIPING:**	OK
CAP:	OK	**LEACHATE:**	Stable

MONITORING WELLS									REMARKS
WELL ID	**GROUND ELEV.**	**TOR ELEV.**	**TOTAL WELL DEPTH**	**BOTTOM ELEV.**	10/29/01 (baseline) (ft)		TODAY'S READINGS (ft)		
	(ft)	(ft)	(ft)	(ft)	Depth to water	Elev.	Depth to water	Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	11.66	451.49	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	3.48	459.53	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.62	433.45	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.73	432.05	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34			frozen
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05			frozen
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	3.44	427.85	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57			frozen
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	5.92	430.20	
Staff Gauge		433.06			0.96	432.10	1.75	431.31	wetland is mostly frozen

GAS VENTS					MAINTENANCE/REMARKS
VENT	**H_2S** (ppm)	**METHANE** (% VOL)	**O_2** (%)	**CO_2** (%)	
V-1	0	0	20.6	0	
V-2	0	0	20.5	0	
V-3	0	4	17.6	0	
V-4	0	0	20.6	0	
V-5	0	3	17.6	0	
V-6	0	1	20.6	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE:	April 30, 2004	**ACTIVITIES:**	Monthly OM&M
OUTSIDE TEMP (°F):	78	**WEATHER:**	sunny, steady breeze, then hazy
PERSONS AT SITE:	JBW, DT	**EQUIPMENT ON SITE:**	Water Level Meter and VRAE
SITE OBSERVATIONS:	spring growth		
ACCESS GATE:	2nd gate needs locking yoke	**VEGETATION:**	green
FLARE SYSTEM:	NA	**GAS VENTS/PIPING:**	OK
CAP:	good	**LEACHATE:**	Stable

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth to water	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	6.95	456.20	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	11.22	451.79	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.14	433.93	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.26	432.52	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.65	432.19	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.40	431.95	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.47	428.82	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.55	429.62	
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	4.66	431.46	
Staff Gauge		433.06			0.96	432.10	**		** water level just over top of gauge

GAS VENTS					MAINTENANCE/REMARKS
VENT	H_2S (ppm)	METHANE (% VOL)	O_2 (%)	CO_2 (%)	
V-1	0	7	19.9	0	At Metro North bridge (59.5 milepost):
V-2	0	1	19.3	0	> Beaver dam holding back 24" of water west of bridge
V-3	0	0	21.1	0	> Water level measured from top of bridge girder: 5.05' on west and 7.05' on east
V-4	0	0	21.3	0	> Metro North work equipment (compressor, welder, tool boxes and acetylene cutting tanks) at northeast bank of outflow
V-5	0	0	21.3	0	
V-6	0	0	21.2	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE:	May 25, 2004	**ACTIVITIES:**	Monthly OM&M; GW & leachate sampling
OUTSIDE TEMP (°F):	70	**WEATHER:**	partly sunny
PERSONS AT SITE:	J. Domery, J. Carter	**EQUIPMENT ON SITE:**	Water Level Meter; VRAE; triple meter
SITE OBSERVATIONS:	Needed mowing; done by Town of Patterson		
ACCESS GATE:	2nd gate needs locking yoke	**VEGETATION:**	overgrown; mowed
FLARE SYSTEM:	NA	**GAS VENTS/PIPING:**	OK
CAP:	good	**LEACHATE:**	Conducted dye tracer test

MONITORING WELLS									REMARKS
WELL ID	**GROUND ELEV.** (ft)	**TOR ELEV.** (ft)	**TOTAL WELL DEPTH** (ft)	**BOTTOM ELEV.** (ft)	10/29/01 (baseline) (ft) Depth to water	Elev.	TODAY'S READINGS (ft) Depth to water	Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	12.69	450.46	3 well vols = 23 gal
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	8.95	454.06	3 well vols = 7 gal
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.52	433.55	3 well vols = 32 gal
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.66	432.12	3 well vols = 15 gal
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.90	431.94	3 well vols = 33 gal
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.26	432.09	3 well vols = 14 gal
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.41	428.88	3 well vols = 9.4 gal
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.92	429.25	3 well vols = 20 gal
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	4.48	431.64	
Staff Gauge		433.06			0.96	432.10	**		** water level over top of gauge

GAS VENTS				
VENT	**H2S** (ppm)	**METHANE** (% VOL)	**O_2** (%)	**CO2** (%)
V-1	0	30	20.6	0
V-2	0	3	20.6	0
V-3	0	59	19.4	0
V-4	0	3	20.6	0
V-5	0	3	20.4	0
V-6	0	4	20.5	0

MAINTENANCE/REMARKS

At Metro North bridge (59.5 milepost):

> Beaver dam still holding back water west of bridge

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: June 30, 2004
OUTSIDE TEMP (°F): 75
PERSONS AT SITE: J. Domery, J. Carter
SITE OBSERVATIONS: none
ACCESS GATE: needs repair
FLARE SYSTEM: N/A
CAP: showing along shoreline @ 30° N from MW-20

ACTIVITIES: Monthly OM&M
WEATHER: sunny with few clouds
EQUIPMENT ON SITE: Water Level Meter; VRAE
VEGETATION: OK
GAS VENTS/PIPING: OK
LEACHATE:

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth to water	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	14.39	448.76	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	10.85	452.16	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.91	433.16	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	4.03	431.75	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.14	431.70	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.50	431.85	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.41	428.88	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.87	429.30	
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	4.23	431.89	
Staff Gauge		433.06			0.96	432.10	**		** water level over top of guage

GAS VENTS				
VENT	H_2S (ppm)	METHANE (% VOL/ppm)	O_2 (%)	CO_2 (%)
V-1	1	54	15.9	0
V-2	0	5	20.9	3
V-3	0	4	0.8	0
V-4	0	2	21.0	0
V-5	0	12	21.0	0
V-6	0	28	20.1	0

MAINTENANCE/REMARKS

> Area near MW-1 A/B very overgrown

> West side of fence near Vent #5 has an animal hole under fence

> Water under RR bridge is 1" from top on west side;

Met with Metro staff who said dam is coming down this week

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE:	July 26, 2004	**ACTIVITIES:**	Monthly OM&M
OUTSIDE TEMP (°F):	84	**WEATHER:**	partly cloudy
PERSONS AT SITE:	J. Domery, J. Carter	**EQUIPMENT ON SITE:**	Water Level Meter; VRAE
SITE OBSERVATIONS:			
ACCESS GATE:	needs repair	**VEGETATION:**	OK
FLARE SYSTEM:	N/A	**GAS VENTS/PIPING:**	OK
CAP:	OK	**LEACHATE:**	

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth to water	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	15.07	448.08	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	1.78	461.23	concrete pad cracked
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.74	433.33	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.88	431.90	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.12	431.72	Under 18" of water
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.46	431.89	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.31	428.98	under 8" water; still has pink dye
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.78	429.39	
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	4.09	432.03	
Staff Gauge		433.06			0.96	432.10	**		** water level over top of gauge

GAS VENTS				
VENT	H_2S (ppm)	METHANE (% VOL/ppm)	O_2 (%)	CO_2 (%)
V-1	0	100	17.2	0
V-2	0	100	20.7	0
V-3	0	100	14.3	0
V-4	0	100	20.7	0
V-5	0	100	18.4	0
V-6	0	100	20.7	0

MAINTENANCE/REMARKS

> Wells 3A and 3B overgrown - need weed wacking

> Background levels are at 100% volume methane

> Cleaned and recalibrated PID per instructions; readings still high

> Pumped leachate (25,740 gallons) on 8/4 and 8/5, treated and discharged on site

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE:	August 23, 2004	**ACTIVITIES:**	Monthly OM&M
OUTSIDE TEMP (°F):	75	**WEATHER:**	partly cloudy
PERSONS AT SITE:	J. Domery, J. Carter	**EQUIPMENT ON SITE:**	Water Level Meter; VRAE
SITE OBSERVATIONS:	Water level much lower		
ACCESS GATE:	needs repair	**VEGETATION:**	Mowed except around wells
FLARE SYSTEM:	N/A	**GAS VENTS/PIPING:**	Good
CAP:	Good	**LEACHATE:**	Monitored

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth to water	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	13.68	449.47	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	9.61	453.40	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.54	433.53	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.65	432.13	red dye still present
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.22	431.62	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.54	431.81	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	3.04	428.25	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	2.20	428.97	
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	6.00	430.12	
Staff Gauge		433.06			0.96	432.10	**		gone

GAS VENTS					MAINTENANCE/REMARKS
VENT	H_2S (ppm)	METHANE (% LEL)	O_2 (%)	CO_2 (%)	
V-1	0	100	17.2	0	> Wells MW-3A/B and MW-5A/B overgrown - need weed wacking
V-2	0	100	20.7	3	> Also overgrown getting to MW-1A/B
V-3	0	100	14.3	0	> Pumped leachate (48,320 gallons) on 9/2 and 9/3, and treated and discharged on site
V-4	0	100	20.7	0	
V-5	0	100	18.4	0	
V-6	0	100	20.7	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE:	September 22, 2004	**ACTIVITIES:**	Monthly OM&M
OUTSIDE TEMP (°F):	75	**WEATHER:**	sunny
PERSONS AT SITE:	J. Domery, J. Carter, D. Tagliento	**EQUIPMENT ON SITE:**	Water Level Meter; VRAE
SITE OBSERVATIONS:	none		
ACCESS GATE:	OK	**VEGETATION:**	Overgrown near wells; otherwise mowed
FLARE SYSTEM:	N/A	**GAS VENTS/PIPING:**	OK
CAP:	Good	**LEACHATE:**	Monitored

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV.	TOR ELEV.	TOTAL WELL DEPTH	BOTTOM ELEV.	10/29/01 (baseline) (ft)		TODAY'S READINGS (ft)		
	(ft)	(ft)	(ft)	(ft)	Depth to water	Elev.	Depth to water	Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	12.20	450.95	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	7.46	455.55	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.42	433.65	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.51	432.27	some dye
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.05	431.79	red dye
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.44	431.91	
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.06	429.23	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	5.91	425.26	
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	6.00	430.12	
Staff Gauge		433.06			0.96	432.10	**		gone

GAS VENTS					MAINTENANCE/REMARKS
VENT	H2S (ppm)	METHANE (% VOL/ppm)	O_2 (%)	CO2 (%)	> find and straighten staff guage
V-1	1	13	17.1	0	> Water level at RR Bridge is 6.58" below railing
V-2	2	39	11.2	3	
V-3	0	1	21.0	0	
V-4	0	1	21.0	0	
V-5	0	1	21.0	0	
V-6	0	1	20.9	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: October 30, 2004 **ACTIVITIES:** Monthly OM&M

OUTSIDE TEMP (°F): 55 **WEATHER:** overcast & heavy fog - misty

PERSONS AT SITE: J. Domery and J. Carter **EQUIPMENT ON SITE:** Water Level Meter; VRAE

SITE OBSERVATIONS:

ACCESS GATE: outer gate good, inner gate open **VEGETATION:** OK

FLARE SYSTEM: N/A **GAS VENTS/PIPING:** good except #4 is twisted

CAP: Good **LEACHATE:** Monitored

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	(ft) Elev.	TODAY'S READINGS (ft) Depth to water	(ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	11.98	451.17	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	7.44	455.57	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.58	433.49	sheen on water in drainage
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	2.14	433.64	ditch - dark brown; iridescent
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.00	431.84	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	5.80	428.55	red dye present
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	3.00	428.29	red dye present
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	2.16	429.01	
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	5.84	430.28	
Staff Gauge		433.06			0.96	432.10	**		not found

GAS VENTS					MAINTENANCE/REMARKS
VENT	H_2S (ppm)	METHANE (% VOL/ppm)	O_2 (%)	CO_2 (%)	> Find and straighten staff guage
V-1	1	32	3.2	2	> Water level at RR Bridge is 6.58" below railing - no change
V-2	2	20	10.4	0	> Vent #4 twisted 45°, but still secured to the ground
V-3	0	0	21.2	0	
V-4	0	4 ppm	18.4	0	
V-5	0	2 ppm	20.8	0	
V-6	0	0	21.2	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE:	November 23, 2004	**ACTIVITIES:**	Monthly OM&M
OUTSIDE TEMP (°F):	33	**WEATHER:**	partly cloudy, calm
PERSONS AT SITE:	D. Iyer, D. Tagliento	**EQUIPMENT ON SITE:**	Water Level Meter; VRAE
SITE OBSERVATIONS:	OK		
ACCESS GATE:	Outer locked, inner gate open	**VEGETATION:**	Mowed, good condition
FLARE SYSTEM:	N/A	**GAS VENTS/PIPING:**	OK
CAP:	OK	**LEACHATE:**	Monitored

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth to water	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	12.43	450.72	
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	8.02	454.99	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.61	433.46	sheen on water in drainage
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.73	432.05	ditch - dark brown; iridescent
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	2.22	431.62	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.64	431.71	red dye present
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	3.34	427.95	red dye present
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	2.21	428.96	
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	8.95	427.17	
Staff Gauge		433.06			0.96	432.10	**		missing

GAS VENTS					MAINTENANCE/REMARKS
VENT	H_2S (ppm)	METHANE (% VOL/ppm)	O_2 (%)	CO_2 (%)	
V-1	0	24	14.5	2	> Find and straighten staff guage
V-2	0	14	15.8	0	> shoreline receded 20 feet at leachate sump; 10' at MW-20A/B
V-3	0	1	18.5	0	> Vent #4 twisted 45°, but still secured to the ground
V-4	0	9	14.3	0	
V-5	0	1	13.8	0	
V-6	0	6	17.3	0	
GP-1	0	0	19.1	0	
GP-2	0	80	13.2	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE:	December 28, 2004	**ACTIVITIES:**	Monthly OM&M
OUTSIDE TEMP (°F):	5	**WEATHER:**	cloudy, calm
PERSONS AT SITE:	R. Allen, D. Tagliento	**EQUIPMENT ON SITE:**	Water Level Meter; VRAE, propane torch
SITE OBSERVATIONS:	OK		
ACCESS GATE:	Outer locked, inner locked	**VEGETATION:**	Mowed, weeds out
FLARE SYSTEM:	N/A	**GAS VENTS/PIPING:**	OK
CAP:	OK	**LEACHATE:**	Monitored

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	10/29/01 (baseline) (ft) Elev.	TODAY'S READINGS (ft) Depth to water	TODAY'S READINGS (ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	11.19	451.96	2" PVC cap broken
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	6.38	456.63	
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.36	433.71	
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.45	432.33	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.93	431.91	
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.36	431.99	Pink tint present; PVC cap broken
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	2.90	428.39	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	1.72	429.45	Frozen at 6" above ground level; measured outside of pipe
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	5.66	430.46	not frozen, light orange, brown skim coat
Staff Gauge		433.06			0.96	432.10	**		Lost below water

GAS VENTS					MAINTENANCE/REMARKS
VENT	H_2S (ppm)	METHANE (% LEL)	O_2 (%)	CO_2 (%)	
V-1	2	>100	13.0	0	> Gas readings taken 12" inside of pipes
V-2	2	>100	20.4	0	> Leachate tank - marsh ice 30' out from tank; carbon barrels frozen to the ground
V-3	2	2	19.8	0	> Vent V-1 has no lock
V-4	2	0	20.3	0	> Lubricated all locks with graphite
V-5	2	0	20.3	0	> Recommend replacing staff gage and adding spacer/latch to North access gate
V-6	2	>100	17.3	0	
GP-1	2	>100	20.6	0	
GP-2	2	0	20.5	0	

FORM 1
CROSS COUNTY SANITATION/KESSMAN LANDFILL
OM&M FIELD MEASUREMENTS

DATE: January 25, 2005
OUTSIDE TEMP (°F): 20
PERSONS AT SITE: R. Allen, D. Tagliento
SITE OBSERVATIONS: Snow cover, up to 4' drifts
ACCESS GATE: Outer locked, inner locked
FLARE SYSTEM: N/A
CAP: OK, 6" of snow cover (average)

ACTIVITIES: Monthly OM&M
WEATHER: Sunny, light breeze, cold
EQUIPMENT ON SITE: Water Level Meter; VRAE, propane torch
VEGETATION: Mowed, weeds trimmed
GAS VENTS/PIPING: OK
LEACHATE: Monitored

MONITORING WELLS									REMARKS
WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	10/29/01 (baseline) (ft) Depth to water	(ft) Elev.	TODAY'S READINGS (ft) Depth to water	(ft) Elev.	
MW-1A	461.15	463.15	59.40	403.75	16.10	447.05	2.63	460.52	2" PVC cap broken, ice
MW-1B	461.07	463.01	23.10	439.91	13.00	450.01	6.38	456.63	15' out to solid ice
MW-3A	432.59	436.07	67.36	368.71	4.80	431.27	2.20	433.87	Well is frozen (south of MW-3B)
MW-3B	432.68	435.78	34.20	401.58	4.47	431.31	3.37	432.41	
MW-5A	431.38	433.84	72.18	361.66	2.50	431.34	1.85	431.99	Both wells frozen (north of MW-5B)
MW-5B	431.70	434.35	30.38	403.97	3.30	431.05	2.27	432.08	PVC cap broken
MW-20A	431.51	431.29	21.61	409.68	3.10	428.19	10.58	420.71	
MW-20B	430.92	431.17	42.53	388.64	2.60	428.57	6.20	424.97	Frozen at 6" above ground level; measured outside of pipe
Leachate Tank		436.12	Baseline from 08/02		6.60	429.52	5.65	430.47	
Staff Gauge		433.06			0.96	432.10	**		Lost below water

GAS VENTS				
VENT	H2S (ppm)	METHANE (% LEL)	O_2 (%)	CO2 (%)
V-1	0	4	17.8	0
V-2	0	0	20.4	0
V-3	0	1	20.0	0
V-4	0	0	20.3	0
V-5	0	0	20.3	0
V-6	0	4	17.9	0
GP-1	0	1	20.7	0
GP-2	0	1	20.2	0
Gate	0	1	21.2	0

MAINTENANCE/REMARKS

> Gas readings taken 12" inside of pipes
> Leachate tank - marsh ice 35' out from tank; carbon barrels frozen to the ground
> Vents GP-1 and GP-2 have no locks
> Lubricated inner and outer gate locks with graphite
> Recommend replacing staff gage and adding spacer/latch to North access gate
> Two warm spots in water - one near wetland sign at MW-20AB, other at end of fenc
> Top of Rail Road Bridge Truss to ice is 6.45'
> Railroad tool chest by Bridge is gone

FORM 2
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
Groundwater Monitoring/Well Purging/Sampling
Date Sampled: 2/27/02

Sample I.D.	DEPTH TO BOTTOM (ft)	DEPTH TO WATER (ft)	HEIGHT OF WC (ft)	MIN. PURGE VOLUME (gal)	Water Quality Parameters				NOTES
					pH (s.u.)	Sp. Cond. ((µmhos))	Temp. (°F)	Turbidity (ntu)	
MW-1A	59.40	15.35	44.05	7.2	7.4	0.190	50.7	clear	
MW-1B	23.10	17.85	5.25	0.9	7.7	0.180	50.4	cloudy	
MW-3A	67.36	4.14	63.22	10.3	7.9	0.220	46.7	clear	Kink in well
MW-3B	34.20	3.81	30.39	5.0	7.4	0.210	47.2	clear	
MW-5A	72.18	2.13	70.05	11.4	7.3	0.184	48.0	cloudy	
MW-5B	30.38	2.51	27.87	4.5	7.4	0.184	46.7	clear	
MW-20A	21.61	2.57	19.04	3.1	7.5	0.230	49.0	clear	
MW-20B	42.53	1.97	40.56	6.6	7.9	0.240	50.1	cloudy	

FORM 2
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
Groundwater Monitoring Well Purging/Sampling
Date Sampled: May 15 & 16, 2002

Sample I.D.	DEPTH TO BOTTOM (ft)	DEPTH TO WATER (ft)	HEIGHT OF WC (ft)	MIN. PURGE VOLUME (gal)	Water Quality Parameters				NOTES
					pH (s.u.)	Sp. Cond. ((µmhos))	Temp. (°F)	Turbidity (ntu)	
MW-1A	59.40	15.35	44.05	7.2	*	0.010	–	–	
MW-1B	23.10	17.85	5.25	0.9	*	0.010	–	–	
MW-3A	67.36	4.14	63.22	10.3	6.8	0.010	17.6	–	
MW-3B	34.20	3.81	30.39	5.0	6.4	0.010	19.8	–	
MW-5A	72.18	2.13	70.05	11.4	*	0.010	24.4	–	
MW-5B	30.38	2.51	27.87	4.5	*	0.010	14.4	–	
MW-20A	21.61	2.57	19.04	3.1	*	0.010	23.1	–	
MW-20B	42.53	1.97	40.56	6.6	6.7	0.010	16.6	–	

NOTE: * pH meter did not work correctly for these wells

FORM 2
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
Groundwater Monitoring Well Purging/Sampling
Date Sampled: September 18 & 19, 2002

Sample I.D.	DEPTH TO BOTTOM (ft)	DEPTH TO WATER (ft)	HEIGHT OF WC (ft)	MIN. PURGE VOLUME (gal)	Water Quality Parameters				NOTES
					pH (s.u.)	Sp. Cond. ((µmhos))	Temp. (°F)	Turbidity (ntu)	
MW-1A	59.40	15.35	44.05	7.2	6.06	0.76	24.3	clear	
MW-1B	23.10	17.85	5.25	0.9	7.31	0.76	28.4	cloudy	
MW-3A	67.36	4.14	63.22	10.3	6.77	0.77	27.0	clear	
MW-3B	34.20	3.81	30.39	5.0	6.53	0.76	27.1	clear	
MW-5A	72.18	2.13	70.05	11.4	6.87	0.76	19.6	cloudy	
MW-5B	30.38	2.51	27.87	4.5	6.85	0.75	28.0	clear	
MW-20A	21.61	2.57	19.04	3.1	7.25	0.76	24.7	clear	
MW-20B	42.53	1.97	40.56	6.6	7.48	0.76	26.4	clear	

FORM 3
CROSS COUNTY SANITATION/KESSMAN LANDFILL
GROUNDWATER/SURFACE WATER/LEACHATE ELEVATIONS

WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	WATER LEVELS (Elevation in feet)												MINIMUM ELEVATION (ft)	MAXIMUM ELEVATION (ft)	VARIATION (ft)
					10/29/01 Baseline	2/27/02	03/28/02	4/25/02	5/15/02	6/13/02	07/25/02	08/22/02	09/18/02	10/24/02	11/17/02	12/19/02			
MW-1A	461.15	463.15	59.40	403.75	447.05	447.80	448.49	448.89	449.82	450.98	448.57	446.93	446.75	447.35	448.95	447.80	446.8	451.0	-4.2
MW-1B	461.07	463.01	23.10	439.91	450.01	445.17	451.99	452.76	453.86	455.10	451.79	450.48	449.75	450.73	452.77	445.17	445.2	455.1	-9.9
MW-3A	431.82	434.65	67.36	367.29	431.27	431.93	432.26	432.25	432.83	432.09	431.03	430.65	430.97	432.11	432.57	430.87	430.7	432.8	-2.2
MW-3B	432.68	435.78	34.20	401.58	431.31	431.97	432.28	432.29	432.89	432.14	431.18	430.27	430.60	431.76	432.20	431.97	430.3	432.9	-2.6
MW-5A	431.38	433.84	72.18	361.66	431.34	431.71	432.05	432.22	432.64	431.85	430.88	429.87	429.92	431.48	431.41	431.71	429.9	432.6	-2.8
MW-5B	431.70	434.35	30.38	403.97	431.05	431.84	432.25	432.39	432.81	432.04	430.71	429.85	429.94	431.64	431.81	431.84	429.9	432.8	-3.0
MW-20A	431.51	431.29	21.61	409.68	428.19	428.72	429.09	429.30	429.71	428.41	427.20	426.87	427.05	428.63	428.39	428.72	426.9	429.7	-2.8
MW-20B	430.92	431.17	42.53	388.64	428.57	429.20	429.52	429.77	430.13	429.02	428.27	427.48	427.68	429.05	428.89	429.20	427.5	430.1	-2.6
Leachate Tank	436.12				429.52	-	-	432.03	429.42	429.99	429.72	429.51	429.74	431.42	431.42	430.42	429.4	432.0	-2.6
Staff Gauge	433.06				432.10	-	-	-	430.49	-	-	430.69	430.91	432.93	431.28	431.48	430.5	432.9	-2.4

Note: 1. All wells and soil gas points were resurveyed in August 2002 after repair work at MW-3A, GP-1 and GP-2
2. Previous elevations at MW-3A were: Ground elev. = 432.59 and Top of Riser elev. = 436.07.

FORM 3
CROSS COUNTY SANITATION/KESSMAN LANDFILL
GROUNDWATER/SURFACE WATER/LEACHATE ELEVATIONS

WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	WATER LEVELS (Elevation in feet)										MINIMUM ELEVATION (ft)	MAXIMUM ELEVATION (ft)	VARIATION (ft)
					10/29/01 Baseline	03/26/03	4/24/03	5/29/03	6/26/03	07/29/03	08/19/03	10/1/03	11/26/03	12/23/03			
MW-1A	461.15	463.15	59.40	403.75	447.05	452.93	452.27	451.10	451.77	450.42	450.28	451.25	452.17	453.07	450.3	453.1	-2.8
MW-1B	461.07	463.01	23.10	439.91	450.01	457.87	456.53	455.28	456.23	454.64	454.45	455.82	456.59	457.47	454.5	457.9	-3.4
MW-3A	431.82	434.65	67.36	367.29	431.27	433.92	433.56	433.47	433.63	433.08	433.06	433.65	433.84	433.99	433.1	434.0	-0.9
MW-3B	432.68	435.78	34.20	401.58	431.31	432.62	431.13	432.03	432.22	431.65	431.64	432.24	432.44	432.56	431.1	432.6	-1.5
MW-5A	431.38	433.84	72.18	361.66	431.34	432.24	431.82	431.62	431.77	431.22	431.20	431.88	432.06	432.15	431.2	432.2	-1.0
MW-5B	431.70	434.35	30.38	403.97	431.05	432.40	431.94	431.71	431.99	431.29	431.32	432.03	432.17	432.31	431.3	432.4	-1.1
MW-20A	431.51	431.29	21.61	409.68	428.19	428.39	427.91	427.82	427.97	424.28	427.37	428.10	428.40	428.44	424.3	428.4	-4.2
MW-20B	430.92	431.17	42.53	388.64	428.57	429.38	428.95	428.91	429.10	426.11	428.65	427.90	429.36	429.43	426.1	429.4	-3.3
Leachate Tank	436.12				429.52	430.42	430.12	429.98	429.98	429.91	429.82	430.14	430.91	430.85	429.8	430.9	-1.1
Staff Gauge	433.06				432.10	431.31	431.76	431.76	431.68	431.70	431.71	431.38	430.86	430.86	430.9	431.8	-0.9

Note: 1. All wells and soil gas points were resurveyed in August 2002 after repair work at MW-3A, GP-1 and GP-2
2. Previous elevations at MW-3A were: Ground elev. = 432.59 and Top of Riser elev. = 436.07.

FORM 3
CROSS COUNTY SANITATION/KESSMAN LANDFILL
GROUNDWATER/SURFACE WATER/LEACHATE ELEVATIONS

WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	WATER LEVELS (Elevation in feet)													MINIMUM ELEVATION (ft)	MAXIMUM ELEVATION (ft)	VARIATION (ft)
					10/29/01 Baseline	01/29/04	02/27/04	04/30/04	05/25/04	06/30/04	07/26/04	08/23/04	09/22/04	10/30/04	11/23/04	12/28/04	01/25/05			
MW-1A	461.15	463.15	59.40	403.75	447.05	451.65	451.49	456.20	450.46	448.76	448.08	449.47	450.95	451.17	450.72	451.96	460.52	448.1	460.5	-12.4
MW-1B	461.07	463.01	23.10	439.91	450.01	455.55	459.53	451.79	454.06	452.16	461.23	453.40	455.55	455.57	454.99	456.63	456.63	451.8	461.2	-9.4
MW-3A	431.82	434.65	67.36	367.29	431.27	433.51	433.45	433.93	433.55	433.16	433.33	433.53	433.65	433.49	433.46	433.71	433.87	433.2	433.9	-0.8
MW-3B	432.68	435.78	34.20	401.58	431.31	432.40	432.05	432.52	432.12	431.75	431.90	432.13	432.27	433.64	432.05	432.33	432.41	431.8	433.6	-1.9
MW-5A	431.38	433.84	72.18	361.66	431.34			432.19	431.94	431.70	431.72	431.62	431.79	431.84	431.62	431.91	431.99	431.6	432.2	-0.6
MW-5B	431.70	434.35	30.38	403.97	431.05			431.95	432.09	431.85	431.89	431.81	431.91	428.55	431.71	431.99	432.08	428.6	432.1	-3.5
MW-20A	431.51	431.29	21.61	409.68	428.19		427.85	428.82	428.88	428.88	428.98	428.25	429.23	428.29	427.95	428.39	420.71	420.7	429.2	-8.5
MW-20B	430.92	431.17	42.53	388.64	428.57			429.62	429.25	429.30	429.39	428.97	425.26	429.01	428.96	429.45	424.97	425.0	429.6	-4.6
Leachate Tank	436.12				429.52	427.30	430.20	431.46	431.64	431.89	432.03	430.12	430.12	430.28	427.17	430.46	430.47	427.2	432.0	-4.9
Staff Gauge	433.06				432.10	430.86	431.31											430.9	431.3	-0.4

Note: 1. All wells and soil gas points were resurveyed in August 2002 after repair work at MW-3A, GP-1 and GP-2
2. Previous elevations at MW-3A were: Ground elev. = 432.59 and Top of Riser elev. = 436.07.

FORM 4A
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
ORGANICS
ROUND: 1 by O'BRIEN & GERE/IEG (First Quarter, 2002)

DATE: February 27, 2002

PARAMETER	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-2	SW-3	SW-103	L-5
Vinyl Chloride	ppb	2						0.2 J	0.3 J						
Chloroethane	ppb	5						0.4 J	1	0.2 J					
trans 1,2-Dichloroethene (DCE)	ppb	5	5						0.1 J						
1,1-Dichloroethane	ppb	5	5					0.2 J	0.4 J	2	0.8				
cis 1,2-Dichloroethene (DCE)	ppb	5	5					0.2 J	0.4 J					4 J	
1,2-Dichloroethane	ppb	0.6	0.6						0.1 J	2	0.8				
Benzene	ppb	1	1					1	2	0.5 J	0.1 J				
1,2-Dichloropropane	ppb							0.1 J							
Toluene	ppb	5	5					0.3 J	0.3 J						
Chlorobenzene	ppb	5	5					7	6						
Isopropylbenzene	ppb	5						0.2 J	0.2 J	1.0	0.2 J				
1,3-Dichlorobenzene	ppb							1							
1,4-Dichlorobenzene	ppb	3	3			0.1 J		1	1						
1,2-Dichlorobenzene	ppb								1						
1,1,1-Trichloroethane (TCA)	ppb														
Cyclohexane	ppb							0.6	0.5						
Methylcyclohexane	ppb							0.4 J	0.4 J						
Methyl tert-butyl ether	ppb						0.2 J								
beta-BHC	ppb			NA	NA	NA	NA	NA	NA	NA	NA		0.0074 J		
gamma-BHC	ppb			NA	NA	NA	NA	NA	NA	NA	NA	0.0064 J	0.0050 J		0.0074 J
Eldrin aldehyde	ppb			NA	NA	NA	NA	NA	NA	NA	NA	0.0081 J	0.013 J	0.0096 J	0.010 J
gamma-Chlordane	ppb			NA	NA	NA	NA	NA	NA	NA	NA				0.0037 J

NOTES:
1. Only detected values are reported
2. NS = Not Sampled; ND = non-detect; Inst.Er. = Instrument Error
3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 4B
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
FIELD PARAMETERS, INDICATOR PARAMETERS AND METALS
ROUND: 1 by O'BRIEN & GERE/IEG (First Quarter, 2002)

DATE: February 27, 2002

PARAMETER (in ppb)	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-2	SW-3	SW-103	L-5
pH (field; s.u.)	s.u.			7.37	7.7	7.87	7.42	7.29	7.42	7.5	7.9	7.7	7.7	7.8	7.7
Temperature (field)	°F			50.7	50.4	46.7	47.2	48	46.7	49	50.1	49	49	49	49
Specific Conductivity	umhos			0.19	0.18	0.22	0.21	0.184	0.184	0.23	0.23	0.24	0.23	0.24	0.25
TSS	ppm			12	130	6	100	10	1300	1300	25				
TOC	ppm							7	12	32	4	12	6	6	10
BOD	ppm			NA	NA	NA	NA	NA	NA	NA	NA	10	9		13
COD	ppm			NA	NA	NA	NA	NA	NA	NA	NA	40	30	20	40
Chlorides	ppm			520	960	840	2200	42	37	15	12	NA	NA	NA	NA
Aluminum	ppb		100		2440		2180		20200	146000		658		12	
Antimony	ppb	30	30												
Arsenic	ppb	25	50							671					
Barium	ppb	1000	1000												
Beryllium	ppb														
Cadmium	ppb														
Calcium	ppb			195000	117000	210000	398000	93100	183000	326000	34000	62700	58400	51300	60900
Chromium	ppb	50	50	18					40	196					
Cobalt	ppb									93					
Copper	ppb								30	217					
Iron	ppb	300	300	189	2600	3060	7700	7260	39600	273000	7510	8480	805	699	1160
Lead	ppb	25	50						11	82		3.2			
Magnesium	ppb	35000		84100	82100	114000	236000	86200	92300	241000	53400	21300	17300	18500	19400
Manganese	ppb	300	300		65	273	707	91	2020	5170	114	289	109	81	
Nickel	ppb	100	100						42	214	184000				
Potassium	ppb			10600	9020	28700	30900	11600	15600	53800		6660	23200		6060
Selenium	ppb									10					
Silver	ppb														
Sodium	ppb	20000		98900	427000	224000	649000	37400	68300	36800	39300	78300	23200	18900	29600
Thallium	ppb														
Vanadium	ppb									224					
Zinc	ppb	20							77	612					
Mercury	ppb														

NOTES: 1. Only detected values are reported
2. NS = Not Sampled; Inst.Er. = Instrument Error
3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 4A
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
ORGANICS
ROUND: 2 by O'BRIEN & GERE/IEG (Second Quarter, 2002)

DATE: May 16, 2002

PARAMETER	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	MHC-1
Vinyl Chloride	ppb	2						0.2								
Methylene chloride	ppb							0.1								
Acetone	ppb							1		1		4 J	4 J	4 J	6 J	4 J
Chloroethane	ppb	5						0.6		0.1						
trans 1,2-Dichloroethene (DCE)	ppb	5	5													
1,1-Dichloroethane	ppb	5	5					0.1		0.9						
cis 1,2-Dichloroethene (DCE)	ppb	5	5					0.3								
1,2-Dichloroethane	ppb	0.6	0.6							0.8						
Benzene	ppb	1	1					1		0.3						2 J
1,2-Dichloropropane	ppb							0.2								
Toluene	ppb	5	5	0.1												
Chlorobenzene	ppb	5	5					14								5 J
2-Hexanone	ppb														2.0	
Isopropylbenzene	ppb	5								1.0						0.7 J
1,3-Dichlorobenzene	ppb															
1,4-Dichlorobenzene	ppb	3	3					3								0.7 J
1,2-Dichlorobenzene	ppb							2								
1,1,1-Trichloroethane (TCA)	ppb															
bis(2-Ethylhexyl)phthalate	ppb															1 J
Napthalene	ppb															2 J
Caprolactum	ppb														2 J	1 J
Cyclohexane	ppb							0.2								
Methylcyclohexane	ppb							0.2								
Methyl tert-butyl ether	ppb							0.1								
beta-BHC	ppb															
gamma-BHC	ppb															
Eldrin aldehyde	ppb															
gamma-Chlordane	ppb															

NOTES:
1. Only detected values are reported
2. NS = Not Sampled; ND = non-detect; Inst.Er. = Instrument Error
3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 4B
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
FIELD PARAMETERS, INDICATOR PARAMETERS AND METALS
ROUND: 2 by OBRIEN& GERE/IEG (Second Quarter, 2002)

DATE: May 16, 2002

PARAMETER (in ppb)	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	MHC-1
pH (field; s.u.)	s.u.															
Temperature (field)	°F															
Specific Conductivity	umhos															
TSS	ppm			110	24		38	20		1200			24	20		52
TOC	ppm							6		5		10	9	10	6	2
BOD	ppm												6			27
COD	ppm															
Chlorides	ppm			600	550	1000	2400	33		19	21					
Aluminum	ppb		100	11100.0	730.0	644.0		14.4 J	1280.0	35200.0		62.8 J	24.1 J	66.3 J		
Antimony	ppb	30	30													
Arsenic	ppb	25	50	2.4 J				11.8		9.6 J	5.2 J					
Barium	ppb	1000	1000	148.0	132.0	482.0	652.0	166.0	82.1	196.0	62.8	62.6	48.1	67.1	89.7	243.0
Beryllium	ppb			0.4 J						1 J						
Cadmium	ppb															
Calcium	ppb			336000.0	72200.0	214000.0	408000.0	101000.0	125000.0	102000.0	56500.0	53300.0	41900.0	44900.0	54200.0	137000.0
Chromium	ppb	50	50	45.4	5.0	2.4 J	4.2 J	5.9 J	6.1 J	49.5	10.1		0.91 J	1.7 J		0.94 J
Cobalt	ppb			8.1						22.4						
Copper	ppb			27.6	1.6 J		3.8 J		4.1 J	48.5		1.1 J	0.98 J			1.5
Iron	ppb	300	300	22000.0	1000.0	2180.0	598.0	14200.0	2460.0	66300.0	2430.0	983.0	1930.0	1700.0	1750.0	41800.0
Lead	ppb	25	50	7.9				0.81 J	1.4 J	24.3	12.4					
Magnesium	ppb	35000		163000.0	49400.0	117000.0	240000.0	112000.0	68900.0	96.0	54400.0	17100.0	15500.0	15800.0	17400.0	30000.0
Manganese	ppb	300	300	332.0	28.8	180.0	334.0	198.0	971.0	1220.0		201.0	233.0	85.2	2020.0	1840.0
Nickel	ppb	100	100	22.7					3.2 J	47.3						
Potassium	ppb			16500.0	6430.0	28100.0	28600.0	11000.0	10700.0	22900.0	13400.0	5810.0	5320.0	5250.0	5220.0	7230.0
Selenium	ppb			3.3 J				2.1 J		2.5 J			2.3 J			2.2 J
Silver	ppb			1.2 J												
Sodium	ppb	20000		92700.0	300000.0	240000.0	612000.0	34900.0	66500.0	34600.0	32700.0	264000.0	22000.0	31400.0	127000.0	54900.0
Thallium	ppb															
Vanadium	ppb			20.4	2.6 J		1.3 J		2 J							52.9
Zinc	ppb	20		129.0	60.7		0.53 J	10.0	78.6	164.0	1.1 J	0.58 J	21.6	16.8	1.8 J	4.5 J
Mercury	ppb					0.4										

NOTES: 1. Only detected values are reported
2. NS = Not Sampled; Inst.Er. = Instrument Error
3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 4A
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED SURFACE WATER/LEACHATE ANALYTICAL RESULTS
ORGANICS
ROUND: Special Sampling by O'BRIEN & GERE/IEG (Second Quarter, 2002)

DATE: June 13, 2002

PARAMETER	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	MHC-1	SW-1	SW-103	SW-2	SW-3
Vinyl Chloride	ppb	2						
Chloroethane	ppb	5						
trans 1,2-Dichloroethene (DCE)	ppb	5	5					
1,1-Dichloroethane	ppb	5	5					
cis 1,2-Dichloroethene (DCE)	ppb	5	5					
1,2-Dichloroethane	ppb	0.6	0.6					
Benzene	ppb	1	1	2 J				4 J
1,2-Dichloropropane	ppb							
Toluene	ppb	5	5					
Chlorobenzene	ppb	5	5					
Isopropylbenzene	ppb	5		1.0				2.0
1,3-Dichlorobenzene	ppb							
1,4-Dichlorobenzene	ppb	3	3					
1,2-Dichlorobenzene	ppb							
1,1,1-Trichloroethane (TCA)	ppb							
Cyclohexane	ppb							
bis(2-Ethylhexyl)phthalate	ppb						1 J	
Napthalene	ppb			5.0				2.0
Caprolactum	ppb			9.0				6.0
Methylcyclohexane	ppb							
Methyl tert-butyl ether	ppb							
PCBs	ppb							
beta-BHC	ppb							
gamma-BHC	ppb							
Eldrin aldehyde	ppb							
gamma-Chlordane	ppb							

NOTES:
1. Only detected values are reported
2. NS = Not Sampled; ND = non-detect; Inst.Er. = Instrument Error
3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. No PCBs were detected in the leachate samples

FORM 4B
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED SURFACE WATER/LEACHATE ANALYTICAL RESULTS
ROUND: Special Sampling Surface Water/Leachate by O'BRIEN & GERE/IEG (Second Quarter, 2002)

DATE: June 13, 2002

PARAMETER (in ppb)	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	MHC-1	SW-1	SW-103	SW-2	SW-3
pH (field; s.u.)	s.u.							
Temperature (field)	°F							
Specific Conductivity	umhos							
TSS	ppm			69	86	240	160	110
TOC	ppm			5	5	14	13	14
BOD	ppm			28		8	10	33
COD	ppm			40	40	80	70	50
Chlorides	ppm							
Aluminum	ppb		100	11 J	918.0	5540.0	3580.0	279.0
Antimony	ppb	30	30					
Arsenic	ppb	25	50		6.6	4.6	3.9	2.0
Barium	ppb	1000	1000	373.0	237.0	206.0	256.0	839.0
Beryllium	ppb					0.1	0.2	
Cadmium	ppb							
Calcium	ppb			117000.0	125000.0	85700.0	80800.0	121000.0
Chromium	ppb	50	50	3.0		6.2	6.0	4.7
Cobalt	ppb							
Copper	ppb				8.8	9.4	19.6	
Iron	ppb	300	300	48000.0	12300.0	22700.0	12700.0	53600.0
Lead	ppb	25	50		3.2	8.4	10.7	1.4
Magnesium	ppb	35000		37400.0	40700.0	28500.0	28900.0	44800.0
Manganese	ppb	300	300	816.0	1640.0	1760.0	2160.0	580.0
Nickel	ppb	100	100			3.6	6.7	2.9
Potassium	ppb			10300.0	7780.0	4540.0	10200.0	14000.0
Selenium	ppb						2.6	
Silver	ppb							
Sodium	ppb	20000		90500.0	1270000.0	613000.0	136000.0	72800.0
Thallium	ppb							
Vanadium	ppb				2.5	7.6	5.7	1.0
Zinc	ppb	20		1.9	18.6	57.0	52.9	91.4
Mercury	ppb							

NOTES: 1. Only detected values are reported
2. NS = Not Sampled; Inst.Er. = Instrument Error
3 Surface water samples labeled previosly as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 4A
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
ORGANICS
ROUND: 3 by O'BRIEN & GERE/IEG (Third Quarter, 2002)

IEG

DATE: September 18, 2002

PARAMETER	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	SW-Bridge	MHC-1
Vinyl Chloride	ppb	2											4 J				
Methylene chloride	ppb			0.5 J	0.9	2		0.2 J	0.1 J	0.3 J	0.1 J	7 J					
Acetone	ppb			2	1	15	2	3	6	3	3		8 J	4 J		6 J	3 J
Chloroethane	ppb	5						0.5	1	0.4 J							
trans 1,2-Dichloroethene (DCE)	ppb	5	5														
1,1-Dichloroethane	ppb	5	5					0.1 J	0.5 J	2	1						
cis 1,2-Dichloroethene (DCE)	ppb	5	5					0.2 J	0.5 J	0.1 J			4 J				
1,2-Dichloroethane	ppb	0.6	0.6					0.2 J	0.1 J	2	1						
Benzene	ppb	1	1					1	1	0.5 J	0.4 J						4 J
1,2-Dichloropropane	ppb																
Toluene	ppb	5	5					0.2 J					0.6 J				
Chlorobenzene	ppb	5	5					12	2								8 J
2-Hexanone	ppb																
Isopropylbenzene	ppb	5						0.3 J	0.2 J	2.0	2.0						
1,3-Dichlorobenzene	ppb							0.4 J									
1,4-Dichlorobenzene	ppb	3	3					2	0.5								1 J
1,2-Dichlorobenzene	ppb							2	0.3 J								
1,1,1-Trichloroethane (TCA)	ppb																
Carbon disulfide	ppb					0.2 J					0.2 J						
2-Butanone	ppb							360	640								
bis(2-Ethylhexyl)phthalate	ppb																
Napthalene	ppb																5.0
Caprolactum	ppb																2.0
Cyclohexane	ppb																
Methylcyclohexane	ppb							0.2 J									1 J
4-Methylphenol	ppb												7.0				
Di-n-butyl phthalate	ppb												3.0	2.0			
Methyl tert-butyl ether	ppb						0.3 J		0.1 J								
Phenol	ppb												11				
PCBs	ppb																
beta-BHC	ppb																
gamma-BHC	ppb																
Eldrin aldehyde	ppb																
gamma-Chlordane	ppb																

NOTES: 1. Only detected values are reported

2. NS = Not Sampled; ND = non-detect; Inst.Er. = Instrument Error

3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13

4. GW & SW Standards based on NYSDEC TAGMs

FORM 4B
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
FIELD PARAMETERS, INDICATOR PARAMETERS AND METALS
ROUND: 3 by O'BRIEN & GERE/IEG (Third Quarter, 2002)

IEG

DATE: September 18, 2002

PARAMETER (in ppb)	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	SW-Bridge	MHC-1
pH (field; s.u.)	s.u.																
Temperature (field)	°F																
Specific Conductivity	umhos																
TSS	ppm			39	150	26	57	73	220	160	79	200	740	520		12	110
TOC	ppm							2			2	9	55	120			
BOD	ppm											17	19	21		30	16
COD	ppm											60	170	250		7	50
Chlorides	ppm			630	190	950	2600	33	44	26	30						
Aluminum	ppb		100	820.0	8710	243	1570	1290	6920	1490	726	510	3690	2910		87.6 J	188 J
Antimony	ppb	30	30	ND	1 J	ND	ND	ND	ND	1.9 J	ND	0.88 J	1.6 J	ND		0.93 J	ND
Arsenic	ppb	25	50	ND	3.9 J	ND	ND	11	3.8 J	3.8 J	2.2 J	3.7 J	4.3 J	4.8 J		2.4 J	ND
Barium	ppb	1000	1000	110 J	125 J	491	659	152 J	130 J	103 J	34 J	298	223	464		52.3 J	612
Beryllium	ppb			ND	0.33 J	ND	ND	ND	0.14 J	ND	ND	ND	0.31 J	0.07 J		ND	ND
Cadmium	ppb			ND	0.53 J	ND	ND	ND	ND	ND	ND	ND	0.26 J	ND		ND	ND
Calcium	ppb			215000	36900	213000	403000	107000	155000	50500	37700	176000	58600	95000		47900	130000
Chromium	ppb	50	50	12	17.2	1.9 J	3.1 J	10.9	17.1	5.3 J	4.7 J	ND	6.1 J	4.8 J		1.5 J	2.3 J
Cobalt	ppb			ND	9.8 J	ND	ND	ND	2.8 J	ND	ND	ND	ND	ND		ND	ND
Copper	ppb			35	30	3.5 J	8.3 J	17.3 J	12.7 J	3.6 J	3.7 J	9.5 J	21.7 J	10.6 J		1 J	1.3 J
Iron	ppb	300	300	992	14900	6820	8690	14000	14300	2500	1700	12300	16400	16700		1590	78200
Lead	ppb	25	50	1.7 J	6.2	ND	ND	ND	2.6 J	ND	ND	2.4 J	11	5		ND	ND
Magnesium	ppb	35000		95000	26800	119000	243000	110000	77400	56000	59500	56000	29100	45800		15700	52500
Manganese	ppb	300	300	27	344	358	560	228	1050	56	67	2210	617	526		655	319
Mercury	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND
Nickel	ppb	100	100	2.3 J	20.1 J	ND	ND	11.3 J	18.9 J	1.3 J	1.5 J	ND	7 J	4.8 J		ND	2.1 J
Potassium	ppb			12500	6650	28000	28100	15200	14000	14500	32000	4490 J	7940	15700		4630 J	16600
Selenium	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND
Silver	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND
Sodium	ppb	20000		105000	214000	243000	641000	33900	47100	31900	35800	1650000	109000	135000		51800	164000
Thallium	ppb			ND	3.6 J	ND	ND	ND	ND	ND	ND	4.9 J	ND	ND		ND	ND
Vanadium	ppb			1	18.6 J	ND	2.4 J	2.9 J	10.3 J	3.1 J	1.4 J	2 J	6.7 J	4.7 J		1.1 J	1.5 J
Zinc	ppb	20		31	46	12.6 J	16.8 J	17.2 J	47.2	10.3 J	23	40	56	19.2 J		1.6 J	8.3 J

NOTES: 1. Only detected values are reported
2. NS = Not Sampled; Inst.Er. = Instrument Error
3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 4A
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
ORGANICS
ROUND: 4 by O'BRIEN & GERE/IEG (Fourth Quarter, 2002)

IEG

DATE: December 19, 2002

PARAMETER	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	SW-Bridge	MHC-1
Vinyl Chloride	ppb	2							0.2 J								
Methylene chloride	ppb								0.2 J	0.1 J							1 J
Acetone	ppb																4 J
Chloroethane	ppb	5						0.3 J	1		0.1 J						
trans 1,2-Dichloroethene (DCE)	ppb	5	5														
1,1-Dichloroethane	ppb	5	5					0.1 J	0.5	2	2						
cis 1,2-Dichloroethene (DCE)	ppb	5	5					0.3 J	0.6	0.1 J	0.2 J						
1,2-Dichloroethane	ppb	0.6	0.6							2	2						
1,2-Dichloropropane	ppb																
Benzene	ppb	1	1					1	1	0.6	0.6						3 J
Toluene	ppb	5	5	0.2 J				0.2 J									
Xylene	ppb																2 J
Chlorobenzene	ppb	5	5					13	4								9 J
2-Hexanone	ppb																
Isopropylbenzene	ppb	5						0.4 J	0.3 J	3.0	3.0						1 J
1,3-Dichlorobenzene	ppb							0.5 J									
1,4-Dichlorobenzene	ppb	3	3					2	0.7								2 J
1,2-Dichlorobenzene	ppb							2	0.5 J								
1,1,1-Trichloroethane (TCA)	ppb																
Carbon disulfide	ppb																
Butanone	ppb																
bis(2-Ethylhexyl)phthalate	ppb																
Napthalene	ppb								0.8								4 J
Dichlorodifluoromethane	ppb							0.4 J			0.1 J						
Caprolactum	ppb																1 J
Methylcyclohexane	ppb							0.2 J									
Cyclohexane	ppb							0.2 J									
Methylcyclohexane	ppb																
Methyl tert-butyl ether	ppb						0.3 J										
PCBs	ppb																
beta-BHC	ppb																
gamma-BHC	ppb																
Eldrin aldehyde	ppb																
gamma-Chlordane	ppb																

NOTES:
1. Only detected values are reported
2. NS = Not Sampled; ND = non-detect; Inst.Er. = Instrument Error
3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 4B
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
FIELD PARAMETERS, INDICATOR PARAMETERS AND METALS
ROUND: 4 by O'BRIEN & GERE/IEG (Fourth Quarter, 2002)

IEG

DATE: December 19, 2002

PARAMETER (in ppb)	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	SW-Bridge	MHC-1
pH (field; s.u.)	s.u.																
Temperature (field)	°F																
Specific Conductivity	umhos																
TSS	ppm			5	260	31	110	32	3300	4100	14						67
TOC	ppm			4.1	ND	0.7	ND	ND	ND	9.2	3.6						ND
BOD	ppm																28
COD	ppm																33
Chlorides	ppm			650	540	980	2500	28	43	26	32						180
Aluminum	ppb		100	22 J	8260	442	1260	122 J	28200	119000	156						150 J
Antimony	ppb	30	30	ND	2.2 J	4.4 J	ND	ND	ND	1.8 J	ND						2
Arsenic	ppb	25	50	ND	4.8 J	1.8 J	ND	10.8	8.3 J	23.4	4.2 J						2
Barium	ppb	1000	1000	113 J	171 J	486	666	152 J	206	527	58.8 J						414
Beryllium	ppb			ND	0.26 J	ND	ND	ND	0.84 J	3.5 J	ND						ND
Cadmium	ppb			ND	ND	ND	ND	ND	ND	2.6 J	ND						ND
Calcium	ppb			215000	68600	212000	392000	94600	233000	281000	57100						121000
Chromium	ppb	50	50	3 J	14.1	3.4 J	2 J	5 J	38.4	153	4.8 J						2
Cobalt	ppb			ND	7.4 J	ND	ND	ND	18.7 J	82	ND						ND
Copper	ppb			8 J	24.8 J	4.1 J	4.3 J	0.89 J	44.5	169	0.92 J						ND
Iron	ppb	300	300	179	13300	5100	7870	12900	48700	216000	28600						60400
Lead	ppb	25	50	ND	5.8	ND	ND	ND	14.2	65	ND						ND
Magnesium	ppb	35000		95800	49100	121000	247000	106000	123000	224000	63100						36700
Manganese	ppb	300	300	25	300	325	455	199	1990	3940	57						983
Mercury	ppb			ND	ND	ND	ND	ND	ND	ND	ND						ND
Nickel	ppb	100	100	ND	13.2 J	ND	ND	2.7 J	43.2	167	ND						2 J
Potassium	ppb			13400	8680	29200	29600	12700	19300	45500	15900						9420
Selenium	ppb			2	ND	ND	ND	ND	ND	ND	ND						ND
Silver	ppb			1 J	1.3 J	1.3 J	ND	ND	1.4 J	ND	ND						ND
Sodium	ppb	20000		106000	318000	250000	678000	34200	53400	33700	33600						89600
Thallium	ppb			2	2.2 J	ND	ND	ND	ND	2.1 J	ND						ND
Vanadium	ppb			ND	18 J	ND	2 J	1.1 J	45.6 J	192	ND						2 J
Zinc	ppb	20		6 J	35	13.5 J	10.6 J	ND	104	462	0.98 J						4 J

NOTES: 1. Only detected values are reported
2. NS = Not Sampled; Inst.Er. = Instrument Error
3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 4A
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
ORGANICS
ROUND: 5 by O'BRIEN & GERE/IEG (First Quarter, 2003)

IEG

DATE: March 26, 2003

PARAMETER	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION													
				MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	SW-Bridge	MHC-1
Vinyl Chloride	ppb	2											330				
Methylene chloride	ppb								0.2 J			0.6 J					
Acetone	ppb							7	4						2 J		
Chloroethane	ppb	5							1		0.3 J						
trans 1,2-Dichloroethene (DCE)	ppb	5	5														
1,1-Dichloroethane	ppb	5	5						0.5	3	2		2 J				
cis 1,2-Dichloroethene (DCE)	ppb	5	5					0.3 J	0.5	0.1 J			1200	2 J			
trans-1,2-Dichloroethene	ppb												4 J				
1,2-Dichloroethane	ppb	0.6	0.6						0.2 J	3	2						
1,2-Dichloropropane	ppb																
Benzene	ppb	1	1					1	2	0.6	0.6		1 J				3 J
Toluene	ppb	5	5					0.1 J					19.0	0.8 J	0.7 J		2 J
Ethylbenzene	ppb	5	5														1 J
Chlorobenzene	ppb	5	5					13	4				0.8 J	0.5 J			
Xylene	ppb												3 J				1 J
2-Hexanone	ppb																
Isopropylbenzene	ppb	5						0.4 J	0.4 J	2.0	3.0						1 J
1,3-Dichlorobenzene	ppb							0.5 J									
1,4-Dichlorobenzene	ppb	3	3					2	0.9								2 J
1,2-Dichlorobenzene	ppb							2	0.5								
Trichloroethene	ppb																
1,1,1-Trichloroethane (TCA)	ppb																
Carbon disulfide	ppb																
Butanone	ppb																
bis(2-Ethylhexyl)phthalate	ppb																
Napthalene	ppb																3 J
Dichlorodifluoromethane	ppb																
Caprolactum	ppb																
Methylcyclohexane	ppb							0.2 J									
Cyclohexane	ppb							0.2 J									
Methylcyclohexane	ppb																
Methyl tert-butyl ether	ppb						0.4 J										
PCBs	ppb																
beta-BHC	ppb																
gamma-BHC	ppb																
Eldrin aldehyde	ppb																
gamma-Chlordane	ppb																

NOTES: 1. Only detected values are reported

2. NS = Not Sampled; ND = non-detect; Inst.Er. = Instrument Error

3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13

4. GW & SW Standards based on NYSDEC TAGMs

FORM 4B
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
FIELD PARAMETERS, INDICATOR PARAMETERS AND METALS
ROUND: 5 by O'BRIEN & GERE/IEG (First Quarter, 2003)

IEG

DATE: March 26, 2003

PARAMETER (in ppb)	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	SW-Bridge	MHC-1
pH (field; s.u.)	s.u.																
Temperature (field)	°F																
Specific Conductivity	umhos																
TSS	ppm			22	130	38	31	30	1900	3300	8.5	ND	13	42	710	ns	5
TOC	ppm			130	77	ND	5.8	34	24	35	2.6	ND	1.2 J	2	14		ND
BOD5	ppm											ND	8.7	8.9	14		32
COD	ppm											17	25	17	29		29
Chlorides	ppm			770	720	1200	2700	37	50	41	47						
Aluminum	ppb		100	165 J	4150	363	89.3 J	71.3 J	13700	35800	60.1 J	29.3 J	52.5 J	186 J	2430		45.3 J
Antimony	ppb	30	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Arsenic	ppb	25	50	ND	ND	ND	ND	12.4	5 J	12.2	5.1 J	ND	ND	ND	ND		2 J
Barium	ppb	1000	1000	115 J	162 J	522	692	152 J	146 J	215	69 J	93.2 J	168 J	214	94.6 J		348
Beryllium	ppb			ND	0.19 J	ND	ND	0.06 J	0.46 J	1.2 J	0.09 J	0.08 J	0.05 J	0.08 J	0.16 J		0.07 J
Cadmium	ppb			ND	0.92 J	ND	ND	ND	0.58 J	0.97 J	ND	ND	ND	ND	ND		ND
Calcium	ppb			249000	78300	232000	419000	98500	178000	112000	63100	88400	77400	77100	69000		121000
Chromium	ppb	50	50	4.1 J	10.8	4.6 J	2.7 J	6.1 J	21	53	6.2 J	ND	2.6 J	2.4 J	4.8 J		3.8 J
Cobalt	ppb			ND	4 J	ND	ND	ND	9.2 J	25.4 J	ND	ND	ND	ND	2.2 J		ND
Copper	ppb			7.3 J	14.4 J	ND	ND	ND	23.5 J	50	ND	ND	ND	ND	3.6 J		ND
Iron	ppb	300	300	309	6390	4870	8530	13800	25800	66800	2680	466	8230	8320	9540		61400
Lead	ppb	25	50	1.6 J	3.2	1.1 J	1.4 J	ND	8	21	ND	ND	1.1 J	1.4 J	5		1.1 J
Magnesium	ppb	35000		114000	61600	133000	261000	111000	93100	105000	64200	31400	23800	17900	22300		34500
Manganese	ppb	300	300	42	160	385	411	210	1330	1250	20	226	809	1100	2600		989
Mercury	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Nickel	ppb	100	100	ND	6.7 J	ND	ND	3.4 J	22.9 J	53	ND	ND	ND	ND	3.2 J		2.3 J
Potassium	ppb			72500	38100	32700	37200	20200	33500	33500	15400	6800	6240	4870 J	5030		8890
Selenium	ppb			2.5 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Silver	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Sodium	ppb	20000		102000	351000	298000	781000	34200	56500	34100	31700	597000	149000	101000	203000		92700
Thallium	ppb			ND	5.1 J	ND	ND	3.2 J	3.4 J	14	3.4 J	ND	ND	5.3 J	5.8 J		4.9 J
Vanadium	ppb			ND	8.9 J	ND	1 J	0.98 J	21.8 J	56	ND	ND	ND	1 J	3.2 J		2.5 J
Zinc	ppb	20		28	29	3.7 J	3.2 J	3.6 J	58.7	146	1.6 J	8.6 J	12.8 J	3.5 J	17.6 J		2.6 J

NOTES: 1. Only detected values are reported
2. NS = Not Sampled; Inst.Er. = Instrument Error
3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 4A
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
ORGANICS
ROUND: 6 by O'BRIEN & GERE/IEG (Fourth Quarter, 2003)

DATE: November 7, 2003

PARAMETER	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	SW-Bridge	MHC-1
Vinyl Chloride	ppb	2		0.1 J				0.2 J	0.2 J				34				3 J
Methylene chloride	ppb								0.2 J	0.5 J							
Acetone	ppb			4				1	1	1							
Chloroethane	ppb	5						0.4 J	0.8	0.5 J				3 J			1 J
trans 1,2-Dichloroethene (DCE)	ppb	5	5														
1,1-Dichloroethane	ppb	5	5						0.4 J	2	1						
cis 1,2-Dichloroethene (DCE)	ppb	5	5					0.3 J	0.4 J	0.2 J			120				9 J
trans-1,2-Dichloroethene	ppb																
1,2-Dichloroethane	ppb	0.6	0.6							2	1						
1,2-Dichloropropane	ppb																
Benzene	ppb	1	1					1	0.8	0.3 J	0.2 J						6 J
Toluene	ppb	5	5	0.1 J	0.2 J		0.2 J	0.2 J	0.2 J	0.1 J			0.9 J	3 J			2 J
Ethylbenzene	ppb	5	5														0.6 J
Chlorobenzene	ppb	5	5					10	2								10.0
Xylene	ppb			0.1 J	0.1 J												10 J
2-Hexanone	ppb																
Isopropylbenzene	ppb	5						0.3 J	0.1 J	1.0	0.9						2 J
1,3-Dichlorobenzene	ppb							0.4 J									
1,4-Dichlorobenzene	ppb	3	3					2	0.4 J								1 J
1,2-Dichlorobenzene	ppb							2	0.2 J								
Trichloroethene	ppb																
1,1,1-Trichloroethane (TCA)	ppb																
Carbon disulfide	ppb			0.2 J													
2-Butanone	ppb			5													
bis(2-Ethylhexyl)phthalate	ppb																
Napthalene	ppb																3 J
4-Nitrophenol	ppb																
Dichlorodifluoromethane	ppb								0.8								
Caprolactum	ppb													1 J	1 J		2 J
Methylcyclohexane	ppb							0.1 J									
Cyclohexane	ppb							0.1 J									0.6 J
Methylcyclohexane	ppb																
Methyl tert-butyl ether	ppb						0.3 J										
PCBs	ppb													2.5			14.0
beta-BHC	ppb																
gamma-BHC	ppb																0.10
Heptachlor	ppb																0.07
Eldrin aldehyde	ppb																
gamma-Chlordane	ppb																

NOTES:
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4. GW & SW Standards based on NYSDEC TAGMs

FORM 4B
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
FIELD PARAMETERS, INDICATOR PARAMETERS AND METALS
ROUND: 6 by O'BRIEN & GERE/IEG (Fourth Quarter, 2003)

DATE: November 7, 2003

PARAMETER (in ppb)	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION													
				MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	SW-Bridge	MHC-1
pH (field; s.u.)	s.u.																
Temperature (field)	°F																
Specific Conductivity	umhos																
TSS	ppm			ND	9	ND	16	24	16	950	12	14	16	280	180		98
TOC	ppm			4.1	5.7	ND	3.8	11	8	6.2	5.5	7.3	7.2	7.3	9.5		6.1
BOD5	ppm											10	9.9	19	15		25
COD	ppm											32	25	27	52		29
Chlorides	ppm			740	690	1100	3300	23	46	42	46						
Aluminum	ppb		100	ND	264	41.7 B	ND	ND	241	36000	ND	99.1 B	42.8 B	854	8640		ND
Antimony	ppb	30	30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Arsenic	ppb	25	50	ND	ND	ND	ND	11.6	ND	10.2	ND	ND	ND	ND	ND		ND
Barium	ppb	1000	1000	121 B	194 B	487 B	654 B	154 B	100 B	276 B	67.1 B	84.9 B	117 B	148 B	198 B		495
Beryllium	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Cadmium	ppb			N	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Calcium	ppb			248000	88000	231000	400000	100000	147000	131000	61100	82200	62500	65400	72600		130000
Chromium	ppb	50	50	4 B	4.2 B	4.2 B	2.6 B	5.2 B	4.1 B	49.7	5.6 B	ND	ND	ND	ND		2.1 B
Cobalt	ppb			ND	ND	ND	ND	ND	ND	18.9 B	ND	ND	ND	ND	ND		ND
Copper	ppb			ND	ND	ND	ND	ND	ND	47.7	ND	ND	ND	ND	ND		ND
Iron	ppb	300	300	224	574	132	8780	12700	3100	61900	2320	2930	3550	4690	25100		512000
Lead	ppb	25	50	ND	ND	ND	ND	ND	ND	18.4	ND	ND	ND	ND	14		ND
Magnesium	ppb	35000		105000	612000	128000	222000	112000	71000	109000	67200	28700	16900	18500	23200		33200
Manganese	ppb	300	300	63	22.8	53	375	207	774	1270	40.5	504.0	908	1460	3900		1260
Mercury	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Nickel	ppb	100	100	ND	ND	1.8 B	ND	5.5 B	5 B	50	ND	ND	ND	ND	ND		ND
Potassium	ppb			29200	7540	30000	27500	11400	12800	23500	140000	8200	7490	7680	8050		7920
Selenium	ppb			ND	ND	ND	ND	ND	ND	3.4 B	ND	ND	ND	ND	ND		ND
Silver	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Sodium	ppb	20000		110000	393000	290000	573000	31900	50800	30100	28400	396000	123000	138000	354000		60600
Thallium	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Vanadium	ppb			ND	ND	ND	ND	ND	ND	54	ND	ND	ND	ND	ND		ND
Zinc	ppb	20		ND	ND	ND	10 B	ND	ND	141	ND	10.3 B	7 B	5.9 B	53		3.6 B

NOTES: 1. Only detected values are reported
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3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 4A
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS
ORGANICS
ROUND: 7 by O'BRIEN & GERE/IEG (Second Quarter, 2004)

DATE: May 25, 2004

PARAMETER	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION													
				MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	SW-Bridge	MHC-1
Vinyl Chloride	ppb	2						0.1 J									
Methylene chloride	ppb											2 J	2 J	2 J	2 J		2 J
Acetone	ppb					1		2			2	5 J	6 J	6 J	4 J		4 J
Chloroethane	ppb	5						0.3 J	1								
trans 1,2-Dichloroethene (DCE)	ppb	5	5								0.5						
1,1-Dichloroethane	ppb	5	5							2	2						
cis 1,2-Dichloroethene (DCE)	ppb	5	5					0.2 J	0.4 J		0.2 J						
trans-1,2-Dichloroethene	ppb																
1,2-Dichloroethane	ppb	0.6	0.6							1	1						
1,2-Dichloropropane	ppb																
Benzene	ppb	1	1					1	1	0.4 J	0.4 J						2 J
Toluene	ppb	5	5					0.3 J									
Ethylbenzene	ppb	5	5														
Chlorobenzene	ppb	5	5					7	5								10 J
Xylene	ppb																0.8 J
2-Hexanone	ppb																
Isopropylbenzene	ppb	5						0.5 J	2 J	2.0	2.0						0.7 J
1,3-Dichlorobenzene	ppb							0.3 J									
1,4-Dichlorobenzene	ppb	3	3					2	1								1 J
1,2-Dichlorobenzene	ppb							1	0.7								
Trichloroethene	ppb																
1,1,1-Trichloroethane (TCA)	ppb																
Carbon disulfide	ppb																
2-Butanone	ppb												1 J	1 J			
bis(2-Ethylhexyl)phthalate	ppb																
Napthalene	ppb																5 J
4-Nitrophenol	ppb																1 J
Dichlorodifluoromethane	ppb								0.6								
Caprolactum	ppb												2 J	1 J	2 J		3 J
Methylcyclohexane	ppb																
Cyclohexane	ppb																
Methylcyclohexane	ppb																
Methyl tert-butyl ether	ppb						0.8										
PCBs	ppb																
beta-BHC	ppb																
gamma-BHC	ppb																
Eldrin aldehyde	ppb																
gamma-Chlordane	ppb																

NOTES:
1. Only detected values are reported
2. NS = Not Sampled; ND = non-detect; Inst.Er. = Instrument Error
3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 4B

CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M

DETECTED GROUNDWATER, SURFACE WATER AND LEACHATE ANALYTICAL RESULTS

FIELD PARAMETERS, INDICATOR PARAMETERS AND METALS

ROUND: 7 by O'BRIEN & GERE/IEG (Second Quarter, 2004)

DATE: May 25, 2004

PARAMETER (in ppb)	UNITS	GROUND WATER STANDARD	SURFACE WATER STANDARD	SAMPLE LOCATION													
				MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-1	SW-2	SW-3	SW-103	SW-Bridge	MHC-1
pH (field; s.u.)	s.u.			6.35	6.41	6.32	6.33	6.04	6.36	6.42	6.43	6.3	6.9	6.85	6.7		5.8
Temperature (field)	°F			56	53	61	56	57	63	68	57	77	82	82	74.8		66.3
Specific Conductivity	umhos			2.15	3.28	4.02	6.28	1.13	1.17	0.75	0.78	0.96	0.56	0.59	0.63		1.36
TSS	ppm			12	110	12	26	51	2300	220	7.5	11	16	42	21		100
TOC	ppm			1.4	0.88 J	0.4 J	1.1	6.8	6.8	4.5	4.6	7.1	8	7.6	7.8		5.6
BOD5	ppm											ND	ND	ND	7.9		20
COD	ppm											30	32	30	32		30
Chlorides	ppm			720	1100	1500	2600	20	49	45	47						
Aluminum	ppb		100	ND	967	16.8 J	ND	107 J	9820	3740	ND	355	48.8 J	648	57.1 J		ND
Antimony	ppb	30	30	2.4 J	2 J	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Arsenic	ppb	25	50	ND	ND	ND	ND	13.1	6 J	6.6 J	6 J	3.2 J	ND	2.5 J	ND		ND
Barium	ppb	1000	1000	121 J	304	635	656	168 J	146 J	123 J	73.4 J	186 J	117 J	143 J	159 J		393
Beryllium	ppb			ND	ND	ND	ND	ND	0.19 J	ND	ND	ND	ND	ND	ND		ND
Cadmium	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Calcium	ppb			237000	141000	285000	405000	100000	173000	69600	64400	64700	54700	59400	58000		122000
Chromium	ppb	50	50	2.4 J	4.3 J	ND	ND	6 J	14.7	8.8 J	4.4 J	1.8 J	1.6 J	1.7 J	ND		ND
Cobalt	ppb			ND	ND	ND	ND	ND	2.9 J	ND	ND	ND	ND	ND	ND		ND
Copper	ppb			ND	2.9 J	ND	ND	ND	13.7 J	4.7 J	ND	1.9 J	ND	2.5 J	ND		ND
Iron	ppb	300	300	100	1570	3560	8.03	15400	19300	7150	2750	5640	4810	4710	2370		59700
Lead	ppb	25	50	ND	1.6 J	1.1 J	2.1 J	ND	5.5	2.3 J	ND	2.9 J	ND	1.2 J	ND		1 J
Magnesium	ppb	35000		101000	110000	162000	246000	110000	85900	69300	69600	24200	20800	22600	21800		36500
Manganese	ppb	300	300	1.4 J	30.2	667	377	228	1330	182	15.4	1610	387	548	719		788
Mercury	ppb			ND	ND	ND	ND	ND	0.059 J	ND	ND	ND	ND	ND	ND		ND
Nickel	ppb	100	100	1.7 J	2.5 J	ND	1 J	7.8 J	18.7 J	6.7 J	ND	1.2 J	0.92 J	1.8 J	ND		1.8 J
Potassium	ppb			11900	9210	37700	32600	10800	14800	15400	13900	6300	5710	6130	5860		10100
Selenium	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Silver	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Sodium	ppb	20000		120	538000	442000	846000	32000	64700	28800	27500	124000	43000	47700	53000		105000
Thallium	ppb			ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND
Vanadium	ppb			ND	3.3 J	ND	ND	1.3 J	15.3 J	6.5 J	ND	1.5 J	0.9 J	1.4 J	ND		ND
Zinc	ppb	20		15	5.3 J	3 J	ND	1.2 J	40.1	15.6 J	0.51 J	11.1 J	11.1 J	13.8 J	9.3 J		28.6

NOTES: 1. Only detected values are reported
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3. Surface water samples labeled previously as follows: SW-2 as SW-10, SW-3 as SW-12, and SW-103 as SW-13
4. GW & SW Standards based on NYSDEC TAGMs

FORM 5
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
SURVEY DATA FOR WATER LEVEL MEASUREMENTS
(August 2002)

WELL ID	Surveyed Coordinates		GROUND ELEV.	TOP OF CASING ELEV.	TOP OF RISER ELEV.	TOTAL WELL DEPTH	BOTTOM ELEV.
	Easting (X)	Northing (Y)	(ft)	(ft)	(ft)	(ft)	(ft)
MW-1A	697901.7	546375.5	461.15	463.52	463.15	59.40	403.75
MW-1B	697902.4	546364.2	461.07	463.21	463.01	23.10	439.91
MW-3A	698636.5	545975.9	431.82	435.01	434.65	67.36	367.29
MW-3B	698623.9	545972.5	432.68	436.08	435.78	34.20	401.58
MW-5A	698576.7	546842.9	431.38	434.01	433.84	72.18	361.66
MW-5B	698563.9	546849.8	431.70	434.49	434.35	30.38	403.97
MW-20A	698754.7	546507.8	431.51	434.09	431.29	21.61	409.68
MW-20B	698751.1	546516.5	430.92	433.68	431.17	42.53	388.64
GP-1	698349.6	546585.4	436.08	439.80	439.58	-	-
GP-2	699010.2	547304.6	435.56	437.44	437.12	-	-
LEACHATE TANK	698803.6	546357.3	436.12	TOP OF MANHOLE RIM			
STAFF GAUGE	698781.5	546523.1	433.06	TOP OF STAFF GAUGE			

Note: 1. All wells and soil gas points were resurveyed in August 2002 after repair work at MW-3A, GP-1 and GP-2
2. Previous elevations at MW-3A were: Ground elev. = 432.59 and Top of Riser elev. = 436.07.

FORM 6
FICA/DUTCHESS SANITATION OM&M
CHECKLIST FOR FIELD EQUIPMENT/SUPPLIES

Multigas meter
Well and leachate tank keys, spare locks
Spec. Cond., pH, Temp. meter
Water level meter
Tool box including crowbar
Distilled water
Container for purge water
Field Data forms
As-built drawing
Ice
Tape Measure/stick
Disposable bailers, ropes
Generator
Well pump
Tubing
Gloves, paper towel, flashlight, extension cord
Sample containers/preservatives from lab
Labels, clear tape, markers
Sample coolers from lab

FORM 7

KESSMAN LANDFILL OM&M

LEACHATE PUMPING/OFF-SITE DISPOSAL (page 1 of 4)

DATE	TIME ELAPSED (minutes)	DEPTH TO WATER (feet)	AMOUNT OF LEACHATE REMOVED (gallons)	REMARKS
10/01/03	0 (START)	5.96	0	1ST LOAD
	20 (END)	6.28	4000	Filled
	50	6.12	--	
	100	6.08	--	
	160	6.04	--	
	0 (START)	6.04	0	2ND LOAD
	20	6.28		Filling
	30 (END)	6.43	4000	Filled
	120	6.11		
	0 (START)	6.04	0	3RD LOAD
	15	6.43		Filling
	20	6.48		Filling
	23 (END)	6.52	4000	Filled
	43	6.43		
	VOLUME PUMPED TODAY		**12,000**	
NOTES:	Surface water and groundwater levels remained constant Truck should hold vacuum to drain pipes so no spillage occurs Contractor used 8 HP generator/pump located near the leachate sump Water level constant at 1.68' (SG) in wetland and at 2.70' (DTW) at MW-20A			
10/07/03	0 (START)	5.71	0	1st Truck
	45 (END)	6.59	8000	Filled
	0 (START)	6.31	0	
	25 (END)	6.66	4000	2nd truck filled
	VOLUME PUMPED TODAY (CUMULATIVE TOTAL)		**12,000 (24,000)**	
NOTES:	Surface water and groundwater levels remained constant Truck should hold vacuum to drain pipes so no spillage occurs Contractor used 8 HP generator/pump located near the leachate sump Water level constant at 1.90' (SG) in wetland and at 3.21' (DTW) at MW-20A			
10/16/03	0 (START)	5.49	0	1st Truck
	33	6.14	8000	Filled – Vol = 8,000
	76 (END)	6.20	4000	2nd truck filled - 12,000 gal
	101	5.95		Post fill water level readings
	111	5.92		
	135	5.81		
	185	5.70		
	VOLUME PUMPED TODAY (CUMULATIVE TOTAL)		**12,000 (36,000)**	
NOTES:	Levels at well MW-20A before pumping=3.08;MW-20B=2.06 and Staff gauge=2.40 Levels at the end of pumping: MW-20A= 3.12;MW-20B=2.07 and No Change for Staff Gauge Contractor had difficulty maintaining prime in pump. It took two hours to start pumping. An 8 HP generator/pump 65 feet from the MH was used by contractor. No spillage was noted from hoses at completion of pumping.			

FORM 7

KESSMAN LANDFILL OM&M

LEACHATE PUMPING/OFF-SITE DISPOSAL (page 2 of 4)

DATE	TIME ELAPSED (minutes)	DEPTH TO WATER (feet)	AMOUNT OF LEACHATE REMOVED (gallons)	REMARKS
10/23/03	START - 0	5.50	0	1st Truck
	END - 25	5.75	4000	Filled: vol = 4000 gal
	START - 30	5.70		2nd truck
	47	5.96		Filled: 4000 gal; Total = 8000 gal
	END – 54	5.99	8000	
	63	5.86		Post-fill water level readings
	67	5.75		
	74	5.68		
	VOLUME PUMPED TODAY (CUMULATIVE TOTAL)		**12,000 (48,000)**	
NOTES:	Levels before pumping: MW-20A = 2.67 ft and Staff gauge = 2.40 ft Levels after pumping: MW-20A = 2.68 ft and no change for Staff Gauge.			
10/30/03	0 (START)	5.08	0	1st Truck
	32	5.51		
	42 (END)	5.49	8000	1st truck filled – Vol = 8,000
	47(START)	5.49		Begin filling 2nd truck
	92 (END)	5.50	4000	2nd truck filled - 12,000 gal
	107	5.38		Post-fill water level readings
	127	5.35		
	147	5.30		
	VOLUME PUMPED TODAY (CUMULATIVE TOTAL)		**12,000 (60,000)**	
NOTES:	Levels at well MW-20A before pumping = 2.66; MW-20B =1.65 and Staff gauge = 2.5 Levels at the end of pumping: MW-20A= 2.76 ; MW-20B = 1.66 and Staff Gauge = 2.5 No spillage was noted from hoses at completion of pumping.			
11/6/03	START – 0	5.64	0	1st Truck
	END – 40	5.75	6500	Filled: vol = 6500 gal
	START - 45			Begin filling 2nd truck
	END- 66	5.86	4000	2nd truck filled for a total of 10,500 gallons removed
	90	5.63		Post-fill water level readings
	115	5.50		
	155	5.49		
	VOLUME PUMPED TODAY (CUMULATIVE TOTAL)		**10,500 (70,500)**	
NOTES:	Levels before pumping: MW-20A =2.70 ft and Staff gauge = 2.6 ft Levels after pumping: MW-20A = 2.71 ft and no change for Staff Gauge. An 8-HP generator/pump 65 feet from the MH was used by contractor. No spillage was noted from hoses at completion of pumping.			

FORM 7

KESSMAN LANDFILL OM&M

LEACHATE PUMPING/OFF-SITE DISPOSAL (page 3 of 4)

DATE	TIME ELAPSED (minutes)	DEPTH TO WATER (feet)	AMOUNT OF LEACHATE REMOVED (gallons)	REMARKS
11/13/03	START -0	5.34	0	Start filling 1st truck
	END -30	5.85	4500	1st truck filled
	START -38	5.81		Start filling 2nd truck
	61	6.06		
	END - 65	5.90	8000	2nd truck filled - 12,500 gallons
	75	5.83		Post-fill water level readings
	93	5.71		
	106	5.66		
	130	5.61		
	VOLUME PUMPED TODAY (CUMULATIVE TOTAL)		**12,500 (83,000)**	
NOTES:	Levels before pumping: MW-20A =2.85 ft and Staff gauge = 2.6 ft Levels after pumping: MW-20A = 2.87 ft and no change for Staff Gauge. An 8-HP generator/pump 65 feet from the MH was used by contractor. No spillage was noted from hoses at completion of pumping.			
11/20/03	START-0	5.52	0	1st truck
	END- 41	5.75	6500	Filled 6500 gallons
	START-56	5.75		Begin Filling 2nd truck
	END-78	5.8	4000	2nd truck filled - 10,500 gallons
	86	5.71		Post-fill water level readings
	101	5.44		
	116	5.46		
	131	5.39		
	VOLUME PUMPED TODAY (CUMULATIVE TOTAL)		**10,500 (93,500)**	
NOTES:	Levels before pumping: MW-20A = 2.69 and Staff gauge = 2.78 ft Levels after pumping: MW-20A = 2.70 ft and no change for Staff Gauge. An 8-HP generator/pump 65 feet from the MH was used by contractor. No spillage was noted from hoses at completion of pumping.			
11/26/03	START -0	5.21	0	Start filling 1st truck
	25	5.95		
	END- 41	5.75	8000	First truck filled
	START - 88	5.72		Start filling 2nd truck
	END - 100	6.10	4000	2nd truck filled - 12,000 gallons
	125	5.59		Post-fill water level readings
	145	5.56		
	VOLUME PUMPED TODAY (CUMULATIVE TOTAL)		**12,000 (105,500)**	
NOTES:	Levels before pumping: MW-20A =2.89 ft and Staff gauge = 2.20 ft After pumping there were no changes in MW- 20A or the staff Gauge. An 8-HP generator/pump 65 feet from the MH was used by contractor. No spillage was noted from hoses at completion of pumping.			

FORM 7

KESSMAN LANDFILL OM&M

LEACHATE PUMPING/OFF-SITE DISPOSAL (page 4 of 4)

DATE	TIME ELAPSED (minutes)	DEPTH TO WATER (feet)	AMOUNT OF LEACHATE REMOVED (gallons)	REMARKS
12/02/03	START -0	5.42	0	Start filling 1st truck
	38		6500	First truck filled
	49	5.32		Start filling 2nd truck
	67	5.26	3500	2nd truck filled - 10,000
	100	5.56		Post-fill water level readings
	VOLUME PUMPED TODAY (CUMULATIVE TOTAL)		**10,000 (115,500)**	
NOTES:	After pumping there were no changes in MW- 20A or the staff Gauge. An 8-HP generator/pump 65 feet from the MH was used by contractor. No spillage was noted from hoses at completion of pumping.			
01/08/04	START-0	5.32	0	Start filling 1st truck
	23	5.52	4000	First truck filled
	53	5.42		Waiting on 2nd truck
	68	5.57		Start pumping 2nd truck
	108	5.80	8000	2nd truck filled for a total of 12,000 gallons removed
	123	5.60		Post-fill water level readings
	163	5.50		
	VOLUME PUMPED TODAY (CUMULATIVE TOTAL)		**12,000 (127,500)**	
NOTES:	Unable to take readings from MW-20A due to blockage by ice. Level before pumping: Staff Gauge = 2.20 ft After pumping there were no changes in the Staff Gauge. An 8-HP generator/pump 65 feet from the MH was used by contractor. No spillage was noted from hoses at completion of pumping. Note that reading at 68 minutes was double checked.			

CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M
OPERATION, MAINTENANCE AND MONITORING

OM&M REPORT

ATTACHMENT C
PREVIOUS ANALYTICAL RESULTS

TABLE C-1
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
PREVIOUS ANALYTICAL RESULTS - GROUNDWATER/SURFACE WATER

		GROUND	SURFACE	11/30/99	11/30/99	11/30/99
	CRQL	WATER	WATER	MW-3B	MW-20A	MW-20B
		STANDARD	STANDARD			
depth to bottom (ft)				34.2	22	42.5
depth to GW (ft)				3.8	3	2.1
pH				7.3	7.9	7.8
cond (umhos)						
temp oC (oC)				11.8	11.9	12.3
VOA						
vinyl chloride	1	2	ns			
chloroethane	1	***5***	ns		1.1	0.8
1,1-dichloroethane	1	***5***	5		4.1	4.1
benzene	1	1	1		0.5	0.6
1,2-dichloroethane	1	0.6	0.6		**2.6**	**2.6**
isopropylbenzene	1	***5***	ns		3.0	3.9
Total VOCs					**11.3**	**12**
BNA						
PCBs						
TAL						
Al	62	ns	100	330	1500	250
Sb	37	3	3	**63**		
As	8	25	50			
Ba	160	1000	1000	580	560	510
Ca		none	none	320000	700000	52000
Cr	10	50	50			
Fe		300*	300 (A(c))	**4000**	**39000**	**2600**
Pb	3	25	50		5.8	
Mg		35000	ns	**180000**	**140000**	**46000**
Mn		300*	300	**320**	**7900**	25
Ni	40	100	100		46	
K		none	none	25000	17000	12000
Na		20000	ns	**350000**	**36000**	**35000**
Zn	10	ns	f hardness	140	17	

number in bold italics is from POC stds
ns = no std nor guidance value; CRQL = Contract required detection limit
SW STDs for H(WS) human water source
* = total of iron and manganese
** std for total of all phenols
Only detected values are reported

TABLE C-1
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
PREVIOUS ANALYTICAL RESULTS - GROUNDWATER/SURFACE WATER

		GROUND	SURFACE	10/17/00	10/17/00	10/17/00	10/17/00	10/17/00	10/17/00	10/17/00	10/17/00	10/17/00	10/17/00
	CRQL	WATER	WATER	MW-1A	MW-1B	MW-3A	MW-3B	MW-20A	MW-20B	SW-10	SW-12	LT-01	LB-01
		STANDARD	STANDARD			damaged				(sw-3)	(sw-2)		
depth to bottom (ft)				60.6	23	57	27.7	22	42.6				
depth to GW (ft)				13.2	10.6	4.8	4.3	4	2.5				
pH					8.1		7.4	8.3	8	7.2	6.7	6.6	6.6
cond (umhos)				1960	225		490	520	740			1510	1640
temp oC (oC)				14	12.5		12.7	13.1	12.7	10.7	13.2	14.2	14.1
VOA													
vinyl chloride	1	2	ns							**3500**	0.5		
chloroethane	1	***5***	ns								**6**	2	1
C-1,2-dichloroethene	1	***5***	5							**8100**	0.6		
diethyl ether	1	ns	ns				7	7		2	16	13	19
1,1-dichloroethene	1	***5***	ns							3			
t-1,2-dichloroethene	1	***5***	5							**12**			
methyl-t-butyl ether	1	ns	ns								0.4	0.4	
acrylonitrile	1	***5***	ns					0.1					
1,1-dichloroethane	1	***5***	5				3	3		0.7	0.6		
benzene	1	1	1				0.3	0.6		**3**	**7**	**4**	**3**
1,2-dichloroethane	1	0.6	0.6				**2**	**2**					
toluene	1	***5***	5							**180**	0.4		
chlorobenzene	1	***5***	5							0.8	8	8	8
ethylbenzene	1	***5***	5							2	0.4		
m,p-xylene	1	***5***	5							**8**	**5**	2	2
o-xylene	1	***5***	5							2			
isopropylbenzene	1	***5***	ns				**1**	3		0.2	2	1	1
n-propylbenzene	1	ns	ns								0.6	0.6	0.5
2-chlorotoluene	1	***5***	5										0.1
1,2,4-trimethylbenzene	1	***5***	5							0.6	3	4	3
1,4-dichlorobenzene	1	3	3							0.3	0.9		1
naphthalene	1	ns	10							0.3	3	5	4
Total VOCs										11814.9	54.4	40	42.6
BNA													
benzyl alcohol	5									2			
2-methylphenol	5	1**	1**							1			
4-methylphenol	5	1**	1**	**11**						**2**			
naphthalene		ns	10								2	2	3
PCB													
arochlor 1232	0.05	0.09	0.09								**13**	**1.1**	**0.22**
TAL													
Al	62	ns	100	2100	1100		330	1800	71	170	130		
Sb	37	3	3										
As	8	25	50					13					
Ba	160	1000	1000				510	720		170	920	420	440
Ca		none	none	220000	84000		340000	1600000	53000	120000	120000	120000	120000
Cr	10	50	50	13									
Fe		300*	300 (A(c))	**3100**	**1400**		**4400**	**34000**	**2200**	**50000**	**58000**	**61000**	**64000**
Pb	3	25	50					10					
Mg		35000	ns	**120000**	**59000**		**210000**	**160000**	**47000**	51000	48000	42000	45000
Mn		300*	300	200	140		**370**	**14000**	14	1400	480	**990**	**840**
Ni	40	100	100										
K		none	none	11000	8400		30000	22000	12000	14000	14000	12000	14000
Na		20000	ns	**130000**	**380000**		**570000**	**38000**	**34000**	18000	67000	**86000**	98000
Zn	10	ns	hardness	72			**34**	13					

number in bold italics is from POC stds
ns = no std nor guidance value; CRQL = Contract required detection limit
Surface Water (SW) Sandards for H(WS) human water source
* = total of iron and manganese
** std for total of all phenols
Only detected values are reported

TABLE C-1
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
PREVIOUS ANALYTICAL RESULTS - GROUNDWATER/SURFACE WATER

		10/17/00		10/17/00	11/09/00	10/17/00	10/17/00	04/30/01
	CRQL	SW-10	SW-03	SW-12	SW-02	LT-01	LB-01	Sump-Leach.
			same location		same location			
			as SW-13		as SW-12			
pH		7.2		6.7		6.6	6.6	
cond						1510	1640	
temp		10.7		13.2		14.2	14.1	
VOA								
vinyl chloride	1	**3500**		0.5				NA
chloroethane	1			6	6	2	1	
C-1,2-dichloroethene	1	**8100**		0.6				
diethyl ether	1	2		16	21	13	19	
methyl-t-butyl ether	1			0.4		0.4		
1,1-dichloroethane	1	0.7		0.6	0.6			
benzene	1	3		7	7	4	3	
toluene	1	**180**		0.4	0.5			
chlorobenzene	1	0.8		8	10	8	8	
ethylbenzene	1	2		0.4	0.5			
m,p-xylene	1	8		5	6	2	2	
isopropylbenzene	1	0.2		2	2	1	1	
n-propylbenzene	1			0.6	0.6	0.6	0.5	
2-chlorotoluene	1						0.1	
1,2,4-trimethylbenzene	1	0.6		3	3	4	3	
1,4-dichlorobenzene	1	0.3		0.9	0.8		1	
naphthalene	1	0.3		3	3	5	4	
Total VOCs				54.4	61	40	42.6	
BNA								
naphthalene	5			2		2	3	
PCBs								
arochlor 1232	0.05			**13**		**1.1**	**0.22**	1.7
Metals								
Al	62	170		130				NA
Ba	160	170		920		420	440	
Ca		120000		120000		120000	120000	
Cr	10							
Fe		50000		58000		61000	64000	
Pb	3							
Mg		51000		48000		42000	45000	
Mn		1400		480		990	840	
K		14000		14000		12000	14000	
Na		18000		67000		86000	98000	
Zn	10							

Only detected values are reported
ns = no std nor guidance value; CRQL = Contract required detection limit\

TABLE C-1
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
PREVIOUS ANALYTICAL RESULTS - GROUNDWATER/SURFACE WATER

		GROUND	SURFACE	04/30/01	04/30/01	04/30/01	04/30/01	04/30/01	04/30/01	04/30/01	04/30/01	04/30/01	04/30/01
	CRQL	WATER	WATER	MW-1A	MW-1B	MW-3A	MW-3B	MW-20A	MW-20B	SW-01	SW-02	SW-03	SW-03
		STANDARD	STANDARD										
depth to bottom (ft)				59.00	23.50	cant read	34.20	42.60	21.00				
depth to GW (ft)				52.00	7.05	well bent	3.70	1.80	3.50				
pH				9.95	7.4	9.11	7.49	6.7	8.66				
cond (umhos)				2020	1950	2350	530	690	560				
temp oC (oC)				15.7	9.6	13.6	10.5	13.1	11.5				
VOC						nd	nd			na			na
chloroethane	1	***5***	ns						0.9				
C-1,2-dichloroethene	1	***5***	5								1	8	
diethyl ether	1	ns	ns					4	5				
1,1-dichloroethane	1	***5***	5					3	4				
benzene	1	1	1	2	0.6			2	0.9				
1,2-dichloroethane	1	0.6	0.6					**2**	**2**				
isopropylbenzene	1	***5***	ns					4.0					
Total VOCs				2	0.6	0	0	8	2.9	0	0	0	0
BNA				nd	nd	nd	nd	nd	nd	na	na	na	na
PCB													
arochlor 1232	0.05	0.09	0.09	nd	nd	nd	nd	nd	nd	nd	0.85	nd	nd
TAL										na	na	na	na
Al	62	ns	100	570	320	310	230	570					
Sb	37	3	3										
As	8	25	50										
Ba	160	1000	1000			340	450						
Ca		none	none	260000	83000	210000	350000	66000	60000				
Cr	10	50	50	25									
Fe		300*	300 (A(c))	**2300**	**370**	**5000**	**4500**	**1800**	**2400**				
Pb	3	25	50					5.8					
Mg		35000	ns	**120000**	**61000**	**110000**	**210000**	**52000**	**62000**				
Mn		300*	300	180	35	**340**	**440**	140	22				
Ni	40	100	100					46					
K		none	none	12000	7900	25000	29000	14000	14000				
Na		20000	ns	110000	**350000**	**160000**	**580000**	**35000**	**36000**				
Zn	10	ns	f hardness	71			12	17					

number in bold italics is from POC stds
ns = no std nor guidance value
SW STDs for H(WS) human water source
* = total of iron and manganese
** std for total of all phenols
Only detected values are reported

TABLE C-1
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
PREVIOUS ANALYTICAL RESULTS - GROUNDWATER/SURFACE WATER

		GROUND	SURFACE	08/01/01	08/01/01	08/01/01	08/01/01	08/01/01	08/01/01	08/)1/01	08/01/01	08/01/01	08/01/01
	CRQL	WATER	WATER	MW-1A	MW-1B	MW-3A	MW-3B	MW-20A	MW-20B	SV /-01	SW-02	SW-03	SW-103
		STANDARD	STANDARD										
depth to bottom (ft)				59.00	23.50	57.00	34.20	42.60	21.00				
depth to GW (ft)				14.50	10.66	4.70	4.50	1.80	2.08				
pH				8.43	8.8	8.6			7.9				
cond (umhos)				800	810	1370	1750		520				
temp oC (oC)				13	13.9	11.9	15.9		18.3				
VOC				nd	nd	nd	nd			nd	nd	nd	nd
chloroethane	1	***5***	ns						0.8				
diethyl ether	1	ns	ns					3	3				
1,1-dichloroethane	1	***5***	5					3	3				
benzene	1	1	1					0.5	0.3				
1,2-dichloroethane	1	0.6	0.6					**2**	**1**				
isopropylbenzene	1	***5***	ns					4.0	0.7				
Total VOCs				0	0	0	0	12.5	8	0	0	0	0
BNA				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
PCB													
arochlor 1232	0.05	0.09	0.09	nd	nd	nd	nd	nd	nd	nd	0.23	0.17	0.6
TAL													na
Al	62	ns	100	250	750		200		2900				
Sb	37	3	3										
As	8	25	50										
Ba	160	1000	1000			330	460						
Ca		none	none	200000	45000	190000	34000	56000	88000	48000	45000	43000	46000
Cr	10	50	50										
Fe		300*	300 (A(c))	**600**	**1200**	**4000**	**6800**	**2300**	**7900**	**2400**	**2100**	**2200**	**2000**
Pb	3	25	50						8.8				
Mg		35000	ns	**88000**	**31000**	**100000**	**200000**	**58000**	**69000**	**15000**	**15000**	**14000**	**15000**
Mn		300*	300	150	100	230	**520**	11	**400**	**320**	160	250	
Ni	40	100	100										
K		none	none	11000	5200	26000	27000	13000	16000				
Na		20000	ns	87000	**240000**	**170000**	**600000**	**32000**	**34000**	47000	29000	28000	32000
Zn	10	ns	f hardness	23					12				

number in bold italics is from POC stds
ns = no std nor guidance value
SW STDs for H(WS) human water source
* = total of iron and manganese
** std for total of all phenols
Only detected values are reported

TABLE C-1
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
PREVIOUS ANALYTICAL RESULTS - GROUNDWATER/SURFACE WATER

		GROUND	SURFACE	10/29/01	10/29/01	10/29/01	10/29/01	10/29/01	10/29/01	10/29/01	10/29/01	10/29/01	10/29/01	10/29/01	10/29/01
	CRQL	WATER	WATER	MW-1A	MW-1B	MW-3A	MW-3B	MW-5A	MW-5B	MW-20A	MW-20B	SW-01	SW-02	SW-03	SW-103
		STANDARD	STANDARD												
depth to bottom (ft)				59.00	23.50	57.00	34.20	72.80	30.00	21.00	42.6				
depth to GW (ft)				16.10	13.00	4.80	4.47	2.50	3.30	3.10	2.60				
pH				8.9	8.5	8.5	8.2	7.9	7.5	8.3	9.3				
cond (umhos)				1380	1800	1620	2990	830	800	580	390				
temp oC (oC)				12.1	13	11.7	12.1	11.8	13.5	14.4	12.3				
VOC				nd	nd	nd	nd					nd		nd	nd
vinyl chloride	1	2	ns						0.4						
chloroethane	1	***5***	ns						2		0.8				
C-1,2-dichloroethene	1	***5***	5						0.3						
diethyl ether	1	ns	ns					7	31	7	9		2		
1,1-dichloroethene	1	***5***	ns						0.4						
1,1-dichloroethane	1	***5***	5							2	2				
benzene	1	1	1						1	0.3	0.4				
1,2-dichloroethane	1	0.6	0.6							**2**	**2**				
chlorobenzene	1	***5***	5					6	4						
isopropylbenzene	1	***5***	ns							0.6	0.8				
1,4-dichlorobenzene	1	3	3					0.5	0.4						
1,2-dichlorobenzene								0.7	0.5						
Total VOCs				**0**	**0**	**0**	**0**	**14.2**	**37.3**	**11.9**	**14.2**	**0**	**2**	**0**	**0**
BNA				NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
phenol	5	1**	1**												
benzyl alcohol	5														
2-methylphenol	5	1**	1**												
4-methylphenol	5	1**	1**												
naphthalene		ns	10												
PCB															
arochlor 1232	0.05	0.09	0.09	nd	nd	nd	nd	nd	nd	nd	nd	0.2	0.98	0.3/(0.17)	0.66
TAL															na
Al	62	ns	100	610	2300		280		170	1600	2900		62	350	
Sb	37	3	3												
As	8	25	50												
Ba	160	1000	1000			390	530							2200	
Ca		none	none	220000	80000	200000	400000	92000	150000	56000	60000	53000	57000	68000	53000
Cr	10	50	50												
Fe		300*	300 (A(c))	**1200**	**2800**	**3700**	**3400**	7400	2100	**3800**	**2100**	**5400**	**5000**	**8200**	**8800**
Pb	3	25	50												
Mg		35000	ns	**89000**	**56000**	**100000**	**220000**	8300	66000	**50000**	**49000**	**17000**	**19000**	**20000**	**17000**
Mn		300*	300	41	130	200	**340**	91	1100	88	11	**980**	730	2600	1300
Ni	40	100	100												
K		none	none	11000	9100	27000	31000	11000	11000	14000	13000	7400	7800	12000	6800
Na		20000	ns	90000	**370000**	**190000**	**620000**	38000	58000	**34000**	**34000**	69000	39000	45000	38000
Zn	10	ns	f hardness											530	

number in bold italics is from POC stds
ns = no std nor guidance value
SW STDs for H(WS) human water source
* = total of iron and manganese
** std for total of all phenols
Only detected values are reported

TABLE C-2
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
PREVIOUS ANALYTICAL RESULTS - SEDIMENT

	SD-01	SD-02	SD-03	SD-04	SD-05	SD-06	SD-07	SD-08	SD-09	SD-103
Nov. 2000										
arochlor 1232 (ug/kg)	NA/> 70	4000/2400	5300/1600	NA/2100	1200	7700	210/280	25000	3500	3500
arochlor 1254 (ug/kg)										
Aug. 2001										
arochlor 1232 (ug/kg)	nd									nd
arochlor 1254 (ug/kg)	nd									nd
Oct. 2001										
arochlor 1232 (ug/kg)	98	660	NA	NA	NA	NA	NA	NA	NA	390
arochlor 1254 (ug/kg)										

duplicate Aroch or results separated by / are splits between DEC LAB/STL
NA = not analyzed

File: KessmanSedmonitorE.qpw

CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M
OPERATION, MAINTENANCE AND MONITORING

OM&M REPORT

ATTACHMENT D
GROUNDWATER CONTOUR PLOTS

FIGURE D- 1
KESSMAN LANDFILL OM&M
GROUND SURFACE CONTOUR (8/2002 Survey)

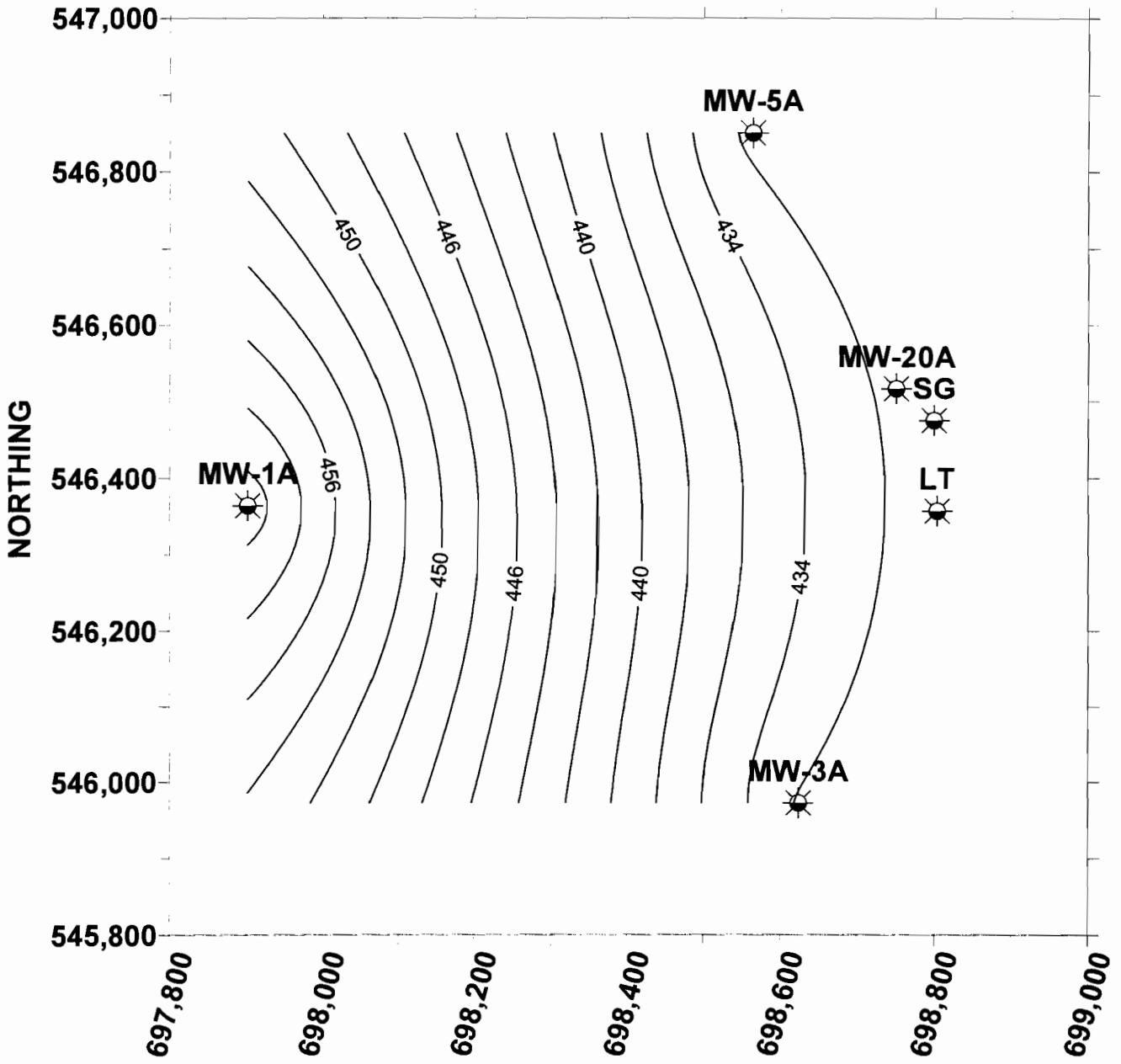

FIGURE D- 2
KESSMAN LANDFILL OM&M
GROUNDWATER CONTOUR : Baseline 10/01
SHALLOW WELLS

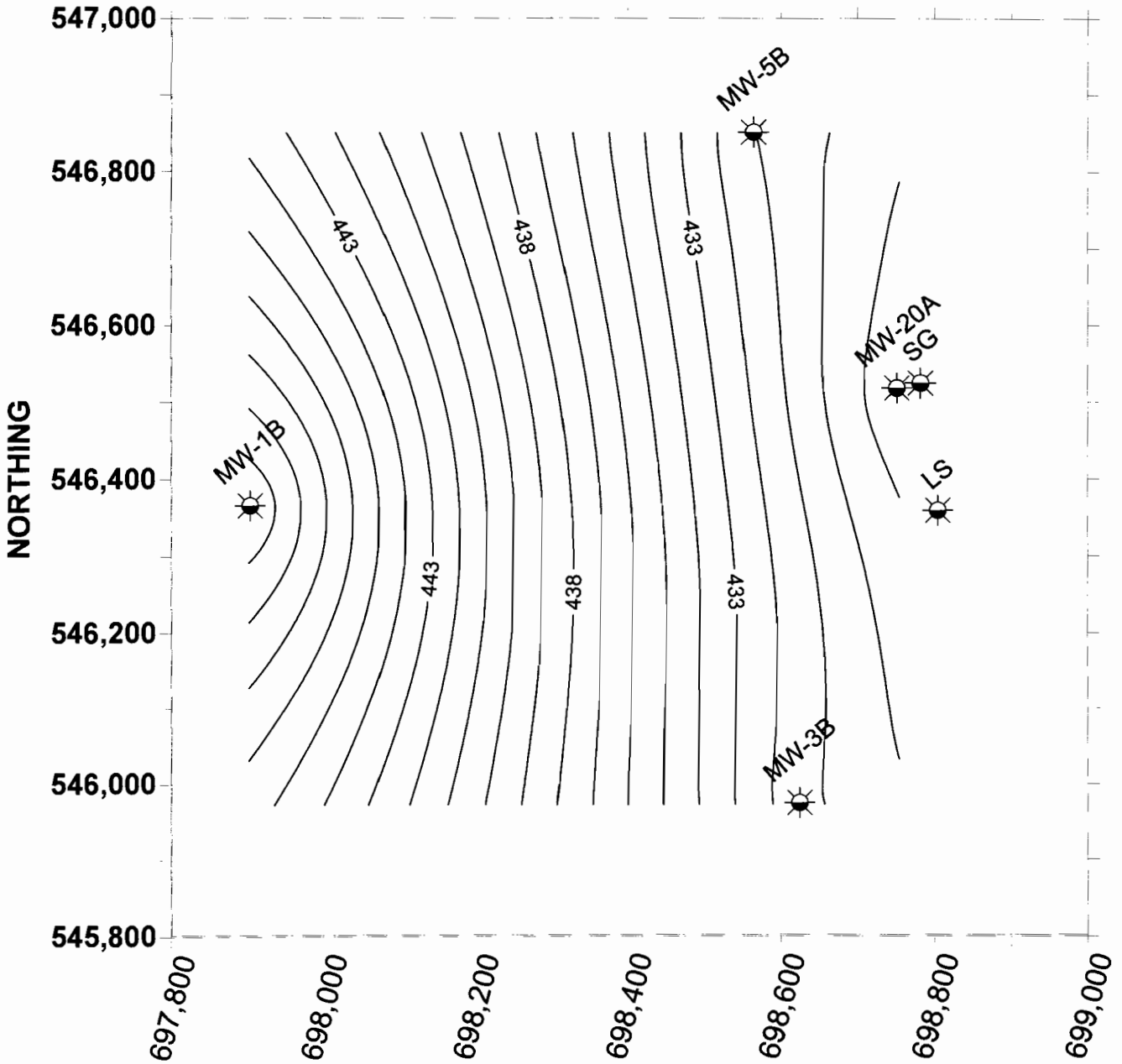

FIGURE D- 2
KESSMAN LANDFILL OM&M
GROUNDWATER CONTOUR : Baseline 10/01
DEEP WELLS

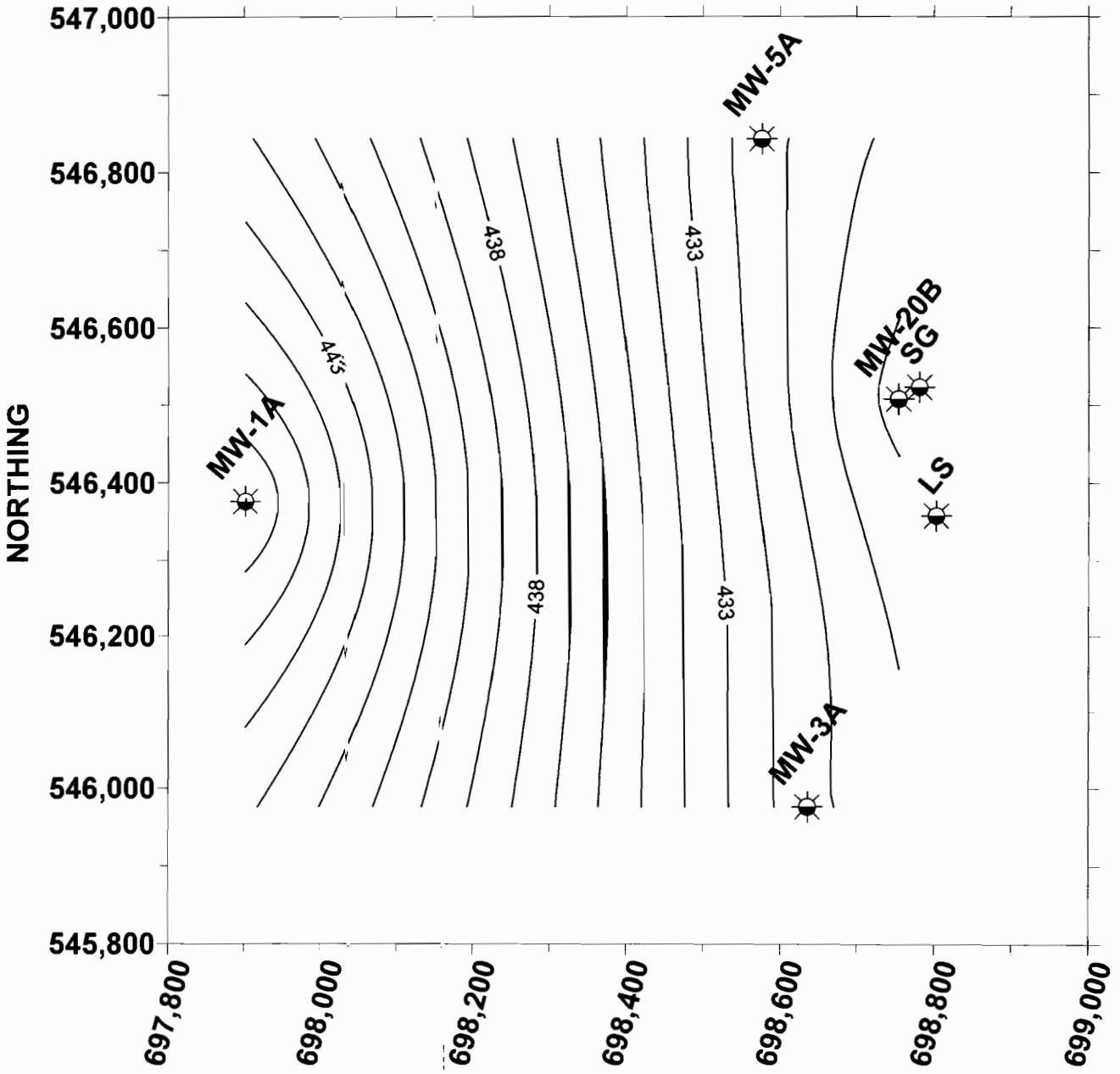

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 2/27/02

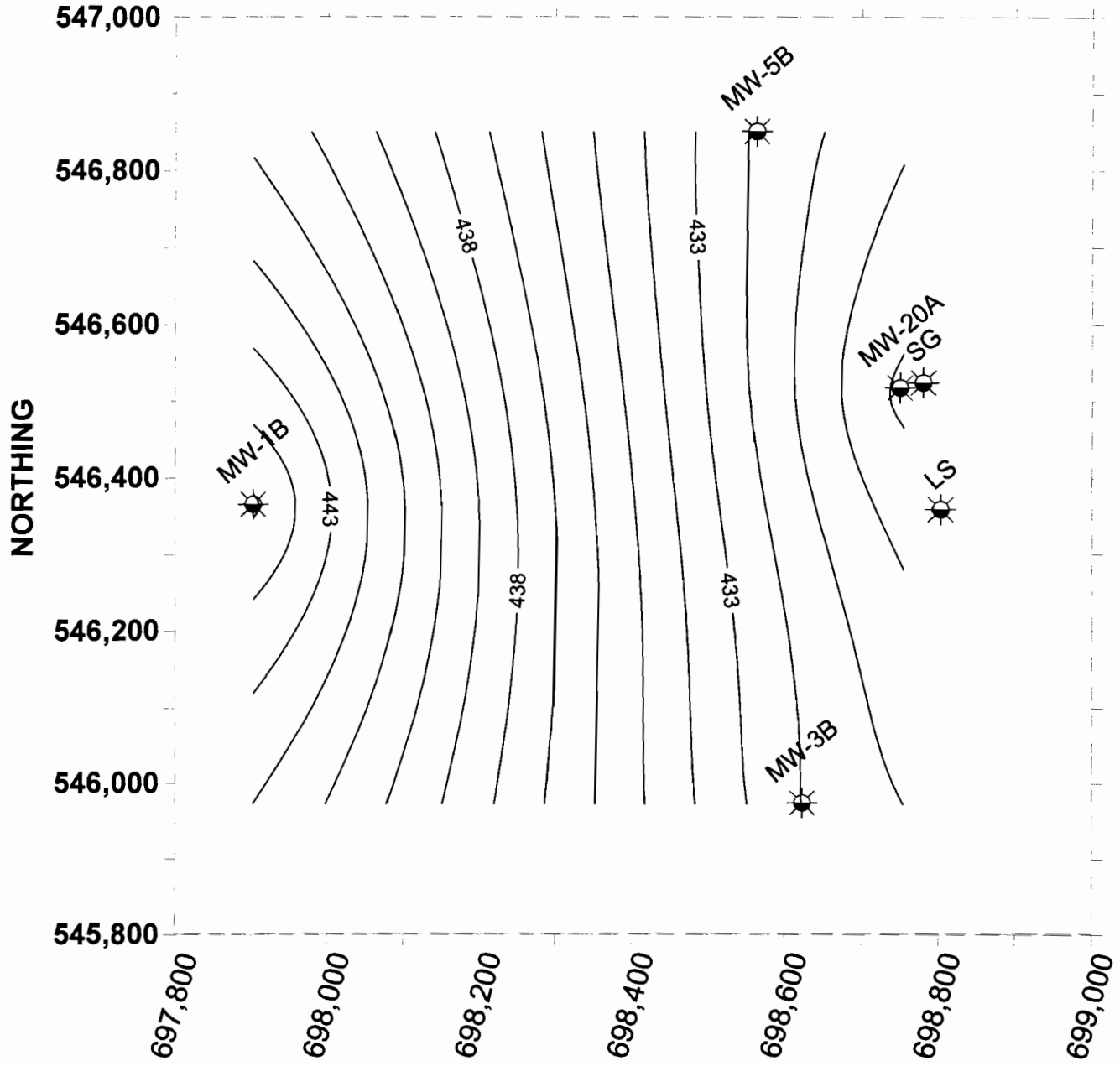

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 3/28/02

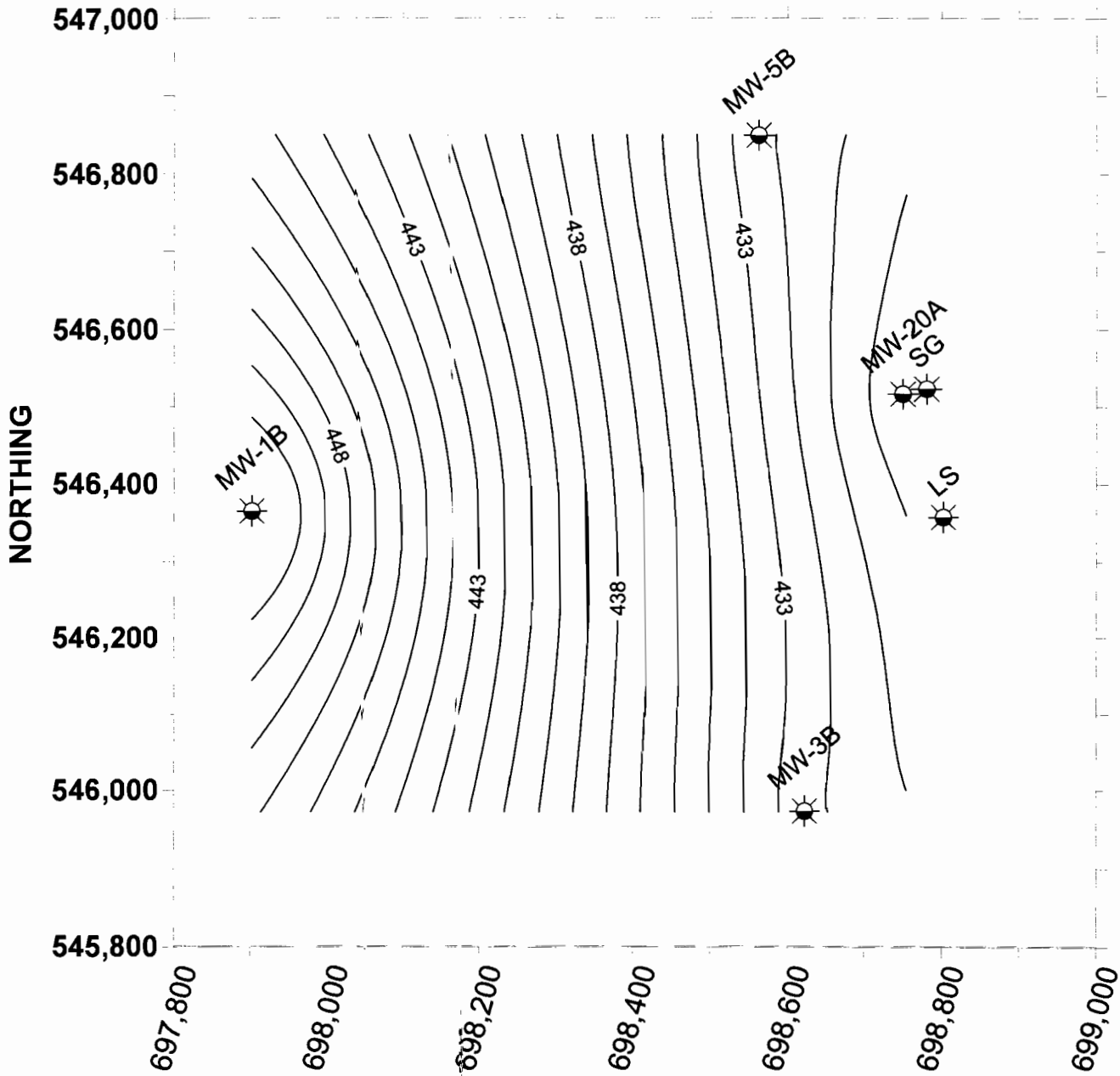

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 4/25/02

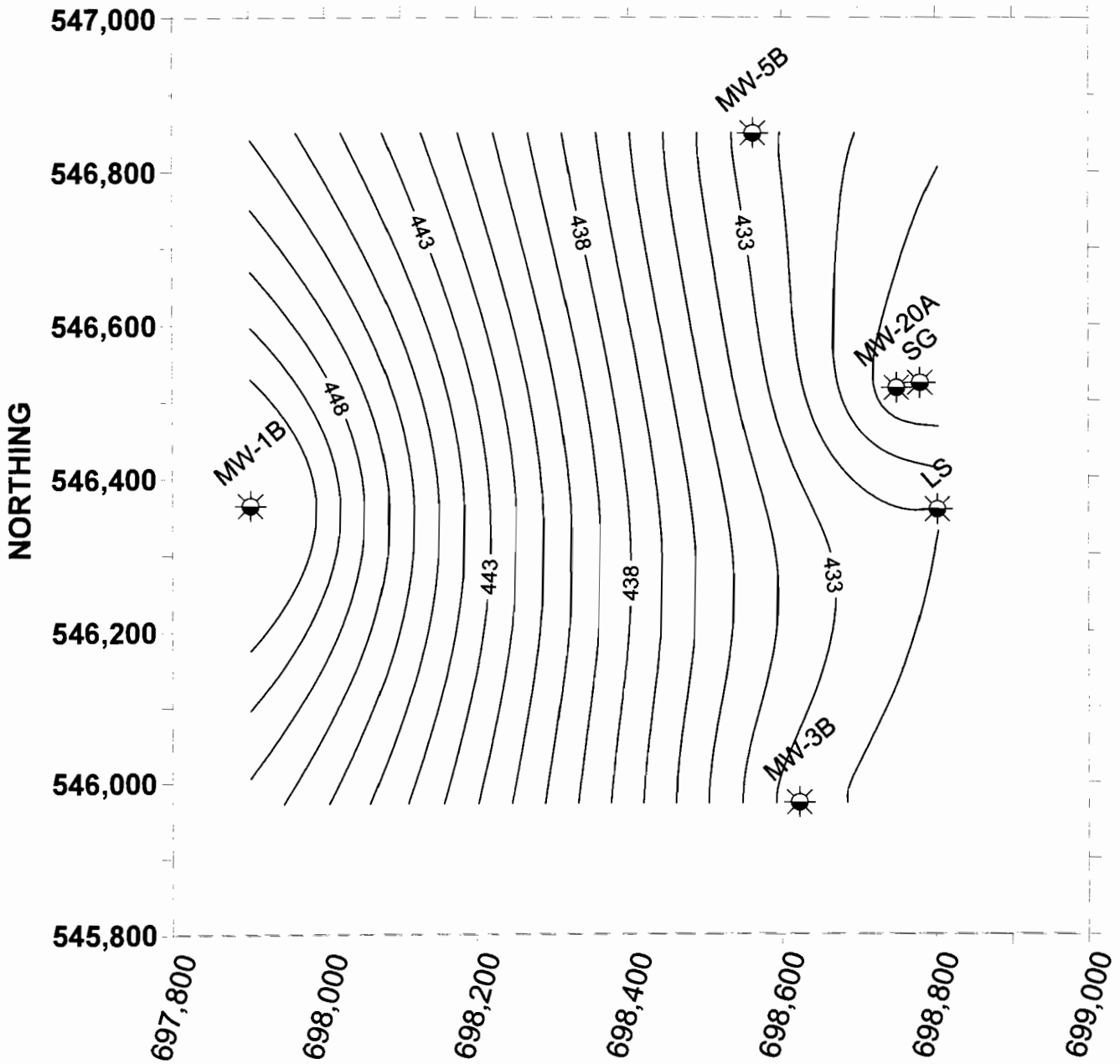

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 5/15/02

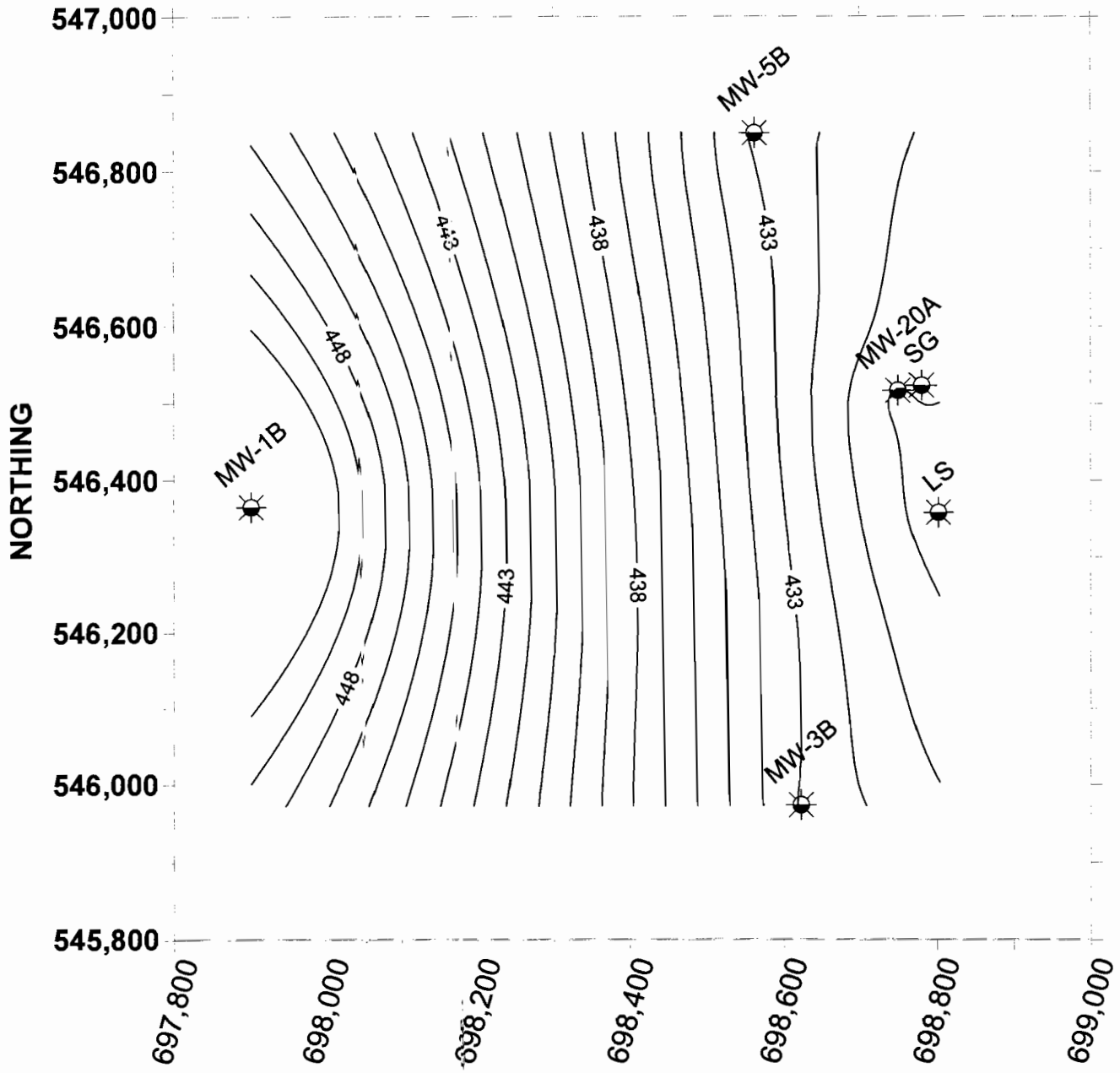

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 6/13/02

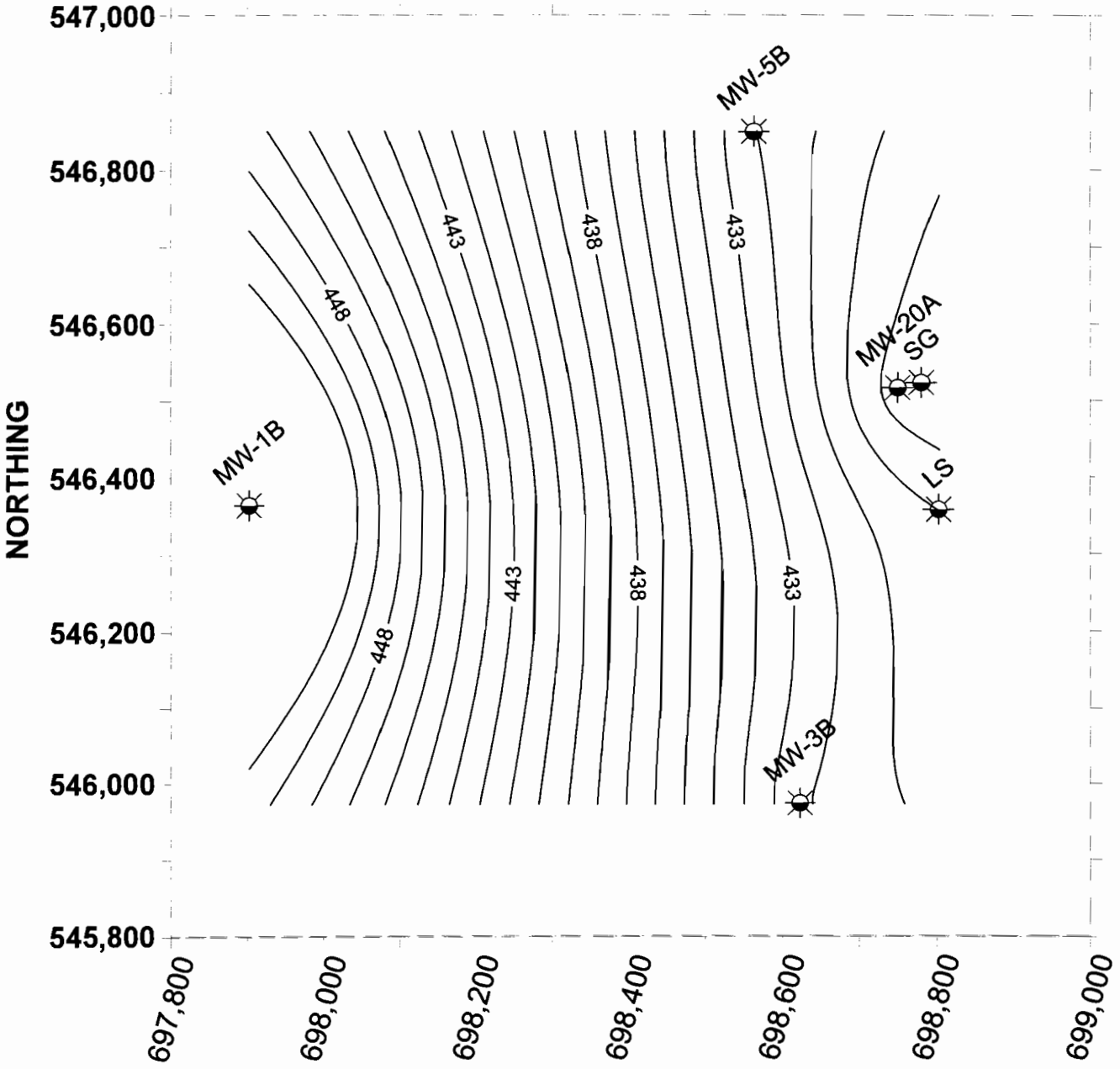

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 7/25/02

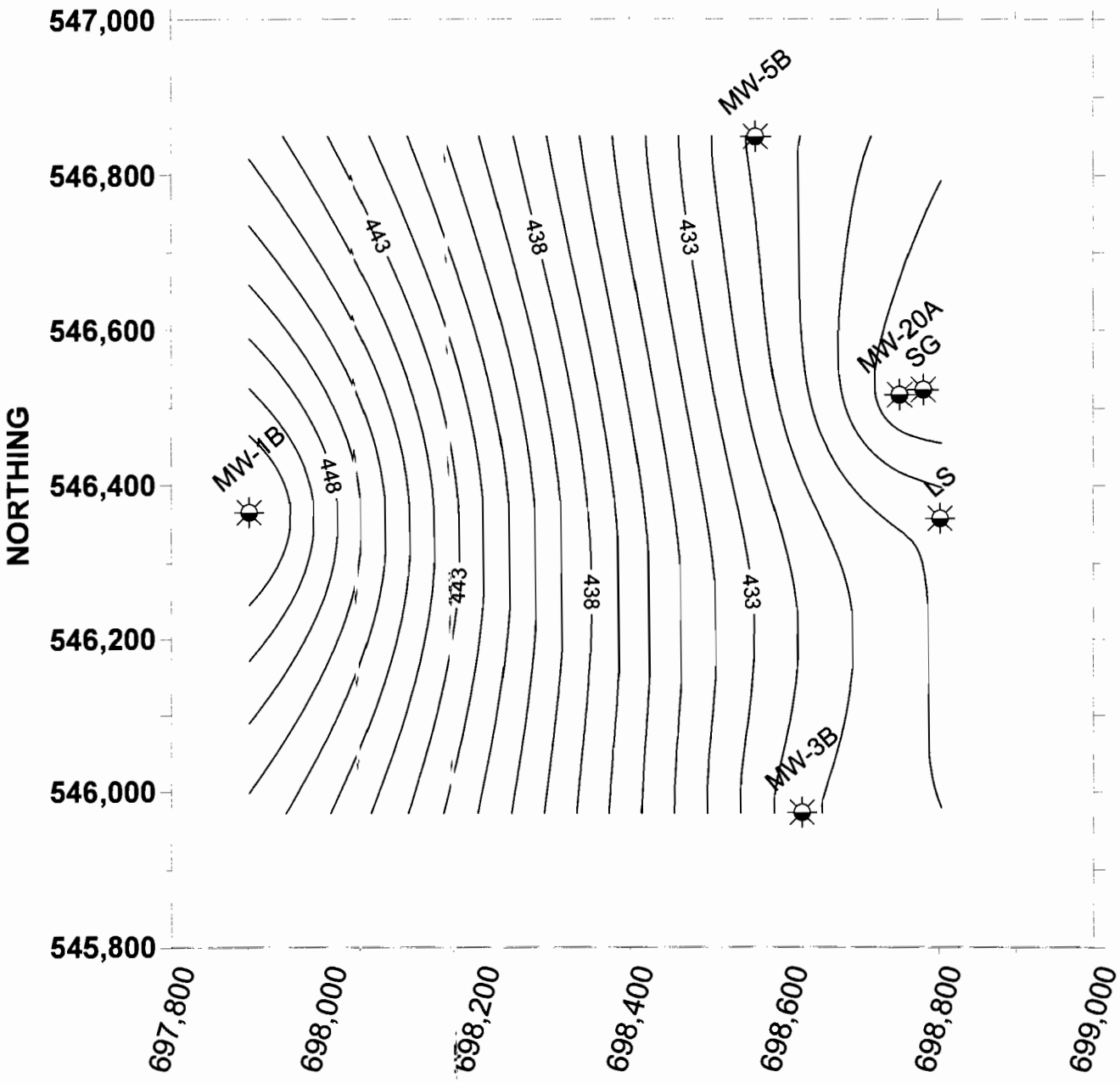

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 8/22/02

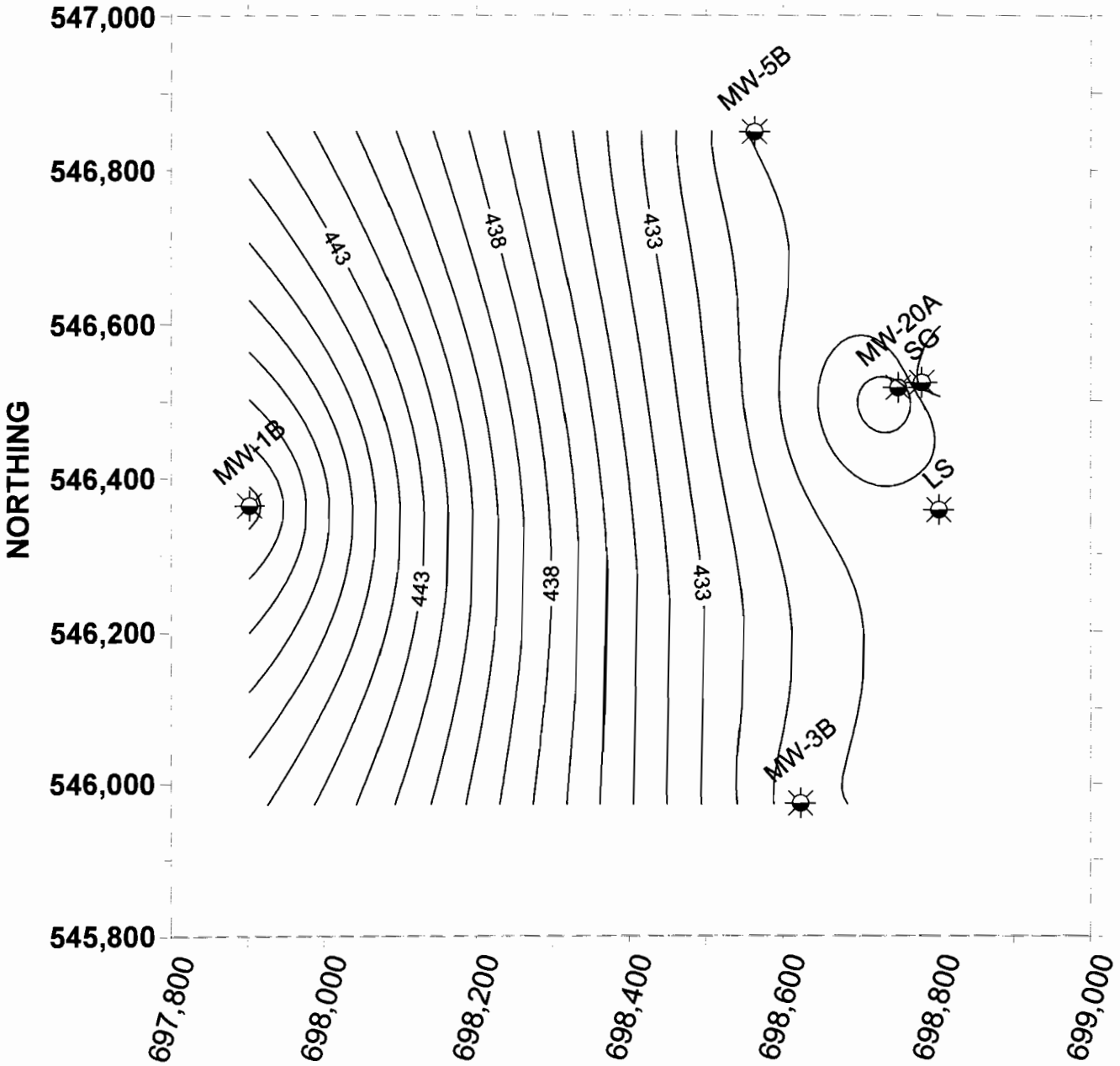

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 9/18/02

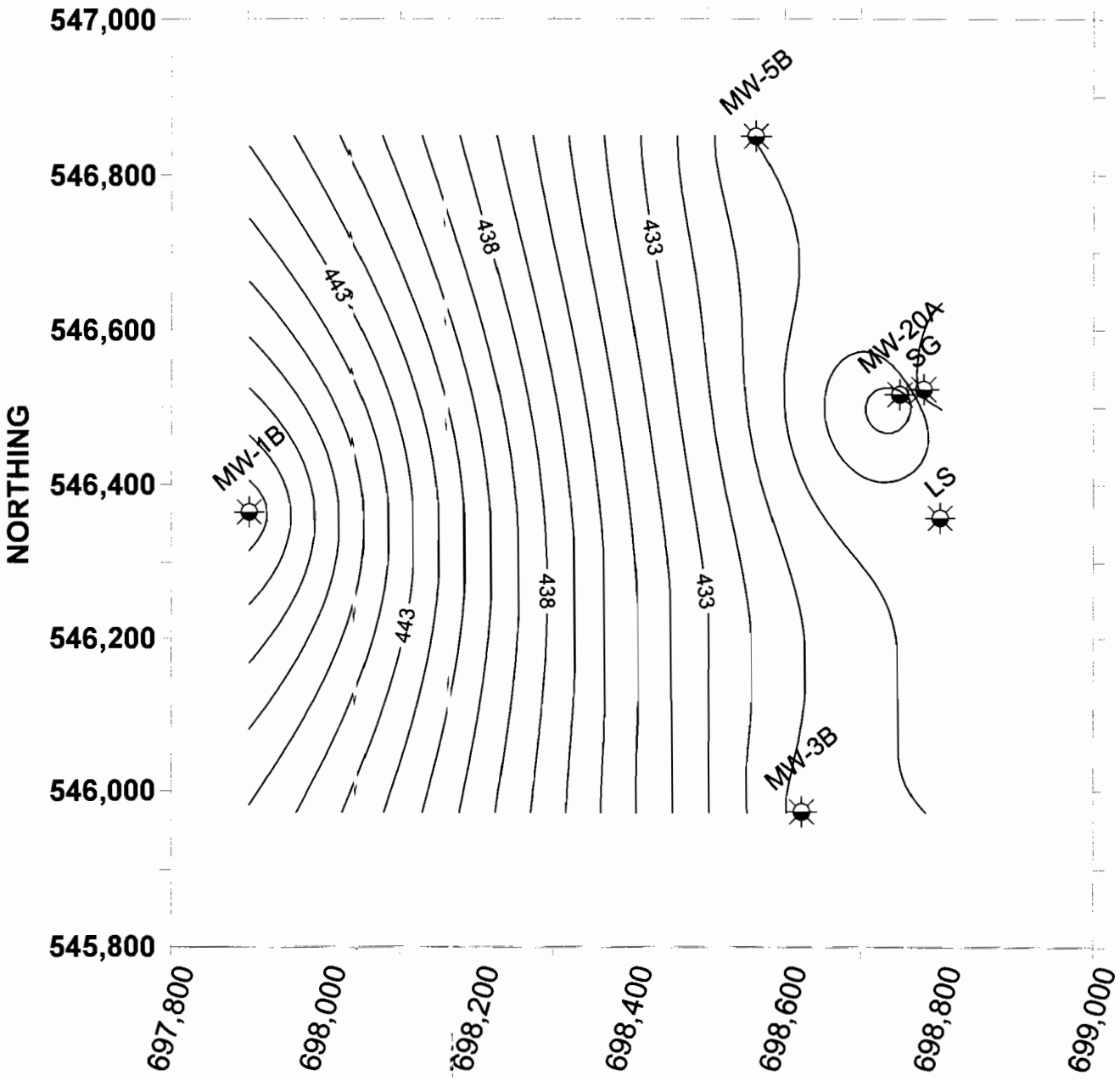

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 10/24/02

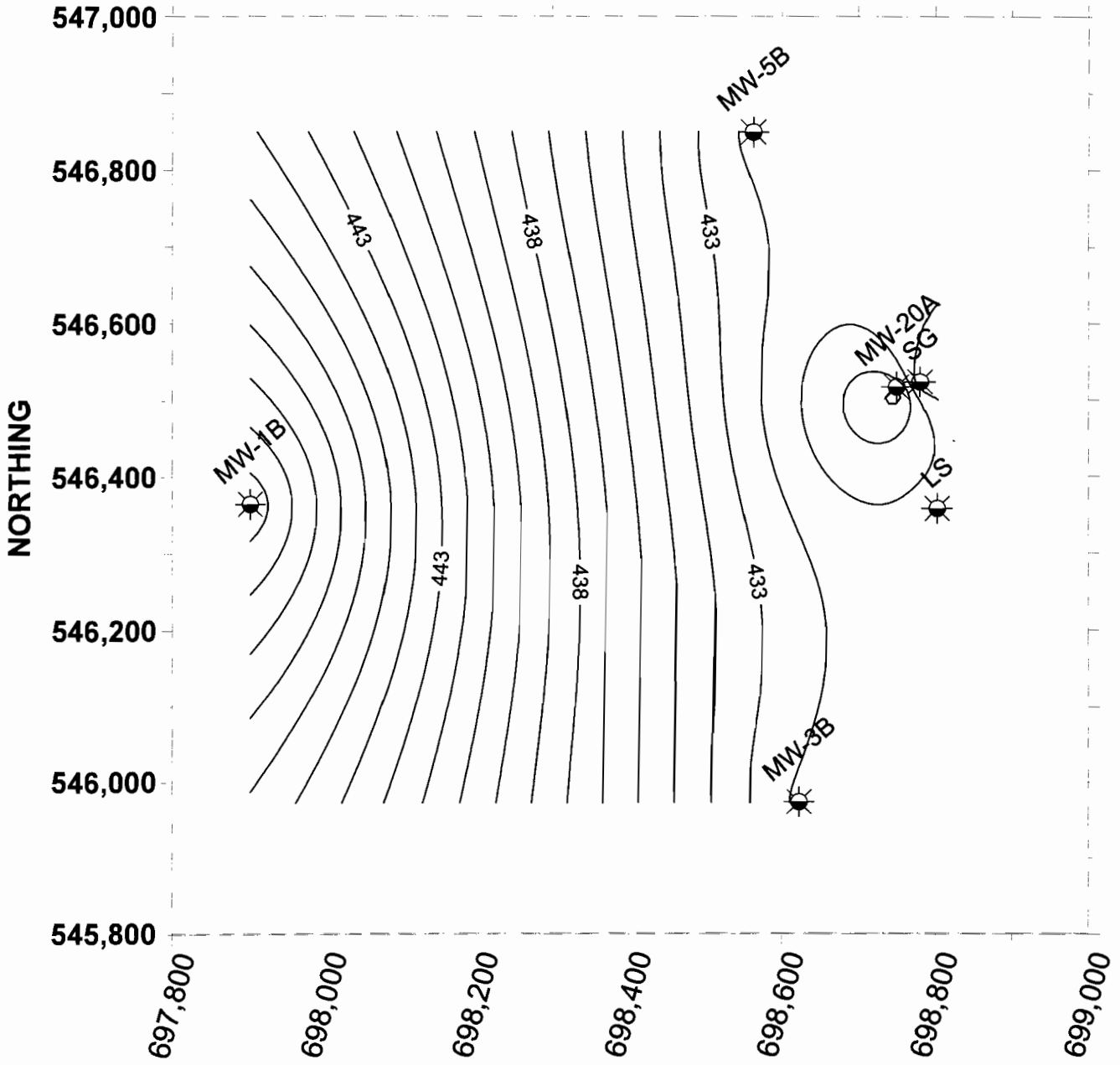

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 11/17/02

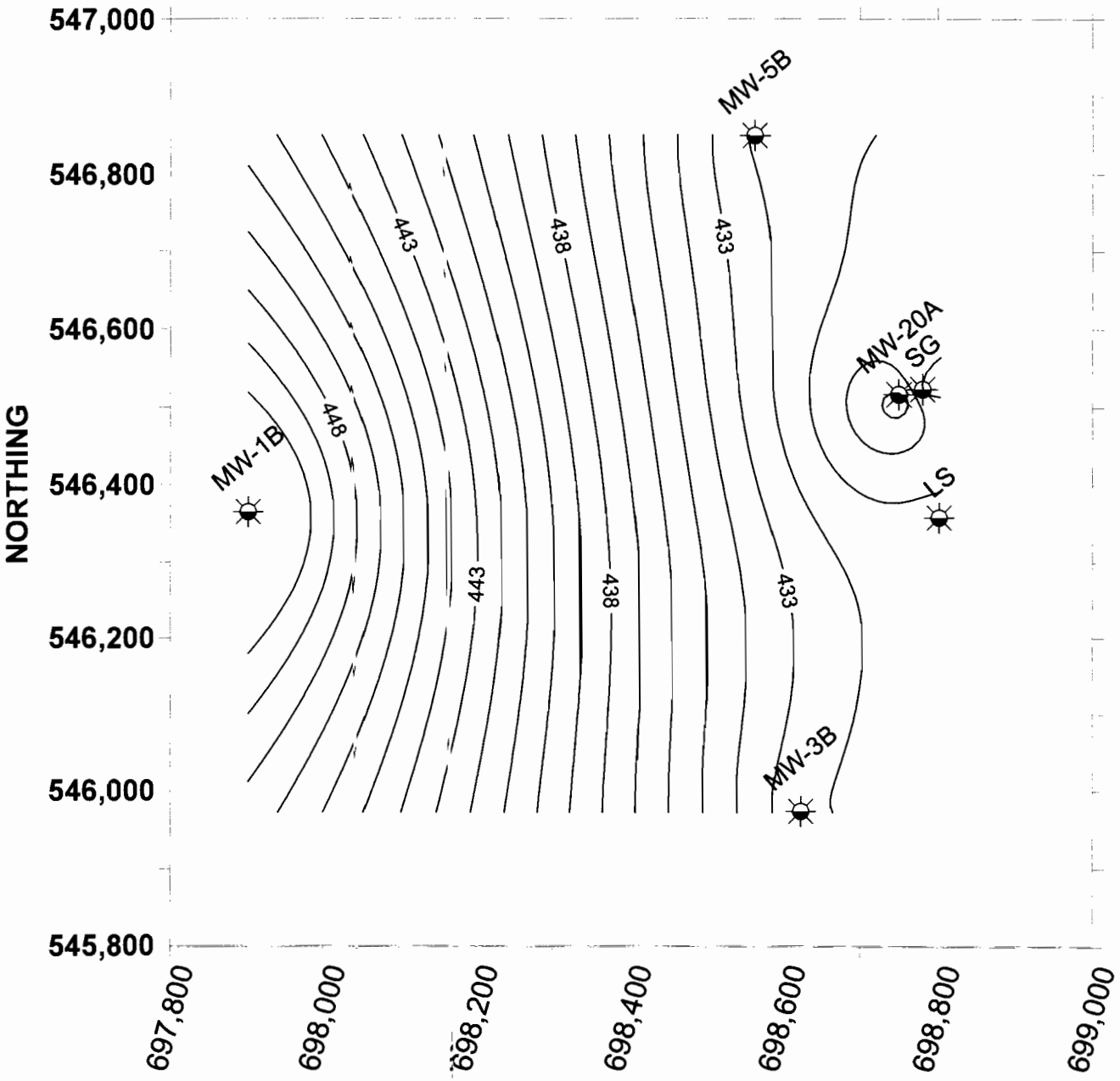

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 12/19/02

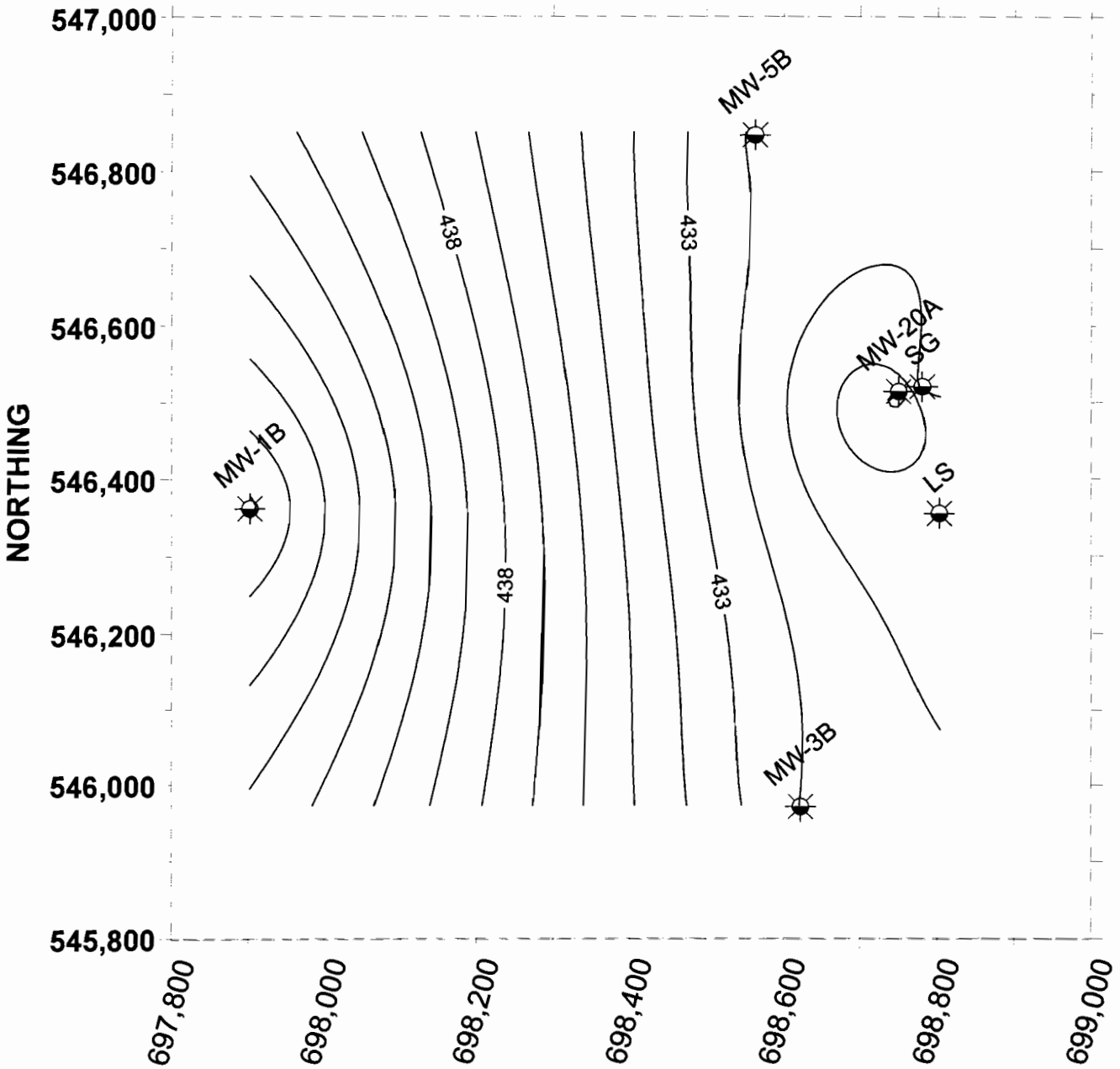

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 03/26/03

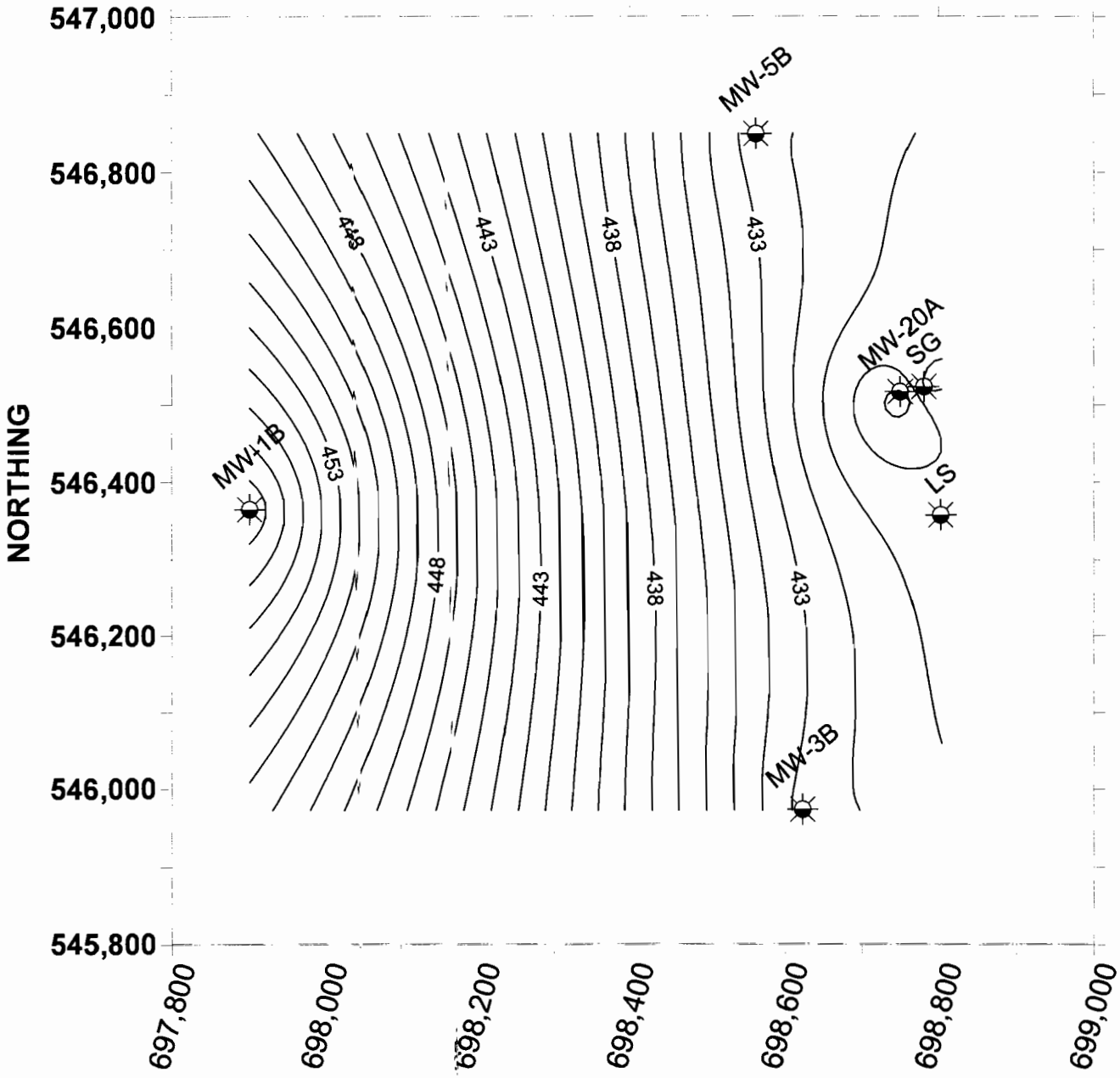

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 04/24/03

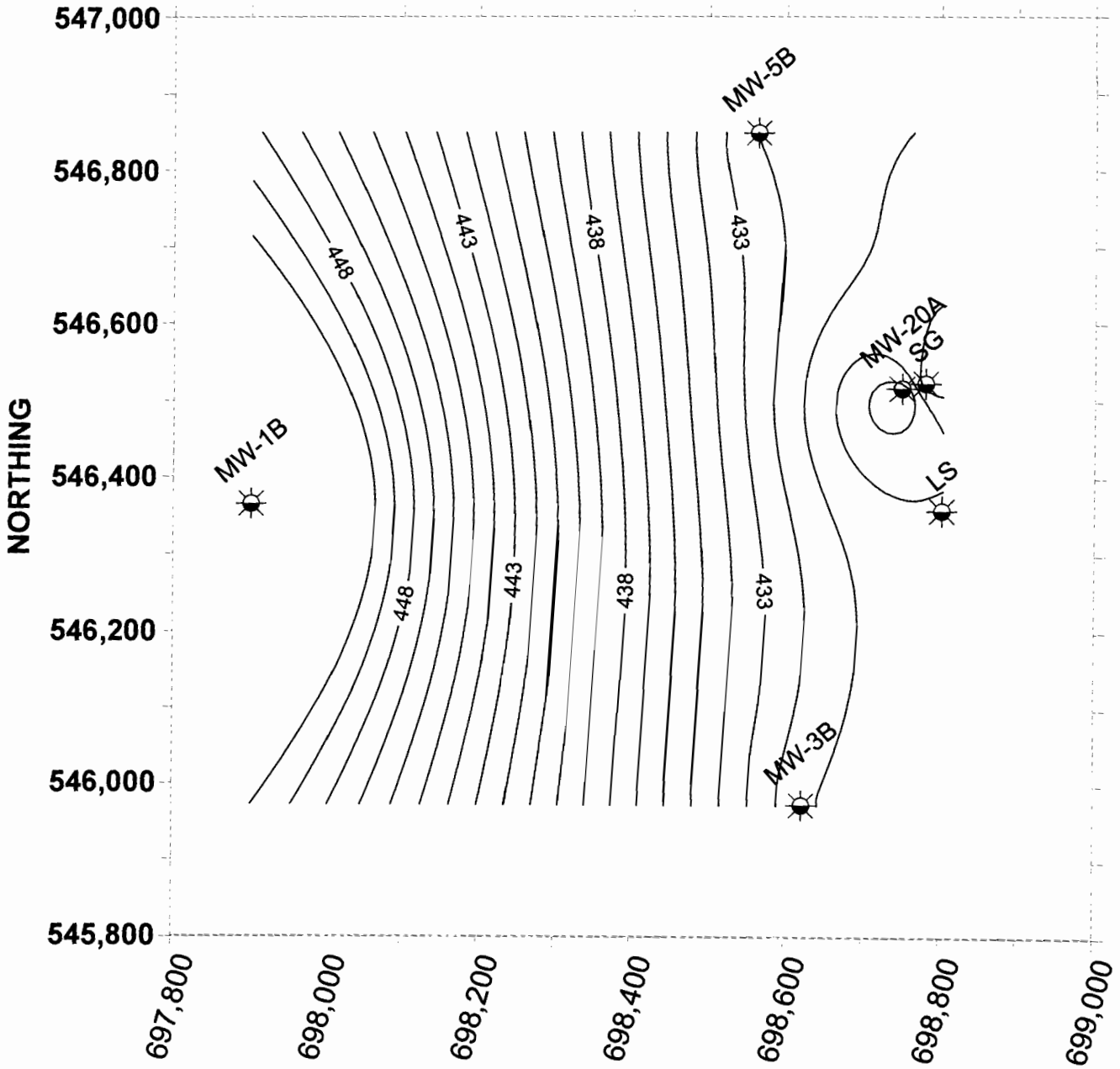

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 05/29/03

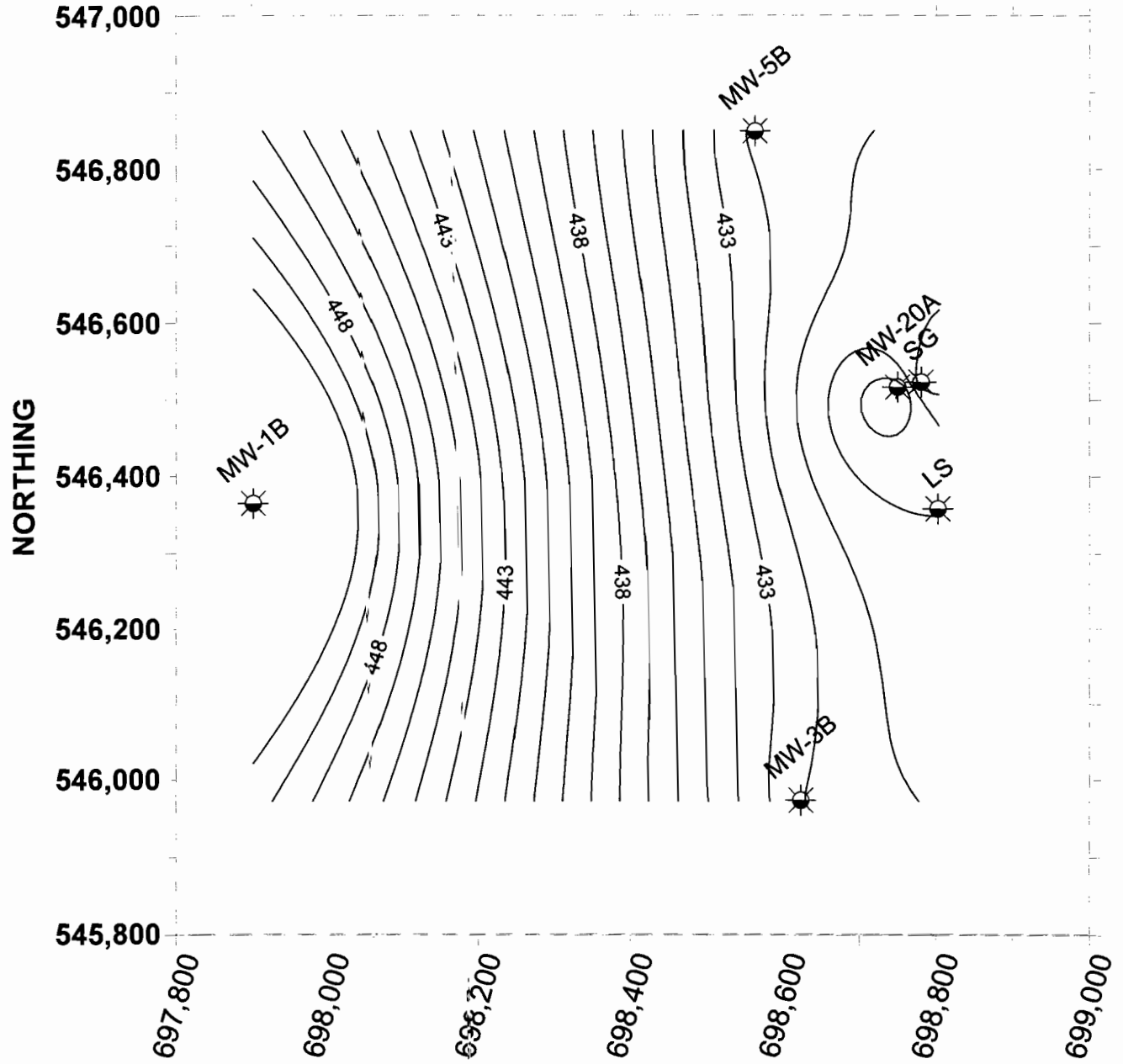

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 06/26/03

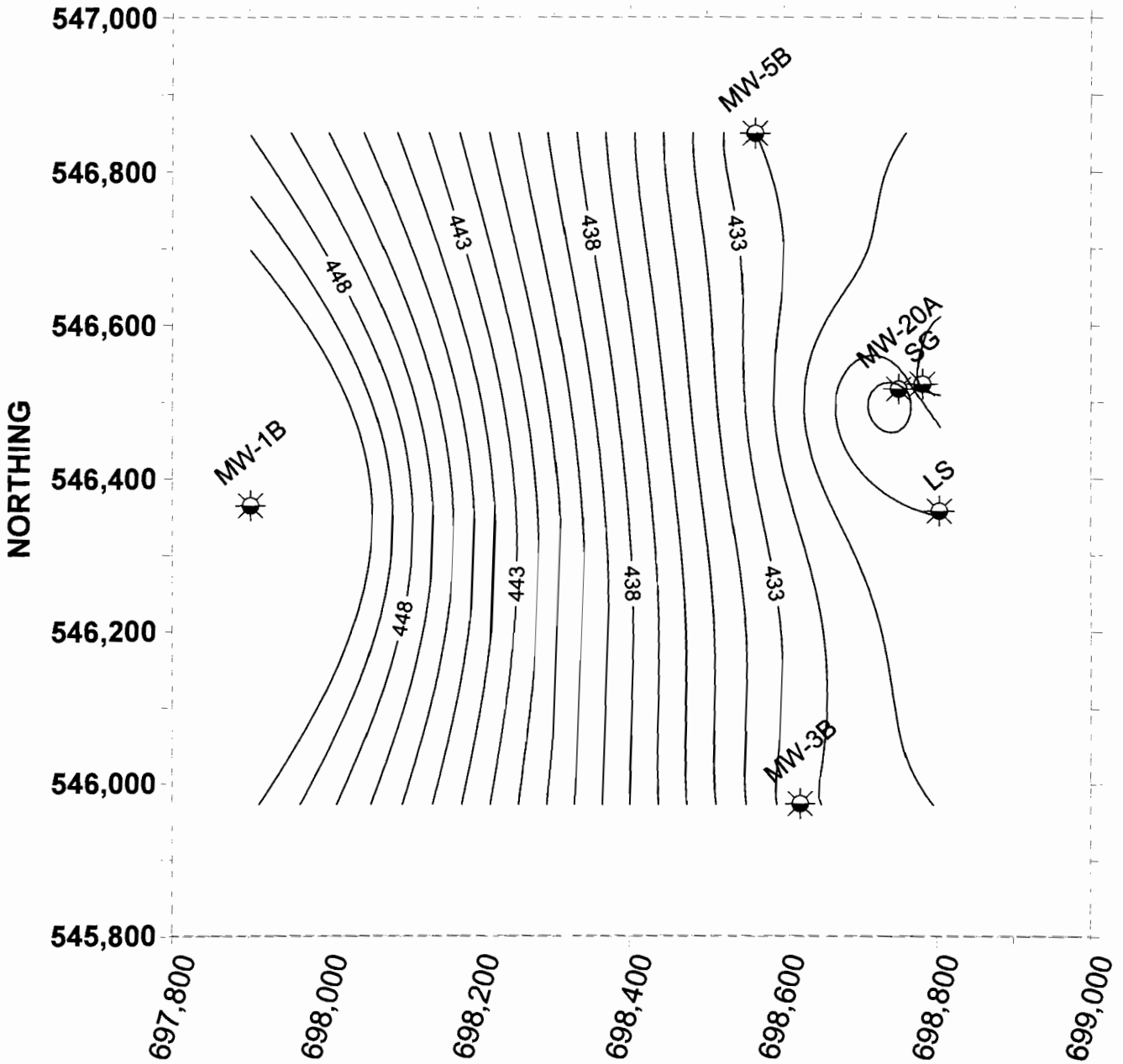

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 07/29/03

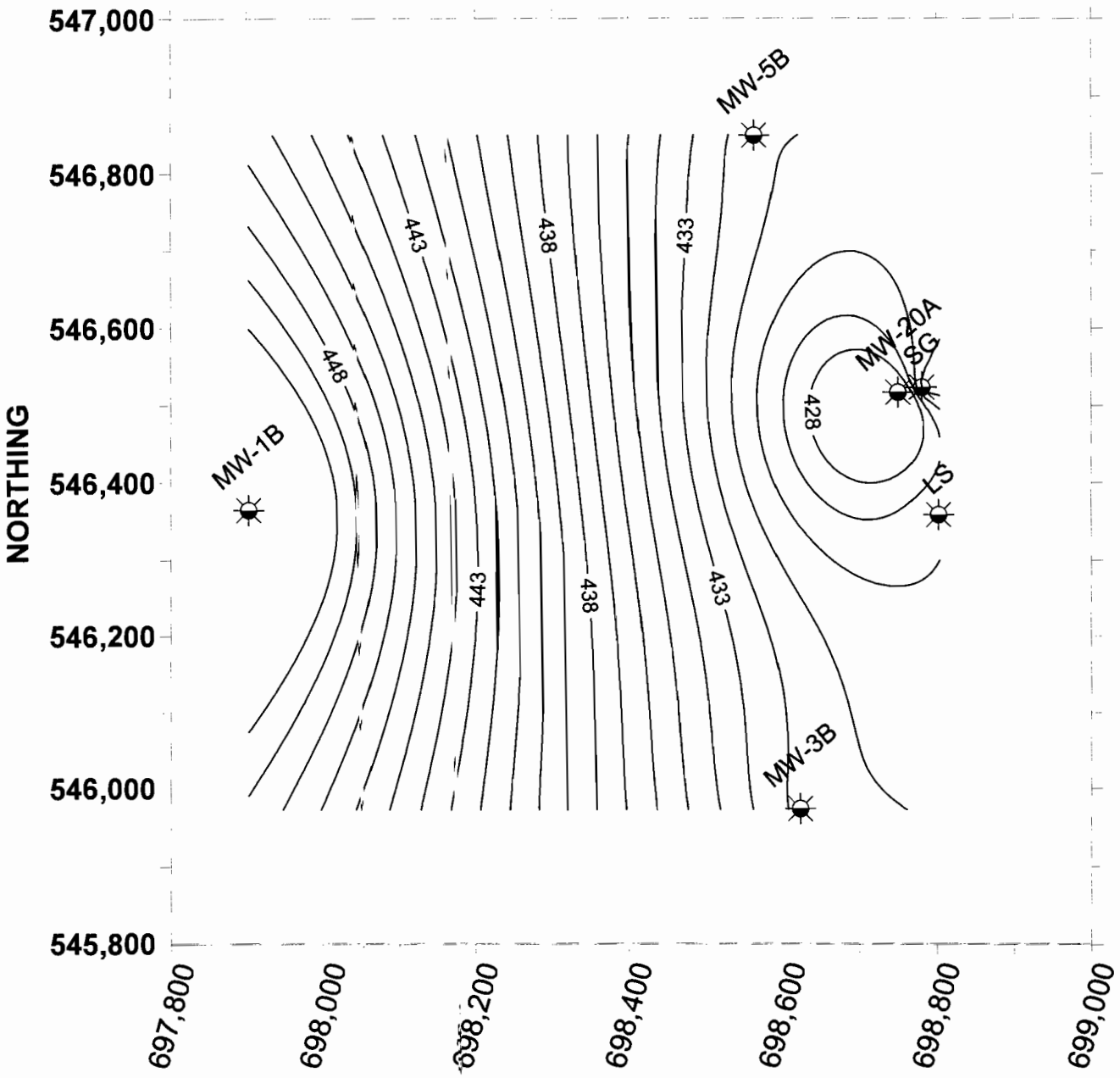

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 08/19/03

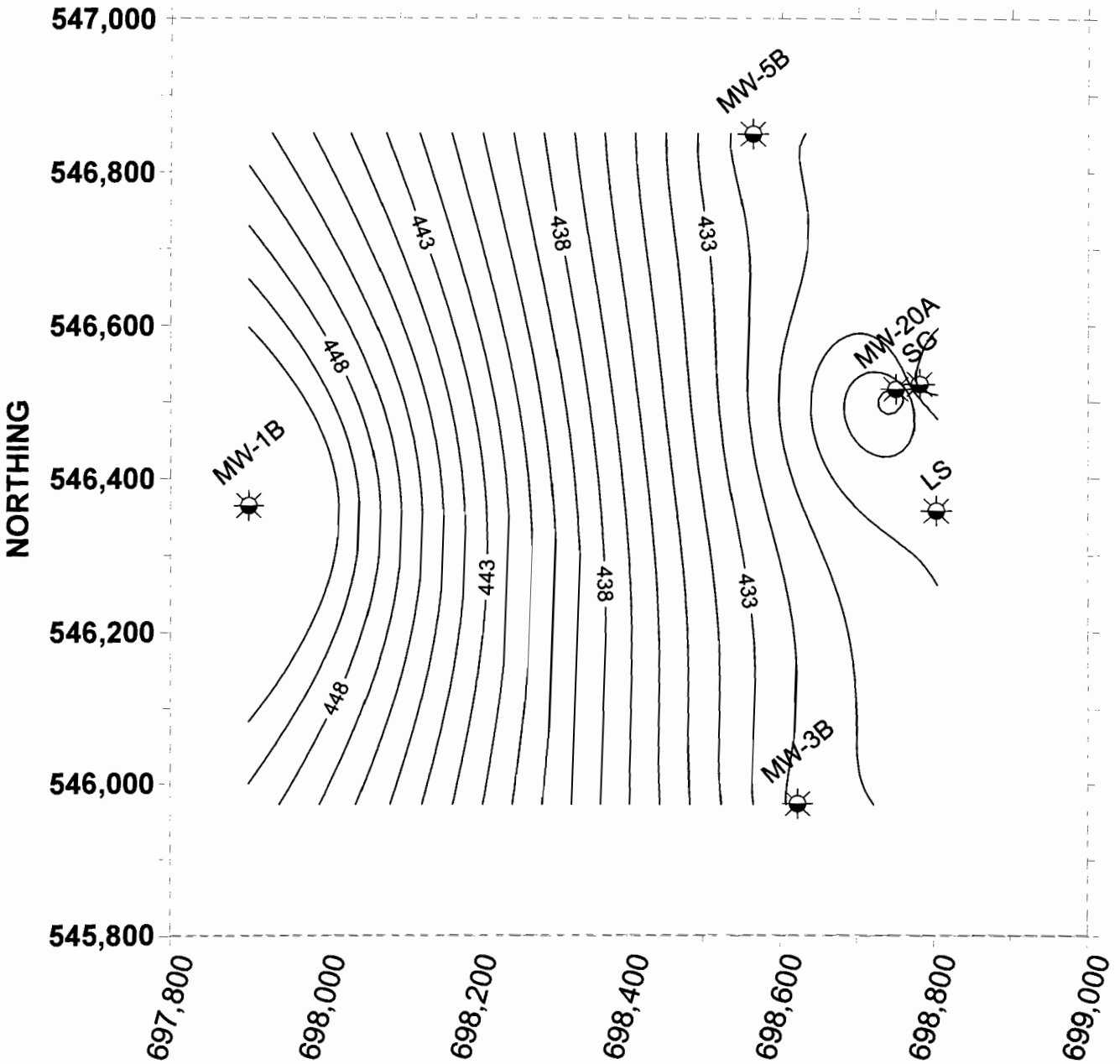

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 10/01/03

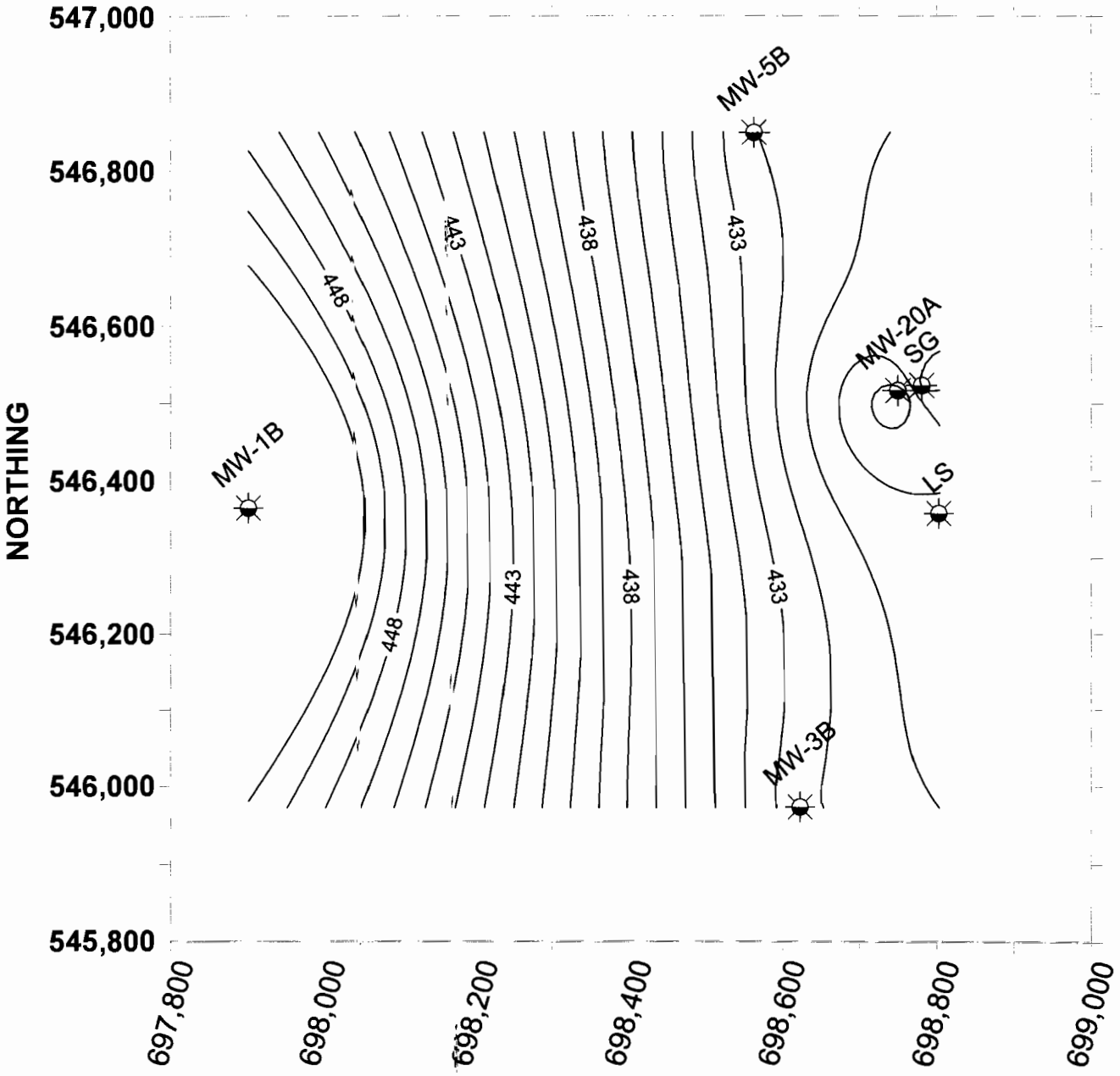

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 11/26/03

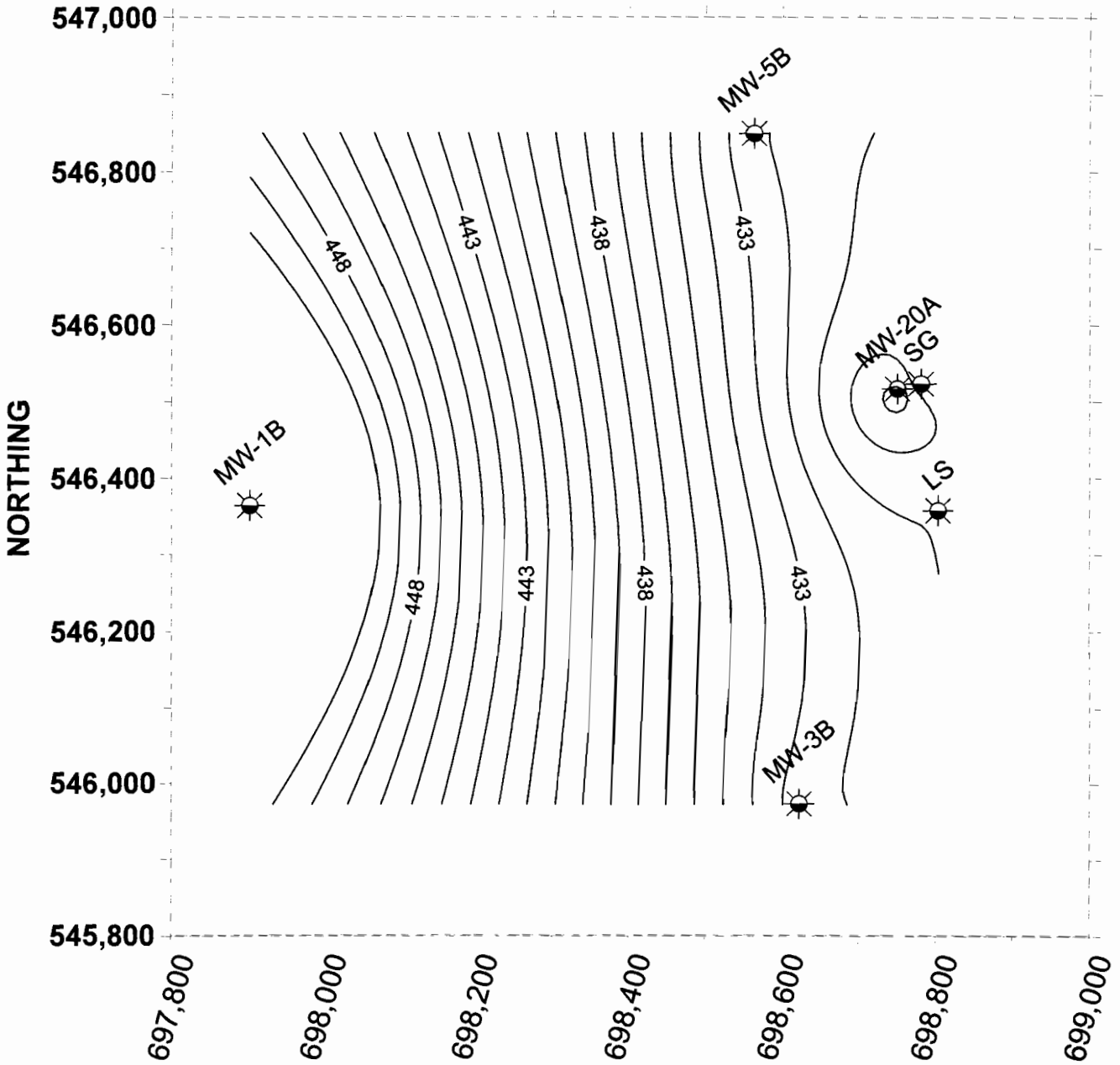

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 12/23/03

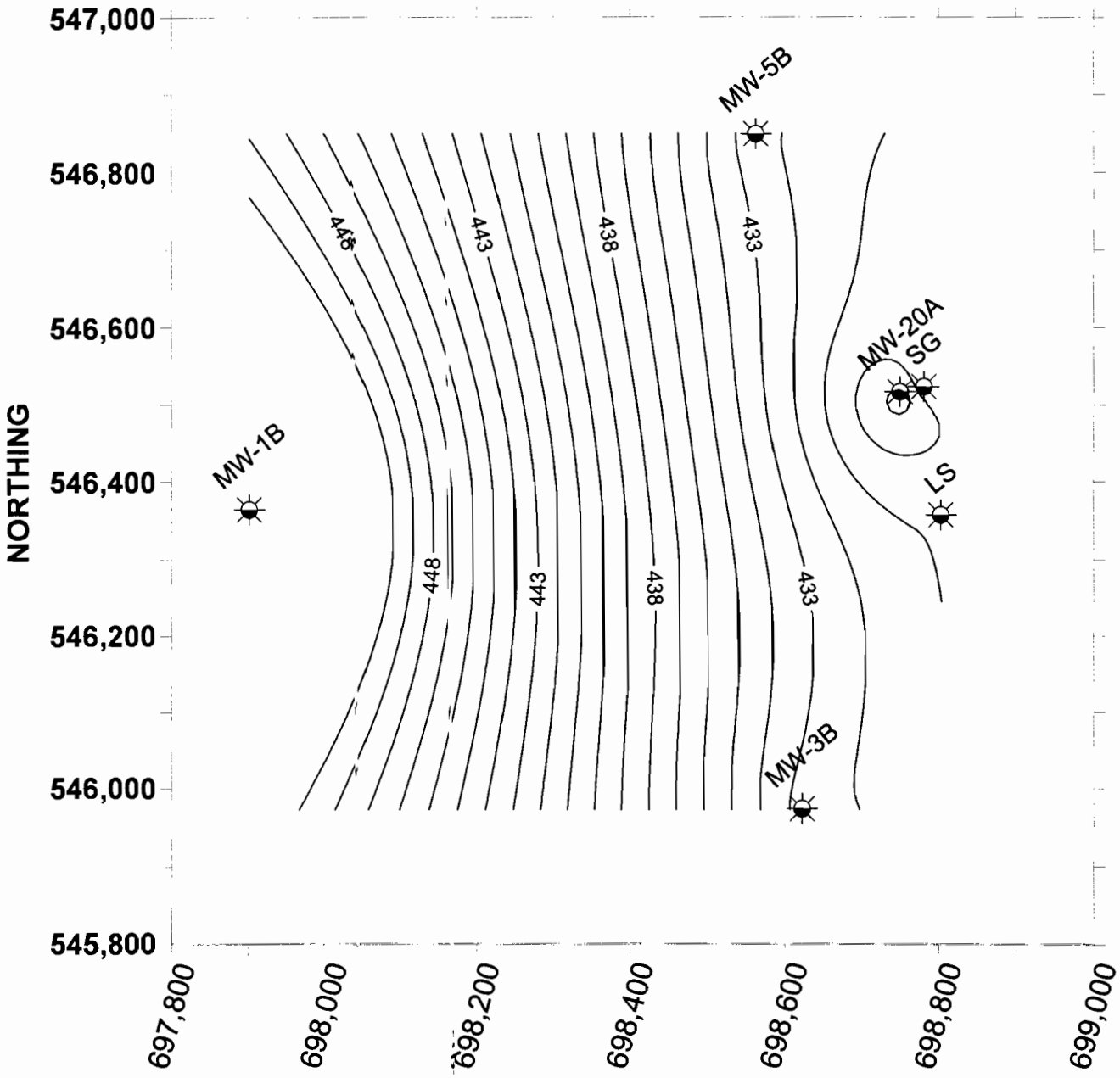

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 01/29/04

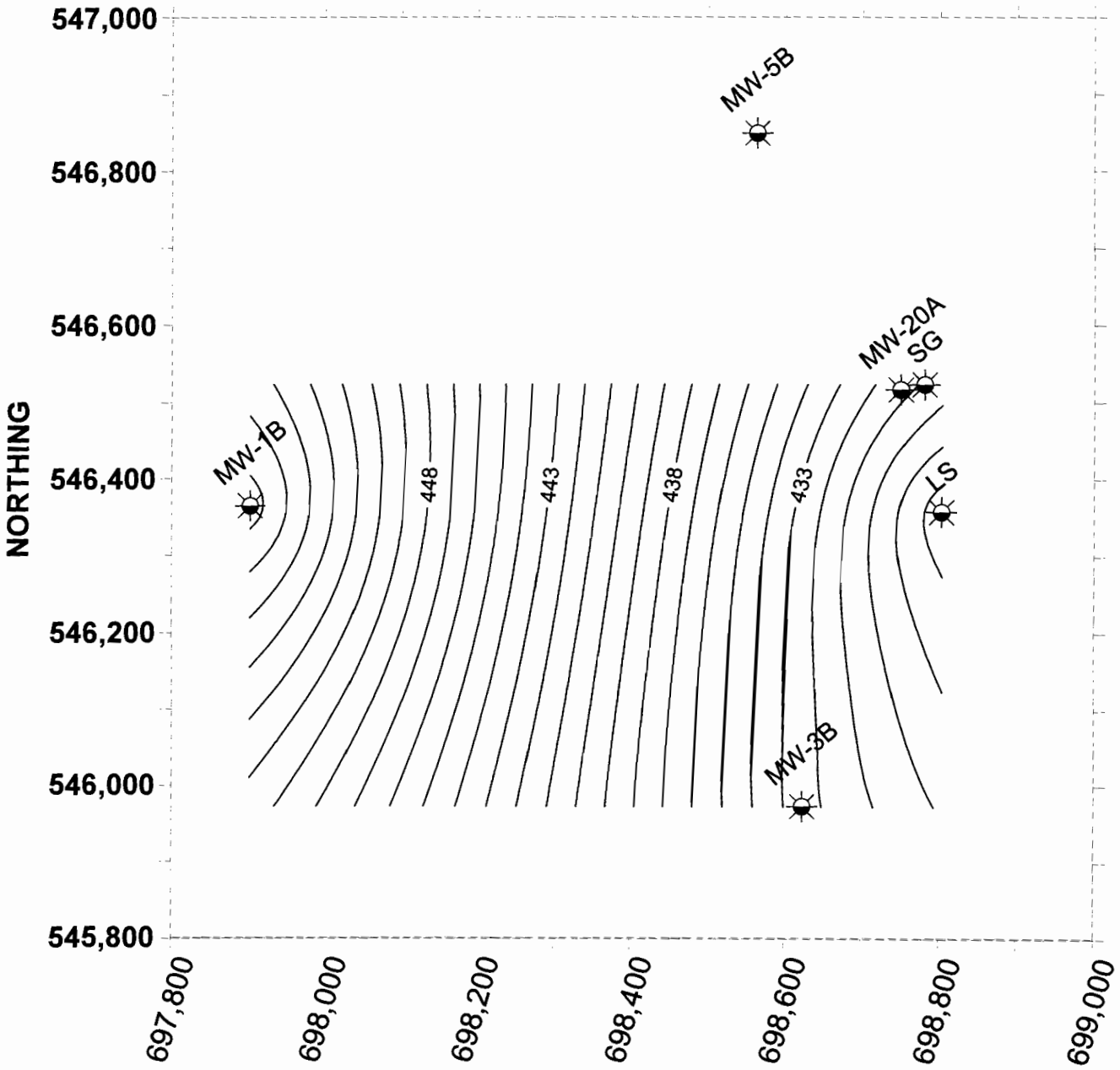

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 02/27/04

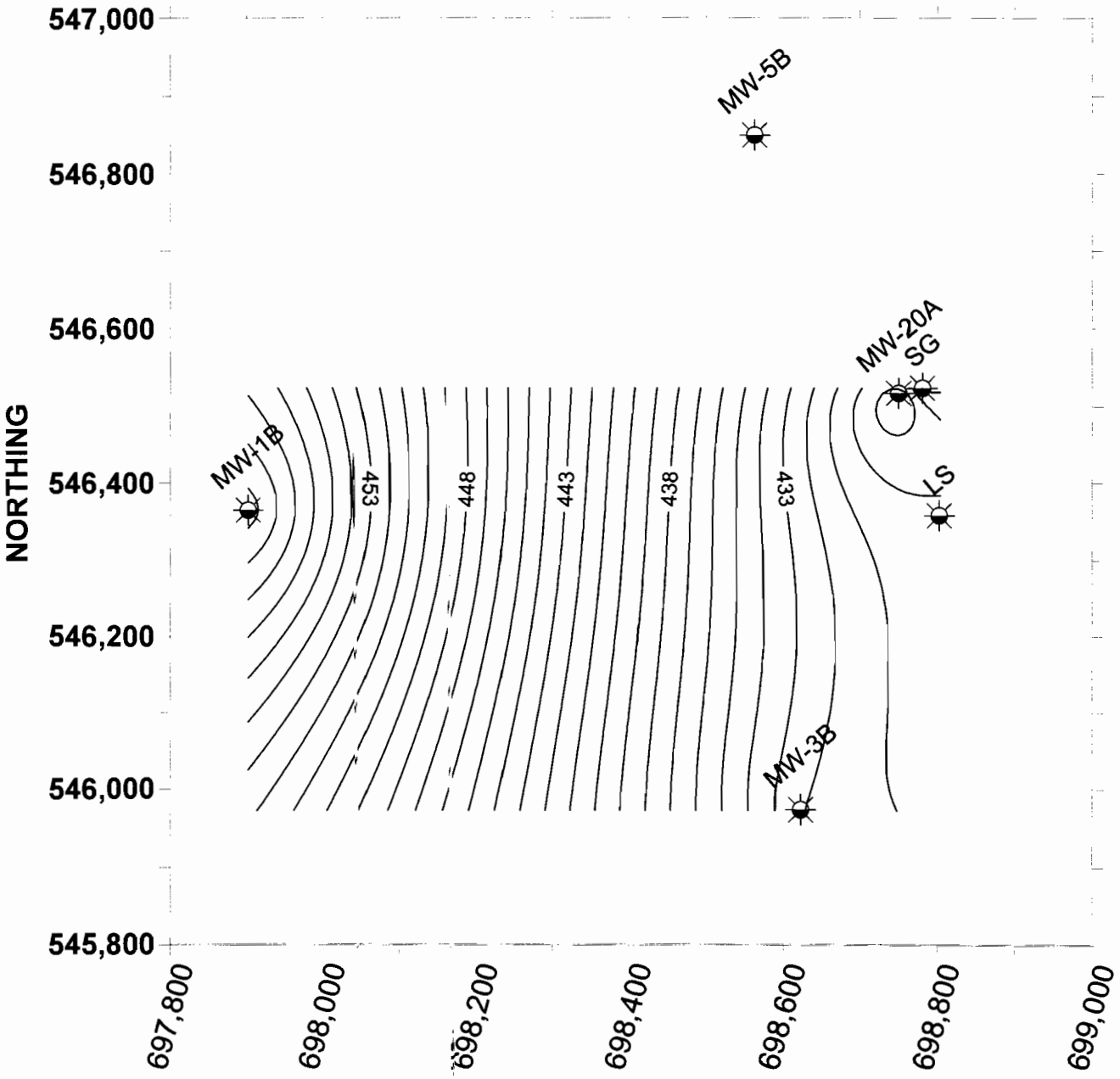

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 04/30/04

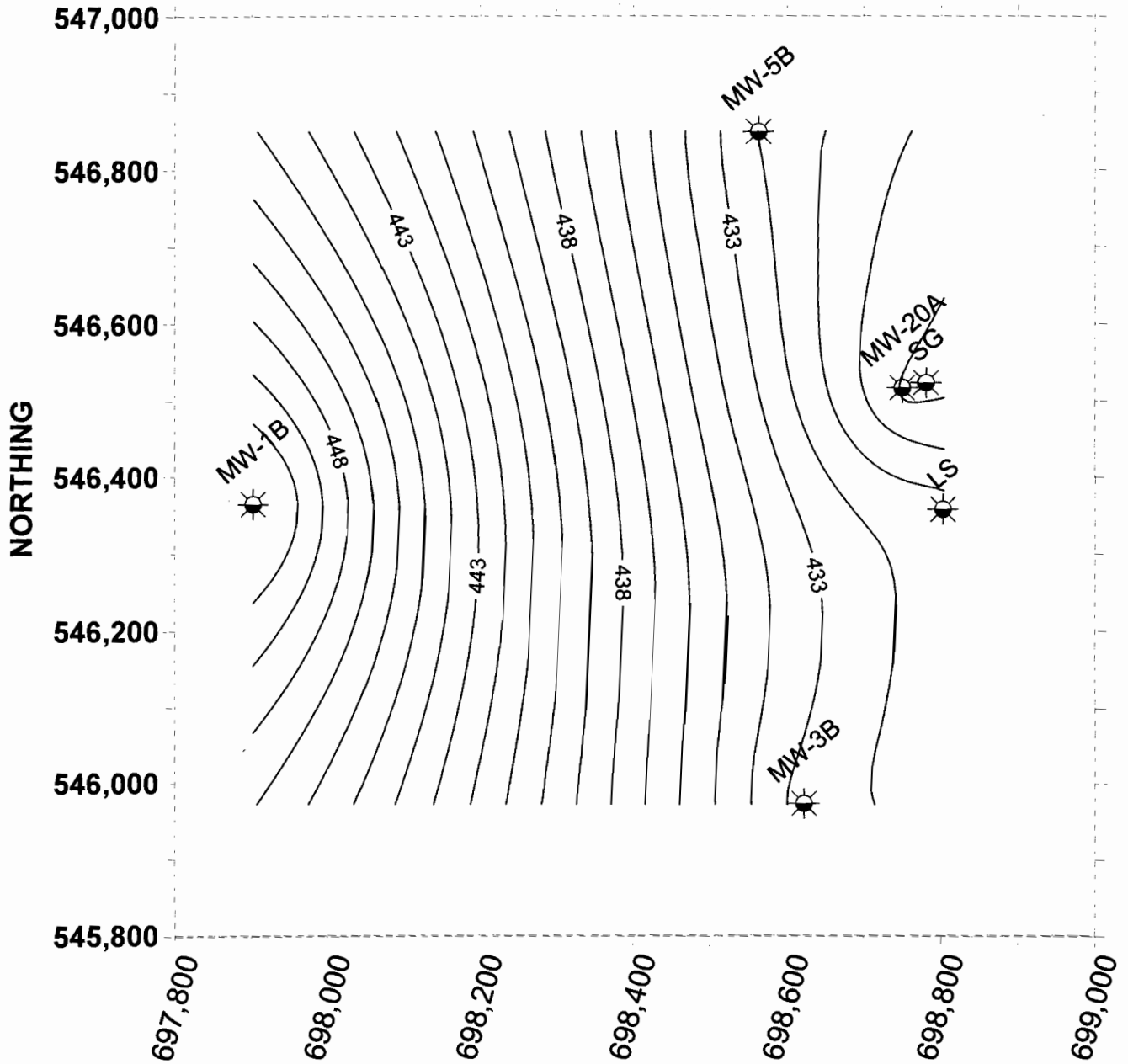

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 05/25/04

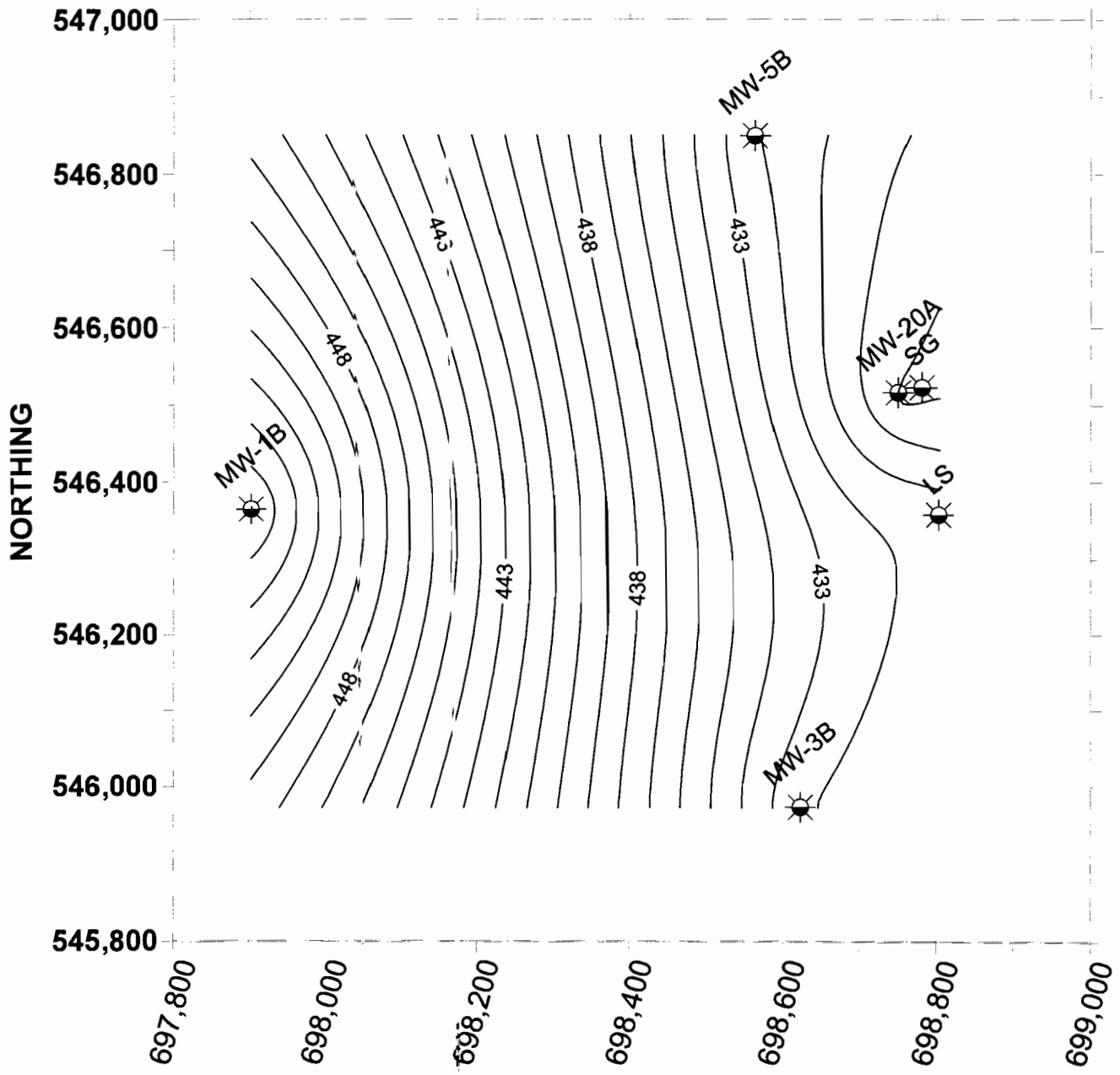

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 06/30/04

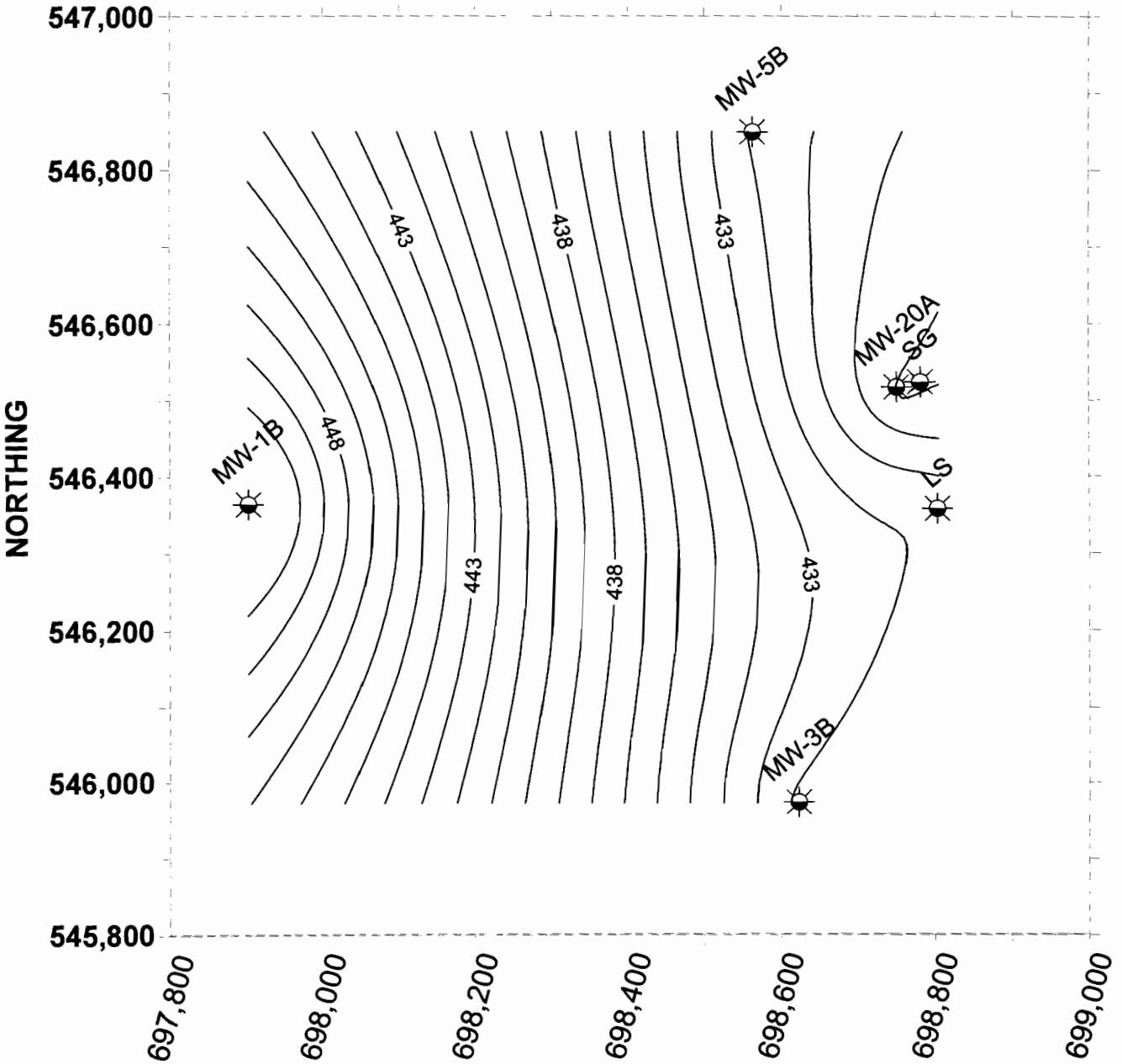

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 07/26/04

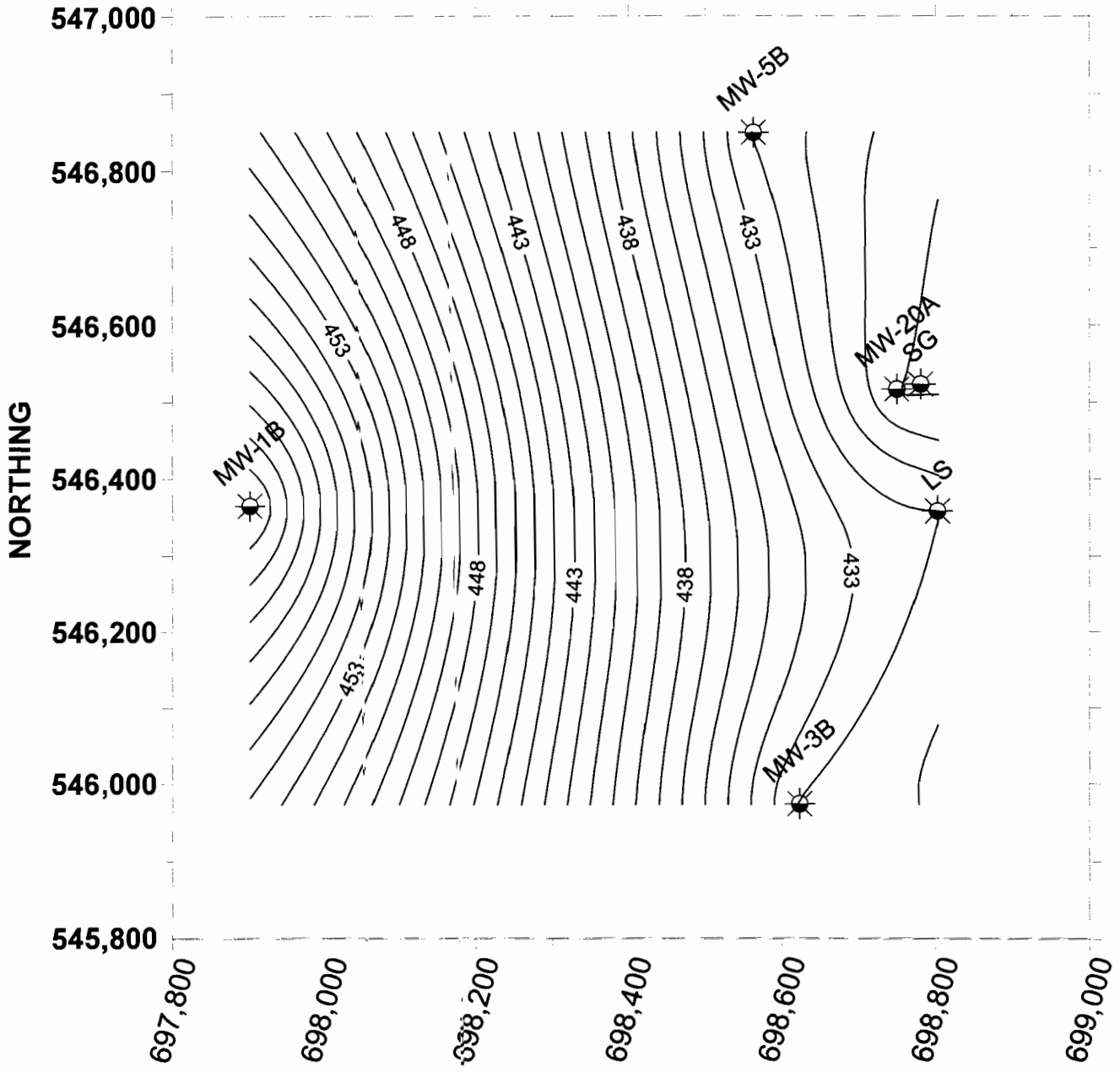

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 08/23/04

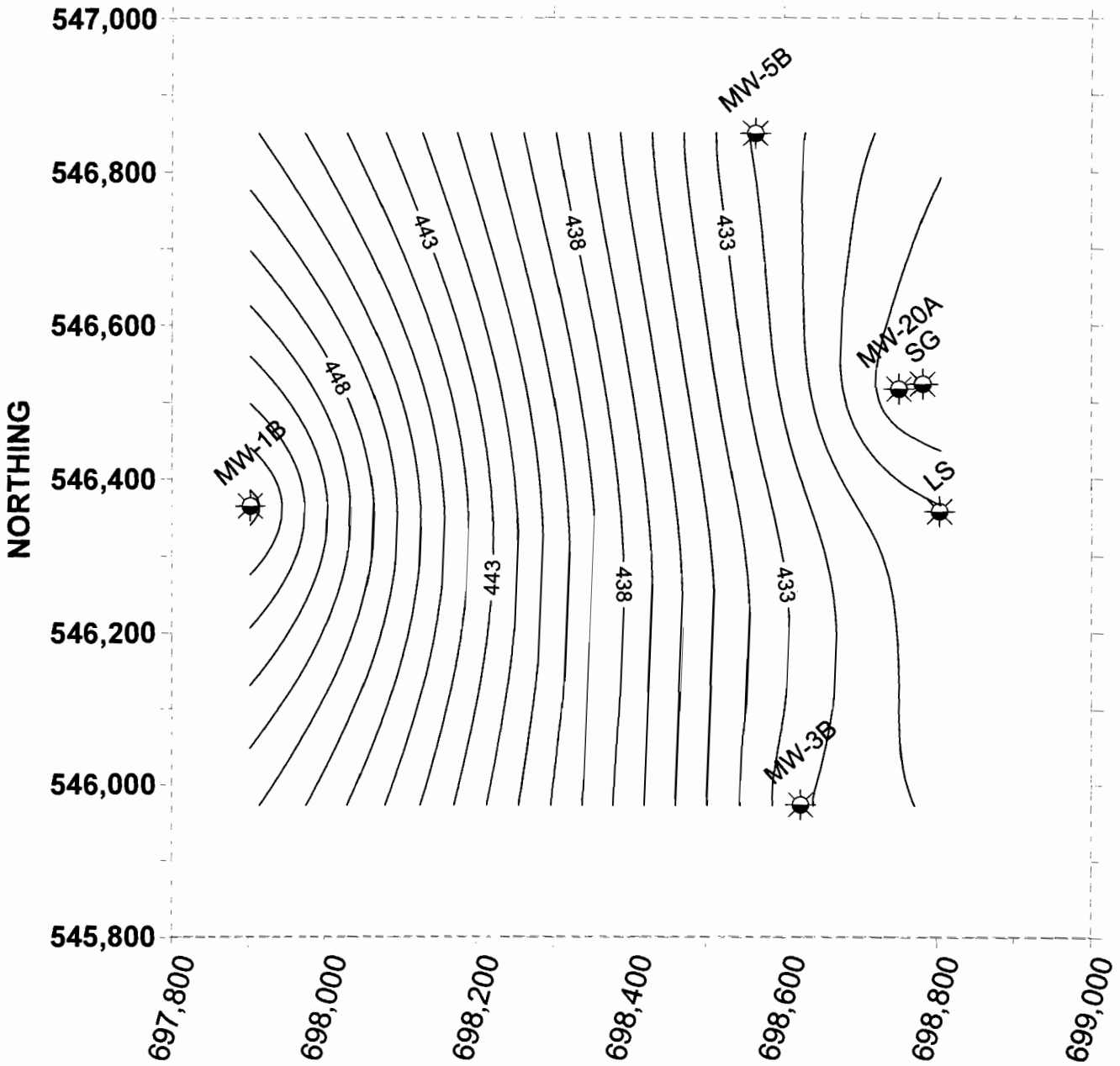

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 09/22/04

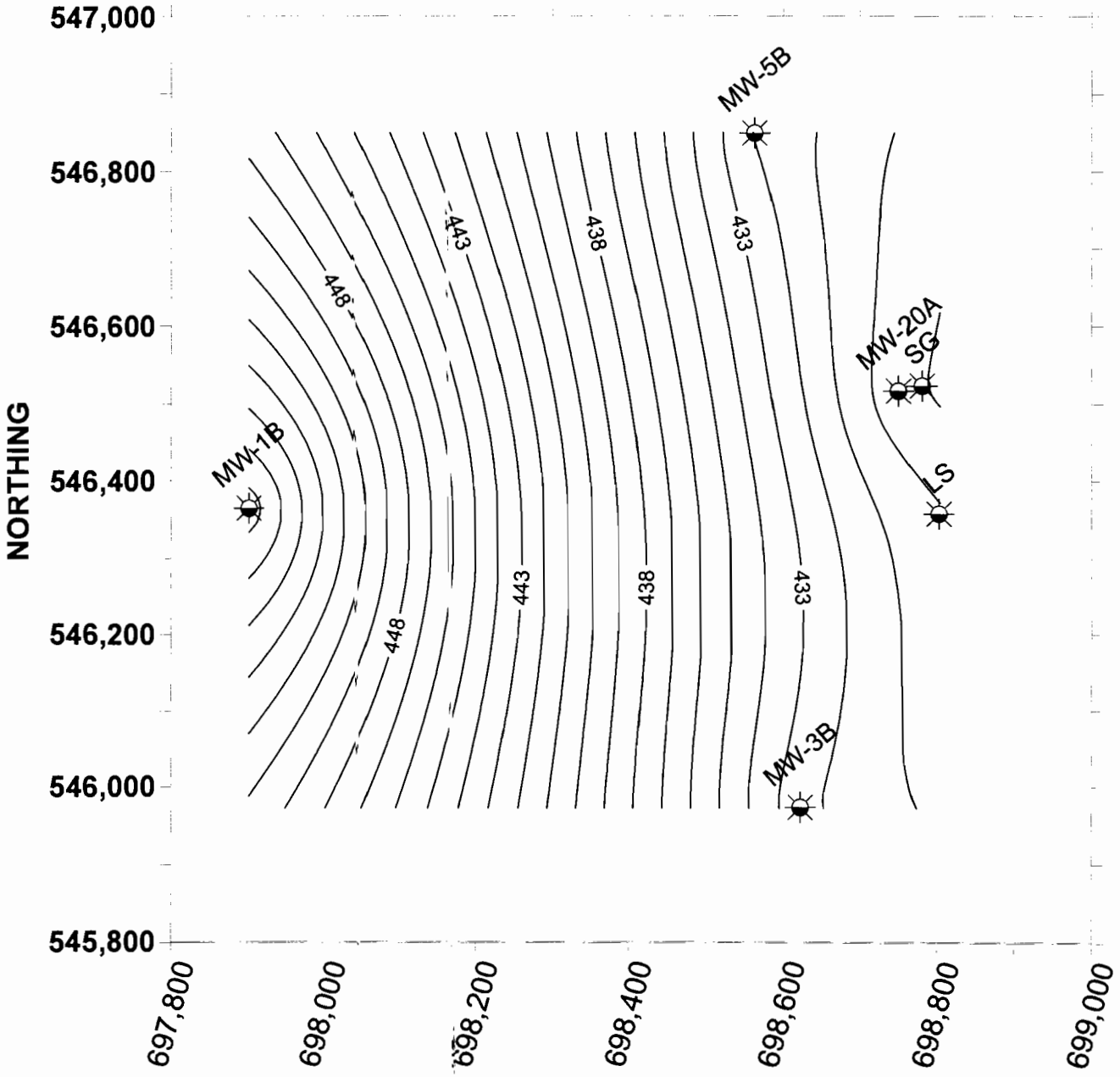

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 10/30/04

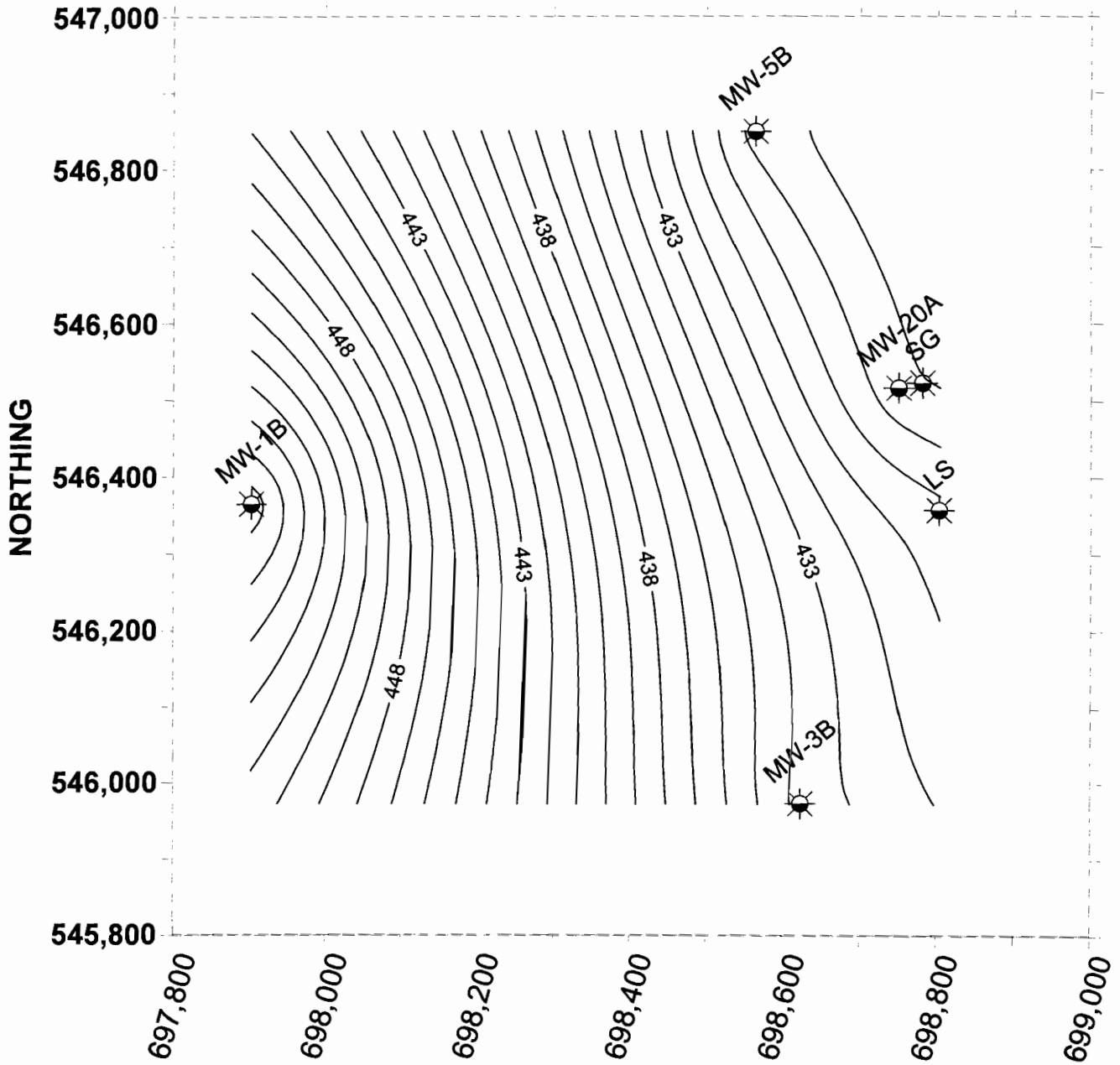

FIGURE D- 3
KE$SMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 11/23/04

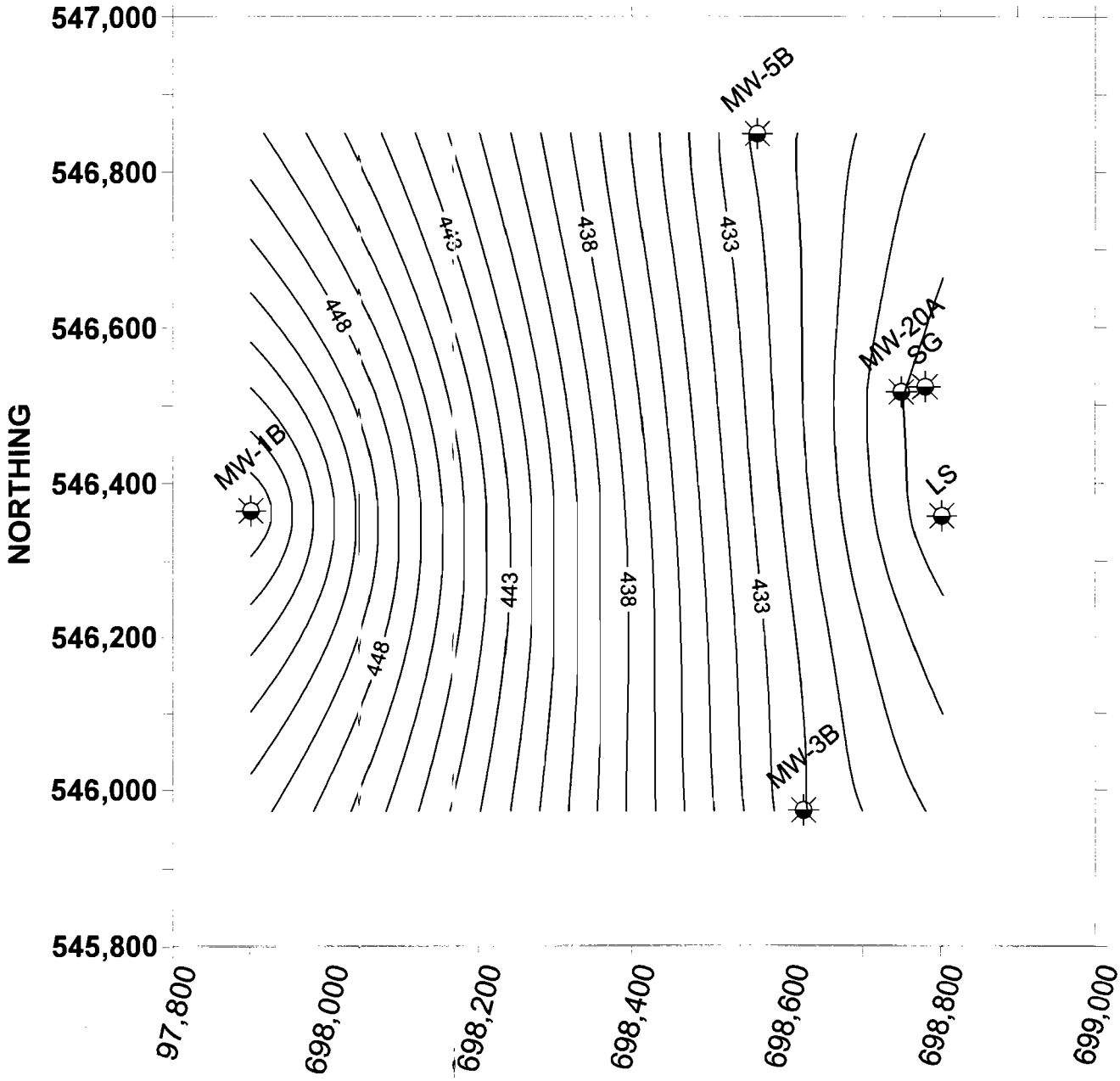

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 12/28/04

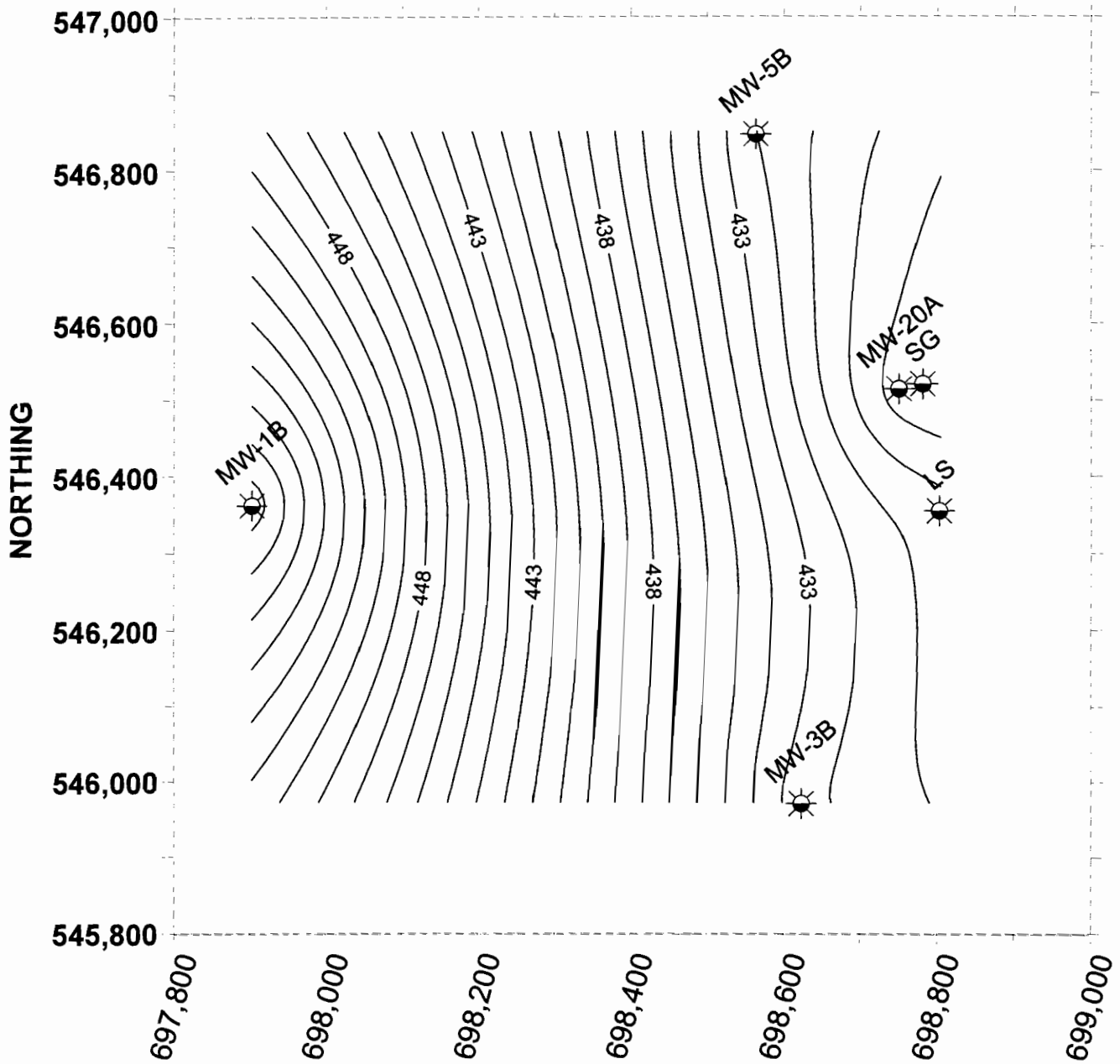

FIGURE D- 3
KESSMAN LANDFILL OM&M
SHALLOW GROUNDWATER CONTOUR : 01/25/05

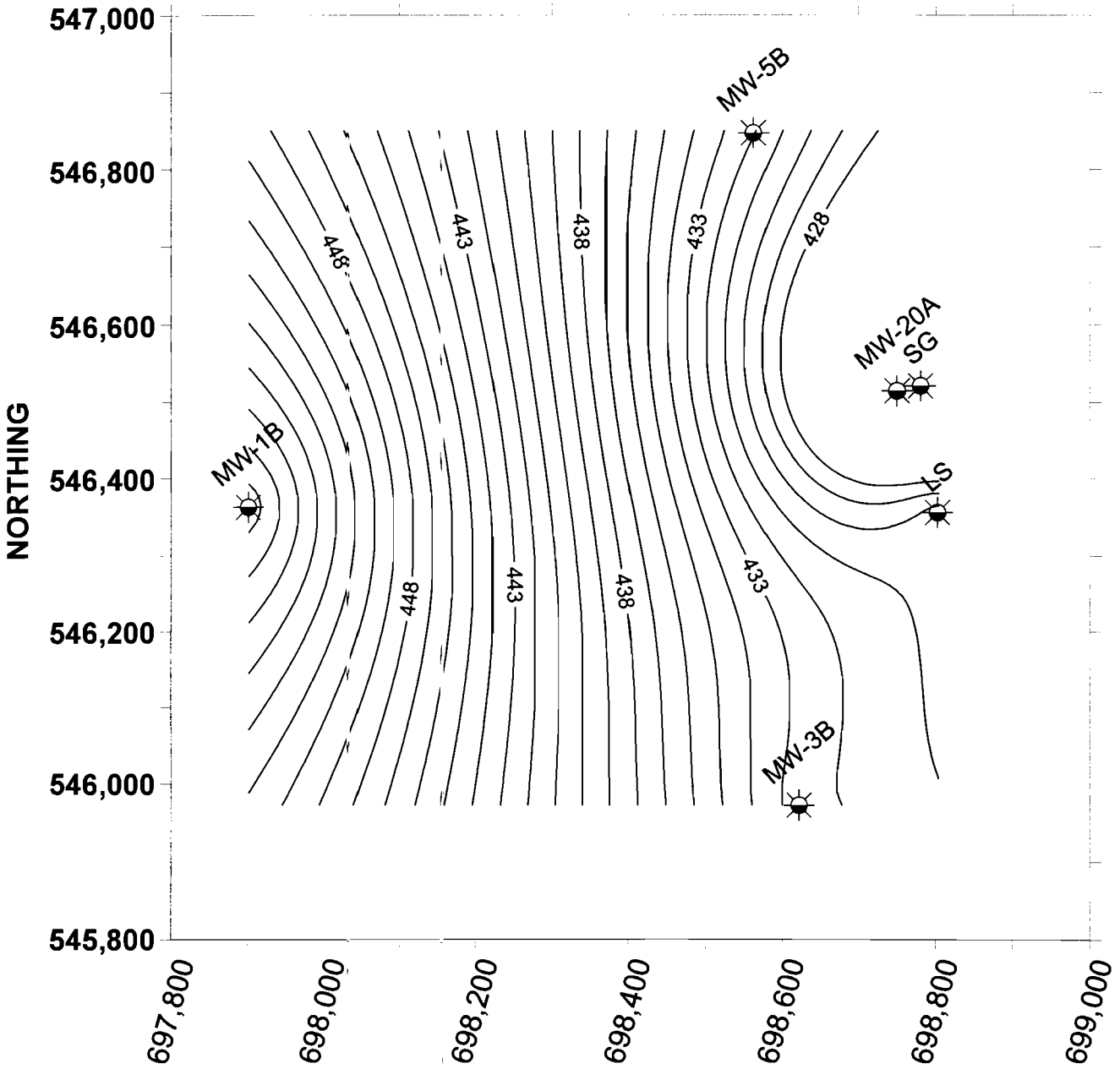

FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 02/27/02

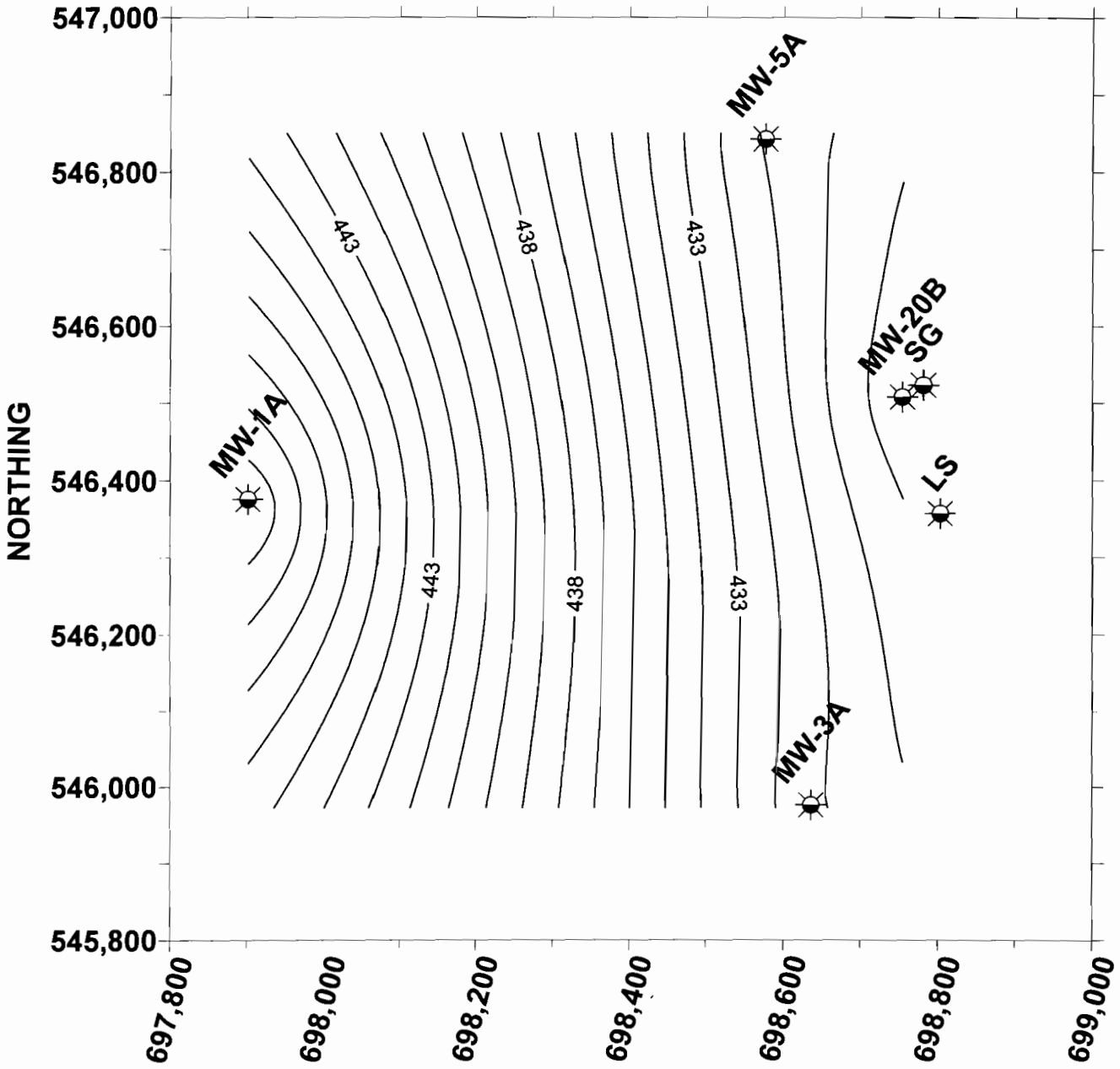

FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 03/28/02

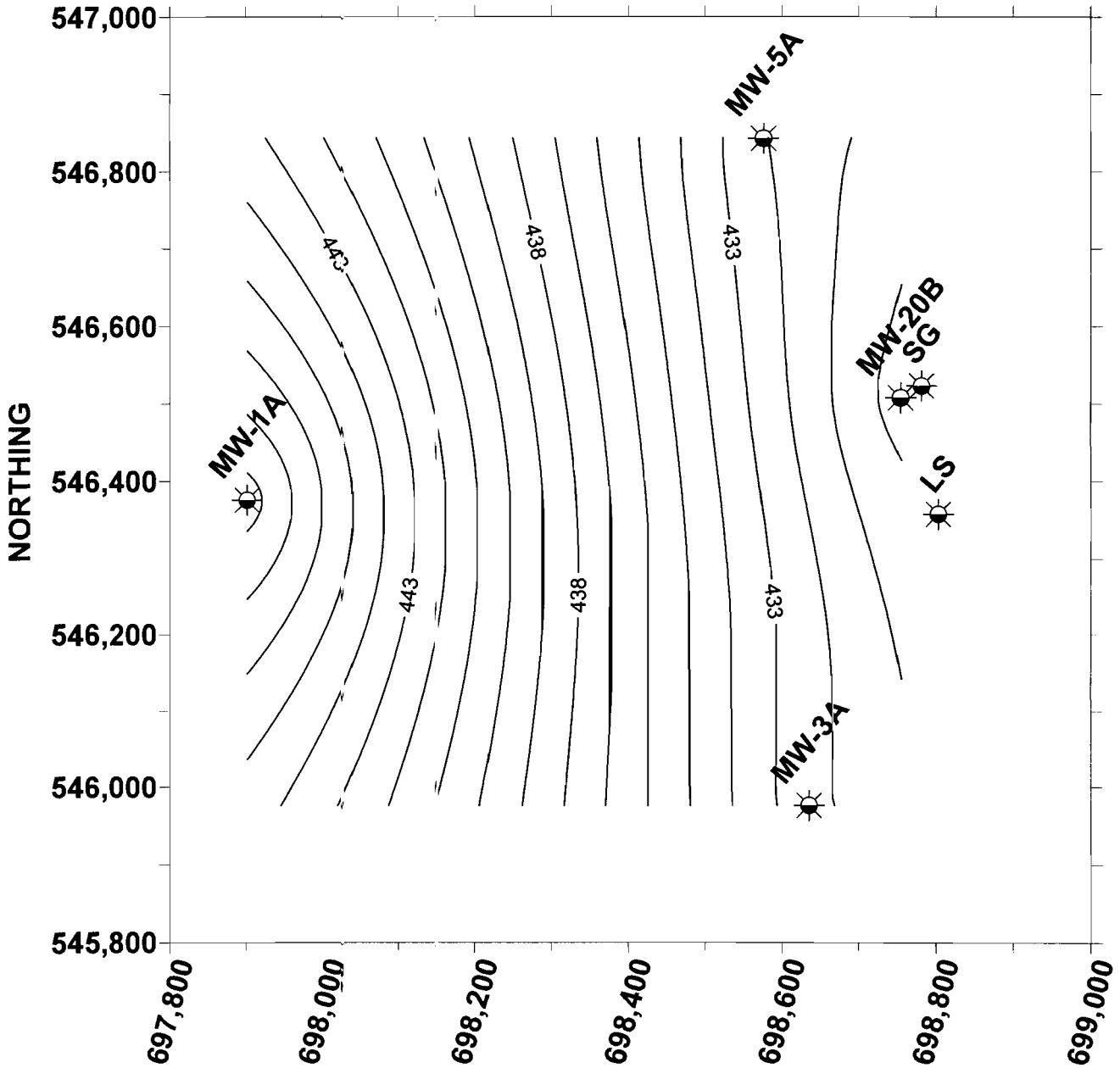

FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 04/25/02

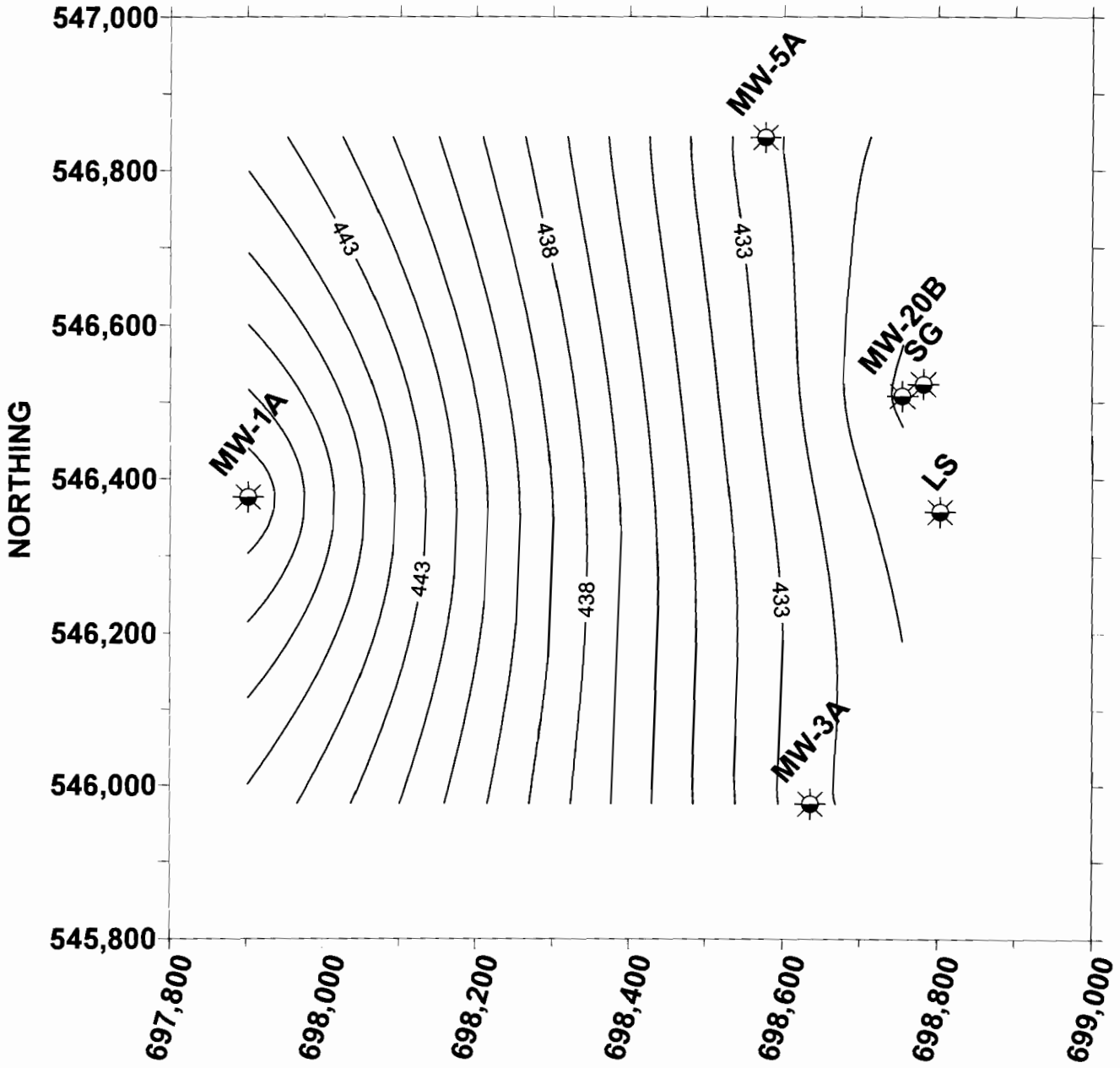

FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 05/15/02

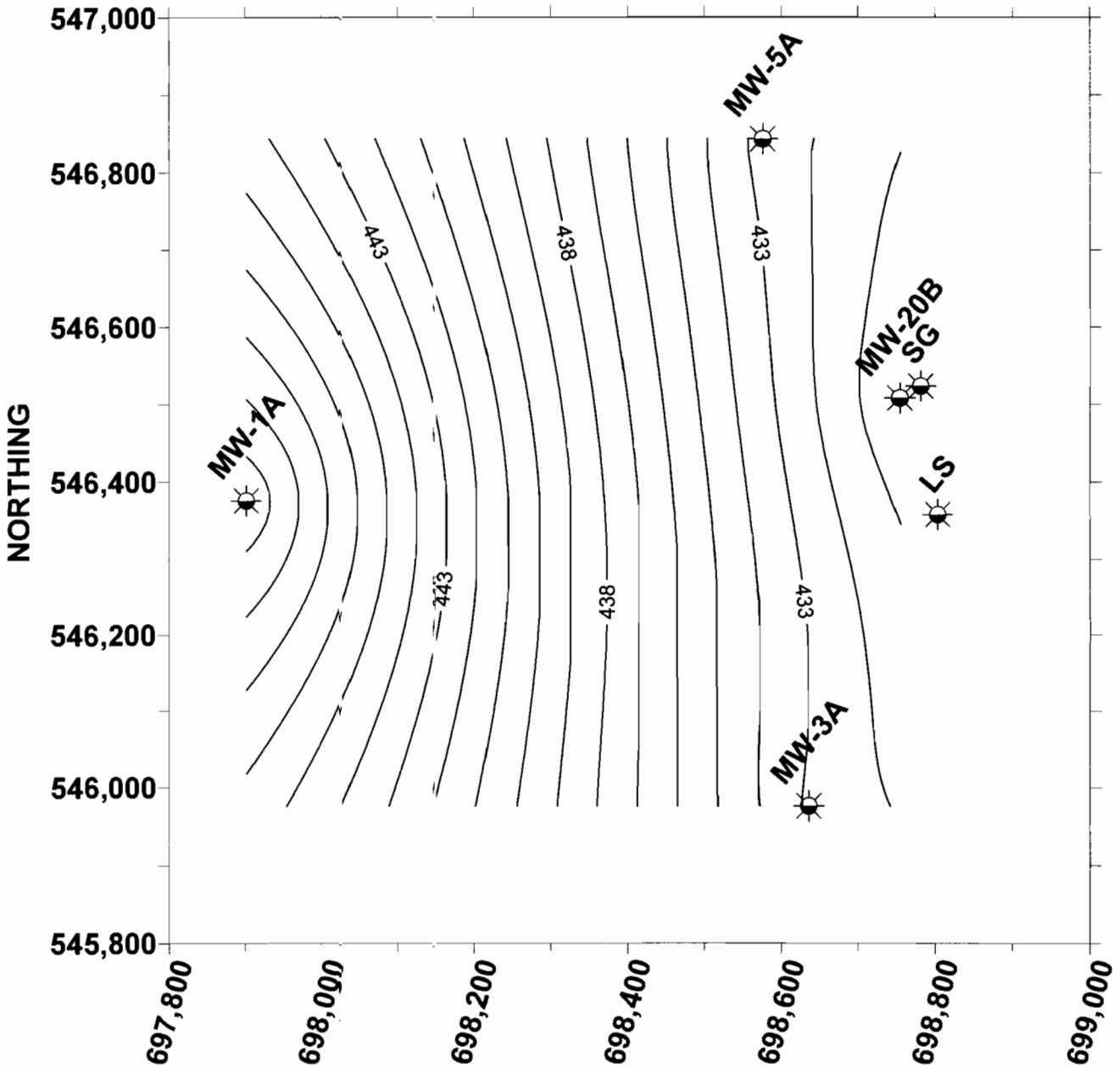

FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 06/13/02

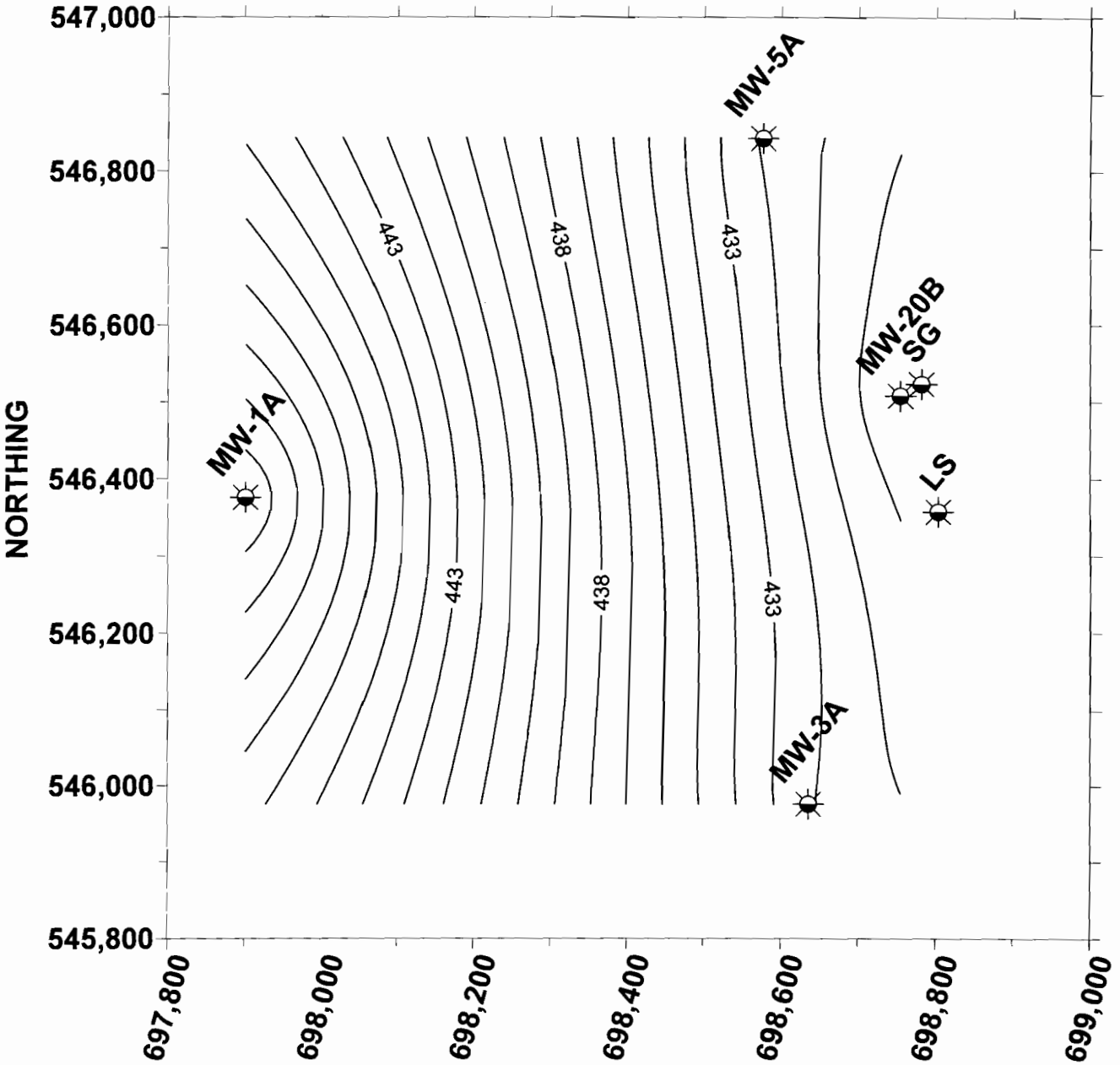

FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 07/25/02

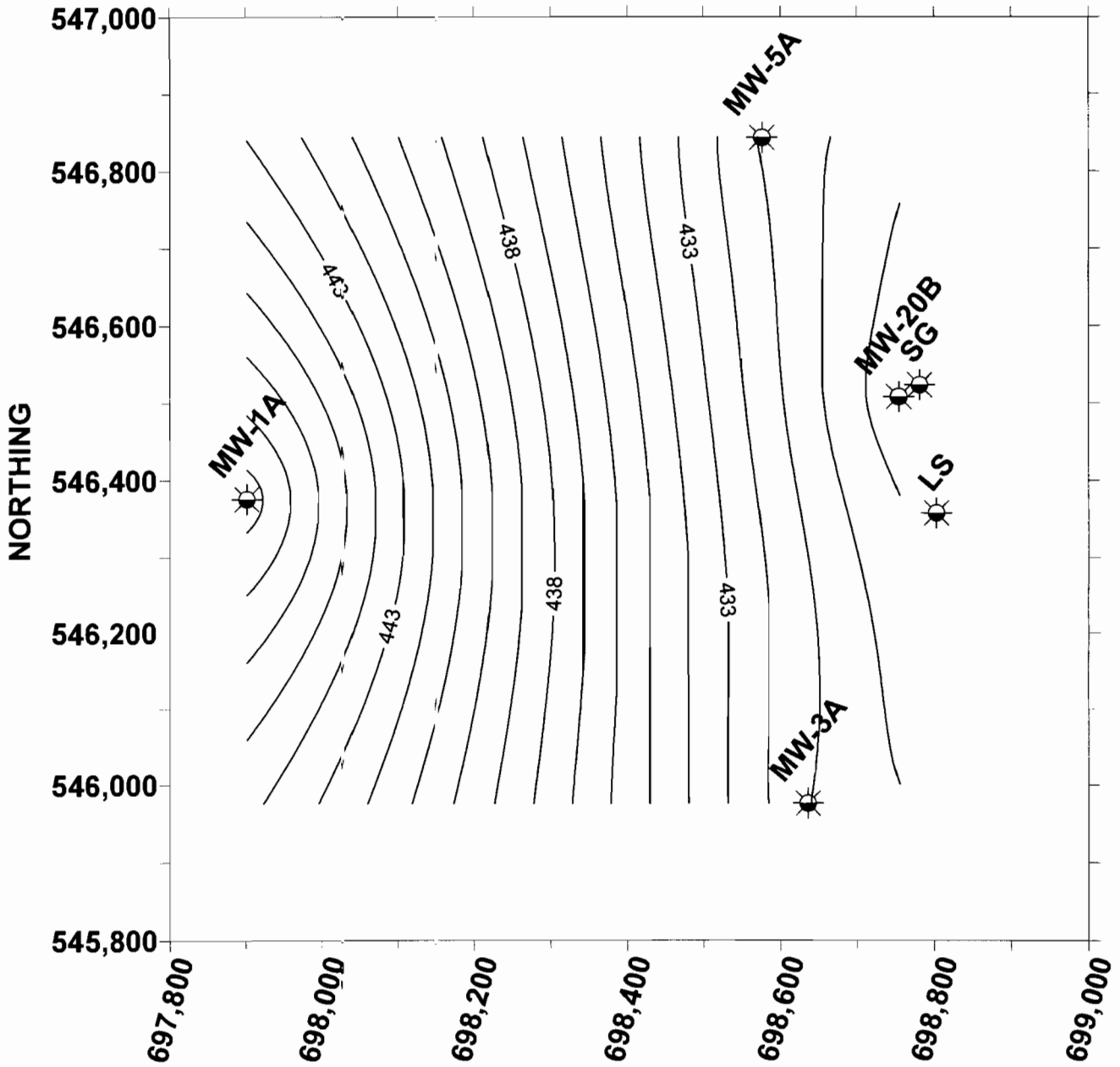

FIGURE D- 4
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DEEP GROUNDWATER CONTOUR: 08/22/02

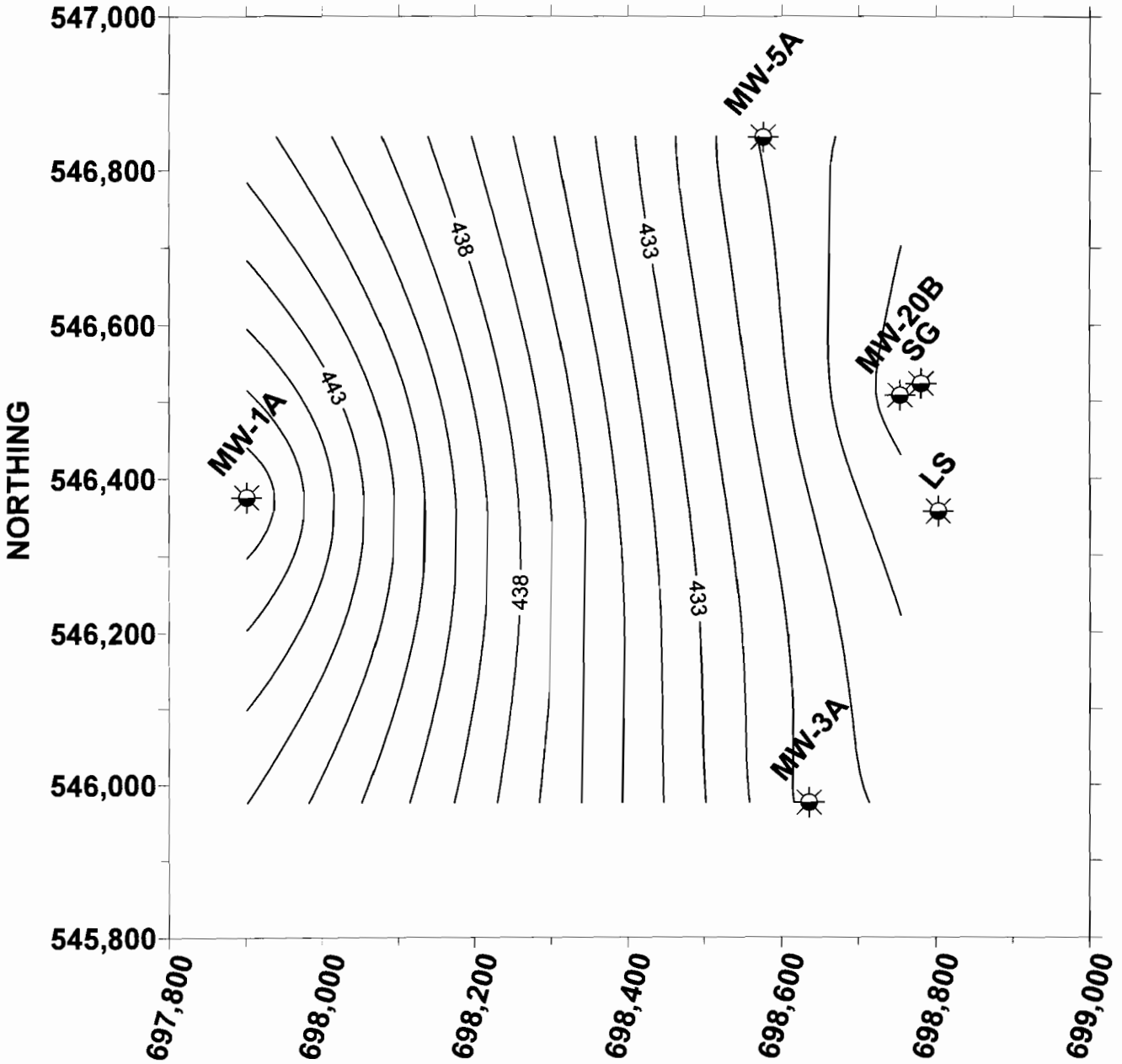

FIGURE D- 4
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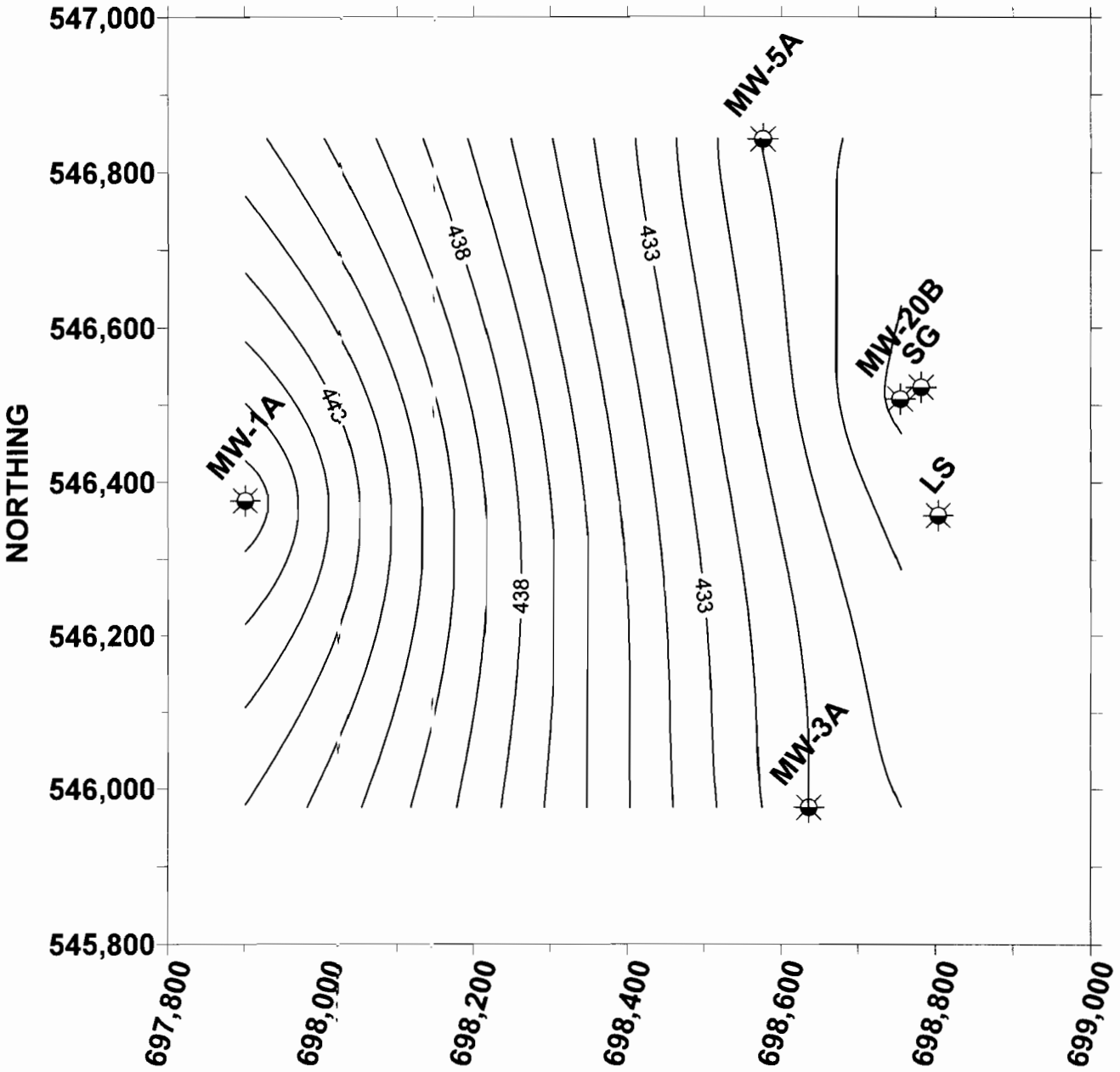

FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 10/24/02

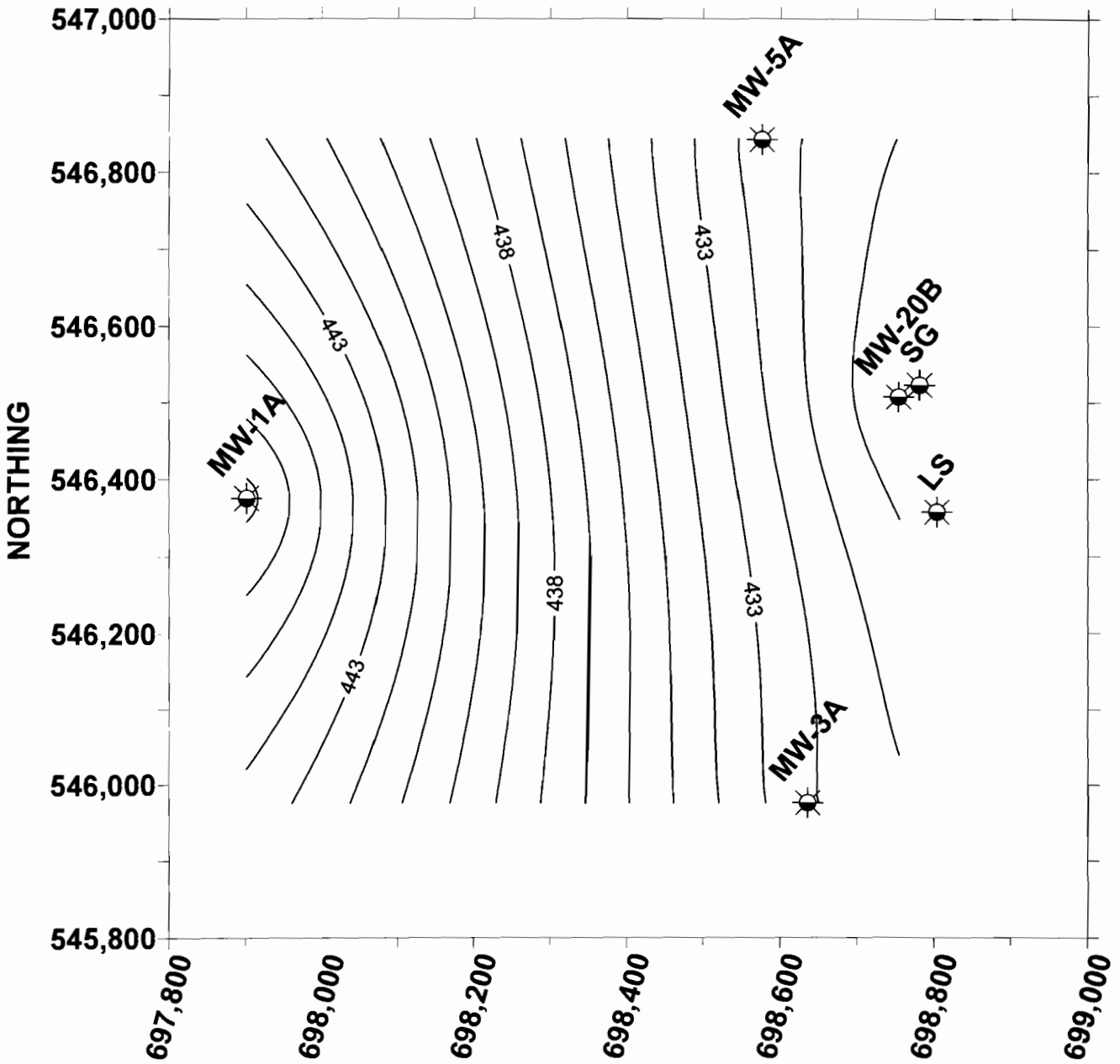

FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 11/17/02

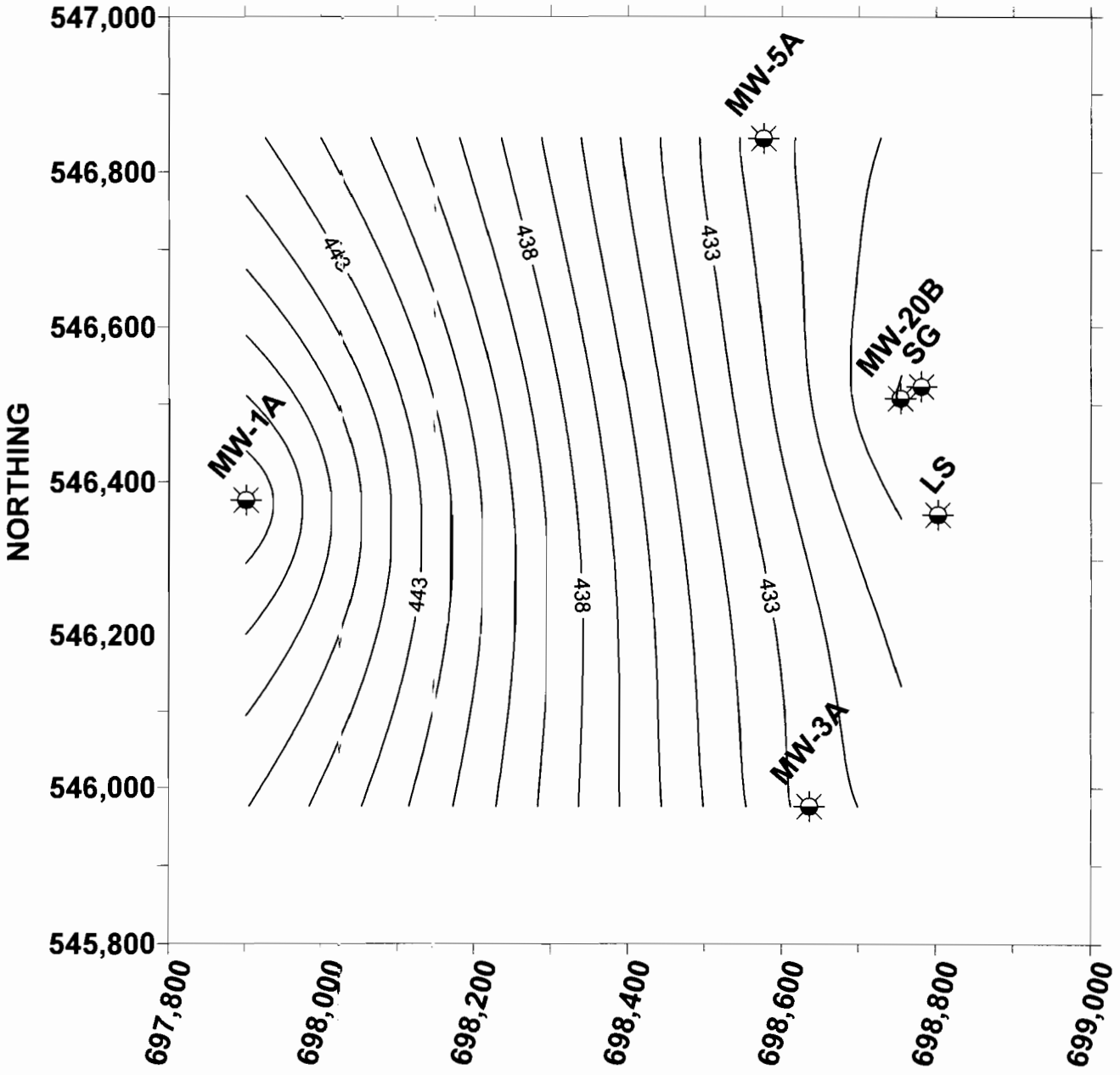

FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 12/19/02

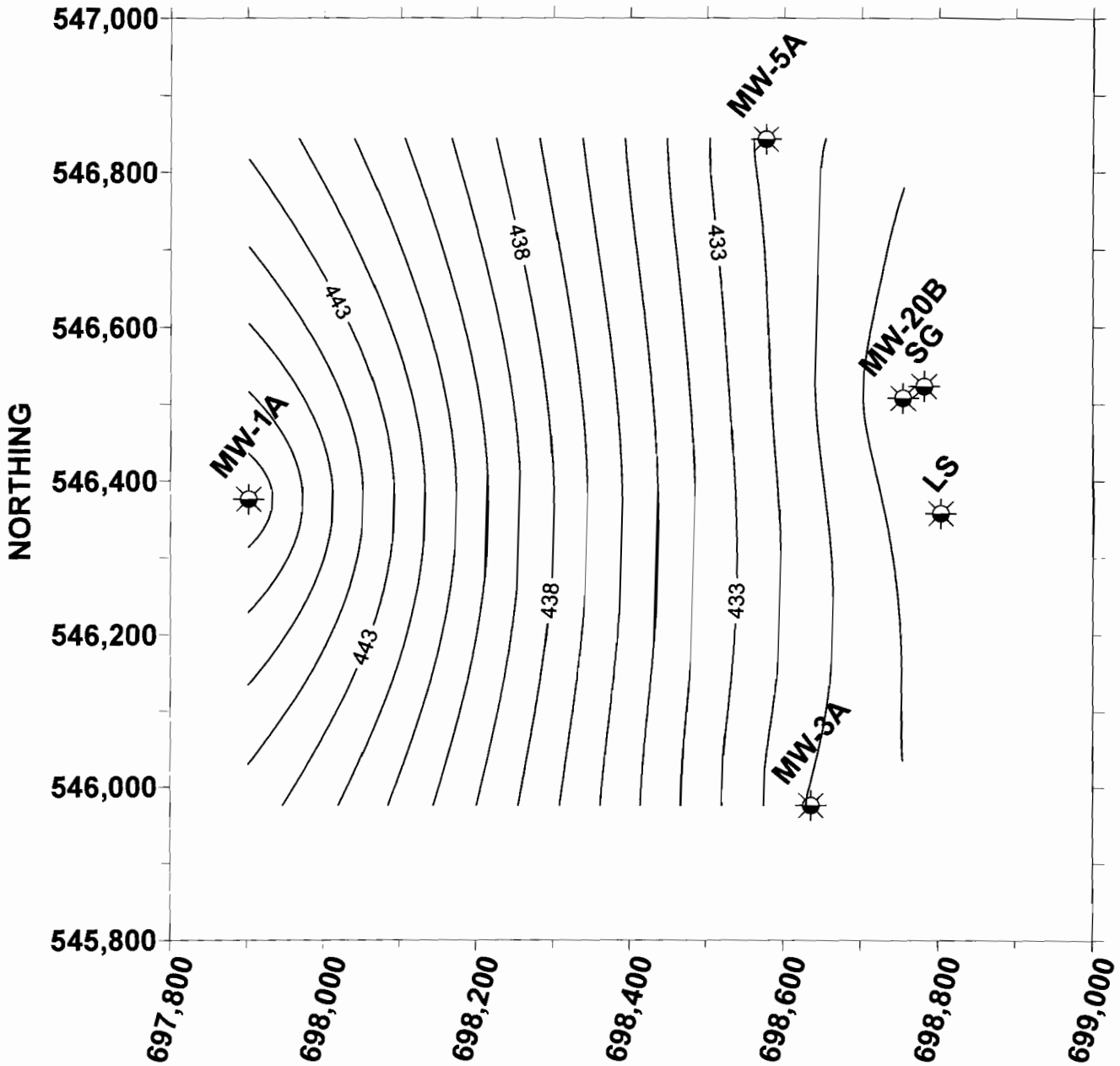

FIGURE D- 4
KE$SMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 03/26/03

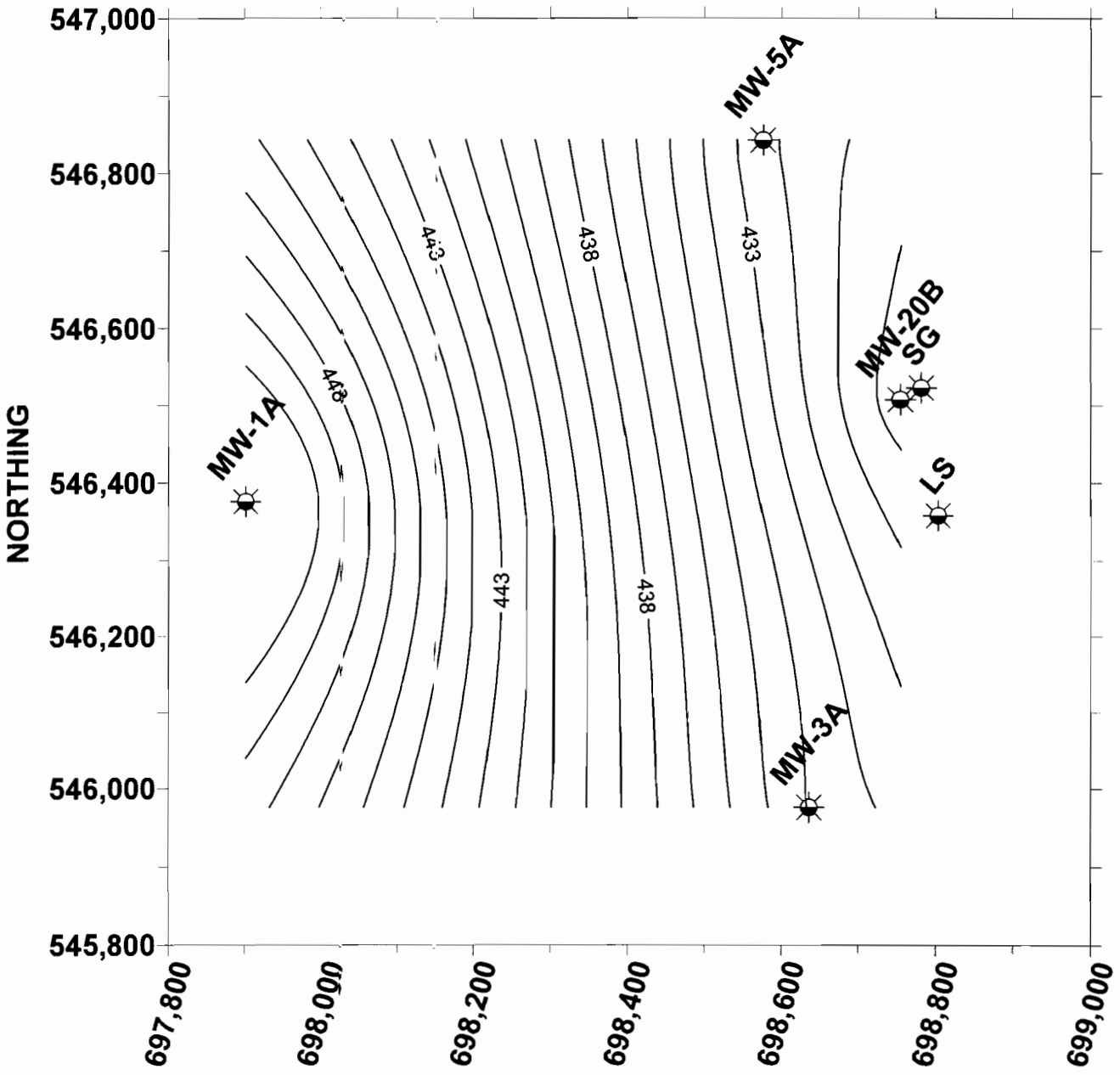

FIGURE D- 4
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DEEP GROUNDWATER CONTOUR: 04/24/03

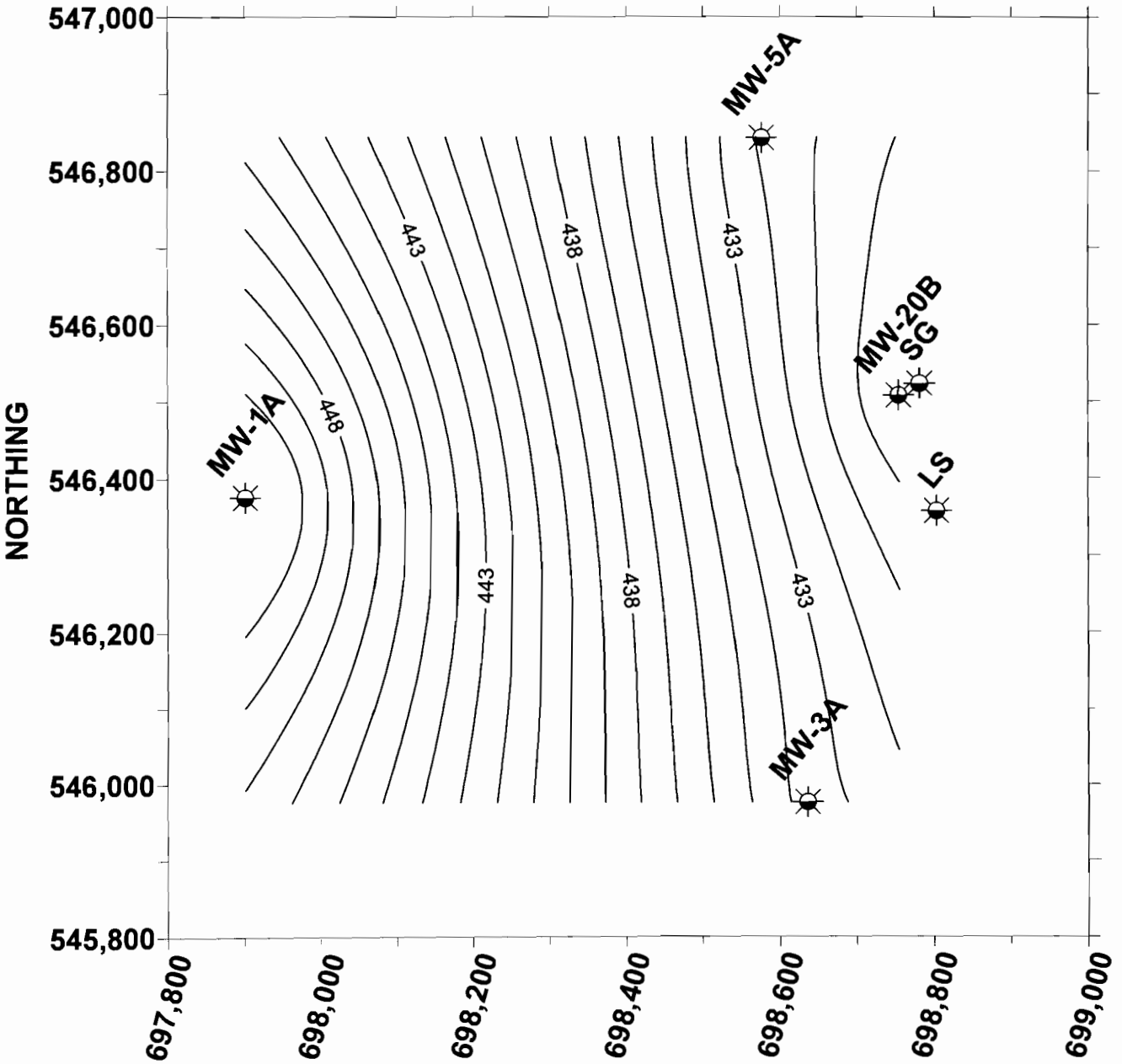


FIGURE D- 4
KE$SMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 05/29/03

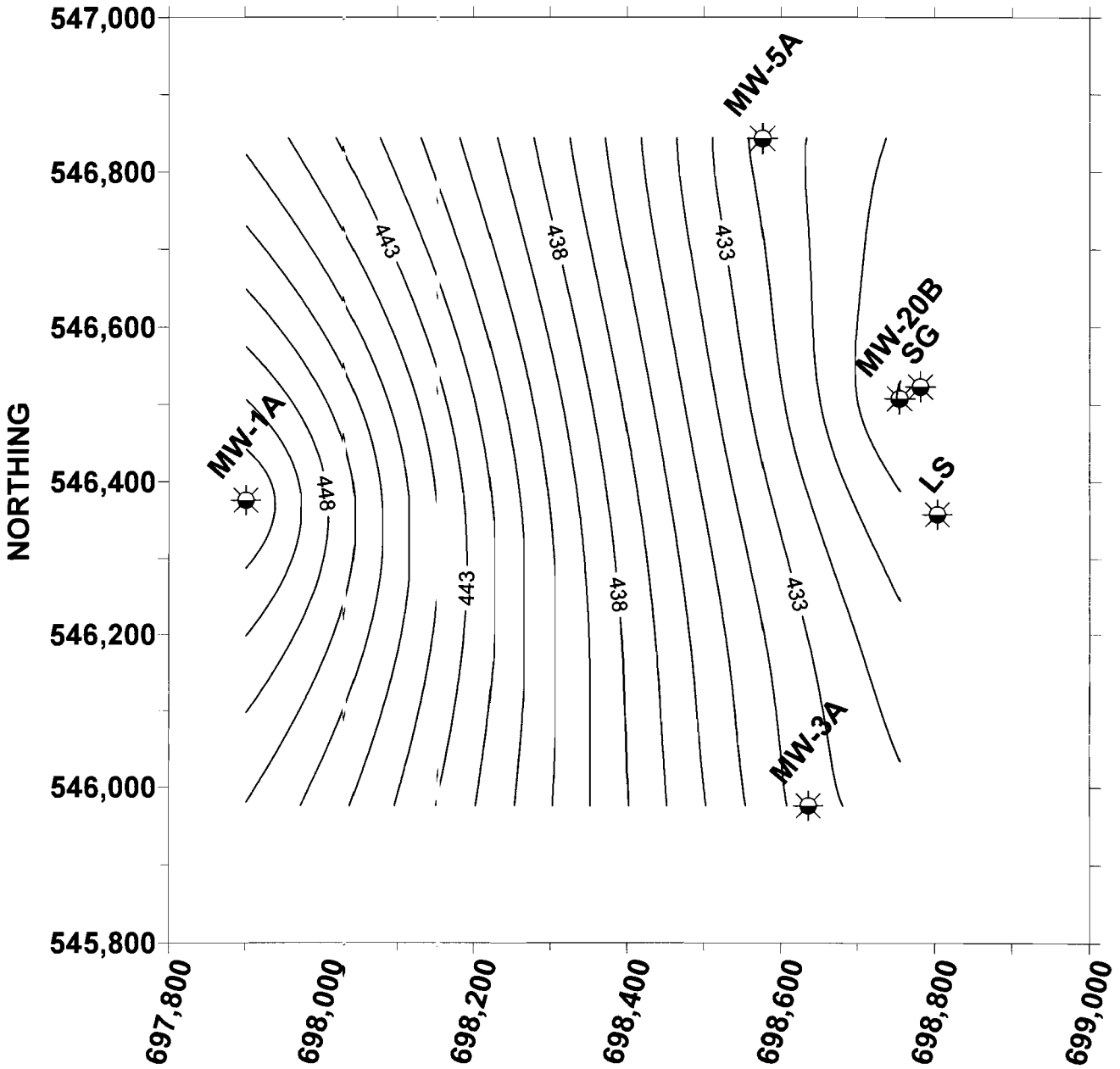


FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 06/26/03

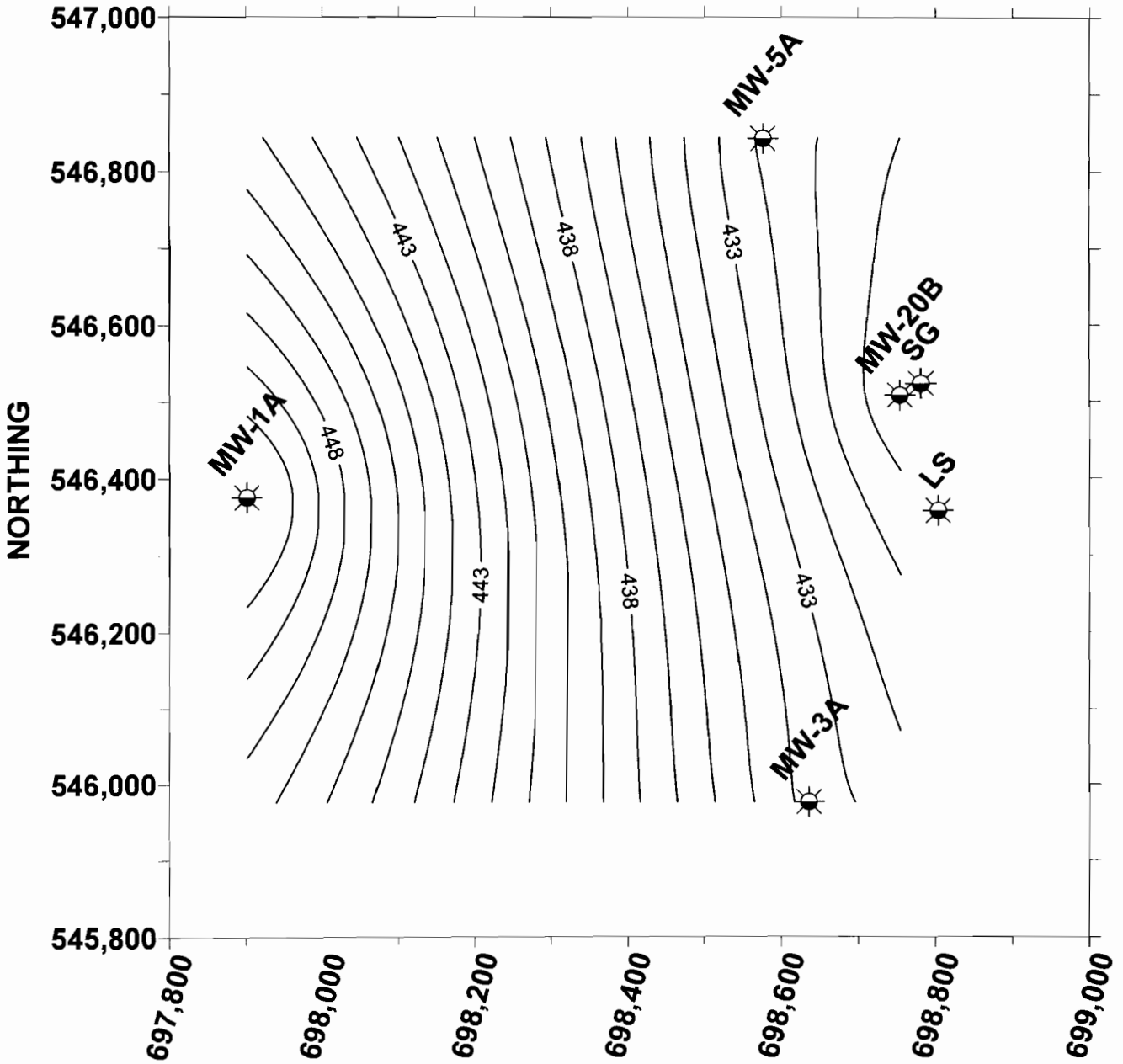


FIGURE D- 4
KE$SMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 07/29/03

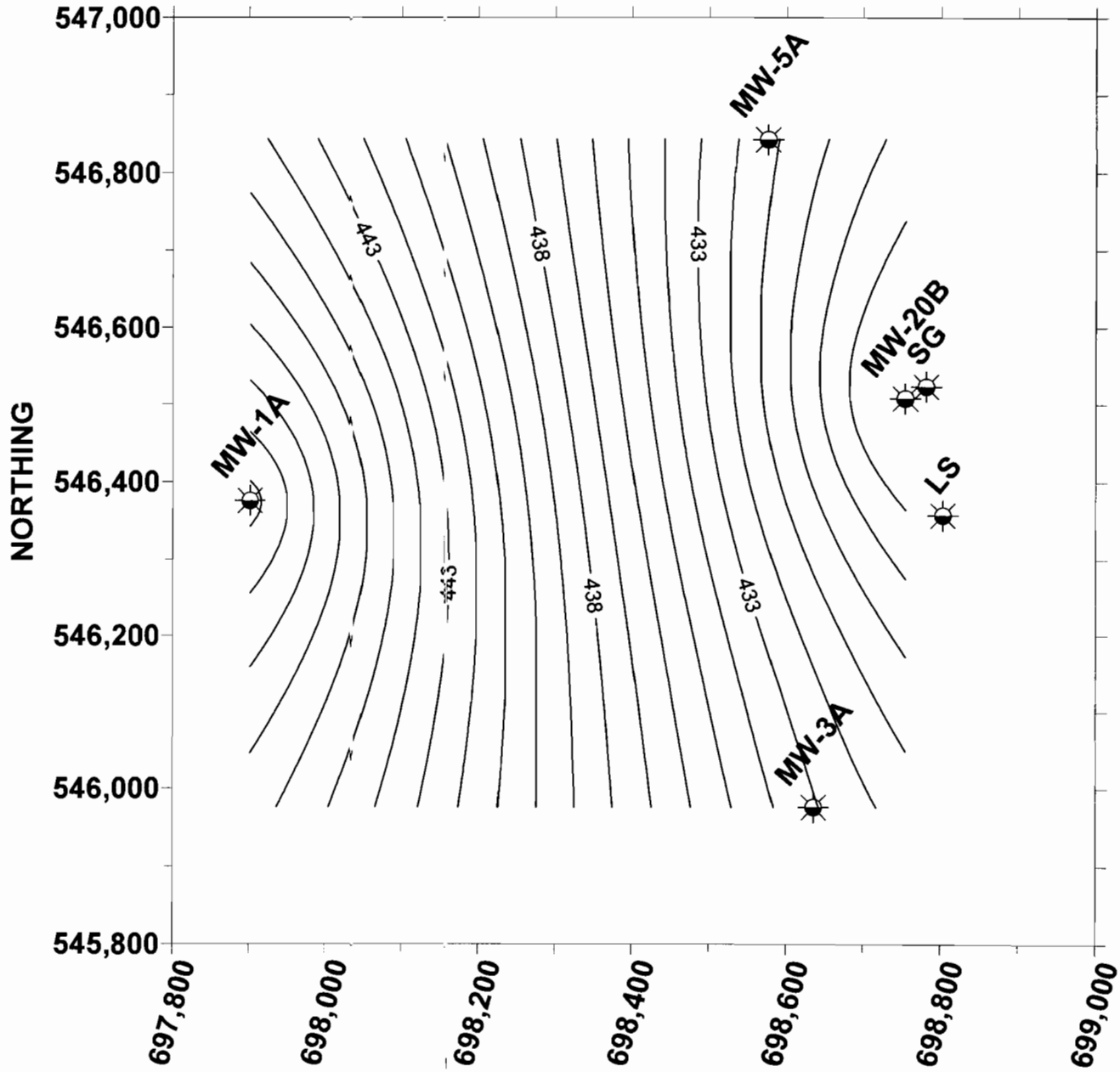


FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 08/19/03

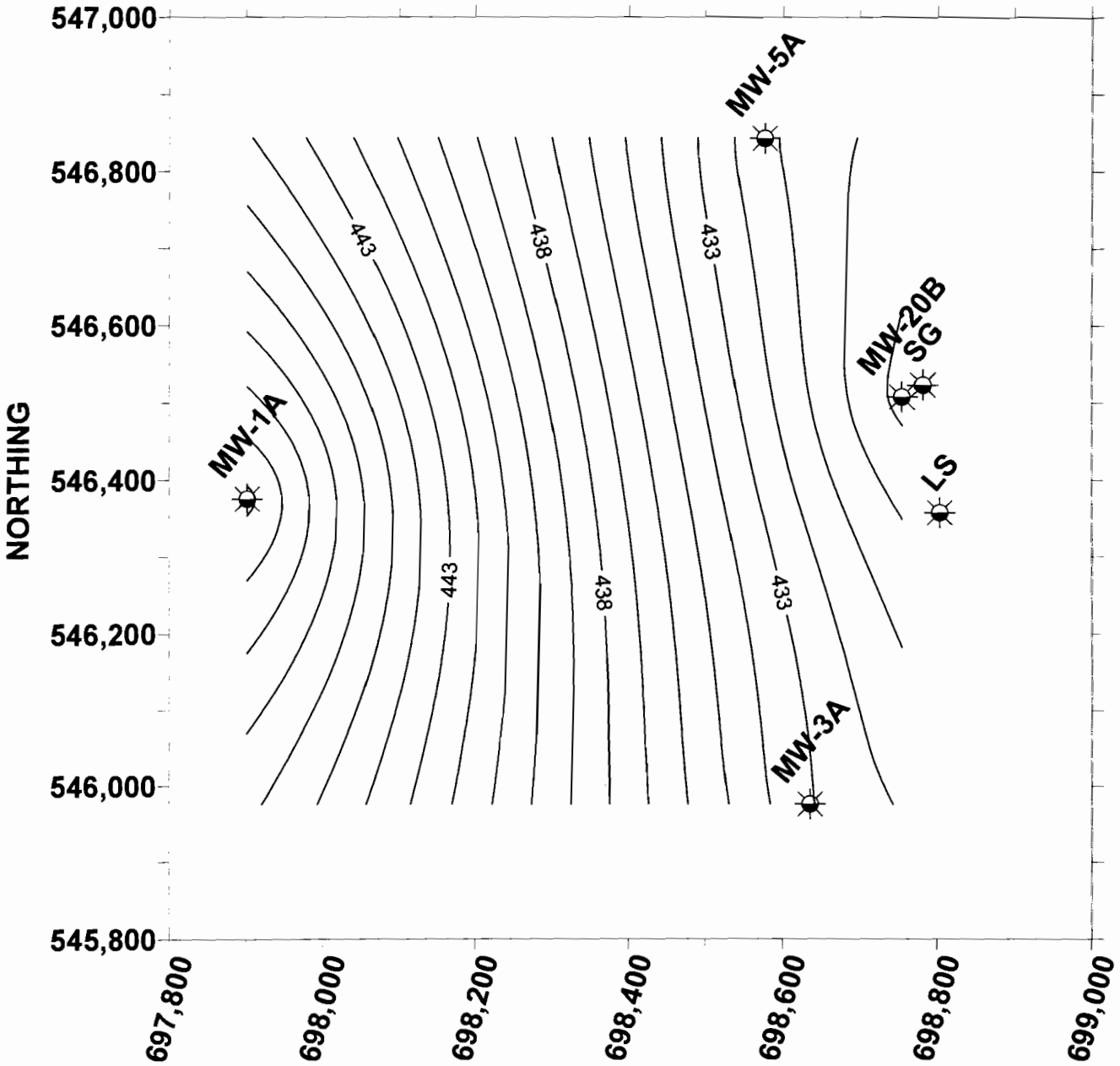


FIGURE D- 4
KE$SMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 10/01/03

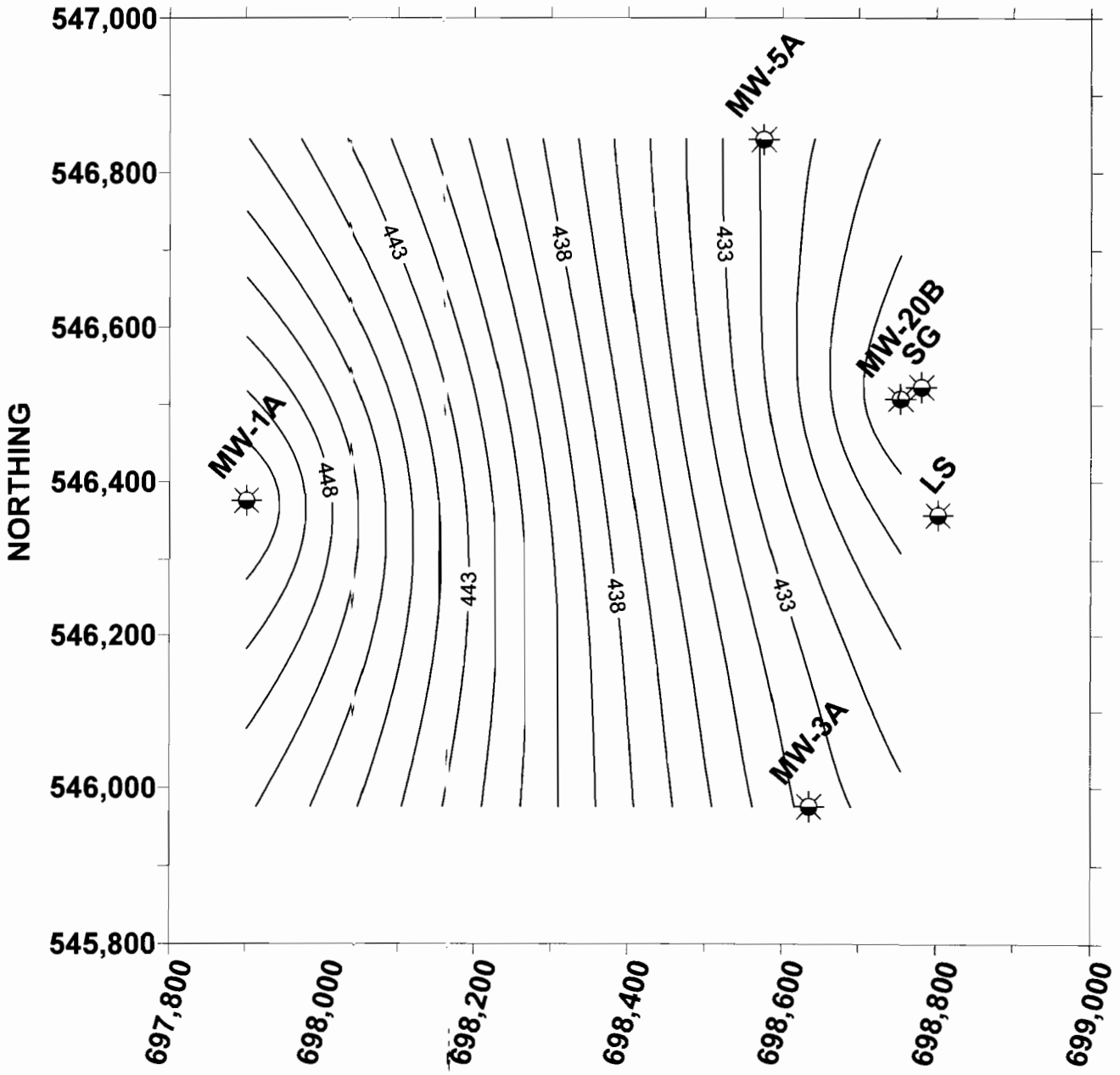


FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 11/26/03

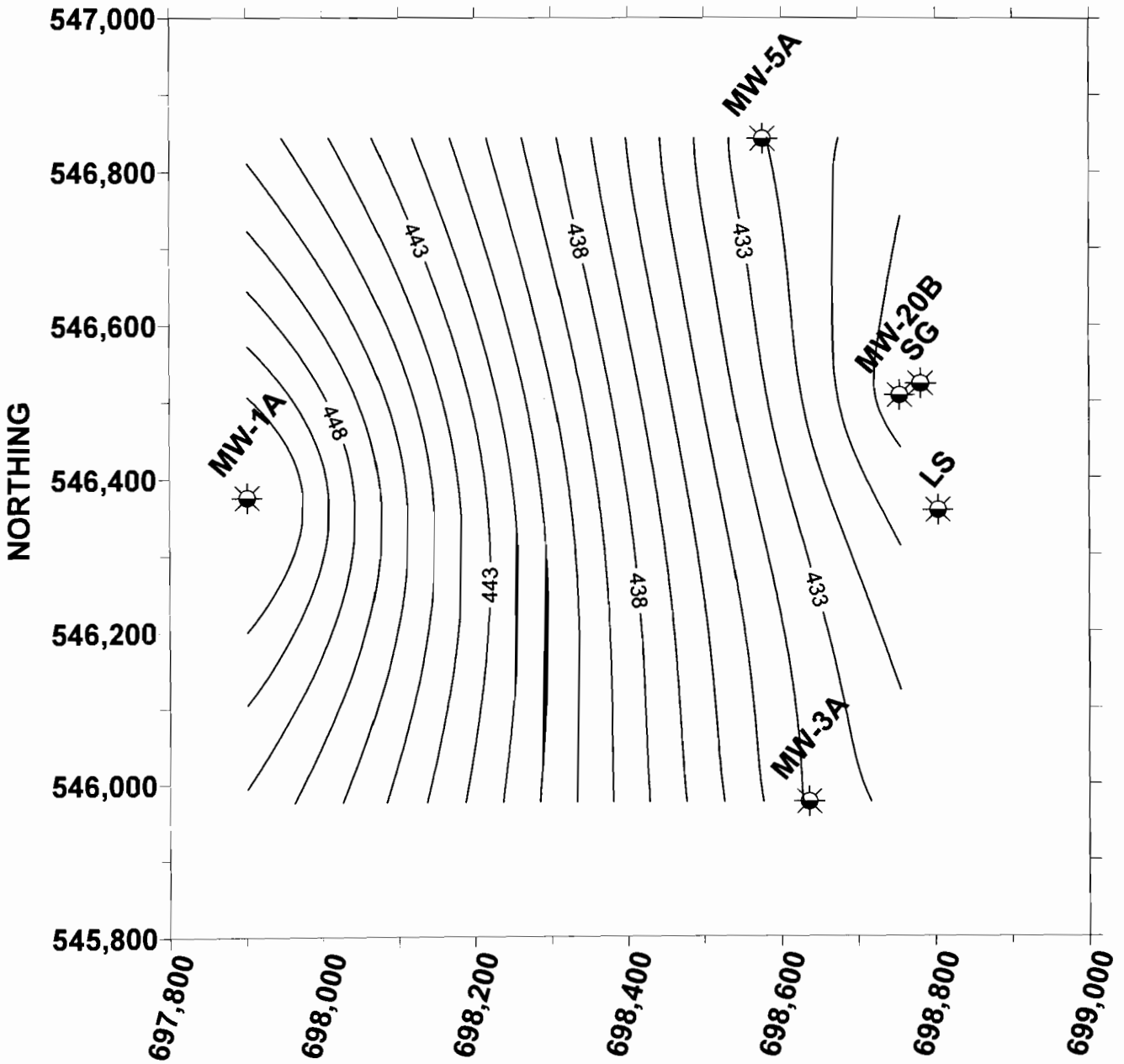


FIGURE D- 4
KE$SMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 12/23/03

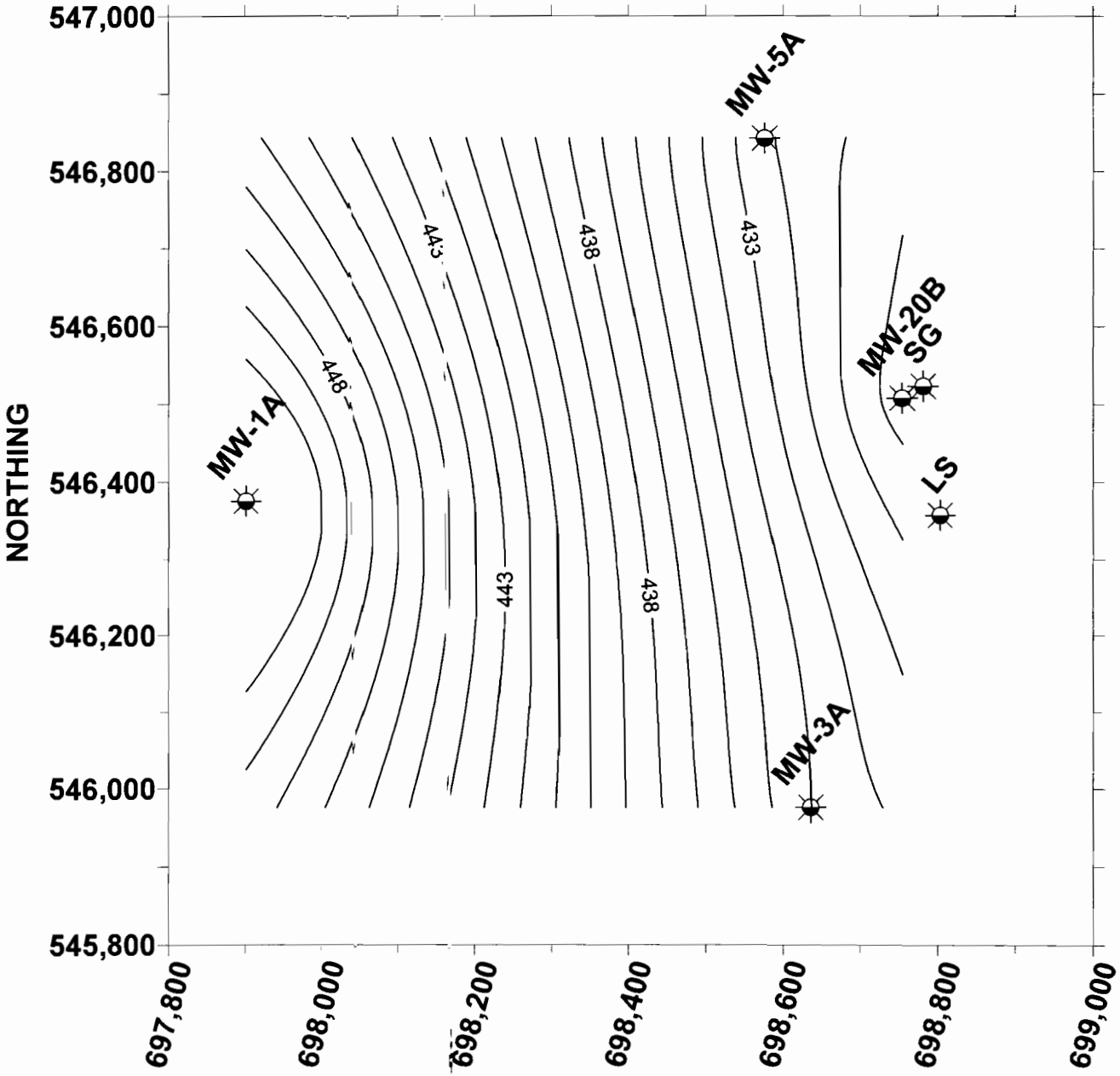


FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 04/30/04

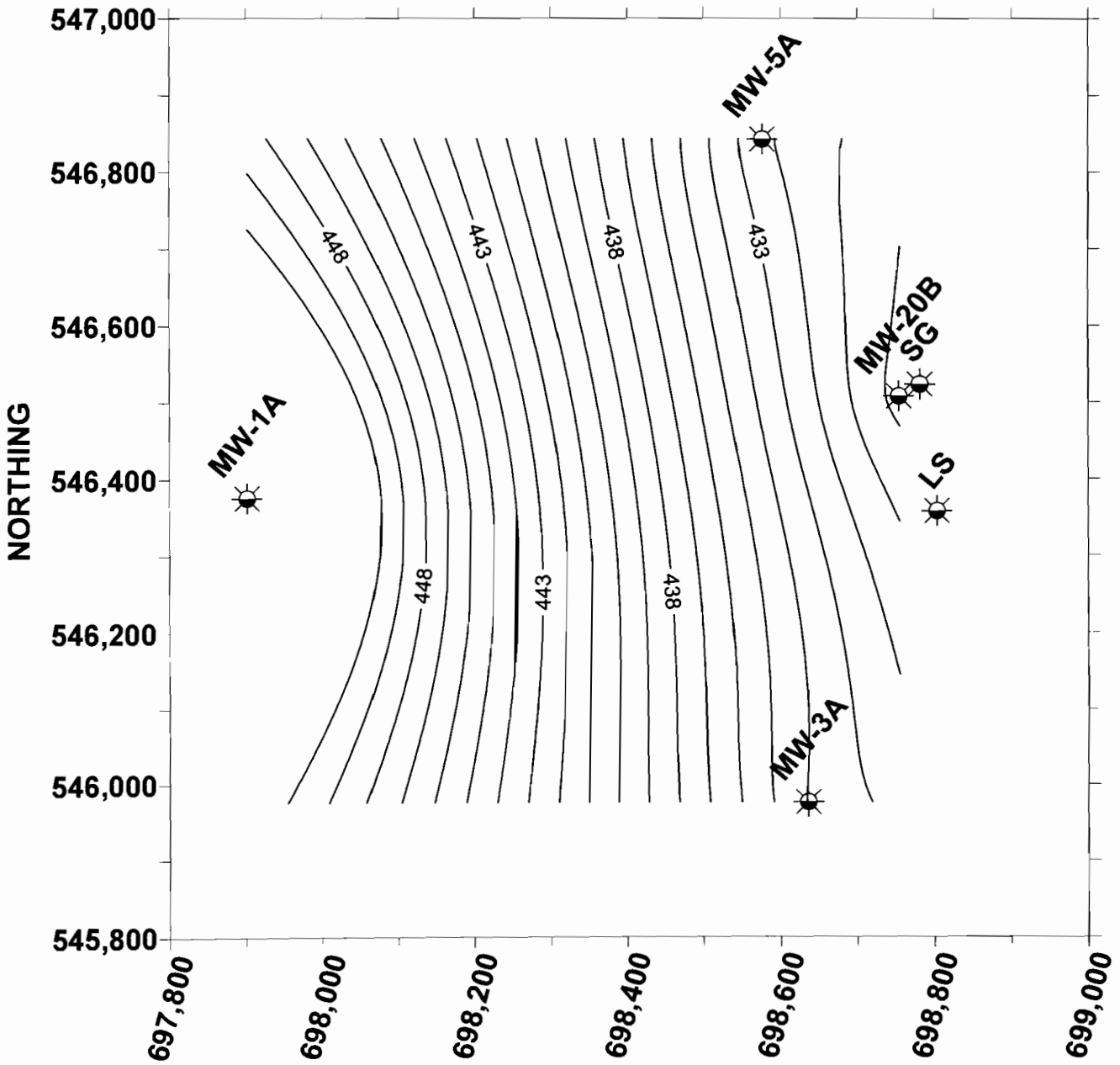


FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 05/25/04

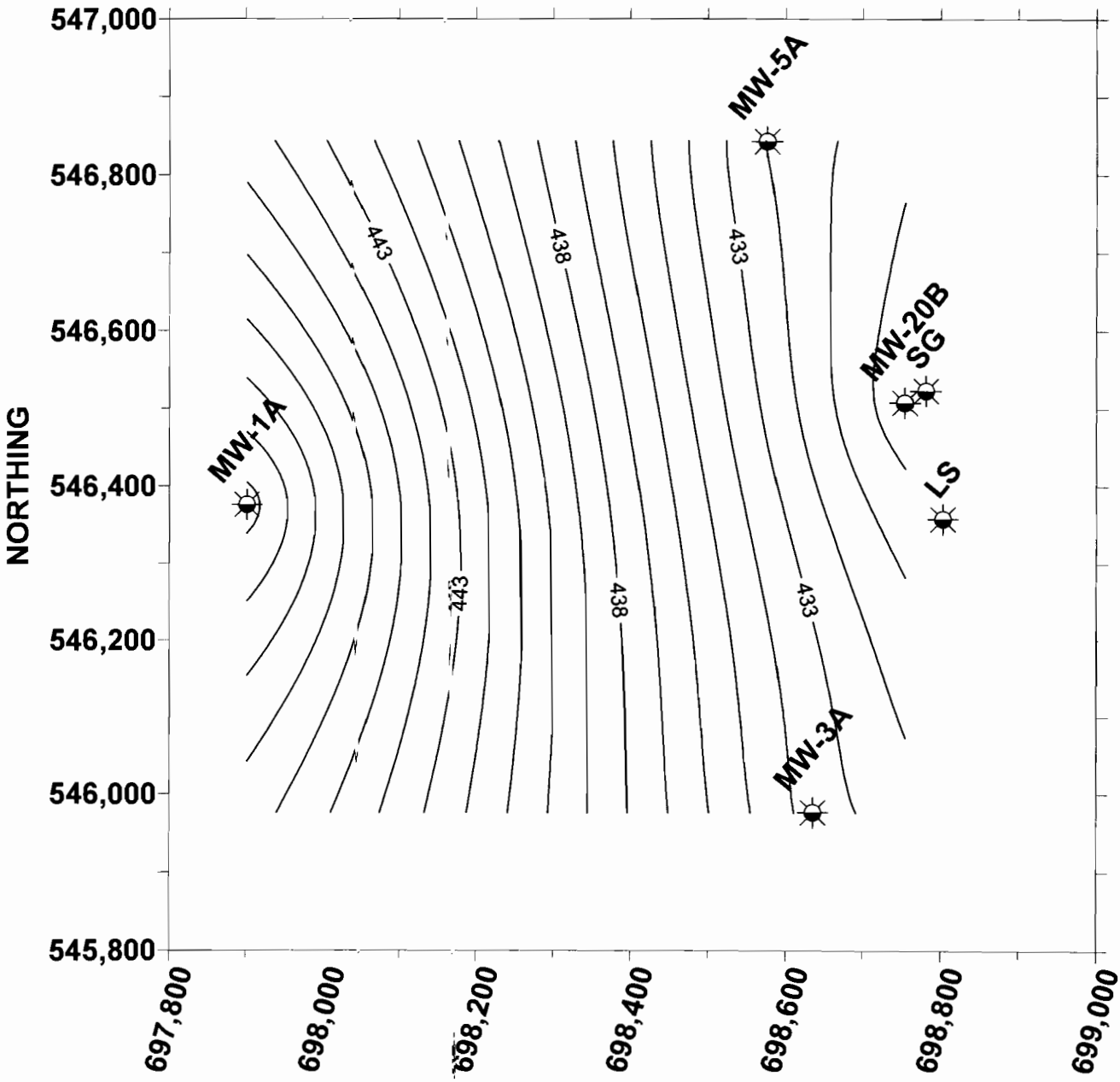


FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 06/30/04

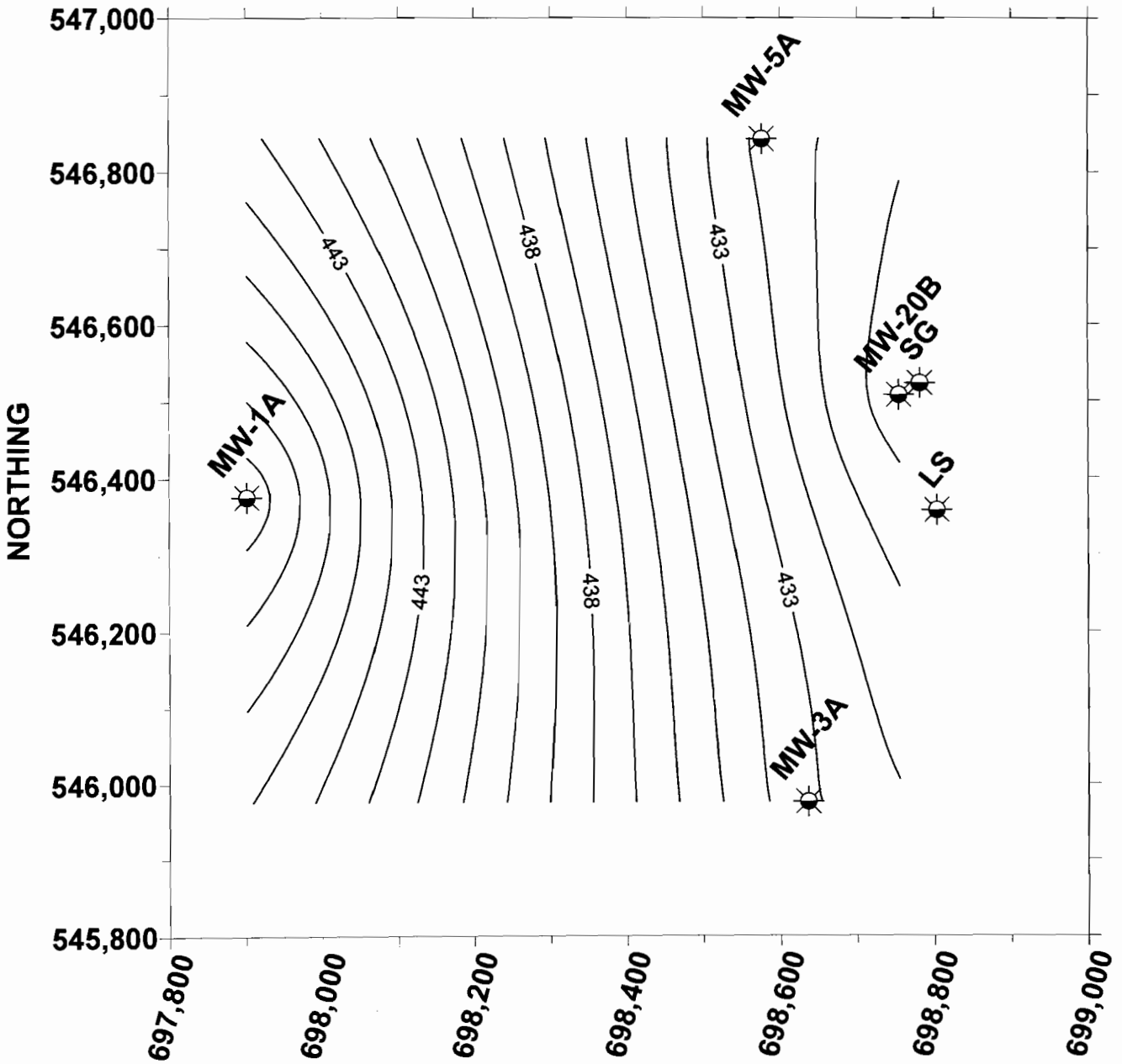


FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 07/26/04

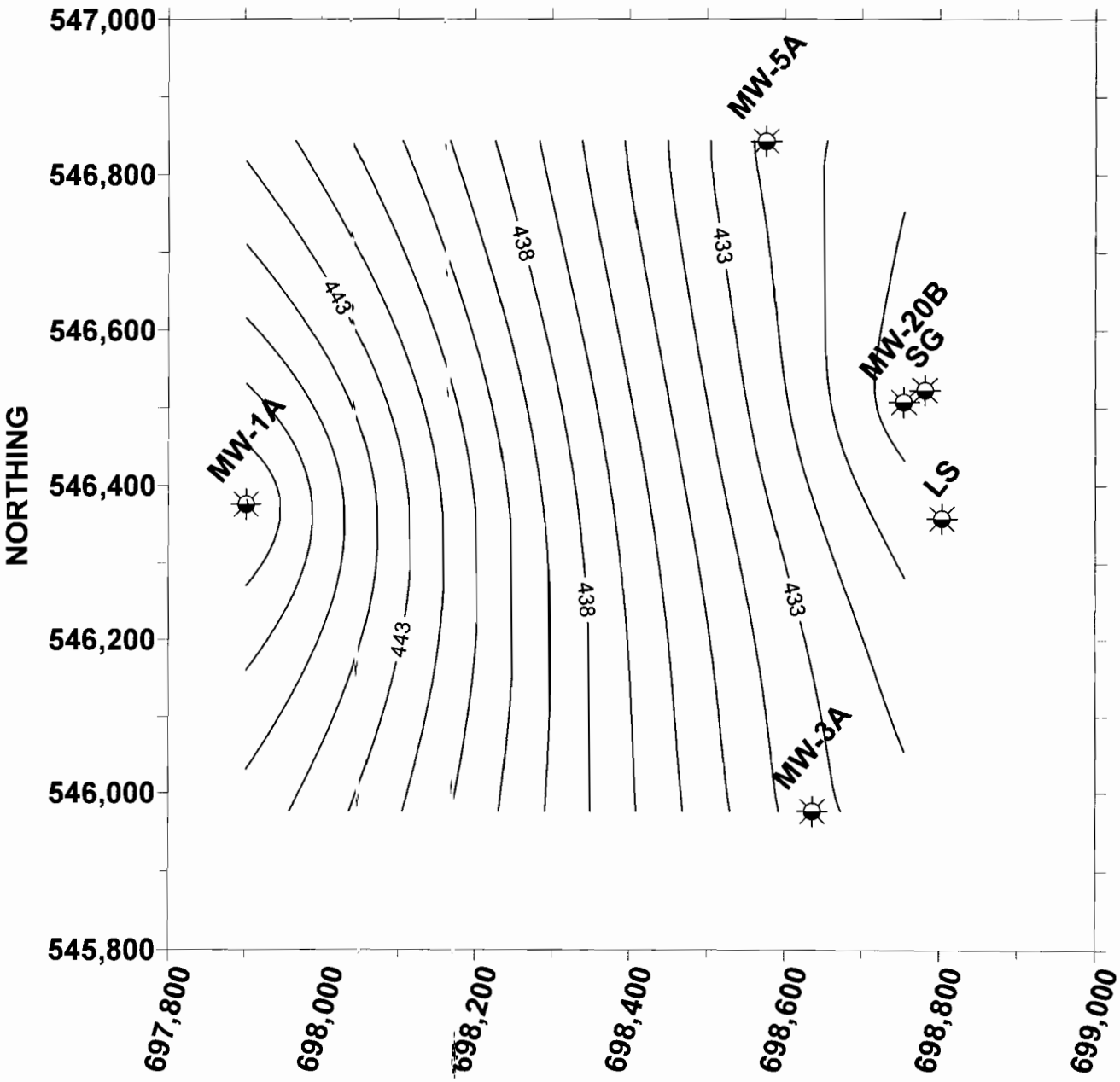


FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 08/23/04

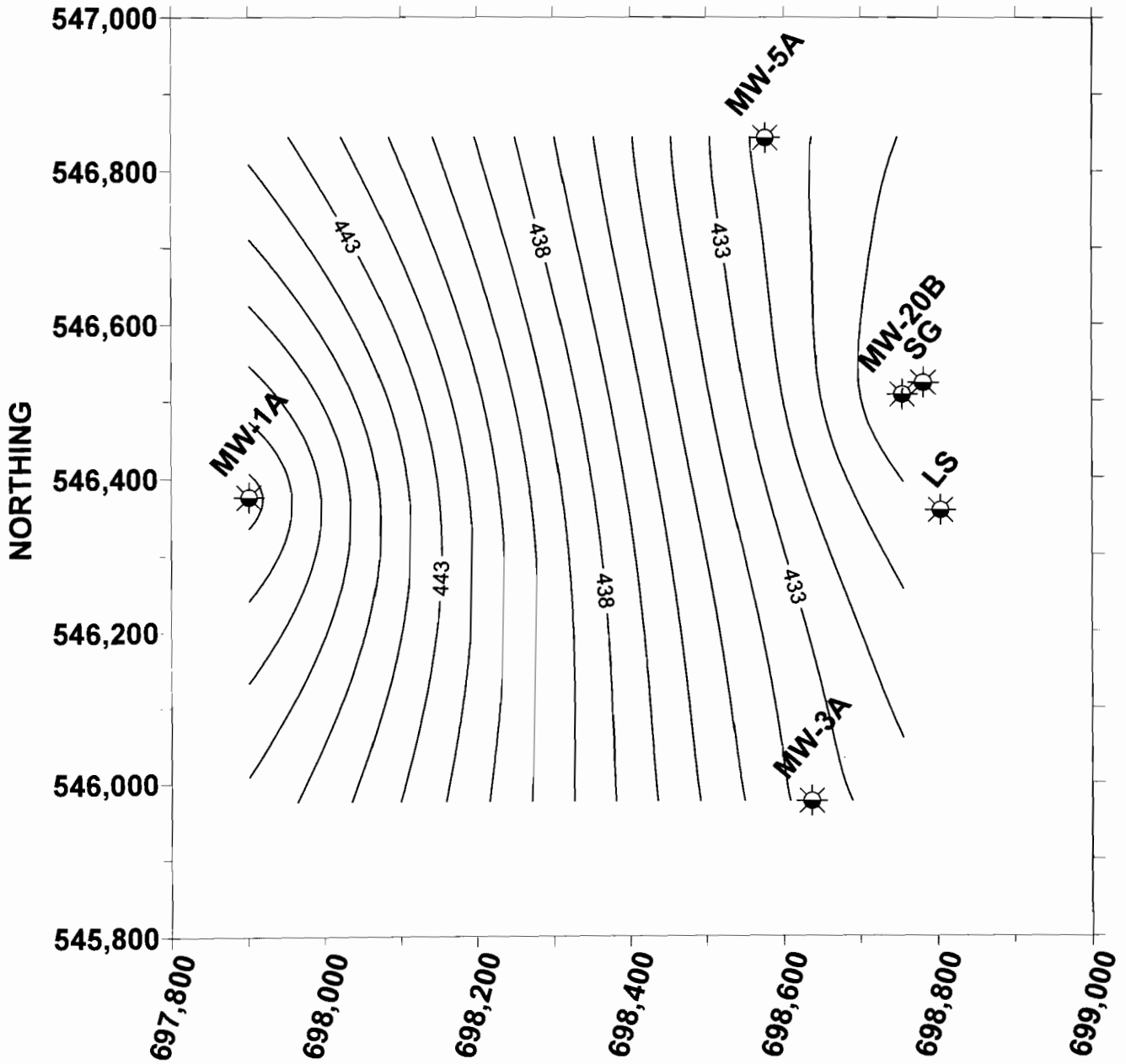


FIGURE D- 4
KE$SMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 09/22/04

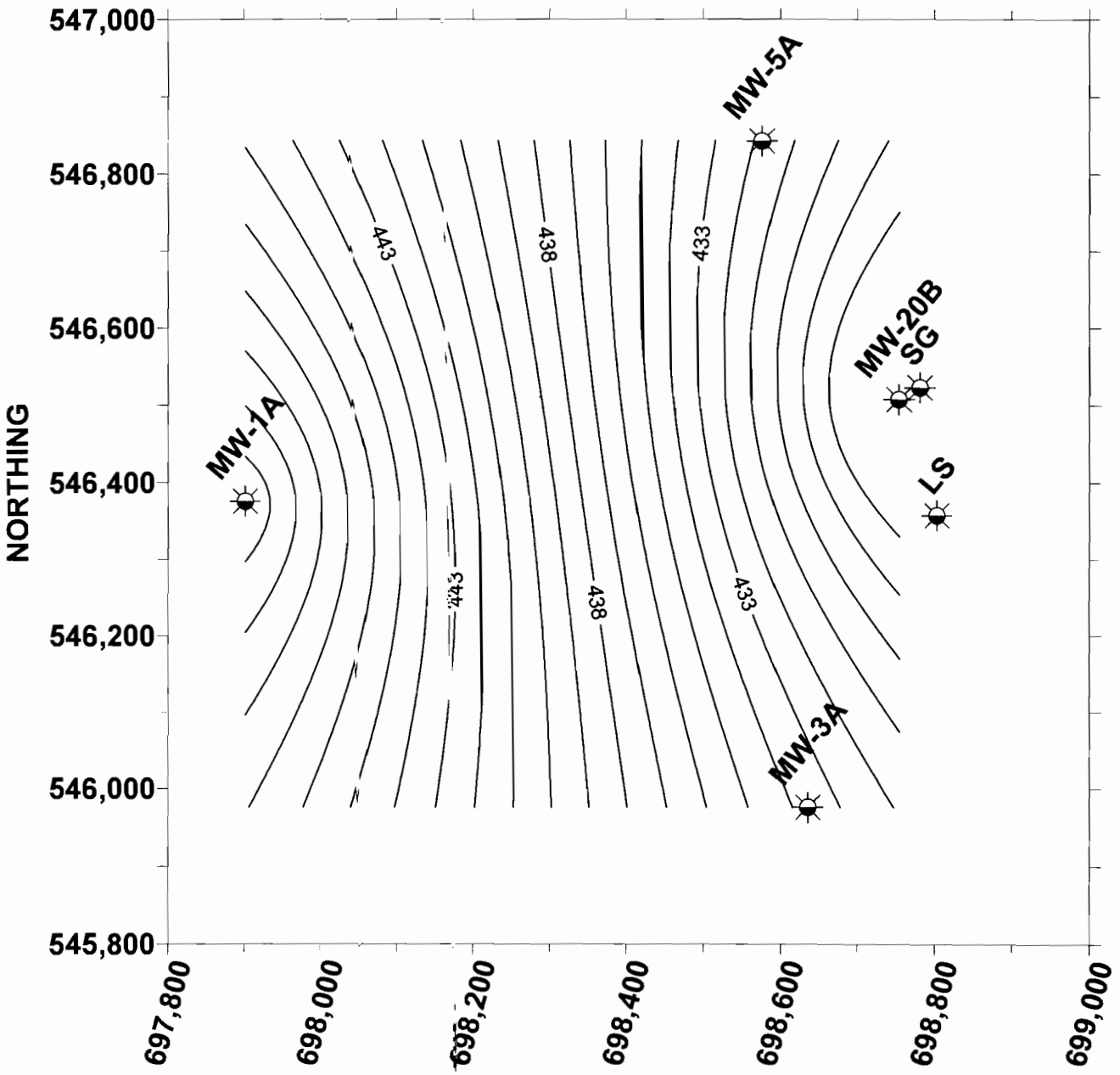


FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 10/30/04

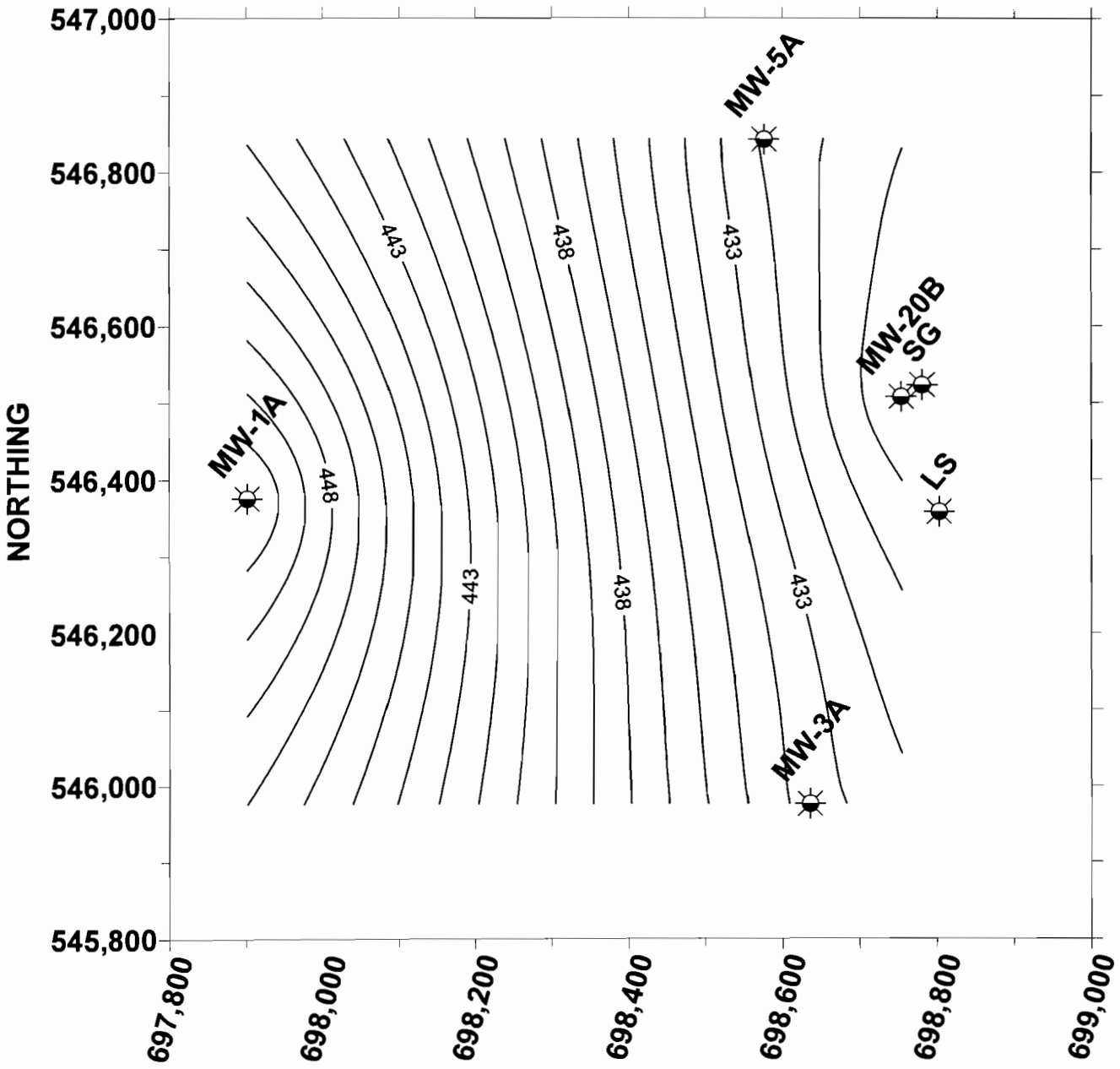


FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 11/23/04

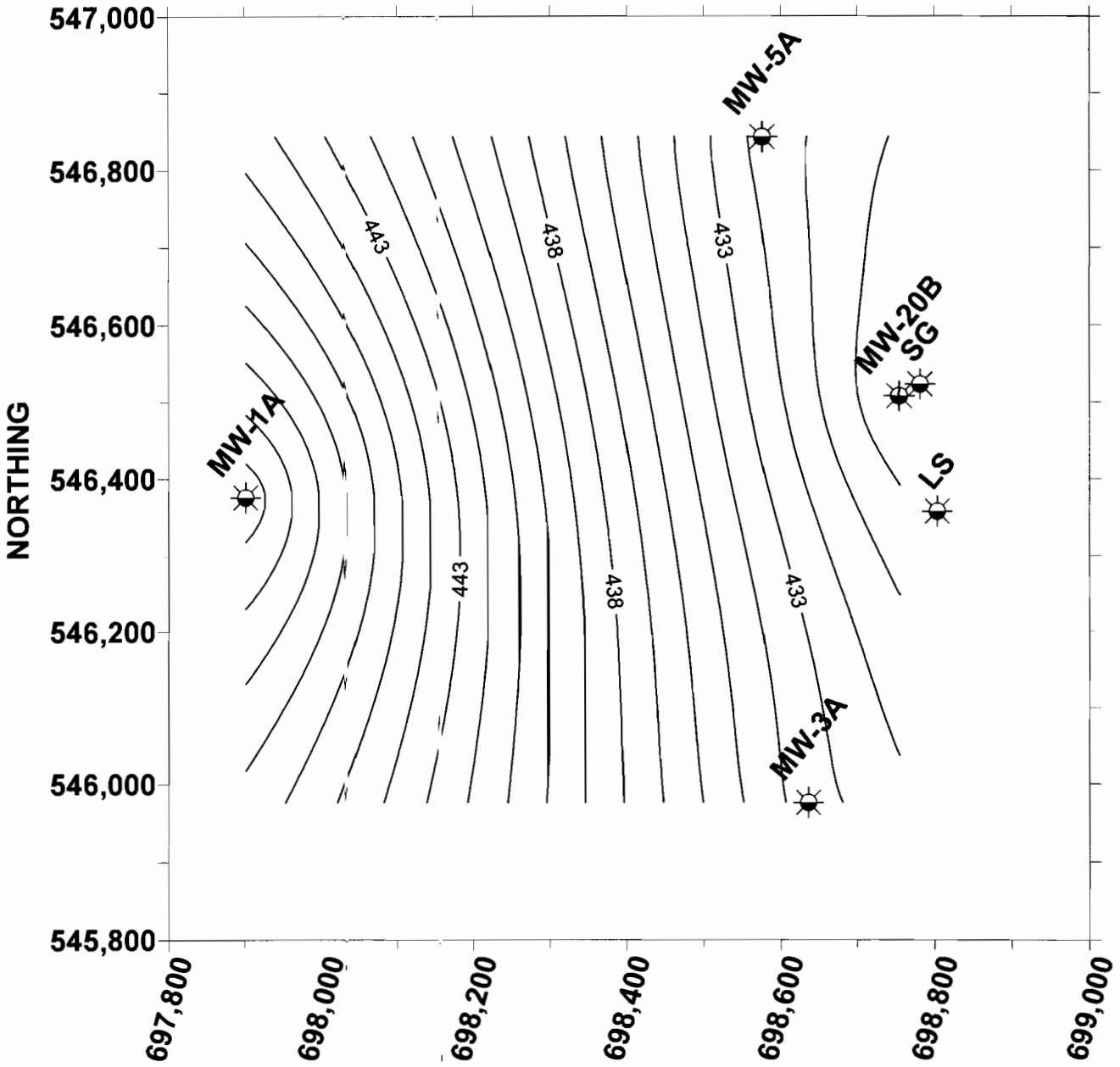


FIGURE D- 4
KESSMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 12/28/04

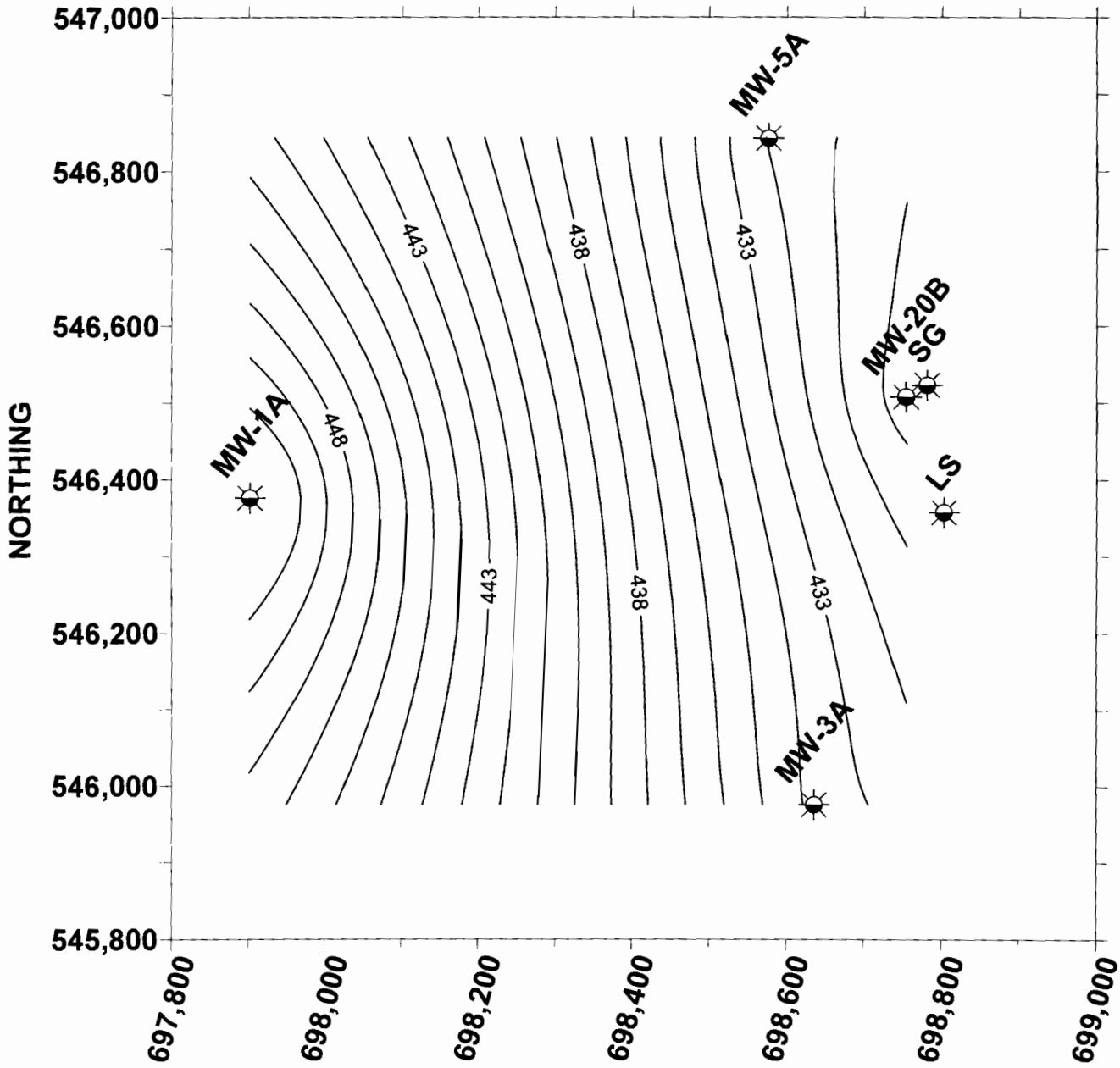
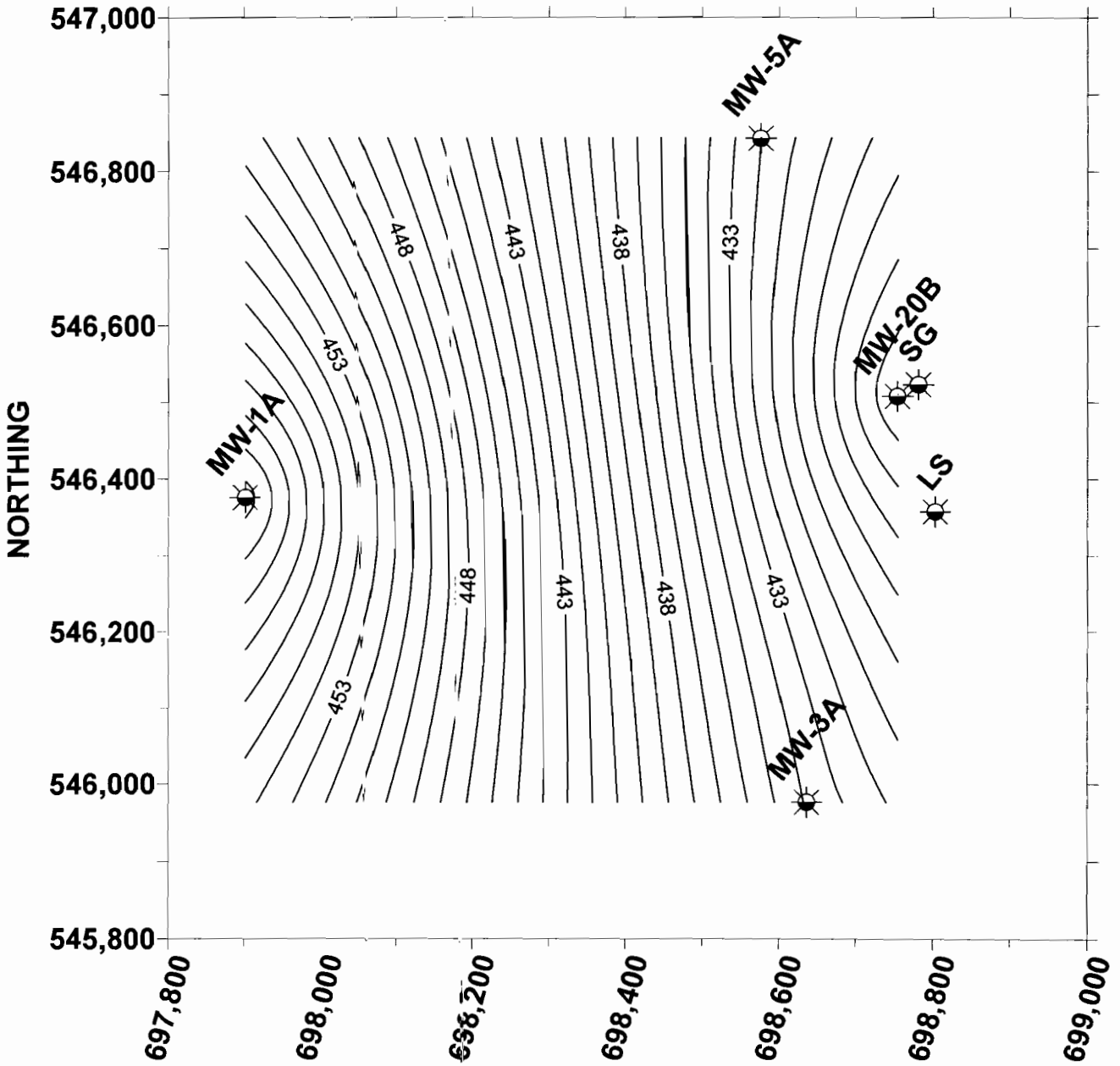


FIGURE D- 4
KE$SMAN LANDFILL OM&M
DEEP GROUNDWATER CONTOUR: 01/25/05



CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M
OPERATION, MAINTENANCE AND MONITORING

OM&M REPORT

ATTACHMENT E
SURVEY REPORT (August 2002)

JOANNE DARCY CRUM, L.S.
PROFESSIONAL LAND SURVEYOR

CROSS COUNTY SANITATION/KESSMAN LANDFILL
FOR IYER ENVIRONMENTAL GROUP, PLLC

MONITORING WELL ELEVATIONS 8/2002

Description	Elevation (FT.)
MW1-1A GROUND	461.15
MW-1A CAP	463.52
MW-1A RISER	463.15
MW-1B GROUND	461.07
MW-1B CAP	463.21
MW-1B RISER	463.01
MW-201B GROUND	431.26
MW-201B CAP	433.68
MW-201B RISER	431.17
MW-201A GROUND	431.51
MW-201A CAP	434.09
MW-201A RISE	431.29
MW-3A GROUND	431.82
MW-3A RISER	434.65
MW-3A CAP	435.01
MW-3B GROUND	432.68
MW-3B CAP	436.08
MW-3B RISER	435.78
MW-5A GROUND	431.38
MW-5A CAP	434.01
MW-5A RISER	433.84
MW-5B GROUND	431.70
MW-5B CAP	434.49
MW-5B RISER	434.35
LEACH. MH RIM	436.12
APPROX LOC STAFF GUAGE	433.06

45 WEST MAIN STREET ♦ COBLESKILL, NEW YORK 12043
TEL (518) 234-4650 ♦ FAX (518) 234-7405
JDCRUM@MIDTEL.NET

JOANNE DARCY CRUM, L.S.
PROFESSIONAL LAND SURVEYOR

CROSS COUNTY SANITATION/KESSMAN LANDFILL
FOR IYER ENVIRONMENTAL GROUP, PLLC

SOIL GAS POINTS ELEVATIONS 8/2002

Description	Elevation
SG-1 GROUND	436.08
SG-1 CAP	439.80
SG-1 RISER	439.58
SG-2 GROUND	435.56
SG-2 CAP	437.44
SG-2 RISER	437.12

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TEL (518) 234-4650 ♦ FAX (518) 234-7405
JDCRUM@MIDTEL.NET

JOANNE DARCY CRUM, L.S.
PROFESSIONAL LAND SURVEYOR

User Name: Computer1
Project: KESSMAN 2002
Report MONITORING WELL Nodes

Date: 08-26-02
Time: 17:11:28
Page: 1

Report Nodes

Node ID	Northing (Y)	Easting (X)	Elevation	Description
2051	546375.53	697901.69	461.15	MW1-1A GROUND
2052	546375.18	697901.64	463.52	MW-1A CAP
2053	546375.26	697901.66	463.15	MW-1A RISER
2054	546364.64	697902.59	461.07	MW-1B GROUND
2055	546364.26	697902.32	463.21	MW-1B CAP
2056	546364.20	697902.39	463.01	MW-1B RISER
2019	546516.51	698750.66	431.26	MW-201B GROUND
2020	546516.47	698751.16	433.68	MW-201B CAP
2021	546516.50	698751.10	431.17	MW-201B RISER
2022	546507.42	698754.62	431.51	MW-201A GROUND
2023	546507.73	698754.70	434.09	MW-201A CAP
2024	546507.83	698754.66	431.29	MW-201A RISE
2031	545976.19	698636.81	431.82	MW-3A GROUND
2033	545975.87	698636.45	434.65	MW-3A RISER
2034	545975.92	698636.44	435.01	MW-3A CAP
2035	545972.48	698624.34	432.68	MW-3B GROUND
2036	545972.54	698623.90	436.08	MW-3B CAP
2037	545972.48	698623.85	435.78	MW-3B RISER
2003	546842.98	698576.43	431.38	MW-5A GROUND
2004	546842.72	698576.66	434.01	MW-5A CAP
2005	546842.87	698576.73	433.84	MW-5A RISER
2006	546849.57	698564.15	431.70	MW-5B GROUND
2007	546849.79	698563.87	434.49	MW-5B CAP
2008	546849.79	698563.92	434.35	MW-5B RISER
2028	546357.32	698803.61	436.12	LEACH. MH RIM
2025	546523.12	698781.53	433.06	APPROX LOC STAFF

Note: MW-201A = MW-20A
MW-201B = MW-20B

45 WEST MAIN STREET ♦ COBLESKILL, NEW YORK 12043
TEL (518) 234-4650 ♦ FAX (518) 234-7405
JDCRUM@MIDTEL.NET

CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M
OPERATION, MAINTENANCE AND MONITORING

OM&M REPORT

ATTACHMENT F
GROUNDWATER MODELING RESULTS

BACKGROUND HYDROGEOLOGY

1.0 Site Hydrogeology

The Kessman site is within the New England Upland physiographic province which is characterized by northwest-southeast trending valley and ridge topography with moderate relief. The site itself consists of a broad, low mound on the west side of a north-south trending valley. The present surface of the landfill ranges from approximately 440 feet above mean sea level (MSL) to just over 470 feet above MSL. The Great Swamp of Patterson, which lies to the east and north of the landfill, is at a lower elevation of approximately 435 ft above MSL.

1.1 Surface Conditions

Aside from the landfill itself, the near surface soils consist of a thin layer of recent marsh deposits. These marsh deposits consist of black organic clay, silt and peat and vary in thickness throughout the site from 2-4 feet in depth. The remediated areas, directly adjacent to the landfill, to the north and east of the site have been covered with similar types of silty soils that were excavated from an on-site borrow pit, and have a depth of at least 2 feet. Landfilled material, 12 to 20 feet thick, consists of mixed refuse and layers of fill. The refuse is overlain by a thin landfill cap made up of approximately one foot of soil and vegetation.

1.2 Subsurface Conditions

The site subsurface consists of three primary geohydrologic units. In descending order they are a kame aquifer, a confining glacial till unit and a carbonate bedrock aquifer which acts as a confined (artesian) aquifer.

The kame aquifer is comprised of permeable unconsolidated loose to moderately dense ablation till and kame deposits composed of mostly sand and silt with some gravel. The kame aquifer is generally 10 to 30 feet thick throughout the site. The water table is within this unit and rises and falls depending on groundwater recharge and discharge. The kame unit is not saturated throughout the site and therefore forms a discontinuous aquifer across the site.

Beneath the kame aquifer, the glacial till unit consist of dense basal till composed of sand, silt and a high percentage of cobbles and boulders which is overlain by an ablation till. The ablation till is less dense and forms a transition zone between the dense basal till and the overlying kame aquifer. The glacial till unit acts as a confining layer.

The carbonate bedrock aquifer varies from a limestone to a metamorphosed marble which regionally contains numerous thrust faults and shear zones. Rock cores taken during the Remedial Investigation shows the upper bedrock contact is highly fractured. Groundwater exists within the fractures of the bedrock and is controlled by the bedrock.

2.0 Surface and Groundwater Flow

2.1 Surface Drainage

Regionally surface water drainage is controlled by bedrock structure, primarily the north-south trending faults. On-site surface drainage is modified by the makeup of the near surface glacial deposits and the capped landfill. Drainage from the site flows radially towards the east and north into the Great Swamp, a regulated wetland. The Great Swamp, in turn, drains both south into the Croton River Reservoir System and north into the Housatonic Basin. Surface flow and water saturation in the Great Swamp is affected by seasonal weather conditions.

2.2 Groundwater Flow

Groundwater flow within the overburden aquifer is variable due to the make up of the kame deposits. By definition, kame deposits can exhibit considerable lateral variability in texture, degree of sorting, sedimentary structure, and thickness. Soil samples collecting during the installation of the on-site wells proves the nonhomogeneous and anisotropic nature of the kame unit. In spite of the geologic differences within the kame unit, the hydraulic conductivity values show a fairly narrow range, from 1.7×10^{-5} to 1.1×10^{-4} centimeters per second (cm/s).

Bedrock hydraulic values range from 1.8×10^{-5} to 3.1×10^{-4} cm/s. These values show the bedrock to be roughly one order of magnitude more permeable than the kame aquifer. This would prove that flow is faster in the more permeable bedrock than in the overburden.

2.3 Groundwater Flow Conditions

Vertical hydraulic gradients, calculated based on water levels over the past several years, vary from well to well. It can be assumed that groundwater flows from west to east in both the overburden and bedrock aquifer systems beneath the site. Data has not been collected on how water flows through the landfilled material itself, but it is assumed that flow would also be from west to east. Data collected during the RI investigation shows that there is an upward hydraulic gradient beneath the landfill and generally a downward gradient in wells that are located upgradient and crossgradient of the site. The calculated hydraulic gradients would show that groundwater recharge occurs in the higher ground upgradient and crossgradient of the site and that discharge occurs to the east of the landfill into the adjacent wetland (The Great Swamp)

MADE BY: MO DATE: 3/26/2004
CHKD BY: DATE:

PROJECT: Kessman/Cross County Landfill
SUBJECT: Estimate of the Ground Water Extraction Rate in the Leachate Collection System

1. PURPOSE

The purpose of this calculation is to estimate the ground water collection rate of the leachate collection system located along the eastern limit of the landfill.

2. PROBLEM STATEMENT

The leachate collection system is located along the eastern boundary of the landfill (see page 7 of this package). It consists of approximately 1,000 feet of 6-inch diameter perforated pipe, draining to a centrally located sump. Schematic of the system is shown on Figure 3 of reference 1 (attached). Based on the elevations of pipe inverts and ground surface, the collection pipe is buried approximately 4 feet below ground.

Three ground water monitoring well clusters are located in the immediate vicinity of the drain: MW-3 near the southern end, MW-20 near the center and MW-5 at the northern end of the drain. Based on total well depths from Form 3 of reference 1 (attached), the shallow wells are MW-3B, MW-5B and MW-20A. These wells indicate the potentiometric surface in the upper portion of the water-bearing zone, where the drain is located. The summary of the water levels as compared to the ground surface elevation is provided below:

Well	Ground Surface [ft]	Maximum/Minimum Water Level [ft]
MW-3B	432.68	432.9 / 430.3
MW-5B	431.70	432.8 / 429.9
MW-20A	431.51	429.7 / 426.9

Maximum hydraulic heads are within a foot of the ground surface. The collection drain is installed approximately 4 feet below ground surface. Therefore, during periods of high water level, the drain is likely to experience approximately 4 feet of hydraulic head.

Minimum heads are approximately 2 to 5 feet below ground surface. During periods of low water, portions of the drain would be above water table, while the remainder would be approximately 2 feet submerged.

For the upper bound of the estimate, use the entire length of the drain and the submergence of 4 feet. For the lower bound, use ¾ of the length of the drain and the submergence of 2 feet.

Figures 3-5, 4-1 and 4-2 of reference 2 indicate that the saturated thickness of the overburden deposits at the location of the leachate collection pipe is significant, approximately 50 feet. Moreover, as stated in Section 4.2.1 of reference 2, the hydraulic conductivity of the overburden materials is relatively uniform. Therefore, it is assumed that the drain is installed within a thick, uniform aquifer.

The hydraulic conductivity of the aquifer has been investigated by performing slug tests. Section 4.2.1 of reference 2 indicates that values of $1.7*10^{-5}$ to $1.1*10^{-4}$ cm/s were obtained for the overburden deposits. Typically, large-scale average values of hydraulic conductivity are somewhat higher than results of slug tests. For the purpose of this estimate, use $5*10^{-5}$ cm/s as the lower bound and $5*10^{-4}$ cm/s as the upper bound of the estimate (or 0.14 and 1.4 ft/d).

MADE BY: MO DATE: 3/26/2004
CHKD BY: DATE:

PROJECT: Kessman/Cross County Landfill
SUBJECT: Estimate of the Ground Water Extraction Rate in the Leachate Collection System

3. METHOD

The expected ground water extraction rate is estimated by approximating the system as a horizontal drain located in an infinitely thick aquifer. Based on equation 11 of reference 3, the drawdown and extraction rate of a partially penetrating drain are related as follows:

$$s = Ix\cos\theta + Iy\sin\theta + \frac{Q}{4\pi KL\sqrt{A}} \cdot \sum_{n=-\infty}^{\infty}\left[\ln\frac{\sqrt{x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}}+y+\frac{L}{2}}{\sqrt{x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}}+y-\frac{L}{2}}+\ln\frac{\sqrt{x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}}+y+\frac{L}{2}}{\sqrt{x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}}+y-\frac{L}{2}}\right]$$

Terms are defined as follows:

A - Anisotropy factor ($A=K_{vertical}/K_{horizntal}$), [-]
b - Thickness of aquifer, [L]
d - Depth from water table to axis of drain, [L]
I - Hydraulic gradient, [-]
K - Horizontal hydraulic conductivity, [L/T]
L - Length of drain, [L]
s - Vertical distance from zero reference level to potentiometric surface (zero reference level is the potentiometric surface at location of drain), [L]
S - Drawdown induced by drain (independent of hydraulic gradient), [L]
Q - Extraction rate, [L^3/T]
θ - Angle between x axis and flow direction, [-]

This equation is simplified as follows:

- Use n=0, corresponding to an infinitely thick aquifer (page 631 of reference 1). This is a conservative assumption, increasing the extraction rate (an infinite aquifer can provide more water than the aquifer of finite thickness).
- To estimate drawdown, use point in the center of the drain x=0, y=0. This is where the maximum drawdown will occur. Calculate drawdown at the surface of the aquifer z=0.
- Use the isotropic case A=1. This is a conservative assumption, increasing the extraction rate (vertical anisotropy increases the resistance to flow of water from depth towards the drain).

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SUBJECT: Estimate of the Ground Water Extraction Rate in the Leachate Collection System

The equation simplifies to:

$$S = \frac{Q}{4\pi KL} \cdot \ln\left[\frac{\sqrt{\left(\frac{L}{2}\right)^2 + (-d)^2} + \frac{L}{2}}{\sqrt{\left(-\frac{L}{2}\right)^2 + (-d)^2} - \frac{L}{2}} \cdot \frac{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} + \frac{L}{2}}{\sqrt{\left(-\frac{L}{2}\right)^2 + d^2} - \frac{L}{2}} \right]$$

$$S = \frac{Q}{4\pi KL} \cdot \ln\left[\frac{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} + \frac{L}{2}}{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} - \frac{L}{2}} \cdot \frac{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} + \frac{L}{2}}{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} - \frac{L}{2}} \right]$$

$$S = \frac{Q}{4\pi KL} \cdot \ln\left[\frac{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} + \frac{L}{2}}{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} - \frac{L}{2}} \right]^2$$

$$S = \frac{Q}{2\pi KL} \cdot \ln \frac{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} + \frac{L}{2}}{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} - \frac{L}{2}}$$

The extraction rate is:

$$Q = \frac{2\pi KLS}{\ln \frac{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} + \frac{L}{2}}{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} - \frac{L}{2}}}$$

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CHKD BY: DATE:

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SUBJECT: Estimate of the Ground Water Extraction Rate in the Leachate Collection System

4. CALCULATIONS

Summary of parameters

Hydraulic conductivity: K = 0.14 to 1.4 ft/d (based on slug tests)
Length of drain: L = 750 to 1,000 ft (at low water and high water)
Drain penetration depth: d = 2 to 4 ft (at low water and high water)
Drawdown at drain: S = 2 to 4 ft (use maximum possible drawdown, equal to penetration depth)

Formula

$$Q = \frac{2\pi KLS}{\ln \frac{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} + \frac{L}{2}}{\sqrt{\left(\frac{L}{2}\right)^2 + d^2} - \frac{L}{2}}}$$

Estimate extraction rate for K = 1.4 ft/d

A) During high water conditions, L = 1,000 ft, S = d = 4 ft

$$Q = \frac{2\pi \cdot 1.4 \cdot 1{,}000 \cdot 4}{\ln \frac{\sqrt{\left(\frac{1{,}000}{2}\right)^2 + 4^2} + \frac{1{,}000}{2}}{\sqrt{\left(\frac{1{,}000}{2}\right)^2 + 4^2} - \frac{1{,}000}{2}}} = \frac{35{,}186}{\ln \frac{1{,}000.016}{0.016}} =$$

$$= \frac{35{,}186}{\ln(62{,}501)} = 3{,}186\, ft^3/day = 17\, gpm$$

B) During low water conditions L = 750 ft, S = d = 2 ft

$$Q = \frac{2\pi \cdot 1.4 \cdot 750 \cdot 2}{\ln \frac{\sqrt{\left(\frac{750}{2}\right)^2 + 2^2} + \frac{750}{2}}{\sqrt{\left(\frac{750}{2}\right)^2 + 2^2} - \frac{750}{2}}} = \frac{13{,}195}{\ln \frac{750.0053}{0.0053}} =$$

$$= \frac{13{,}195}{\ln(140{,}627)} = 1{,}113\, ft^3/day = 6\, gpm$$

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Estimate extraction rate for K = 0.14 ft/d

A) During high water conditions, L = 1,000 ft, S = d = 4 ft

$$Q = \frac{2\pi \cdot 0.14 \cdot 1{,}000 \cdot 4}{\ln \frac{\sqrt{\left(\frac{1{,}000}{2}\right)^2 + 4^2} + \frac{1{,}000}{2}}{\sqrt{\left(\frac{1{,}000}{2}\right)^2 + 4^2} - \frac{1{,}000}{2}}} = \frac{3{,}519}{\ln \frac{1{,}000.016}{0.016}} =$$

$$= \frac{3{,}519}{\ln(62{,}501)} = 319\, ft^3/day = 1.7\, gpm$$

B) During low water conditions L = 750 ft, S = d = 2 ft

$$Q = \frac{2\pi \cdot 0.14 \cdot 750 \cdot 2}{\ln \frac{\sqrt{\left(\frac{750}{2}\right)^2 + 2^2} + \frac{750}{2}}{\sqrt{\left(\frac{750}{2}\right)^2 + 2^2} - \frac{750}{2}}} = \frac{1{,}320}{\ln \frac{750.0053}{0.0053}} =$$

$$= \frac{1{,}320}{\ln(140{,}627)} = 111\, ft^3/day = 0.6\, gpm$$

5. CONCLUSIONS

The ground water extraction rate that may be expected from the leachate collection drain along the eastern limit of the landfill has been estimated to be on the order of 1 to 17 gpm. Actual collection rates will be influenced by water levels in the adjacent wetland and the possible hydraulic contact between the landfill leachate and the wetland.

MADE BY: MO DATE: 3/26/2004
CHKD BY: DATE:

PROJECT: Kessman/Cross County Landfill
SUBJECT: Estimate of the Ground Water Extraction Rate in the Leachate Collection System

6. REFERENCES

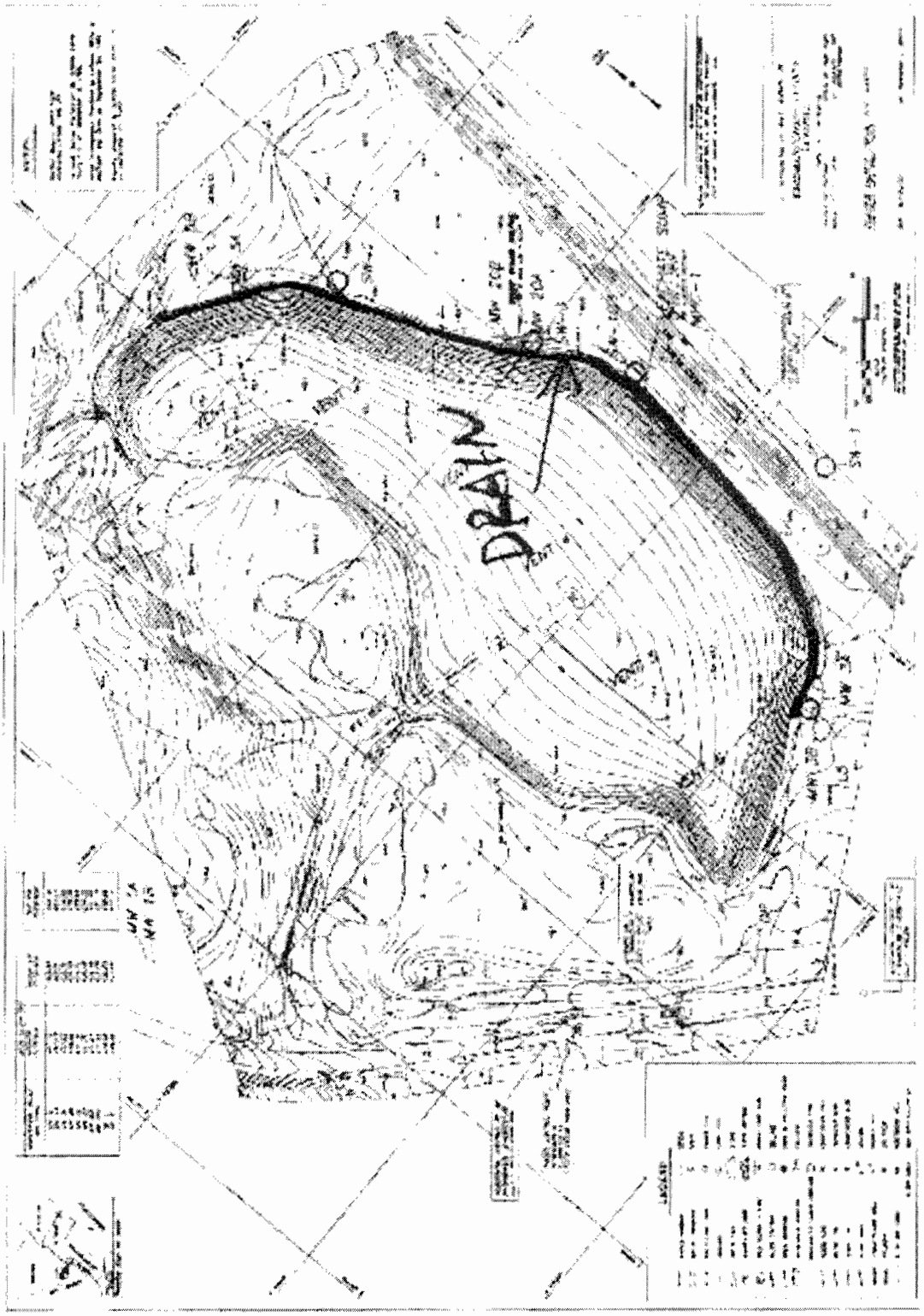
1 Cross County Sanitation/Kessman Landfill
OM&M Report
February to November, 2002
Iyer Environmental Group, Dec 12, 2002

2 Kessman/Cross County Sanitation Landfill Site
Remedial Investigation Report
ABB Environmental Services, September 1994

3 Determining 3D Capture Zones in Homogeneous Anisotropic Aquifers
D. Schafer
Ground Water, July-August 1996

MADE BY: MO DATE: 3/26/2004
CHKD BY: DATE:

PROJECT: Kessman/Cross County Landfill
SUBJECT: Estimate of the Ground Water Extraction Rate in the Leachate Collection System



CROSS COUNTY SANITATION/KESSMAN LANDFILL
OPERATION, MAINTENANCE AND MONITORING

OM&M REPORT
(February to November, 2002)

Site No. 3-40-011

Reference 1

Prepared for:

DIVISION OF ENVIRONMENTAL REMEDIATION
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION
625 BROADWAY, ALBANY, NY 12233-7012

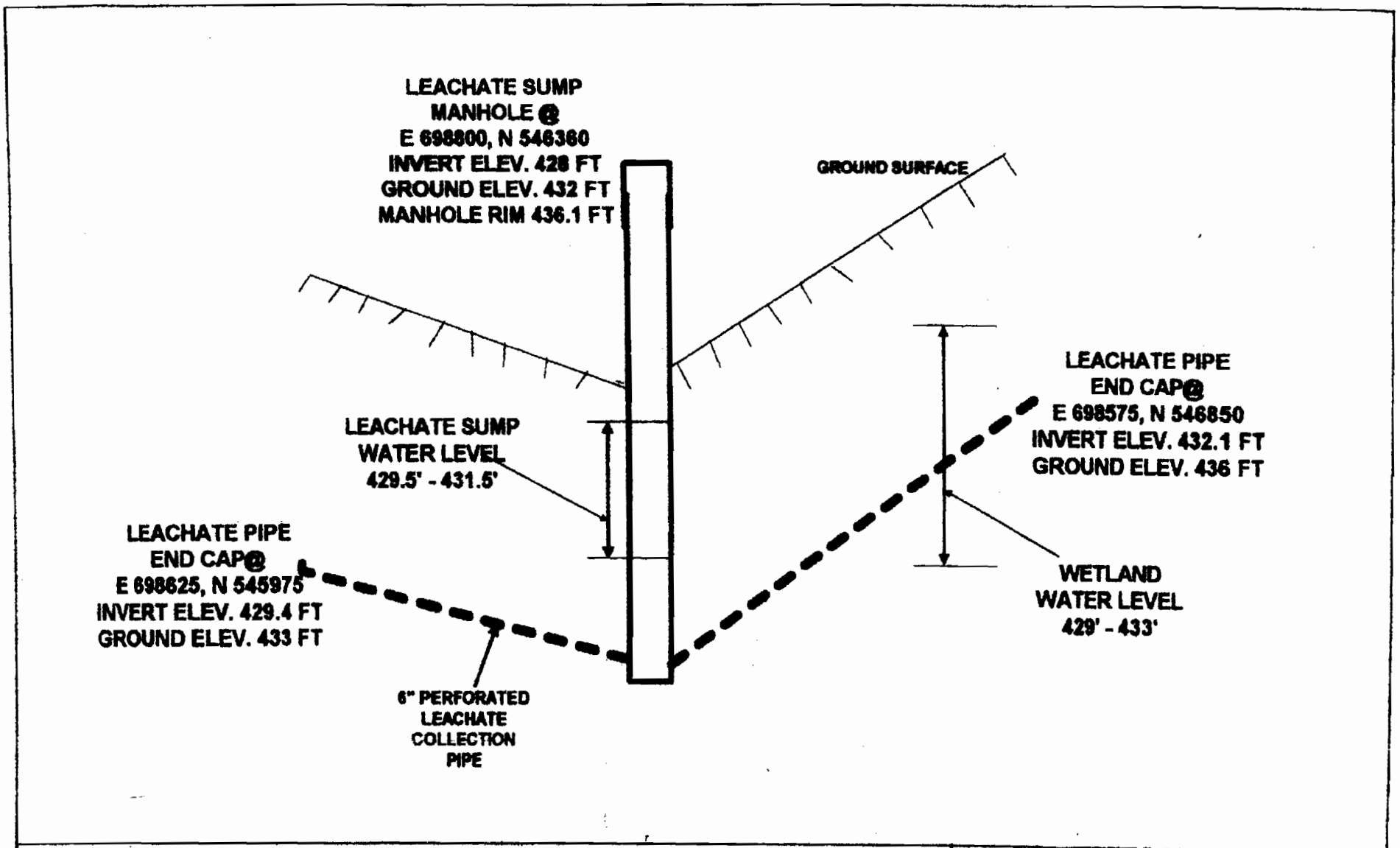
Prepared by:

Iyer Environmental Group, PLLC
44 Rolling Hills Drive
Orchard Park, NY 14127

Submitted by:

O'Brien & Gere Engineers, Inc
5000 Brittonfield Parkway,
East Syracuse, NY 13057

December 12, 2002



CROSS COUNTY SANITATION/KESSMAN LF
LEACHATE COLLECTION SYSTEM PROFILE

FIGURE 3

IVER ENVIRONMENTAL GROUP PLLC

FORM 3
CROSS COUNTY SANITATION/KESSMAN LANDFILL OM&M
GROUNDWATER/SURFACE WATER/LEACHATE ELEVATIONS

WELL ID	GROUND ELEV. (ft)	TOR ELEV. (ft)	TOTAL WELL DEPTH (ft)	BOTTOM ELEV. (ft)	WATER LEVELS (Elevation in feet)										MINIMUM ELEVATION (ft)	MAXIMUM ELEVATION (ft)	VARIATION (ft)
					10/29/01 Baseline	2/27/02	03/28/02	4/25/02	5/15/02	6/13/02	07/25/02	08/22/02	09/18/02	10/24/02			
MW-1A	461.15	463.15	59.40	403.75	447.05	447.80	448.49	448.89	449.82	450.98	448.57	446.93	446.75	447.35	446.8	451.0	-4.2
MW-1B	461.07	463.01	23.10	439.91	450.01	445.17	451.99	452.76	453.86	455.10	451.79	450.48	449.75	450.73	445.2	455.1	-9.9
MW-3A	431.82	434.65	67.36	367.29	431.27	431.93	432.26	432.25	432.83	432.09	431.03	430.65	430.97	432.11	430.7	432.8	-2.2
MW-3B	432.68	435.78	34.20	401.58	431.31	431.97	432.28	432.29	432.89	432.14	431.18	430.27	430.60	431.76	430.3	432.9	-2.6
MW-5A	431.38	433.84	72.18	361.66	431.34	431.71	432.05	432.22	432.64	431.85	430.88	429.87	429.92	431.48	429.9	432.6	-2.8
MW-5B	431.70	434.35	30.38	403.97	431.05	431.84	432.25	432.39	432.81	432.04	430.71	429.85	429.94	431.64	429.9	432.8	-3.0
MW-20A	431.51	431.29	21.61	409.68	428.19	428.72	429.09	429.30	429.71	428.41	427.20	426.87	427.05	428.63	426.9	429.7	-2.8
MW-20B	430.92	431.17	42.53	388.64	428.57	429.20	429.52	429.77	430.13	429.02	428.27	427.48	427.68	429.05	427.5	430.1	-2.6
Leachate Tank	436.12				-	-	-	432.03	429.42	429.99	429.72	429.51	429.74	431.42	429.4	432.0	-2.6
Staff Gauge	433.06				-	-	-	-	430.49	-	-	430.69	430.91	432.93	430.5	432.9	-2.4

Note: 1. All wells and soil gas points were resurveyed in August 2002 after repair work at MW-3A, GP-1 and GP-2
2. Previous elevations at MW-3A were: Ground elev. = 432.59 and Top of Riser elev. = 436.07.

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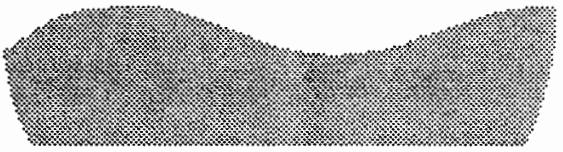
NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION

SUPERFUND STANDBY CONTRACT

KESSMAN/CROSS COUNTY SANITATION LANDFILL SITE

Patterson, New York

WORK ASSIGNMENT NO. D002472-9



REMEDIAL INVESTIGATION REPORT VOLUME I

SEPTEMBER 1994

ABB Environmental Services

4.2.1 Hydraulic Conductivity Testing Results

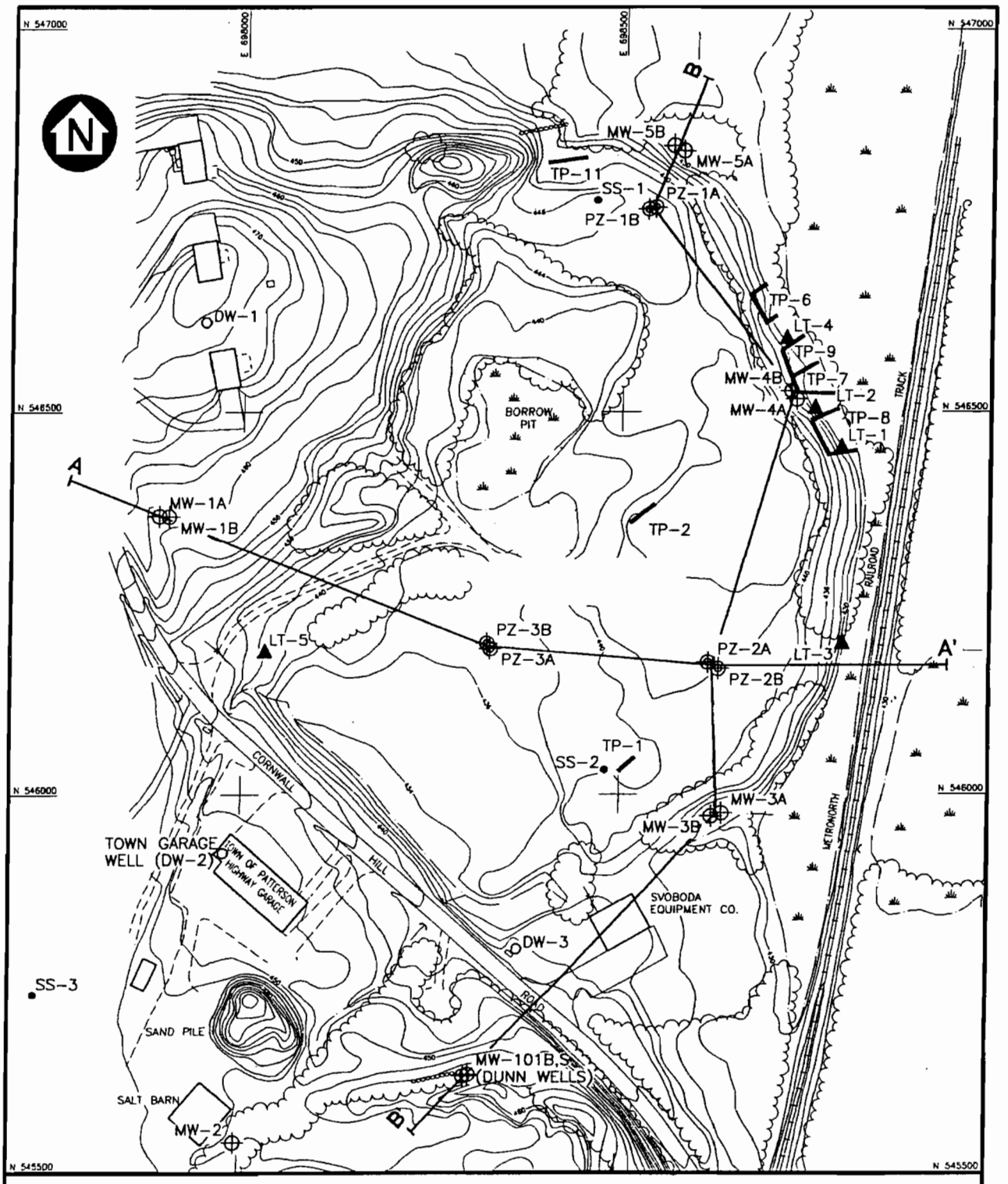
Rising-head and falling-head slug tests were performed in the nine RI wells and two existing wells, MW-101B and MW-101S, installed by Dunn in 1990. Data was collected using a 10 psi pressure transducer and Hermit™ data logger (see Section 3.1) and analyzed using Aqtesolv™ software and the Bouwer and Rice slug test solution for unconfined aquifers (Bouwer and Rice, 1976). Test data and Aqtesolv™ plots are presented in Table 4-1 and Appendix A-8.

Hydraulic conductivities are not reported for MW-1A (Rising Head Test) and MW-2 due to uncertainty in the validity of the slug test data collected for these wells. It is also important to note that in not all cases do the initial displacement values presented in Table 4-1 match the initial displacement (Y_o) values shown on the hydraulic conductivity graphs included in Appendix A-8. In the case of the analysis of the falling head test data for well MW-1A and the rising head test data for well MW-1B, the initial displacement values (Y_o) have been adjusted downward in an attempt to match the slope with the valid portion of the curve.

Bedrock hydraulic conductivity (K_P) values ranged from $1.8x10^{-5}$ to $3.1x10^{-4}$ centimeters per second (cm/sec) with an arithmetic average of $2.2x10^{-4}$ cm/sec. The average K_P value of $2.2x10^{-4}$ cm/sec lies at the high end of the range of hydraulic conductivities for limestone and dolostone tabulated by Freeze and Cherry (1979).

Overburden K_P values were measured in five wells, one screened entirely in the basal till, two screened across the contact of the basal till and the ablation till/kame deposits, and two screened entirely in the ablation till/kame deposits. Despite the inherent differences in these geologic deposits, the range of K_P in the overburden wells was small, $1.7x10^{-5}$ to $1.1x10^{-4}$ cm/sec, with an arithmetic average of $6.1x10^{-5}$ cm/sec. These test results imply that the loose, fine-grained ablation till and kame deposits have water transmitting properties similar to the dense, well-graded basal till.

Results of the hydraulic conductivity testing show that bedrock is roughly one order of magnitude more permeable than the overburden deposits. The Bouwer and Rice solution for unconfined aquifers is believed to be appropriate for the bedrock aquifer because artesian conditions were not encountered, and four of



SCALE IN FEET
0 200

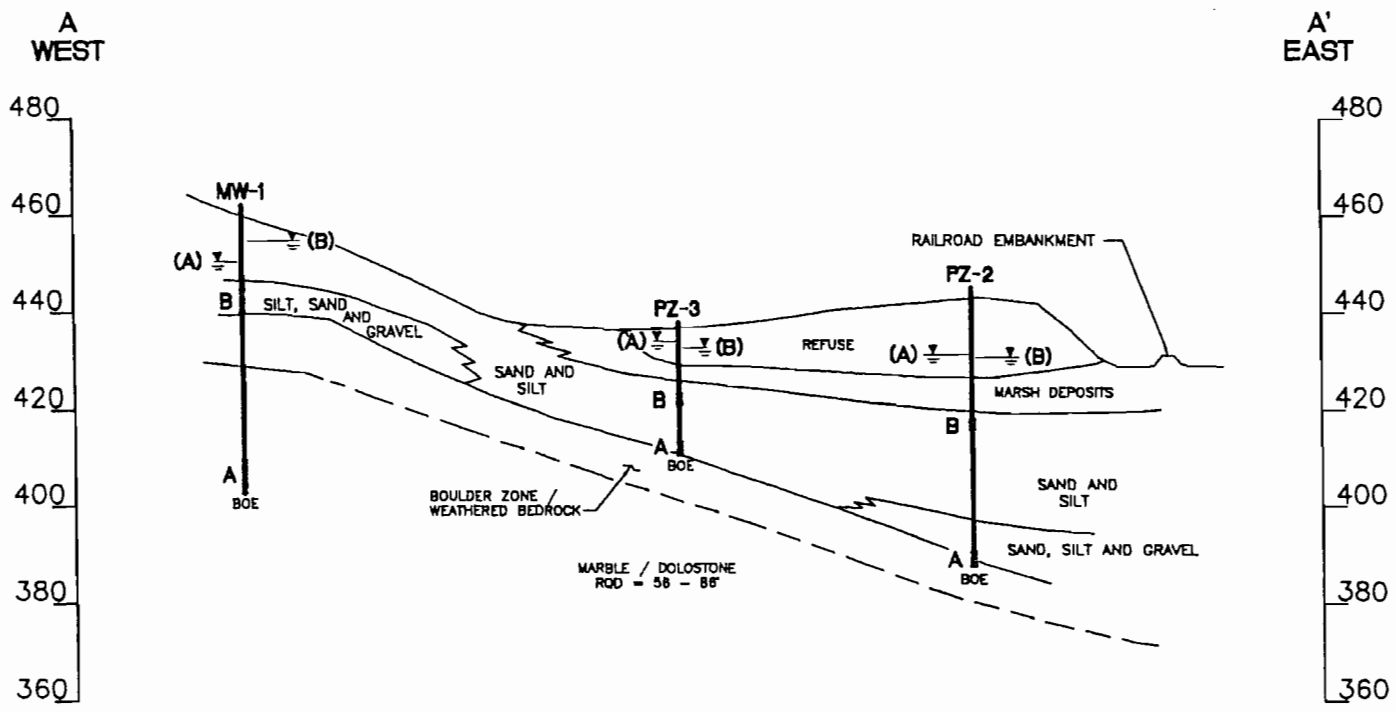
LEGEND

- PIEZOMETER
- SURFACE SOIL SAMPLE
- A A' LOCATION OF INTERPRETED GEOLOGIC PROFILE
- DOMESTIC WELL
- MONITORING WELL
- LEACHATE SAMPLE LOCATION
- TEST PIT TRENCH

6873-23\RI\FIG3-5

FIGURE 3-5
ON-SITE EXPLORATION LOCATION MAP
KESSMAN/CROSS COUNTY SANITATION LANDFILL SITE

ABB ENVIRONMENTAL SERVICES



1" = 200' HORIZ.
1" = 40' VERT.

NOTES

REFUSE: COVER MATERIAL LAYERED WITH TRASH.

SAND AND SILT: KAME AND ABLATION TILL DEPOSITS.

SILT, SAND AND GRAVEL: LODGEMENT TILL.

WEATHERED ROCK: TRANSITION ZONE

BEDROCK: CARBONATES, USUALLY WELL FRACTURED.

FOR LOCATION OF SECTION SEE FIGURE 3-5

LEGEND

- WATER LEVELS FROM 3/16/92
- WELL SCREEN LOCATION
- BOE BOTTOM OF EXPLORATION

SCALE IN FEET
0 200

6873-23\R1\FIG4-1

FIGURE 4-1
GEOLOGIC PROFILE A - A'
KESSMAN/CROSS COUNTY SANITATION LANDFILL SITE
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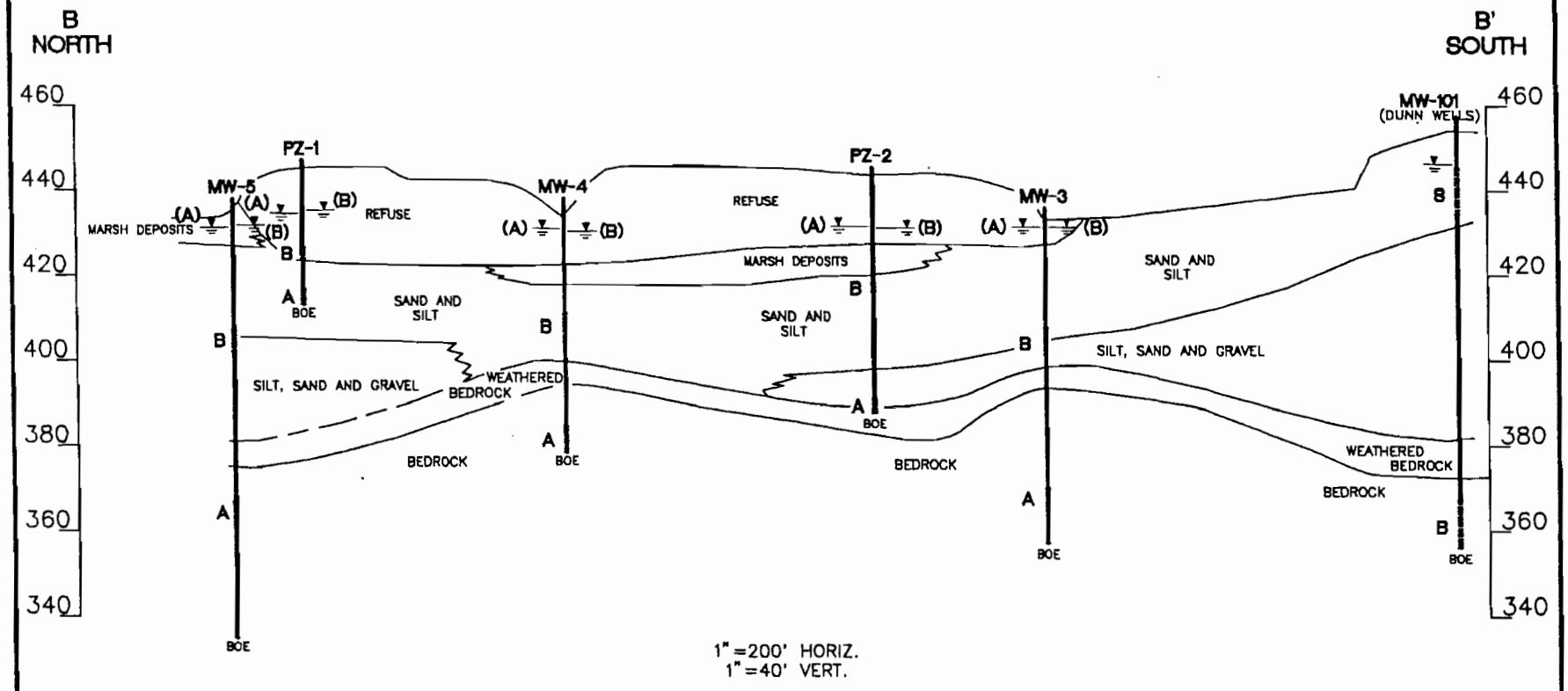

NOTES

REFUSE: COVER MATERIAL LAYERED WITH TRASH.

SAND AND SILT: KAME AND ABLATION TILL DEPOSITS.

SILT, SAND AND GRAVEL: LODGEMENT TILL.

WEATHERED ROCK: TRANSITION ZONE

BEDROCK; CARBONATES, USUALLY WELL FRACTURED.

FOR LOCATION OF SECTION SEE FIGURE 3-5

LEGEND

- WATER LEVELS FROM 3/16/92
- WELL SCREEN LOCATION
- BOE BOTTOM OF EXPLORATION

SCALE IN FEET

0 200

6873-23\R\FIG4-2

FIGURE 4-2
GEOLOGIC PROFILE B - B'
KESSMAN/CROSS COUNTY
SANITATION LANDFILL SITE

ABB ENVIRONMENTAL SERVICES

Determining 3D Capture Zones in Homogeneous, Anisotropic Aquifers

pg 16 of 20

by David C. Schafer[a]

Reference 3

Abstract

A method is presented for determining steady-state capture zones in three dimensions around horizontal drains and vertical wells in homogeneous, anisotropic aquifers in a uniform flow field. Equations are presented for determining drawdown and velocity vector components in three dimensions around drains and wells. Using these equations, a second-order Runge-Kutta particle tracking algorithm is applied to trace streamlines in three dimensions. By tracking a large number of particles, it is possible to determine areas where capture occurs and areas where particles escape capture. The resulting 3D capture zones are diagrammed as both 2D (section view) plots and 3D plots.

Introduction

In designing remediation systems for contamination plumes, hydraulic analysis is required to determine appropriate flow rates and locations of extraction wells or trenches to achieve hydraulic containment of the contaminants. Determining capture zones in two dimensions is well understood and relatively straightforward (Javandel and Tsang, 1986). Simple, analytical equations can be used, for instance, to calculate discharge rates necessary to achieve hydraulic containment. Alternatively, several easy-to-use, analytical flow models are readily available to calculate and diagram capture zones for proposed recovery systems.

A limitation of 2D solutions, however, is the assumption that the capture zone fully penetrates the aquifer. Although this assumption might be valid for relatively thin aquifers, it could be inappropriate for thick aquifers in which the contaminant plume penetrates just a fraction of the aquifer thickness. In such systems, treating the problem as two-dimensional leads to unnecessarily high extraction rates, as well as expensive remediation system treatment and operating costs.

When a thick aquifer becomes contaminated, dissolved contaminants often exist only in the upper portions of the aquifer. Under these circumstances, the most economical hydraulic containment system is often one that captures only the shallow (contaminated) ground water, allowing deeper, clean water to pass beneath the extraction system. For these installations, existing 2D equations and flow models are not adequate for accurately describing capture zones and required flow rates and a 3D approach is required.

Methods

3D capture zone analysis is accomplished by tracing streamlines in three dimensions. Streamlines are traced from a large number of different starting points and a determination is made for each starting point as to whether or not the streamline reaches the extraction system or passes on downgradient. By tracking a sufficient number of particles, it is possible to determine those areas where capture is occurring and those areas where particles are escaping capture.

Before particle tracking can be accomplished, it is first necessary to determine hydraulic head (or drawdown) in three dimensions around the extraction system. After the drawdown in three dimensions is known, it is possible to determine the extraction-induced gradients in three dimensions by differentiating the drawdown with respect to x, y, and z. Finally, velocities in the x, y, and z directions can be computed from these gradients. After this three-dimensional velocity field has been determined, a standard numerical integration technique is used to calculate the paths that particles would take moving through that field. If a particle path leads to the extraction system, the particle is assumed to have been captured, whereas a particle that bypasses the extraction system by a sufficient distance is assumed to have escaped.

In performing the analysis, it is most convenient to examine the capture zone "one slice at a time." The typical procedure is to fix a specific x coordinate and determine in section view the profile of the capture zone in a plane passing through that x coordinate and oriented perpendicular to the x axis. By repeating this process for a number of x coordinates, it is possible to gain an understanding of what the capture zone looks like in three dimensions.

At each x location, the calculated capture zone profile can be compared with the known position of the contaminant plume to judge whether complete plume capture will occur.

Theory

Drawdown Around a Point Sink

Drawdown around a line sink feature such as a horizontal drain or vertical well can be determined by representing the feature as an infinite number of point sinks, each with an infinitesimal discharge such that their combined discharge equals that of the drain or well. The drawdown for each point sink is determined and the cumulative drawdown is obtained by integrating along the length of the line sink. The first step is to determine the steady-state drawdown around a point sink in a homogeneous, anisotropic, infinitely thick aquifer. In this analysis, anisotropy is considered in the vertical direction because the horizontal deposition of most sediments tends to produce greater hydraulic conductivity in the horizontal direction (paral-

[a]Geraghty & Miller, Inc., 105 Fifth Avenue South, Suite 350, Minneapolis, Minnesota 55401.

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lel to the bedding planes) and lower hydraulic conductivity in the vertical direction (perpendicular to the bedding planes).

Consider an anisotropic aquifer having horizontal hydraulic conductivity, K, and vertical hydraulic conductivity, K_z, with the anisotropy ratio, A, defined as K_z/K. According to Harr (1962) and Strack (1989), the anisotropic system can be transformed to an equivalent isotropic one by stretching the vertical z axis by the square root of the anisotropy ratio and assigning an isotropic hydraulic conductivity equal to $K(A)^{1/2}$. Thus, in the transformed system, indicated by the asterisk,

$$z^* = \frac{z}{(A)^{1/2}} \tag{1a}$$

$$K^* = K(A)^{1/2} \tag{1b}$$

In the isotropic aquifer, the point sink drawdown equation for steady-state conditions can be obtained from Darcy's law. Assuming an infinitely thick aquifer, flow toward point (x_p, y_p, z_p*) through a spherical shell of radius r_D and thickness $-dr$ (dr is taken to be negative, i.e., r_D is decreasing from infinity to zero) is, according to Darcy's law

$$Q = K^*\left(\frac{-ds}{dr_D}\right) 4\pi r_D^2 \tag{2}$$

In this equation, Q is flow rate, and s represents drawdown. Rearranging terms gives

$$-ds = \frac{Q}{4\pi K^*}\frac{dr_D}{r_D^2} \tag{3}$$

Integrating from infinity to r yields

$$-[s(r) - s(\infty)] = \frac{Q}{4\pi K^*}\left[-\left(\frac{1}{r} - \frac{1}{\infty}\right)\right] \tag{4}$$

and, because the drawdown at infinity is zero,

$$s = \frac{Q}{4\pi K^* r} \tag{5}$$

At a point (x, y, z*) located a distance r from (x_p, y_p, z_p have

$$s = \frac{Q}{4\pi K^*}\frac{1}{[(x - x_p)^2 + (y - y_p)^2 + (z^* - z_p^*)^2]^{1/2}}$$

Finally, in terms of the anisotropic aquifer,

$$s = \frac{Q}{4\pi K(A)^{1/2}}\frac{1}{[(x - x_p)^2 + (y - y_p)^2 + ((z - z_p)^2/A}$$

Horizontal Drain

Ground-water extraction is frequently accomplishe pumping from shallow, horizontal trenches or drains structed across the front of contaminant plumes. In add horizontal wells are becoming popular for capturing con nants because they can be used effectively to "skim" bı shallow plumes at the tops of thick aquifers. Special equa are required to calculate capture zones around these horiz pumping features.

Figure 1 shows a horizontal drain of length L located depth d below the top of an aquifer of thickness b, center x = y = 0 and oriented parallel to the y axis. Because the aq is bounded at the top and bottom, the theory of images is us transform it to an infinitely thick aquifer. Figure 2 shows im obtained by repeatedly reflecting the actual drain and su quent image drains across the upper and lower aquifer bou aries. The resulting pattern of image drains is symmetric at both the upper and lower boundaries, thus assuring a no-f condition at each boundary.

The drawdown around a drain is calculated by integra the point sink equation. For a drain such as that shown in Fig 1 but at an arbitrary elevation, Z, the infinitesimal flow t segment of length dy_D at position y_D is

$$dq = (Q/L)\, dy_D$$

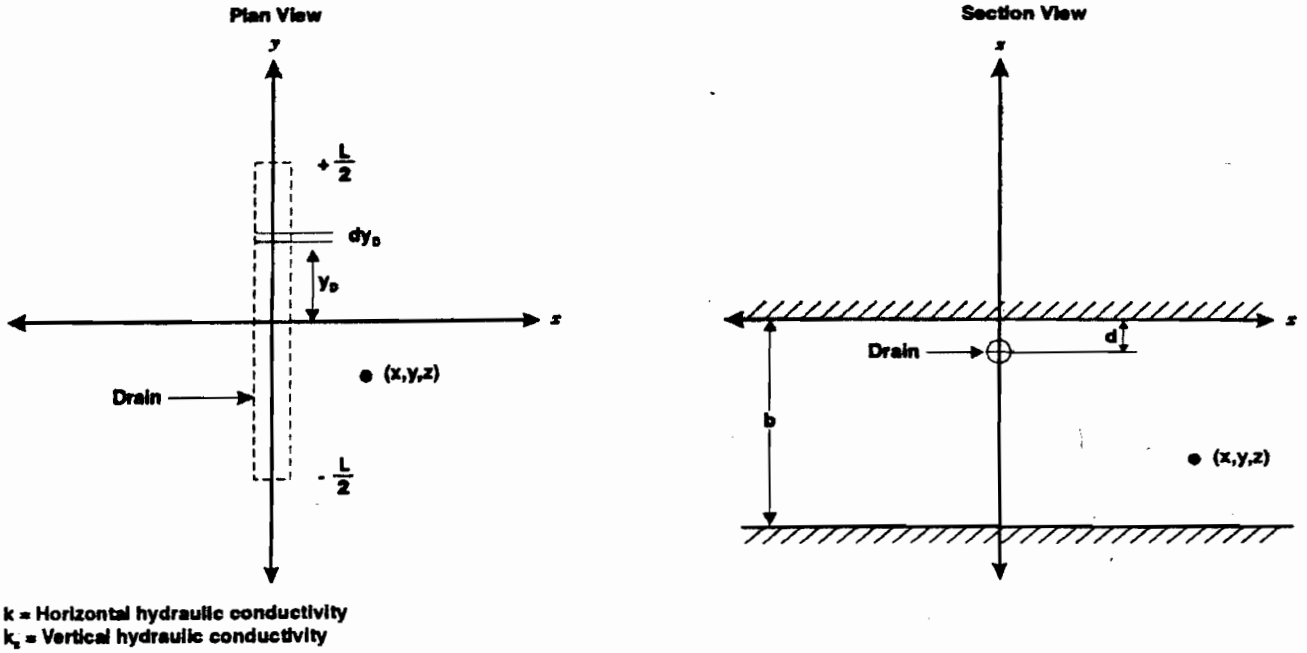


Fig. 1. Plan and section views of horizontal drain.

... applying equation (7), the resulting infinitesimal drawdown at point (x, y, z) is

$$ds = \frac{(Q/L)\,dy_D}{4\pi K(A)^{1/2}} \frac{1}{\left[x^2 + (y - y_D)^2 + \frac{(z - Z)^2}{A}\right]^{1/2}} \quad (9)$$

Integrating with respect to y_D over the length of the drain from $-L/2$ to $L/2$ yields

$$s = \frac{Q}{4\pi KL(A)^{1/2}} \int_{-L/2}^{L/2} \frac{dy_D}{\left[x^2 + (y - y_D)^2 + \frac{(z - Z)^2}{A}\right]^{1/2}}$$

$$= \frac{Q}{4\pi KL(A)^{1/2}} \ln \frac{\left[x^2 + \left(y + \frac{L}{2}\right)^2 + \frac{(z - Z)^2}{A}\right]^{1/2} + y + \frac{L}{2}}{\left[x^2 + \left(y - \frac{L}{2}\right)^2 + \frac{(z - Z)^2}{A}\right]^{1/2} + y - \frac{L}{2}} \quad (10)$$

The principle of superposition is used to determine the total drawdown by adding the drawdowns caused by the actual drain and all of the image drains. The z coordinate locations of the actual drain and image drains in Figure 2 are $-d$, d, $-2b + d$, $-2b - d$, $2b - d$, $2b + d$, $-4b + d$, $-4b - d$, $4b - d$, $4b + d$, etc. These values are substituted into equation (10) and in addition, a gradient term is added to account for a prepumping gradient of magnitude I in a direction θ with respect to the x axis. The term s thus becomes a measure of the distance of the water level below the nonpumped level at the origin of the coordinate system and is expressed as follows:

$$s = Ix\cos\theta + Iy\sin\theta + \frac{Q}{4\pi KL(A)^{1/2}} \sum_{n=-\infty}^{\infty} \left[\ln \frac{\left[x^2 + \left(y + \frac{L}{2}\right)^2 + \frac{(z - 2nb - d)^2}{A}\right]^{1/2} + y + \frac{L}{2}}{\left[x^2 + \left(y - \frac{L}{2}\right)^2 + \frac{(z - 2nb - d)^2}{A}\right]^{1/2} + y - \frac{L}{2}} \right.$$

$$\left. + \ln \frac{\left[x^2 + \left(y + \frac{L}{2}\right)^2 + \frac{(z - 2nb + d)^2}{A}\right]^{1/2} + y + \frac{L}{2}}{\left[x^2 + \left(y - \frac{L}{2}\right)^2 + \frac{(z - 2nb + d)^2}{A}\right]^{1/2} + y - \frac{L}{2}} \right] \quad (11)$$

Head or drawdown must be referenced to common datum. The choice of the static head at the origin of the coordinate system was arbitrary and solely for convenience.

Summarizing the terms in equation (11), s = distance of the water level at (x, y, z) below the static water level measured at the origin of the coordinate system; I = regional gradient; θ = gradient direction, measured from the positive x axis; Q = flow rate; K = horizontal hydraulic conductivity; A = anisotropy ratio = K_z/K (K_z = vertical hydraulic conductivity); L = length of drain; x, y, z = coordinates of point where s is computed; b = aquifer thickness; and d = depth of drain below top of aquifer.

Key assumptions made in developing this equation are the following: (1) The aquifer is homogeneous and anisotropic. (2) The aquifer is confined or it is unconfined and s is small in relation to aquifer thickness ($s \ll b$). (3) The flow is constant per unit length of drain.

In equation (11), the terms corresponding to $n = 0$ represent the drain and one image reflected across the top of the aquifer. Terms corresponding to negative n represent image pairs below the aquifer, whereas terms corresponding to positive n represent image pairs above the aquifer, as illustrated in Figure 2.

Having obtained an expression for s, particle velocity components may be computed as follows:

$$v_x = \frac{K}{\eta} \frac{\partial s}{\partial x} \quad (12a)$$

$$v_y = \frac{K}{\eta} \frac{\partial s}{\partial y} \quad (12b)$$

$$v_z = \frac{KA}{\eta} \frac{\partial s}{\partial z} \quad (12c)$$

where v_x = velocity vector component in the x direction; v_y = velocity vector component in the y direction; v_z = velocity vector component in the z direction; and η = effective porosity.

Differentiating s with respect to x, y, and z and substituting into equations (12a) through (12c) yields the following:

$$v_x = \frac{KI}{\eta}\cos\theta + \frac{Qx}{4\pi L\eta(A)^{1/2}} \cdot \sum_{n=-\infty}^{\infty}$$

$$\left[\frac{1}{\left[x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}\right]^{1/2}\left(\left[x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}\right]^{1/2}+y+\frac{L}{2}\right)}\right.$$

$$-\frac{1}{\left[x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}\right]^{1/2}\left(\left[x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}\right]^{1/2}+y-\frac{L}{2}\right)}$$

$$+\frac{1}{\left[x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}\right]^{1/2}\left(\left[x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}\right]^{1/2}+y+\frac{L}{2}\right)}$$

$$\left.-\frac{1}{\left[x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}\right]^{1/2}\left(\left[x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}\right]^{1/2}+y-\frac{L}{2}\right)}\right]$$

$$v_y = \frac{KI}{\eta}\sin\theta + \frac{Q}{4\pi L\eta(A)^{1/2}} \cdot \sum_{n=-\infty}^{\infty}$$

$$\left[\frac{1}{\left[x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}\right]^{1/2}}-\frac{1}{\left[x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}\right]^{1/2}}\right.$$

$$\left.+\frac{1}{\left[x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}\right]^{1/2}}-\frac{1}{\left[x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}\right]^{1/2}}\right] \quad (10)$$

$$v_z = \frac{Q}{4\pi L\eta(A)^{1/2}} \cdot \sum_{n=-\infty}^{\infty}$$

$$\left\{(z-2nb-d)\left[\frac{1}{\left[x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}\right]^{1/2}\left(\left[x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}\right]^{1/2}+y+\frac{L}{2}\right)}\right.\right.$$

$$\left.-\frac{1}{\left[x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}\right]^{1/2}\left(\left[x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb-d)^2}{A}\right]^{1/2}+y-\frac{L}{2}\right)}\right]$$

$$+(z-2nb+d)\left[\frac{1}{\left[x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}\right]^{1/2}\left(\left[x^2+\left(y+\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}\right]^{1/2}+y+\frac{L}{2}\right)}\right.$$

$$\left.\left.-\frac{1}{\left[x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}\right]^{1/2}\left(\left[x^2+\left(y-\frac{L}{2}\right)^2+\frac{(z-2nb+d)^2}{A}\right]^{1/2}+y-\frac{L}{2}\right)}\right]\right\} \quad (11)$$

These equations permit particle tracking using numerical integration techniques. In practice, the infinite series is truncated b summing over n from $-N$ to N where N is chosen to provide the accuracy required. While the expression for s [equation (11)] goes t infinity as N increases, the expressions for v_x, v_y, v_z converge for large values of N.

Computing time increases as N increases, so problem solving is speeded up by restricting N to relatively small values. Experien has shown that small values of N usually provide adequate results. In fact, if the capture zone penetrates just a fraction of the aquif thickness (for example, less than half), setting $N = 0$ provides good results. This is equivalent to assuming the aquifer is infinitely thic

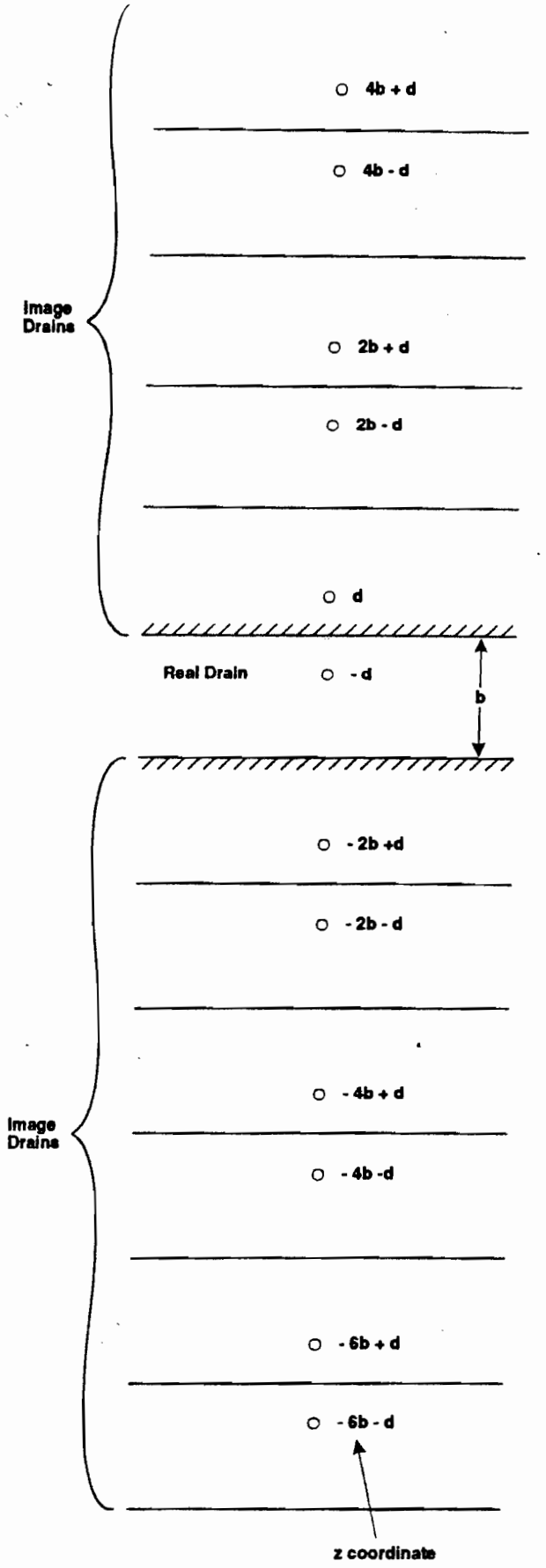


Fig. 2. Coordinates of real drain and image drains.

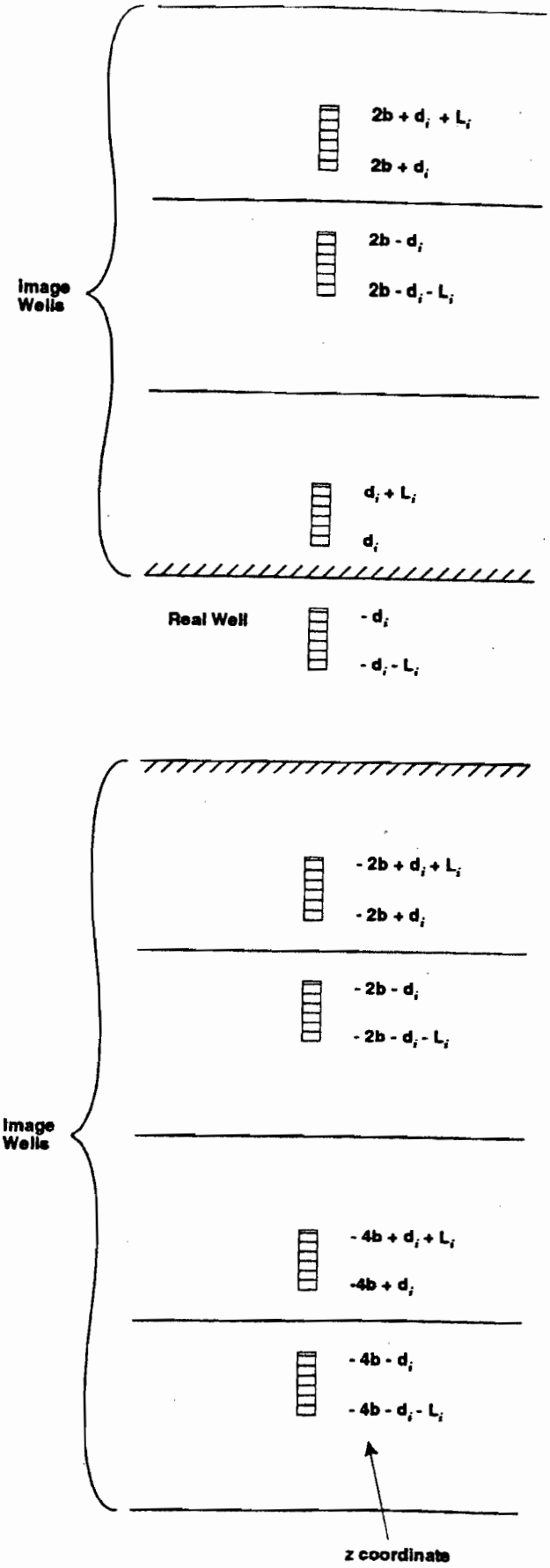


Fig. 4. Intake coordinates of real well and image wells.

Vertical Wells

The equation for drawdown around a system of partially penetrating extraction wells can be derived in the same manner as the one for the horizontal drain. Analysis of flow to vertical, partially penetrating wells has been treated by others for both water flow Philip and Walter, 1992) and air flow in the vadose zone (Shan, Falta, and Javandel, 1992).

CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M
OPERATION, MAINTENANCE AND MONITORING

OM&M REPORT

ATTACHMENT G
SEDIMENT SAMPLING REPORT

SEDIMENT SAMPLING

1.0 INTRODUCTION

1.1 Objective

Sediment sampling was conducted at Kessman September 29 through October 2, 2003. The purpose of the sediment sampling activities was to evaluate whether a previously remediated wetlands area adjacent to the landfill had become contaminated by the hazardous materials that are contained in the landfill, and if so the extent of that contamination.

2.0 Scope of Work

2.1 Sampling

O'Brien and Gere and IEG personnel arrived on site on September 29 and began gridding and staking the areas that were to be sampled. Five distinct areas, A through E, were selected for discrete sampling as shown on Figure 4A of this Report. Area A consisted of the previously remediated wetlands area that would be most impacted by leachate seeps. Area B also represented an area that would be impacted by leachate seeps as well as serving as a drainage pathway from the landfill to the east. Area C represented the previously remediated wetlands. Area D covered an area of the wetlands that had not been remediated and Area E represented a drainage pathway to the northeast. Figure 2 shows the five Areas that were sampled along with the sample location numbers as designated in the field.

Sediment samples were taken by using both a hand auger and by pushing Lexicon tubing into the subsurface. The specific subsurface conditions determined which method was used. A total of 34 near surface samples were collected from a depth of 0 to 6 inches. An additional eight samples were taken from the 6 to 12 inch interval at select locations from which the shallower samples had also been collected. Additional QA/QC samples were also collected.

Most of the areas sampled were covered with surface water ranging from 0.5 feet to 3 feet in depth. In addition heavy vegetation was encountered in many areas.

As sediment samples were collected, the samples were logged and described in the field. Each sample was composited prior to being placed into clean bottleware to be shipped overnight to the O' Brien and Gere laboratory. Proper decontamination procedures were followed on the sampling equipment.

After each sample was collected GPS coordinates were recorded for each location. The coordinates were recorded in the field log book as well as on the GPS's internal data logger. After sampling was completed GPS coordinates were also recorded for the eight monitoring well locations.

2.2 Description of Sediments

Generally speaking there was a distinct difference between the soil encountered in the remediated areas and the areas that have remained undisturbed. The soils in the unremediated areas (Areas D and E) were siltier in the near surface and contained less clay. The soils in the remediated areas (Areas A to C) contained more clay and more near surface organic material. Table 4 of this Report provides a visual description of the sediment samples that were taken.

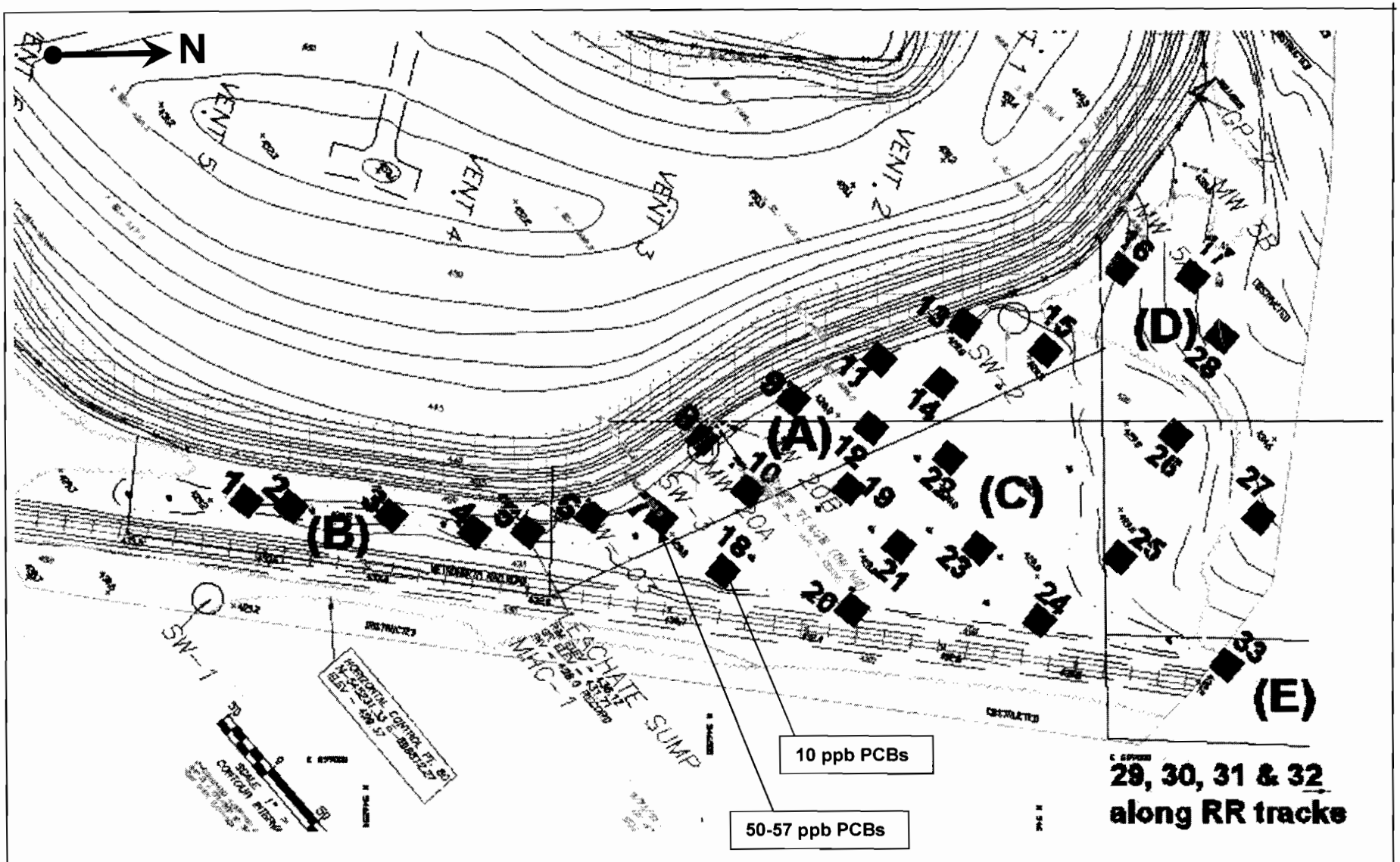
2.3 Analytical Results

Samples were analyzed for PCB's using Method SWA 8082. Table 4 of this Report shows the analytical results for each sample taken. Only two of the samples showed the presence of PCBs at a total concentration greater than 50 ppm. These samples were further tested for dioxins with the results being negative for the presence of dioxins. The two samples that contained PCB's greater than 50 ppm were both from location Number 7 in Area A. Figure 4B of this Report shows the GPS location of each sample and is numbered to correspond with the analytical lab results.

The samples that had the PCB hits were located near the edge of the landfill at a location that has been suspected of being a leachate seep location. This location is located near the leachate sump and was confirmed by the tracer study to be hydraulically connected. We have collected surface water from this location in the past with results for PCB's always coming up negative.

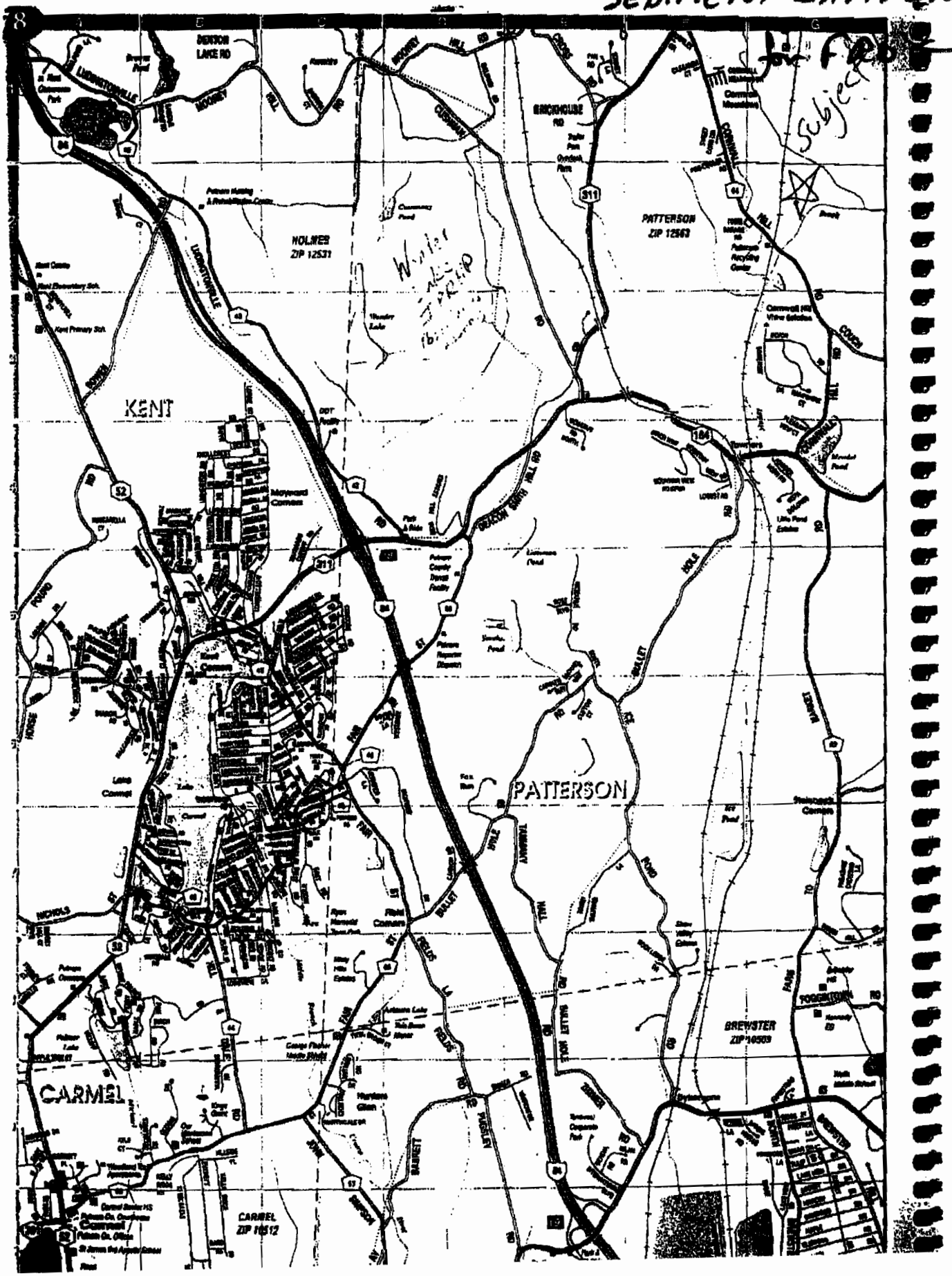
3.0 RECOMMENDATIONS

The areas that were sampled covered any suspected contaminate pathways that would be leading from the site. The only area that contained any noteworthy PCB contamination was on the ENE edge of the landfill. Since there is no evidence that PCB contamination has spread beyond this location, we recommend that no further action be taken at this time. The site should continue to be monitored on a regular basis.

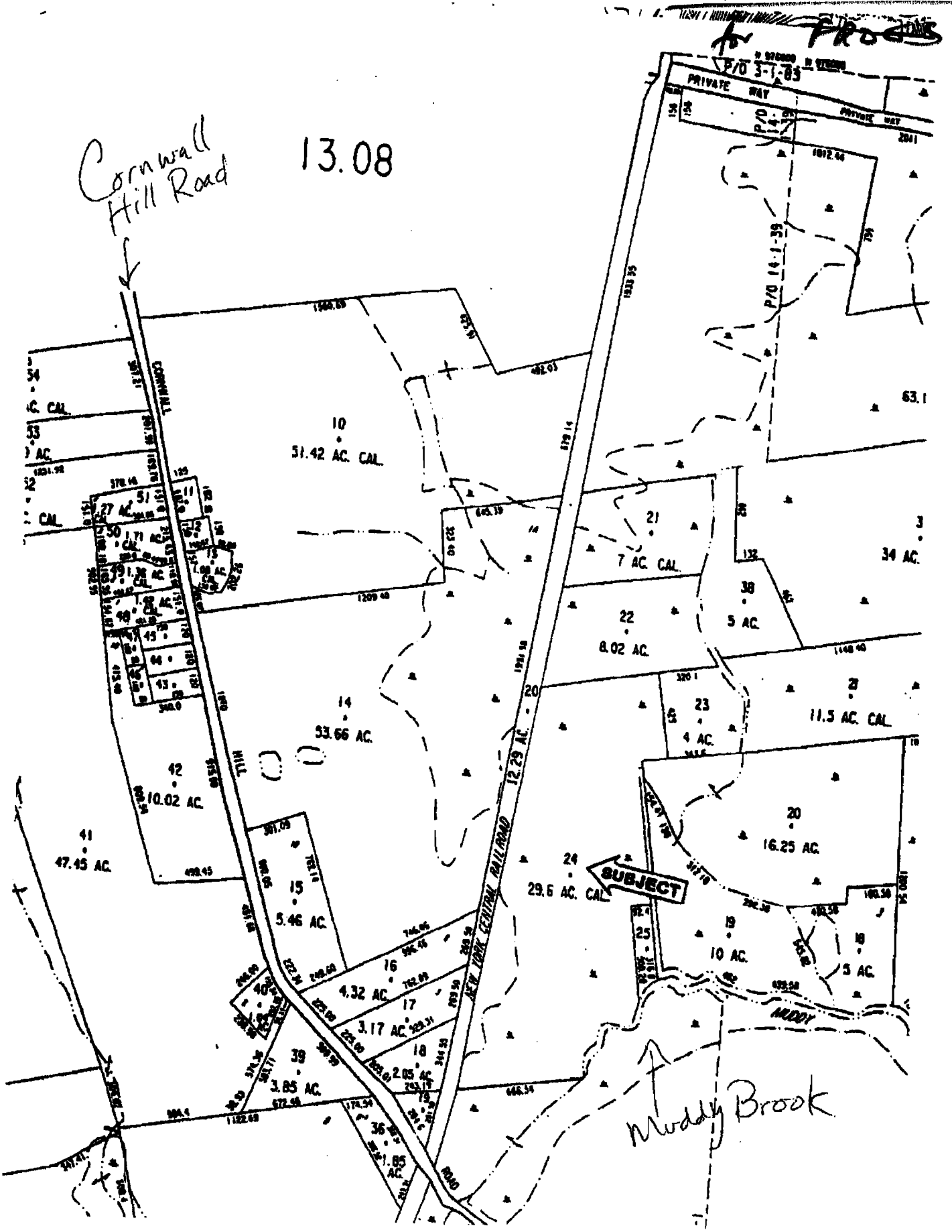


KESSMAN LANDFILL OM&M	FIGURE 4A
Sediment Sampling Locations	IEG

SEDIMENT SAMPLING



SEDIMENT SAMPLING



CROSS COUNTY SANITATION/KESSMAN LANDFILL O&M
OPERATION, MAINTENANCE AND MONITORING

OM&M REPORT

ATTACHMENT H
TRACER STUDY REPORT (SU)

224 Stolp Avenue
Syracuse, NY 13207
November 24, 2004

Iyer Environmental Group, PLLC
44 Rolling Hills Drive
Orchard Park, NY 14127

Dear Mr. Iyer:

This is a final letter report presenting our findings with respect to a dye tracing experiment done at the Kessman Landfill in Patterson, New York. This work was done from May 2004 to August 2004.

Introduction

The dye tracing experiment described herein, done at the request of Iyer Environmental Group (IEG), tested whether water from a wetland adjacent to the Kessman Landfill (Patterson, New York; Fig. 1), drains into a drainage trench constructed to remove landfill leachate. Pumps remove leachate from the trench and the leachate is placed in tanker trucks and treated offsite. IEG believes that the amount of leachate generated by the drainage trench from the landfill is larger than anticipated from the landfill. Consequently, it costs more to remove the leachate than anticipated.

Methods

Field Studies

Briefly, IEG injected five dyes as liquid on May 26, 2004 at noon, into monitoring wells and into standing surface water in the wetland closest to the wetland edge (Table 1). These dyes were: Na-naphtionate, eosine, sulforhodamine B, sulforhodamine G, and lissamine FF. Subsequently, IEG sampled surface water and leachate collected at the leachate collection points when leachate was pumped from the system at variable time intervals.

Analytical

These samples were sent to Syracuse University's fluorescence laboratory for analysis by synchronous spectrofluorometry. In this approach, known wavelengths of radiation are passed through a sample. Dissolved fluorescent dyes in the water then will emit unique radiation, fluorescence, depending on their organic molecular compositions (Table 2). We added 200 grams of all dyes except for Na-Naphtionate, which fluoresces with approximately a 10 fold less intensity. Therefore, we added about ten times as much of NAP than the other dyes for consistency in relative intensity response.

We quantified the amount of the other dyes in the samples by linear regression of relative peak intensities in standard solutions prepared from background leachate and wetland waters. In all cases, the regression coefficients between relative intensity of the dyes and dye concentrations in background water were very good, and exceeded 0.88 and most were near 1.0 (Fig. 2). These regressions included the range of dye emissions found at the site.

Results and Interpretation

The locations, times, and concentrations of detected dye are shown in Table 3. Figure 3 shows a plot of dyes identified in the leachate reservoir. Of the five injected dyes, Na-naphtionate, sulforhodamine B, and lissamine FF were found in the wetland surface waters. Although they were diluted over time, these dyes persisted at the wetland injection points,. Lissamine FF also appeared at sampling site RS, southeast of the wetland and away from the leachate collection system. EOS and SRG were not found anywhere, suggesting that they degraded or their fluorescence was masked by the intrinsic fluorescence of the dissolved organic carbon. Much larger amounts of these dyes would have had to be introduced to make them possibly effective. Alternatively, perhaps the low hydraulic gradient from the injection point for these dyes precluded their arriving to the leachate collection system. Without more sampling points, it is impossible to clarify why EOS and SRG were not found in the leachate reservoir.

In contrast, Na-naphtionate and sulforhodamine B appeared in leachate at the reservoir (Fig. 3). The breakthrough of these dyes show that the integrity of the drainage trench is compromised and wetland water is entering the drainage trench when the trench is pumped.

The mixing of wetland water with the leachate may have inhibited possible biodegradation of the Na-naphtionate and sulforhodamine B. Without introducing them into the landfill environment directly, it is impossible to determine whether they would biochemically degrade there. In general, LIS, NAP, and EOS biochemically degrade or have their fluorescence quenched more rapidly than do SRG and SRB. However, the degree to which this happens depends upon the specific microbial populations present, pH and redox state, and trace metals in solution. This biodegradation and quenching has to be evaluated by in-situ experiments. This kind of experimentation was not the focus of this study. Rather, the study was designed to qualitatively identify if wetland water is leaking into the leachate recovery system and contributing more water than is anticipated from the landfill proper.

Two dyes introduced into the wetland did arrive into the leachate collection reservoir; Na-naphtionate and sulforhodamine B. Na-naphtionate first arrived at the leachate reservoir on May 27, 2004, after 30,000 gallons of leachate were pumped from the system. Subsequently, sulforhodamine B appeared in the leachate after 36,000 gallons were removed.

Concentrations of Na-naphtionate decreased as concentrations of sulforhodamine B increased, and then NAP increased again. The decrease in Na-naphtionate and then subsequent increase could have occurred because the most mobile portion of the dye near its injection point was extracted quickly with pumping. The remainder of the dye could have moved in more diffuse pore space later to where sulforhodamine B was injected. Then, both dyes together would have leaked into the leachate drainage trench, which probably is breached near both dye injection locations.

In the landfill leachate reservoir, the two dyes appeared within 6000 gallons of each other. Interestingly, SRB appeared later than NAP, even though the SRB injection point was closer to the sump. However, in wetland settings, hydraulic pathways are complex and local heterogeneities in the hummock and hollow topography lead to a macro-pore flow system that is complex. These hydraulic pathways can have variable water residence times unrelated to direct linear distances along general hydraulic gradients.

Summary and Conclusions

The dye tracing experiment shows that the leachate recovery trench is compromised near the dye injection points 2 and 4. A portion of the "leachate" being collected consists of wetland water. The dyes that were introduced into the landfill-monitoring wells did not enter the leachate reservoir, probably because they were biodegraded in the landfill leachate geochemical environment. Another possibility is that the fluorescence of these dyes was masked by the fluorescence of the leachate dissolved organic carbon or quenched by trace metals.

To now quantitatively determine how much wetland water is entering the leachate drainage trench, mixing models should be done using relatively non-reactive inorganic constituents common to both the leachate and wetland waters, such as dissolved carbon, sodium, alkalinity, calcium and chloride.

Sincerely yours,

Donald I. Siegel, PhD.
Hydrogeologist

ID	DESCRIPTION	DYE
1	MW-5B	200 g sulforhodamine G extra
2	Wetland near MW-5B	2.5 kg Na-Naphtionate
3	MW-20A	200 g eosine
4	Wetland next to MW-20A	200 g sulforhodamine B
5	Wetland near leachate sump	1 kg lissamine FF

Table 1
Dye injection points and the amount of dye injected as solution

Dye	λex	λem	Δλ
NAP	320 nm	420 nm	100 nm
LIS	469 nm	490 nm	21 nm
EOS	516 nm	538 nm	22 nm
SRG	532 nm	552 nm	20 nm
SRB	564 nm	583 nm	19 nm

Table 2
Excitation, Emission and DELTA wavelengths
used in the synchroscans

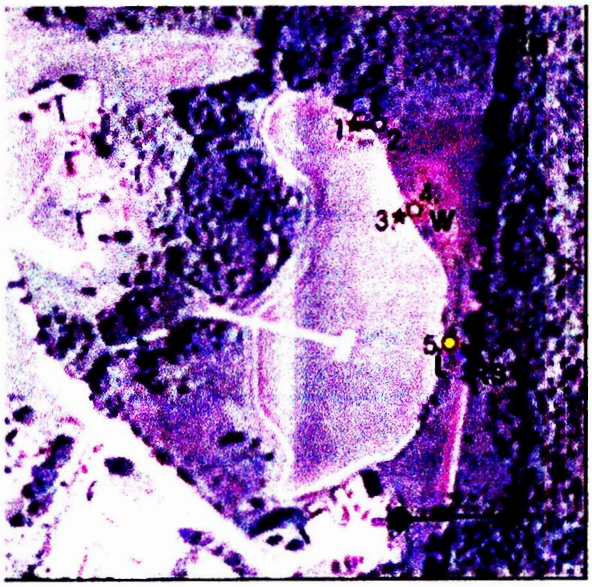


FIGURE 1
The Kessman Landfill, aerial view, with locations of dye injection sites in wetland surface water (sites 2,4, & 5; as pentagons) and monitoring wells 1 and 3 (as stars). W is the wetland sampling point; L is the leachate collection point, RN and RS are the upgradient and down gradient surface water sampling locations in the wetland in a creek crossing the railway, indicated as the straight lineation on the figure. Line for scale is 50 m long.

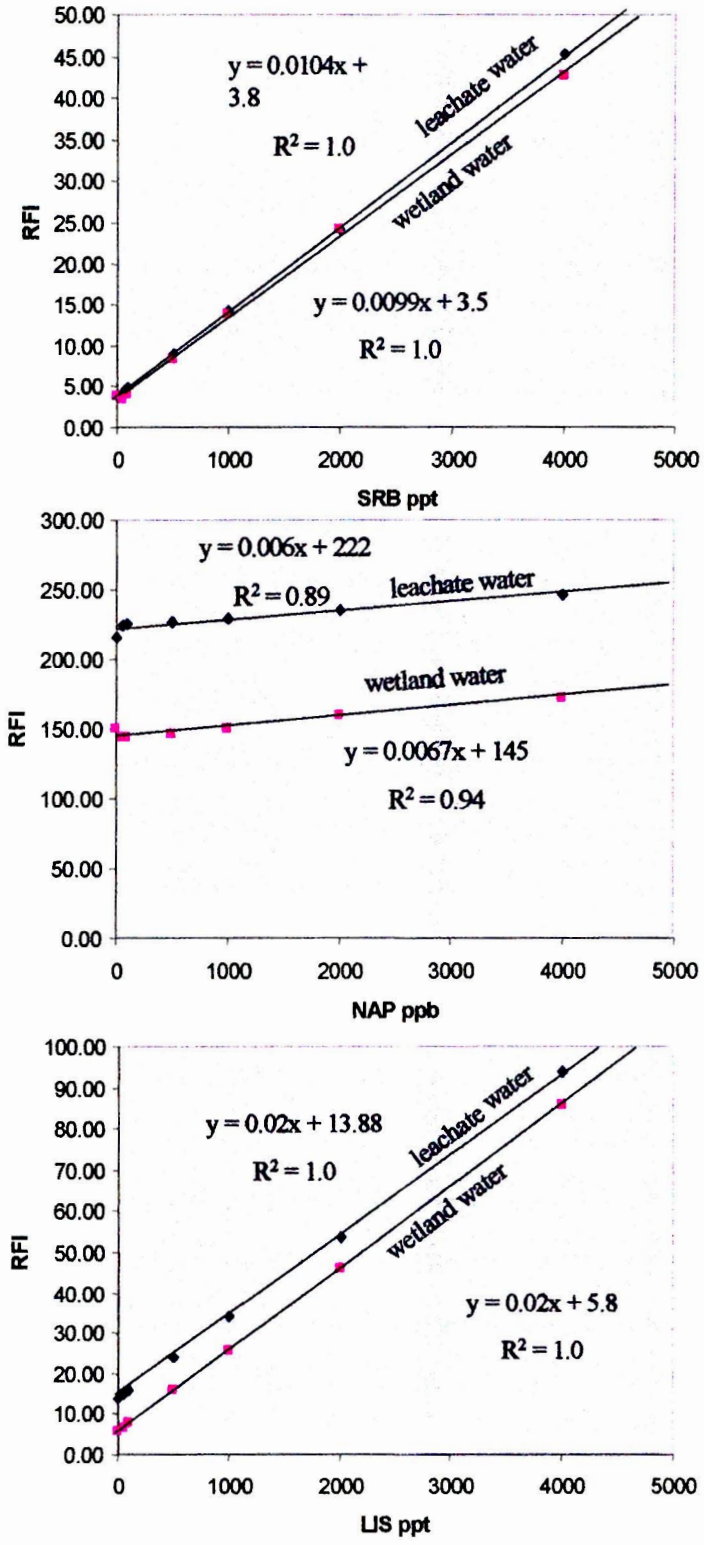


Figure 2
Regressions of Relative Fluorescent Intensity
in Leachate and Wetland Water Against Concentration

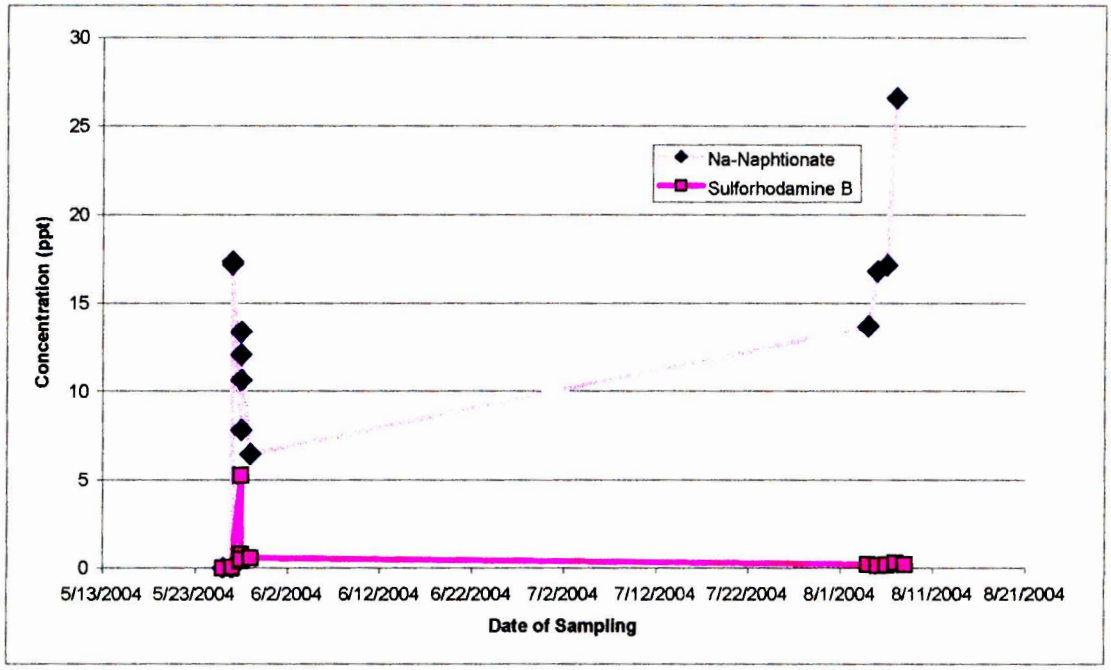


Figure 3

Plot of Concentrations of Dye Detected in Leachate Reservoir With Time