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July 26, 2001

HAI #99-331.01
Phase 1
File 13.2

Via UPS Overnight

Mr. Kim Ford, P.E.
Solid Waste Section
Florida Department of Environmental Protection
Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

RECEIVED
JUL 30 2001
Department of Environmental Protection
BY SOUTHWEST DISTRICT

Subject: **Request for Supplemental Information, dated June 29, 2001**
Sid Larkin & Son, Inc.
Enterprise Recycling and Disposal Facility, Class III Landfill
Pasco County, Florida
Pending Permit Numbers 177982-001-SC and 177982-002-SO

Dear Mr. Ford:

On behalf of Sid Larkin & Son, Inc. (SLS), Hartman & Associates, Inc. (HAI) is submitting for your review, responses to the hydrogeological comments of your request for supplemental information, dated June 29, 2001, for the above referenced facility. Your comments requiring supplemental information are stated first with our responses following. Although Mr. Ford's comments under Part B did not require responses, we have responded accordingly.

Kim Ford's Review Comments

Part B – Disposal Facility General Information

1. B.21., B.22., B.24., and B.25. It is noted that revisions to Chapter 62-701, F.A.C., effective May 27, 2001, change the rule citations for Class III wastes and landfills. The definition of Class III wastes is presented in Rule 62-701.200(14), F.A.C., and the exemption language is presented in Rule 62-701.340(3) (c), F.A.C. It is also noted that the revised rule indicates that it is the applicant who demonstrates that no significant threat to the environment will result from the requested exemption.

Submittal 3 includes statements regarding the applicability of the requested exemption from liner and leachate collection requirements at the subject facility. The following comments address several of these statements:

Comment 1a: It is indicated that the Department's publication entitled *Florida Class III Lined Landfill Leachate Data Summary Report,* dated May 18, 2000, includes average concentrations for leachate constituents which are not representative of actual concentrations. Richard Tedder, FDEP Tallahassee at (850) 488-0300, should be contacted to obtain revised leachate average concentrations that include the results for non-detects.

Response:

We have received "draft" revised Class III landfill leachate average concentrations that include the results for non-detects from Richard Tedder's office, see attached. The inclusion of the non-detects has reduced the average of most of the parameters of concern by an order of magnitude, i.e. vinyl chloride from 3.2 to 0.7 µg/L. However, the "non-detects" were given the concentration value of the laboratory method's MDL (for example vinyl chloride at 1.0 µg/L), which acts to again skew the data to the right or toward the excessively conservative side, assuming that some level of contaminant is always in a sample. Although we do not consider the revised Class III leachate results representative of typical leachate from a properly operated Class III landfill, we have revised Table 1 – Calculated Dilution of Potential Contaminants, using the revised data, see attached. Our revised table indicates that only iron is estimated to exceed the secondary standard at the edge of Cells 1 and 2. The Department's zone of discharge (ZOD) rule recognizes that some localized aquifer water quality degradation may occur at sites such as a Class III landfill, but our site-specific geology, design and operations will prevent any impacts outside of the site's ZOD.

Comment 1b: It is indicated that the leachate data for the West Pasco Class III landfill does not exceed FDEP standards or guidance concentrations, with the exception of mercury. The attached table provides a summary of leachate samples collected at the West Pasco Class III landfill for the period from August 1999 to February 2001. It is noted that exceedances of ground water standards were reported for the following sampling events: August 1999 – total dissolved solids; February 2000 – iron; July 2000 – pH, iron, and total dissolved solids; February 2001 – iron, total dissolved solids, and benzene.

Response:

Our conclusions for leachate quality at the West Pasco Class III landfill were based on the data supplied with Mr. Tedder's report, which was older data.

Comment 1c: It is indicated that the Cedar Trail Class III landfill has a similar clay layer and has not experienced any significant ground water exceedances. It is noted that site hydrogeology and the consistency of the emplaced phosphatic clay slimes at the Cedar Trail Class III landfill is

sediments at the proposed Enterprise Class III landfill. It is also noted that persistent exceedances of standard have been reported for one of the detection wells at Cedar Trail Class III that are not considered to be "naturally occurring".

Response:

We acknowledge that the two sites are somewhat hydrogeologically dissimilar. We assume that the persistent exceedances referred to at the Cedar Trail Landfill are iron, manganese, sulfate and TDS, which arguably may not be indicative of background concentrations, but are secondary drinking water standard parameters that are commonly exceeded in the surficial aquifer.

Comment: Submittal 4 includes calculations of dilution for potential pollutants based on rainfall from the upgradient ground water basin from west to east across the site. The following comments address the dilution approach:

Comment 1d: It is understood that the area of the region upgradient of Cells 1 and 2 that contribute ground water (A_u) was based on topography from quadrangle maps for the vicinity of the subject property. Documentation of the area upgradient of Cells 1 and 2 was not included in the submittal for review.

Response:

See attached map to document area (A_u) used for calculations upgradient of Cells 1 and 2.

Comment 1e: The difference in effective porosity between native soils and emplaced wastes is not addressed in the dilution calculation.

Response:

We acknowledge that the porosity variability of the native soils versus the wastes would affect a more complex solute transport equation. However, many other variables, such as soil carbon content, oxygen content and diffusion also can affect the result. So for simplicity, we did not consider porosity variations, or the other variables listed.

Comment 1f: The seasonal variability in hydraulic gradient and direction of ground water flow is not addressed in the dilution calculation.

Response:

We assumed that the surface water, and most of the groundwater, would flow downhill (from approximately 180 ft NGVD to the west to 100 ft NGVD to the east). Again, to keep it simple, we did not include these variables.

Comment 1g: The assumption that all potential pollutants are not present in background (C_b) is not considered to be valid. The attached table presents water quality data for surficial aquifer wells located within 50 miles of Dade City that are considered to be more representative of background conditions.

Response:

Our initial permit submittal included representative background water quality for the surficial and Floridan aquifer in Pasco County, see Appendix 5-H. It is obvious that many of the surficial aquifer wells included on your 50 mile radius list have been impacted by pollution sources. We acknowledge that the upgradient surface and groundwater may not be free from all contaminants, but for the past 75 years the site and uphill areas have only been used for agricultural uses such as orange groves or cattle grazing, not considered significant pollution sources. Basically, the results of our dilution equation can be considered concentrations above background concentrations.

Comment: It is noted that Department technical staff do not consider the dilution equation and the associated assumptions to adequately describe the transient nature of the surficial aquifer at the subject property. A more detailed analytical solution or a numerical model would be required to characterize potential impacts to ground water quality. However, given the other assurances provided in Submittal 3 regarding control of unauthorized wastes, site hydrogeology, stormwater control, ground water monitoring, and cell certification, the Department is not requesting a more comprehensive demonstration of potential ground water quality impacts in the surficial aquifer for the proposed Enterprise Class III landfill, at this time.

Response:

We acknowledge that the Department considers our demonstration sufficient to allow our requested exemptions from the liner and leachate controls since our application's assurances regarding control of unauthorized wastes, site hydrogeology, stormwater control, groundwater monitoring, and cell certification will prevent significant threat to the groundwater quality of the surficial and Floridan aquifers and the environment.

John Morris' Review Comments:

Part H – Hydrogeological Investigation Requirements (Rule 62-701.410.F.A.C.)

Comment 3. H.1.b – Rate and Direction of Groundwater Flow (Rule 62-701.410(1)(a)1, F.A.C.)

Comment 3. b. Please respond to the following comments provided regarding the response:

Comment 3. i. The response provided in Submittal 3 does not appear to address the response to comment No. 8.e., regarding the occurrence of ground water relative to the top of limestone. It is noted that the elevations reported for P-5 appear to fit on both Figures 11.1 and 14.1, and it is not clear which unit(s) is monitored by P-5.

Response: At the location of piezometer P-5, groundwater in the Floridan aquifer is above the top of the limestone. Although the measured water levels in P-5 appear to fit into both surficial and Floridan contour maps, the top of the screened interval of P-5 intersects the surficial aquifer at about 68 ft NGVD. Therefore, P-5, is monitoring the surficial aquifer. The potentiometric surface map for the Floridan aquifer in May 2000 shows the water level at the site at about 62-65 ft NGVD, see attached.

Comment 3. ii. The boring log provided for P-10B (Submittal 3, Appendix 5-A) indicates the boring was completed 55 feet below land surface, while the well completion log for P-10 (Submittal 2, Appendix 5-A) indicates the piezometer was installed to a depth of 75 feet below land surface. It has not been demonstrated what zone is monitored at this location.

Response: Piezometer P-10 was originally installed in March 2001 as a deep (Floridan) piezometer to be 10 feet into the limestone, but only a driller's log was available. So, we returned to the P-10 location on 5/10/01 and obtained a Geologist's log at boring P-10B to confirm that limestone begins at 50 ft bls. The total measured depth of piezometer P-10 is 75 ft., so it is monitoring the Floridan aquifer zone.

Comment 3. vi. The revision to the boring log for P-12 (Submittal 3, Appendix 5-A) appears to be inappropriate. The documentation from Universal Engineering Sciences (UES) regarding the indicated confirmation that the description of "clayey silt with limerock" is analogous to limestone has not been provided. It is also noted that the modification provided to the boring log for P-12 has changed the soil encountered at a depth of 8 feet below land surface described as "yell brn clay sand/sandy cl" to limestone.

Response: A revised boring log for P-12 is attached that corrects the "limestone" lithology at 8 feet bls back to the original "yell brn clay sand/sandy cl" description. UES was to correct the lithology at 50 ft bls to "limestone" as in the corrected log.

Comment 3. vii. The revision to the boring log for P-1A (Submittal 3, Appendix 5-A) is noted. The documentation from UES regarding the indicated confirmation that the description of "clayey silt with limerock" is analogous to limestone has not been provided.

Response: The requested documentation from UES is attached.

Comment 3. viii. The discussion provided in Submittal 3, regarding anomalous ground water elevations at P-11 is noted. It is also noted that the potentiometric surface contour map provided for water levels measured on May 8, 2001 (Submittal 3, Figure 14.2) incorrectly includes the ground water elevation at P-3A. Revision of Figure 14.2 to exclude data from P-3A will cause substantial changes to the direction of ground water flow.

Response: As correctly suggested, we have excluded the P-3A water level data from Figure 14.2, see the attached revised Figure. This has shifted the Floridan's groundwater flow to the north-northeast, the historically predominant flow direction in the area.

We trust that this supplemental information is sufficient to comply with 62-701.410 and 62-701.510, FAC, and will satisfy the Department's concerns and will allow for the approval of the applicable construction and operation permits for the facility. Please call us if you have any questions or comments, or wish to meet regarding this submittal.

Very truly yours,

Hartman &Associates, Inc.

Jennifer L. Deal, E.I.
Engineer III

James E. Golden, P.G.
Senior Hydrogeologist/Associate

JEG/sas/99-331.01/Ph 1/corresp/Ford-4.jeg
Attachments
Addressee (3)
cc: Robert Butera, P.E., FDEP Tampa
Jon Larkin, SLS

ATTACHMENTS

Department of Environmental Protection

Jeb Bush
Governor

Twin Towers Building
2600 Blair Stone Road MS 4565
Tallahassee, Florida 32399-2400

David B. Struhs
Secretary

FAX TRANSMITTAL LETTER

DATE:	**July 20, 2001**
NUMBER OF PAGES INCLUDING COVER SHEET:	**5**

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If any pages are not clearly received please call (850) 488-0300 or SUNCOM 278-0300.

COMMENTS:
Jennifer,

Per our conversation please find attached the draft updated Class III leachate tables. Without getting into to much detail about what is presented in the tables, they are are based on inclusion of minumim detect levels from the data sheets I have. I intend to rewrite the Class III Leachate Report and hope to complete that soon. Until then, or until I have had a chance to thoroughly check what is presented in the attached tables I'm compelled to call these tables a draft. However, if you have any questions about the tables please feel free to call. I hope this helps.

-David

Class III Leachate Organic Parameter Data Including Minimum Detect Levels

DRAFT

	Units	Minimum	Maximum	Average	Standard Deviation	95% UCL	# of Sampling Events	# of Times Sampled For	Number of Detects	# of Non Detects
1,1,1-Trichloroethane	ug/L	0.296	10	2.39	2.40	2.72	264	210	4	206
1,1-Dichloroethane	ug/L	0.275	25	3.40	3.55	3.95	264	163	5	158
1,1 Dichloroethene	ug/L	0.5	110	5.01	14.79	7.98	264	95	3	92
1,2,4-Trimethylbenzene	ug/L	0.9	3.43	1.77	1.01	2.43	264	9	6	3
1,2-Dichlorobenzene	ug/L	0.365	10.3	2.52	2.54	2.91	264	170	4	166
1,2-Dichloroethane	ug/L	0.5	18	2.00	2.46	2.46	264	111	2	109
1,3,5-Trimethylbenzene	ug/L	0.5	1.08	0.88	0.21	1.05	264	6	4	2
1,4-Dichlorobenzene	ug/L	0.298	10	2.86	2.38	3.21	264	179	50	129
2,4,5-T	ug/L	0.1	10	3.17	4.68	6.64	264	7	1	6
2-Hexanone	ug/L	0.43	100	15.51	22.59	19.90	264	102	6	96
4 Methyl 2 Pentanone	ug/L	5	100	20.55	28.62	37.46	264	11	3	8
Acetone	ug/L	0.33	1400	57.98	162.05	89.13	264	104	27	77
Benzene	ug/L	0.147	30	2.83	3.79	3.32	264	236	80	156
Carbon disulfide	ug/L	0.459	26	5.12	5.27	6.15	264	101	15	86
Chlorobenzene	ug/L	0.234	10	2.43	2.29	2.78	264	169	30	139
Chloroethane	ug/L	1	25	3.82	3.64	4.47	264	121	6	115
Chloroform	ug/L	1	10	4.07	2.85	5.15	264	27	1	26
Dichlorodiflouromethane	ug/L	0.5	25	4.08	6.85	7.96	264	12	2	10
Dinoseb	ug/L	1.5	2	1.75	0.35	2.24	264	2	1	1
Ethylbenzene	ug/L	0.173	30	3.50	4.22	4.14	264	166	53	113
Isopropylbenzene	ug/L	0.5	2	1.00	0.61	1.54	264	5	3	2
m-cresol	ug/L	10	52	31.00	29.70	72.16	264	2	1	1
Methyl Ethyl Ketone	ug/L	5	670	79.70	154.98	143.03	264	23	5	18
Methylene Chloride	ug/L	0.282	14	2.81	2.63	3.51	264	54	5	49
Methyl-Tert-Butyl Ether	ug/L	0.5	9	2.65	2.49	3.80	264	18	5	13
Naphthalene	ug/L	0.5	60	8.66	11.72	13.08	264	27	10	17
p-cresol	ug/L	10	380	147.33	202.59	376.58	264	3	2	1
Phenols	ug/L	0.99	654	46.26	77.12	56.57	264	215	139	76

Class III Leachate Organic Parameter Data Including Minimum Detect Levels

DRAFT

	Units	Minimum	Maximum	Average	Standard Deviation	95% UCL	# of Sampling Events	# of Times Sampled For	Number of Detects	# of Non Detects
p-Isopropyltoluene	ug/L	0.5	2	1.10	0.82	1.82	264	5	2	3
sec-Butylbenzene	ug/L	8	8				264	1	1	0
Tetrahydrofuran	ug/L	12.6	12.6				264	1	1	0
TOH	ug/L	135	181	158.67	23.03	184.73	264	3	3	0
Toluene	ug/L	0.249	480	7.06	38.85	13.10	264	159	27	132
Trichloroethene	ug/L	0.5	440	6.13	35.11	11.56	264	161	9	152
Trichloroflouromethane	ug/L	1	25	4.08	3.76	5.00	264	64	3	61
Vinyl Chloride	ug/L	0.205	95	3.71	10.93	5.15	264	221	22	199
Xylenes	ug/L	0.108	30	5.02	5.67	5.90	264	161	37	124

Class III Leachate Indicator Parameters Including Minimum Detect Levels

DRAFT

	Units	Minimum	Maximum	Average	Standard Deviation	95% UCL	# of Sampling Events	# of Times Sampled For	Number of Detects	# of Non Detects
Alkalinity	mg/L	70.3	3130	1257.04	747.20	1393.01	264	116	116	0
Ammonia Nitrogen	mg/L	0.02	1080	91.75	97.38	103.65	264	257	255	2
Bicarbonates	mg/L	74.4	3130	1200.46	947.53	1432.60	264	64	64	0
BOD_5	mg/L	1	510	42.46	63.65	51.11	264	208	183	25
Calcium	mg/L	45.7	372	233.24	76.30	249.37	264	86	86	0
Chloride	mg/L	3.2	1760	305.33	253.76	336.24	264	259	259	0
COD	mg/L	5	1462	467.03	357.77	517.63	264	192	190	2
Conductivity	umhos/cm	21	8200	3296.29	1878.25	3528.19	264	252	252	0
Corrosivity	Units	-0.777	2.2	1.04	0.71	1.18	264	108	108	0
Dissolved Oxygen	mg/L	0	8.52	1.95	1.98	2.41	264	70	70	0
Fluoride	mg/L	0.05	2	0.35	0.25	0.38	264	194	190	4
Iron	mg/L	0.02	49.7	3.58	7.60	4.52	264	255	251	4
Nitrate Nitrogen	mg/L	0.01	208	2.74	19.52	5.22	264	237	112	125
pH	SU	5.4	8.5	6.88	0.42	6.93	264	256	256	0
Phosphorus	mg/L	0.02	6.04	1.60	1.66	1.83	264	191	180	11
Sodium	mg/L	0.221	810	194.25	155.94	216.20	264	194	194	0
Sulfate	mg/L	1	918	171.84	188.92	198.50	264	193	189	4
Sulfide	mg/L	0.1	4	1.43	2.22	3.95	264	3	1	2
TDS	mg/L	20.1	5390	2024.22	1046.92	2152.97	264	254	253	1
TKN	mg/L	0.75	1380	141.34	183.50	167.30	264	192	192	0
TOC	mg/L	9	471	115.11	89.54	145.21	264	34	34	0
TSS	mg/L	0.1	126	26.56	36.06	43.22	264	18	16	2
Turbidity	NTU	0.76	533	52.23	80.26	63.01	264	213	213	0

DRAFT

Class III Leachate Metal Parameters Including Minimum Detect Levels

	Units	Minimum	Maximum	Average	Standard Deviation	95% UCL	# of Sampling Events	# of Times Sampled For	Number of Detects	# of Non Detects
Aluminum	ug/L	58	58				264	1	1	0
Antimony	ug/L	0.1	200	16.79	39.05	22.27	264	195	12	183
Arsenic	ug/L	1.28	190	19.17	23.94	22.10	264	257	160	97
Barium	ug/L	2.47	500	116.45	73.16	125.60	264	246	186	60
Beryllium	ug/L	0.4	10	2.73	2.85	3.14	264	190	6	184
Cadmium	ug/L	0.05	50	3.62	3.76	4.09	264	251	7	244
Chromium	ug/L	1	290	30.89	32.36	34.84	264	258	215	43
Cobalt	ug/L	1	50	14.57	16.65	17.54	264	121	15	106
Copper	ug/L	0.1	86	9.34	11.10	10.86	264	204	49	155
Cyanide	ug/L	0.059	252	13.66	42.26	27.87	264	34	9	25
Lead	ug/L	0.1	50	6.60	6.13	7.35	264	254	13	241
Magnesium	mg/L	3.75	132	35.48	27.30	41.75	264	73	73	0
Manganese	ug/L	0.077	1020	171.77	161.95	199.30	264	133	131	2
Mercury	ug/L	0.02	1.7	0.31	0.24	0.34	264	250	22	228
Nickel	ug/L	2	140	20.90	20.13	23.65	264	206	89	117
Potassium	ug/L	155	396	297.67	111.07	386.54	264	6	6	0
Selenium	ug/L	0.1	250	12.04	29.53	15.80	264	237	17	220
Silver	ug/L	0.05	76	8.53	5.82	9.25	264	252	13	239
Thallium	ug/L	0.1	300	9.61	31.78	13.94	264	207	6	201
Tin	ug/L	1.9	1400	163.13	323.20	301.37	264	21	10	11
Vanadium	ug/L	1.6	60	12.71	9.81	14.44	264	123	68	55
Zinc	ug/L	0.1	2000	62.32	146.16	80.23	264	256	128	128

TABLE 1 - REVISED
PROPOSED ENTERPRISE RECYCLING AND DISPOSAL FACILITY
DADE CITY, FLORIDA
CALCULATED DILUTION OF POTENTIAL POLLUTANTS

Parameters	Units	Average Leachate* Concentration (C_L)	FDEP Standard or (Guidance) Concentration	Diluted Concentration (C_D)	Number of Landfills with Exceedences
Chloride	mg/L	305.33	250	54	4
Iron	mg/L	3.58	0.3	**0.6**	4
Sodium	mg/L	194.25	160	34	4
TDS	mg/L	2024.22	500	356	4
Antimony	mg/L	16.79	6	3	3
Manganese	mg/L	171.77	50	30	3
Thallium	mg/L	9.61	2	2	2
1,2-Dichloroethane	mg/L	2.0	3	0.4	1
Benzene	mg/L	2.8	1	0.5	4
Isopropylbenzene	mg/L	1.0	(0.8)	0.2	2
Methylene chloride	mg/L	2.8	5	0.5	2
Naphthalene	mg/L	8.7	(6.8)	1.5	4
p-Cresol	mg/L	147.3	(35)	25.9	1
Phenols	mg/L	46.3	(10)	8.1	4
Trichloroethylene	mg/L	6.1	3	1.1	1
Vinyl Chloride	mg/L	3.7	1	0.7	2

*Source: Draft Updated Class III Leachate Tables
FDEP July 20, 2001

EQUATIONS:

$C_D = (C_L * A_c * R + C_b * A_u * R) / ((A_c + A_u) * R)$

$C_D = (C_L * A_c * \cancel{R} + 0) / ((A_c + A_u) * \cancel{R})$

$C_D = (C_L * A_c) / (A_c + A_u)$

ASSUMPTIONS and GIVEN:

C_b =	0	mg/L or mg/L
A_c =	526,400	ft^2
A_u =	2,464,000	ft^2

WHERE:

C_D = Calculated diluted concentration of potential pollutants

C_L = Average leachate concentration of potential pollutants

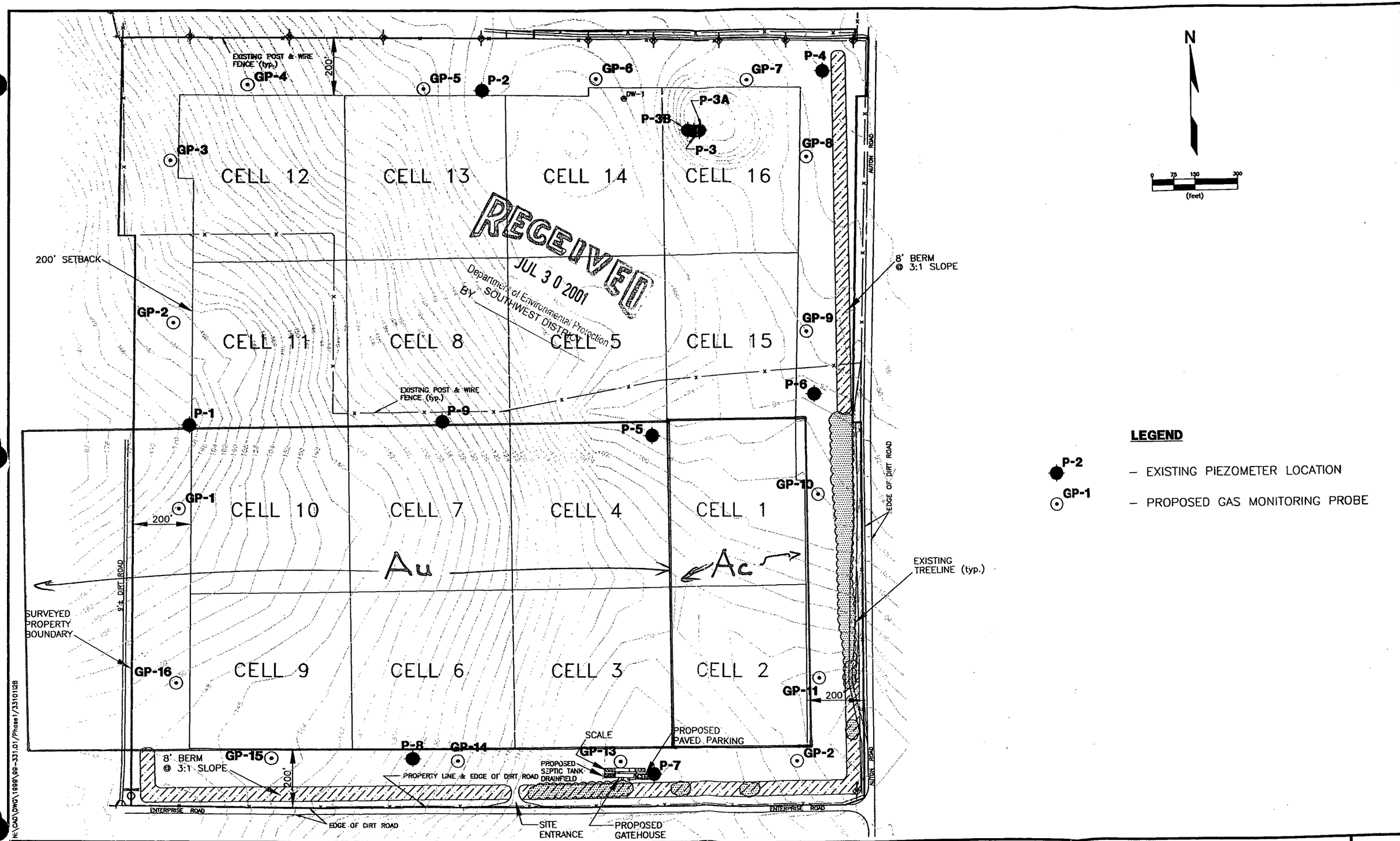
C_b = Background concentration of potential pollutants

A_c = Area of Cells 1 and 2

A_u = Area of region that is upgradient of Cells 1 and 2 that contributes groundwater

R = Rainfall

072601



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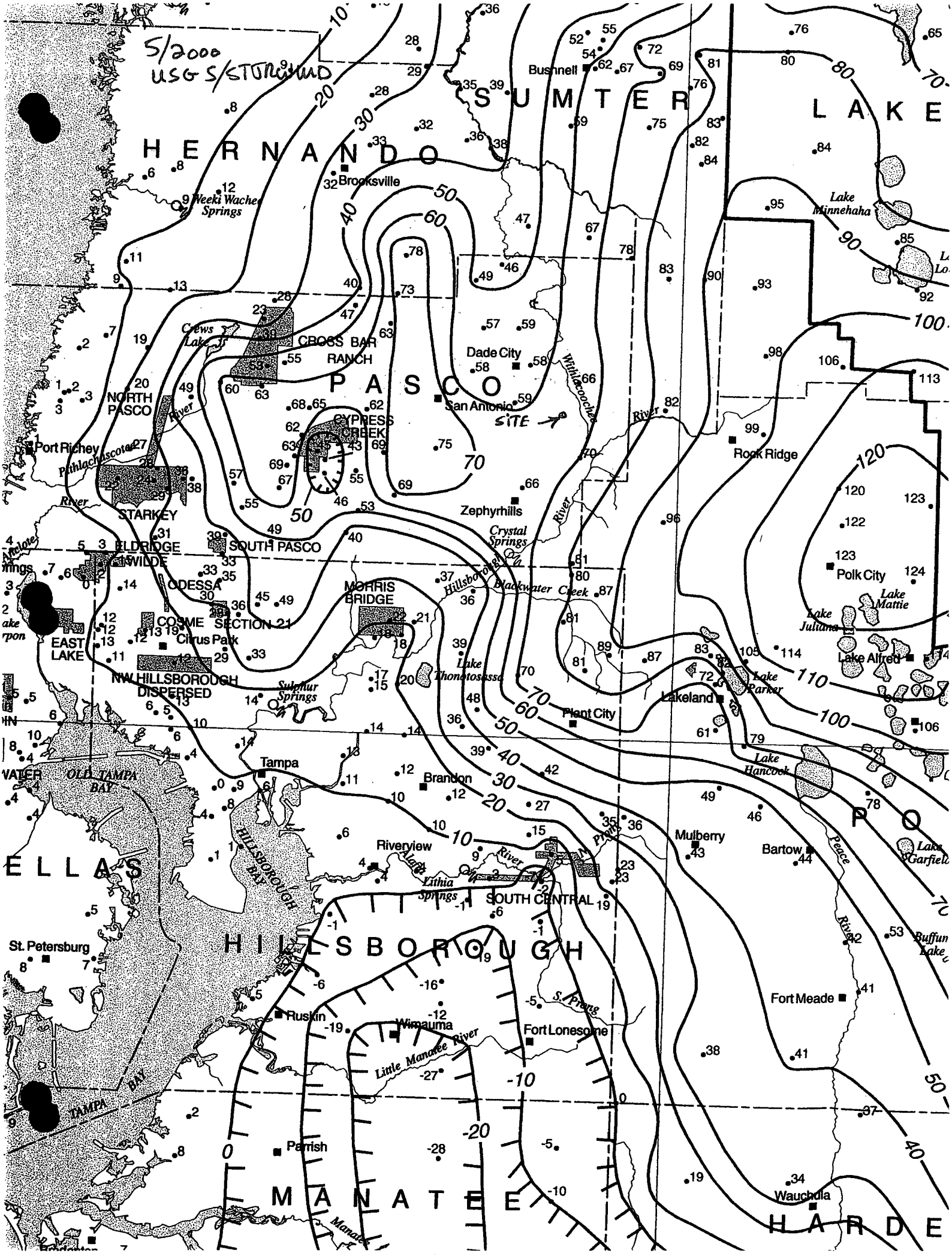
~~PROPOSED GAS MONITORING PROBE LOCATION MAP~~ Dilution Equation Areas
PROPOSED ENTERPRISE RECYCLING AND DISPOSAL FACILITY
DADE CITY, FLORIDA

FIGURE 3-13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Brooksville
Bushnell
Weeki Wachee Springs
Lake Minnehaha
Crews Lake
CROSS BAR RANCH
Dade City
San Antonio
SITE
Withlacoochee River
Rock Ridge
NORTH PASCO
Port Richey
Pithlachascotee River
STARKEY
ELDRIDGE WILDE
SOUTH PASCO
Zephyrhills
Crystal Springs
Hillsborough River
Blackwater Creek
ODESSA
MORRIS BRIDGE
COSME
SECTION 21
Citrus Park
EAST LAKE
NW HILLSBOROUGH DISPERSED
Sulphur Springs
Lake Thonotosassa
Polk City
Lake Mattie
Lake Juliana
Lake Alfred
Lake Parker
Lakeland
Plant City
Lake Hancock
Tampa
Brandon
OLD TAMPA BAY
HILLSBOROUGH BAY
Riverview
Alafia River
Lithia Springs
SOUTH CENTRAL
Mulberry
Bartow
Peace River
Lake Garfield
St. Petersburg
Ruskin
Wimauma
Little Manatee River
Fort Lonesome
Fort Meade
TAMPA BAY
Parrish
Wauchula
10
20
30
40
50
60
70
80
90
100
110
120

SOIL BORING LOG - 18" DRIVE

UNIVERSAL ENGINEERING SCIENCES, INC.
5804 Breckenridge Parkway, Suite E
Tampa, Florida 33610
Phn: (813) 740-8506 Fax: (813) 740-8706

File No: _____ Sheet #: ONE of 2
Boring #: MW P-12 Total Depth: 60'
Date Started: 3-8-01 Date Finished: 3-9-01
Driller: SPLINCE Rig: CME 45
Boring Type: WASH Elevation: _____
Casing Length: NONE Type: _____
Water Table Depth: 1st 53± Date: _____
Water Table Depth: 2nd _____ Date: _____

Project Name: DADE City LANDFILL
Client Name: _____
Boring Location: Staked by CLIENT
Remarks: Installed MW @ 60' 10' SCREEN

Depth (ft.)	Blows per 6" Increment	N value (bpf)	Sample No.	Soil Description
0				GREY SAND
				-3.0 YELL BR SAND
5				
				-8.0' YELL BR CLAYSAND/SANDY CL
10				
15				
20				
25				
30				

SOIL BORING LOG - 1" DRIVE

UNIVERSAL ENGINEERING SCIENCES, INC.
5804 Breckenridge Parkway, Suite E
Tampa, Florida 33610
Phn: (813) 740-8506 Fax: (813) 740-8706

File No:_____ Sheet #: 2 of 2
Boring #: MW P-12 Total Depth: 60'
Date Started: 3-8-01 Date Finished: 3-9-01
Driller: LP Rig: CME 45
Boring Type: WASH Elevation:_____
Casing Length:_____ Type:_____
Water Table Depth:1st_____ Date:_____
Water Table Depth:2nd_____ Date:_____

Project Name: DADE City Land Fill
Client Name:_____
Boring Location:_____
Remarks:_____

Depth (ft.)	Blows per 6" Increment	N value (bpf)	Sample No.	Soil Description
35				35.0' ± LT Grey CLAY SA/SANDY CL.
40				42.0' - 48.0' LOSS H_2O
45				
50				LT BR CLAY, SILTY Limestone ~~w/ LIMEROCK~~
55				SCREEN
60				EOB 60.0'

Universal Engineering Sciences, Inc.
5804 Breckenridge Parkway, Suite E
Tampa, FL 33610
Telephone: 813-740-8506 Fax: 813-740-8705

MEMORANDUM

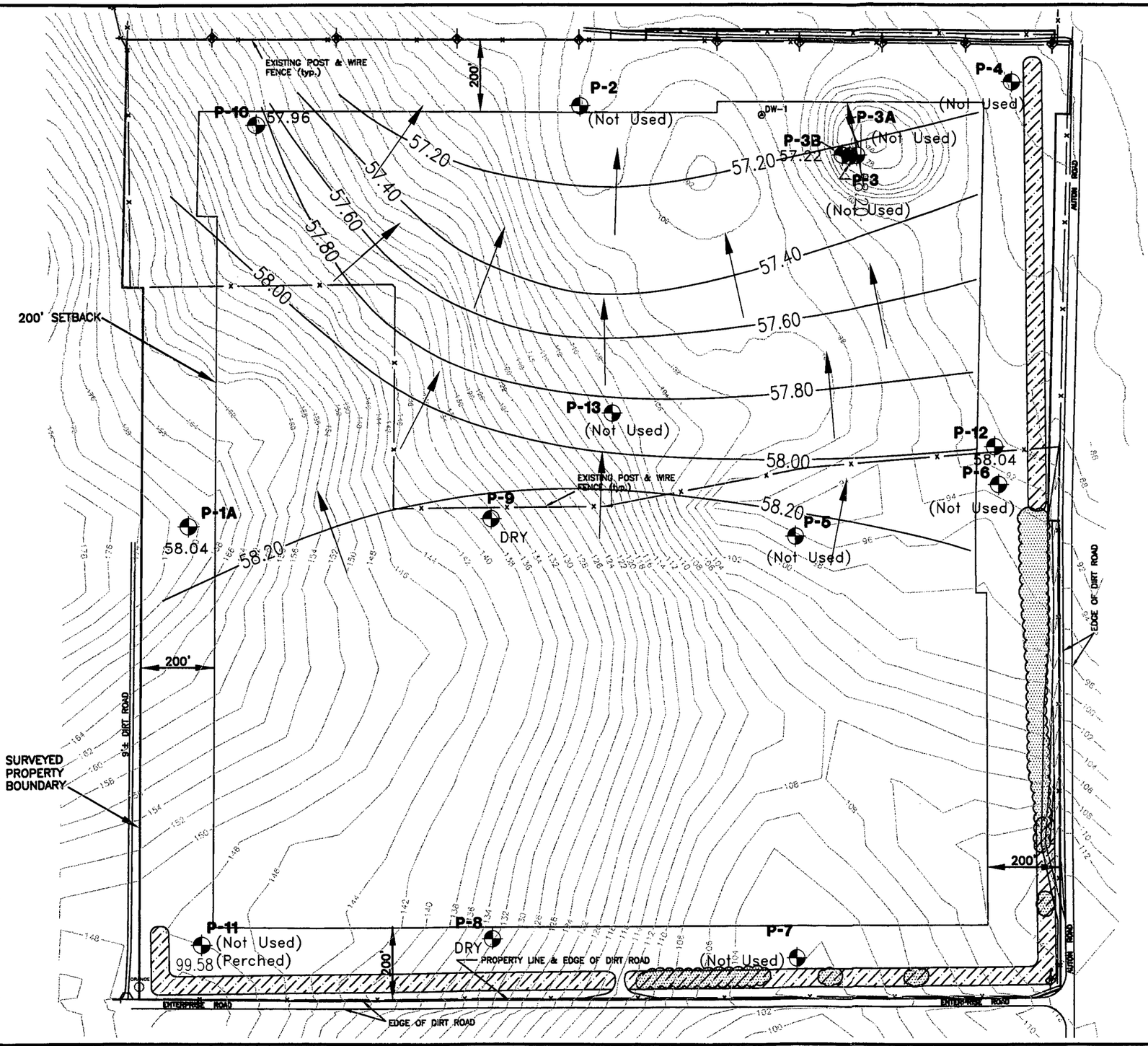
DATE. 7-26-2001

TO: Jim Golden, P.G.

FROM: Wayne Pandorf. P.E.

RE: Dade City Landfill

Our drill crew installed peizometers and wells at the subject project. Logs of the general lithology were maintained by our drill crew chief. He Has 15 years experience and I have worked with him for about 7 years. Based on my familiarity with his descriptive tendencies, as well as, visual classification of borings performed on this site compared to his field descriptions, it is my opinion that field descriptions such as clay or silt with limerock is actually limestone which may have clayey or silty inclusions or may sometimes be weathered. This classification change is shown on the logs for the following locations: MW-P1A, MW-P12, and P-10B.



LEGEND

P-12 – PIEZOMETER I.D.
– PIEZOMETER LOCATION
– WATER ELEVATION, Feet NGVD

58.00 – FLORIDAN AQUIFER POTENTIOMETRIC SURFACE ELEVATION CONTOUR, 5/8/01, (ft. NGVD)

– ESTIMATED GROUNDWATER FLOW DIRECTION

99-331.01/Phase5/3310IN10 7/26/01

HARTMAN & ASSOCIATES, INC.
engineers, hydrogeologists, surveyors & management consultants
201 EAST PINE STREET – SUITE 1000 – ORLANDO, FL 32801
TELEPHONE (407) 839-3955 – FAX (407) 839-3790

FLORIDAN AQUIFER POTENTIOMETRIC SURFACE ELEVATION MAP, 5/8/01
PROPOSED ENTERPRISE RECYCLING AND DISPOSAL FACILITY
DADE CITY, FLORIDA

FIGURE 14.2