

# A

July 10, 1986

Martin County Dept. of Environmental Services  
2685 S. E. Dixie Highway  
Stuart, FL 33494

ARRIBAS ENGINEERS, INC. • 6570 E. Rogers Circle • Boca Raton, Florida 33431  
Broward (305) 523-5503 • Boca Raton (305) 997-5503/2 • WPB/ Boynton Beach (305) 734-5503

Attn: Mr. Lester E. Scherer, Director

Re: Closed Hobe Sound Landfill  
Permit #MP-43-112613  
Arribas File #PB-265

Gentlemen:

Enclosed are the analyses of water samples collected from monitor wells #1, 2 & 3 on June 11 and June 6, 1986 at the above referenced site.

Should you have any questions, please do not hesitate to contact the undersigned at (305) 997-5503

Respectfully submitted,

ARRIBAS ENGINEERS, INC.

*David Schulte*

David Schulte  
Engineering Geologist  
For the Firm

DS/mm

Enclosures

cc: State of Florida Dept. of Environmental Regulations  
Southeast Florida District  
Port St. Lucie, Florida

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**PAUL R. McGINNES AND ASSOCIATES  
CONSULTING LABORATORIES, INC.**

950 OLD DIXIE HIGHWAY

LAKE PARK, FLORIDA 33403

(305) 842-2849

Client: Arribas Engineers, Inc. June 30, 1986  
Mr. David Schulte  
6570 E. Rogers Circle  
Boca Raton, FL 33431

Project: Hobe Sound Closed Landfill Job No. 86-6-11-AN-76

Samples: Well water samples collected 6-11-86 and 6-16-86 by L.Shea of McGinnes Laboratories.

Collection/ Methods: All three wells had been flushed three days prior to McGinnes Laboratories' sample collections. McGinnes Labs technician cleared each well casing approximately three to five times with teflon bailer before collecting water samples for laboratory analysis. Specifically, samples for Metals analyses were collected and preserved in 5% nitric acid and analyzed by atomic absorption. Samples for Volatiles and Purgeables were collected in glass vials with teflon-lined caps and analyzed by EPA Method 601 and 602 respectively. Samples for miscellaneous nutrient and secondary analyses were collected in plastic nalgene bottles and analyzed by approved methods as listed on the enclosed Methods Sheet.

All procedures were performed using the analytical methods listed in Standard Methods and/or EPA approved analytical methods. Original field notes, meter calibrations, and routine quality control/quality assurance accompanying all laboratory work will be retained on file and can be made available if required.

*Rebecca Elliott*  
DHRS Laboratory I.D. No. 86140

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Field Readings:

Weather conditions - mostly sunny; mild breezes from SE.

	A 11/83 <u>Well #1</u>	A 11/84 <u>Well #2</u>	A 11/85 <u>Well #3</u>
✓ Collection Date	6-17-86	6-11-86	6-11-86
✓ Collection Time	1352-1500	1350-1447	1215-1335
✓ Temperature, °C	00010 ✓ 28.8	✓ 29.0	✓ 30.0
Static Water Level (top of casing to water)	4.71'	7.00'	5.19'
✓ Conductivity, $\mu\text{MHOS}$	00094 ✓ 1280	✓ 690	✓ 1330
Comments	Brown sand; very turbid; light pungent odor.	Brown sand; very turbid; sulfur odor.	Brown sand; very turbid; no odor noted.

*Klaus Elliott*  
DHRS Laboratory I.D. No. 86140

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Laboratory Analyses:

<u>Secondary Inorganics</u>	<u>Well #1</u>	<u>Well #2</u>	<u>Well #3</u>	<u>Analysis Date/Tech</u>
✓ Alkalinity, Total, mg/L as CaCO <sub>3</sub> 00430	✓164	✓239	✓415	6-12/17 KN
✓ Calcium, mg/L Ca 00916	✓74	✓116	✓95	6-12/17 HW
✓ Chloride, mg/L Cl <sup>-</sup> 00940	✓33	✓24	✓86	6-17 KN
✓ Color, APHA units 900216	✓>70	✓>70	✓>70	6-12/17 KN
✓ Copper, mg/L Cu 900181	<0.01	<0.01	<0.01	6-12/17 HW
✓ Corrosivity, L.I.	-0.34	-0.13	-0.33	Calculation
✓ Foaming Agents, mg/L MBAS	<0.02	✓0.05	✓0.05	6-12/17 KN
✓ Iron, mg/L Fe 900183	✓0.21	✓2.01	✓5.4	6-12/17 HW
✓ Manganese, mg/L Mn 900226	✓0.05	✓0.06	✓0.08	6-12/17 HW
✓ Odor, threshold 60086	✓1	✓1	✓2	6-12/17 KN
✓ pH, units 00460	✓6.90	✓6.75	✓6.40	6-11/17 LS
pHs, units	7.24	6.88	6.73	Calculation
✓ Sulfate, mg/L SO <sub>4</sub> 00445	✓<2	✓<2	✓<2	6-17 KN
✓ Solids, Total Dissolved mg/L 70304	✓278	✓334	✓573	6-13/17 LC
✓ Zinc, mg/L Zn 900221	✓0.017	✓0.003	✓0.003	6-12/17 HW
✓ Temperature, °C 00010	✓28.8	✓29.0	✓30.0	6-11/16 LS

Additional Parameters

✓ Ammonia Nitrogen, mg/L N 00610	✓0.5	✓34	6-12/17 JM
✓ Lead, mg/L Pb 900212	<0.05	<0.05	6-12/17 HW
✓ Selenium, mg/L Se 900214	<0.01	<0.01	6-17 HW
✓ Ethylene Dibromide, µg/L 294	<0.02	<0.02	6-18 PM

Karen Elliott  
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Laboratory Analyses (cont.):

<u>Additional Parameters</u>	<u>Well #1</u>	<u>Well #2</u>	<u>Well #3</u>	<u>Analysis Date/Tech</u>
Purgeable Halocarbons, $\mu\text{g/L}$				6-18 PM
Chloromethane	<0.02	<0.02	<0.02	
Bromomethane	<0.02	<0.02	<0.02	
Dichlorodifluoromethane	<0.01	<0.01	<0.01	
Vinyl chloride 39175	<0.05	<0.05	<0.05	
Chloroethane	<0.05	<0.05	<0.05	
Methylene chloride	<0.05	<0.05	<0.05	
Trichlorofluoromethane	<0.01	<0.01	<0.01	
1,1-Dichloroethene	<0.05	<0.05	<0.05	
1,1-Dichloroethane	<0.05	<0.05	<0.05	
trans-1,2-Dichloroethene	<0.05	<0.05	<0.05	
Chloroform	<0.05	<0.05	<0.05	
1,2-Dichloroethane 34531	<0.05	<0.05	<0.05	
1,1,1-Trichloroethane 34506	<0.05	<0.05	<0.05	
Carbon tetrachloride 32162	<0.05	<0.05	<0.05	
Bromodichloromethane	<0.01	<0.01	<0.01	
1,2-Dichloropropane	<0.01	<0.01	<0.01	
trans-1,3-Dichloropropene	<0.01	<0.01	<0.01	
Trichloroethene 39140	<0.05	<0.05	<0.05	
Dibromochloromethane	<0.01	<0.01	<0.01	
1,1,2-Trichloroethane	<0.01	<0.01	<0.01	
Cis-1,3-Dichloropropene	<0.05	<0.05	<0.05	
2-Chloroethylvinyl ether	<0.02	<0.02	<0.02	
Bromoform	<0.02	<0.02	<0.02	
1,1,2,2-Tetrachloroethane	<0.02	<0.02	<0.02	
Tetrachloroethene 34475	<0.05	<0.05	<0.05	
Chlorobenzene	<0.05	<0.05	<0.05	
1,3-Dichlorobenzene	<0.02	<0.02	<0.02	
1,2-Dichlorobenzene	<0.02	<0.02	<0.02	
1,4-Dichlorobenzene	<0.02	<0.02	<0.02	
Purgeable Aromatics, $\mu\text{g/L}$				6-15/21 PM
Benzene 34030	<0.02	<0.02	<0.02	
Chlorobenzene	<0.02	<0.02	<0.02	
1,2-Dichlorobenzene	<0.02	<0.02	<0.02	
1,3-Dichlorobenzene	<0.02	<0.02	<0.02	
1,4-Dichlorobenzene	<0.02	<0.02	<0.02	
Ethylbenzene	<0.02	<0.02	<0.02	
Toluene	<0.02	<0.02	<0.02	
o-Xylene	<0.02	<0.02	<0.02	
m-Xylene	<0.02	<0.02	<0.02	
p-Xylene	<0.02	<0.02	<0.02	

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Laboratory I.D. No. 86140

ECR-II/FAC 17-22  
 mg/l allowed in  
 Drinking Water

Analysis	Collection/Storage	Analysis Method	
<b>PRIMARY INORGANICS:</b>			
Arsenic; Selenium.....	0.5%HNO <sub>3</sub> /<6 mos.	Hydride generation into hydrogen argon flame	0.05; 0.01
Mercury .....	0.5%HNO <sub>3</sub> /<14 days	Cold vapor atomic absorption	0.002
Chromium; Lead .....	0.5%HNO <sub>3</sub> /<6 mos.	Atomic Absorption	0.05; 0.05
Barium; Cadmium; Silver .....	0.5%HNO <sub>3</sub> /<6 mos.	Atomic Absorption	1.0; 0.010; 0.05
Nitrate .....	Refrigerate/<24hrs	Brucine sulfate colorimetric	10.0
Fluoride .....	Refrigerate/<7 days	Specific ion probe	1.4
<b>PRIMARY ORGANICS:</b>			
Endrin; Lindane .....	Extract <7 days	Gas chromatography	0.0002; 0.004
Methoxychlor; Toxaphene ....	Extract <7 days	Gas chromatography	0.1; 0.005
2,4-D; 2,4,5-TP Silvex .....	Extract <7 days	Gas chromatography	0.1; 0.01; 0.10
Trihalomethanes .....	<7 days	Solvent extraction GC	0.10
<b>SECONDARY INORGANICS:</b>			
Total Dissolved Solids .....	Refrigerate/<7 days	Gravimetric difference	500
pH .....	On site	Corning 610A meter	6.5 min.
Magnesium; Iron; Copper ....	0.5%HNO <sub>3</sub> /<6 mos.	Atomic absorption	--; 0.3; 1.0
Zinc; Manganese .....	0.5%HNO <sub>3</sub> /<6 mos.	Atomic absorption	5/0.05
Sulfate .....	Refrigerate/<7 days	Turbidimetric	250
Sulfide .....	ZnAc pres./<24hrs	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> titrimetric	--
Hydrogen Sulfide .....	ZnAc pres./<24hrs	CaCl <sub>2</sub> from sulfide	0.05
Chloride .....	<7 days	Hg(NO <sub>3</sub> ) <sub>2</sub> titrimetric	250
Sodium; Calcium .....	0.5%HNO <sub>3</sub> /<6 mos.	Atomic emission	160; 200
Detergents(MBAS) .....	Refrigerate/<24hrs	Chloroform extraction/ colorimetric	0.5
Hardness .....	Refrigerate	EDTA titrimetric	--
Color .....	Refrigerate/<24hrs	Colorimetric	15
Odor .....	Immediate	Panel evaluation	3.0
Turbidity .....	Refrigerate/<24hrs	Hach 2100A turbidimeter	1.0
Alkalinity .....	Immediate	H <sub>2</sub> SO <sub>4</sub> titrimetric	--
Conductivity .....	Immediate	YSI SCT meters	--
Corrosivity .....	--	Calculation	-0.2 to +0.2
H <sub>2</sub> S .....	--	Calculation	--
Carbon Dioxide .....	--	Nomograph	--

Note: Detection limits for each analysis vary with nature and condition of sample analyzed.

ev.2-85

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Analysis	Collection/ Storage	Method	Detection* Limits, mg/l
Total Kjeldahl N	Refrigerate <24 hrs	H <sub>2</sub> SO <sub>4</sub> /K <sub>2</sub> SO <sub>4</sub> Digestion-Distillation-Nesslerization	0.1
Kjeldahl Organic N	"	" " "	0.1
Kjeldahl Ammonia N	"	Distillation-Nesslerization	0.1
Nitrate	"	Chromotropic Acid Colorimetric	0.1
Nitrite	"	NEO dihydrochloride	0.002/0.01
Total Phosphate	"	Persulfate Digestion-Ammonium Molybdate/Stannous Chloride Colorimetric	0.002
Ortho Phosphate	"	Ammonium Molybdate/Stannous Colorimetric	0.002
Total Coliform Bacteria	Na <sub>2</sub> S <sub>2</sub> O <sub>3</sub> Refrigerate <24 hrs	Membrane Filter	---
Fecal Coliform Bacteria	"	"	---
Fecal Streptococcus	"	"	---
30D-5	Refrigerate <24 hrs	DO Probe/O <sub>2</sub> Uptake	1.0
CBOD-5	"	DO Probe/O <sub>2</sub> Uptake/Nitrification Inhibitor	1.0
Chlorine	on-site	DPD Colorimetric	0.1
OD	Refrigerate <14 days	Dichromate Reflux/Ferrous Ammonium Sulfate Titration	2
Chlorophyll	Filter/Freeze <30 days	90% Acetone Extraction/Spectrophotometric	1 mg/m <sup>3</sup>
Oil & Greases	Glass/H <sub>2</sub> SO <sub>4</sub> <24 hrs	Freon Extraction-Distillation-Gravimetric	1
Oil & Greases	"	Freon Extraction-Infrared	---
Total Suspended Solids	Ref.: < 24 hrs	Gravimetric	2
Tenols	Glass <24 hrs	Distillation-4AAP Colorimetric	2 µg/l
Enols	"	Direct Injection Gas Chromatography	1
Ckel	0.5 HNO <sub>3</sub>	Atomic Absorption	0.05
Lica	---	"	3
Rontium	0.5 HNO <sub>3</sub> <6 mos	"	0.1
V	0.5 HNO <sub>3</sub> <6 mos	"	1
Volatile Organics per 17-22		EPA Method 601, 602 and Fla.DHRS Method for EDB.	
Synthetic Organics per 17-22		EPA Method 601, 602, 603, 608, 625.	

Units are mg/l unless noted. These are conservative detection limits based on previous lab performance. Specific samples may demonstrate different detection limit capabilities and will be noted.

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