SUMTER COUNTY (CLOSED) LANDFILL QUARTERLY GROUNDWATER MONITORING REPORT Quarter I (February) 2014

Prepared for:

SUMTER COUNTY SOLID WASTE DEPARTMENT SUMTER COUNTY, FLORIDA

Prepared by:

THE COLINAS GROUP, INC.

377 Maitland Avenue, Suite 2012 Altamonte Springs, Florida 32701

March 2014

Potts, Jr., P.G. License No. 1113

Florida Department of Environmental Protection 3319 Maguire Boulevard, Suite 232, Orlando, Florida 32803-3767

Ground Water Monitoring Report Certification Form Rule 62-520.600(11)

PART I GENERAL INFORMATION			
(1) Facility Name Sumter County Closed Cl	ass I Landfill		
Address 835 C.R. 529			
City Lake Panasoffkee		Zip <u>33538</u>	County Sumter
Telephone Number (352)-793-3368		E-mail address	jackey.jackson@sumtercountyfl.gov
(2) WACS_Facility 53008			
(3) DEP Permit Number <u>22926-004-SF</u>		······································	
(4) Authorized Representative's Name <u>Jack</u>	ey Jackson	·	Title Ass't. Director Public Works
Address 319 E. Anderson Avenue			
City Bushnell	Zip _	33513	County Sumter
Telephone Number (352)-793-0240		E-mail address	jackey.jackson@sumtercountyfl.gov
(5) Type of Discharge NA			
(6) Method of Discharge NA			
	CERTIFICA		
I certify under penalty of law that I have p document and all attachments and that, bas information, I believe that the information is for submission of false information including I	ed on my inquiry of true, accurate, and	those individuals complete. I am	immediately responsible for obtaining the aware that there are significant penalties
3-11-14	ach		do-
Date Owner	or Authorized Repr	esentative's Signa	ature
PART II QUALITY ASSURANCE REQUIREM	MENTS		
Sampling Organization Name & DOH # The	Colinas Group, Inc	. / 870148G/3	
Analytical Lab Organization DOH # _E53076	E84589 E82574		
Lab Name Advanced Environmental Labora	atories, Inc.	<u> </u>	
Address 6601 Southport Parkway, Jackson	ville, Florida 32216		
Phone Number (904)-363-9350			
E-mail Address <u>msantiago@aellab.com</u>			

THE COLINAS GROUP, INC.

HYDROGEOLOGISTS & ENGINEERS

March 11, 2014

Mr. F. Thomas Lubozynski, P.E.

Florida Department of Environmental Protection 3319 Maguire Boulevard, Suite 232 Orlando, Florida 32803-3767

Subj: Quarter I (February) 2014 Groundwater Monitoring Report Sumter County Closed Class I Landfill Sumter County, Florida WACS_Facility ID #53008 FDEP Permit No. 22926-003-SF

Dear Mr. Lubozynski:

On behalf of Sumter County Board of County Commissioners, The Colinas Group, Inc. (TCG) herewith submits the Electronic Data Deliverable of the report prepared by TCG entitled:

Sumter County (Closed) Landfill Quarterly Groundwater Monitoring Report, Quarter I (February) 2014

The report was prepared and is submitted in satisfaction of part of the requirements of the Sumter County Closed Landfill Long-Term Care Permit.

If you have any questions concerning the contents of the report please do not hesitate to contact me at your convenience.

Very truly yours,

THE COLINAS EROUP IN

Richard L. Potts, Jr., E Principal Consultant

Fl. P.G. Reg. No.

rickpotts@cfl.rr.com

cc: Mr. Jackey Jackson (Sumter County)

Ms. Denise Warnock (Sumter County)

SUMTER COUNTY (CLOSED) LANDFILL GROUNDWATER MONITORING REPORT SUMTER COUNTY, FLORIDA Quarter I (February) 2014

TABLE OF CONTENTS

EXECUTIVE SUMMARY

INTRODUCTION
SAMPLING EVENT
RESULTS
SUMMARY AND RECOMMENDATIONS

Table I - Field Parameter Results Summary Table II - Summary of Groundwater Levels Table III - Summary of Laboratory Results

ATTACHMENTS:

- 1. Quarter I (February) 2014 Groundwater Contour Map
- 2. Laboratory Analytical Reports
- 3. Field Sampling and Testing Logs
- 4. Chain-of-Custody Forms
- 5. Field Quality Control Reports
- 6. FDEP ADaPT/EDD Disc (In Pocket)

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SUMTER COUNTY (CLOSED) LANDFILL QUARTERLY GROUNDWATER MONITORING REPORT QUARTER I (FEBRUARY) 2014

INTRODUCTION

The Colinas Group, Inc. (TCG) has reviewed the groundwater monitoring well sampling and analytical results for the Quarter I (February) 2014 sampling event at the Sumter County (Closed) Class I Landfill near Lake Panasoffkee in Sumter County. The sampling event was completed in accordance with the quarterly water quality monitoring and reporting requirements of the closed landfill's Long-Term Care Permit #22926-003-SF.

SAMPLING EVENT

The Quarter I 2014 sampling event at the Sumter County Landfill was completed during the period August 3 -17, 2014. Sampling was performed by TCG in accordance with the Florida Department of Environmental Protection (FDEP) Standard Operating Procedures (SOP) for Field Activities. Water samples collected from the facility groundwater monitoring wells were tested for the required field parameters. Monitoring wells were purged and the groundwater discharge allowed to stabilize prior to sample collection.

The results of field testing were recorded as part of the Field Reports (Attachment 3) and are listed in Table I. All samples were preserved and stored as required prior to shipment to the analytical laboratory.

Laboratory analytical services were provided by Advanced Environmental Laboratories, Inc. (AEL) in accordance with the laboratory's NELAC and FDHRS Certification No. E53076, E84589, and E82574. The original analytical reports prepared by AEL are presented in Attachment 2 to this report.

Water table depth measurements in each facility groundwater monitoring well and piezometer were recorded on February 3, 2014. These measurements were used to construct the Groundwater Contour Map shown on Figure 1 (Attachment 1) for the uppermost receiving groundwater aquifer beneath the site. Depth to water table measurements and corresponding groundwater elevations are listed in Table II.

The closed landfill's Long-Term Care Permit (Permit No.22926-003-SF) was modified by the FDEP on December 20, 2013. Modifications to the facility monitoring plan included:

- 1. Monitoring Well MW-4A was designated as a Detection Well (Specific Condition No.15);
- 2. MW-4C and MW-4D were designated as new Compliance Wells (Specific Condition No.15);
- MW-4 and MW-4B were designated as Piezometers (Specific Condition No. 15);
- 4. The lateral Zone of Discharge boundary is expanded to the western and northern landfill property boundaries (Specific Condition No.14.a), and;
- 5. Identifies the Sumter County Closed Class I Landfill as an existing installation in accordance with Rule 62-520.520(1),F.A.C. (Specific Condition No. 14.b).

RESULTS

Field Tested Parameters

Results of field testing completed at groundwater monitoring wells for the Quarter I 2014 sampling event are summarized in Table I. Field tests were completed in strict accordance with the FDEP SOP requirements.

Hq

The field testing results indicate pH of groundwater in the uppermost aquifer was within the Florida Secondary Drinking Water Standards (SDWS) range (6.5 - 8.5 pH units) at seven (7) of the nine (9) groundwater monitoring wells sampled. The nearly neutral to slightly basic pH values measured are consistent across the landfill property and appear normal considering the monitoring well screen intervals at and near the top of carbonate rocks and sediments.

One well (**MW-4D**) produced groundwater with a pH above the upper FDEP range at 9.23 pH units. One well (**MW-11**) reported pH slightly below the range at 6.39 pH units.

Fluid Temperature

Temperature of each water sample was measured in the field immediately following discharge into the flow cell used to accept flow from the purging pump. Temperature measurements of groundwater from the monitoring wells varied through a relatively narrow range of 23.54 C to 26.01 C.

Dissolved Oxygen

Dissolved oxygen (DO) exceeded the FDEP sampling guidance level of 20% saturation at three (3) of the nine (9) monitoring wells sampled, including the facility Background Well **MW-6A** and up-gradient well **MW-8**.

Specific Conductance

Specific conductance of groundwater samples collected during this sampling event are included in Table I. Specific conductance values varied through a relatively narrow range of 206 umhos/cm to 924 umhos/cm.

Turbidity

The FDEP recommends attainment of turbidity values less than 10 to 20 NTUs in groundwater samples obtained from monitoring wells. As shown in Table I, groundwater samples collected had measured turbidity values less than 20 NTUs at eight (8) of the nine (9) wells. New monitoring well **MW-4D**, sampled for the first time this quarter, produced groundwater with turbidity exceeding 20 NTUs.

Regulatory Exceedances

A summary of groundwater laboratory analytical results that exceeded the regulatory level for a particular parameter in the Quarter I 2014 sample set is presented in Table III. As shown, five (5) constituents were reported at specific monitoring wells at concentrations that exceed applicable regulatory levels. Exceeding parameters were: Aluminum, iron, manganese, nitrate nitrogen and total dissolved solids (TDS).

Aluminum

Aluminum was reported above the 200 ug/l SDWS MCL at new monitoring well **MW-4D** at 1,700 ug/l and slightly above the MCL at well **MW-9A** at 210 ug/l.

Iron

Dissolved iron was detected at a concentration above the FSDWS MCL of 300 ug/l at monitoring well **MW-9A** at 1,500 ug/l. Iron was not detected above the laboratory minimum detection limit of 38 ug/l at six (6) wells.

Manganese

Manganese was reported at a concentration above the FSDWS MCL of 50 ug/l at monitoring well **MW-9A** at 100 ug/l. Manganese was detected at the eight (8) remaining monitoring wells at concentrations considerably less than 50 ug/l.

Nitrate Nitrogen

Nitrate was reported above the FPDWS MCL (10 mg/l) at monitoring well **MW-4A** at 12 mg/l. Remaining monitoring wells reported nitrate values ranging from 0.82 mg/l (**MW-9A**) to 7.0 mg/l at new Compliance Well **MW-4C**.

Total Dissolved Solids (TDS)

TDS concentration was reported nominally above the 500 mg/l FSDWS MCL at monitoring well **MW-9A** at 570 mg/l.

No other exceedance of a parameter regulatory maximum contaminant level was reported in the laboratory analytical results for samples from groundwater monitoring wells at the Sumter County Closed Landfill.

Other Significant Detected Parameters

Antimony was reported at trace concentrations at each of the landfill monitoring wells, including background/upgradient wells **MW-6A** and **MW-8**. Reported concentrations do not approach the low PDWS MCL of 6 ug/l for this constituent.

Chloride concentrations reported for seven (7) of the nine (9) monitoring wells, including facility background monitoring well **MW-6A**, appear consistent between individual wells and typical for natural shallow groundwaters in Florida. Chloride concentrations at monitoring wells **MW-4A** and **MW-9A** (22 mg/l - 23 mg/l) appear slightly elevated compared to the other wells. The SDWS MCL for chloride in groundwater is 250 mg/l.

Gross alpha and/or Radium 226+228 are reported at concentrations elevated above background levels and approaching PDWS MCLs (15 pCi/l and 5 pCi/l, respectively) at monitoring wells MW-4C, MW-9A, MW-10 and MW-11.

Sodium appears slightly elevated at monitoring wells **MW-4A**, **MW-4D** and **MW-9A** (19 mg/l - 22 mg/l) as compared to background and other downgradient monitoring wells. The PDWS MCL for sodium is 160 mg/l.

SUMMARY AND CONCLUSIONS

Chemical characteristics of groundwater monitored at the Sumter County Closed Landfill are reported for the Quarter I (February) 2014 sampling event. Exceedances of constituent regulatory maximum contaminant levels (MCLs) are reported at specific monitoring wells for the Secondary Drinking Water Standards (SDWS) parameters: **Aluminum**, **Iron**, **manganese** and **total dissolved solids (TDS)**. One well reported an exceedance of the Primary Drinking Water Standards (PDWS) MCL for **nitrate nitrogen** in groundwater,

Elevated **dissolved oxygen** (DO) levels were measured at three of the nine groundwater monitoring wells sampled, including background monitoring well **MW-6A** and up-gradient well **MW-8**. These wells routinely produce groundwater with elevated DO levels and are considered to represent natural groundwater conditions. An elevated (alkaline) groundwater **pH** outside the SDWS pH range is reported at new Compliance Well **MW-4D**.

Aluminum was reported well above the SDWS at new Compliance Well **MW-4D**. Recently added to the landfill monitoring plan in December 2013, this quarter is the first sampling event at this well. Aluminum concentrations, considered a likely artifact of well construction and elevated turbidity, are expected to decline over time with continued well development by pumping to collect water samples.

Dissolved **iron** above the FSDWS MCL was reported at detection monitoring well **MW-9A**. **Manganese** was also reported above the FSDWS MCL at **MW-9A**. Both iron and manganese occur naturally in sediments and carbonate rocks penetrated by the monitoring wells.

Nitrate nitrogen was reported slightly above the FPDWS MCL at Detection Well **MW-4A** at 12 mg/l. The MCL for nitrate in groundwater is 10 mg/l. Compliance wells **MW-4C** and **MW-4D**, positioned down-gradient from **MW-4A**, report nitrate below the MCL and slightly above and below, respectively, elevated background levels consistently reported at Background Well **MW-6A**.

TDS was reported slightly above the SDWS provisional MCL (500 mg/l) at well **MW-9A** at 570 mg/l. Past analytical data from the monitoring network indicates that dissolved calcium carbonate accounts for a large part of the TDS load in groundwater at the landfill. Calcium carbonate is not a regulated compound in groundwaters.

Considering water quality results from this and prior routine monitoring events and corrective actions investigations at the landfill, we offer the following conclusions regarding compliance with regulatory requirements in accordance with the closed landfill's long-term-care permit:

- 1. With the lone exception of nitrate-nitrogen at Detection Well MW-4A, monitoring parameters exceeding respective MCLs are solely constituents regulated under the Florida Secondary Drinking Water Standards in Chapter 62-550, F.A.C. Monitoring parameters that have historically, from time to time, exceeded secondary drinking water standards and are reported above standards in the current quarterly sampling event include aluminum, iron, manganese and total dissolved solids.
- 2. The Sumter County Closed Class I Landfill is an "existing installation" as defined in Rule 62-520.200(10), F.A.C. and is exempt from compliance with secondary drinking water standards parameters at the facility's property boundary in accordance with the provisions of rule 62-520.520(1), F.A.C. and Specific Condition No.14b of the landfill's long-term care permit.
- 3. **Nitrate** concentrations in samples from Detection Well **MW-4A** continue to be reported nominally above the Florida Primary Drinking Water Standards MCL.

* * * * *

TABLE I FIELD PARAMETER RESULTS SUMMARY SUMTER COUNTY (CLOSED) LANDFILL SUMTER COUNTY, FLORIDA Quarter I (February) 2014

Sampling Point	Temp. (C)	Dissolved Oxygen (mg/l)	рН	Specific Conductance (umhos/cm)	Turbidity (NTU)
MW-2	26.01	5.02	6.68	206	0.40
MW-4A	25.99	1.07	7.08	592	1.51
MW-4C	23.75	1.43	7.39	436	9.95
MW-4D	25.18	1.55	9.23	308	31.3
MW-6A	24.76	6.76	7.81	254	13.3
MW-8	23.54	4.00	7.43	308	0.71
MW-9A	25.22	0.99	6.50	924	11.6
MW-10	24.12	1.20	7.00	539	8.48
MW-11	25.04	1.27	6.39	370	6.10

Notes: Bold lettering indicates:

Exceedance of FDEP 20% saturation dissolved oxygen limit Exceedance of secondary standards pH range (6.5 - 8.5) Exceedance of FDEP-recommended turbidity (20 NTU)

TABLE II

SUMMARY OF GROUNDWATER LEVELS SUMTER COUNTY (CLOSED) LANDFILL SUMTER COUNTY, FLORIDA Quarter I (February) 2014

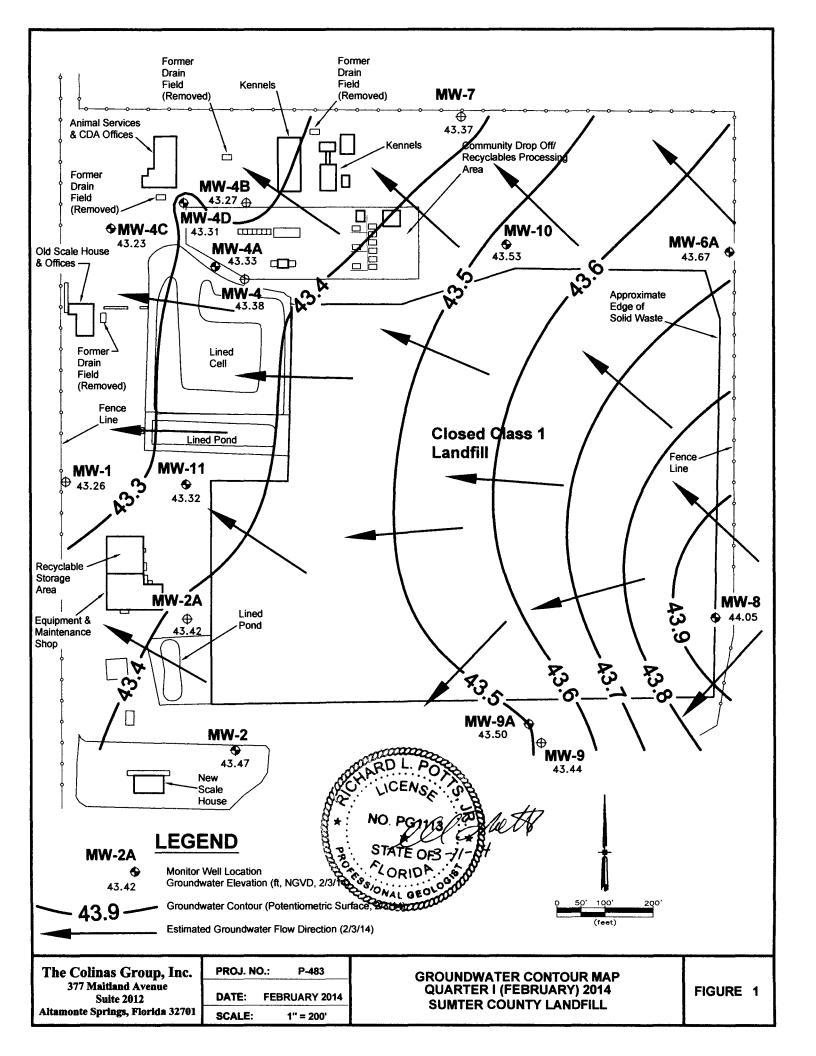
Well No.	MP Elev. <u>1</u> / (ft. +NGVD)	Depth to Water <u>₂</u> (ft MP)	Groundwater Elevation (ft. +NGVD)
MW-1	70.10	26.84	43.26
MW-2	68.96	25.49	43.47
MW-2A	71.98	28.56	43.42
MW-4	70.33	26.95	43.38
MW-4A	75.49	32.16	43.33
MW-4B	73.49	30.22	43.27
MW-4C	70.64 <u>ş</u> ı	27.41	43.23
MW-4D	70.20 <u>s</u> ı	26.89	43.31
MW-6A	77.48	33.81	43.67
MW-7	72.93	29.56	43.37
MW-8	68.63	24.58	44.05
MW-9	72.62	29.18	43.44
MW-9A	75.14	31.64	43.50
MW-10	68.14	24.61	43.53
MW-11	70.02	26.70	43.32

Notes: 1/ Measuring Point is top of PVC well casing.
2/ Water levels recorded on February 3, 2014.
3/ New post-wellhead repair TOC elevation (Steven B. Wiley, PSM, August 31, 2013)

TABLE III SUMMARY OF LABORATORY RESULTS SUMTER COUNTY (CLOSED) LANDFILL QUARTER I (February) 2014

Parameter	units	MW-2	MW-4A	MW-4C	MW-4D	MW-6A	MW-8	MW-9A	MW-10	MW-11	MCL
Ammonia	mg/l	BDL	BDL	0.03	0.03	BDL	BDL	0.83	BDL	BDL	2.8
Aluminum	ug/l	BDL	BDL	94	1,700*	BDL	BDL	210*	140	BDL	200
Antimony	ug/l	0.44	0.098	0.39	0.23	0.095	0.14	0.12	0.68	0.24	6
Cadmium	ug/l	BDL	BDL	BDL	BDL	BDL	BDL	1.1	1.7	2.7	5
Chloride	mg/l	5.3	22	13	6.4	8.3	8.8	23	9.0	5.0	250
Chromium	ug/l	0.53	1.4	0.97	10	3.8	3.9	5.8	1.1	2.0	100
Fluoride	mg/l	0.09	BDL	0.14	0.12	0.070	BDL	BDL	0.14	0.13	4
Gross Alpha	pCi/l	1.8 <u>+</u> 1.1	2.1 <u>+</u> 10.9	10.8 <u>+</u> 1.7	3.0 <u>+</u> 1.1	1.0 <u>+</u> 0.6	1.1 <u>+</u> 0.9	13.6 <u>+</u> 2.4	12.3 <u>+</u> 1.7	8.0 <u>+</u> 1.3	15
Iron	ug/l	BDL	BDL	BDL	78	BDL	BDL	1,500*	89	BDL	300
Lead	ug/l	0.14	BDL	0.15	1.8	BDL	0.084	0.53	0.23	0.15	15
Manganese	ug/l	3.3	1.7	0.34	0.60	0.49	0.94	100*	17	5.1	50
Mercury	ug/l	BDL	BDL	BDL	0.031	BDL	BDL	0.058	BDL	0.16	2
Nitrate, as N	mg/l	1.5	12	7.0	4.8	5.2	1.7	0.82	1.8	4.6	10
Ra226+Ra228	pCi/l	1.1 <u>+</u> 0.5	2.6 <u>+</u> 1.2	4.1 <u>+</u> 1.3	0.8 <u>+</u> 0.4	< 0.5 <u>+</u> 0.3	<0.6 <u>+</u> 0.4	5.6 <u>+</u> 1.0	3.0 <u>+</u> 1.2	5.9 <u>+</u> 1.3	5
Silver	ug/l	0.15	BDL	BDL	BDL	BDL	0.11	BDL	0.11	BDL	100
Sodium	mg/l	2.0	19	11	21	2.9	4.3	22	5.7	7.0	160
TDS	mg/l	130	350	280	230	190	210	570*	320	230	500
Thallium	ug/l	0.56	0.26	0.11	BDL	BDL	0.65	0.18	0.24	0.23	2

Notes: 1/. BDL means below laboratory minimum detection limit 2/. Bold lettering indicates result exceeds MCL / 62-777,F.A.C. GCTL 3/. * Sumter County Closed Landfill is exempt from compliance with Florida Secondary Drinking Water Standards MCLs



Advanced Externitories, Inc.

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6615 SW Archer Road - Geinesville, FL 20208 - 352.377.2349 - Fax 352.365.6509 - E82001 |
77 - 6215 S. Nenth Lafte Bhrd., Sta. 1016 - Allamonte Sentrae, FL 32701 - 407.827 1594 - Fax 407.837.1967 - E55079

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Celved on los Form revised 2/8/08

	Advanced Environmental Laboratories, Inc.
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SAMPLE DESCRIPTION

MW-4A

M W- 6A

MW-9A

Matrix Code: WW = wastewater SW = surface water GW = ground water DW = drinking water

20B

The Colinas Grown, Inc. 377 Maitland Ave, Ste 2012

407-622-8196

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