



Analytical Resources, Incorporated
Analytical Chemists and Consultants

April 14, 2016

Philip Nerenberg
Apex Laboratories
12232 SW Garden Place
Tigard, OR 97223

RE: Project: A6C1134
ARI Job No.: AYO7

Dear Mr. Nerenberg:

Please find enclosed the original Chain of Custody records (COCs), sample receipt documentation, and the final data for the samples from the project referenced above.

Sample receipt information and analytical details are addressed in the Case Narrative.

An electronic copy of this report and all supporting raw data will be kept on file at ARI. Should you have any questions or concerns, please feel free to call me at your convenience.

Respectfully,
ANALYTICAL RESOURCES, INC.

Cheronne Oreiro
Project Manager
(206) 695-6214
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www.arilabs.com

cc: eFile: AYO7

Enclosures

SUBCONTRACT ORDER

AY07

Apex Laboratories
A6C1134

SENDING LABORATORY:

Apex Laboratories
12232 S.W. Garden Place
Tigard, OR 97223
Phone: (503) 718-2323
Fax: (503) 718-0333
Project Manager: Philip Nerenberg

RECEIVING LABORATORY:

Analytical Resources, INC
4611 S. 134th Place
Tukwila, WA 98168
Phone : (206) 695-6200
Fax: (206) 695-6201

Sample Name: 5237-160330-DC-EMB033 **Soil** **Sampled: 03/30/16 11:00** **Soil Embankmebnt (0-3.5)** **(A6C1134-02)**

Analysis	Due	Expires	Comments
Sulfide, Total by PSEP (376.2) (SUB)	04/13/16 17:00	04/13/16 11:00	
<i>Containers Supplied:</i> (E)4 oz Glass Jar			

Sample Name: 5237-160330-DC-EMB032 **Soil** **Sampled: 03/30/16 11:40** **Soil Embankmebnt (0-3.5)** **(A6C1134-04)**

Analysis	Due	Expires	Comments
Sulfide, Total by PSEP (376.2) (SUB)	04/13/16 17:00	04/13/16 11:40	
<i>Containers Supplied:</i> (E)4 oz Glass Jar			

Sample Name: 5237-160329-DC-EMB029 **Soil** **Sampled: 03/30/16 12:15** **Soil Embankmebnt (0-3.5)** **(A6C1134-06)**

Analysis	Due	Expires	Comments
Sulfide, Total by PSEP (376.2) (SUB)	04/13/16 17:00	04/13/16 12:15	
<i>Containers Supplied:</i> (E)4 oz Glass Jar			

Sample Name: 5237-160330-DC-EMB028 **Soil** **Sampled: 03/30/16 13:00** **Soil Embankmebnt (0-3.5)** **(A6C1134-08)**

Analysis	Due	Expires	Comments
Sulfide, Total by PSEP (376.2) (SUB)	04/13/16 17:00	04/13/16 13:00	
<i>Containers Supplied:</i> (E)4 oz Glass Jar			

Standard TAT

Released By: [Signature] Date: 3/31/16 Received By: [Signature] Date: 4-1-16 1300

Released By: [Signature] Date: Received By: [Signature] Date:

UPS (Shipper)

UPS (Shipper)

SUBCONTRACT ORDER

Apex Laboratories

A6C1134

Ay07

Soil Embankmebnt (0-3.5)			
Sample Name:	5237-160330-DC-EMB056	Soil	Sampled: 03/30/16 14:15 (A6C1134-10)
Analysis	Due	Expires	Comments
Sulfide, Total by PSEP (376.2) (SUB)	04/13/16 17:00	04/13/16 14:15	
<i>Containers Supplied:</i> (E)4 oz Glass Jar			

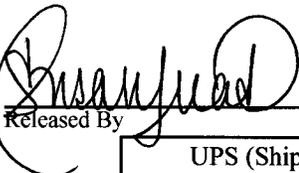
Soil Embankmebnt (0-3.5)			
Sample Name:	5237-160330-DC-EMB055	Soil	Sampled: 03/30/16 14:16 (A6C1134-12)
Analysis	Due	Expires	Comments
Sulfide, Total by PSEP (376.2) (SUB)	04/13/16 17:00	04/13/16 14:16	
<i>Containers Supplied:</i> (E)4 oz Glass Jar			

Soil Embankmebnt (0-3.5)			
Sample Name:	5237-160329-DC-EMB051	Soil	Sampled: 03/30/16 15:00 (A6C1134-14)
Analysis	Due	Expires	Comments
Sulfide, Total by PSEP (376.2) (SUB)	04/13/16 17:00	04/13/16 15:00	
<i>Containers Supplied:</i> (E)4 oz Glass Jar			

Soil Embankmebnt (0-3.5)			
Sample Name:	5237-160330-DC-EMB050	Soil	Sampled: 03/30/16 15:30 (A6C1134-16)
Analysis	Due	Expires	Comments
Sulfide, Total by PSEP (376.2) (SUB)	04/13/16 17:00	04/13/16 15:30	
<i>Containers Supplied:</i> (E)4 oz Glass Jar			

Soil Embankmebnt (0-3.5)			
Sample Name:	5237-160330-DC-EMB035	Soil	Sampled: 03/30/16 16:00 (A6C1134-18)
Analysis	Due	Expires	Comments
Sulfide, Total by PSEP (376.2) (SUB)	04/13/16 17:00	04/13/16 16:00	
<i>Containers Supplied:</i> (E)4 oz Glass Jar			

Soil Embankmebnt (0-3.5)			
Sample Name:	5237-160330-DC-EMB035D	Soil	Sampled: 03/30/16 16:10 (A6C1134-20)
Analysis	Due	Expires	Comments
Sulfide, Total by PSEP (376.2) (SUB)	04/13/16 17:00	04/13/16 16:10	
<i>Containers Supplied:</i> (E)4 oz Glass Jar			

Released By  Date 3/31/16

Received By  Date 4-1-16 1300

Released By Date

Received By Date



Cooler Receipt Form

ARI Client: Apex

Project Name: _____

COC No(s): _____ NA

Delivered by: Fed-Ex UPS Courier Hand Delivered Other: _____

Assigned ARI Job No: AY07

Tracking No: 1Z X4720R139506 1527 NA

Preliminary Examination Phase:

Were intact, properly signed and dated custody seals attached to the outside of to cooler? YES NO

Were custody papers included with the cooler? YES NO

Were custody papers properly filled out (ink, signed, etc.) YES NO

Temperature of Cooler(s) (°C) (recommended 2.0-6.0 °C for chemistry)

Time: _____ 14 _____

If cooler temperature is out of compliance fill out form 00070F

Temp Gun ID#: D005276

Cooler Accepted by: TR Date: 4-1-16 Time: 1300

Complete custody forms and attach all shipping documents

Log-In Phase:

Was a temperature blank included in the cooler? YES NO

What kind of packing material was used? ... Bubble Wrap Wet Ice Gel Packs Baggies Foam Block Paper Other: _____

Was sufficient ice used (if appropriate)? NA YES NO

Were all bottles sealed in individual plastic bags? YES NO

Did all bottles arrive in good condition (unbroken)? YES NO

Were all bottle labels complete and legible? YES NO

Did the number of containers listed on COC match with the number of containers received? YES NO

Did all bottle labels and tags agree with custody papers? YES NO

Were all bottles used correct for the requested analyses? YES NO

Do any of the analyses (bottles) require preservation? (attach preservation sheet, excluding VOCs)... NA YES NO

Were all VOC vials free of air bubbles? NA YES NO

Was sufficient amount of sample sent in each bottle? YES NO

Date VOC Trip Blank was made at ARI NA

Was Sample Split by ARI : YES Date/Time: _____ Equipment: _____ Split by: _____

Samples Logged by: TR Date: 4-1-16 Time: 1455

**** Notify Project Manager of discrepancies or concerns ****

Sample ID on Bottle	Sample ID on COC	Sample ID on Bottle	Sample ID on COC

Additional Notes, Discrepancies, & Resolutions:

By: _____ Date: _____

<p>Small Air Bubbles ~2mm</p>	<p>Peabubbles 2-4 mm</p>	<p>LARGE Air Bubbles > 4 mm</p>	Small → "sm" (< 2 mm)
			Peabubbles → "pb" (2 to < 4 mm)
			Large → "lg" (4 to < 6 mm)
			Headspace → "hs" (> 6 mm)



Case Narrative

Client: Apex Laboratories
Project: A6C1134
ARI Job No.: AYO7

Sample Receipt

Analytical Resources, Inc. (ARI) accepted ten soil samples on April 1, 2016 under ARI job AYO7. The cooler temperature measured by IR thermometer following ARI SOP was 1.4°C. For further details regarding sample receipt, please refer to the Cooler Receipt Form.

The samples were analyzed for parameters as requested.

Sulfide by SM4500-S2

Sulfide sample volumes were preserved upon receipt.

There were no irregularities with this analysis.

Sample ID Cross Reference Report



ARI Job No: AYO7
Client: Apex Labs
Project Event: A6C1134
Project Name: N/A

Sample ID	ARI Lab ID	ARI LIMS ID	Matrix	Sample Date/Time	VTSR
1. 5237-160330-DC-EMB033	AYO7A	16-5376	Soil	03/30/16 11:00	04/01/16 13:00
2. 5237-160330-DC-EMB032	AYO7B	16-5377	Soil	03/30/16 11:40	04/01/16 13:00
3. 5237-160329-DC-EMB029	AYO7C	16-5378	Soil	03/30/16 12:15	04/01/16 13:00
4. 5237-160330-DC-EMB028	AYO7D	16-5379	Soil	03/30/16 13:00	04/01/16 13:00
5. 5237-160330-DC-EMB056	AYO7E	16-5380	Soil	03/30/16 14:15	04/01/16 13:00
6. 5237-160330-DC-EMB055	AYO7F	16-5381	Soil	03/30/16 14:16	04/01/16 13:00
7. 5237-160329-DC-EMB051	AYO7G	16-5382	Soil	03/30/16 15:00	04/01/16 13:00
8. 5237-160330-DC-EMB050	AYO7H	16-5383	Soil	03/30/16 15:30	04/01/16 13:00
9. 5237-160330-DC-EMB035	AYO7I	16-5384	Soil	03/30/16 16:00	04/01/16 13:00
10. 5237-160330-DC-EMB035D	AYO7J	16-5385	Soil	03/30/16 16:10	04/01/16 13:00

SAMPLE RESULTS-CONVENTIONALS
AY07-Apex Labs



Matrix: Soil
Data Release Authorized: *W*
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Client ID: 5237-160330-DC-EMB033
ARI ID: 16-5376 AY07A

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	04/05/16 040516#1	SM2540G	Percent	0.01	72.71
Sulfide	04/05/16 040516#1	SM4500-S2D	mg/kg	1.36	< 1.36 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
AY07-Apex Labs



Matrix: Soil
Data Release Authorized: W
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Client ID: 5237-160330-DC-EMB032
ARI ID: 16-5377 AY07B

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	04/05/16 040516#1	SM2540G	Percent	0.01	71.37
Sulfide	04/05/16 040516#1	SM4500-S2D	mg/kg	1.31	< 1.31 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
AY07-Apex Labs



Matrix: Soil
Data Release Authorized: w
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Client ID: 5237-160329-DC-EMB029
ARI ID: 16-5378 AY07C

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	04/05/16 040516#1	SM2540G	Percent	0.01	71.01
Sulfide	04/05/16 040516#1	SM4500-S2D	mg/kg	1.32	< 1.32 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
AYO7-Apex Labs



Matrix: Soil
Data Release Authorized: W
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Client ID: 5237-160330-DC-EMB028
ARI ID: 16-5379 AYO7D

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	04/05/16 040516#1	SM2540G	Percent	0.01	71.81
Sulfide	04/05/16 040516#1	SM4500-S2D	mg/kg	1.35	< 1.35 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
AY07-Apex Labs



Matrix: Soil
Data Release Authorized: }
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Client ID: 5237-160330-DC-EMB056
ARI ID: 16-5380 AY07E

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	04/05/16 040516#1	SM2540G	Percent	0.01	71.74
Sulfide	04/05/16 040516#1	SM4500-S2D	mg/kg	1.37	< 1.37 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
AY07-Apex Labs



Matrix: Soil
Data Release Authorized: W
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Client ID: 5237-160330-DC-EMB055
ARI ID: 16-5381 AY07F

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	04/05/16 040516#1	SM2540G	Percent	0.01	71.74
Sulfide	04/05/16 040516#1	SM4500-S2D	mg/kg	1.29	< 1.29 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
AY07-Apex Labs



Matrix: Soil
Data Release Authorized: ✓
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Client ID: 5237-160329-DC-EMB051
ARI ID: 16-5382 AY07G

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	04/05/16 040516#1	SM2540G	Percent	0.01	68.00
Sulfide	04/05/16 040516#1	SM4500-S2D	mg/kg	1.36	< 1.36 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
AY07-Apex Labs



Matrix: Soil
Data Release Authorized: ✓
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Client ID: 5237-160330-DC-EMB050
ARI ID: 16-5383 AY07H

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	04/05/16 040516#1	SM2540G	Percent	0.01	69.62
Sulfide	04/05/16 040516#1	SM4500-S2D	mg/kg	1.39	< 1.39 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
AY07-Apex Labs



Matrix: Soil
Data Release Authorized: w
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Client ID: 5237-160330-DC-EMB035
ARI ID: 16-5384 AY07I

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	04/05/16 040516#1	SM2540G	Percent	0.01	74.53
Sulfide	04/05/16 040516#1	SM4500-S2D	mg/kg	1.27	< 1.27 U

RL Analytical reporting limit
U Undetected at reported detection limit

SAMPLE RESULTS-CONVENTIONALS
AYO7-Apex Labs



Matrix: Soil
Data Release Authorized: *W*
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Client ID: 5237-160330-DC-EMB035D
ARI ID: 16-5385 AYO7J

Analyte	Date	Method	Units	RL	Sample
Preserved Total Solids	04/05/16 040516#1	SM2540G	Percent	0.01	73.65
Sulfide	04/05/16 040516#1	SM4500-S2D	mg/kg	1.24	< 1.24 U

RL Analytical reporting limit
U Undetected at reported detection limit

MS/MSD RESULTS-CONVENTIONALS
AYO7-Apex Labs



Matrix: Soil
Data Release Authorized: *w*
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Analyte	Date	Units	Sample	Spike	Spike Added	Recovery
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ARI ID: AYO7A Client ID: 5237-160330-DC-EMB033

Sulfide	04/05/16	mg/kg	< 1.36	144	183	78.7%
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REPLICATE RESULTS-CONVENTIONALS
AY07-Apex Labs



Matrix: Soil
Data Release Authorized: *W*
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: 03/30/16
Date Received: 04/01/16

Analyte	Date	Units	Sample	Replicate(s)	RPD/RSD
ARI ID: AY07A Client ID: 5237-160330-DC-EMB033					
Preserved Total Solids	04/05/16	Percent	72.71	72.79	0.1%
Sulfide	04/05/16	mg/kg	< 1.36	< 1.30	NA

LAB CONTROL RESULTS-CONVENTIONALS
AY07-Apex Labs



Matrix: Soil
Data Release Authorized: *w*
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: NA
Date Received: NA

Analyte/Method	QC ID	Date	Units	LCS	Spike Added	Recovery
Sulfide SM4500-S2D	PREP	04/05/16	mg/kg	7.25	7.19	100.8%

METHOD BLANK RESULTS-CONVENTIONALS
AY07-Apex Labs



Matrix: Soil
Data Release Authorized: W
Reported: 04/13/16

Project: NA
Event: A6C1134
Date Sampled: NA
Date Received: NA

Analyte	Date	Units	Blank	QC ID
Preserved Total Solids	04/05/16	Percent	< 0.01 U	ICB
Sulfide	04/05/16	mg/kg	< 0.05 U	PREP