

September 13, 2019

Roy Quinn  
TVA Cumberland Fossil Plant  
815 Cumberland City Road  
Cumberland City, TN 37050

RE: TVA Cumberland Fossil Plant Project/0777010 – Analytical Report  
RJ Lee Group Project Number AOH1055321-0

Dear Mr. Quinn,

RJ Lee Group, Inc. (RJLG) Monroeville laboratory received 11 samples on September 4, 2019 associated with Tennessee Valley Authority (TVA) Cumberland Fossil Plant. The samples were logged into RJ Lee Group project number AOH1055321-0 and assigned RJLG sample numbers as indicated in Appendix A.

The samples were received in good condition with all custody seals in place and intact. Attached in Appendix A is the signed sample receipt confirmation form, revised COC and sample receipt check list.

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified to return the samples covered in this report, RJ Lee Group will store them for a period of ninety (90) days before discarding.

Should you have any questions regarding this information, please do not hesitate to contact us.

Sincerely,



Monica McGrath-Koerner  
Geologist

Attachments: Chain of Custody Forms  
Mineral Identification Report  
Polarized Light Microscopy Images, Bench Sheets,  
QC Tabulation (when applicable)



**Appendix A**  
Chain of Custody Forms



Original Issue: 09/16/2005  
 Effective Date: May 2014  
 Approved By: Quality Assurance

Form A FOR.002.4  
 Supersedes: Form FOR-002A Rev. 03  
 Page 1 of 2

**Chain of Custody**  
**RJ Lee Group Work Order #: AOH1055321-0**  
**Project Name/Case #: Cumberland Fossil Plant / 0777010**

Received From:	Relinquished To:
Tyler Baker Tennessee Valley Authority TVA Chickamauga Power Service Center Chattanooga, TN 37415 United States Main: 423-876-6733	RJLee Group, Inc. 350 Hochberg Road Monroeville, PA 15146 United States Main: 724-325-1776 Fax: 724-325-1775

Sample ID	Client Sample ID	Date Received
10487079	CUF-SED-UT03-CORCC-0.0/0.5-20190821	09/04/2019 8:56 AM EDT
10487080	CUF-SED-UT03-CORCC-0.5/1.0-20190821	09/04/2019 8:56 AM EDT
10487081	CUF-SED-UT03-CORLB-0.0/0.5-20190821	09/04/2019 8:56 AM EDT
10487082	CUF-SED-UT02-CORCC-0.0/0.5-20190821	09/04/2019 8:56 AM EDT
10487083	CUF-SED-UT02-CORRB-0.0/0.5-20190821	09/04/2019 8:56 AM EDT
10487084	CUF-SED-UT02-CORRB-0.5/2.0-20190821	09/04/2019 8:56 AM EDT
10487085	CUF-SED-UT01-CORRB-0.0/0.5-20190821	09/04/2019 8:56 AM EDT
10487086	CUF-SED-UT01-CORLB-0.0/0.5-20190821	09/04/2019 8:56 AM EDT
10487087	CUF-SED-UT01-CORCC-0.0/0.5-20190821	09/04/2019 8:56 AM EDT
10487088	CUF-SED-UT01.5-CORCC-0.0/0.5-20190821	09/04/2019 8:56 AM EDT
10487089	CUF-SED-UT01-DUP01-20190821	09/04/2019 8:56 AM EDT
10487090	QC_CUF-SED-UT01.5-CORCC-0.0/0.5-20190821	09/04/2019 8:56 AM EDT



	<b>Received From:</b> Tyler Baker	<i>Method of Shipment:</i> Federal Express
	<b>Company:</b> Tennessee Valley Authority	<b>Date:</b> 09/04/2019
	<b>Received By:</b> Monica Carse	<i>Package Condition Upon Receipt:</i> Sealed
	<b>Company:</b> RJ Lee Group, Inc.	<b>Date:</b> 09/04/2019

	<b>Relinquished</b>	<i>Method of Shipment:</i>
	<b>Company:</b>	<b>Date:</b>
	<b>Received By:</b>	<i>Package Condition Upon Receipt:</i>
	<b>Company:</b>	<b>Date:</b>

	<b>Relinquished</b>	<i>Method of Shipment:</i>
	<b>Company:</b>	<b>Date:</b>
	<b>Received By:</b>	<i>Package Condition Upon Receipt:</i>
	<b>Company:</b>	<b>Date:</b>



**RJ Lee Group  
Sample Receipt and Log in Check List**

Client:	TVA	Date Received:	9/4/2019	Log in Date:	9/4/2019
Time Received:	8:56 AM	By:	Monica Carse	COC# :	CUF_SED_20190821_1C
Project:	AOH1055321-0	# Coolers Received	1	Means of Shipment:	FedEx
Air Bill:	7895 5673 0399				

As Received Screen	Yes	No	Comments
Were the Coolers received in good condition?	✓		
Was there evidence of tampering?		✓	
Are Custody Seals intact and in good condition?	✓		
Were Coolers received between 2 and 4 degrees C?	N/A		
Were all samples intact?	✓		
Were all samples accurately labeled?	✓		
Was the COC received in good condition?	✓		
Did the sample ID on COC match the ID on the sample jars?	✓		
Were there any discrepancies among samples and COC?		✓	
Is the COC completely filled out?	✓		
Was the COC relinquished properly?	✓		

List any anomalies associated with Sample Receipt

N/A

Analyst Signature: M. Carse 09-04-19

Manager Signature: [Signature] 09-04-19



A041055321-0



Tennessee Valley Authority

## TVA Environmental Investigations

## Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

COOLER No.:	1	of	1
COC No.:	CUF_SED_20190821_1C		
1 of 1 Pages			
Task Desc:	CUF_SED		

Required Ship to Lab:		Required Project Information:		Required Sampler Information:	
Lab Name:	RJ Lee Group, Inc.	Site ID #:	CUMBERLAND FOSSIL PLANT	Sampler:	Tyler Baker
Lab Address:	350 Hochberg Road Monroeville, PA 15146	Project #:	0777010	Sampling Company:	TVA
Lab Manager Contact Information		Site Address:	815 Cumberland City Road	Address:	
		City:	Cumberland City	State, Zip:	TN, 37763
Lab PM:	Monica Carse	Site PM Name:	Roy Quinn	Phone:	423-876-6733
Phone/Fax:	724.325.1776	Phone/Fax:	423-751-3753	Sampling Team Number:	1
Lab Email:	MCarse@rjleegroup.com	Site PM Email:	rquinn@tva.gov	Send EDD/Hard Copy to:	tva_deliverables@envstd.com

## Analysis Turnaround Time

☐ CALENDAR DAYS☒ WORKING DAYS

TAT if different from Below

☐ 24 Hours☐ 3 Business Days☐ 5 Business Days☒ 10 Business Days (Standard)

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Sample Depth		MATRIX CODE	G= GRAB C=COMP	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD	Analysis
			Start Depth	End Depth									
1	CUF-SED-UT03-CORCC-0.0/0.5-20190821	SED-UT03	0.0	0.5	SED	G	N	8/21/2019	1510	1		<input type="checkbox"/>	X
2	CUF-SED-UT03-CORCC-0.5/1.0-20190821	SED-UT03	0.5	1.0	SED	G	N	8/21/2019	1510	1		<input type="checkbox"/>	X
3	CUF-SED-UT03-CORLB-0.0/0.5-20190821	SED-UT03	0.0	0.5	SED	G	N	8/21/2019	1525	1		<input type="checkbox"/>	X
4	CUF-SED-UT02-CORCC-0.0/0.5-20190821	SED-UT02	0.0	0.5	SED	G	N	8/21/2019	1545	1		<input type="checkbox"/>	X
5	CUF-SED-UT02-CORRB-0.0/0.5-20190821	SED-UT02	0.0	0.5	SED	G	N	8/21/2019	1615	1		<input type="checkbox"/>	X
6	CUF-SED-UT02-CORRB-0.5/2.0-20190821	SED-UT02	0.5	2.0	SED	G	N	8/21/2019	1615	1		<input type="checkbox"/>	X
7	CUF-SED-UT01-CORRB-0.0/0.5-20190821	SED-UT01	0.0	0.5	SED	G	N	8/21/2019	1650	1		<input type="checkbox"/>	X
8	CUF-SED-UT01-CORLB-0.0/0.5-20190821	SED-UT01	0.0	0.5	SED	G	N	8/21/2019	1710	1		<input type="checkbox"/>	X
9	CUF-SED-UT01-CORCC-0.0/0.5-20190821	SED-UT01	0.0	0.5	SED	G	N	8/21/2019	1700	1		<input type="checkbox"/>	X
10	CUF-SED-UT01.5-CORCC-0.0/0.5-20190821	SED-UT01	0.0	0.5	SED	G	N	8/21/2019	1720	1		<input type="checkbox"/>	X
11	CUF-SED-UT01-DUP01-20190821	--	NA	NA	SED	G	FD	8/21/2019	--	1		<input type="checkbox"/>	X
12												<input type="checkbox"/>	
13												<input type="checkbox"/>	

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION

DATE

TIME

ACCEPTED BY / AFFILIATION

DATE

TIME

Sample Receipt Conditions

☐ Yes☐ Yes☐ Yes☐ Yes☒ No☒ No☐ No☒ No☐ Yes☐ Yes☐ Yes☐ Yes☐ No☐ No☐ No☐ No☐ Yes☐ Yes☐ Yes☐ Yes☐ No☐ No☐ No☐ No

SHIPPING METHOD:

Fedex

SAMPLER NAME AND SIGNATURE

Tyler Baker

Temperature in °C

Sample on Ice?

Sample Intact?

Trip Blank?

Custody Seal 641266





## TVA Environmental Investigations

## Chain-of-Custody / Analytical Request Document

Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed and accurate

COOLER No.:	1	of	1
GOC No:	CUF_SED 20190821_1C		
1 of 1 Pages			
Task Desc:	CUF_SED		

ffb090619

<b>Required Ship to Lab:</b> Lab Name: RJ Lee Group, Inc. Lab Address: 350 Hochberg Road Monroeville, PA 15146		<b>Required Project Information:</b> Site ID #: CUMBERLAND FOSSIL PLANT Project #: 0777010 Site Address: 815 Cumberland City Road City: Cumberland City State, Zip: TN, 37783 Site PM Name: Roy Quinn Phone/Fax: 423-751-3753 Site PM Email: rquinn@tva.gov		<b>Required Sampler Information:</b> Sampler: Tyler Baker Sampling Company: TVA Address: TVA Chickamauga Power Service Center, 4601 N. Access Road, 37415 City/State: Chattanooga, TN 37415 Phone: 423-876-6733 Sampling Team Number: 1 Send EDD/Hard Copy to: tva_deliverables@envysid.com	
<b>Lab Manager Contact Information</b> Lab PM: Monica Carse Phone/Fax: 724.325.1776 Lab Email: MCarse@rjleegroup.com				<b>Analysis Turnaround Time</b>	

Sample Depth		E	OMP	E	<input type="checkbox"/> CALENDAR DAYS <input checked="" type="checkbox"/> WORKING DAYS	
					TAT if different from Below _____	
Depth	Meters				<input type="checkbox"/> 24 Hours <input type="checkbox"/> 3 Business Days <input type="checkbox"/> 5 Business Days <input checked="" type="checkbox"/> 10 Business Days (Standard)	

ITEMS #	SAMPLE ID Samples IDs MUST BE UNIQUE	SAMPLE LOCATION	Unit		MATRIX CODE	G= GRAB C=C	SAMPLE TYPE	SAMPLE DATE	SAMPLE TIME	# OF CONTAINERS	Comments/ Lab Sample I.D.	MS/MSD
			Start Depth	End Depth								
1	CUF-SED-UT03-CORCC-0.0/0.5-20190821	SED-UT03	0.0	0.5	SED	G	N	8/21/2019	1510	1		<input type="checkbox"/>
2	CUF-SED-UT03-CORCC-0.5/1.0-20190821	SED-UT03	0.5	1.0	SED	G	N	8/21/2019	1510	1		<input type="checkbox"/>
3	CUF-SED-UT03-CORLB-0.0/0.5-20190821	SED-UT03	0.0	0.5	SED	G	N	8/21/2019	1525	1		<input type="checkbox"/>
4	CUF-SED-UT02-CORCC-0.0/0.5-20190821	SED-UT02	0.0	0.5	SED	G	N	8/21/2019	1545	1		<input type="checkbox"/>
5	CUF-SED-UT02-CORRB-0.0/0.5-20190821	SED-UT02	0.0	0.5	SED	G	N	8/21/2019	1615	1		<input type="checkbox"/>
6	CUF-SED-UT02-CORRB-0.5/2.0-20190821	SED-UT02	0.5	2.0	SED	G	N	8/21/2019	1615	1		<input type="checkbox"/>
7	CUF-SED-UT01-CORRB-0.0/0.5-20190821	SED-UT01	0.0	0.5	SED	G	N	8/21/2019	1650	1		<input type="checkbox"/>
8	CUF-SED-UT01-CORLB-0.0/0.5-20190821	SED-UT01	0.0	0.5	SED	G	N	8/21/2019	1710	1		<input type="checkbox"/>
9	CUF-SED-UT01-CORCC-0.0/0.5-20190821	SED-UT01	0.0	0.5	SED	G	N	8/21/2019	1700	1		<input type="checkbox"/>
10	CUF-SED-UT01.5-CORCC-0.0/0.5-20190821	SED-UT01.5	0.0	0.5	SED	G	N	8/21/2019	1720	1		<input type="checkbox"/>
11	CUF-SED-UT01-DUP01-20190821	SED-UT01 #40090619	NA	NA	SED	G	FD	8/21/2019	--	1		<input type="checkbox"/>
12												<input type="checkbox"/>
13												<input type="checkbox"/>

Additional Comments/Special Instructions:

RELINQUISHED BY / AFFILIATION		DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	Sample Receipt Conditions			
Tyler Baker / TVA		9-3-19	1500	M. Canan / H&E GROUP	09-04-19	08:56	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
							<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No
SHIPPING METHOD:		SAMPLER NAME AND SIGNATURE				Temperature in °C	Sample on Ice?	Sample intact?	Trip Blank?	
Fedex		Tyler Baker								

Custody Seal 641266



**Appendix B**  
Mineral Identification Report



## Mineral Identification

Polarized Light Microscopy (PLM) Laboratory Report

Roy Quinn  
 TVA Cumberland Fossil Plant  
 815 Cumberland City Road  
 Cumberland City, TN 37050 United States  
 Email: jrquinn@tva.gov  
 Main: 423-751-3753

**Report Date:** 09/10/2019  
**Sample Received Date:** 09/04/2019  
**RJLG Project:** AOH1055321-0  
**Customer COC:** CUF\_SED\_20190821\_1C  
**Purchase Order:** 4663341  
**Analytical Method:** Fly Ash Determination by PLM

Customer Sample # :	RJLG ID	Date Analyzed	Date Collected	Area % Fly Ash	Non-Fly Ash Components	Comments
CUF-SED-UT01-CORCC-0.0/0.5-20190821	10487087	09/06/2019	08/21/2019	29%	Carbonate Clay Opaques Quartz	Grey Sediment
CUF-SED-UT01-CORLB-0.0/0.5-20190821	10487086	09/05/2019	08/21/2019	27%	Carbonate Clay Opaques Organic Particulate Quartz	Grey-Brown Sediment
CUF-SED-UT01-CORRB-0.0/0.5-20190821	10487085	09/05/2019	08/21/2019	21%	Amphibole Carbonate Opaques Quartz	Brown Sediment
CUF-SED-UT01-DUP01-2 0190821	10487089	09/06/2019	08/21/2019	29%	Carbonate Clay Opaques Quartz	Dark Brown Sediment
CUF-SED-UT01.5-CORC-C-0.0/0.5-20190821	10487088	09/06/2019	08/21/2019	30%	Carbonate Clay Opaques Quartz	Dark Brown Sediment



Customer Sample # :	RJLG ID	Date Analyzed	Date Collected	Area % Fly Ash	Non-Fly Ash Components	Comments
CUF-SED-UT02-CORCC- 0.0/0.5-20190821	10487082	09/06/2019	08/21/2019	41%	Carbonate Clay Opaques Quartz	Grey Sediment
CUF-SED-UT02-CORRB- 0.0/0.5-20190821	10487083	09/06/2019	08/21/2019	29%	Carbonate Clay Opaques Quartz	Dark Brown Sediment
CUF-SED-UT02-CORRB- 0.5/2.0-20190821	10487084	09/05/2019	08/21/2019	10%	Carbonate Opaques Organic Particulate Quartz	Brown Sediment
CUF-SED-UT03-CORCC- 0.0/0.5-20190821	10487079	09/06/2019	08/21/2019	22%	Carbonate Clay Opaques Quartz	Light Grey-Brown Sediment
CUF-SED-UT03-CORCC- 0.5/1.0-20190821	10487080	09/06/2019	08/21/2019	32%	Carbonate Clay Opaques Quartz	Light Brown Sediment
CUF-SED-UT03-CORLB- 0.0/0.5-20190821	10487081	09/06/2019	08/21/2019	22%	Carbonate Clay Opaques Quartz	Brown Sediment
QC_CUF-SED-UT01.5-C ORCC-0.0/0.5-20190821	10487090	09/06/2019	08/21/2019	28%	NA	Dark Brown Sediment



#### Disclaimer Notes

- \* Samples will be returned to client immediately upon the release of final report.
- \* These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.
- \* This test report relates to the items tested.
- \* Any reproduction of this document must include the entire document in order for the report to be valid.
- \* This report may not be used to claim product endorsement by NVLAP Lab Code 101208-0 or any agency of the U.S. Government.
- \* Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA # 100364, NVLAP # 101208-0, NY ELAP # 10884) facility.
- \* If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results is limited to the reported values.
- \* For the purposes of this method, Fly Ash is defined as any particle consistent with Coal Ash.
- \* The method reporting level is 1% and anything <1% is considered a not-detected.

Quartz – Angular anisotropic particulate with low relief.

Feldspar – Angular to blocky anisotropic particulate, low to moderate relief, biaxial, can have polysynthetic twinning.

Clay – Sheet silicates with polycrystalline or display non-uniform extinction with low to moderate relief, and zero to low birefringence. Clay also refers to particles that are less than 2.0 microns.

Opakes – Opaque is a generic term for a particle that does not transmit light. Opaque minerals are distinguished from opaque bottom ash based on morphology of fracture.

Fly Ash – Isotropic to opaque spheres, agglomeration of spheres, and angular ash particles.

Organic Particulate – Pollen, plant and insect matter, and carbonaceous matter.

Carbonates – High birefringent, can be rhombohedral, with high relief.

Diatoms – Silica rich isotropic particles with various morphologies.

Mica – Sheet silicate with moderate to high relief and low birefringence, mono-crystalline, and normal extinction.

Miscellaneous Silicate – Isotropic and anisotropic silicates, with low to high relief, identification unsure and beyond the scope of the method to identify.

Amphibole – Elongated anisotropic particulate with moderate to high relief.

Coal – Irregular to angular particles with moderate opacity, edges and thin particles are reddish brown in color.

<1% Fly Ash – Fly Ash observed, none counted.

ND – No Fly Ash detected.



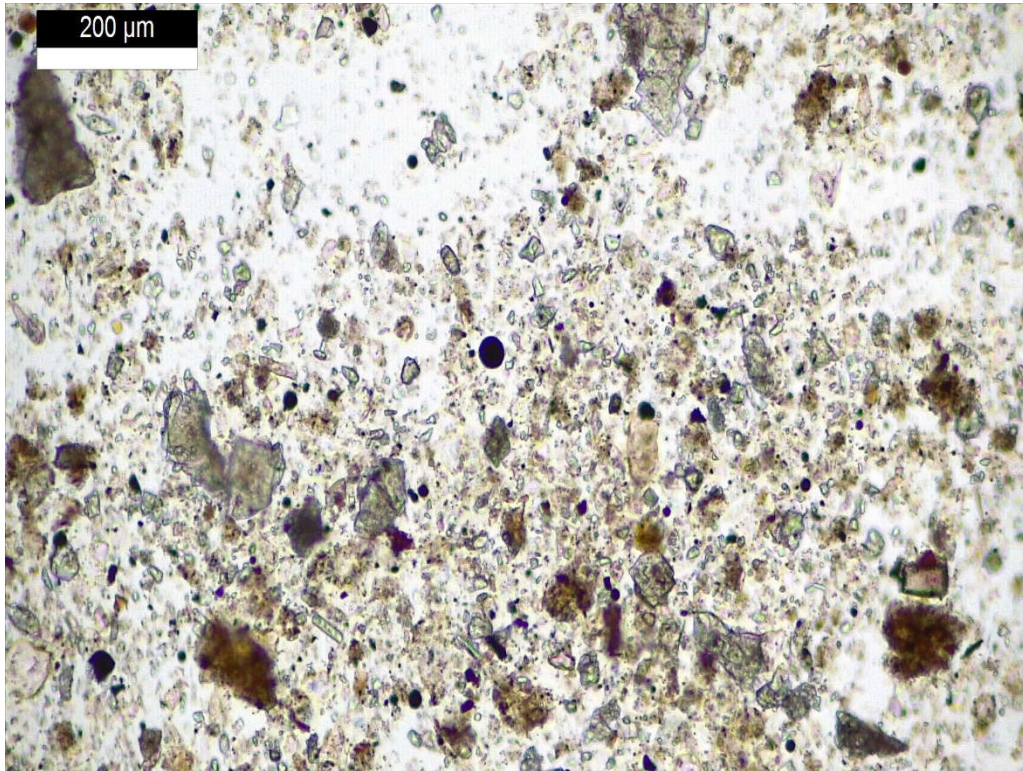
**Appendix C**

Polarized Light Microscopy Images

Bench Sheets

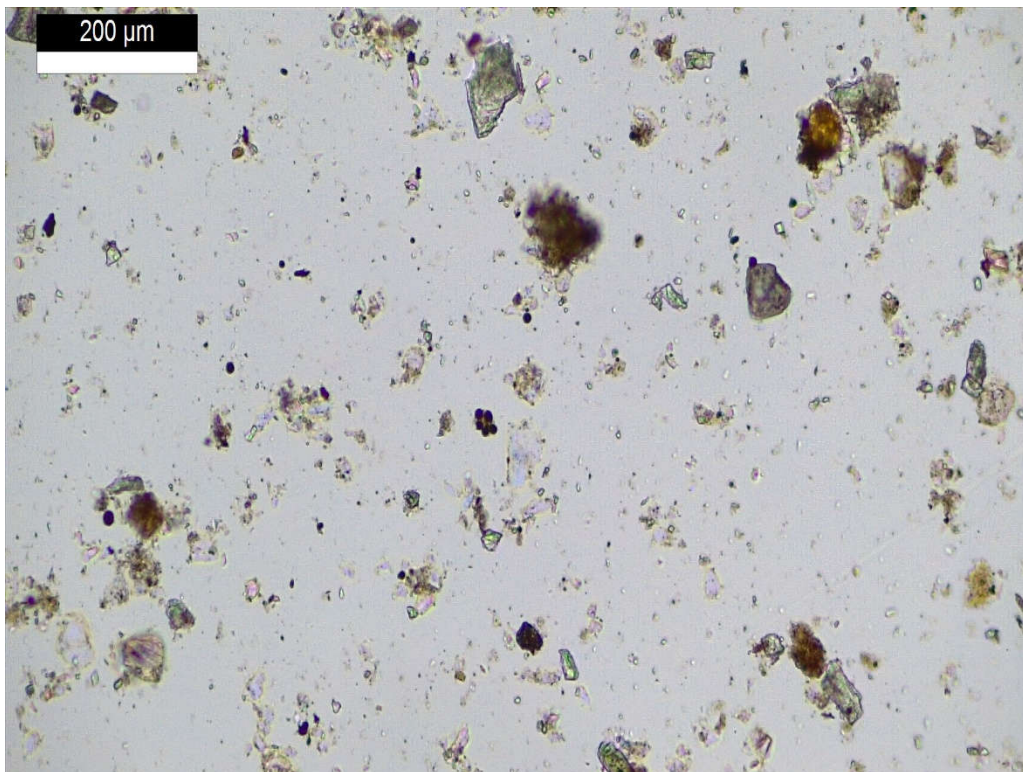
QC Tabulation





**Sample CUF-SED-UT03-CORCC-0.0/0.5-20190821. RJLG ID 10487079.**

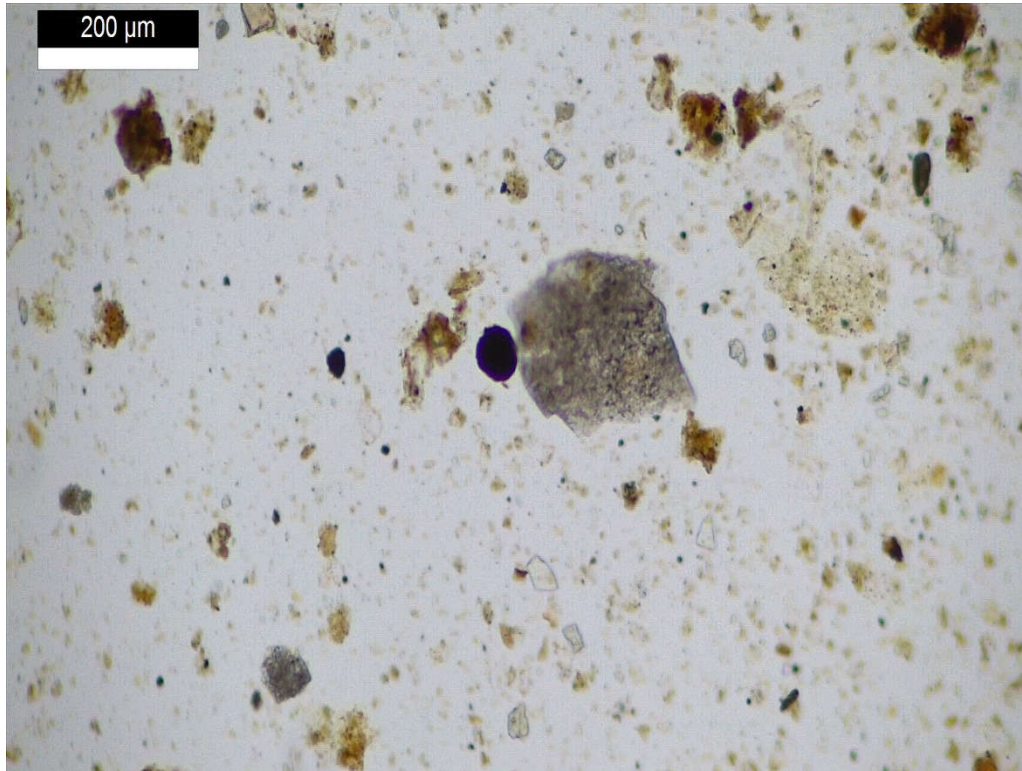
Photomicrograph of sample in plane polarized light illustrating overall sample appearance.



**Sample CUF-SED-UT03-CORCC-0.5/1.0-20190821. RJLG ID 10487080.**

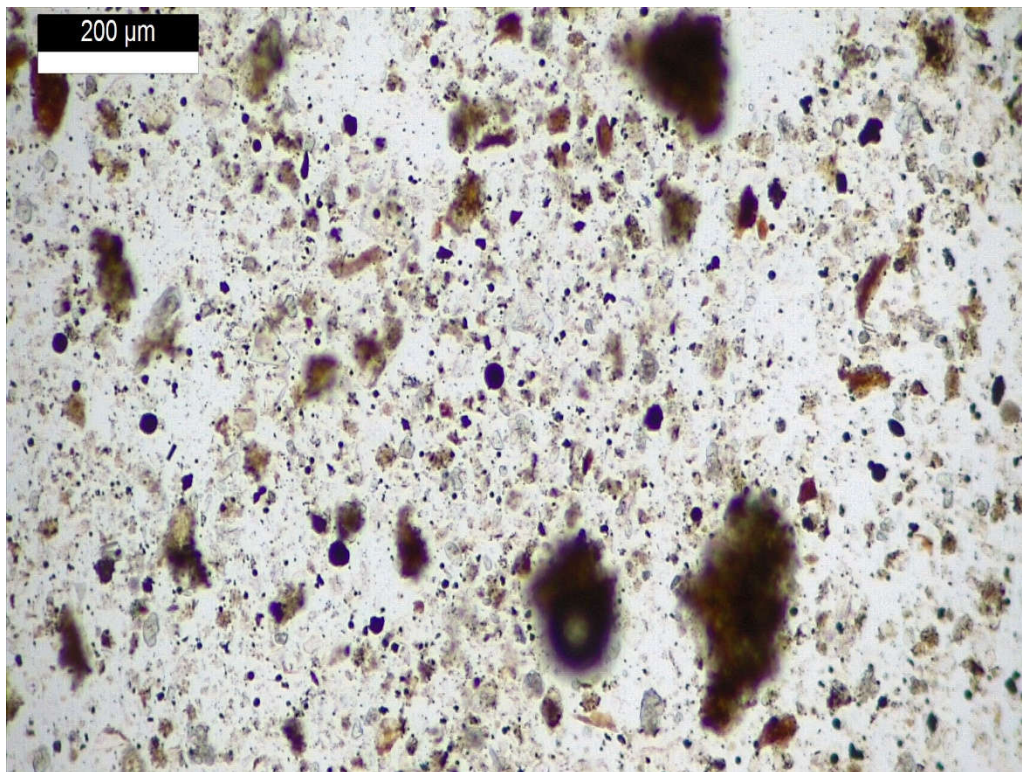
Photomicrograph of sample in plane polarized light illustrating overall sample appearance.





**Sample CUF-SED-UT03-CORLB-0.0/0.5-20190821. RJLG ID 10487081.**

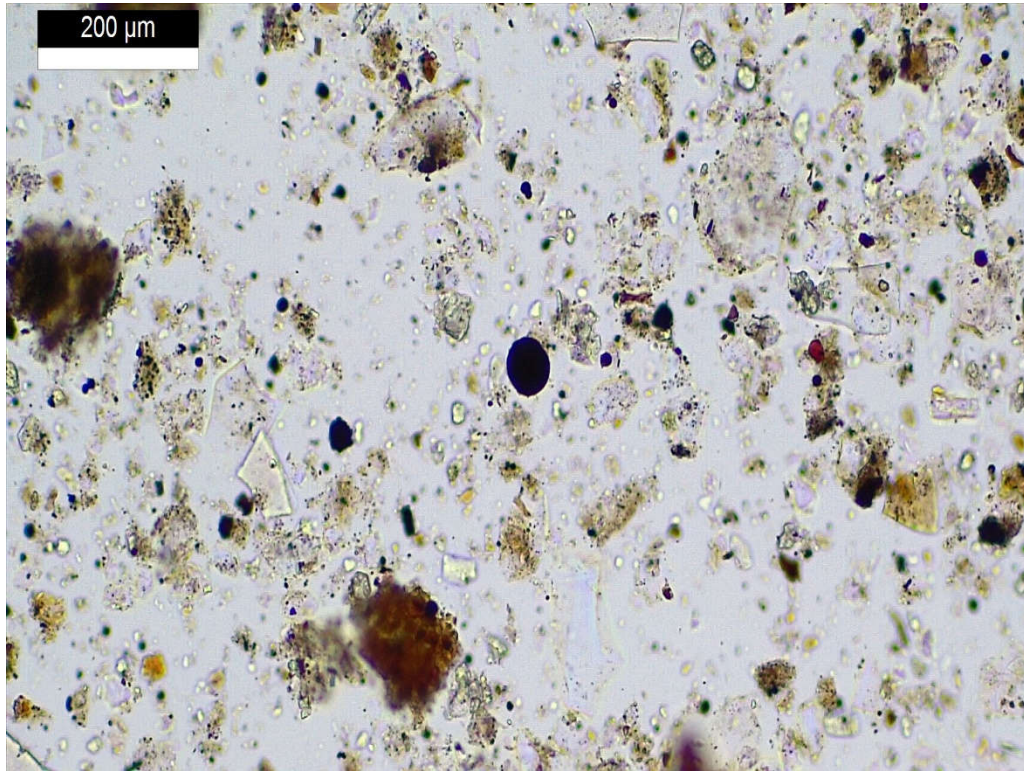
Photomicrograph of sample in plane polarized light illustrating overall sample appearance.



**Sample CUF-SED-UT02-CORCC-0.0/0.5-20190821. RJLG ID 10487082.**

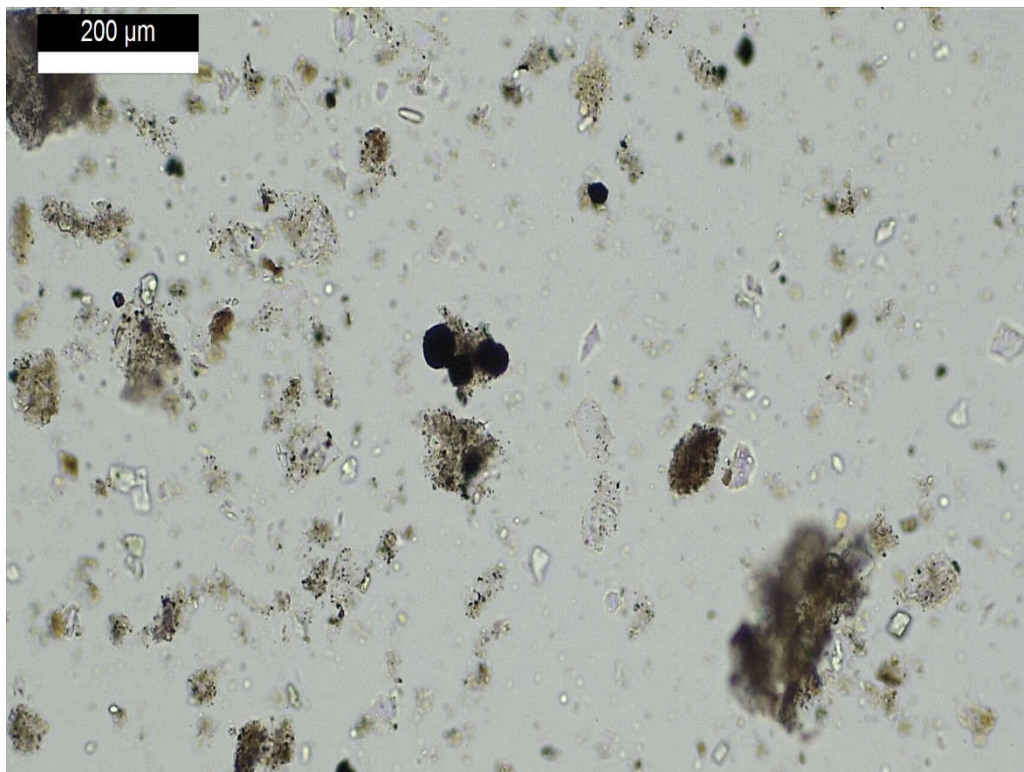
Photomicrograph of sample in plane polarized light illustrating overall sample appearance.





**Sample CUF-SED-UT02-CORRB-0.0/0.5-20190821. RJLG ID 10487083.**

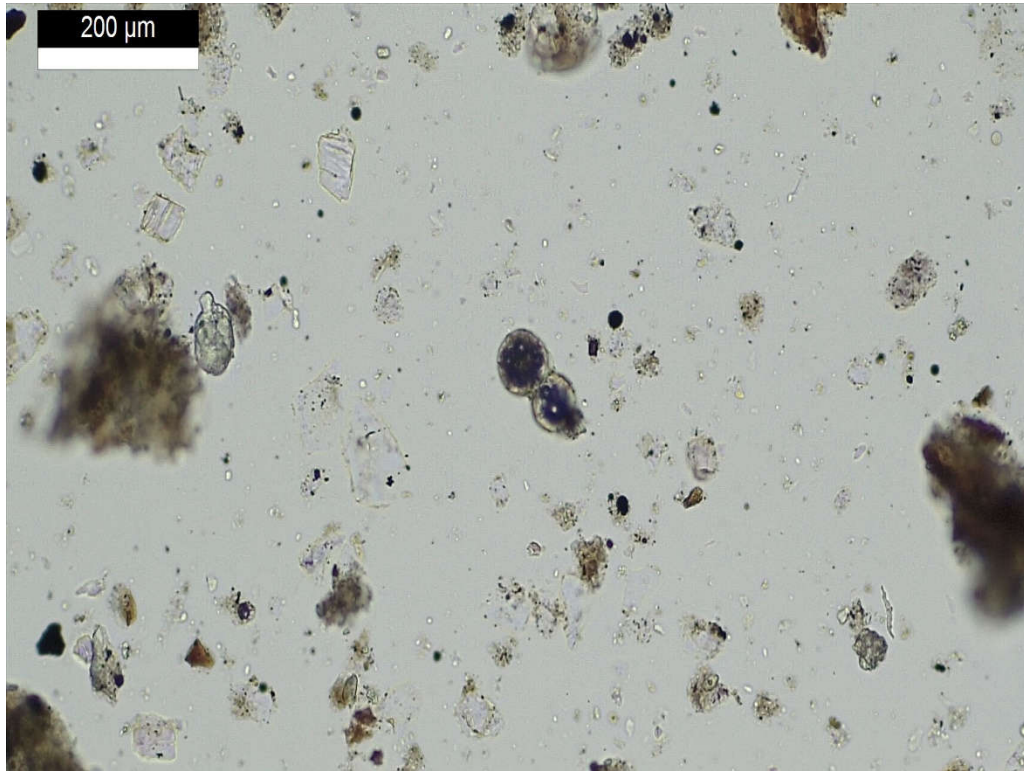
Photomicrograph of sample in plane polarized light illustrating overall sample appearance.



**Sample CUF-SED-UT02-CORRB-0.5/2.0-20190821. RJLG ID 10487084.**

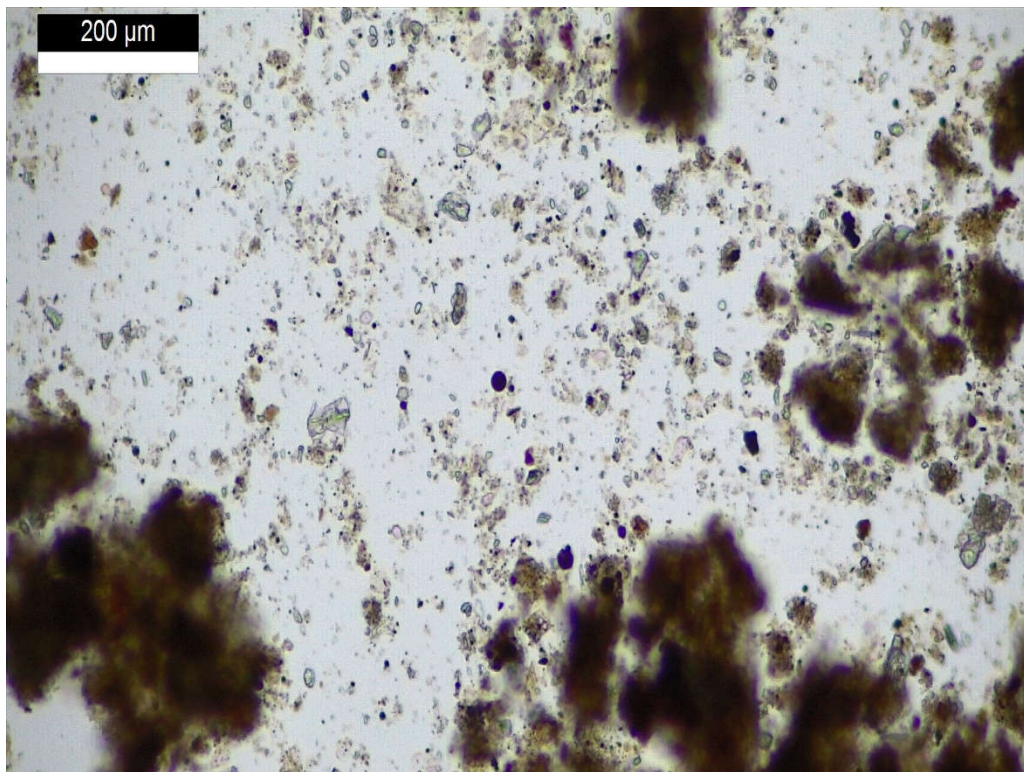
Photomicrograph of sample in plane polarized light illustrating overall sample appearance.





**Sample CUF-SED-UT01-CORRB-0.0/0.5-20190821. RJLG ID 10487085.**

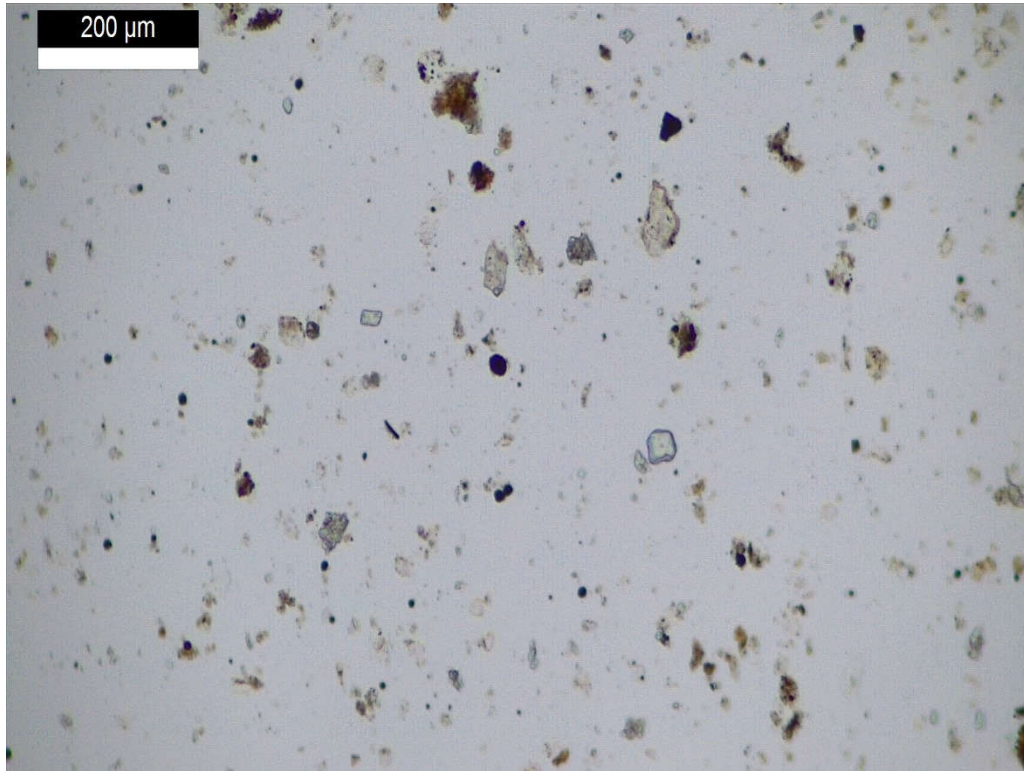
Photomicrograph of sample in plane polarized light illustrating overall sample appearance.



**Sample CUF-SED-UT01-CORLB-0.0/0.5-20190821. RJLG ID 10487086.**

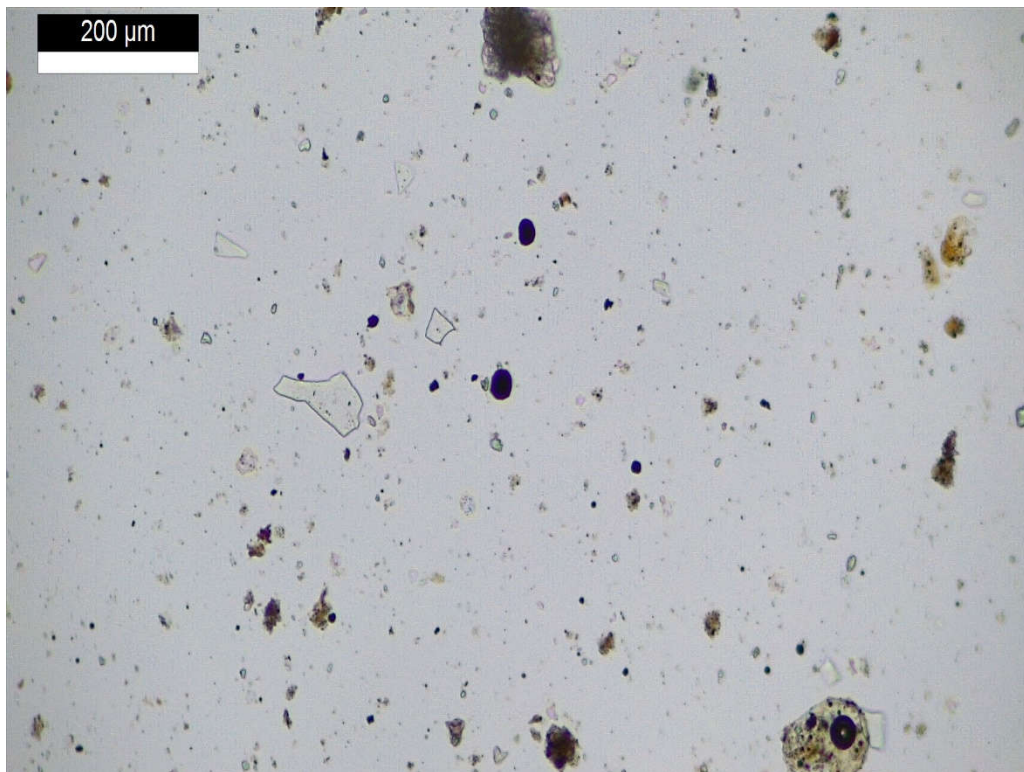
Photomicrograph of sample in plane polarized light illustrating overall sample appearance.





**Sample CUF-SED-UT01-CORCC-0.0/0.5-20190821. RJLG ID 10487087.**

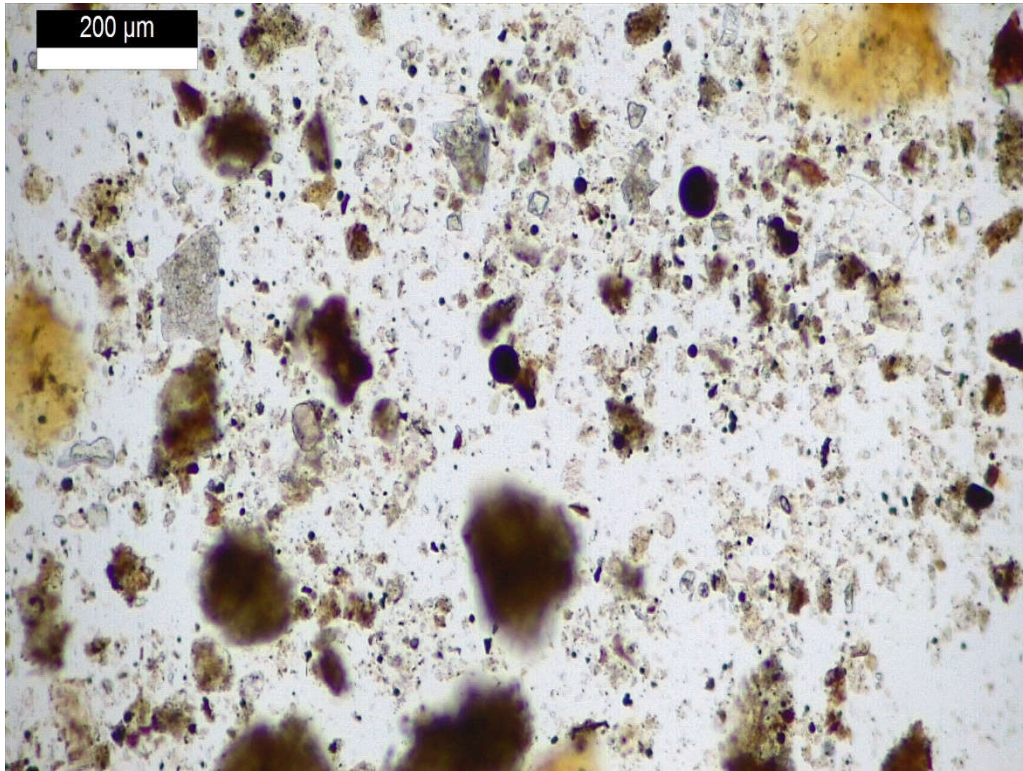
Photomicrograph of sample in plane polarized light illustrating overall sample appearance.



**Sample CUF-SED-UT01.5-CORCC-0.0/0.5-20190821. RJLG ID 10487088.**

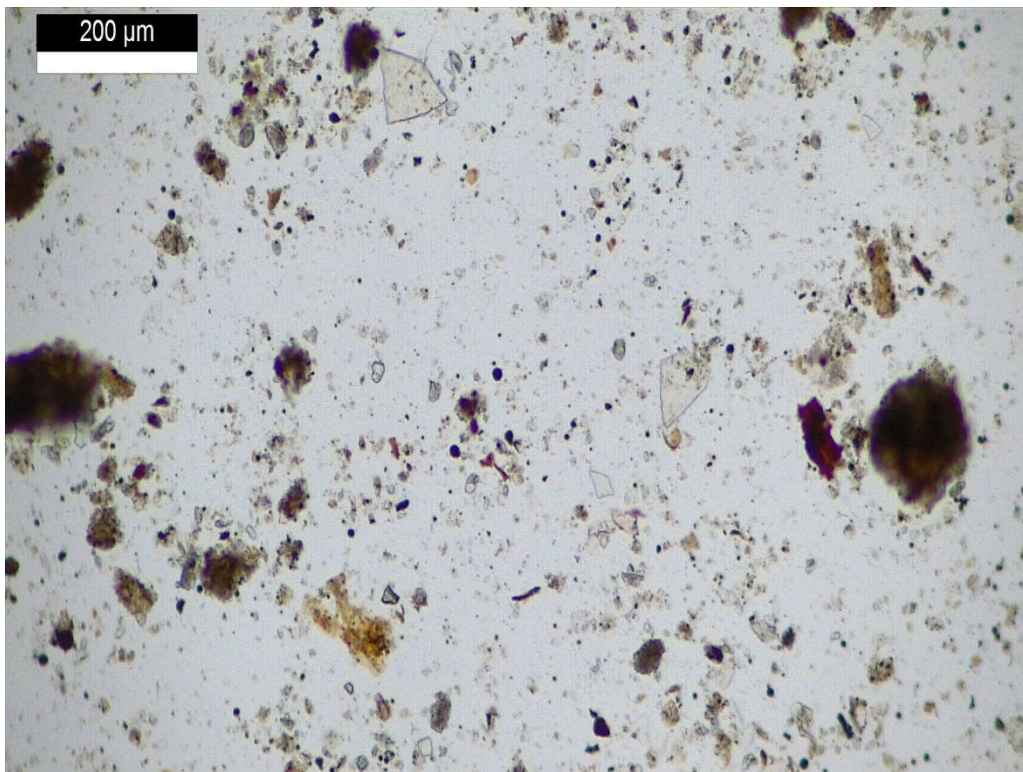
Photomicrograph of sample in plane polarized light illustrating overall sample appearance.





**Sample CUF-SED-UT01-DUP01-20190821. RJLG ID 10487089.**

Photomicrograph of sample in plane polarized light illustrating overall sample appearance.



**Sample QC\_CUF-SED-UT01.5-CORCC-0.0/0.5-20190821. RJLG ID 10487090.**

Photomicrograph of sample in plane polarized light illustrating overall sample appearance.



# Fly Ash Bench Sheet

RJLG ID: 10487079

Customer Sample # : CUF-SED-UT03-CORCC-0.0/0.5-20190821

Slide 1: 6      Slide 2: 5      Slide 3: 6      Slide 4: 5      Fly Ash % 22%

Non-Fly Ash  
Components

Carbonate  
Clay  
Opagues  
Quartz

Other Components:

Results Comments:

Light Grey-Brown Sediment

Analysis Date: 2019-09-06

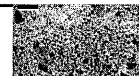
Analysis Time: 14:38

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-06 14:38:17.507

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: ac

Date: 09/06/19



# Fly Ash Bench Sheet

RJLG ID: 10487080

Customer Sample # : CUF-SED-UT03-CORCC-0.5/1.0-20190821

Slide 1: 9      Slide 2: 7      Slide 3: 8      Slide 4: 8      Fly Ash %    32%

Non-Fly Ash  
Components

Carbonate  
Clay  
Opaques  
Quartz

Other Components:

Results Comments:

Light Brown Sediment

Analysis Date: 2019-09-06

Analysis Time: 14:35

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-06 14:38:51.717

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: ac

Date: 09/06/19



# Fly Ash Bench Sheet

RJLG ID: 10487081

Customer Sample # : CUF-SED-UT03-CORLB-0.0/0.5-20190821

Slide 1: 5      Slide 2: 7      Slide 3: 3      Slide 4: 7      Fly Ash % 22%

Non-Fly Ash  
Components

Carbonate  
Clay  
Opagues  
Quartz

Other Components:

Results Comments:

Brown Sediment

Analysis Date: 2019-09-06

Analysis Time: 12:40

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-06 12:40:23.087

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: ac

Date: 09/06/19



# Fly Ash Bench Sheet

RJLG ID: 10487082

Customer Sample # : CUF-SED-UT02-CORCC-0.0/0.5-20190821

Slide 1: 12      Slide 2: 11      Slide 3: 9      Slide 4: 9      Fly Ash % 41%

Non-Fly Ash  
Components

Carbonate  
Clay  
Opaques  
Quartz

Other Components:

Results Comments:

Grey Sediment

Analysis Date: 2019-09-06

Analysis Time: 13:59

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-06 13:59:43.763

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: au

Date: 09/06/19



# Fly Ash Bench Sheet

RJLG ID: 10487083

Customer Sample # : CUF-SED-UT02-CORRB-0.0/0.5-20190821

Slide 1: 10      Slide 2: 7      Slide 3: 7      Slide 4: 5      Fly Ash % 29%

Non-Fly Ash  
Components

Carbonate  
Clay  
Opagues  
Quartz

Other Components:

Results Comments:

Dark Brown Sediment

Analysis Date: 2019-09-06

Analysis Time: 15:09

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-06 15:09:19.847

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: AL

Date: 09/06/19



# Fly Ash Bench Sheet

RJLG ID: 10487084

Customer Sample # : CUF-SED-UT02-CORRB-0.5/2.0-20190821

Slide 1: 3      Slide 2: 0      Slide 3: 2      Slide 4: 5      Fly Ash % 10%

Non-Fly Ash  
Components

Carbonate  
Opagues  
Organic Particulate  
Quartz

Other Components:

Results Comments:

Brown Sediment

Analysis Date: 2019-09-05

Analysis Time: 15:17

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-05 15:17:38.113

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: ac

Date: 09/05/19



# Fly Ash Bench Sheet

RJLG ID: 10487085

Customer Sample # : CUF-SED-UT01-CORRB-0.0/0.5-20190821

Slide 1: 4      Slide 2: 6      Slide 3: 4      Slide 4: 7      Fly Ash % 21%

Non-Fly Ash  
Components

Amphibole  
Carbonate  
Opaques  
Quartz

Other Components:

Results Comments:

Brown Sediment

Analysis Date: 2019-09-05

Analysis Time: 15:46

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-05 15:46:03.657

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: ac

Date: 09/05/19



# Fly Ash Bench Sheet

RJLG ID: 10487086

Customer Sample # : CUF-SED-UT01-CORLB-0.0/0.5-20190821

Slide 1: 7      Slide 2: 6      Slide 3: 6      Slide 4: 8      Fly Ash % 27%

Non-Fly Ash  
Components

Carbonate  
Clay  
Opagues  
Organic Particulate  
Quartz

Other Components:

Results Comments:

Grey-Brown Sediment

Analysis Date: 2019-09-05

Analysis Time: 16:06

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-05 16:20:21.85

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: ac

Date: 09/05/19



# Fly Ash Bench Sheet

RJLG ID: 10487087

Customer Sample # : CUF-SED-UT01-CORCC-0.0/0.5-20190821

Slide 1: 6      Slide 2: 7      Slide 3: 8      Slide 4: 8      Fly Ash %    29%

Non-Fly Ash  
Components

Carbonate  
Clay  
Opaques  
Quartz

Other Components:

Results Comments:

Grey Sediment

Analysis Date: 2019-09-06

Analysis Time: 12:07

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-06 12:20:29.68

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: ac

Date: 09/06/19



RJLG ID: 10487088

Customer Sample # : CUF-SED-UT01.5-CORCC-0.0/0.5-20190821

Slide 1: 7      Slide 2: 6      Slide 3: 8      Slide 4: 9      Fly Ash % 30%

Non-Fly Ash  
Components

Carbonate  
Clay  
Opagues  
Quartz

Other Components:

Results Comments:

Dark Brown Sediment

Analysis Date: 2019-09-06

Analysis Time: 14:54

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-06 14:54:50.773

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: ac

Date: 09/06/19



# Fly Ash Bench Sheet

RJLG ID: 10487089

Customer Sample # : CUF-SED-UT01-DUP01-20190821

Slide 1: 7      Slide 2: 6      Slide 3: 8      Slide 4: 8      Fly Ash %    29%

Non-Fly Ash  
Components

Carbonate  
Clay  
Opagues  
Quartz

Other Components:

Results Comments:

Dark Brown Sediment

Analysis Date: 2019-09-06

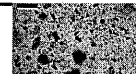
Analysis Time: 12:24

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-06 12:24:07.213

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: ac

Date: 09/06/19



# Fly Ash Bench Sheet

RJLG ID: 10487090

Customer Sample # : QC\_CUF-SED-UT01.5-CORCC-0.0/0.5-20190821

Slide 1: 6      Slide 2: 7      Slide 3: 7      Slide 4: 8      Fly Ash % 28%

Non-Fly Ash  
Components

Carbonate  
Clay  
Opaques  
Quartz

Other Components:

Results Comments:

Dark Brown Sediment

Analysis Date: 2019-09-06

Analysis Time: 15:22

Result Last Modified By: Alexandra Cheek

Result Last Modified On: 2019-09-06 15:22:47.537

Images:

Image Path: \\hq.rjlg.com\dfs\Department\pool28-PA\_Optical\2019 Completed Projects\TVA\_Cumberland



Initials: al

Date: 09/06/19



Original Issue: 03/04/10  
Effective Date: March 2013  
Approved By: Quality Assurance

FLY ASH  
10% Quality Control Record

Form OPT-023A  
Rev. 02  
Page 1 of 1

Laboratory\_\_\_\_\_ PLM

RSD:\_\_\_\_\_

Job #	Sample #	Analyst	Result	QC Analyst	Result	Pass or Fail	Retest? (Y or N)	CV Value	RSD	Comments
AOH1055321-0	CUF-SED-UT01.5-CORCC-0.0/0.5-20190821	AC	30	AC	28	Pass	No	0.061139643	0.358034573	