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## Technical Report for

**Alfred Ward & Son**

**Blomenkamp Lease**

**#4, OM**

**SGS Job Number: DA30338**

**Sampling Date: 11/05/20**

### Report to:

Alfred Ward & Son  
P.O. Box 737  
Ogallala, NE 69153  
randy@wardoil.com

**ATTN: Randy Ward**

**Total number of pages in report: 70**



Test results contained within this data package meet the requirements of the National Environmental Laboratory Accreditation Program and/or state specific certification programs as applicable.



**Jason Savoie**  
**General Manager**

**Client Service contact: Elizabeth Sutcliffe 303-425-6021**

Certifications: CO (CO00049), NE (NE-OS-06-04), ND (R-027), UT (NELAP CO00049)  
LA (LA150028), TX (T104704511), WY (8TMS-L)

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Test results relate only to samples analyzed.

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Sample Summary

Alfred Ward & Son

Job No: DA30338

Blomenkamp Lease  
Project No: #4, OM

Sample Number	Collected Date	Time By	Received	Matrix Code	Type	Client Sample ID
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This report contains results reported as ND = Not detected. The following applies:  
Organics ND = Not detected above the MDL

DA30338-1	11/05/20	00:00	RW	11/09/20	SO	Soil	B4 FTB
DA30338-1A	11/05/20	00:00	RW	11/09/20	SO	Soil	B4 FTB
DA30338-2	11/05/20	00:00	RW	11/09/20	SO	Soil	B4 FTS
DA30338-2A	11/05/20	00:00	RW	11/09/20	SO	Soil	B4 FTS
DA30338-3	11/05/20	00:00	RW	11/09/20	SO	Soil	B4 WOU
DA30338-3A	11/05/20	00:00	RW	11/09/20	SO	Soil	B4 WOU
DA30338-4	11/05/20	00:00	RW	11/09/20	SO	Soil	B4 SOU
DA30338-4A	11/05/20	00:00	RW	11/09/20	SO	Soil	B4 SOU
DA30338-5	11/05/20	00:00	RW	11/09/20	SO	Soil	B4 EOU
DA30338-5A	11/05/20	00:00	RW	11/09/20	SO	Soil	B4 EOU

Soil samples reported on a dry weight basis unless otherwise indicated on result page.

## CASE NARRATIVE / CONFORMANCE SUMMARY

2

**Client:** Alfred Ward & Son

**Job No:** DA30338

**Site:** Blomenkamp Lease

**Report Date** 11/16/2020 5:14:03 P

On 11/09/2020, 5 sample(s), 0 Trip Blank(s), and 0 Field Blank(s) were received at SGS North America Inc. (SGS) at a temperature of 17.3 °C. The samples were intact and properly preserved, unless noted below. An SGS Job Number of DA30338 was assigned to the project. The lab sample ID, client sample ID, and date of sample collection are detailed in the report's Results Summary.

Specified quality control criteria were achieved for this job except as noted below. For more information, please refer to the analytical results and QC summary pages.

### MS Volatiles By Method SW846 8260B

**Matrix:** SO

**Batch ID:** V5V2947

- All samples were analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA30250-1MS, DA30250-1MSD were used as the QC samples indicated.

### GC Volatiles By Method SW846 8015D

**Matrix:** SO

**Batch ID:** GGA2432

- All samples were analyzed within the recommended method holding time.
- Sample(s) DA30336-6MS, DA30336-6MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.

### GC/LC Semi-volatiles By Method SW846-8015D

**Matrix:** SO

**Batch ID:** OP19564

- All samples were extracted and analyzed within the recommended method holding time.
- Sample(s) DA30339-1MS, DA30339-1MSD were used as the QC samples indicated.
- All method blanks for this batch meet method specific criteria.
- The matrix spike (MS) recovery(s) of TPH-DRO (C10-C28) are outside control limits. Outside control limits due to high level in sample relative to spike amount.

### Metals Analysis By Method SW846 6010C

**Matrix:** AQ

**Batch ID:** MP31650

- All samples were digested and analyzed within the recommended method holding time.
- All method blanks for this batch meet method specific criteria.
- Sample(s) DA30338-3AMS, DA30338-3AMSD, DA30338-3ASDL were used as the QC samples for the metals analysis.

### General Chemistry By Method SM 2510B-2011 MOD

**Matrix:** SO

**Batch ID:** GP28030

- Sample(s) DA30375-4DUP were used as the QC samples for the Specific Conductivity analysis.

### General Chemistry By Method SM2540G-2011 M

**Matrix:** SO

**Batch ID:** GN51693

- Sample(s) DA30338-5DUP were used as the QC samples for the Solids, Percent analysis.

Monday, November 16, 2020

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## General Chemistry By Method SW846 9045D

**Matrix:** SO

**Batch ID:** GN51705

- The data for SW846 9045D meets quality control requirements.
- The following samples were run outside of holding time for method SW846 9045D: DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5
- DA30338-1 for pH: Field parameter analyzed by the laboratory upon request.
- DA30338-2 for pH: Field parameter analyzed by the laboratory upon request.
- DA30338-3 for pH: Field parameter analyzed by the laboratory upon request.
- DA30338-4 for pH: Field parameter analyzed by the laboratory upon request.
- DA30338-5 for pH: Field parameter analyzed by the laboratory upon request.

## General Chemistry By Method USDA HANDBOOK 60

**Matrix:** SO

**Batch ID:** MP31650

- DA30338-1A for Sodium Adsorption Ratio: Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$
- DA30338-3A for Sodium Adsorption Ratio: Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$
- DA30338-5A for Sodium Adsorption Ratio: Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$
- DA30338-4A for Sodium Adsorption Ratio: Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$
- DA30338-2A for Sodium Adsorption Ratio: Calculated as:  $(\text{Na meq/L}) / \sqrt{[(\text{Ca meq/L}) + (\text{Mg meq/L})/2]}$

SGS certifies that data reported for samples received, listed on the associated custody chain or analytical task order, were produced to specifications meeting SGS's Quality System precision, accuracy and completeness objectives except as noted.

Estimated non-standard method measurement uncertainty data is available on request, based on quality control bias and implicit for standard methods. Acceptable uncertainty requires tested parameter quality control data to meet method criteria.

SGS is not responsible for data quality assumptions if partial reports are used and recommends that this report be used in its entirety. This report is authorized by SGS indicated via signature on the report cover.

## Summary of Hits

Job Number: DA30338  
 Account: Alfred Ward & Son  
 Project: Blomenkamp Lease  
 Collected: 11/05/20

Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
DA30338-1	B4 FTB					
TPH-DRO (C10-C28)		1190	120	110	mg/kg	SW846-8015D
Specific Conductivity		2680	1.0		umhos/cm	SM 2510B-2011 MOD
pH <sup>a</sup>		8.78			su	SW846 9045D
DA30338-1A	B4 FTB					
Calcium		246	2.0		mg/l	SW846 6010C
Magnesium		108	1.0		mg/l	SW846 6010C
Sodium		257	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio <sup>b</sup>		3.44			ratio	USDA HANDBOOK 60
DA30338-2	B4 FTS					
TPH-DRO (C10-C28)		1050	110	100	mg/kg	SW846-8015D
Specific Conductivity		1610	1.0		umhos/cm	SM 2510B-2011 MOD
pH <sup>a</sup>		9.10			su	SW846 9045D
DA30338-2A	B4 FTS					
Calcium		176	2.0		mg/l	SW846 6010C
Magnesium		55.8	1.0		mg/l	SW846 6010C
Sodium		144	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio <sup>b</sup>		2.42			ratio	USDA HANDBOOK 60
DA30338-3	B4 WOU					
TPH-DRO (C10-C28)		11.7	11	11	mg/kg	SW846-8015D
Specific Conductivity		826	1.0		umhos/cm	SM 2510B-2011 MOD
pH <sup>a</sup>		8.92			su	SW846 9045D
DA30338-3A	B4 WOU					
Calcium		64.4	2.0		mg/l	SW846 6010C
Magnesium		18.7	1.0		mg/l	SW846 6010C
Sodium		77.1	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio <sup>b</sup>		2.17			ratio	USDA HANDBOOK 60
DA30338-4	B4 SOU					
TPH-DRO (C10-C28)		352	11	11	mg/kg	SW846-8015D
Specific Conductivity		427	1.0		umhos/cm	SM 2510B-2011 MOD
pH <sup>a</sup>		9.12			su	SW846 9045D

## Summary of Hits

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Job Number: DA30338  
Account: Alfred Ward & Son  
Project: Blomenkamp Lease  
Collected: 11/05/20



Lab Sample ID	Client Sample ID	Result/ Qual	RL	MDL	Units	Method
DA30338-4A	B4 SOU					
Calcium		43.8	2.0		mg/l	SW846 6010C
Magnesium		10.5	1.0		mg/l	SW846 6010C
Sodium		21.4	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio <sup>b</sup>		0.753			ratio	USDA HANDBOOK 60
DA30338-5	B4 EOU					
TPH-DRO (C10-C28)		93.0	12	11	mg/kg	SW846-8015D
Specific Conductivity		773	1.0		umhos/cm	SM 2510B-2011 MOD
pH <sup>a</sup>		8.86			su	SW846 9045D
DA30338-5A	B4 EOU					
Calcium		60.2	2.0		mg/l	SW846 6010C
Magnesium		16.9	1.0		mg/l	SW846 6010C
Sodium		72.0	2.0		mg/l	SW846 6010C
Sodium Adsorption Ratio <sup>b</sup>		2.11			ratio	USDA HANDBOOK 60

(a) Field parameter analyzed by the laboratory upon request.

(b) Calculated as: (Na meq/L) / sqrt [(Ca meq/L) + (Mg meq/L)/2]



Wheat Ridge, CO

Section 4

4

Sample Results

Report of Analysis



## Report of Analysis

Client Sample ID:	B4 FTB	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-1	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	85.7
Method:	SW846 8260B		
Project:	Blomenkamp Lease		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V57660.D	1	11/10/20 17:38	DC	n/a	n/a	V5V2947
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.08 g	5.0 ml
Run #2		

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.1	0.57	ug/kg	
108-88-3	Toluene	ND	2.3	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	2.3	0.57	ug/kg	
1330-20-7	Xylene (total)	ND	2.3	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		70-131%
2037-26-5	Toluene-D8	97%		70-130%
460-00-4	4-Bromofluorobenzene	102%		70-130%
17060-07-0	1,2-Dichloroethane-D4	104%		70-130%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	B4 FTB	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-1	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	85.7
Method:	SW846 8015D		
Project:	Blomenkamp Lease		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	GA53836.D	1	11/11/20 00:55	JB	n/a	n/a	GGA2432

Run #1	Initial Weight	Final Volume	Methanol Aliquot
Run #2	5.1 g	5.0 ml	100 ul

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	13	6.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	113%		60-140%		

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	B4 FTB	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-1	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	85.7
Method:	SW846-8015D SW846 3546		
Project:	Blomenkamp Lease		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH052506.D	10	11/12/20 20:53	NO	11/11/20	OP19564	GFP2122
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.0 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	1190	120	110	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	76%		25-141%		

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.1  
4

Report of Analysis

Client Sample ID:	B4 FTB	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-1	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	85.7
Project:	Blomenkamp Lease		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
%solids							
Solids, Percent	85.7		%	1	11/10/20	SR	SM2540G-2011 M
prep: DEPT.OF AG, BOOK N9							
Specific Conductivity	2680	1.0	umhos/cm	1	11/12/20	SR	SM 2510B-2011 MOD
pH <sup>a</sup>	8.78		su	1	11/11/20 15:00	SR	SW846 9045D

(a) Field parameter analyzed by the laboratory upon request.

RL = Reporting Limit

Report of Analysis

Client Sample ID: B4 FTB  
Lab Sample ID: DA30338-1A  
Matrix: SO - Soil  
Project: Blomenkamp Lease

Date Sampled: 11/05/20  
Date Received: 11/09/20  
Percent Solids: 85.7

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	246	2.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Magnesium	108	1.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Sodium	257	2.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>

(1) Instrument QC Batch: MA13323  
(2) Prep QC Batch: MP31650

RL = Reporting Limit

4.2  
4

Report of Analysis

Client Sample ID: B4 FTB  
Lab Sample ID: DA30338-1A  
Matrix: SO - Soil  
Project: Blomenkamp Lease

Date Sampled: 11/05/20  
Date Received: 11/09/20  
Percent Solids: 85.7

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	3.44		ratio	1	11/12/20 18:24	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

## Report of Analysis

Client Sample ID:	B4 FTS	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-2	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	92.5
Method:	SW846 8260B		
Project:	Blomenkamp Lease		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V57661.D	1	11/10/20 18:02	DC	n/a	n/a	V5V2947
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.00 g	5.0 ml
Run #2		

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.1	0.54	ug/kg	
108-88-3	Toluene	ND	2.2	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	2.2	0.54	ug/kg	
1330-20-7	Xylene (total)	ND	2.2	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	102%		70-131%
2037-26-5	Toluene-D8	99%		70-130%
460-00-4	4-Bromofluorobenzene	103%		70-130%
17060-07-0	1,2-Dichloroethane-D4	103%		70-130%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	B4 FTS	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-2	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	92.5
Method:	SW846 8015D		
Project:	Blomenkamp Lease		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	GA53837.D	1	11/11/20 01:31	JB	n/a	n/a	GGA2432

Run #1	Initial Weight	Final Volume	Methanol Aliquot
Run #2	5.2 g	5.0 ml	100 ul

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	11	5.7	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	96%		60-140%		

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.3  
4



Report of Analysis

Client Sample ID:	B4 FTS	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-2	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	92.5
Method:	SW846-8015D SW846 3546		
Project:	Blomenkamp Lease		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH052508.D	10	11/12/20 21:15	NO	11/11/20	OP19564	GFP2122
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	1050	110	100	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	77%		25-141%		

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
RL = Reporting Limit      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

4.3  
4

Report of Analysis

Client Sample ID:	B4 FTS	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-2	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	92.5
Project:	Blomenkamp Lease		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
%solids							
Solids, Percent	92.5		%	1	11/10/20	SR	SM2540G-2011 M
prep: DEPT.OF AG, BOOK N9							
Specific Conductivity	1610	1.0	umhos/cm	1	11/12/20	SR	SM 2510B-2011 MOD
pH <sup>a</sup>	9.10		su	1	11/11/20 15:00	SR	SW846 9045D

(a) Field parameter analyzed by the laboratory upon request.

RL = Reporting Limit

Report of Analysis

Client Sample ID: B4 FTS  
Lab Sample ID: DA30338-2A  
Matrix: SO - Soil  
Project: Blomenkamp Lease

Date Sampled: 11/05/20  
Date Received: 11/09/20  
Percent Solids: 92.5

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	176	2.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Magnesium	55.8	1.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Sodium	144	2.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>

(1) Instrument QC Batch: MA13323  
(2) Prep QC Batch: MP31650

RL = Reporting Limit

4.4  
4

Report of Analysis

Client Sample ID:	B4 FTS	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-2A	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	92.5
Project:	Blomenkamp Lease		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	2.42		ratio	1	11/12/20 18:30	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

## Report of Analysis

Client Sample ID:	B4 WOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-3	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	87.0
Method:	SW846 8260B		
Project:	Blomenkamp Lease		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V57662.D	1	11/10/20 18:25	DC	n/a	n/a	V5V2947
Run #2							

Run #	Initial Weight	Final Volume
Run #1	5.09 g	5.0 ml
Run #2		

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.1	0.56	ug/kg	
108-88-3	Toluene	ND	2.3	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	2.3	0.56	ug/kg	
1330-20-7	Xylene (total)	ND	2.3	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	107%		70-131%
2037-26-5	Toluene-D8	97%		70-130%
460-00-4	4-Bromofluorobenzene	101%		70-130%
17060-07-0	1,2-Dichloroethane-D4	107%		70-130%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	B4 WOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-3	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	87.0
Method:	SW846 8015D		
Project:	Blomenkamp Lease		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	GA53838.D	1	11/11/20 02:06	JB	n/a	n/a	GGA2432

Run #1	Initial Weight	Final Volume	Methanol Aliquot
Run #2	5.0 g	5.0 ml	100 ul

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	13	6.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	93%		60-140%		

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	B4 WOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-3	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	87.0
Method:	SW846-8015D SW846 3546		
Project:	Blomenkamp Lease		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	FH052510.D	1	11/12/20 21:37	NO	11/11/20	OP19564	GFP2122

Run #1	Initial Weight	Final Volume
Run #2	20.1 g	1.0 ml

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	11.7	11	11	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	64%		25-141%		

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

4.5  
4

Report of Analysis

Client Sample ID:	B4 WOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-3	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	87.0
Project:	Blomenkamp Lease		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
%solids							
Solids, Percent	87		%	1	11/10/20	SR	SM2540G-2011 M
prep: DEPT.OF AG, BOOK N9							
Specific Conductivity	826	1.0	umhos/cm	1	11/12/20	SR	SM 2510B-2011 MOD
pH <sup>a</sup>	8.92		su	1	11/11/20 15:00	SR	SW846 9045D

(a) Field parameter analyzed by the laboratory upon request.

RL = Reporting Limit



Report of Analysis

Client Sample ID:	B4 WOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-3A	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	87.0
Project:	Blomenkamp Lease		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	64.4	2.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Magnesium	18.7	1.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Sodium	77.1	2.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>

- (1) Instrument QC Batch: MA13323  
(2) Prep QC Batch: MP31650

RL = Reporting Limit

Report of Analysis

Client Sample ID:	B4 WOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-3A	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	87.0
Project:	Blomenkamp Lease		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	2.17		ratio	1	11/12/20 18:00	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

## Report of Analysis

Client Sample ID:	B4 SOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-4	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	86.8
Method:	SW846 8260B		
Project:	Blomenkamp Lease		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V57663.D	1	11/10/20 18:48	DC	n/a	n/a	V5V2947
Run #2							

	Initial Weight	Final Volume
Run #1	5.08 g	5.0 ml
Run #2		

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.1	0.57	ug/kg	
108-88-3	Toluene	ND	2.3	1.1	ug/kg	
100-41-4	Ethylbenzene	ND	2.3	0.57	ug/kg	
1330-20-7	Xylene (total)	ND	2.3	1.1	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		70-131%
2037-26-5	Toluene-D8	97%		70-130%
460-00-4	4-Bromofluorobenzene	99%		70-130%
17060-07-0	1,2-Dichloroethane-D4	100%		70-130%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

## Report of Analysis

Page 1 of 1

Client Sample ID:	B4 SOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-4	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	86.8
Method:	SW846 8015D		
Project:	Blomenkamp Lease		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	GA53839.D	1	11/11/20 02:42	JB	n/a	n/a	GGA2432
Run #2							

Run #	Initial Weight	Final Volume	Methanol Aliquot
Run #1	5.0 g	5.0 ml	100 ul
Run #2			

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	13	6.5	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	70%		60-140%		

ND = Not detected      MDL = Method Detection Limit  
 RL = Reporting Limit  
 E = Indicates value exceeds calibration range

J = Indicates an estimated value  
 B = Indicates analyte found in associated method blank  
 N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	B4 SOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-4	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	86.8
Method:	SW846-8015D SW846 3546		
Project:	Blomenkamp Lease		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH052512.D	1	11/12/20 21:59	NO	11/11/20	OP19564	GFP2122
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	352	11	11	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	71%		25-141%		

ND = Not detected      MDL = Method Detection Limit      J = Indicates an estimated value  
RL = Reporting Limit      B = Indicates analyte found in associated method blank  
E = Indicates value exceeds calibration range      N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	B4 SOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-4	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	86.8
Project:	Blomenkamp Lease		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
%solids							
Solids, Percent	86.8		%	1	11/10/20	SR	SM2540G-2011 M
prep: DEPT.OF AG, BOOK N9							
Specific Conductivity	427	1.0	umhos/cm	1	11/12/20	SR	SM 2510B-2011 MOD
pH <sup>a</sup>	9.12		su	1	11/11/20 15:00	SR	SW846 9045D

(a) Field parameter analyzed by the laboratory upon request.

RL = Reporting Limit

4.7  
4

Report of Analysis

Client Sample ID:	B4 SOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-4A	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	86.8
Project:	Blomenkamp Lease		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	43.8	2.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Magnesium	10.5	1.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Sodium	21.4	2.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>

- (1) Instrument QC Batch: MA13323  
(2) Prep QC Batch: MP31650

RL = Reporting Limit

Report of Analysis

Client Sample ID:	B4 SOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-4A	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	86.8
Project:	Blomenkamp Lease		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	0.753		ratio	1	11/12/20 18:36	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit



## Report of Analysis

Client Sample ID:	B4 EOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-5	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	85.1
Method:	SW846 8260B		
Project:	Blomenkamp Lease		

	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	5V57664.D	1	11/10/20 19:12	DC	n/a	n/a	V5V2947
Run #2							

	Initial Weight	Final Volume
Run #1	5.06 g	5.0 ml
Run #2		

## Purgeable Aromatics

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.2	0.58	ug/kg	
108-88-3	Toluene	ND	2.3	1.2	ug/kg	
100-41-4	Ethylbenzene	ND	2.3	0.58	ug/kg	
1330-20-7	Xylene (total)	ND	2.3	1.2	ug/kg	

CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits
1868-53-7	Dibromofluoromethane	105%		70-131%
2037-26-5	Toluene-D8	98%		70-130%
460-00-4	4-Bromofluorobenzene	102%		70-130%
17060-07-0	1,2-Dichloroethane-D4	103%		70-130%

ND = Not detected MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	B4 EOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-5	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	85.1
Method:	SW846 8015D		
Project:	Blomenkamp Lease		

Run #1	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #2	GA53840.D	1	11/11/20 03:18	JB	n/a	n/a	GGA2432

Run #1	Initial Weight	Final Volume	Methanol Aliquot
Run #2	5.0 g	5.0 ml	100 ul

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	14	6.8	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
120-82-1	1,2,4-Trichlorobenzene	84%		60-140%		

ND = Not detected

MDL = Method Detection Limit

J = Indicates an estimated value

RL = Reporting Limit

B = Indicates analyte found in associated method blank

E = Indicates value exceeds calibration range

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	B4 EOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-5	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	85.1
Method:	SW846-8015D SW846 3546		
Project:	Blomenkamp Lease		

Run #	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
Run #1	FH052514.D	1	11/12/20 22:21	NO	11/11/20	OP19564	GFP2122
Run #2							

Run #	Initial Weight	Final Volume
Run #1	20.1 g	1.0 ml
Run #2		

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	93.0	12	11	mg/kg	
CAS No.	Surrogate Recoveries	Run# 1	Run# 2	Limits		
84-15-1	o-Terphenyl	81%		25-141%		

ND = Not detected

MDL = Method Detection Limit

RL = Reporting Limit

E = Indicates value exceeds calibration range

J = Indicates an estimated value

B = Indicates analyte found in associated method blank

N = Indicates presumptive evidence of a compound

Report of Analysis

Client Sample ID:	B4 EOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-5	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	85.1
Project:	Blomenkamp Lease		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
%solids							
Solids, Percent	85.1		%	1	11/10/20	SR	SM2540G-2011 M
prep: DEPT.OF AG, BOOK N9							
Specific Conductivity	773	1.0	umhos/cm	1	11/12/20	SR	SM 2510B-2011 MOD
pH <sup>a</sup>	8.86		su	1	11/11/20 15:00	SR	SW846 9045D

(a) Field parameter analyzed by the laboratory upon request.

RL = Reporting Limit

Report of Analysis

Client Sample ID:	B4 EOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-5A	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	85.1
Project:	Blomenkamp Lease		

SAR Metals Analysis

Analyte	Result	RL	Units	DF	Prep	Analyzed By	Method	Prep Method
Calcium	60.2	2.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Magnesium	16.9	1.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>
Sodium	72.0	2.0	mg/l	1	11/11/20	11/12/20 JM	SW846 6010C <sup>1</sup>	SW846 3010A/M <sup>2</sup>

(1) Instrument QC Batch: MA13323

(2) Prep QC Batch: MP31650

RL = Reporting Limit

Report of Analysis

Client Sample ID:	B4 EOU	Date Sampled:	11/05/20
Lab Sample ID:	DA30338-5A	Date Received:	11/09/20
Matrix:	SO - Soil	Percent Solids:	85.1
Project:	Blomenkamp Lease		

General Chemistry

Analyte	Result	RL	Units	DF	Analyzed	By	Method
Sodium Adsorption Ratio <sup>a</sup>	2.11		ratio	1	11/12/20 18:42	JM	USDA HANDBOOK 60

(a) Calculated as: (Na meq/L) / sqrt [(Ca meq/L)+ (Mg meq/L)/2]

RL = Reporting Limit

4.10  
4

**Misc. Forms**

5

**Custody Documents and Other Forms**

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**Includes the following where applicable:**

- Chain of Custody





# SGS Sample Receipt Summary

**Job Number:** DA30338      **Client:** ALFRED WARD & SON      **Project:** BLOMENCAMP 4  
**Date / Time Received:** 11/9/2020 10:00:00 AM      **Delivery Method:**      **Airbill #'s:** FX  
**Cooler Temps (Initial/Adjusted):** #1: (17.3/17.3):

**Cooler Security**      Y or N      Y or N  
 1. Custody Seals Present: ☒ ☐      3. COC Present: ☒ ☐  
 2. Custody Seals Intact: ☒ ☐      4. Smpl Dates/Time OK ☒ ☐

**Cooler Temperature**      Y or N  
 1. Temp criteria achieved: ☐ ☒  
 2. Cooler temp verification: IR Gun  
 3. Cooler media: No Ice  
 4. No. Coolers: 1

**Quality Control Preservation**      Y      N      N/A  
 1. Trip Blank present / cooler: ☐ ☐ ☒  
 2. Trip Blank listed on COC: ☐ ☐ ☒  
 3. Samples preserved properly: ☒ ☐  
 4. VOCs headspace free: ☐ ☐ ☒

**Sample Integrity - Documentation**      Y or N  
 1. Sample labels present on bottles: ☒ ☐  
 2. Container labeling complete: ☒ ☐  
 3. Sample container label / COC agree: ☒ ☐

**Sample Integrity - Condition**      Y or N  
 1. Sample recvd within HT: ☒ ☐  
 2. All containers accounted for: ☒ ☐  
 3. Condition of sample: Intact

**Sample Integrity - Instructions**      Y      N      N/A  
 1. Analysis requested is clear: ☒ ☐  
 2. Bottles received for unspecified tests: ☐ ☒  
 3. Sufficient volume recvd for analysis: ☒ ☐  
 4. Compositing instructions clear: ☐ ☐ ☒  
 5. Filtering instructions clear: ☐ ☐ ☒

**Comments**      Samples received warm at 17.3C, no ice used. Samples 2 through 5 do not have a collection date on the COC.

## Sample Receipt Summary - Problem Resolution

**Job Number:** DA30338

**Initiator:** SZ

**CSR:** Lizz Sutcliffe

**Response Date:** 11/16/2020

**Response:** Per client all samples were collected on 11/5/2020. Analyze samples deposite receipt at warm temperature.

5.1

5

**DA30338: Chain of Custody**

**Page 3 of 3**

**MS Volatiles****QC Data Summaries**

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**Includes the following where applicable:**

- **Method Blank Summaries**
- **Blank Spike Summaries**
- **Matrix Spike and Duplicate Summaries**

## Method Blank Summary

Page 1 of 1

Job Number: DA30338  
Account: ALFWSNEO Alfred Ward & Son  
Project: Blomenkamp Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V2947-MB	5V57644.D	1	11/10/20	DC	n/a	n/a	V5V2947

The QC reported here applies to the following samples:

Method: SW846 8260B

DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	50	25	ug/kg	
100-41-4	Ethylbenzene	ND	100	25	ug/kg	
108-88-3	Toluene	ND	100	50	ug/kg	
1330-20-7	Xylene (total)	ND	100	50	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	97% 70-131%
2037-26-5	Toluene-D8	97% 70-130%
460-00-4	4-Bromofluorobenzene	102% 70-130%
17060-07-0	1,2-Dichloroethane-D4	97% 70-130%

Method Blank Summary

Job Number: DA30338  
Account: ALFWSNEO Alfred Ward & Son  
Project: Blumenkamp Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V2947-MB	5V57645.D	1	11/10/20	DC	n/a	n/a	V5V2947

The QC reported here applies to the following samples: Method: SW846 8260B

DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5

CAS No.	Compound	Result	RL	MDL	Units	Q
71-43-2	Benzene	ND	1.0	0.50	ug/kg	
100-41-4	Ethylbenzene	ND	2.0	0.50	ug/kg	
108-88-3	Toluene	ND	2.0	1.0	ug/kg	
1330-20-7	Xylene (total)	ND	2.0	1.0	ug/kg	

CAS No.	Surrogate Recoveries	Limits
1868-53-7	Dibromofluoromethane	99% 70-131%
2037-26-5	Toluene-D8	97% 70-130%
460-00-4	4-Bromofluorobenzene	100% 70-130%
17060-07-0	1,2-Dichloroethane-D4	99% 70-130%

Blank Spike Summary

Job Number: DA30338  
Account: ALFWSNEO Alfred Ward & Son  
Project: Blomenkamp Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
V5V2947-BS	5V57642.D	1	11/10/20	DC	n/a	n/a	V5V2947

The QC reported here applies to the following samples: Method: SW846 8260B

DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5

CAS No.	Compound	Spike ug/kg	BSP ug/kg	BSP %	Limits
71-43-2	Benzene	50	44.9	90	68-130
100-41-4	Ethylbenzene	50	46.7	93	69-130
108-88-3	Toluene	50	45.0	90	65-130
1330-20-7	Xylene (total)	150	138	92	69-130

CAS No.	Surrogate Recoveries	BSP	Limits
1868-53-7	Dibromofluoromethane	100%	70-131%
2037-26-5	Toluene-D8	99%	70-130%
460-00-4	4-Bromofluorobenzene	100%	70-130%
17060-07-0	1,2-Dichloroethane-D4	98%	70-130%

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA30338  
Account: ALFWSNEO Alfred Ward & Son  
Project: Blumenkamp Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA30250-1MS	5V57647.D	1	11/10/20	DC	n/a	n/a	V5V2947
DA30250-1MSD	5V57648.D	1	11/10/20	DC	n/a	n/a	V5V2947
DA30250-1	5V57646.D	1	11/10/20	DC	n/a	n/a	V5V2947

The QC reported here applies to the following samples: Method: SW846 8260B

DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5

CAS No.	Compound	DA30250-1 ug/kg	Spike Q ug/kg	MS ug/kg	MS %	Spike ug/kg	MSD ug/kg	MSD %	RPD	Limits Rec/RPD
71-43-2	Benzene	ND	61.1	43.3	71	61	47.0	77	8	48-130/30
100-41-4	Ethylbenzene	ND	61.1	43.5	71	61	47.2	77	8	25-144/30
108-88-3	Toluene	ND	61.1	43.0	70	61	46.3	76	7	34-130/30
1330-20-7	Xylene (total)	ND	183	131	71	183	143	78	9	24-143/30

CAS No.	Surrogate Recoveries	MS	MSD	DA30250-1	Limits
1868-53-7	Dibromofluoromethane	103%	102%	102%	70-131%
2037-26-5	Toluene-D8	98%	98%	97%	70-130%
460-00-4	4-Bromofluorobenzene	101%	102%	101%	70-130%
17060-07-0	1,2-Dichloroethane-D4	102%	103%	104%	70-130%

\* = Outside of Control Limits.

**GC Volatiles****QC Data Summaries**

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**Includes the following where applicable:**

- **Method Blank Summaries**
- **Blank Spike Summaries**
- **Matrix Spike and Duplicate Summaries**



Method Blank Summary

Job Number: DA30338  
Account: ALFWSNEO Alfred Ward & Son  
Project: Blomenkamp Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA2432-MB	GA53824.D	1	11/10/20	JB	n/a	n/a	GGA2432

The QC reported here applies to the following samples: Method: SW846 8015D  
DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	9.9	5.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	91% 60-140%

Method Blank Summary

Job Number: DA30338  
Account: ALFWSNEO Alfred Ward & Son  
Project: Blumenkamp Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA2432-MB	GA53825.D	1	11/10/20	JB	n/a	n/a	GGA2432

The QC reported here applies to the following samples: Method: SW846 8015D  
DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-GRO (C6-C10)	ND	10	5.0	mg/kg	

CAS No.	Surrogate Recoveries	Limits
120-82-1	1,2,4-Trichlorobenzene	91% 60-140%

Blank Spike Summary

Job Number: DA30338  
Account: ALFWSNEO Alfred Ward & Son  
Project: Blomenkamp Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
GGA2432-BS	GA53823.D	1	11/10/20	JB	n/a	n/a	GGA2432

The QC reported here applies to the following samples: Method: SW846 8015D

DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-GRO (C6-C10)	109	93.4	86	54-139

CAS No.	Surrogate Recoveries	BSP	Limits
120-82-1	1,2,4-Trichlorobenzene	86%	60-140%

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA30338  
Account: ALFWSNEO Alfred Ward & Son  
Project: Blumenkamp Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
DA30336-6MS	GA53827.D	1	11/10/20	JB	n/a	n/a	GGA2432
DA30336-6MSD	GA53828.D	1	11/10/20	JB	n/a	n/a	GGA2432
DA30336-6	GA53826.D	1	11/10/20	JB	n/a	n/a	GGA2432

The QC reported here applies to the following samples: Method: SW846 8015D

DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5

CAS No.	Compound	DA30336-6 mg/kg	Spike Q mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-GRO (C6-C10)	239	180	361	68	180	403	91	11	36-145/30

CAS No.	Surrogate Recoveries	MS	MSD	DA30336-6	Limits
120-82-1	1,2,4-Trichlorobenzene	105%	102%	105%	60-140%

\* = Outside of Control Limits.

**GC/LC Semi-volatiles****QC Data Summaries**

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**Includes the following where applicable:**

- **Method Blank Summaries**
- **Blank Spike Summaries**
- **Matrix Spike and Duplicate Summaries**

Method Blank Summary

Job Number: DA30338  
Account: ALFWSNEO Alfred Ward & Son  
Project: Blomenkamp Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP19564-MB	FH052492.D	1	11/12/20	NO	11/11/20	OP19564	GFP2122

The QC reported here applies to the following samples: Method: SW846-8015D  
DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5

CAS No.	Compound	Result	RL	MDL	Units	Q
	TPH-DRO (C10-C28)	ND	10	9.5	mg/kg	

CAS No.	Surrogate Recoveries	Limits
84-15-1	o-Terphenyl	86% 25-141%

Blank Spike Summary

Job Number: DA30338  
Account: ALFWSNEO Alfred Ward & Son  
Project: Blomenkamp Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP19564-BS	FH052494.D	1	11/12/20	NO	11/11/20	OP19564	GFP2122

The QC reported here applies to the following samples: Method: SW846-8015D

DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5

CAS No.	Compound	Spike mg/kg	BSP mg/kg	BSP %	Limits
	TPH-DRO (C10-C28)	250	156	62	49-130

CAS No.	Surrogate Recoveries	BSP	Limits
84-15-1	o-Terphenyl	76%	25-141%

\* = Outside of Control Limits.

Matrix Spike/Matrix Spike Duplicate Summary

Job Number: DA30338  
Account: ALFWSNEO Alfred Ward & Son  
Project: Blumenkamp Lease

Sample	File ID	DF	Analyzed	By	Prep Date	Prep Batch	Analytical Batch
OP19564-MS	FH052496.D	10	11/12/20	NO	11/11/20	OP19564	GFP2122
OP19564-MSD	FH052498.D	10	11/12/20	NO	11/11/20	OP19564	GFP2122
DA30339-1	FH052502.D	10	11/12/20	NO	11/11/20	OP19564	GFP2122

The QC reported here applies to the following samples: Method: SW846-8015D

DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5

CAS No.	Compound	DA30339-1 mg/kg	Spike mg/kg	MS mg/kg	MS %	Spike mg/kg	MSD mg/kg	MSD %	RPD	Limits Rec/RPD
	TPH-DRO (C10-C28)	2100	279	2660	201* a	279	2440	122	9	10-149/30

CAS No.	Surrogate Recoveries	MS	MSD	DA30339-1	Limits
84-15-1	o-Terphenyl	79%	72%	72%	25-141%

(a) Outside control limits due to high level in sample relative to spike amount.

\* = Outside of Control Limits.



## Metals Analysis

### QC Data Summaries

Includes the following where applicable:

- Method Blank Summaries
- Matrix Spike and Duplicate Summaries
- Blank Spike and Lab Control Sample Summaries
- Serial Dilution Summaries

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: DA30338  
Account: ALFWSNEO - Alfred Ward & Son  
Project: Blumenkamp Lease

QC Batch ID: MP31650  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 11/11/20

Metal	RL	IDL	MDL	MB raw	final
Aluminum	500	55	75		
Antimony	150	11	34		
Arsenic	130	19	23		
Barium	50	1	6.5		
Beryllium	50	4.5	6.5		
Boron	250	4	32		
Cadmium	50	1	6.5		
Calcium	2000	12	250	-24	<2000
Chromium	50	1.5	6.5		
Cobalt	25	2.5	3.2		
Copper	50	4	6.5		
Iron	350	7.5	60		
Lead	250	11	32		
Lithium	25	2	6.5		
Magnesium	1000	34	130	97.0	<1000
Manganese	25	2.5	3.2		
Molybdenum	50	2	14		
Nickel	150	2.5	19		
Phosphorus	500	75	80		
Potassium	5000	500	630		
Selenium	250	36	110		
Silicon	250	24	75		
Silver	150	1.5	19		
Sodium	2000	37	250	117	<2000
Strontium	25	.05	3.2		
Thallium	50	9	22		
Tin	300	60	260		
Titanium	50	.5	6.5		
Uranium	250	15	43		
Vanadium	50	2	6.5		
Zinc	150	2	19		

Associated samples MP31650: DA30338-1A, DA30338-2A, DA30338-3A, DA30338-4A, DA30338-5A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits

BLANK RESULTS SUMMARY  
Part 2 - Method Blanks

Login Number: DA30338  
Account: ALFWSNEO - Alfred Ward & Son  
Project: Blumenkamp Lease

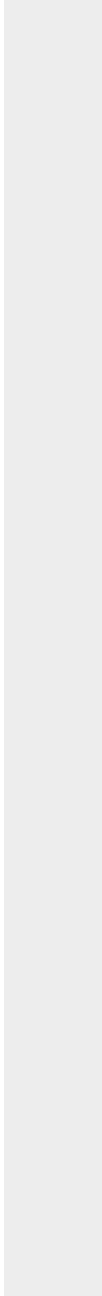
QC Batch ID: MP31650  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 11/11/20

Metal	RL	IDL	MDL	MB raw	final
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(anr) Analyte not requested



MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA30338  
 Account: ALFWSNEO - Alfred Ward & Son  
 Project: Blumenkamp Lease

QC Batch ID: MP31650  
 Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
 Units: ug/l

Prep Date: 11/11/20

Metal	DA30338-3A Original MS		Spikelot ICPAL2	% Rec	QC Limits
Aluminum					
Antimony					
Arsenic					
Barium					
Beryllium					
Boron					
Cadmium					
Calcium	64400	192000	125000	102.1	75-125
Chromium					
Cobalt					
Copper					
Iron					
Lead					
Lithium					
Magnesium	18700	140000	125000	97.0	75-125
Manganese					
Molybdenum					
Nickel					
Phosphorus					
Potassium					
Selenium					
Silicon					
Silver					
Sodium	77100	205000	125000	102.3	75-125
Strontium					
Thallium					
Tin					
Titanium					
Uranium					
Vanadium					
Zinc					

Associated samples MP31650: DA30338-1A, DA30338-2A, DA30338-3A, DA30338-4A, DA30338-5A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits

Login Number: DA30338  
Account: ALFWSNEO - Alfred Ward & Son  
Project: Blumenkamp Lease

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Metal	DA30338-3A Original MS	Spikelot ICPALL2 % Rec	QC Limits
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MATRIX SPIKE AND DUPLICATE RESULTS SUMMARY

Login Number: DA30338  
 Account: ALFWSNEO - Alfred Ward & Son  
 Project: Blumenkamp Lease

QC Batch ID: MP31650  
 Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
 Units: ug/l

Prep Date: 11/11/20

Metal	DA30338-3A Original MSD		Spikelot ICPALL2 % Rec		MSD RPD	QC Limit
Aluminum						
Antimony						
Arsenic						
Barium						
Beryllium						
Boron						
Cadmium						
Calcium	64400	184000	125000	95.7	4.3	20
Chromium						
Cobalt						
Copper						
Iron						
Lead						
Lithium						
Magnesium	18700	138000	125000	95.4	1.4	20
Manganese						
Molybdenum						
Nickel						
Phosphorus						
Potassium						
Selenium						
Silicon						
Silver						
Sodium	77100	195000	125000	94.3	5.0	20
Strontium						
Thallium						
Tin						
Titanium						
Uranium						
Vanadium						
Zinc						

Associated samples MP31650: DA30338-1A, DA30338-2A, DA30338-3A, DA30338-4A, DA30338-5A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits

Login Number: DA30338  
Account: ALFWSNEO - Alfred Ward & Son  
Project: Blomenkamp Lease

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

11/11/20

	DA30338-3A	Spikelot	MSD	QC
Metal	Original MSD	ICPALL2 % Rec	RPD	Limit

(N) Matrix Spike Rec. outside of QC limits  
(anr) Analyte not requested

Login Number: DA30338  
Account: ALFWSNEO - Alfred Ward & Son  
Project: Blumenkamp Lease

Prep Date: 11/11/20

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	120000	125000	96.0	80-120
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	120000	125000	96.0	80-120
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	124000	125000	99.2	80-120
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP31650: DA30338-1A, DA30338-2A, DA30338-3A, DA30338-4A, DA30338-5A

Results < IDL are shown as zero for calculation purposes  
(\*) Outside of QC limits



## SPIKE BLANK AND LAB CONTROL SAMPLE SUMMARY

Login Number: DA30338

Account: ALFWSNEO - Alfred Ward & Son

Project: Blumenkamp Lease

QC Batch ID: MP31650

Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60

Units: ug/l

Prep Date:

11/11/20

Metal	BSP Result	Spikelot ICPALL2	% Rec	QC Limits
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(anr) Analyte not requested

SERIAL DILUTION RESULTS SUMMARY

Login Number: DA30338  
 Account: ALFWSNEO - Alfred Ward & Son  
 Project: Blumenkamp Lease

QC Batch ID: MP31650  
 Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
 Units: ug/l

Prep Date: 11/11/20

DA30338-3A			QC	
Metal	Original	SDL 1:5	%DIF	Limits
Aluminum				
Antimony				
Arsenic				
Barium				
Beryllium				
Boron				
Cadmium				
Calcium	12900	12300	4.2	0-10
Chromium				
Cobalt				
Copper				
Iron				
Lead				
Lithium				
Magnesium	3740	3710	0.9	0-10
Manganese				
Molybdenum				
Nickel				
Phosphorus				
Potassium				
Selenium				
Silicon				
Silver				
Sodium	15400	15100	1.8	0-10
Strontium				
Thallium				
Tin				
Titanium				
Uranium				
Vanadium				
Zinc				

Associated samples MP31650: DA30338-1A, DA30338-2A, DA30338-3A, DA30338-4A, DA30338-5A

Results < IDL are shown as zero for calculation purposes  
 (\*) Outside of QC limits

SERIAL DILUTION RESULTS SUMMARY

Login Number: DA30338  
Account: ALFWSNEO - Alfred Ward & Son  
Project: Blumenkamp Lease

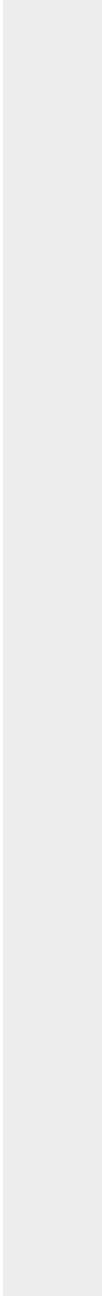
QC Batch ID: MP31650  
Matrix Type: AQUEOUS

Methods: SW846 6010C, USDA HANDBOOK 60  
Units: ug/l

Prep Date: 11/11/20

	DA30338-3A		QC
Metal	Original SDL 1:5	%DIF	Limits

(anr) Analyte not requested



## General Chemistry

### QC Data Summaries

Includes the following where applicable:

- Method Blank and Blank Spike Summaries
- Duplicate Summaries
- Matrix Spike Summaries

METHOD BLANK AND SPIKE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: DA30338  
Account: ALFWSNEO - Alfred Ward & Son  
Project: Blumenkamp Lease

Analyte	Batch ID	RL	MB Result	Units	Spike Amount	BSP Result	BSP %Recov	QC Limits
Specific Conductivity	GP28030/GN51712			umhos/cm	xxxxxxx	1000	100.5	90-110%

Associated Samples:  
Batch GP28030: DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5  
(\*) Outside of QC limits

DUPLICATE RESULTS SUMMARY  
GENERAL CHEMISTRY

Login Number: DA30338  
Account: ALFWSNEO - Alfred Ward & Son  
Project: Blumenkamp Lease

Analyte	Batch ID	QC Sample	Units	Original Result	DUP Result	RPD	QC Limits
Solids, Percent	GN51693	DA30338-5	%	85.1	88	3.4	0-10%
Specific Conductivity	GP28030/GN51712	DA30375-4	umhos/cm	1100	1100	0.4	0-20%

Associated Samples:  
Batch GN51693: DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5  
Batch GP28030: DA30338-1, DA30338-2, DA30338-3, DA30338-4, DA30338-5  
(\*) Outside of QC limits