



Alaska Department of Environmental Conservation  
**Division of Water**



# Module 6B

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## Seafood Wastewater Testing

**2012 SEAFOOD PROCESSING WASTE PERMITTING & COMPLIANCE WORKSHOP**

Seattle, Washington April 24-25, 2012

# Module 6B

MODULE 6



## Outfall & Receiving Water Monitoring

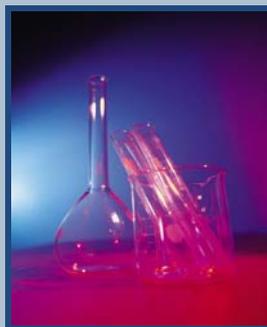
Elizabeth Rensch, Principal  
The Analytica Group



# Analytica Group

## Environmental Laboratories

### Seafood Processors Waste Water Monitoring Workshop



“We Take The **Red Tape** OUT of Your Water”

# Welcome !

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## Alaska Seafood Processors



# Today's Agenda

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## Outfall & Receiving Water Monitoring

- ADEC Certified Lab - Test Methods - Sampling Techniques
  - BOD, TSS, Oil & Grease
  - Fecal Coliform Bacteria, Enterococci Bacteria
- Field Test Methods - Sampling Techniques
  - pH, Total Residual Chlorine, Temperature, Color, Dissolved Oxygen, Salinity.
- Working Effectively with Analytica – Some Basic Stuff....



# Our Company History

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## Milestones.....

- 1984 - Opened Corporate Headquarters in Denver
- 1992 - Opened 1<sup>st</sup> Alaska Facility in Anchorage
- 2003 - Acquired NTL, Expanded to 4 Alaska Facilities
- 2004 – Became Largest Certified WQ Lab in Alaska
- 2009 - Opened Mat-Su Service Center in Wasilla
- 2012 - 20<sup>th</sup> Anniversary





# Our Locations

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Three ALASKA  
SERVICE  
CENTERS



# State of Alaska Certifications

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- Our ADEC Accredited laboratories provide full service testing for Drinking Water and Wastewater.





# Our Clients

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- Public Water Systems
- Industrial Facilities WWTP
- Commercial Well Clients
  - Well Drilling Contractors
- Private Well Clients
- Water Quality Engineering Firms
  - Watershed Surveys
  - Baseline Studies
  - Treatment Design
- Federal, Municipal, & State Agencies.
- Oil & Gas
- Fisheries, Timber, Mining.
- Tourism, Lodges, Hotels, Cruise Ships

# Our Expertise



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**We specialize in Drinking Water &  
Wastewater Compliance  
Monitoring Regulations.**



# Our Dramatic Difference

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- “WE TAKE THE **RED TAPE** OUT OF YOUR WATER”
  - Save Time
  - Ease Your Mind
  - Reduce Your Risk



# Methods, Sampling Techniques

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- Effluent Outfall 001, 002, 003 & Receiving Waters
- **BOD5** - Method 5210B – Biochemical Oxygen Demand – 5 Day
- **TSS** – Method 2540D – Total Suspended Solids
- **Oil & Grease** - Method 1664 - vegetable oils, animal fats, lubricants and synthetic oils (e.g. hydraulic oil)
- **Fecal Coliform** - Method 9222D
- **Enterococci Bacteria** - Method ASTM D 6503-99

# Primary Reasons for Rejection of Your Sample

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Following are the primary reasons why we are required (by ADEC and EPA regulation) to reject your sample:

- **Hold Time**
  - BOD – 48 Hours
  - TSS – 7 Days
  - Oil & Grease – 28 Days
  - Fecal Coliform and Enterococci - 6 Hours
- **Temperature**
  - Between 0-6 degrees Celsius - not frozen
- **Insufficient sample volume**
- **Broken container, leaking samples**



# POP QUIZ !!

Name 3 Reasons why an ADEC Certified lab is required to reject your Sample?

# Test Method and Sampling Techniques



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## **BOD 5 - Method 5210B** – Biochemical Oxygen Demand

- Measure the impact of the waste on the oxygen content of the receiving water body. (marine water for example). Hold Time is 48 hours.

## **TSS – Method 2540D**

- Measures the total solid materials suspended in water. High concentrations of solids can lower water quality and harm aquatic life. Hold Time is 7 Days.

# Test Method and Sampling Techniques



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## Sampling Supplies and Technique – BOD & TSS

- 1 Liter Plastic Bottle – No Preservative – You will fill one bottle for both BOD and TSS tests.
- Wear clean gloves, do not touch inside of lid.
- Sample directly from designated effluent sampling location.
- Fill bottle to shoulder.
- Complete the Chain of Custody (COC).
- Ship immediately in cooler to the lab.

# Test Method and Sampling Techniques



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**Oil & Grease – Method 1664** - vegetable oils, animal fats, lubricants and synthetic oils (e.g. hydraulic oil)

- Measures the total amount of oils, animal fats, lubricants and synthetic oils in a seafood processing waste discharge. Hold Time is 28 days.

## Sampling Supplies and Technique – Oil & Grease 1664

- 1 Liter Amber Glass Bottle – Sulfuric Acid Preserved.
- You will fill one bottle for each Oil & Grease 1664 test.
- Wear clean gloves, do not touch inside of lid.
- Sample directly from designated effluent sampling location.
- Fill bottle to shoulder.
- Complete the COC.
- Ship immediately in cooler to the lab.



# Test Methods and Sampling Techniques

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- **Fecal Coliform - Method 9222D**
- **Enterococci Bacteria Method ASTM D 6503-99**

Fecal Coliform Bacteria and Enterococci Bacteria come from feces of warm blooded animals, including human. The presence of such bacteria can indicate a water source contaminated with human or animal wastes. Microbes in these wastes can cause short term and long term health effects. The hold time for both tests is 6 Hours. MPN results shall not exceed 14 bacteria/100/ml.



# Test Methods and Sampling Techniques

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## Sampling Supplies and Technique – Fecal Coliform and Enterococci

- 1 – (150 ml) STERILE Plastic Bottle for each Fecal and Enterococci sample.
  - Preserved with Sodium Thiosulfate.
- Wear clean gloves; do not rinse bottle or touch inside cap or bottle.
- Sample after the treatment system.
- Remove plastic seal and cap from bottle.
- Use moderate water flow-fill to slightly over the 100 ml mark, avoid splashing.
- ID and label all samples, Complete the COC.
- Pack, chill and ship the samples “overnight” to Analytica ASAP.
- Sample MUST arrive at Analytica within 6 hours.

# Field Test Methods

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- All “field” tests should be performed **ASAP** within 15 minutes of sampling:
  - Total Residual Chlorine - Method 4500 Cl G
  - pH – Method 4500 H B
  - Temperature
  - Apparent Color – Method 2120B
  - Dissolved Oxygen – Method 4500 O G
  - Salinity – Method 2520B
  - **NOTE:** Turbidity, Settleable Solids and Salinity can also be performed at Analytica in Anchorage.

# 4500 Cl G

## Hach - Pocket Colorimeter II

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Step 1 - Insert "Blank" to Calibrate at 0



Step 2 - Insert prepared Sample



Step 3 - Press "measure" indicator



Standard For  
Receiving  
Water

1 hr av. < 13  
ug/l;  
4 day av. <  
7.5 ug/l.

Step 4 - Record Your Results



# pH – Method 4500 H B

Beckman 200 pH Meter; Magnetic Stirring Device

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Standard For  
Receiving  
Water  
Between  
6.5 & 8.5  
S.U.

1. With Probe in solution, standardize at pH 4, 7 and 10 to determine calibration curve.
  2. Confirm calibration curve using a pH buffer of 8.
- Place Probe in Sample....record your reading from the pH Meter

# Temperature

Fisher Scientific – Traceable - Nist - Certified Meter

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1. Place meter probe in Sample or in the Temperature Blank.
2. Record Your results.

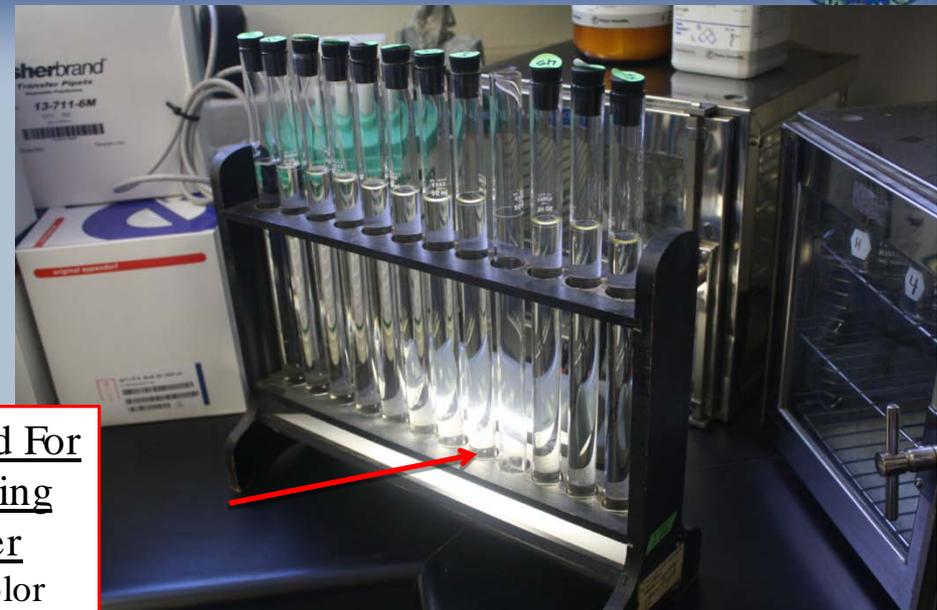
Standard  
For  
Receiving  
Water  
< 15 C.

Kelly Garretts,  
Lab Manager  
Anchorage



# Apparent Color – Method 2120B

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Standard For  
Receiving  
Water  
< 15 Color  
Units.

1. Each vial contains a diluted standard in increments of 5, 10, 15 - up to 50.
2. The actual wastewater Sample goes into the vial noted on left.
3. A light is placed behind the Color Rack and the variance in Color is recorded based on the dilutions.

# Dissolved Oxygen – Method 4500 O G

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## YSI DO Meter – Model 58



1. Calibrate Meter
  2. Fill BOD Bottle with 300 ML of sample.
- Record reading from meter.

Standard For  
Receiving  
Water  
Surface DO >  
6.0 mg/l for 1  
mtr. depth; > 4  
mg/l below  
surface.

# Salinity – Method 2520B

Thermo Scientific – Orion 3 Star

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Matt Clark, Chemist  
Anchorage Lab  
UAA Grad



1. Calibrate instrument with Blank – reading should be below 2.
2. Run Lab Control Spike (LCS) to check calibration.
  - Measure sample along with a duplicate.
  - Run a final LCS to confirm results.

# Working Effectively with Analytica

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## Some Basic Stuff.....

- Sample Collection & Shipping Tips
- Chain of Custody

# Sample Collection & Shipping Tips

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- Use all containers provided by Analytica.
- Do not rinse or tamper with preservative.
- Fill container to capacity and make sure cap is snug!
- Complete the Chain of Custody.
- Pack samples close...but not touching frozen gel packs.
  - Place the “temp blank” close to the gel packs.
- Protect containers from breakage – use the bubble wrap!
- Ship “Overnight” to Anchorage - the rest is our responsibility
- Call the Anchorage lab -carrier, flight #, air-bill information.



# POP QUIZ !!

Name 5 Sample Collection and Shipping Tips.



## Analytica Chain of Custody Form

4307 Arctic Blvd. Anchorage, AK 99503 (907) 258-2125 (907) 258-8834 fax  
 1203 W. Parla Hwy. Wasilla, AK 99654 (907) 373-5440 (907) 258-8834 fax  
 475 Hall Street Fairbanks, AK 99701 (907) 456-3116 (907) 456-3125 fax  
 12189 Pennsylvania St. Thornton, CO 80241 (303) 469-8888 (303) 469-5254 fax

Chain of Custody No: \_\_\_\_\_

<b>Client Name &amp; Address:</b> BIG CATCH SEAFOOD INC. 1122 FISH PLACE BRISTOL BAY, ALASKA	<b>Project Name:</b> BIG CATCH January 2013	<b>To be Completed by Analytica</b>
	<b>Public Water System ID#:</b> NA	Quote ID No: _____ LGN: _____
<b>Contact Person:</b> CHARLIE SALMON	<b>Results to STATE:</b> YES NO <b>X</b>	<b>Report to:</b> CHARLIE SALMON
<b>Phone No:</b> 907-555-1212	<b>Data Deliverables:</b> Level I Level II Level III Level IV	
<b>Fax No:</b> 907-555-1211	<b>EDD:</b> YES NO Type of EDD:	<b>Invoice to:</b> BIG CATCH SEAFOOD INC.
<b>E-mail:</b> charlie@bigcatch.com	<b>Requested TAT:</b> Standard <b>X</b> RUSH (lab authorization required)	<b>P.O. or Contract No:</b> TRIGS421
<b>Special Instructions:</b> SHORT HOLD TIMES II	<b>Results Due Date:</b> 1/31/2013	

Lab Bottle Order No:	Requested Analysis/Method													Comments
	Date Sampled	Time Sampled	Matrix (S-DW-WW-Other)	No. of Containers	BOD 5	OIL & GREASE	TSS	FECAL COLIFORM	ENTEROCOCCI BAC-T	Turbidity	Settleable Solids	Salinity	MIS/MSD ?	
Vessel 1 - OUTFALL 001 - SP WW	1/1/2013	8:00 AM	W	2	X	X	X					X		1 / Month when discharging
Vessel 1 - OUTFALL 002 - MSD	1/1/2013	8:15 AM	W	2				X	X					1 / Month when discharging
Vessel 1 - OUTFALL 003 - Graywater	1/1/2013	8:30 AM	W	2				X	X					1 / Month when discharging
Vessel 1 - Receiving Water Loc. 1 - Depth 1	1/1/2013	8:45 AM	W	5	X	X	X	X	X	X	X	X		1/Quarter- 2 depths, 2 locations
Vessel 1 - Receiving Water Loc. 1 - Depth 2	1/1/2013	9:00 AM	W	5	X	X	X	X	X	X	X	X		
Vessel 1 - Receiving Water Loc. 2 - Depth 1	1/1/2013	9:15 AM	W	5	X	X	X	X	X	X	X	X		
Vessel 1 - Receiving Water Loc. 2 - Depth 2	1/1/2013	9:30 AM	W	5	X	X	X	X	X	X	X	X		

Collected/Relinquished by:	Date	Time	Received by:	Date	Time	<b>To be Completed by Analytica</b>			
CHARLIE SALMON	1/13/2013	10:00 AM				Chain-of-Custody Seal: Intact Broken Absent			
Relinquished by:	Date	Time	Received by:	Date	Time	Location Rcvd/Temp on Arrival:			
						THO ___C JUN ___C ANC ___C FAI ___C PB ___C			
Relinquished by:	Date	Time	Received by:	Date	Time	Thermometer ID # _____ Measurement Method: Temp. Blank Other			
Name of Sampler: (printed)	CHARLIE SALMON <i>Charlie Salmon</i>					Shipping Method/Tracking Number:			



# POP QUIZ !!

How often are you required to  
sample your Effluent Outfalls?  
Your Receiving Waters?

# How to Read Your Report

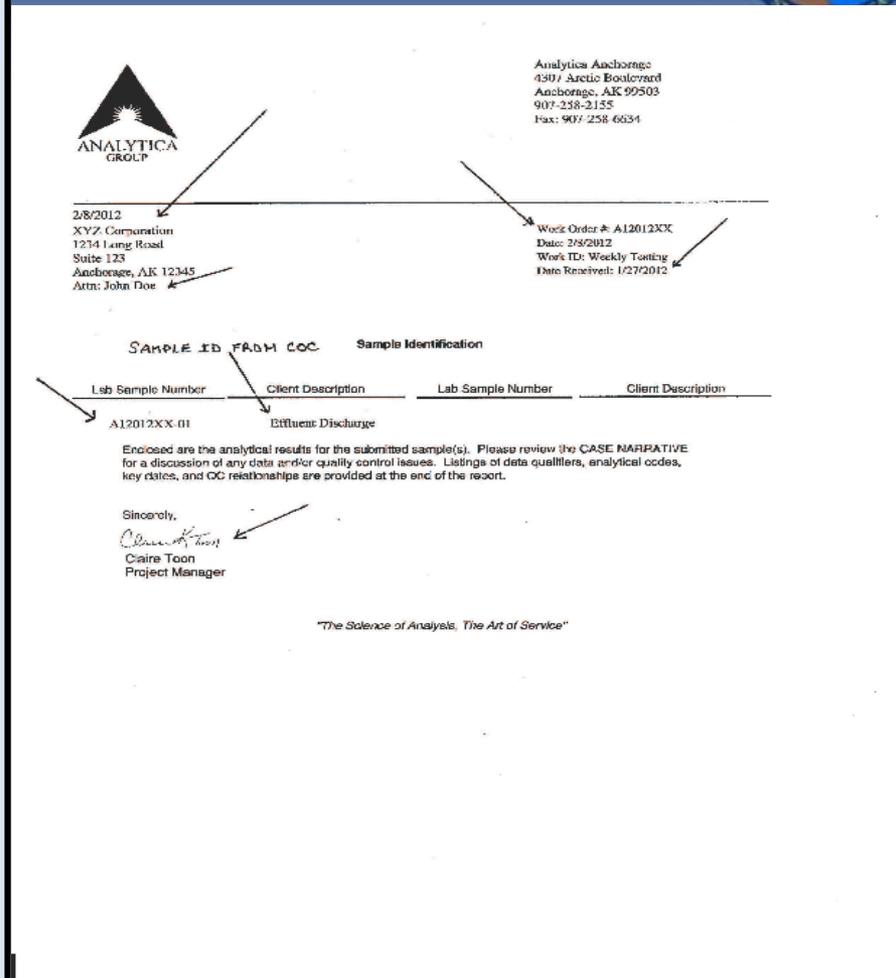
(Read: What Do I REALLY Need to Know?)

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## The Cover Letter

- Company & Contact Is this YOU?
- Work Order # and Date Received - Have this information available when contacting the lab or your Project Manager.
- Lab Sample Number – This is the number we assign your sample.
- Client Description – This is the Sample ID taken from your Chain of Custody and logged into our system upon receipt.
- Project Manager – This is the person to contact with questions about your results. All data is sent by email.



# How to Read Your Report

(Read: What Do I REALLY Need to Know?)

MODULE 6



## The Case Narrative

- Sample Receipt - This section shows the date, time, condition and temperature of your samples upon receipt – To avoid sample rejection and re-sampling costs BOD, TSS, O&G must be received between 0-6 degrees C. Don't forget the ice packs!
- Summary - This section details quality assurance compliance and/or any deviations related to your samples.

**Case Narrative**  
*Analytica Alaska Inc.*  
*Work Order: A1701222*

Samples were prepared and analyzed according to EPA or equivalent methods outlined in the following references:

Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998.

← **SAMPLE RECEIPT:**  
One (1) sample was received on 1/21/2012 8:25:00 AM, at a temperature of 0.5°C, at Analytica Anchorage. The sample was received in good condition and in order per chain of custody. **\* MUST BE BETWEEN 0-6° C**  
The sample was transferred for COB analysis to Analytica Environmental Laboratories (AEL), 2249 Pennsylvania St., Thornton, Colorado 80241, where it was received at a temperature of 2.8°C, in good condition and in order per chain of custody on 1/31/2012.

← **REVIEW FOR COMPLIANCE WITH ANALYTICA QA PLAN**  
A summary of our review is shown below.

All analytical results contained in this report have been reviewed under Analytica's internal quality assurance and quality control program. Any deviations in quality control parameters for specific analyses are found in the following text. A complete quality assurance report, including laboratory control, matrix spike, and sample duplicate recoveries is kept on file in our office and is available upon request.

← **All method specifications were met for the following tests, unless otherwise noted:**

Test Method: 8M5540D - Solids, Total Suspended Solids Dried at 103-105 C - TSS - Aqueous  
Test Method: 8M5210D - BOD-5 - Aqueous  
Test Method: 8M5220D - Chemical Oxygen Demand - COB - Aqueous

# How to Read Your Report

(Read: What Do I REALLY Need to Know?)

MODULE 6



## The Results

- Sample Comment – This section indicates any special comments about your sample.
- Results - This is the total number of Units found in your sample. (Your allowable Maximum Concentration Limit (MCL) is established by ADEC and typically found in your Permit.)
- Flags – Flags provide additional details or qualifiers to your results. An MCL Flag can be added per your permit requirements.

**ANALYTICA GROUP**  
XYZ Corporation  
Attn: Mr. John Doe  
1234 Long Road  
Suite 123  
Anchorage, AK 12345  
907-xxx-xxxx  
Fax: 907-xxx-xxxx

Client Sample ID: Effluent Discharge  
Sampling Location:  
Client Project: Weekly Testing  
Sample Matrix: Aqueous  
COC #:   
PWSS:  
Residual Chlorine:  
Comments:

Analysis Anchorage  
4301 Arctic Boulevard  
Anchorage, AK 99503  
Phone: 907-258-2155  
Fax: 907-258-6634

Report Date: 2/8/2012  
Receipt Date: 1/27/2012  
Sample Date: 1/26/2012  
Sample Time: 9:00:00AM  
Collected By: JD

**Flag Definitions:**  
MRL = Method Reporting Limit  
MCL = Maximum Contaminant Limit  
H = Present also in Method Blank  
H = Exceeds Regulatory Limit  
M = Matrix Interference  
J = Estimated Value  
D = Lost to Dilution  
\*\* = RL higher than MCL; target not detected  
TNC = Too Numerous to Count - result rejected  
CF = Confluent Growth - result rejected  
TCNG = Turbid Culture No Growth - rejected

Lab#: A12012XX-01A  
Sample Comment: Composite 01/25 1200 - 01/26 0900

Analysis Method Parameter	Result	Units	Flags	MRL	Prep Method	Prep Date	Analysis Date	Analyst
2540D/2540D (Aqueous) - TSS								
Total Suspended Solids	776	mg/l		40	2540D	1/27/2012	1/27/2012	KM
5210H/5210B (Aqueous) - BOD5								
Biochemical O2 Demand, 5 Day	1109	mg/L		2.0	5210B	1/27/2012	1/27/2012	KM

Lab#: A12012XX-01B  
Sample Comment: Composite 01/25 1200 - 01/26 0900

Analysis Method Parameter	Result	Units	Flags	MRL	Prep Method	Prep Date	Analysis Date	Analyst
SM5220D/SV5220D (Aqueous) - COD								
Chemical Oxygen Demand	1709	mg/l		600	SM5220	1/31/2012	2/1/2012	JKK

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# How to Read Your Report

(Read: What Do I REALLY Need to Know?)

MODULE 6



## The Results (Microbial)

- Results - This is the total number of Units found in your sample. (Your allowable **M**aximum **C**oncentration **L**imit (MCL) is established by ADEC and typically found in your Permit.)
- Flags – Flags provide additional details or qualifiers to your results.

### Detailed Analytical Report

Analytica Alaska Inc.

Workorder (SUG):	A1108XXXX	Analysis Date:	8/14/2011 7:15:00AM					
Project:	Weekly Testing	Instrument:	Micro					
Client:	XYZ Corporation	File Name:						
Client Project Number:	None	Dilution Factor:	1					
Report Section:	Client Sample Report	Analyst Initials:	KM					
Client Sample Name:	Sample 1	Prep Extract Vol:	100.00 ml					
Matrix:	Ocean Water							
The following test was conducted by: Analytica - Anchorage								
Lab Sample Number:	A1108XXXX-01A	Analysis Date:	8/14/2011 12:58:00PM					
Prep Date:	8/14/2011	Instrument:	Micro					
Analytical Method ID:	Enterococci by MPN - ASTM-D-6503-99 Balcal	File Name:						
Prep Method ID:		Dilution Factor:	1					
Prep Batch Number:	A110815006	Analyst Initials:	KM					
Report Basis:	As Received	Prep Extract Vol:	100.00 ml					
Sample prep wt./vol:	10.00 ml							
Analyte	CASNo	Result	Flag	Units	COLI	MCL	min	hi
Enterococci by MPN		560		MPN/100	10	10		
The following test was conducted by: Analytica - Anchorage								
Lab Sample Number:	A1108XXXX-01A	Analysis Date:	8/14/2011 1:23:00PM					
Prep Date:	8/14/2011	Instrument:	Micro					
Analytical Method ID:	SM9222D Fecal Coliform by MP - FC by Membrane Filter	File Name:						
Prep Method ID:	9222D	Dilution Factor:	10					
Prep Batch Number:	A110815007	Analyst Initials:	KM					
Report Basis:	As Received	Prep Extract Vol:	1.00 ml					
Sample prep wt./vol:	1.00 ml							
Analyte	CASNo	Result	Flag	Units	COLI	MCL	min	hi
Fecal Coliform Bacteria by MP		1,200		CFU/100ml	10	10		

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# MCL Out of Compliance Notification

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## Immediate **MCL** Out of Compliance Notification

Analytica can customize your report by uploading your Permit specific **MCL**. We will notify you **immediately** by email of an exceedance, indicating potential out of compliance.



### EXAMPLE OF MCL NOTIFICATION (OUT OF COMPLIANCE)

----- Original e-mail Message -----

From: [Technical.Director@Analyticagroup.com](mailto:Technical.Director@Analyticagroup.com)

To: [CUSTOMER@cityofnowhere.org](mailto:CUSTOMER@cityofnowhere.org)

Cc: [Project.Manager@Analyticagroup.com](mailto:Project.Manager@Analyticagroup.com); [LabManager@analyticagroup.com](mailto:LabManager@analyticagroup.com); [MicroAnalyst@analyticagroup.com](mailto:MicroAnalyst@analyticagroup.com)

Sent: Monday, December 10, 2008 12:48 PM

Subject: MCL Notification –

Please send a reply to the sender when you receive this message.

The following MCL Results have been validated as being OUT OF COMPLIANCE:

Client	Sample No.	Analyte	Result	MCL Units	PWS #	Sample Date
City of Nowhere	A01252-01B	Total Haloacetic Acids	0.0881	0.06 mg/L	10022017	10/09/2008

Analysts  
Comments: Spoke to Mr. Customer on 10/10/2008.  
Client notified via e-mail and Phone call.



# POP QUIZ – BONUS ROUND !!

What Does Analytica Take **Out**  
of Your Water???





# How Do I Order Kits and Get the Best Service Available?

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Laboratory Business Hours are  
8-5, Monday – Friday

Standard Report Turnaround is  
10 Business Days

Place your order well in  
advance of your sampling  
event

Call the Alaska Service Team  
representative at the  
location most convenient to  
you!





# Analytica - Anchorage Laboratory

Client Services Michelle Spiegel 907-258-2155 Ext. 224

[mspiegel@analyticagroup.com](mailto:mspiegel@analyticagroup.com)



“We Take The **Red Tape** OUT of Your Water”



# Analytica - Fairbanks Laboratory

Client Services Marc Harmon 907-456-3116

[mharmon@analyticagroup.com](mailto:mharmon@analyticagroup.com)



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# Analytica –Mat-Su Service Center

Client Services Michelle Spiegel 907-258-2155 Ext. 224

[m Spiegel@analyticagroup.com](mailto:m Spiegel@analyticagroup.com)



“We Take The **Red Tape** OUT of Your Water”



# Who Do You Call If Not 100% Satisfied?

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## Analytica Group®

Jerry Baker 800-873-8707, Ext 117

Customer Service Manager

[jbaker@analyticagroup.com](mailto:jbaker@analyticagroup.com)

“We Take The **Red Tape** OUT of Your Water”



**THANK YOU**

“We Take The **Red Tape** OUT of Your Water”