2017 Dry Weather Screening Report APDES Permit No. AKS052558

FINAL REPORT

November 2017

MUNICIPALITY OF ANCHORAGE

WATERSHED MANAGEMENT SERVICES

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1.0 Introduction

1.1 Background

The U.S. Environmental Protection Agency (EPA) issued the Municipality of Anchorage (MOA) and the Alaska Department of Transportation and Public Facilities (ADOT&PF) a Municipal Separate Storm Sewer System (MS4) permit under the National Pollutant Discharge Elimination System (NPDES) in 1999. To meet the requirements of the permit, the MOA Watershed Management Services (WMS) initiated a Dry Weather Screening (DWS) program in 1999 to identify potential illicit discharges to the MS4. This program was conducted during the dry season (typically May through mid-July) each year through 2009.

The EPA re-issued the permit in 2009 prior to the State of Alaska receiving primacy to operate the NPDES program. The re-issued permit became effective February 1, 2010, under the administration of the Alaska Department of Environmental Conservation (ADEC) as an Alaska Pollutant Discharge Elimination System (APDES) MS4 permit. The permit expired on January 31, 2015, and ADEC re-issued the permit with revisions, effective August 1, 2015 (APDES Permit No. ASK052558). The expiration date of the current permit is July 31, 2020.

The APDES permit continues the requirement of DWS and subsequent follow-up actions to identify illicit discharges and associated pollutants to the MS4.

1.2 **Problem Definition**

The MS4 permit requires that the MOA implement an illicit discharge management program to reduce the unauthorized and illegal discharge of pollutants to the MS4 (Section 3.5). An illicit discharge is defined as any discharge to a MS4 that is not entirely composed of storm water.¹ Illicit discharges, such as those from industrial process wastewater, domestic wastewater, car wash water, and other sources, can inadvertently introduce pollutants both directly and indirectly to the storm sewer system. Flow from storm drain outfalls during dry weather is generally an indicator of illicit discharges to the MS4.

1.3 Screening Program

DWS is conducted to identify illicit discharges to the MS4 within the MOA. Identification is the first step to eliminating these illicit discharges. To identify potential illicit discharges, field screening and laboratory testing techniques are used to identify obvious pollutant concentrations in what is expected to be clean storm water. Guidance on illicit discharge screening identifies a list of 15 indicator parameters that can be used to confirm the presence of illicit discharges, noting that generally only 3 to 5 of these parameters need to be used to characterize the discharge for subsequent identification and elimination of the discharge (CWP and Pitt, 2004).

¹ Excepting any discharges authorized under an NPDES permit and discharges resulting from fire-fighting activities (40 Code of Federal Regulations [CFR] §122.26(b)(2)).

The MS4 permit establishes minimum requirements for the DWS program (Section 3.5.4). The Quality Assurance Plan (QAP) for the MS4 permit monitoring programs includes the full DWS monitoring plan (MOA 2016a). The QAP, including the DWS methodology, was updated in 2016 to comply with the re-issued permit revisions.

The MS4 permit requires the MOA to sample dry weather flow from at least 15 storm water outfalls per year, and to have an additional 30 outfalls prioritized for sampling as alternates should a targeted outfall be dry. The permit also requires that sampled outfalls be geographically dispersed and represent all major land uses within the Municipality. The permit specifies screening for seven parameters: pH; total chlorine; detergents; total copper; phenols; fecal coliform bacteria; and turbidity. Benchmark or threshold exceedances are used to trigger MOA investigative action and provide information to support that action.

2.0 Project Summary

2.1 Watershed Prioritization

There are 12 watersheds within the area regulated by the MS4 permit. The DWS methodology established in the QAP includes a methodology to rank the 12 watersheds in order of priority for screening (MOA 2016a). Watersheds are prioritized at the beginning of each five-year permit cycle. The results of the watershed prioritization for the current permit cycle are described in the 2016 DWS Report (MOA 2016b) and summarized in Table 1.

Rank	Watershed
1	Ship Creek
2	Chester Creek
3	Campbell Creek
4	Fish Creek
5	Furrow Creek
6	Rabbit Creek
7	Eagle River
8	Hood Creek
9	Peters Creek
10	Potter Creek
11	Mirror Creek
12	Glacier Creek

Table 1. Watershed Prioritization for the 2016-2020 MS4 Permit Cycle

Note: Bold watersheds were sampled in 2017.

The Fish Creek, Furrow Creek, Rabbit Creek, and Eagle River watersheds were investigated in 2017. Only one potentially suitable outfall in the Rabbit Creek watershed was identified during reconnaissance (see Section 2.2 Outfall Sample Locations), so the next watershed in the



prioritized list, Eagle River, was also investigated. Maps of the investigated watersheds are provided in Appendix A.

2.2 Outfall Sample Locations

The following procedures are used to identify the 15 outfalls to be examined within the watersheds:

- The DWS program will only evaluate samples from outfalls that both: 1) fit the definition
 of an outfall provided at 40 CFR 122.25(b)(9), and 2) are owned by the MOA or
 ADOT&PF. Outfalls fitting these criteria will be preliminarily identified from the MOA
 hydrography geodatabase (HGDB; MOA 2017a).² Samples from pipes or ditches that
 are privately owned or from pipes that convey streamflow will not be considered part of
 the DWS program. Additionally, sedimentation basin outfalls and outfalls emptying into
 them will not be considered for sampling in this program.
- 2. Prior to field reconnaissance each year, the list of complaints received by MOA that involve discharges into or from the MS4 will be consulted to identify any associated outfalls for potential sampling.³
- 3. Each of the three watersheds will be divided approximately in half (an upper watershed and a lower watershed). If there are not five "complaint" outfalls within the watershed, outfalls will be added beginning at the mouth of the lower half and the beginning of the upper half of the urbanized watershed until five sample sites have been identified. These are the primary sampling sites within that watershed. The same process will be used to identify ten alternate outfall sites in each watershed.
- 4. An alternate site will be selected for sampling when a primary site is dry or is completely submerged when the field team arrives to sample. Other reasons that require an alternate site to be sampled will be assessed on a case-by-case basis.
- 5. Unresolved complaint sites will have the highest priority for sampling, then sampling will begin at the furthest downstream outfall identified for sampling.

Using these procedures, sixteen outfalls within the Fish Creek, Furrow Creek, and Eagle River watersheds were selected for sampling in 2017. Prior to any field effort, potentially suitable outfalls were identified through a geographic information system (GIS) analysis using the HGDB. The field team performed reconnaissance trips to locate the targeted sites and ensure the outfalls were otherwise suitable for sampling (safe legal access, flowing water during dry weather conditions, etc.). To evenly distribute the sampled outfalls, five outfalls in each watershed were sampled (a sixth outfall in the Furrow Creek watershed that had been selected as an alternate site was also inadvertently sampled).

² As of 2017, MOA Watershed Management Services updates the HGDB weekly. The most current version of the HGDB is available for download at <u>http://anchoragestormwater.com/datalibrary.html</u>. HDR downloaded the HGDB prior to reconnaissance activities on May 15, 2017 and following completion of sampling activities on October 6, 2017.

³ No outfalls in the targeted watersheds were associated with a known or suspected illicit discharge between 2012 and 2016 (MOA 2017b).

The intent of the reconnaissance trips was also to identify 10 alternate outfalls within each watershed for a total of 30 alternates as required by the MS4 permit. The QAP allows for outfalls to be passed over for sample consideration if the team cannot access the outfall due to lack of safe access or private property concerns. Additionally, although the HGDB for the watersheds in the Anchorage bowl is fairly accurate, the precise location and nature of an outfall is not always provided in the GIS data. For example, many outfalls drain into a culvert passing under a road, or are open drainage ditches. Lack of safe legal access, poor outfall condition that precludes collection of an isolated sample of flow from the MS4, or lack of flow during reconnaissance, disqualify the outfall from sampling consideration. These conditions were recorded and the team moved to the next outfall. Notes recorded during reconnaissance were recorded in field log books (Appendix B).

Only 16 potential alternate outfalls were identified within the four watersheds (one on Rabbit Creek, 12 on Fish Creek, and three on Eagle River). The 41 alternate outfalls in the Ship Creek, Chester Creek, and Campbell Creek watersheds identified for the 2016 program were considered suitable alternates for the 2017 program.

In addition to the 16 outfalls sampled within the targeted watersheds, one outfall to Campbell Creek was sampled. Outfall 105-1 was sampled during the 2016 program, and the sample exceeded the program threshold for fecal coliform. The exceedance was not identified by project staff and no follow-up sampling was conducted in 2016. Outfall 105-1 was resampled for all parameters in 2017.

Table 2 lists the outfalls sampled in 2017. Outfall codes are numbers assigned to all nodes in the HGDB. All other outfalls investigated during reconnaissance and sampling activities are listed in Appendix B. All outfalls investigated are shown on the watershed maps presented in Appendix A.

Outfall Code	Latitude	Longitude	Location Description and Notes					
Fish Creek								
682-1	61.19586	-149.92836	West bank, north of LaHonda Dr. Outfall is in concrete headwall south of cross-culvert conveying creek below Forest Park Dr. Water in outfall level with creek, visibly flowing. Sample collected inside outfall to isolate outflow.					
1287-994	61.19336	-149.92501	East bank, at Little Park on Willow St. Approximately 2 inches of sediment in bottom of pipe at outfall.					
462-1	61.19069	-149.93133	West bank, on Fish Creek Trail at W. 33 rd Ave. Outfall flows into channel through wetland area to creek. Approximately 5 inches of water in channel, flowing slowly.					
228-1	61.18615	-149.93433	West bank, at Fish Creek Park on E. Turnagain Blvd. Steady flow. Orange flocculent in outfall and flow path. Collar of outfall is corroded.					
1287-1858-1	61.18471	-149.87800	Southeast corner of pond at Cuddy Family Midtown Park. Good condition. Not in HGDB, HDR assigned temporary ID in 2013.					

Table 2. Outfalls Sampled During 2017 DWS Program



Outfall Code	Latitude	Longitude	Location Description and Notes
Furrow Creek			
5-1	61.10603	-149.88295	North bank, at Johns Park. Outfall is at social trail off paved path south of Botanical Cir. Well-defined flow path to creek. Steady flow with some foam during reconnaissance visit.
1345-1	61.10855	-149.87100	North bank, at Division St. Outfall discharges into flow path approximately 175 feet north of creek. Outfall is in good condition. Flow path routed through culvert under trail along creek; culvert is slightly eroded. Steady flow, slight odor of laundry detergent during reconnaissance visit.
1359-1	61.10855	-149.86822	South bank, at Beachcomber Dr. Sod and grass are overhanging outfall. Outfall is in good condition. Steady flow, slight metallic odor during reconnaissance visit.
306-1	61.10813	-149.86435	South bank, at Huffman Rd. and Old Seward Hwy. Outfall is in concrete headwall below traffic circle. Flow path through wetland to creek. Trickle flow.
402-1	61.11274	-149.83145	Northwest corner of wetland at private park at Alderwood Loop and Woodway Dr. No outfall at location shown in HGDB. Sample collected from EOP 20 feet to west, mapped in HGDB as network node but not as outfall. Outfall in good condition.
332-1	61.11240	-149.83083	Southeast corner of wetland at private park at Alderwood Loop And Woodway Dr. No outfall at location shown in HGDB. Sample collected from EOP 30 feet to west, mapped in HGDB as network node but not as outfall. Outfall in good condition.
Eagle River			
Eagle River Ma	ainstem		
1335-1	61.29961	-149.54223	North bank, at pedestrian tunnel below Eagle River Loop Rd. Outfall in concrete headwall, discharges to flow path constructed with rock gabions. Water flows for approximately 100 feet in flow path, then infiltrates into gabions. Outfall and flow path in good condition.
303-1	61.29799	-149.53480	North bank, outfall is along trail below Little Cape Cir. EOP is located at terminus of mapped closed conveyances and flow path conveys discharge to west and south (not to south as mapped in HGDB). High flow. Outfall in good condition.
1417-1	61.29864	-149.51362	North bank, south of Driftwood Bay Dr. at Meadow Park Cir. Well- defined flow path below EOP. Steady flow. Outfall in good condition.
Eagle River			
Meadow Creek	1		
646-71	61.31722	-149.55439	South bank, west of Chain of Rock St. Outfall is approximately 150 feet farther downstream than shown on HGDB. Good condition.
1375-99	61.31725	-149.55412	North bank, west of Chain of Rock St. Unnamed outfall discharging into Meadow Creek. High flow. No outfall or connected network shown on HGDB (as of October 6, 2017), HDR assigned temporary ID in 2013. No evidence of network observed up Chain of Rock St. to Kahiltna Dr.
Campbell Cree	k		
105-1	61.17242	-149.86760	South bank, east of Old Seward Hwy. across from the Peanut Farm. Outfall appears to have been reconstructed since last sampled in 2016. Good condition.

2.3 Measured Parameters

Table 3 lists the screening parameters required by the permit and the sampling methods, reporting ranges, and the program thresholds for each parameter. Appendix E, DWS Monitoring Plan, of the QAP (MOA 2016a) provides rationale for screening parameter thresholds. The thresholds for all parameters were maintained from the previous MS4 permit cycle (MOA 2012). Thresholds are established at concentrations sufficiently different from clean storm water to detect potential illicit discharges. In a guidance manual, the Center for Watershed Protection (CWP) and Robert Pitt (2004) recommend benchmarks (thresholds) orders of magnitude higher than ambient storm water quality to reduce the incidences of false positives. Thresholds in Table 3 were established based on available environmental data and field test kit specifications. Values below the threshold are considered to be within an acceptable range for background concentrations. Values at or above the threshold concentration for a parameter indicate that the parameter may be above background concentrations. Outfalls with results that exceeded the threshold (or are outside the pH range) for one or more of the pollutant indicators are targeted for follow-up action.

Parameter	Method	Reporting Range	Threshold	
рН	pH test strips, YSI 556 hand-held probe	0 - 14 STD	≤ 4 or ≥9 STD	
Total Chlorine	LaMotte Total Chlorine Octa-Slide Bar kit (3314) (EPA 330.5)	0.1 - 6.0 mg/L	≥ 1.0 mg/L	
Detergents	Hach model DE-1 Toluidine blue colorimetric (Analytical Chemistry Method #38-791)	0.05 – 5.0 mg/L	≥ 1.0 mg/L	
Total Copper	LaMotte model EC-70 Cuprizone Color Chart	0.05 – 4.0 mg/L	≥ 1.0 mg/L	
Total Phenols	LaMott 4 Amino Anti-Pyrene (4 AAP) colorimetric (SM 5530C)	0.1 - 1 mg/L	≥ 0.5 mg/L	
Turbidity	Hach 2100P Turbidimeter	0.1 - 1,000 NTU	≥ 250 NTU	
Fecal Coliform	Standard Methods 9222D	1 colony/100 mL – too numerous to count	≥ 400 colonies/100 mL	

Table 3. Sampling Methods, Reporting Ranges, and Thresholds for Measured Parameters

2.4 Sampling Procedures

Sampling procedures were carried out in accordance with the methodology outlined in the QAP. No changes from previous years' sampling procedures or deviations from the QAP were required in 2017.

2.4.1 Field Preparation

The MS4 permit stipulates that DWS should be conducted between June 1 and August 30 of each year. Precipitation in the Anchorage area in summer 2017 was normal. The total precipitation that fell in June and July was within the normal range, and the total precipitation for August was higher than normal (Figure 1).

Field sampling was conducted after at least 48 hours of dry weather following a storm event that created runoff in the MS4. Recent precipitation recorded by the National Weather Service at the Ted Stevens Anchorage International Airport was consulted to determine appropriate sample

timing when necessary (NWS 2017a). Field sampling occurred on four days in June and August. Figure 2 shows the daily precipitation and 48 hour running total precipitation for summer 2017. The dates when field sampling occurred are indicated by the black arrows.

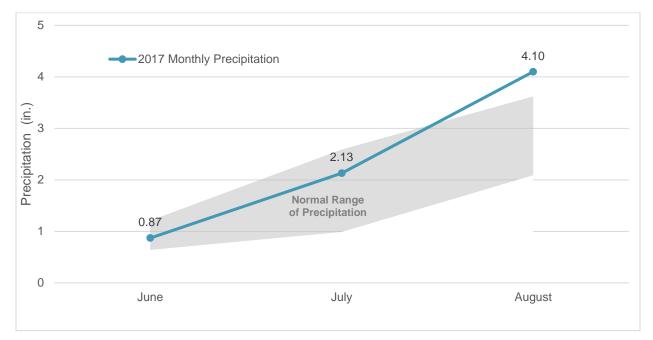


Figure 1. Monthly Precipitation in Anchorage, Summer 2017

Notes: 2017 monthly precipitation data recorded at Ted Stevens International Airport. Source: NWS 2017b. Normal range of precipitation shown is the range between the 25th and 75th percentiles of monthly precipitation averages recorded at the Ted Stevens International Airport for the 30 year period from 1981 to 2010. Source: NOAA 2016.

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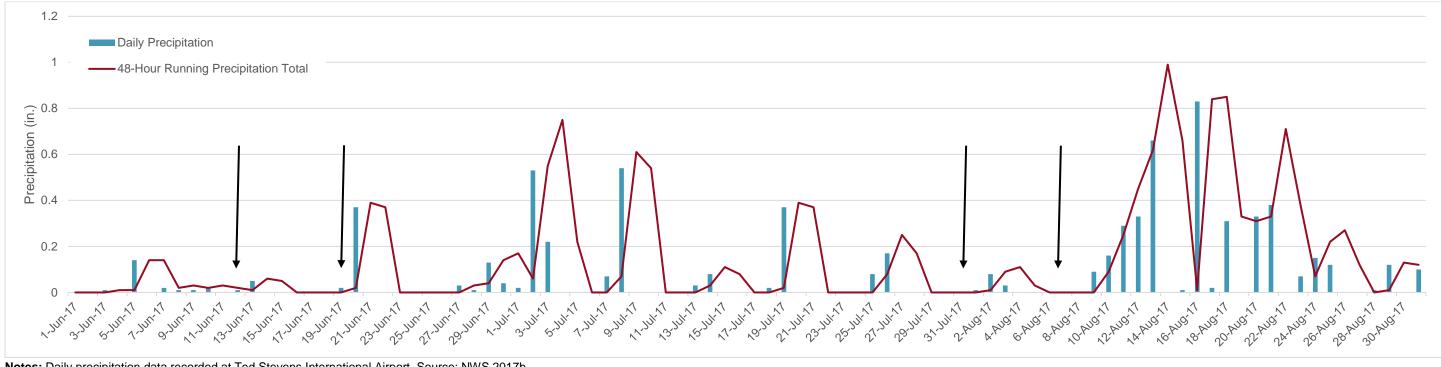


Figure 2. Daily Precipitation in Anchorage, Summer 2017

Notes: Daily precipitation data recorded at Ted Stevens International Airport. Source: NWS 2017b. Black arrows indicate sampling dates.

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The field team conducted calibration and equipment blank analyses at the beginning of each day of sampling prior to entering the field. This equipment blank analysis examined each test kit by testing deionized water provided by SGS North America, Inc (SGS), the laboratory conducting fecal coliform analysis. The calibration and field test kit equipment blank data were recorded on the field data forms and are provided in Appendix C.

Each day before departing for field sampling the field team conducted a safety briefing. The team took the following items into the field:

- List of targeted outfalls (primary and alternate sites)
- GPS-enabled iPad loaded with HGDB and aerial imagery
- Field forms with guidelines
- Water quality analysis protocols (included in the QAP)
- Field sampling supplies
- Personal protective equipment

- YSI 556 hand-held meter
- LaMotte and Hach water quality field test kits
- Laboratory-supplied fecal coliform bottles
- Hach turbidimeter
- pH test strips
- Job Hazard Analysis and Travel Safety Forms

2.4.2 Sampling Activities

Sampling activities conducted at each outfall consisted of recording visual observations about the condition of the outfall and the discharging water, taking photographs of the outfall, measuring or qualitatively describing the flow of the discharging water, and collecting a sample for laboratory analysis of fecal coliform and two grab samples to measure all other parameters using field test kits or water quality meters. Detailed sampling methodology, including instructions for the field test kits, is included in the QAP (MOA 2016a).

The sample bottle for laboratory analysis of fecal coliform and grab samples for field test kits were filled directly from the outfall flow. The two grab samples were collected using a clean 750-milliliter (mL) amber glass bottle (for the detergents test kit) and a clean 1-liter HDPE plastic bottle (for all other field test kits and measurements). Field test kits were recorded as soon as possible after sample collection, and field measurements were recorded and compared against the thresholds described in Table 3.

The field team conducted replicate sample analyses at a rate of at least 15 percent per day per parameter (minimum of one per day). The field team also collected replicate samples for the laboratory analysis of fecal coliform at a rate of 15 percent per day (minimum of one per day).

Completed data sheets are included as Appendix C, and photographs of sampled outfalls are included as Appendix D.

2.4.3 Follow-Up Activities

To avoid repeating the missed sample exceedance in 2017, HDR provided results of the field measurements to the MOA WMS immediately following every sampling day. SGS provided

results of the fecal coliform analysis to HDR as soon as the results were available (typically within 3 days), and HDR provided these results to the MOA WMS.

The QAP outlines notification procedures and follow-up activities to be performed when a sample exceeds the program threshold for any parameter (MOA 2016a). Samples from two outfalls exceeded the threshold for fecal coliform in 2017. Per the QAP, HDR notified the MOA WMS of the exceedances as soon as the results were available, and field teams collected follow-up samples for fecal coliform analysis on the next suitable day for sampling. The follow-up samples were within the acceptable range for fecal coliform, and no further follow-up activities were required.

2.5 Chain of Custody Records

The field team leader completed a chain of custody record which included each sample collected during a single field day for sample tracking. The original form was delivered with the samples to SGS. Copies of the chain of custody records are included in the laboratory analysis reports provided in Appendix E.

2.6 Laboratory Sampling Procedures

Fecal coliform samples were collected in laboratory-supplied sample bottles. The project name, sample ID, and sample date and time were clearly marked on the sample bottle labels. Samples were stored in a cooler with gel ice and a temperature blank while in the field. The samples were delivered to SGS within six hours to satisfy the short hold time of the fecal coliform samples. Fecal coliform was analyzed using standard method 9222D.

SGS provided results of the laboratory analysis to HDR via email or telephone immediately after the analysis was complete (approximately within 24 hours). The expedited turn-around time allowed for expedited follow-up sampling in the event of an exceedance of the fecal coliform threshold. SGS provided a full report of the analysis through Engage, an on-line document portal, within a week.

3.0 Results

3.1 Field and Laboratory Results

The results of the 2017 DWS sampling effort adds to the data set of previous years' sampling efforts (MOA 2008, 2009, 2011, 2012b, 2013, 2014, 2016c). The 2017 sample results program are provided in Table 4. Complete laboratory analysis reports are provided in Appendix E.

Two outfalls (Furrow Creek 5-1 and Eagle River 1335-1) exceeded the threshold for fecal coliform. Follow-up sampling at these outfalls was conducted on the next suitable day, and follow-up samples did not exceed the threshold for fecal coliform. The exceedances and follow-up sampling events are discussed further in Section 4.1. No parameter at any other outfall exceeded the assigned threshold (shown in Table 3).

Watershed	Outfall ID	Date	Flow	рН	Total Chlorine (mg/L)	Detergents (mg/L)	Total Phenols (mg/L)	Turbidity (NTU)	Total Copper (mg/L)	Fecal Coliform (colonies/ 100mL)
Fish Creek	682-1	6/12/2017	Low	7.0	<0.5	<0.05	<0.1	1.22	<0.05	1.0
Fish Creek	462-1	6/12/2017	Medium	7.0	<0.5	<0.05	<0.1	2.57	<0.05	4.0
Fish Creek	228-1	6/12/2017	Medium	7.0	<0.5	<0.05	<0.1	10.7	<0.05	ND
Fish Creek	1287- 994	6/12/2017	Low	6.0 R = 6.0	<0.5 R <0.5	<0.05 R <0.05	<0.1 R <0.1	169 R = 160	<0.05 R <0.05	ND R = ND
Fish Creek	1287- 1858-1	6/12/2017	High	7.0	<0.5	<0.05	<0.1	7.47	<0.05	5.0
Furrow		6/12/2017	Low	7.0	<0.5	<0.05	<0.1	208	<0.05	890
Creek	5-1	6/19/2017 (Resample)	-	-	-	-	-	-	-	4.9 R = 6.6
Furrow Creek	1345-1	6/12/2017	Medium	7.0	<0.5	<0.05	0.2	1.07	<0.05	169
Furrow Creek	1359-1	6/12/2017	High	7.0 R = 7.0	<0.5 R <0.5	<0.05 R <0.05	<0.1 R <0.1	7.74 R = 7.94	<0.05 R <0.05	65 R = 320
Furrow Creek	306-1	6/12/2017	Low	7.0	<0.5	0.45	0.3	29.1	<0.05	4.0
Furrow Creek	402-1	6/12/2017	Medium	8.0	<0.5	<0.05	<0.1	2.44	<0.05	ND
Furrow Creek	332-1	6/12/2017	Low	8.0	<0.5	<0.05	<0.1	2.72	<0.05	4.0
Campbell Creek	105-1	6/12/2017	Low	7.0 R = 7.0	<0.5 R <0.5	0.2 R = 0.15	<0.1 R <0.1	89.2 R = 113	<0.05 R <0.05	6.0 R = 5.0
Eagle River	303-1	8/1/2017	High	7.0	<0.5	<0.05	<0.1	0.25	<0.05	ND
Eagle River	1417-1	8/1/2017	Medium	7.0	<0.5	<0.05	<0.1	0.48	<0.05	ND
Eagle River	1375- 99	8/1/2017	High	7.0	<0.5	<0.05	<0.1	0.49	<0.05	ND
Eagle River	646-71	8/1/2017	High	7.0	<0.5	<0.05	<0.1	0.40	<0.05	ND
Foolo Diver	1005 4	8/1/2017	Medium	7.0 R = 7.0	<0.5 R <0.5	0.05 R = 0.05	<0.1 R <0.1	1.45 R = 1.62	<0.05 R <0.05	690 R = 410
Eagle River	1335-1	8/7/2017 (Resample)	-	-	-	-	-	-	-	19 R = 18

Notes: R = replicate sample; ND = not detectable

Bold results are exceedances. Italicized results are notably higher than other sites, but are not exceedances.

3.2 Quality Assurance and Quality Control

Quality assurance and quality control (QA/QC) procedures were followed according to the QAP (MOA 2016a). The procedures included analytical checks (field replicates, equipment blanks), instrument calibration, and procedures to assess data for precision, accuracy, representativeness, comparability, and completeness.

SGS is certified by the EPA and the Alaska Drinking Water Program and has an approved QA/QC program. Analytical methods and testing procedures were in adherence with the QAP (MOA 2016a) and standard methods (APHA 2005).

3.3 Data Validation

Verification analyses for laboratory parameters were conducted by SGS. The data review was focused on criteria for the following QA/QC parameters and their overall effects on the data:

- Data validation
- Sample handling (chain of custody)
- Holding time compliance
- Field replicate comparison

Samples were collected from the water flowing from the end of pipe at the outfall to avoid mixing with the stream water. Field analyses met the sensitivities prescribed in the QAP (MOA 2016a).

Replicate samples were collected at one outfall in each watershed to determine field precision and variability. Additionally, replicate fecal coliform analysis samples were collected at the two outfalls where follow-up sampling occurred following a threshold exceedance. For the field test kits, the QAP requires that percent difference between primary and replicate samples is calculated. The results need to be within the precision of the equipment used. For the fecal coliform samples analyzed at the laboratory, the QAP requires that relative percent difference (RPD) be calculated between the primary and replicate samples and be within 60%. The variance between the primary and replicate samples are presented in Table 5.

Parameter	QAP standard	Fish Creek 1287-994	Furrow Creek 1359-1	Eagle River 1335-1	Campbell Creek 105-1	Furrow Creek 5-1 (Resample)	Eagle River 1335-1 (Resample)
рН	± 0.2 pH units	0 pH units	0 pH units	0 pH units	0 pH units	-	-
Total Chlorine	30%	0%	0%	0%	0%	-	-
Detergents	30%	0%	0%	0%	25%	-	-
Total Phenols	30%	0%	0%	0%	0%	-	-
Turbidity	± 1 NTU	9 NTU	0.20 NTU	0.17 NTU	23.8 NTU	-	-
Total Copper	30%	0%	0%	0%	0%	-	-

Table 5. Replicate Sample Variance from Primary Sample

Parameter	QAP standard	Fish Creek 1287-994	Furrow Creek 1359-1	Eagle River 1335-1	Campbell Creek 105-1	Furrow Creek 5-1 (Resample)	Eagle River 1335-1 (Resample)
Fecal Coliform	60%	0%	392%	41%	17%	35%	5%

Note: Bold values indicate replicate variance that exceeds the QAP standard.

Most of the results fall within the QAP standards. Two QC sampling locations exceeded the variance threshold for turbidity, and one QC sampling location exceeded the variance threshold for fecal coliform.

Fish Creek 1287-994 and Campbell Creek 105-1 exceeded the variance threshold for turbidity. The QAP standard for turbidity is based on the precision of the turbidity meter. However, this does not take into consideration the natural variance of turbidity within storm water. Turbidity varies, to some degree, on a regular basis and more turbid water has the potential to vary more widely as the suspended particles continually move throughout the sample, resulting in different readings even when the sample is retested. The primary and replicate samples that exceeded the variance threshold for turbidity were more turbid than the primary and replicate samples that did not exceed the variance threshold. The primary and replicate samples at Fish Creek 1287-994 and Campbell Creek 105-1 were below the exceedance threshold for turbidity, and were not flagged for follow-up action.

Furrow Creek 1359-1 exceeded the variance threshold for fecal coliform. Fecal coliform is widely variable and large variations are expected. The primary and replicate samples were below the exceedance threshold for turbidity, and this result was not flagged for follow-up action.

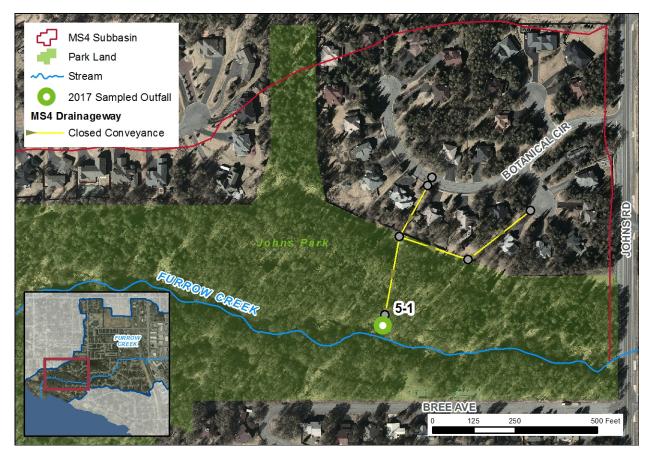
Sample custody was adequately maintained for the samples. The coolers transporting the fecal coliform samples were held at temperatures of less than 10°C. The holding times were met for all samples.

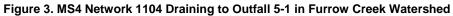
4.0 Discussion

4.1 Threshold Exceedances

The result of the fecal coliform analysis of the sample collected on June 12, 2017 at Outfall 5-1 was 890 col/100 mL, an exceedance of 490 col/100 mL above the program threshold (400 col/100 mL). Outfall 5-1 is located on the north bank of Furrow Creek in Johns Park (Figure 3). SGS transmitted the results of the fecal coliform analysis to HDR on June 15. Per the QAP, a follow-up sample for fecal coliform analysis was collected from Outfall 5-1 on the next suitable day, June 19. The results of the laboratory analysis of the primary and replicate follow-up samples (4.9 col/100 mL and 6.6 col/100 mL) were below the program threshold and no further follow-up action was required.

Outfall 5-1 is connected to network 1104, which drains Botanical Circle and Hansa Rose Circle within the Botanical Garden neighborhood off Johns Road. A paved path along the north edge of Johns Park and many social trails through the woods on both sides of Furrow Creek are regularly used by pedestrians, cyclists, and dog walkers.





Both the primary and replicate samples collected at Outfall 1335-1 on August 1, 2017 exceeded the program threshold for fecal coliform. The result of the fecal coliform analysis of the primary sample was 690 col/100 mL, and the replicate was 410 col/100mL. Outfall 1335-1 drains to Eagle River west of Eagle River Loop Road (Figure 4). SGS transmitted preliminary results to HDR on August 3, and a follow-up sample for fecal coliform analysis was collected on August 7. The results of the laboratory analysis of the primary and replicate follow-up samples were below the program threshold (19 col/100 ml and 18 col/100 mL, respectively) and no further follow-up action was required.

Outfall 1335-1 is connected to network 1294, which drains subbasin 1294. At 999.7 acres, subbasin 1294 is the largest MS4 subbasin in the Eagle River watershed. Land use in the subbasin is predominantly residential, with one large commercial lot containing the Walmart Supercenter at the southeast corner of Eagle River Road and Eagle River Loop Road. The subbasin also includes the southern slopes of Mount Magnificent within Chugach State Park. Outfall 1335-1 discharges north of the pedestrian underpass below Eagle River Loop Road into

F)5

a flow path constructed with rock gabions. This storm water control feature was constructed and is maintained by the ADOT&PF Maintenance and Operations Division.

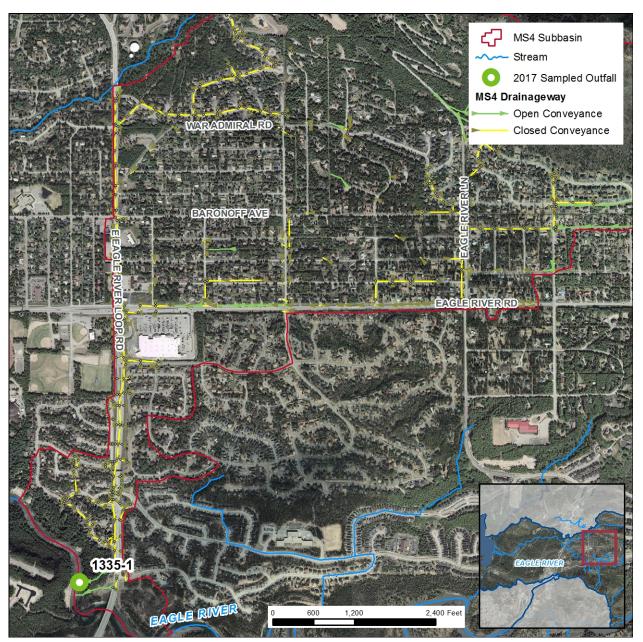


Figure 4. MS4 Network 1294 Draining to Outfall 1335-1 in Eagle River Watershed

4.2 Observations from Reconnaissance Trips

During reconnaissance trips prior to sampling, 60 outfalls to Fish, Furrow, Rabbit, and Campbell creeks and Eagle River were investigated. Of these, 20 were determined to be not suitable for sampling. Reasons that outfalls were deemed not suitable include that they were not flowing during dry weather conditions, that the network connected to the outfall conveys both storm water and a segment of piped creek, that they were outfalls to or from sedimentation basins, that they were damaged or submerged, and/or that access was limited due to unsafe conditions

or private property. Outfalls that were observed to be clogged, damaged, or submerged and may require maintenance are listed in Table 6. All outfalls investigated in 2017 are listed in Appendix B.

Watershed	Outfall Number	Type of Issue	Notes
Fish Creek	684-1	Damaged	EOP is corroded and unravelling.
Fish Creek	298-1	Unknown – Damaged?	Could not locate outfall. May have been crushed below large mayflower tree?
Fish Creek	27-1	Damaged	Outfall is perched approximately 12 feet within extensive erosion below EOP. Further erosion may compromise outfall.
Fish Creek	32-1	Partially Buried	Outfall is partially buried behind a large willow. A flow path was observed incised through sediment, suggesting outfall flows during storm events, but potential exists for outfall to become completely buried.
Fish Creek	1259-1	Submerged	Partially submerged, cannot sample.
Fish Creek	1259-2	Submerged	Partially submerged, cannot sample.
Fish Creek	7-1	Submerged	Partially submerged, could not sample in 2017. Construction along W. 36 th will include replacement of outfall, may be resolved in future years.
Fish Creek	686-167	Submerged	Partially submerged, cannot sample.
Furrow Creek	407-2	Potentially Unauthorized Alteration	Outfall is located in backyard of private residence. Homeowner has constructed a large structure over outfall, inhibiting access to EOP and preventing investigation and sample collection.

Table 6. Damaged, Clogged and Submerged Outfalls

Field teams also noted areas where recent construction may have resulted in changes to the storm system that are not reflected on the HGDB. The HGDB should be updated in these locations to ensure that DWS, as well as any other MS4 permit compliance activities, can be conducted in the future. These areas include:

4.2.1 Fish Creek

- Turnagain Boulevard Upgrade 35th Avenue to Spenard Road. The HGDB may need to be updated to reflect any associated rerouting and/or changes to the MS4 network.
- Northwood Park. Extensive clearing of vegetation and recent ground disturbance was observed on the north portion of Northwood Park. Outfall 137-1 could not be accessed during reconnaissance due to an apparent homeless camp in the area. The HGDB may need to be updated if any future upgrades or maintenance includes modification to the MS4 network.

4.2.2 Rabbit Creek

• East 140th Avenue and Buffalo Street. Outfall 691-1 could not be located during reconnaissance. The date of the HGDB mapping (as of October 2017) is 2007. The

HGDB may need to be update to reflect any rerouting and/or changes to the MS4 network since 2007.

Outfalls in the Fish Creek watershed may be sampled again during the current permit cycle. By ensuring that the HGDB contains up-to-date and accurate information on the MS4, the MOA will facilitate prompt response to reports of illicit discharges and thorough dry weather screening in the future.

GIS analysis of the outfalls from the MS4 in the Rabbit Creek watershed shows few outfalls suitable for sampling for the DWS program, primarily due to a lack of closed conveyances from which an isolated sample of storm water can be collected. No outfalls in the Rabbit Creek watershed were sampled under the DWS program in 2017. The HGDB mapping of the MS4 network for the Rabbit Creek watershed has been referred to WMS for updating. Should updates to the HGDB show outfalls that may be suitable for sampling, those outfalls would be targeted for sampling within the current permit cycle.

4.3 Future DWS Sampling

Outfalls in the Hood Creek, Peters Creek, and Potter Creek watersheds will be investigated and targeted for sampling in 2018. Outfalls in the Hood Creek and Potter Creek watersheds were last sampled in 2013, when only one outfall in each watershed was found to be suitable for sampling (MOA 2013). There are no outfalls in the Peters Creek watershed mapped in the HGDB.⁴ It is not anticipated that 15 outfalls that are suitable for sampling will be identified between these three watersheds. As in prior years when additional outfalls are required, the next watersheds in the prioritized list will be investigated. There are no outfalls in the Mirror Creek or Glacier Creek watersheds mapped in the HGDB,⁵ and thus outfalls in the Ship Creek and Chester Creek watersheds will be investigated again in 2018.

Field notes from previous years' reconnaissance and sampling activities in these watersheds will be reviewed prior to field activities in 2018 to guide selection of outfalls for sampling. Outfalls in the Ship Creek and Chester Creek watersheds that were sampled in 2016 will not be selected for sampling in 2018.

⁴ As of October 6, 2017.

⁵ As of October 6, 2017.

5.0 References

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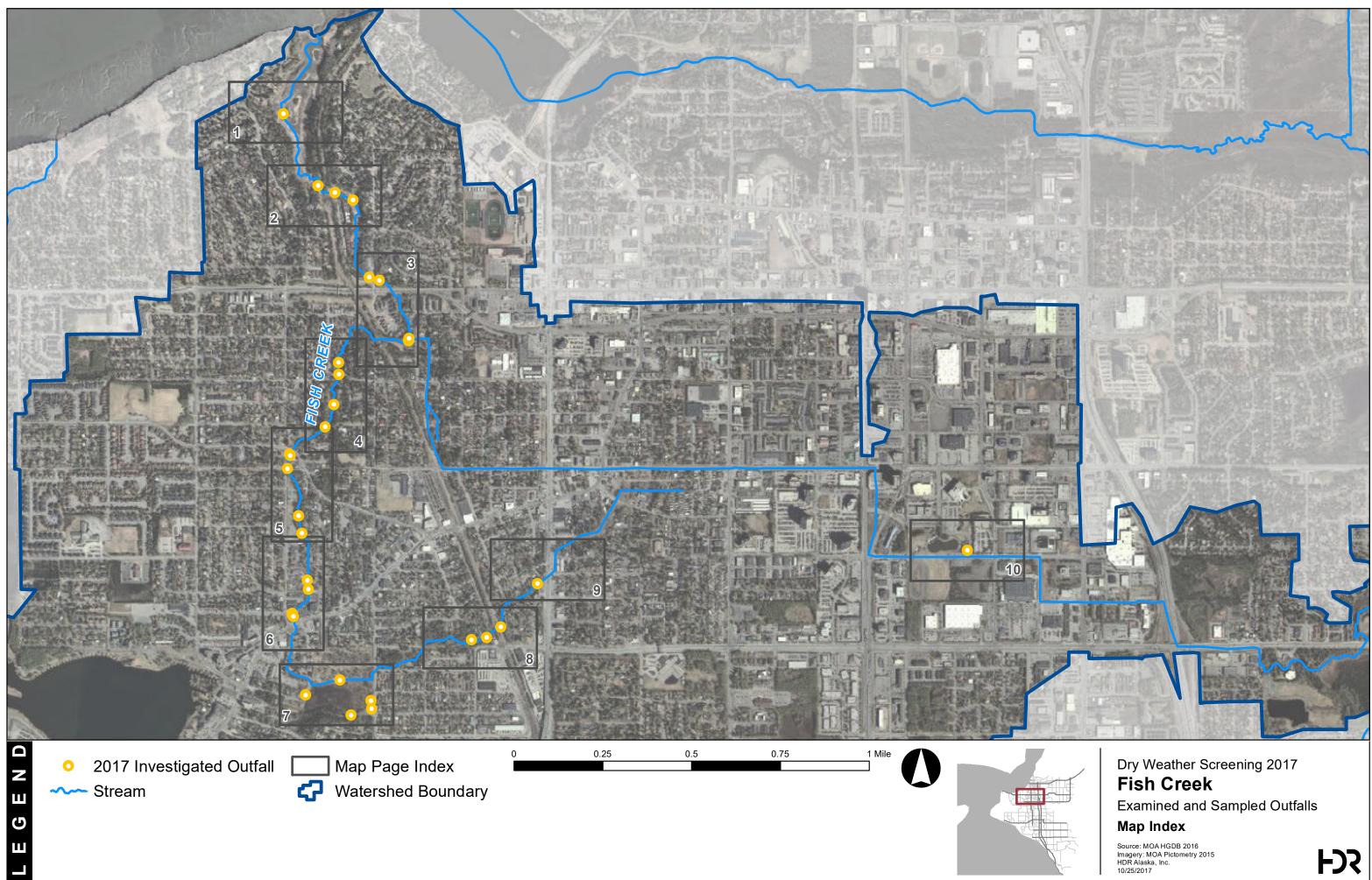


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- ------. 2017b. Observed Weather Reports for Anchorage, Alaska, June, July and August 2017. Accessed at <u>http://w2.weather.gov/climate/index.php?wfo=pafc</u> on October 17, 2017.

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Appendix A Watershed Maps

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2017 Examined Outfall, Alternate 0

----- Stream

Drainage Ways Pipe ► Open Channel

Drainage Way Nodes

End of Pipe (EOP)

Outfall Minor

Outlet



Dry Weather Screening 2017 Fish Creek Examined and Sampled Outfalls Page 1





0 2017 Could Not Locate Outfall

----- Stream

Drainage Ways

Pipe Routing Open Channel

Drainage Way Nodes

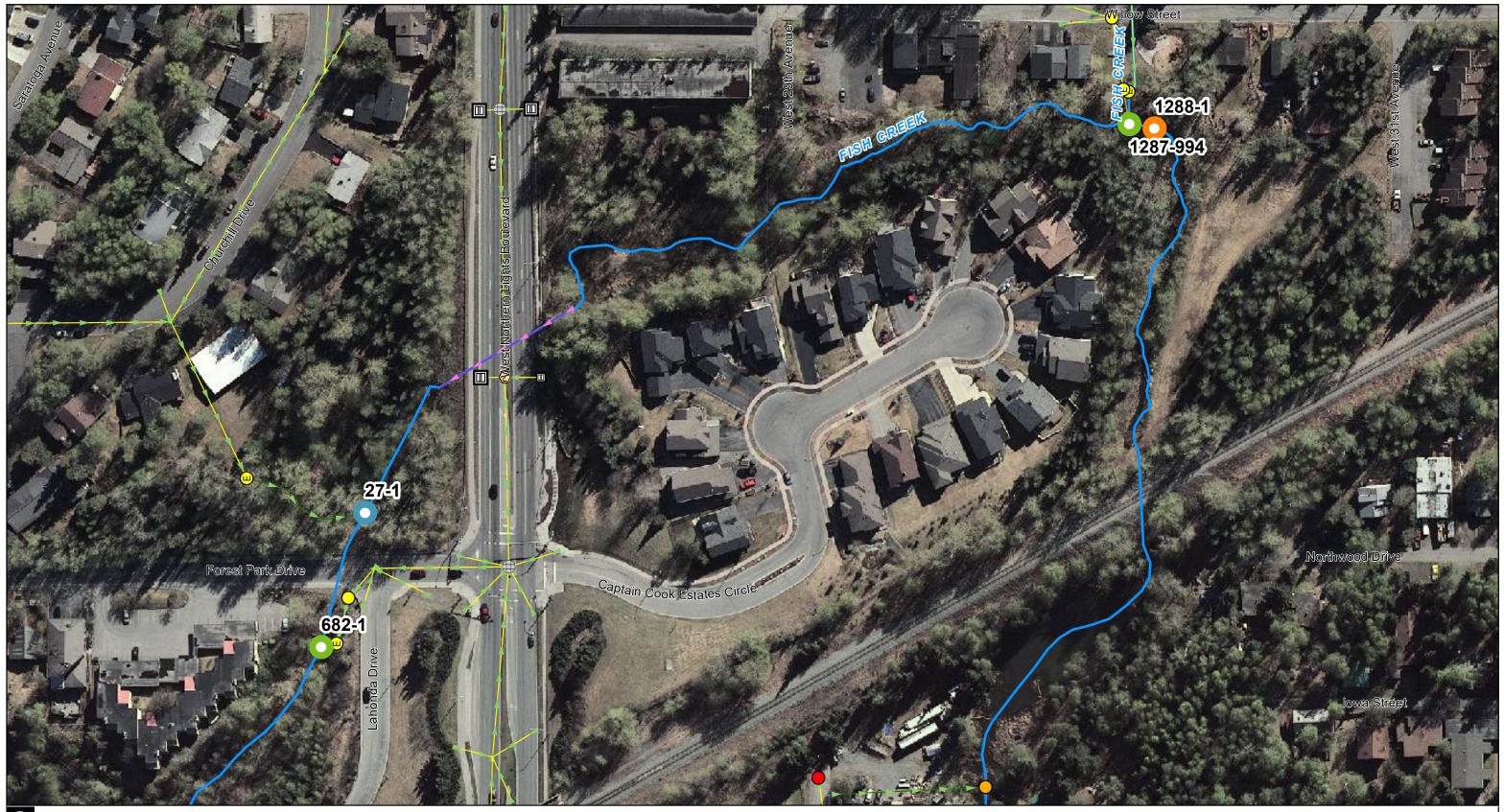
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- Control Outlet
- End of Pipe (EOP)
- Outfall
- Outfall Major
- Outfall Minor



Dry Weather Screening 2017 Fish Creek Examined and Sampled Outfalls Page 2





EGEND

- 2017 Sampled Outfall
 - 2017 Examined Outfall, Alternate
 - 2017 Examined Outfall, Not Suitable
- ----- Stream

- Drainage Ways
- Pipe
- ► Routing ► Open Channel ► Xing Culvert
- Drainage Way Nodes
- Catch Basin
- Curb Inlet
- End of Pipe (EOP)
- ① Manhole
- 🔊 ogs
- Outfall
 Outfall Major
 Outlet

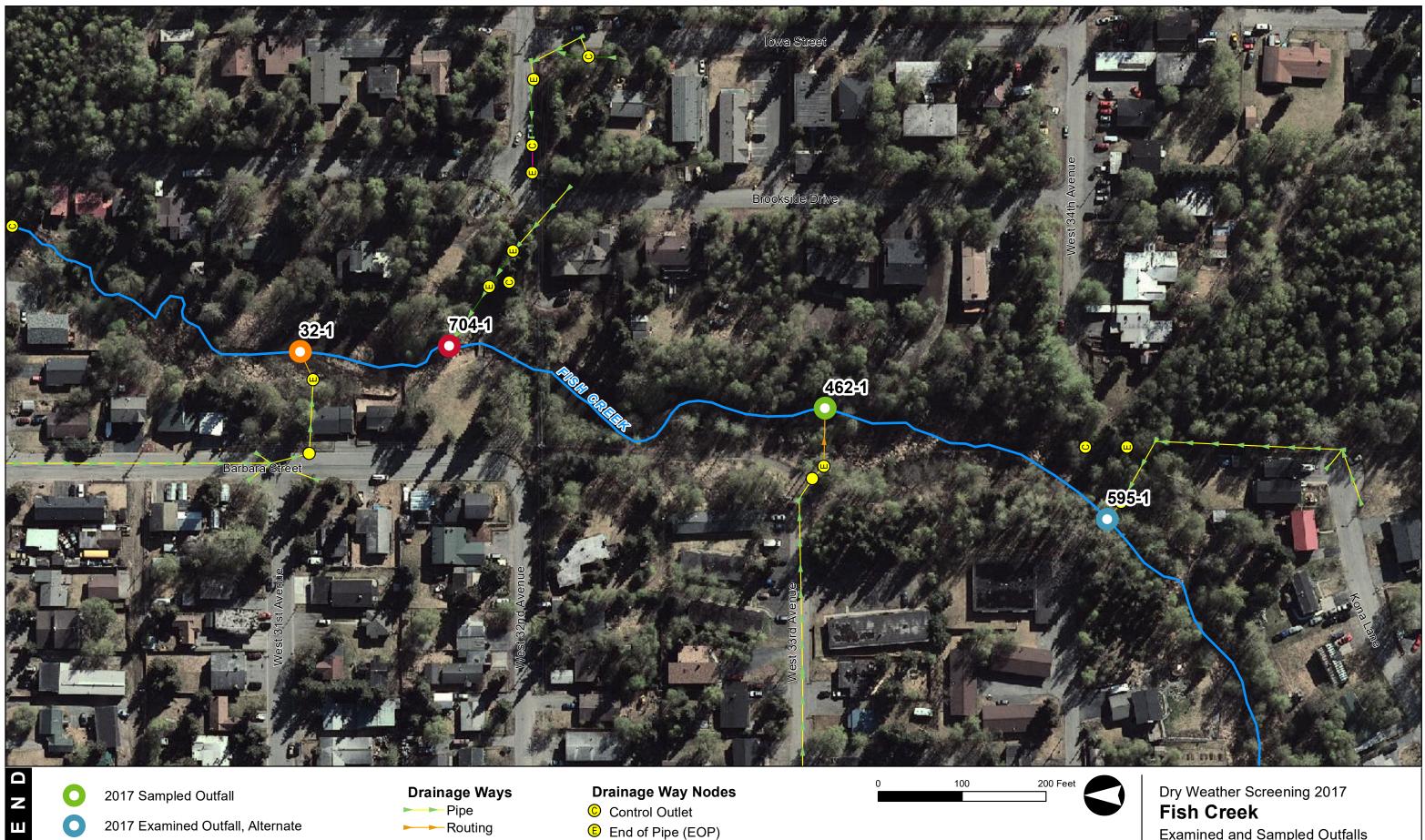
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200 Feet

Dry Weather Screening 2017 **Fish Creek** Examined and Sampled Outfalls **Page 3**





2017 Sampled Outfall

-Stream-

G

ш

- 2017 Examined Outfall, Alternate \bigcirc
- 2017 Examined Outfall, Not Suitable
 - 2017 Could Not Locate Outfall

- Drainage Ways
- Pipe Routing
- ► Open Channel Xing Culvert

Drainage Way Nodes

- Control Outlet
- End of Pipe (EOP)
- Outfall Major
- Outfall Minor
- Outlet



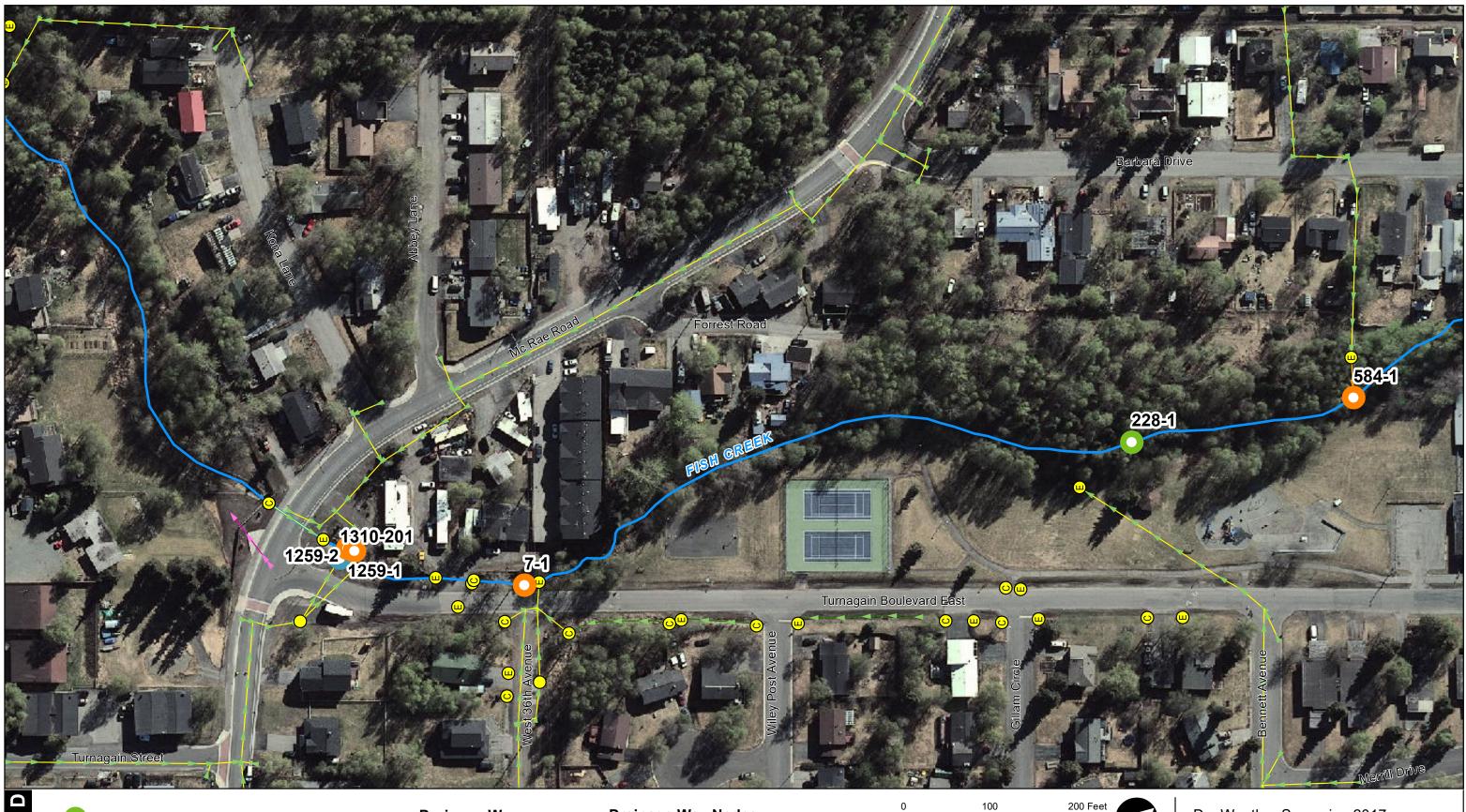
200 Feet

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Dry Weather Screening 2017 Fish Creek Examined and Sampled Outfalls Page 4





- 2017 Sampled Outfall
 - 2017 Examined Outfall, Alternate
- 2017 Examined Outfall, Not Suitable

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LEG

- Drainage Ways
- Pipe Routing
- Open Channel
 Xing Culvert

Drainage Way Nodes

- Control Outlet Outlet
- End of Pipe (EOP)
- Outfall
- Outfall Major
- Outfall Minor



Dry Weather Screening 2017 **Fish Creek** Examined and Sampled Outfalls **Page 5**





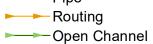
2017 Examined Outfall, Alternate

2017 Examined Outfall, Not Suitable

----- Stream

LEG





Drainage Way Nodes

- Bypass Outlet Outlet
- Control Outlet
- End of Pipe (EOP)
- Outfall
- Outfall Major



200 Feet

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0

Dry Weather Screening 2017 Fish Creek Examined and Sampled Outfalls Page 6





- 2017 Examined Outfall, Alternate
- 2017 Examined Outfall, Not Suitable
 - 2017 Could Not Locate Outfall
- ----- Stream

Б П

- Drainage Ways Continuity Pipe
- ► Open Channel

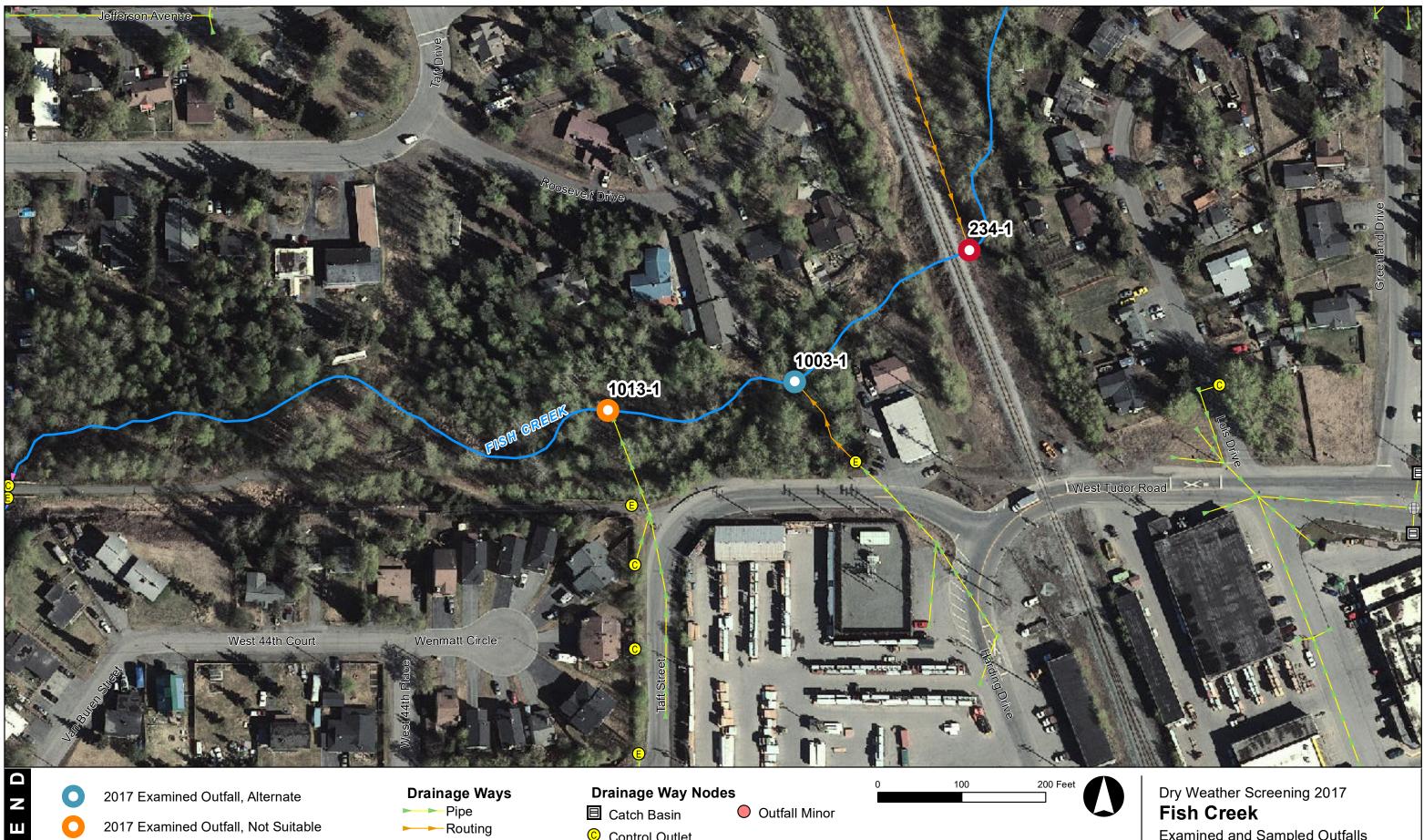
Drainage Way Nodes

- Control Outlet
- End of Pipe (EOP)
- Outfall
- Outfall Major
- Outfall Minor



Dry Weather Screening 2017 Fish Creek Examined and Sampled Outfalls Page 7





- 2017 Examined Outfall, Not Suitable
 - 2017 Could Not Locate Outfall
- ----- Stream

G

Ш

- Pipe Routing
- Xing Culvert
- Catch Basin
- Control Outlet
- End of Pipe (EOP)
- Manhole
 Manhole
- Outfall

Fish Creek Examined and Sampled Outfalls Page 8





 \bigcirc 2017 Examined Outfall, Alternate

----- Stream

Drainage Ways

- Pipe ► Inlet Routing
- ► Open Channel
- Xing Culvert

Drainage Way Nodes

- Catch Basin 😌 Catchbasin Manhole
- Control Outlet
- End of Pipe (EOP)
- ① Manhole
- 🖻 OGS Outfall Outfall Major Outfall Minor Outlet



200 Fee

100

Dry Weather Screening 2017 Fish Creek Examined and Sampled Outfalls Page 9







2017 Sampled Outfall

----- Stream

Drainage Ways Pipe Xing Culvert

Drainage Way Nodes

- Control Outlet
- E End of Pipe (EOP)
- Outfall Minor

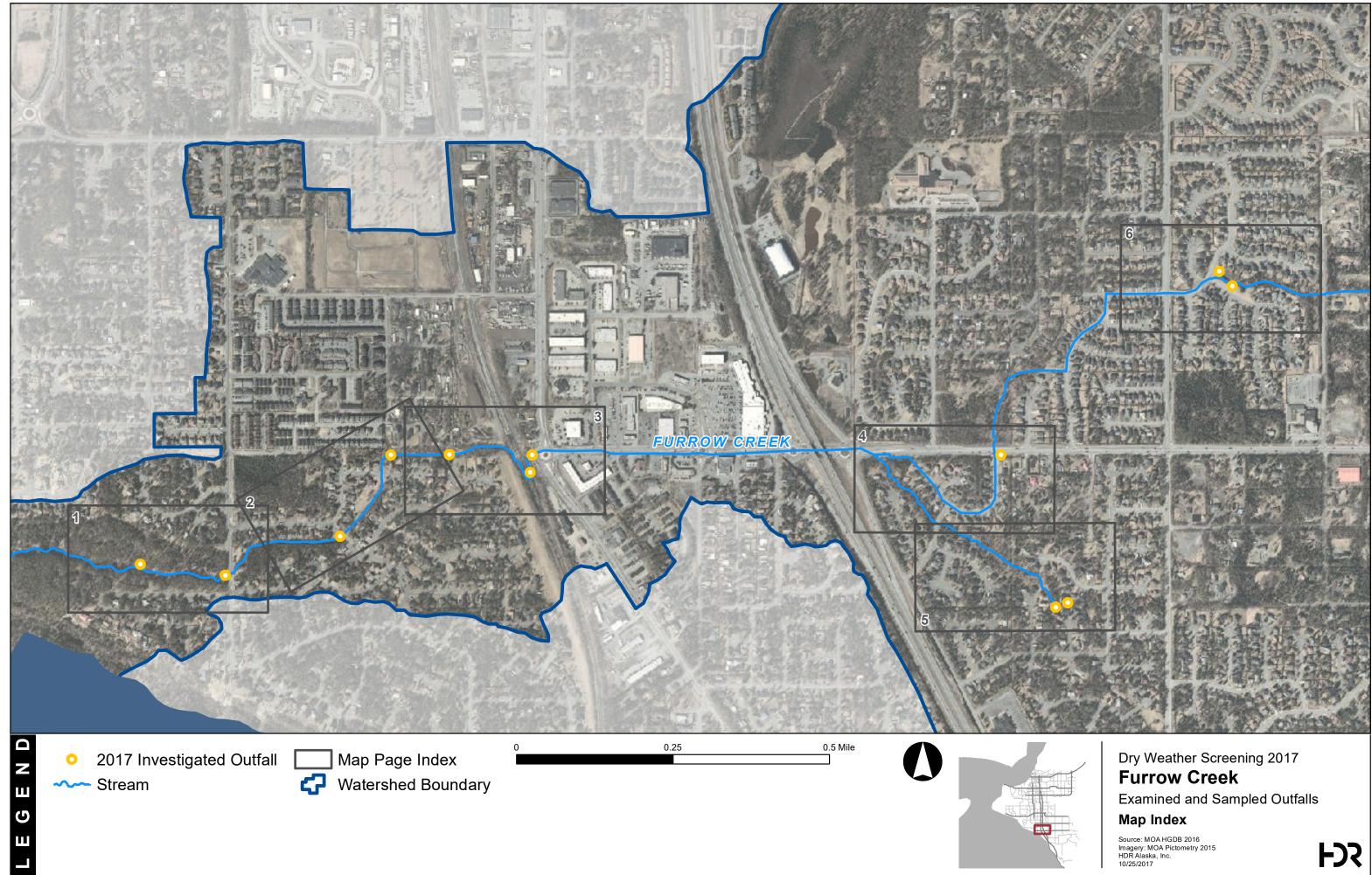
Outlet

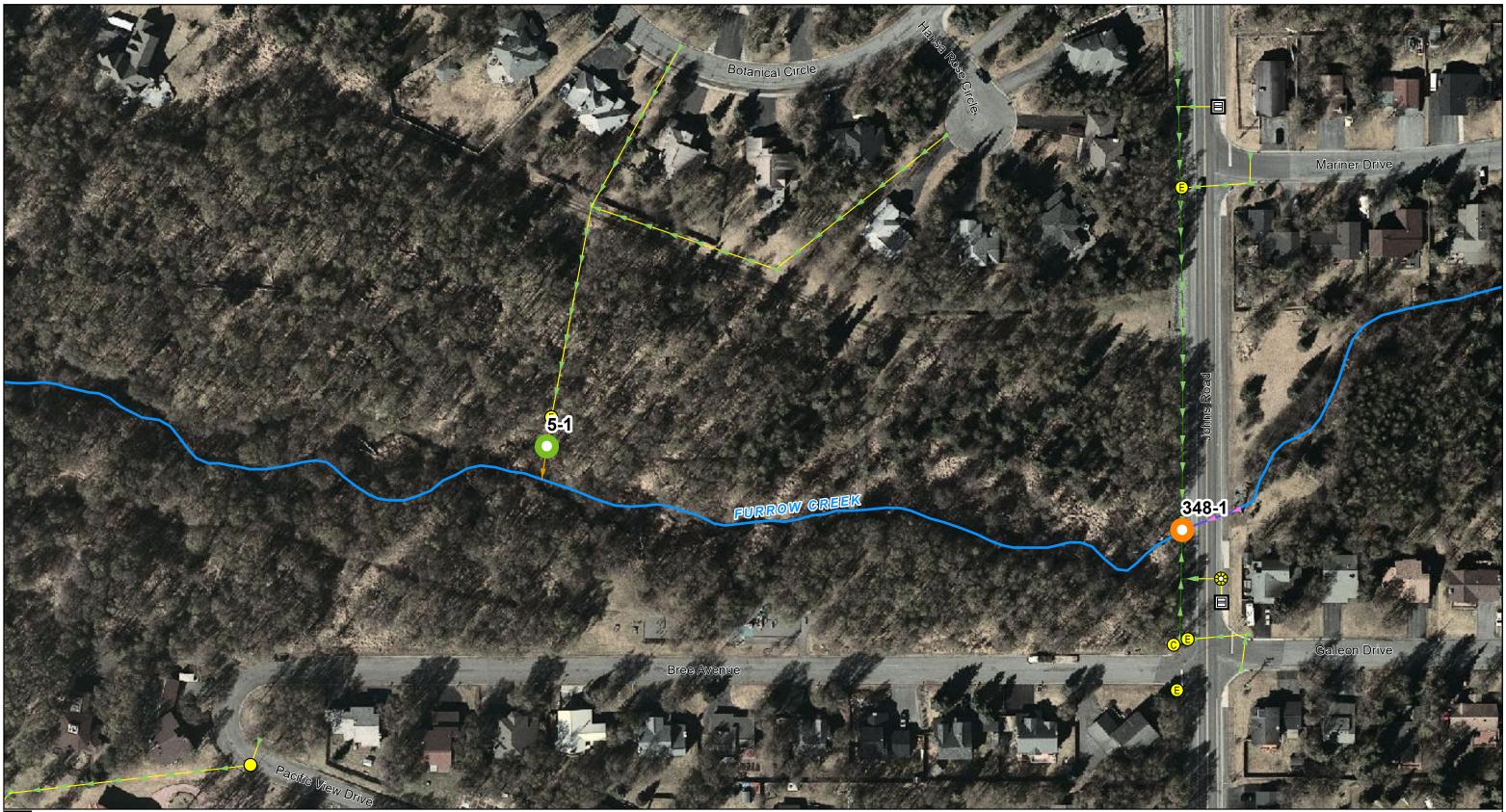
0 100 200 Feet



Dry Weather Screening 2017 **Fish Creek** Examined and Sampled Outfalls **Page 10**









2017 Sampled Outfall

2017 Examined Outfall, Not Suitable

----- Stream





► Xing Culvert

Drainage Way Nodes

- Catch Basin
- 😵 Catchbasin Manhole

Outlet

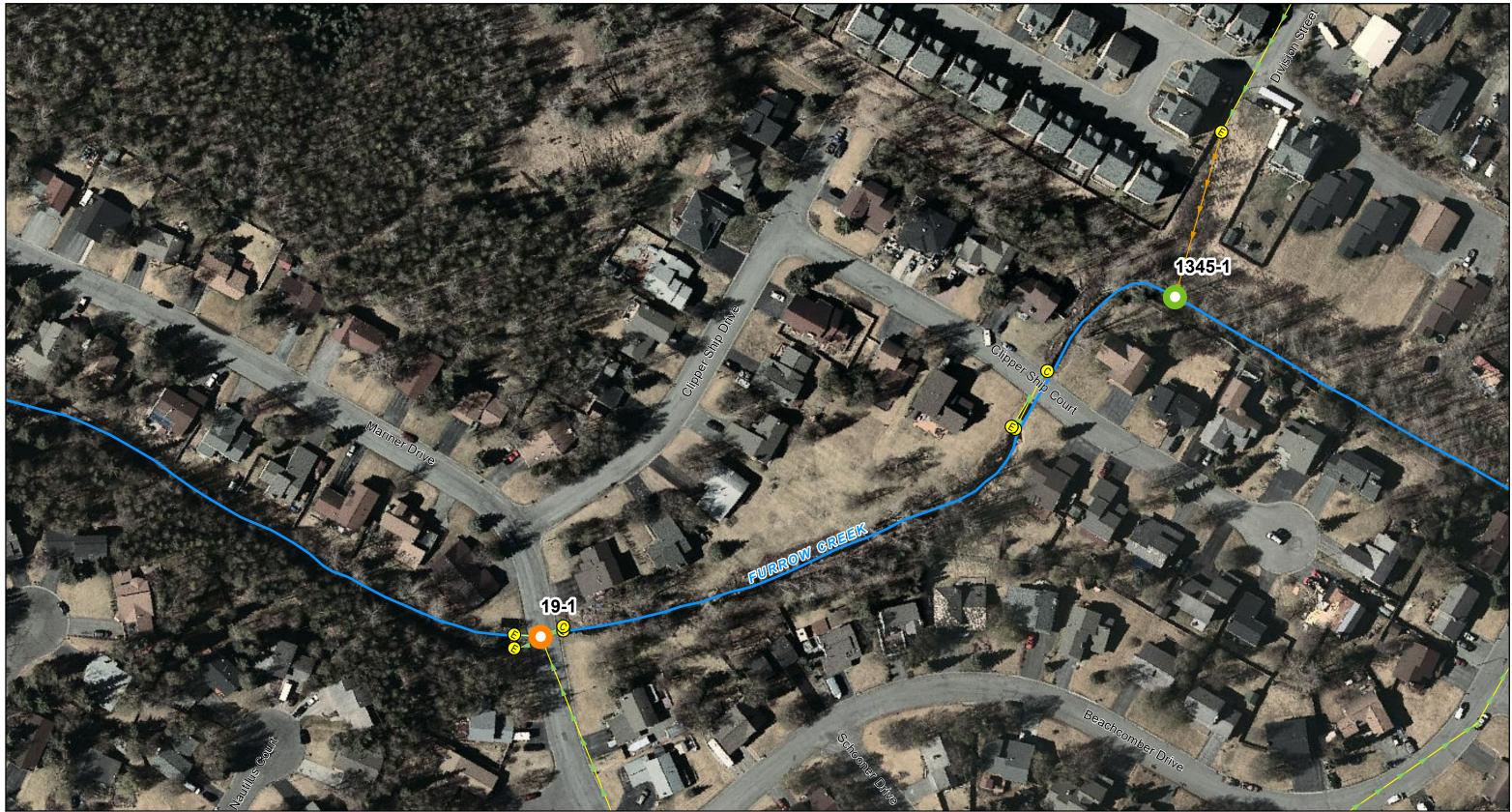
- Control Outlet
- End of Pipe (EOP)
- Outfall
- 100 Outfall Major



200 Feet

Dry Weather Screening 2017 **Furrow Creek** Examined and Sampled Outfalls Page 1







2017 Sampled Outfall 2017 Examined Outfall, Not Suitable

Drainage Ways Pipe Routing

Drainage Way Nodes

- Control Outlet
- End of Pipe (EOP)
- Outfall Major
- Outfall Minor



100

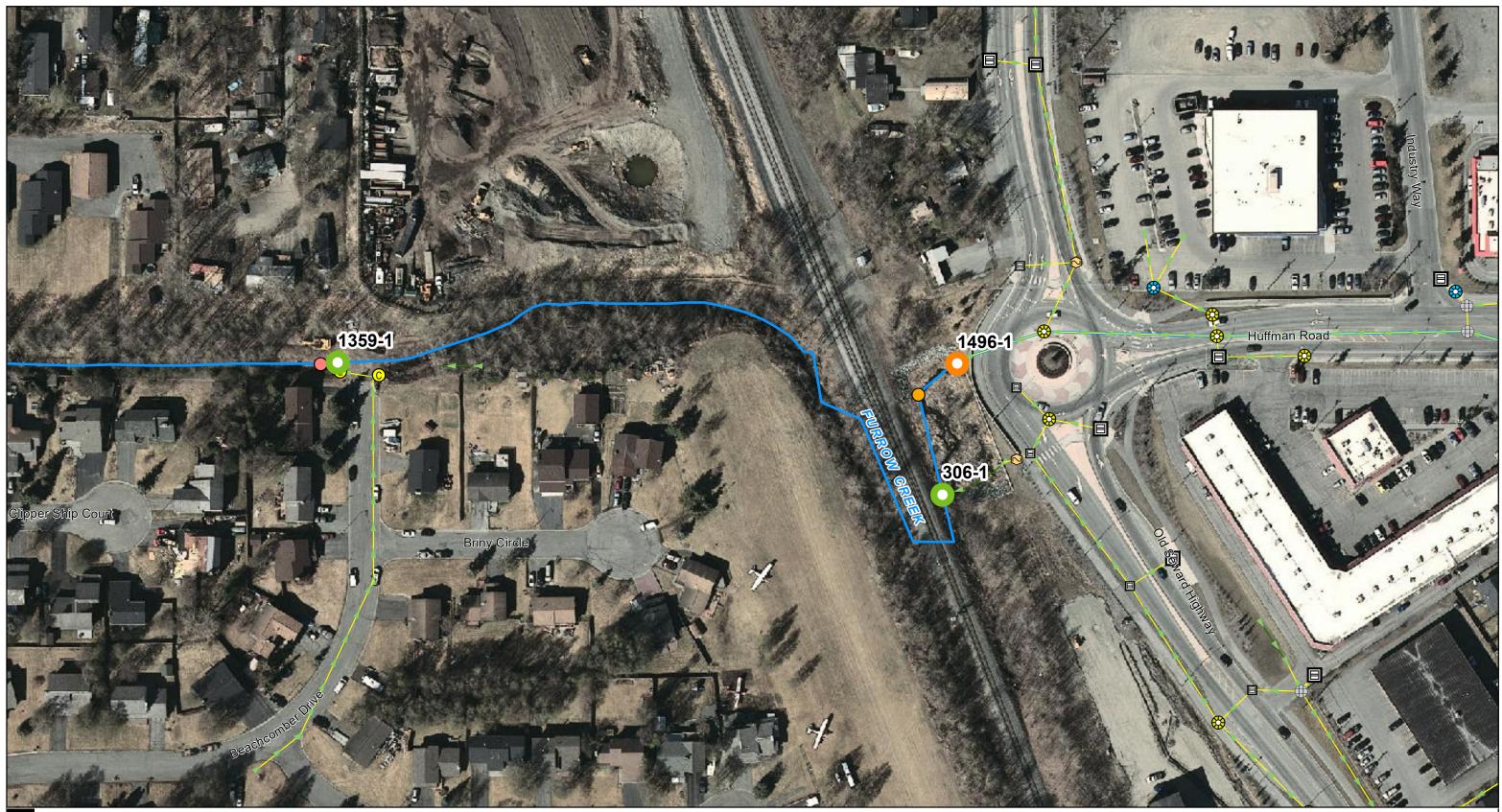
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Dry Weather Screening 2017 **Furrow Creek** Examined and Sampled Outfalls Page 2







2017 Sampled Outfall

2017 Examined Outfall, Not Suitable

----- Stream

Drainage Ways

Pipe Routing ► Open Channel

Drainage Way Nodes

- Catch Basin Catchbasin Manhole
- Control Outlet
- Curb Inlet
- End of Pipe (EOP)
- 🛇 OGS Outfall Outfall Minor

① Manhole

0

😵 Top Intake Manhole



100

Dry Weather Screening 2017 **Furrow Creek** Examined and Sampled Outfalls Page 3





2017 Examined Outfall, Not Suitable

----- Stream

E G





Drainage Way Nodes

- Catch Basin 😌 Catchbasin Manhole
- Curb Inlet
- End of Pipe (EOP)
- O Inlet ① Manhole Outfall Outlet

O Feature Start



Dry Weather Screening 2017 **Furrow Creek** Examined and Sampled Outfalls Page 4







→ Open Channel
 ▶ Vegetated Drainage Way
 ▶ Feature Start

- Outfall

Page 5







2017 Sampled Outfall

----- Stream

Drainage Ways Pipe ► Open Channel

Drainage Way Nodes

- Control Outlet
- End of Pipe (EOP)
- Outfall
- Outfall Major
- Outlet

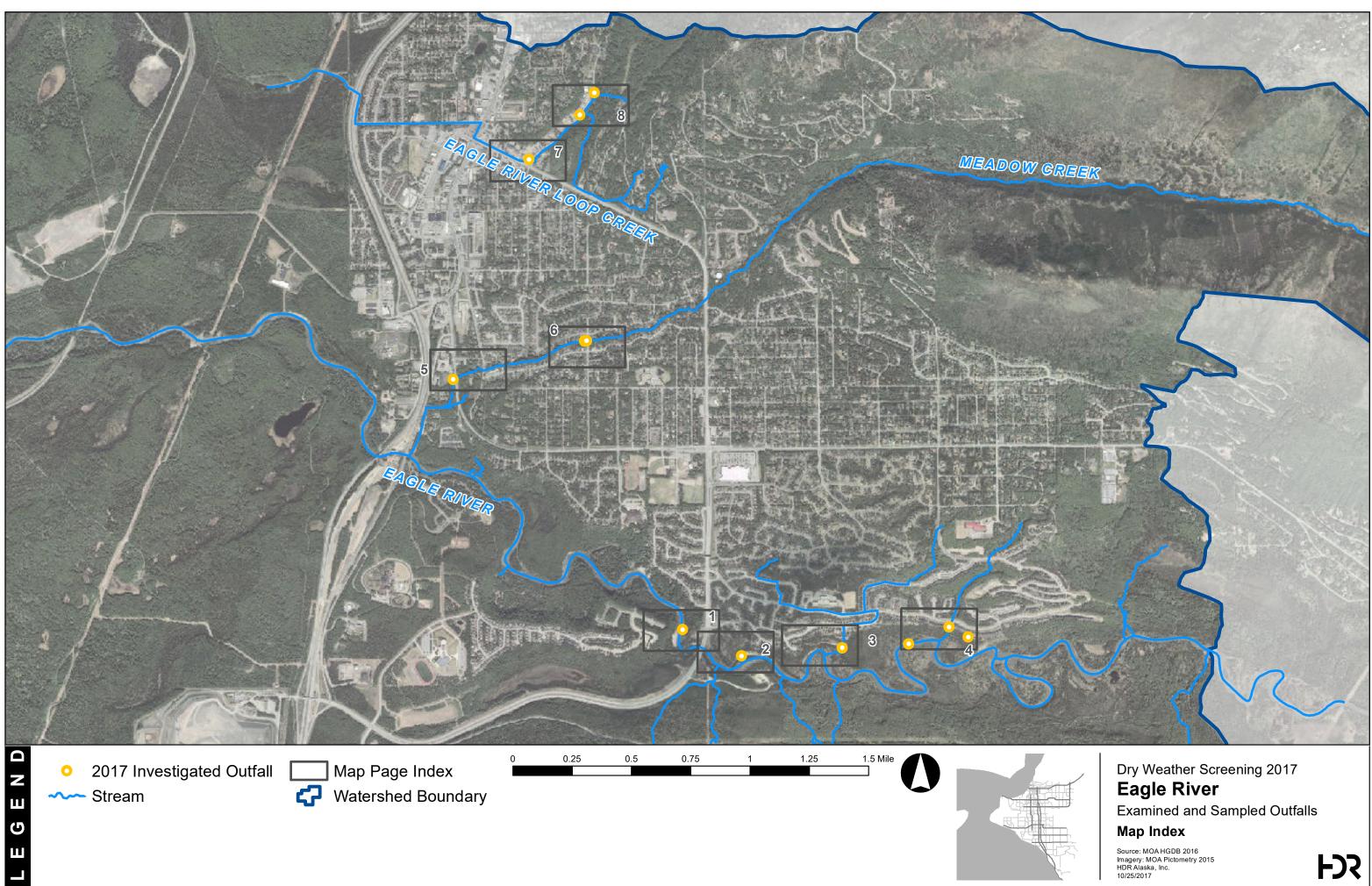


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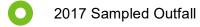
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Dry Weather Screening 2017 **Furrow Creek** Examined and Sampled Outfalls Page 6









----- Stream

Е С

Drainage Ways

Pipe ► Routing Open Channel Xing Culvert

Drainage Way Nodes

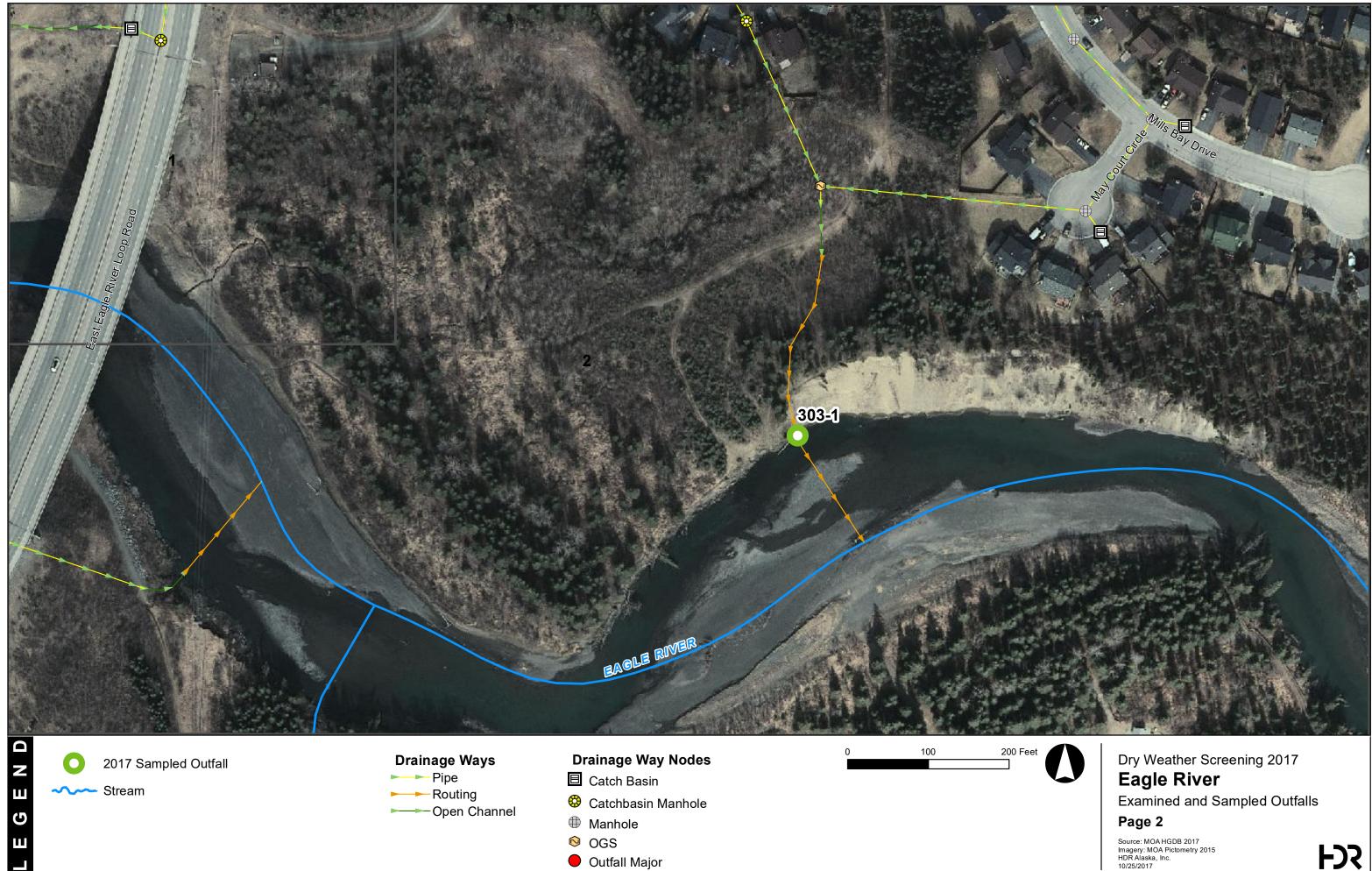
0

- Catch Basin
- 😌 Catchbasin Manhole
- 🔍 OGS
- Outfall Major



Dry Weather Screening 2017 Eagle River Examined and Sampled Outfalls Page 1





----- Stream

- Routing
- Open Channel

Catch Basin

- 😌 Catchbasin Manhole
- Manhole
 Manhole
- 🔍 ogs
- Outfall Major

Eagle River Examined and Sampled Outfalls Page 2





2017 Examined Outfall, Alternate

----- Stream

Е С

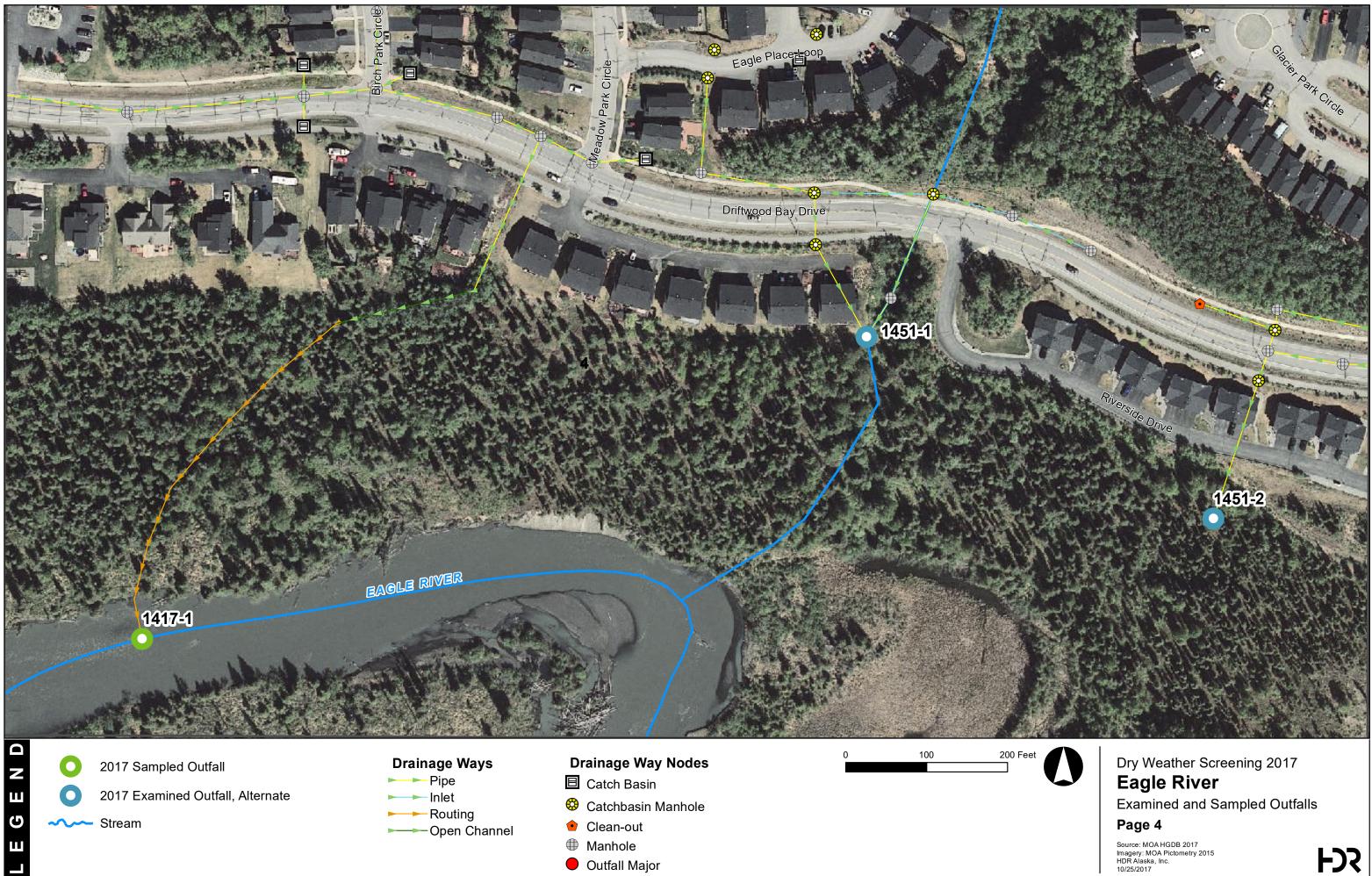
Drainage Ways Pipe Routing

Drainage Way Nodes Catch Basin 😌 Catchbasin Manhole O Inlet Manhole Outfall Major



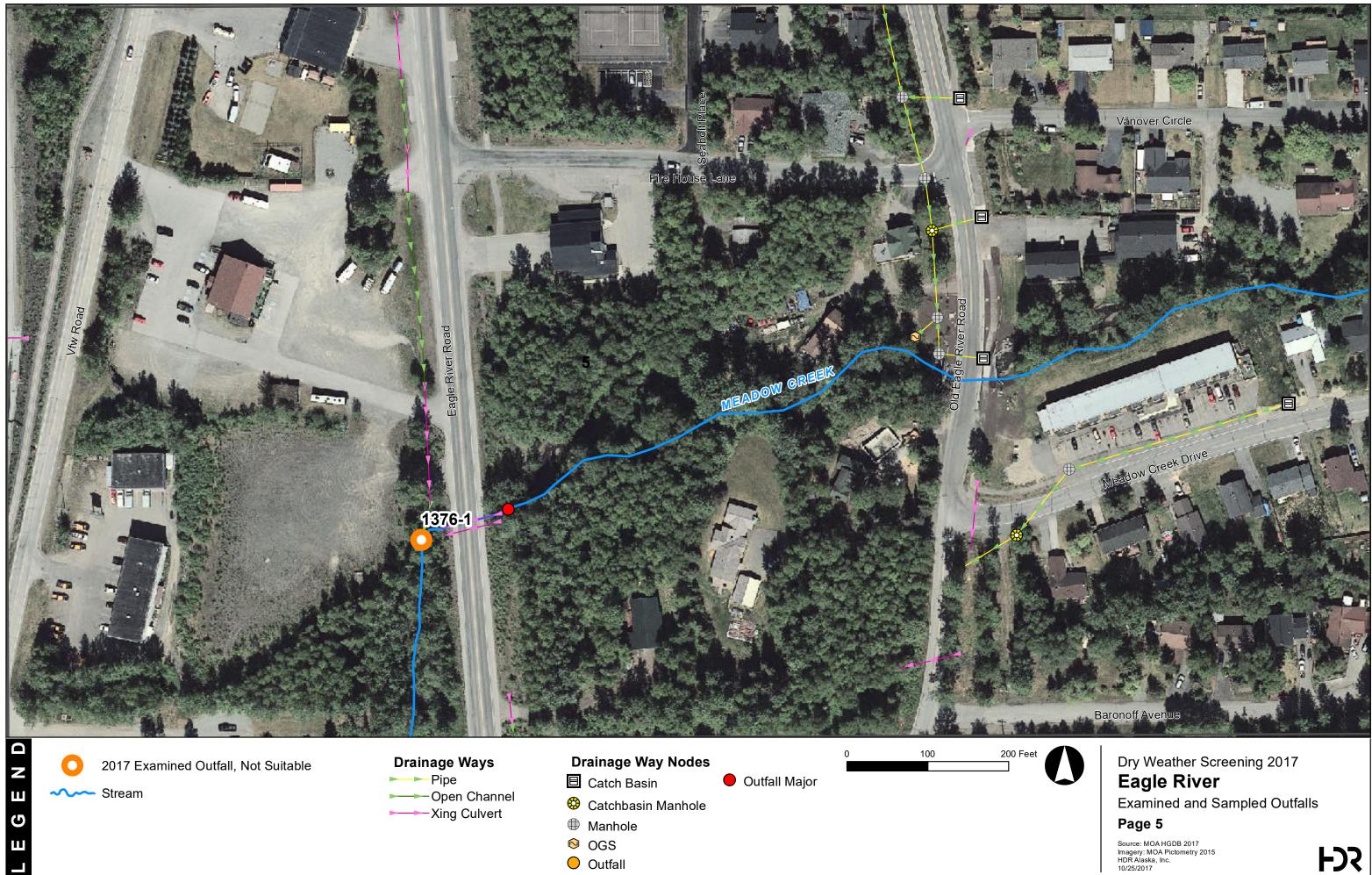
Dry Weather Screening 2017 Eagle River Examined and Sampled Outfalls Page 3





Outfall Major

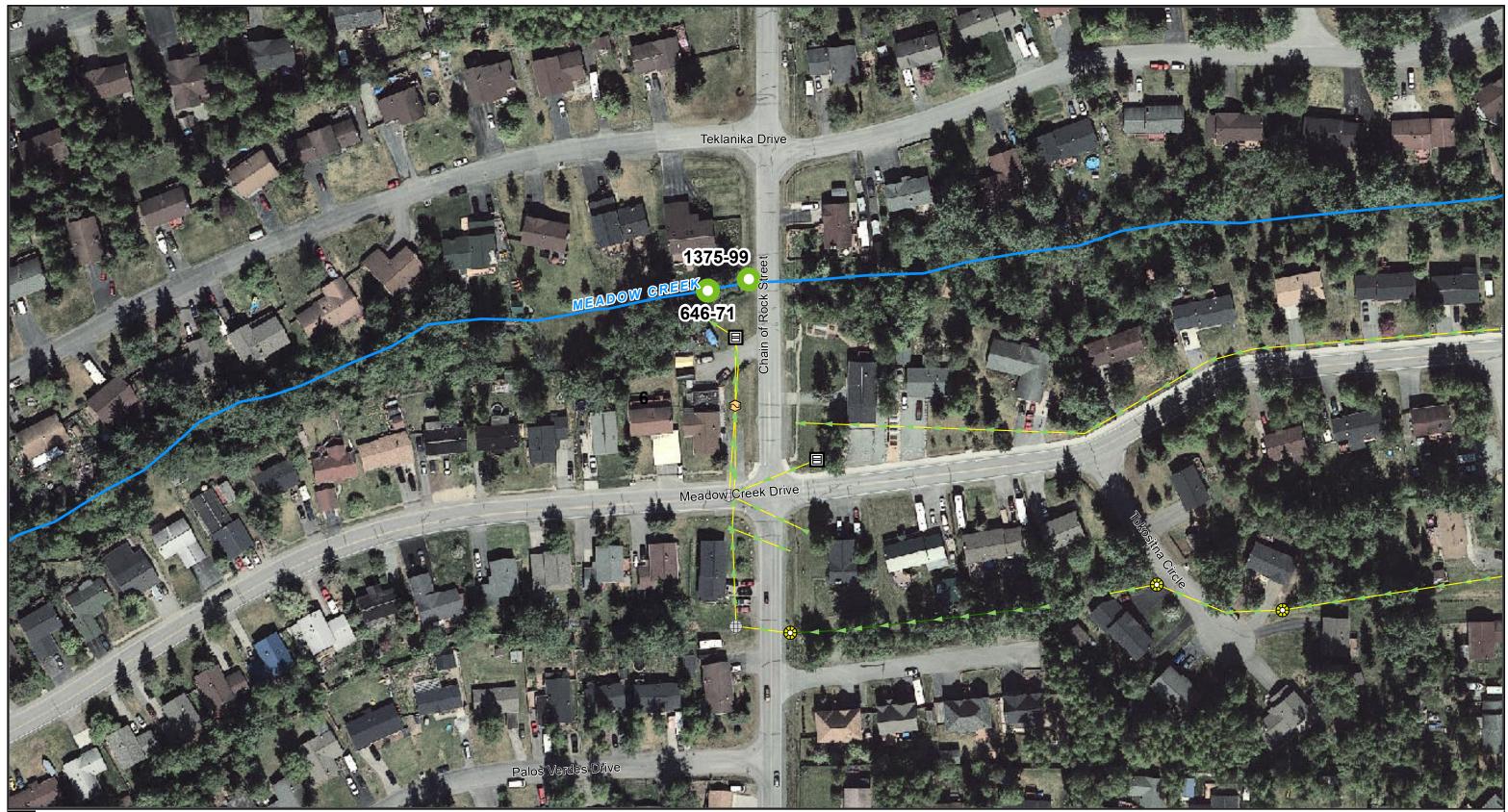




🛇 OGS

Outfall







2017 Sampled Outfall

----- Stream

Drainage Ways
Pipe
Open Channel

Drainage Way Nodes Catch Basin

- 😌 Catchbasin Manhole
- ① Manhole
- 🔊 ogs
- Outfall

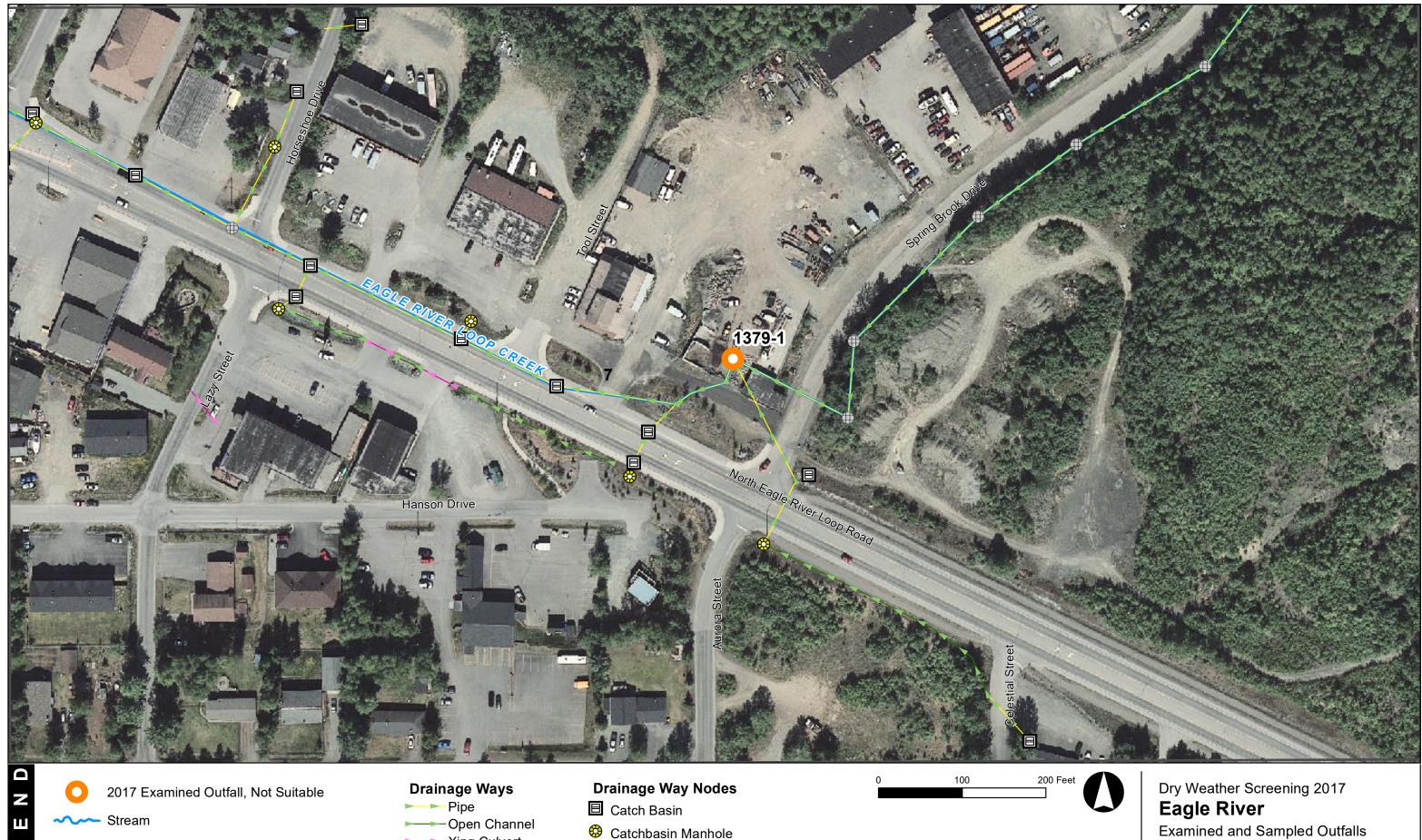


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Dry Weather Screening 2017 **Eagle River** Examined and Sampled Outfalls **Page 6**





2017 Examined Outfall, Not Suitable

----- Stream

LEG

Drainage Ways Pipe ► Open Channel Xing Culvert

Drainage Way Nodes

- Catch Basin
- 😌 Catchbasin Manhole

Manhole

Outfall

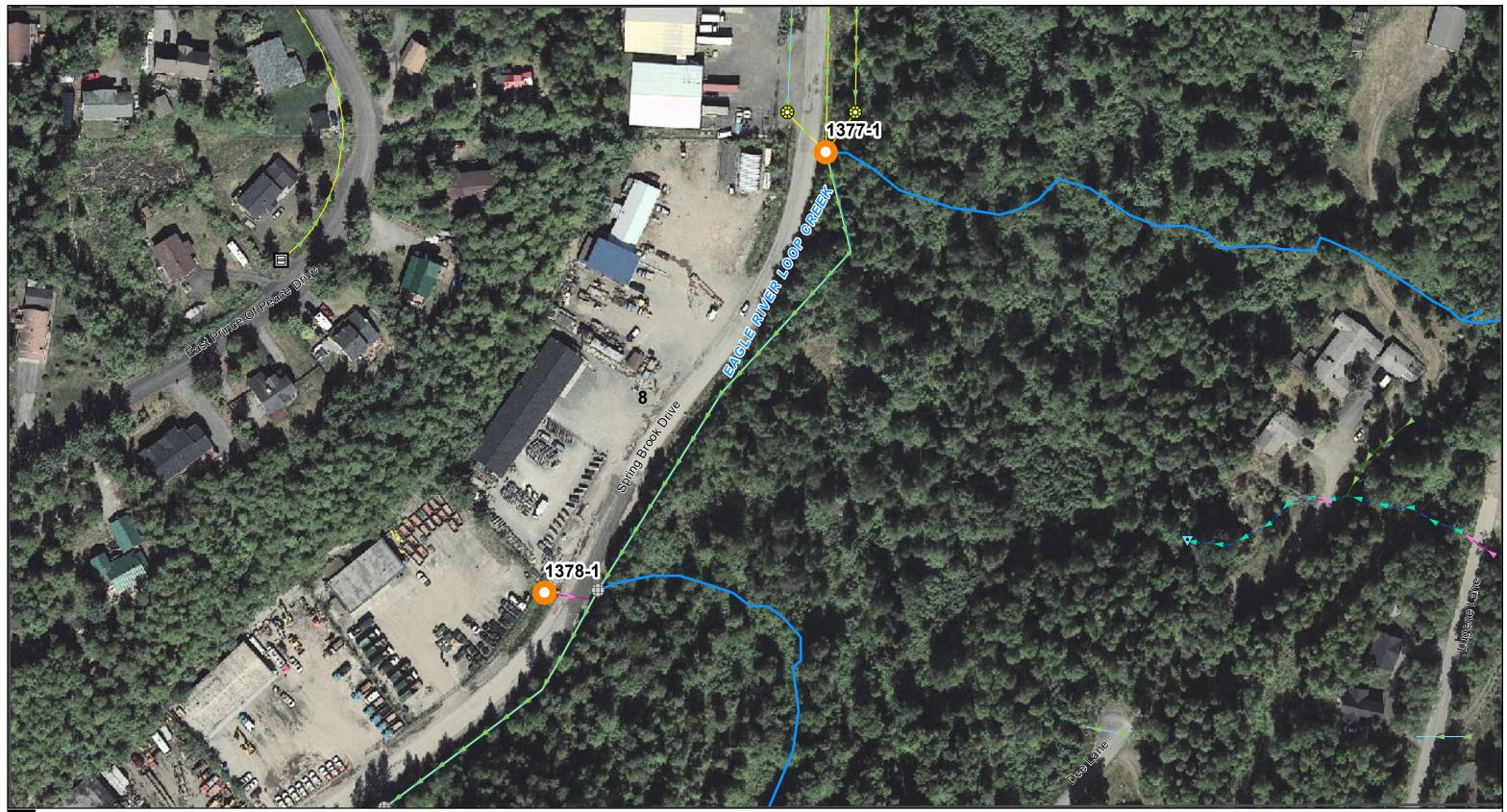


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Dry Weather Screening 2017 Eagle River Examined and Sampled Outfalls Page 7





2017 Examined Outfall, Not Suitable

----- Stream

EGEND

- Drainage Ways
- Pipe Inlet
- ► ► Ephemeral Channel ► - ► - Open Channel
- Xing Culvert
 - Ally Cuivert

Drainage Way Nodes

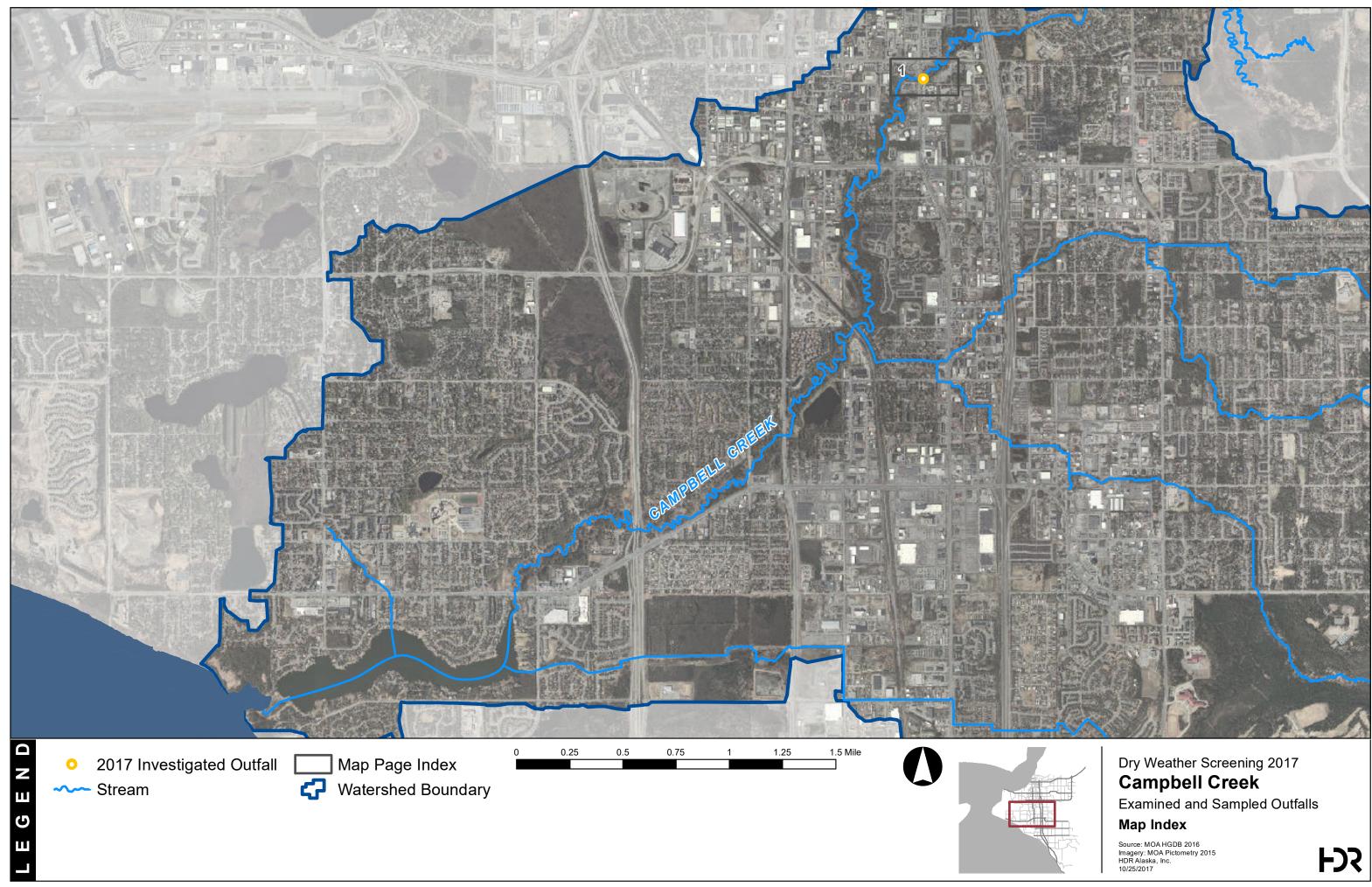
- Catch Basin
- 🔻 Sink
- 😌 Catchbasin Manhole
- Manhole
- Outfall Major
- Outlet



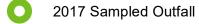
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Dry Weather Screening 2017 **Eagle River** Examined and Sampled Outfalls **Page 8**









----- Stream

LEG

Drainage Ways

Pipe Routing ► Xing Culvert

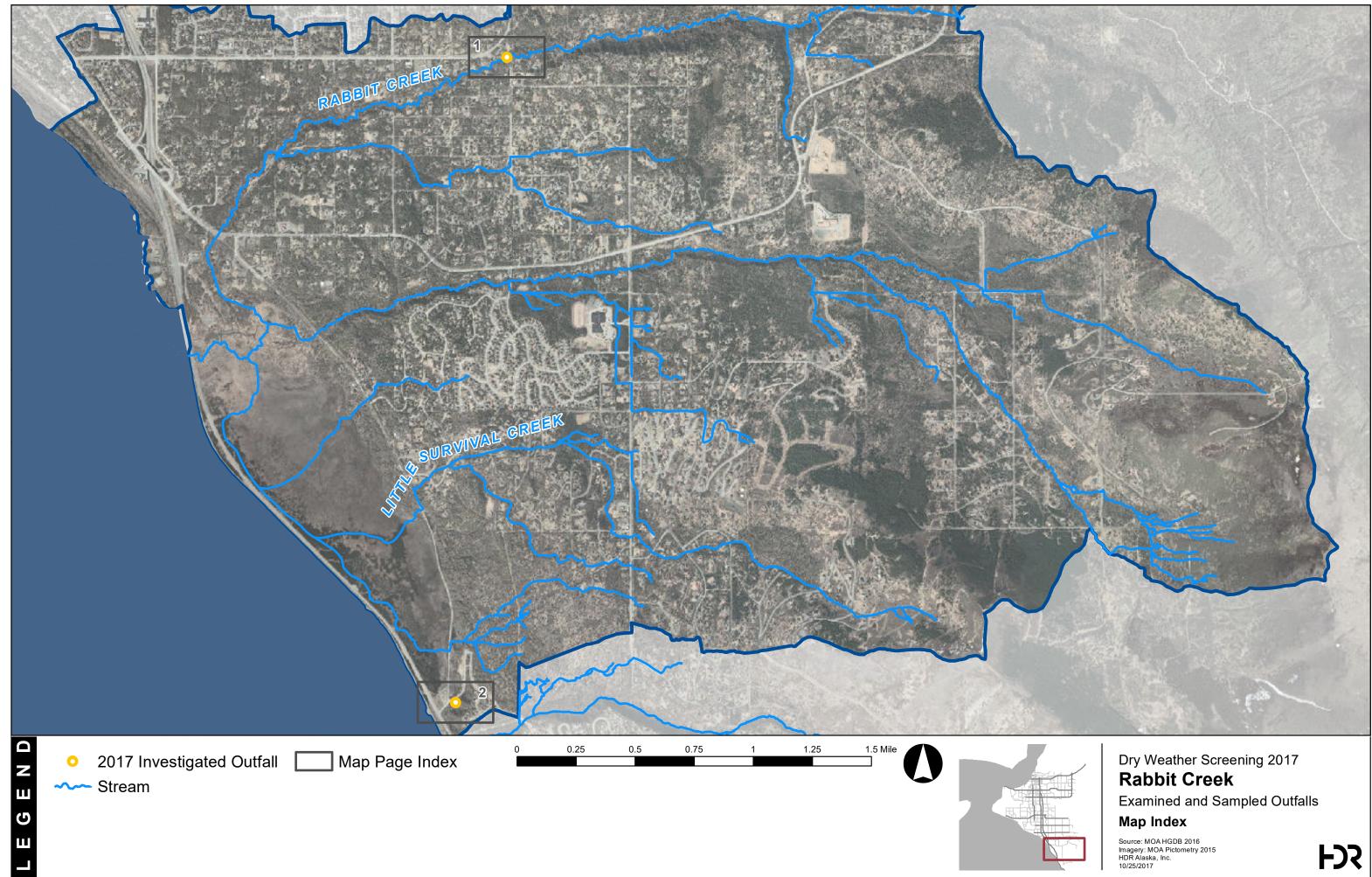
Drainage Way Nodes

- Catch Basin Catchbasin Manhole
- Control Outlet
- End of Pipe (EOP)
- ① Manhole
- 🛇 OGS Outfall Outfall Major Outfall Minor Outlet



Dry Weather Screening 2017 Campbell Creek Examined and Sampled Outfalls Page 1







2017 Could Not Locate Outfall 0

----- Stream

Drainage Ways

Pipe ► Open Channel Xing Culvert

Drainage Way Nodes

- Divide
- Inlet

Outfall

Outfall Major



Dry Weather Screening 2017 Rabbit Creek Examined and Sampled Outfalls Page 1





► Open Channel

- Divide
- End of Pipe (EOP)
- Inlet
- Outfall Major

Rabbit Creek Examined and Sampled Outfalls Page 2



Appendix B Field Notes

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Outfall Code	Activity; Category	Latitude	Longitude	Location Description and Notes	
Fish Creel	Fish Creek				
684-1	Examined; Alternate	61.20251	-149.93555	West bank, within Fish Creek Estuary. Standing water in pipe, flowing water in flow path to creek; may be groundwater discharge. End of Pipe (EOP) is corroded and unravelling.	
494-1	Could not locate	61.19959	-149.93266	West bank, below Loussac Dr. No access due to private property and Alaska Railroad tracks.	
429-1	Could not locate	61.19931	-149.93122	East bank, below Arcadia Dr. No access due to private property and Alaska Railroad tracks.	
298-1	Could not locate	61.19900	-149.92970	East bank, below Forest Park Dr. Surface runoff from road has incised small channel and eroded a flow path. Could not locate EOP; may be crushed below large mayflower tree. Cold, clear water discharging at base of tree, likely groundwater.	
27-1	Examined; Alternate	61.19572	-149.92750	East bank, east of Forest Park Dr. at Northern Lights Blvd. Outfall is perched approximately 12 feet above ground with extensive scour erosion below. Water flowing from outfall and down flow path to creek.	
1288-1	Examined; Not Suitable	61.19328	-149.92504	East bank, at Little Park on Willow St. Piped branch of Fish Creek co-routed with MS4. Cannot isolate outflow.	
32-1	Examined; Not Suitable	61.19240	-149.93094	West bank, at Barbara St. Park on Barbara St. No flow, EOP is buried behind a large willow. Storm flow from outfall has incised a flow path through shrubs and diffuses into wetland area.	
704-1	Could not locate	61.19191	-149.93090	East bank, at Barbara St. Park on W. 32 nd Ave. No evidence of outfall or storm network.	
595-1	Examined; Alternate	61.18977	-149.93208	East bank, on Fish Creek Trail at W. 34 th Ave. Outfall discharges approximately 30 feet from creek, no defined flow path to creek. Trickle flow.	
1310-201	Examined; Alternate	61.18866	-149.93508	West bank, south of McRae Rd. Two EOPs, slight flow from south EOP.	
1259-1	Examined; Not Suitable	61.18864	-149.93502	East bank, south of McRae Rd. Not coded as outfall in HGDB (as of October 6, 2017), given temporary ID. Creek water is backwashing into outfall. Cannot collect isolated sample of outflow.	
1259-2	Examined; Not Suitable	61.18861	-149.93504	East bank, south of McRae Rd. Not coded as outfall in HGDB (as of October 6, 2017), given temporary ID. Creek water is backwashing into outfall. Cannot collect isolated sample of outflow.	
7-1	Examined; Not Suitable	61.18808	-149.93526	West bank, at W. 36 th Ave. EOP is half- submerged, creek water is backwashing into outfall. Cannot collect isolated sample of outflow. Construction along W. 36 th Ave. will include replacement of outfall, may be able to sample in future years.	

Table B-1. Outfalls Investigated During 2017 DWS Program

I	-)	2

Outfall Code	Activity; Category	Latitude	Longitude	Location Description and Notes
Fish Creek	ζ.			
584-1	Examined; Not Suitable	61.18545	-149.93404	East bank, at Fish Creek Park on E. Turnagain Blvd. Outfall is below Barbara Dr. Not flowing. Defined flow path below EOP with some standing water; likely flows during storm events.
1312-19	Examined; Alternate	61.18353	-149.93358	West bank, behind junkyard on E. Turnagain Blvd. Flowing. Outfall in good condition.
1277-59	Examined; Alternate	61.18317	-149.93349	East bank, at Borland Dr. Outfall is below Barbara Dr. Approximately 8 inches of sediment in outfall. Flowing steadily, some flow may be from brief rain shower 20 minutes prior to reconnaissance.
686-1	Examined; Alternate	61.18218	-149.93486	West bank, on Fish Creek Trail at Spenard Rd. Water in outfall level with creek, visibly flowing. Sample could be collected inside outfall to isolate outflow.
686-167	Examined; Not Suitable	61.18213	-149.93483	West bank, on Fish Creek Trail at Spenard Rd. Creek water is backwashing into outfall. Cannot collect isolated sample of outflow.
391-1	Examined; Alternate	61.18207	-149.93475	East bank, on Fish Creek Trail at Spenard Rd. Flowing steadily during reconnaissance, outflow very cloudy, foamy. Targeted for sampling, but outfall was not flowing during sampling event.
610-1	Examined; Alternate	61.17887	-149.93375	West shore of pond at Northwood Park. Outfall is at Iris Dr. Flow path obstructed by debris causing water in flow path to back up and submerging outfall. Sample could be collected if flow path were cleared.
1054-1	Examined; Alternate	61.17805	-149.92991	South shore of pond at Northwood Park. Outfall is below Melvin Ave. Approximately 5 inches of sediment in outfall. Water flowing through channel incised through sediment and into flow path to wetland area adjacent to pond.
388-201	Examined; Not Suitable	61.17831	-149.92818	At Northwood Park on Northwood St. Steady flow. Outfall into east side of sedimentation basin, not considered suitable for sampling.
388-197	Examined; Not Suitable	61.17863	-149.92826	At Northwood Park on Northwood St. High flow. Outfall into east side of sedimentation basin, not considered suitable for sampling based on program requirements.
137-1	Could not locate	61.17947	-149.93084	North bank, at Northwood Park. Could not access outfall due to apparent homeless camp in area.
1013-1	Examined; Not Suitable	61.18110	-149.91976	South bank, at W. Tudor Rd and Taft St. Outfall is behind fence below Fish Creek Trail. Not flowing. Outfall is perched approximately 2 feet. Scour below EOP; likely flows during storm events.
1003-1	Examined; Alternate	61.18119	-149.91849	South bank, at W. Tudor Rd. and Harding Dr. Flow path below EOP down ravine and to creek. Trickle flow.
234-1	Could not locate	61.18162	-149.91732	North bank, at Jefferson Ave. and Lois Dr. Could not locate. No evidence of flow path to creek.

Outfall Code	Activity; Category	Latitude	Longitude	Location Description and Notes
Fish Creek				
191-1	Examined; Alternate	61.18338	-149.91422	North bank, south of Jefferson Ave. Flowing. Sediment and debris in flow path to creek.
Furrow Cr	eek			
348-1	Examined; Not Suitable	61.10577	-149.87891	North bank, at Johns Rd. EOP is at Botanical Cir., roadside ditch conveys flow approximately 600 to creek. Not flowing.
19-1	Examined; Not Suitable	61.10667	-149.87342	North bank, at Mariner Dr. Not flowing. Outfall discharges into pool with standing water. No evidence of flow to creek; flow path has upslope gradient.
1496-1	Examined; Not Suitable	61.10854	-149.86426	South bank, at Huffman Rd. and Old Seward Hwy. Piped branch of Furrow Creek co-routed with MS4. Cannot isolate outflow.
281-1	Examined; Not Suitable	61.10499	-149.83929	Outfall is below Huffman Cir. Piped branch of Furrow Creek co-routed with MS4. Cannot isolate outflow.
407-2	Examined; Not Suitable	61.10510	-149.83872	Outfall is below Loren Cir. in backyard of private residence. Homeowner has constructed a large structure over outfall, inhibiting access to EOP. Well-defined flow path conveys water to creek.
572-3	Examined; Not Suitable	61.10851	-149.84189	Huffman Rd. and Meander Dr. Outfall discharges to piped creek below road. Cannot sample.
Eagle Rive	er			
Eagle Rive	er Mainstem			
541-1	Examined; Alternate	61.29843	-149.52203	North bank, on utility easement from Mountain Point Cir. EOP is in concrete headwall, discharges into swale above trail. Outlet from swale not flowing, no evidence of flow below outlet culvert to creek. Water in swale likely being absorbed into wetland and infiltrating.
1451-1	Examined; Alternate	61.29965	-149.50851	North bank, south of Driftwood Bay Dr. west of Riverside Dr. Outfall discharges to creek that flows to Eagle River.
1451-2	Examined; Alternate	61.29902	-149.50609	North bank, outfall is below Riverside Dr. Not coded as outfall in HGDB (as of October 6, 2017), given temporary ID. Outfall discharges from drainage way 1451-6-1 into swale that flows to southeast toward Eagle River.
Meadow Creek				
1376-1	Examined; Not Suitable	61.31495	-149.57107	North bank, west of Eagle River Rd. at VFW Post 9785. Network consists of roadside ditches with cross-culverts below driveways. Not flowing.
Eagle River Loop Creek				
1379-1	Examined; Not Suitable	61.32831	-149.56130	North Eagle River Loop Rd. and Spring Brook Dr. Outfall discharges into piped branch of creek below north of intersection. Cannot sample.



Outfall Code	Activity; Category	Latitude	Longitude	Location Description and Notes	
Eagle Rive	Eagle River				
Eagle River Loop Creek					
1378-1	Examined; Not Suitable	61.33100	-149.55479	West side of Spring Brook Dr. Eagle River Loop Creek is piped below road. Drainage ditches on the west side of the road flow into the piped creek through a storm drain at the outfall. Cannot sample.	
1377-1	Examined; Not Suitable	61.33235	-149.55296	East side of Spring Brook Dr. Outfall discharges into piped branch of creek below road. Cannot sample.	
Rabbit Creek					
Rabbit Creek Mainstem					
691-1	Could not locate	61.09419	-149.78967	North bank, at E. 140 th Ave. and Buffalo St. Could not locate outfall. Map date in HGDB is 2007; road and/or MS4 network construction may have occurred since map date.	
Potter Marsh					
680-40	Examined; Alternate	61.05477	-149.79641	South of Potter Valley Rd. at Old Seward Hwy. Outfall is below Potter Creek sign. Steady flow. Discharges to gully and flows north through culvert under Potter Valley Rd. to Potter Marsh. Low priority alternate, uncertain extent of network upstream. Discharge may be mostly conveyed from roadside ditches.	

Note: EOP = end of pipe

Dry Weather Screening 19 Fish Creek Recon - AG, LS May 2017 standing water in pipe flow ind dramage faith - may be gw discharge Sheen no odor pam off EDF she is corrocled + unraveling 298-1 Forest Pork Brive EOP THOM POURD suchace what from road has maked small channel (4" wide, 4" deep) + ended dramage parts (no flow at time of inist cold, clear water powing from the face of a long may lower tree no odos party culates, 160 dimess - likely GW steady flow n path to cneek - not Stow water catch bush on E side of Forest Park has water but not enough to flow into pipe

B5

Cheek Rectin 19 May Lely O plo 1.00 CAP 4 the ADDUR EOP 0/ j100 Drughed MANNel proe endere 1014830 chance UN ALA pipe m concret headwal ۱L Nent CPM wat Phal sec on m eddy from (M 0 neek water outro Some frum 7 men DAVENOUS IN 1912 nek impldin below CU FOR 06 010 100 1961/14 2 OUM M 10w GN ALD. hear outlall. New rineok 10 water sheen w Sneell M Charle 04 2.0 5 Ner SO 8 Traul bed = rlay Ind 692

B6

neek peron May Auna Large willow OXLAU CN0 Muld black o NUT Fanc channel stording water no 200 not locate could P 1.800 of Fish CNOO.K. annel 40 CY \mathbb{D} 2 yallmin -19 al 150 , water level lowpath WAL 00 CLAR -alony 33rd wi De wol STAN ery odkal - Summer, malu redore NR dear wates, po oder: lettis sher alt. stightly ke colored DODE IND W Mto glost ploin, No defined flow peth 203/2250 = 1941/14050 = .43 gal/mm B7

eek Recon AGUS 19 May 17 alberts on Wside of check Howing, sed in Stight flow, water lend even of creek - could sample m pipe (act.) annamed angalls - across from 1310-201 verts on E side of cneek both are ponded us black glow from coles MA GLAWING Pipe, 20 wars in pipe - level w reek - back flow from cneek no L DANIDAD (ma) 100 Work on Turnagain Blud this SUMMER A full + net work will be replaced 192 Mac mouthall Flowpath ame! collor by pipe I 5 condella writer clear, no speed -Slightmet 9 SALL 584-1 dibost leaves med Slewpathin some stare oklow Rex water - May law duins toms

Check Recon AGULS 19 May 17 - B" sediment, 11/2" waker - 3 sec/ 9+ = 20 91/min punny lightly murky - no oder theen 1016005 rain shower ~ Zomn prior alt <1/4" water. primy, could sample of ape water dear, no odor/sharp octfull in Good condition alt pipe - M" water level w/ preek owing - 2 sec/ gt = 30 gt/mm an simple inside pipe water murky, No sheen/odo e80-167 36" pipe, more than hall full of water not flowing likely brok flow from chee water murty, no sheer/odor 2" water Mpipe -1415ec -= 604 mm 100 ing very dividy, Spam, no oder Shee 111" pope, cottar tamujed

Β9

Fish Creek Recon AG, LS 19 May 17 0-Dalt. mpletely submerged - flowporth obstr + balled up. could samp - flourry. ANDIA + 12' fed; ment water ates above sed basin 60 standing and s - surface drainage from rac mentary to N? 154-D alt. Outhall mb sed basin pipe, 5" sediment in pipe water glowing in 2" wide channel the sediment, I deep ous into methonds adjulent to sa IL DURUNG COR 308-201 fall mys Sec 36 0122 water in pipe Stammy, Couchness, goan DC trash do collar is rusted + water flow, my A through racky

B10

19 May 17 Cheek fecon 388-197 MO seel Brown out la 36" pipe, " water morpe = 4027 Imm wan staining floc, cloudiness metallic odar Art as strong as 398-201 1003-1) alt. B" pipe inside 24" collar mille Ylow Hy choudy, no odes sheen - unbon deborg 1 side above ravine - water ravine + who creek. Stording water raine nor Young No demed Youpath 1013-1 24" pipe in hill below Tudos + bike path dry, perched below EOP - likely Jows in storms Slout 1-1) alt ess along evenen from Je fleson 12' pipe, Water mape Slowphith to creek glaysed w SU cloudy, the colored, poodor Sheer

B11

Fish Cneek Reion AG, LS 19 Muy 19 288-1 - Dranch of Fish Cneek+ out Jails 8" pipe W/grat CANNOT SAMPLE 15h Jow, Murky - 1 ftdeep thru notch wer one under allors in grate - trash swell How from out fail flow upstream in neek channel -"pipe sedwent in most of pipe lates & burry in 2" channel through idiment. I' deep on floc, the stained water, iron odor NOOMY IN MAS

DW CREEK RECON ABILS 31 May 17 3 approx. 50 RT N of check lows through well anne to creek NO el Muler rport at eitlet, no oder MAN (0)05 W Jord Cor DiALAI VITION 348-1 Chin NO + GN OU 10 to MS4 long John's Road archingar untler Johns Over you au lue oad Sac Wates BUA ON 19-1 lowing ek - standing water impoul SINGLE evidence At 9V a 181 R overhanging Sool pipe over otherm Wmass DWW on locan substrutt + MARE ic smell, no sheen COLAS SIGht +41 goe approx 1" deep, NIZ Water N Sec. republic par par

FULTOW CHEEK RECON HGILS 31 May 17 345-D @ 24" pipe mode plastic collor- good condition in llaktor oist to cheek. WING under path of cneek ended shiphity when m pipe 1/2" deep, 812" wide the 1 ft sec lear, no color sheer istinct alor - similar to laundry solfaler IT slight chlorine smell? that from MSY and prod stream corouted alt 6" pipe, n concrete helding below that le XIOW -10010 Sample to odor. Slight cloudness, no sher water ~1/2" deep mpipe, User 197 flows through wettend swall to 572-3 ms check under road - no out hall from MSY and good stream cannot Sample

B14

Errow Creek Recon AG, LS 31 May 17 CLESS & Nor Solver Spruce Cit, walkup creek palkydd - nomeowner hey rutre over outlan Londe st acres annot Of ppe octor metallic Wates (OGY, SHAV R WIGIAH 9000 condition 0 mpipe - 3 sec St= DING Makes 12" across in pie), slight organic swell plat ha cales sheer R 1 out full stown on more is concred 101 Darte DUM 15 an For. 10- HGDB SWA Mto wetland to creek OIDE = 304/m,n Monthy Wates 3" deep, 10" will a odor wher sheer 13710 In - connected to ditches along Failed we Rd no evanue at flow DS to Rate-Sulogged

B15

Meek Plean AG, LS 31 May 17 ap Pote neek sign lou) deep B"invole, 1ft/sec=6091/WM ma 11/2" 019 lar, no oder color sheen 17 Jul of avail met nor o Only + Nough orch wet POF certain extent of network upstream -1-140 -redore locate - ondiget retw n 2017 DARLING COR T CLEEK-- OF NEEDUF TED AGD 112

B16

River Recon ABLLS 35 May Je) west of where dramage is shown Sor. STACH 0 SLC: 308 11 V'deep , p'ac 1855 7CA N ador loor, 201 Scut ours down definer to River -turgent chanke - Sloupath on HEDB 1 Sh our chete headlight ron SEL SWALLES 1) - pipe more than 12 fr barkara " of water + 11 Mon 8 - Ox Give 5heen N Se 0 NO/ iken HANV 5.8/12 12 this \bigotimes pipe of plastic coll = 30 St/mm work M Q 1/4 1sec MPR un no sheen scum ador, cold-GW. glows who deliv channel vi usele 10 algal M p. 20+ glowpath

20named outgan old. HGLS 31 May 17 etwork 1451-le-1 ama Hort grate Youn Oppe across, Slow 2024/min ĺΔ tows not swell - structure oucked water cold - GW mgn? rat amed porlall B metal ape - out alls mito River on AV side to of cham of Rock 5 + (New OF 646-70) of char deep, 7" across - high flow west fee lowing - 3" to network shown on HGDB walked up cham of fock to Kahilton - no DODINA WA 1842 network enderie a 377-1 ovel 1378-1 unde I River Loop, Cneek is proved ring Brook Rd. Notwal drain from 130 NOUS MAD C reek from on 5 spled pood 1 no along N State of trad to creek stills mad they annot sample 79-1 MSU jows piped creek inde Can hot Show

THE RELAN AGILS 3 May 17 1325. nete head wall + grate metal ct. DIC A 2 ageli 0 51 104 across 3097 2 sec lor/ OTAL NG hD ou or 45 O'NG au 614 <u>)</u> 0 Э . AD. A -rush stuck in wine 697 andhior

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Appendix C Field Data Forms

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Municipality of			ATHER SCREENI		epartment of Public Works	
Outfall Number	T TST 0	82-1				WALKARD JERAVEALIT
Part 1. Genera	al information					Contraction of the second
1. Date _	6/12/17	Time	1110		1.1.1.1.1.1.1	
2. Field Crew	A.Gerkk	, A. MOXINCSS	Water quality ar	alyses conducted l	y: A.Gerlell,	, Spancer
3. How long sin	nce last rainfall?	, 🗆 raining now 🔲	ess than 3 days 🔰	3 or more days		NUL V
4. Size of last r	ain event. 0. L	1 inches (Attach data fro	m Anchorage International Air	rport or Girdwood.	Websites provided	I on back of form.)
5. End-of-pipe	diameter:	2feet	inches			
6. Depth of wa	ter in end-of-pipe:	feet	_inches			
Part 2. Visual	Observations		<i>a</i>		N. 19 1. 19	e line mas
7. Photograph	Log: Camera # an	d frame number (s)	A NEW OF A			
	ng from end-of-pipe and log photograp	oh of outfall, record any pertiner		nd go to next outfall n comment section.		f YES, continue.
10. Floatables	in water flowing fro	m end-of-pipe: D None D M	oving oily sheen 🗇 Surface so	cum 🗆 Soapy suds	Debris D	Other
	none	12.	Structural Condition:	ocl	N. March 19	
13. Biology	none		0	4	3	<u>.</u>
Part 3. Field /	Analyses					
14. Flow:	gal/min;	OR				
Low: Not inte	ense, water moving	very slowly 🛛 Medium: \	Vater moving at a moderate ra	ate 🗆 Hig	h; Intense water m	oving very quickly
15. Appearance	e of water flowing fr	rom end-of-pipe: 🗹 Clear	Cloudy/Muddy			in the second
16. Color of wa	ter flowing from en	d-of-pipe: 🛛 🗹 Clear	Colored	16		1.00
17. Water Qual	ity Analyses:					
		Quality Control Samples	as:	Water Qu	ality Samples	
	Parameter	Equipment Blank [1 each before sampling event]	Duplicate Sample	Parameter	Primary Samp	le
	pH	N/A	pH units	pH	2 pH uni	ts

Total chlorine <1).5 ppm ppm L0.05 Detergents ppm ppm <0.05 Total copper ppm ppm Total phenols <0.1 ppm ppm Turbidity 0.03 (outfall) Turbidity (upstream) Fecal Coliform

ppm Gree Auril C. 5 4.5 20.05 20.05 **Total chlorine** Detergents ppm Total copper ppm 20.1 **Total phenols** ppm Turbidity .22 mln (outfall) Turbidity (upstream) Fecal Coliform

Part 4. Comments: Wates level un creek glowing stonly

Municipality of		Contraction of Contraction Contract	EATHER SCREENI ELD DATA FORM	D	epartment of Public Works	
Outfall Number	FSHL	162-1				MALLKONLU HAAAGLALMI
Part 1. Genera	I Information					and the second
1. Date _	6 12/17	Time	1125		ile ver søv	
2. Field Crew	A. Gert	ek, A. Moxnes	Water quality a	nalyses conducted t	y: A. Gelek	L. Spances
3. How long sin	ce last rainfall?	raining now	less than 3 days	3 or more days	S. Grid	Sennic
4. Size of last ra	110		from Anchorage International Ai	all and a little way in the second	Websites provided	on back of form.)
5. End-of-pipe		/ feet	O inches			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
10000		feet 1	inches			
Part 2. Visual	Observations				knew	Marine Marine
7. Photograph	Log: Camera # an	d frame number (s)		3 B X 22		
	g from end-of-pipe and log photograp		ent information in comments, a	nd go to next outfall.		f YES, continue.
9. Odors:		No E	Yes If yes, describe i	in comment section.		
10. Floatables i	n water flowing fro	m end-of-pipe: 🛛 None 🛛	Moving oily sheen 🗆 Surface s	cum 🗆 Soapy suds	Debris D	Other
11. Vegetation:		ione 1	2. Structural Condition:	od		
13. Biology		none	0			
Part 3. Field A	nalyses		6 - 18			
14. Flow:	gal/min;	OR				
Low: Not inte	nse, water moving	y very slowly 🖾 Medium	: Water moving at a moderate r	rate 🗆 Higi	h; Intense water m	oving very quickly
15. Appearance	of water flowing fr	rom end-of-pipe: 🗹 Clear	Cloudy/Muddy			
	er flowing from en		Colored	in ind		in the second
17. Water Quali	and the second second			5		
		Quality Control Sampl	es	Water Out	ality Samples	
	Parameter	Equipment Blank [1 each before sampling event]	Duplicate Sample [1 each sampling event]	Parameter	Primary Sampi	le

	[1 each before samp	ing event]	[1 each sampling event]
рН	N/A		pH units
Total chlorine	20.5	ppm	ppm
Detergents	2905	ppm	ppm
Total copper	< 0.05	ppm	ppm
Total phenols	20.1	ppm	ppm
Turbidity (outfall)	0.03		
Turbidity (upstream)			
Fecal Coliform	and show where the second	and the state	Personal and the second

Water Qua	lity Samples	
Parameter	Primary Sample	
pH	C pH units	
Total chlorine	< 5 ppm	free AU. C. 5
Detergents	40.05 ppm	
Total copper	60.05 ppm	Section and Section 1
Total phenols	20.1 ppm	
Turbidity (outfall)	2.57 ntu	
Turbidity (upstream)		107 h Tule
Fecal Coliform	1.2012 4	

glow ~ Bsec/1L pipe perched ~ 4 moches

water in flowpath level in creek some sheen in flowpath- iron

Outfail Number: Part 1. General Information 1. Date GI12/17 2. Field Crew A. GUUL, A. MOMPLS Water quality analyses conducted by: A. GUUL, 2. Field Crew A. GUUL, A. MOMPLS Water quality analyses conducted by: A. GUUL, 3. How long since last rainfall? Iraining now Inches Inches (Attach data from Anchorage International Airport or Girdwood. Websites provided 5. End-of-pipe diameter:	Schoon n back of form.)
1. Date GIUIT Time IIUU 2. Field Crew A. GUUU, A. MOMES Water quality analyses conducted by: A. GUU, A. GU	n back of form.)
2. Field Crew A GUUL A MOMES Water quality analyses conducted by: A GUUL 3. How long since last rainfall? raining now less than 3 days and 3 or more days show of the second data from Anchorage International Airport or Girdwood. Websites provided 5. End-of-pipe diameter: <u>cert</u> feet <u>b</u> inches 6. Depth of water in end-of-pipe: feet <u>inches</u> that a frame number (s) 7. Photograph Log: Camera # and frame number (s) 8. Water flowing from end-of-pipe? No Ves If yes, describe in comments, and go to next outfall. If 9. Odors: Value No Ves If yes, describe in comment section. 10. Floatables in water flowing from end-of-pipe: No Ves If yes, describe in comment section. 11. Vegetation: <u>Nore</u> 12. Structural Condition: <u>proc bothom of yold</u> 13. Biology <u>Acamee flow</u> OR 14. Flow: <u>gal/min;</u> OR 14. Flow: <u>gal/min;</u> OR 15. Appearance of water flowing from end-of-pipe: Sclear Cloudy/Muddy	n back of form.)
3. How long since last rainfall? araining now less than 3 days arain or more days araining now less than 3 days arain or more days araining now less than 3 days arain or more days araining now less than 3 days linking 4. Size of last rain event	n back of form.)
4. Size of last rain event. OIM inches (Attach data from Anchorage International Airport or Girdwood. Websites provided 5. End-of-pipe diameter: feet inches 6. Depth of water in end-of-pipe: feet inches 7. Pholograph Log: Camera # and frame number (s)	n back of form.)
 5. End-of-pipe diameter:	n back of form.)
 Depth of water in end-of-pipe:feetinches + / inch Sed MeAtAppe Part 2. Visual Observations Photograph Log: Camera # and frame number (s)	
 Depth of water in end-of-pipe:feetinches + / inch Sed MeAtAppe Part 2. Visual Observations Photograph Log: Camera # and frame number (s)	
Part 2. Visual Observations 7. Pholograph Log: Camera # and frame number (s)	
7. Photograph Log: Camera # and frame number (s) 8. Water flowing from end-of-pipe? □ No □ Yes 8. Water flowing from end-of-pipe? □ No □ Yes 9. Odors: □ No □ Yes If yes, describe in comments, and go to next outfall. If 9. Odors: □ No □ Yes If yes, describe in comment section. If 10. Floatables in water flowing from end-of-pipe: □ None □ Moving oily sheen □ Surface scum □ Soapy suds □ Debris □ C 11. Vegetation:	·
 8. Water flowing from end-of-pipe? DNO No Yes If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. 9. Odors: DNO Yes If yes, describe in comment section. 10. Floatables in water flowing from end-of-pipe: None Moving oily sheen D Surface scum Doapy suds Debris Oder 11. Vegetation:	
If NO, take and log photograph of outfall, record any pertinent information in comments, and go to next outfall. If 9. Odors: In No IYes If yes, describe in comment section. 10. Floatables in water flowing from end-of-pipe: In No IYes If yes, describe in comment section. 11. Vegetation:	
11. Vegetation: None 12. Structural Condition: por - bottom of pipe 13. Biology Aranye floc + collar Part 3. Field Analyses 14. Flow: gal/min; OR 14. Flow: gal/min; OR Image: Medium: Water moving at a moderate rate Image: High; Intense water moving at a moderate rate 15. Appearance of water flowing from end-of-pipe: Image: Clear Image: Cloudy/Muddy	/ES, continue.
13. Biology Arayye + Colloc + Colloc Part 3. Field Analyses 14. Flow:gal/min; OR	
13. Biology Arayye + Colloc + Colloc Part 3. Field Analyses 14. Flow:gal/min; OR	NSted out
14. Flow:gal/min; OR □ Low: Not intense, water moving very slowly ☑ Medium: Water moving at a moderate rate □ High; Intense water moderate rate 15. Appearance of water flowing from end-of-pipe: ☑ Clear □ Cloudy/Muddy	1 2 4 4 4
14. Flow:gal/min; OR □ Low: Not intense, water moving very slowly ☑ Medium: Water moving at a moderate rate □ High; Intense water moderate rate 15. Appearance of water flowing from end-of-pipe: ☑ Clear □ Cloudy/Muddy	
□ Low: Not intense, water moving very slowly □ Medium: Water moving at a moderate rate □ High; Intense water moving 15. Appearance of water flowing from end-of-pipe: □ Clear □ Cloudy/Muddy	
15. Appearance of water flowing from end-of-pipe: Clear Cloudy/Muddy	
16. Color of water flowing from end-of-pipe:	ing very quickly
	ring very quickly
17. Water Quality Analyses:	ring very quickly
Quality Control Samples Water Quality Samples	ing very quickly
Parameter Equipment Blank [1 each before sampling event] Duplicate Sample [1 each sampling event] Parameter Primary Sample	ring very quickly
pH N/A pH units pH 7 pH units	ring very quickly
Total chlorine(0.5ppmppmTotal chlorine(0.5ppnDetergents(0.05ppmppmDetergents(0.05ppm	

Total chlorine	(0.5	ppm	ppm
Detergents	40.05	ppm	ppm
Total copper	C0.05	ppm	ppm
Total phenols	<0.1	ppm	ppm
Turbidity (outfall)	0,03		10.7 nth
Turbidity (upstream)			
Fecal Coliform	waxaa maaaaaa	er offen i de	

Water Qua	lity Samples	
Parameter	Primary Sample	
pН	7 pH units	2
Total chlorine	20,5 ppm	181
Detergents	(0.05 ppm	
Total copper	60.05 ppm	1
Total phenols	LON ppm	
Turbidity (outfall)	10.7 Ntu	
Turbidity (upstream)	376393	10
Fecal Coliform	in the second second]

40.ª

Part 4. Comments:

Non Stoc in Chell ~ 15 St down Stream of OF

Municipality o		a Contractor of Charlester of Charlester	ATHER SCRE	The indiana and	D	epartment of ublic Works	
Outfall Numbe	r. FSH	391- 1287-0	294			adric works	NERSHED MANAGEMENT
Part 1. Gener 1. Date	al information	7 Time	1220			1.0 1.	
2. Field Crew	A. Gert	16 A. MODINESS	Water qu		alyses conducted b	y: A. hellely L	Spences
	ince last rainfall?		less than 3 days		3 or more days		n
4. Size of last	rain event.	1 inches (Attach data fro	m Anchorage Internatio	onal Airr	port or Girdwood.	Websites provided o	n back of form.)
5. End-of-pipe	diameter:	feet(D inches				
6. Depth of wa	ater in end-of-pipe:	feet	inches				
Part 2. Visual	Observations	s			-	Cherry 1.	
7. Photograph	Log: Camera # an	d frame number (s)	1				
8. Water flowi	ng from end-of-pipe		Yes				
		h of outfall, record any pertiner		ents, and	l go to next outfall.	If Y	'ES, continu o .
9. Odors:					comment section.		10 mm 19
10. Floatables	in water flowing fro	m end-of-pipe: 🗆 None 🛛 M	ovina oily sheen 🗖 Sur	face sci			her floc
	.0.00 (,				Juc .
11. Vegetation 13. Biology	· · · · · · · · · · · · · · · · · · ·	12.	Structural Condition:	100			
	0		Contract of Statement of	Direction for			
Part 3. Field /	Analyses						
14. Flow:	gal/min;	OR					
Low: Not int	ense, water moving	yvery slowly 🖾 Medium: V	Nater moving at a mode	erate ral	te 🖸 Hiah	; Intense water mov	ing very quickly
15 Appearance	e of water flowing fr		Cloudy/Mu			1998 1 119 1	
					Dalia		
16. Color of wa	ter flowing from end	d-of-pipe: Clear	V Colored	-01	ange	And the second	Contraction of the second
17. Water Qual	ity Analyses:						
		Quality Control Samples			Water Qua	lity Samples	
	Parameter	Equipment Blank [1 each before sampling event]	Duplicate Sample [1 each sampling event]	1	Parameter	Primary Sample	
-	pH	N/A	pH units		pН	6 pH units	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
	Total chlorine	20.5 ppm	∠0.5 ppm	20.5	Total chlorine	205 ppm	gree arail CO.
	Detergents	2005 ppm	20,05 ppm		Detergents	2<0.05 ppm	5
	Total copper	C0.05 ppm	20.05 ppm		Total copper	<0.05 ppm	
	Total phenois	<u>(0.1 ppm</u>)	Zo I ppm		Total phenols	20.1 ppm	
	Turbidity (outfall)	0.03	160 ntu		Turbidity (outfall)	169 ntu	grand 2
	Turbidity		1 - I - I - I - I - I - I - I - I - I -		Turbidity	TO HILL	
	(upstream)				(upstream)	1 304030	The Holes
	Fecal Coliform		HERE STREET, ST		Fecal Coliform	The second synapses	
Part 4. Comm	ients:	0					
s noni	NC M Pipe	-+ glowpath d cate sumple	to creak				
collact	ed Anali	rade sumali					
where	u uppi	cure our pr					

C4

Municipality of Anchorage		DRY 287-185	FIELD D	ER SCREEN DATA FORM	ING	Department of Public-Works	RATERSHED HANAGEMENT
Part 1. General la	nformation						
1. Date	10/12/17	Tim	e _	1245			
2. Field Crew	A. Gerle	K, A. Mox	hess	Water quality a	analyses conducte	d by: A. GULUL	L.Spenor
3. How long since	ast rainfall?	raining now	🗆 less tha		x 3 or more day	- 5.124	LUNING
4. Size of last rain	event. D.M	inches (Attach o	data from Ancl	horage International A			d on back of form.)
5. End-of-pipe dia	ameter: 7	feet	0	_ inches			
6. Depth of water	in end-of-pipe:	feet	<u>O</u> inche	es			
Part 2. Visual Ot	servations						
7. Photograph Lo	g: Camera # and fra	me number (s)	_				3.1
 Water flowing f <i>If NO, take an</i> Odors: 		□ No outfall, record any p I No	vertinent inform □ Yes	nation in comments, a If yes, describe	and go to next out in comment section		If YES, continue.
10. Floatables in v	vater flowing from e	nd-of-pipe: 12 None	Moving o	ily sheen 🖾 Surface s	scum 🗆 Soapy su	ds 🗆 Debris 🛛	Other
11. Vegetation: 13. Biology	nore iron Slow		12. Struct	ural Condition:	jood		
Part 3. Field Ana	lyses		11 - 111	the first start			
14. Flow:	gal/min;	OR					
Low: Not intens	e, water moving ver	y slowly 🛛 Me	dium: Water n	noving at a moderate	rate 12 H	ligh; Intense water n	noving very quickly
15. Appearance of	water flowing from e	end-of-pipe: 🔽 Cle	ar	Cloudy/Muddy			
16. Color of water t	flowing from end-of-	pipe: 🗹 Cle	ar	Colored			
17. Water Quality A	Analyses:						
Г		Quality Control Sa	amples		Water 0	uality Samples	
		Fastan ant Bland	Dunl	Lasta Consta			

Parameter	Equipment B [1 each before samp		Duplicate Sample [1 each sampling event]
рН	N/A		pH units
Total chlorine	<0.5	ppm	ppm
Detergents	2005	ppm	ppm
Total copper	20.05	ppm	ppm
Total phenols	<0.1	ppm	ppm
Turbidity (outfall)	0.03		
Turbidity (upstream)			
Fecal Coliform			1. A.

Water Qua	lity Samples	
Parameter	Primary Sample	
рН	- pH units	
Total chlorine	د. 6 _ ppm	١
Detergents	40,05 ppm]
Total copper	<0.05 ppm	
Total phenols	ZO. ppm	1
Turbidity (outfall)	7.47 ntu	
Turbidity		
(upstream)		
Fecal Coliform		

Cheenvail. c.5

Part 4. Comments: Storie trach Stuck of grate (plaster) Non floc + Staming on rocks below OF

	_FUR	5-1				
Part 1. General	Information				V. The second	13.204
	06/12/2017	Time	11:28 Am			
2. Field Crew	Lynn, Sam G		Water quality a	analyses conducted b	y: Lynn Spe	non.
	ce last rainfall?	□ raining now □	ess than 3 days	Is 3 or more days	A. Gerlyn S	Ginsent
4. Size of last ra	0111		m Anchorage International A		Websites provided or	back of form.)
5. End-of-pipe of	liameter:	feet	6 inches			
6. Depth of wate	er in end-of-pipe:	feet	inches		The second second	
Part 2. Visual (Observations					
7. Photograph l	.og: Camera # and	I frame number (s) I-PI	40			-
8. Water flowing	g from end-of-pipe	? 🗆 No 🗹	Yes			
If NO, take	and log photograpi	h of outfall, record any pertinen	t information in comments, a	and go to next outfall.	lf Yi	ES, continue.
9. Odors:		DÍ No 🖸 Y	Yes If yes, describe	in comment section.		
10. Floatables in	water flowing from	n end-of-pipe: 🗆 None 🖾 Ma	oving oily sheen 🗆 Surface	scum I Soapy suds	Debris Ott	ner
				1		
	A/ .			al all a sold	Dr. 1111	141
11. Vegetation:		12.	Structural Condition:	ed collar, escul	Pipe in bood (contran
11. Vegetation:		12.	Structural Condition: <u>Till</u>	ed collar, escul	Pipe in Lood (constitution
		12.	Structural Condition: <u>114</u>	ed collar, estad	Ripe in Load (endetran
13. Biology Part 3. Field A	nalyses		Structural Condition: <u>Till</u>	ed collar, estad	Pipe in bood (condottion
13. Biology Part 3. Field A	nalyses gal/min;	OR				
13. Biology Part 3. Field A	nalyses	OR	Structural Condition:H		<u>Pipe in bood (i</u>	
13. Biology Part 3. Field A 14. Flow: 14. Low: Not interview	nalyses gal/min; nse, water moving	OR	Vater moving at a moderate ☑ Cloudy/Muddy	rate 🗆 Higt	n; Intense water movi	
13. Biology Part 3. Field A 14. Flow: 12 Low: Not inter 15. Appearance	nalyses gal/min; nse, water moving	OR very slowly	Vater moving at a moderate ☑ Cloudy/Muddy	rate 🗆 Higt	n; Intense water movi	
13. Biology Part 3. Field A 14. Flow: 14. Cow: Not inter 15. Appearance 16. Color of wate	nalyses gal/min; nse, water moving of water flowing fro er flowing from end	OR very slowly	Vater moving at a moderate ☑ Cloudy/Muddy		n; Intense water movi	
13. Biology Part 3. Field A 14. Flow: 12 Low: Not inter 15. Appearance	nalyses gal/min; nse, water moving of water flowing fro er flowing from end	OR very slowly	Nater moving at a moderate ☑ Cloudy/Muddy ☑ Colored	rate 🗆 Higt Slightly tinkel,	n; Intense water movi tra Colund	
13. Biology Part 3. Field A 14. Flow: 14. Cow: Not inter 15. Appearance 16. Color of wate	nalyses gal/min; nse, water moving of water flowing fro er flowing from end y Analyses:	OR very slowly	Water moving at a moderate ☑ Cloudy/Muddy ☑ Colored	rate □ Higt Slightly tinkd, Water Qua	n; Intense water movi tra columnt	
13. Biology Part 3. Field A 14. Flow: 14. Cow: Not inter 15. Appearance 16. Color of wate	nalyses gal/min; nse, water moving of water flowing fro er flowing from end y Analyses: Parameter	OR very slowly	Vater moving at a moderate ☑ Cloudy/Muddy ☑ Colored Duplicate Sample [1 each sampling event]	rate 🗆 Higt Slightly tinkd, Water Qua Parameter	n; Intense water movi tra column lity Samples Primary Sample	ing very quickly
13. Biology Part 3. Field A 14. Flow: 14. Cow: Not inter 15. Appearance 16. Color of wate	nalyses gal/min; nse, water moving of water flowing fro er flowing from end y Analyses: Parameter pH	OR very slowly	Vater moving at a moderate ☑ Cloudy/Muddy ☑ Colored Duplicate Sample [1 each sampling event] pH units	rate □ High Slightly tinkd, Water Qua Parameter pH	n; Intense water movi tra column lity Samples Primary Sample	ing very quickly
13. Biology Part 3. Field A 14. Flow: 14. Cow: Not inter 15. Appearance 16. Color of wate	nalyses gal/min; nse, water moving of water flowing fro er flowing from end y Analyses: Parameter 	OR very slowly ☐ Medium: V om end-of-pipe: ☐ Clear I-of-pipe: ☐ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A ∠O:5 ppm	Vater moving at a moderate ☑ Cloudy/Muddy ☑ Colored Duplicate Sample [1 each sampling event] pH units ppm	rate □ Higt Slightly_tinkd, Water Qua Parameter pH Total chlorine	n; Intense water movi tra column lity Samples Primary Sample F pH units	
13. Biology Part 3. Field A 14. Flow: 14. Cow: Not inter 15. Appearance 16. Color of wate	nalyses gal/min; nse, water moving of water flowing fro er flowing from end y Analyses: Parameter pH	OR very slowly ☐ Medium: V om end-of-pipe: ☐ Clear I-of-pipe: ☐ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A ∠O.5 ppm ∠O.05 ppm	Vater moving at a moderate ☑ Cloudy/Muddy ☑ Colored Duplicate Sample [1 each sampling event] pH units	rate □ High Slightly tinkd, Water Qua Parameter pH	tra Colució tra Colució lity Samples Primary Sample 7 pH units 20.5 ppm 30.05 ppm	ing very quickly
13. Biology Part 3. Field A 14. Flow: 14. Cow: Not inter 15. Appearance 16. Color of wate	nalyses gal/min; nse, water moving of water flowing fro er flowing from end y Analyses: Parameter 	OR very slowly □ Medium: Momend-of-pipe: □ Clear l-of-pipe: □ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A ∠O.5 ppm ∠O.05 ppm	Vater moving at a moderate ☑ Cloudy/Muddy ☑ Colored Duplicate Sample [1 each sampling event] pH units ppm ppm	rate Higt Slightly tinkd, Water Qua Parameter pH Total chlorine Detergents	n; Intense water movi tra column lity Samples Primary Sample 7 pH units 40.05 ppm	ing very quickly
13. Biology Part 3. Field A 14. Flow: 14. Cow: Not inter 15. Appearance 16. Color of wate	nalyses gal/min; nse, water moving of water flowing fro er flowing from end y Analyses: Parameter pH Total chlorine Detergents Total copper Total phenols Turbidity	OR very slowly ☐ Medium: V om end-of-pipe: ☐ Clear I-of-pipe: ☐ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A ∠O·5 ppm ∠O·05 ppm ∠O·05 ppm	Vater moving at a moderate ☑ Cloudy/Muddy ☑ Colored <u>Duplicate Sample</u> [1 each sampling event] <u>pH units</u> <u>ppm</u> <u>ppm</u> <u>ppm</u>	rate Higt Slightly tinkd, Water Qua Parameter pH Total chlorine Detergents Total copper Total phenols Turbidity	tra colored hity Samples Primary Sample 7 pH units <0.5 ppm <0.05 ppm <0.05 ppm <0.05 ppm <0.05 ppm <0.05 ppm <0.05 ppm	ing very quickly
13. Biology Part 3. Field A 14. Flow: 14. Cow: Not inter 15. Appearance 16. Color of wate	nalyses gal/min; nse, water moving of water flowing fro er flowing from end y Analyses: Parameter 	OR very slowly □ Medium: Momend-of-pipe: □ Clear d-of-pipe: □ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A <u>LO</u> , 5 ppm <u>LO</u> , 05 ppm <u>CO</u> , 05 ppm	Vater moving at a moderate ☑ Cloudy/Muddy ☑ Colored <u>Duplicate Sample</u> [1 each sampling event] <u>pH units</u> <u>ppm</u> <u>ppm</u> <u>ppm</u>	rate High Slightly tinkd, Water Qua Parameter PH Total chlorine Detergents Total copper Total phenols Turbidity (outfall)	tra colord hity Samples Primary Sample Primary Sample Primary Sample Primary Sample CO-5 ppm CO-05 ppm CO-05 ppm	ing very quickly
13. Biology Part 3. Field A 14. Flow: 14. Cow: Not inter 15. Appearance 16. Color of wate	nalyses gal/min; nse, water moving of water flowing fro er flowing from end y Analyses: Parameter pH Total chlorine Detergents Total copper Total phenols Turbidity (outfall) Turbidity	OR very slowly ☐ Medium: V om end-of-pipe: ☐ Clear I-of-pipe: ☐ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A ∠O·5 ppm ∠O·05 ppm ∠O·05 ppm	Vater moving at a moderate ☑ Cloudy/Muddy ☑ Colored <u>Duplicate Sample</u> [1 each sampling event] <u>pH units</u> <u>ppm</u> <u>ppm</u> <u>ppm</u>	rate High Slightly tinkd, Water Qua Parameter pH Total chlorine Detergents Total chlorine Detergents Total copper Total phenols Turbidity (outfall) Turbidity	tra colored hity Samples Primary Sample 7 pH units <0.5 ppm <0.05 ppm <0.05 ppm <0.05 ppm <0.05 ppm <0.05 ppm <0.05 ppm	ing very quickly
13. Biology Part 3. Field A 14. Flow: 14. Cow: Not inter 15. Appearance 16. Color of wate	nalyses gal/min; nse, water moving of water flowing fro er flowing from end y Analyses: Parameter 	OR very slowly ☐ Medium: V om end-of-pipe: ☐ Clear I-of-pipe: ☐ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A ∠O·5 ppm ∠O·05 ppm ∠O·05 ppm	Vater moving at a moderate ☑ Cloudy/Muddy ☑ Colored <u>Duplicate Sample</u> [1 each sampling event] <u>pH units</u> <u>ppm</u> <u>ppm</u> <u>ppm</u>	rate High Slightly tinkd, Water Qua Parameter PH Total chlorine Detergents Total copper Total phenols Turbidity (outfall)	tra colored hity Samples Primary Sample 7 pH units <0.5 ppm <0.05 ppm <0.05 ppm <0.05 ppm <0.05 ppm <0.05 ppm <0.05 ppm	ing very quickly

C6

Municipality of		Contraction of the second second second	ATHER SCREEN D DATA FORM	D	epartment of ublic Works	TERSHED MANACEMENT
Outfall Number:	FUR 1345	-1				
Part 1. General	Information		· •3			
1. Date	06/12/2017	Time	12:04 PM			
2 Field Crew	Lynn Spenur.	Scean Prosenick	Water quality a	analyses conducted b	Nº / un Conver	A.Gerley
		A R. P. S. Street Street Street Street	Iter O days	analyses conducted b	S. GIOSEN	CL
3. How long sin		□ raining now □ le				
4. Size of last ra	in event. D. 14	inches (Attach data from	m Anchorage International A	irport or Girdwood.	Websites provided or	back of form.)
5. End-of-pipe of	liameter:	feet	6 inches			
6. Depth of wat	er in end-of-pipe; _	feet 34	_inches			
Part 2. Visual				127		10-10 00-00
		frame number (s)				4
1.		1		200 - 10 - 20		*173
	g from end-of-pipe?					
9. Odors:	and log photograph	of outfall, record any pertinen		and the second second second	If Y	ES, continue.
		1		in comment section.		
		n end-of-pipe: 🗹 None 🗖 Mo				
11. Vegetation:	Abre	12.	Structural Condition: They	nter has underest	Hepipe, water isn	of pecising though pipe.
13. Biology		Content three last	Compression of the	11 1 1 1 1 1 1 1		
Part 3. Field A	nalveae	Sandar III - Sanda	an Borrenn Favil	Auto strandski og stor		
14. Flow:	gal/min;	OR				
Low: Not inte	nse, water moving	very slowly 🛛 🗹 Medium: V	Vater moving at a moderate	rate 🛛 Higi	n; Intense water movi	ing very quickly
15. Appearance	of water flowing fro	om end-of-pipe: 🗹 Clear	Cloudy/Muddy			
	Mine Partie (/	and the second had			
16. Color of wat	er flowing from end	-of-pipe: 🗹 Clear	Colored		execting process	State and a second
17. Water Qualit	y Analyses:					
		Quality Control Samples		Water Qua	ality Samples	The second second
-	Parameter	Equipment Blank	Duplicate Sample	Parameter	Primary Sample	1
	рН	[1 each before sampling event] N/A	[1 each sampling event] pH units	pH		
	Total chlorine	<0.5 ppm	pri units	Total chlorine	<0.5 ppm	gree available 20.5
	Detergents	<0,05 ppm	ppm	Detergents	.40.05 ppm	2
	Total copper	20.05 ppm	ppm	Total copper	\$0.05 ppm	
	Total phenois	<0.) ppm	ppm	Total phenols	20.2 ppm	
	Turbidity	0.03	8-04	Turbidity	107 .	Del Como de
	(outfall)	0.03	Charles Strangers	(outfall)	1.07 ntu	Community of the second s

Part 4. Comments: Structural Cond: water is pussing undernich pipe

Turbidity

(upstream)

Fecal Coliform

0.03

Aur: 3/4" Dep 3/4 Pt/sec 6" wide

otal phenols Turbidity (outfall) ррп 1.07 ntu Turbidity (upstream)

Fecal Coliform

4

C7

Outfall Number: FUR 1357-1			iblic Works	NATERSHER MANAGEMENT
Reading the second s				
Part 1. General Information		NAME OF CASE AND CONTRACTOR	2010 - 2011 1027	ALCONTRACTOR
1. Date 06/12/2017 Time	12:35 PM			
2. Field Crew Lynn Spencer; Sam Grosenick		alvses conducted by	r I was Sources	A. Geruh
3. How long since last rainfall? □ raining now □		3 or more days	S.Gros	servel
		and the second se		NTI
4. Size of last rain event. 0,14 inches (Attach data t	from Anchorage International Air	port or Girdwood. W	lebsites provided	on back of form.)
5. End-of-pipe diameter:feet	<u>6</u> inches			
6. Depth of water in end-of-pipe:feet6	inches			
Part 2. Visual Observations				
7. Photograph Log: Camera # and frame number (s)	A CONTRACTOR OF A CONTRACT	1. A. A. A.		11/2/17
	Yes		San Chin She ass	send - hele
If NO, take and log photograph of outfall, record any pertin		nd ao to nevt outfall	IF	YES, continue.
		n comment section.	"	res, commue.
10. Floatables in water flowing from end-of-pipe:		1		Other
				Auer
11. Vegetation: little bit of Algre 1	2. Structural Condition: Exulta	M		
13. Biology		1 1 L L L		
Part 3. Field Analyses				
14. Flow: gal/min; OR				
Low: Not intense, water moving very slowly	: Water moving at a moderate ra	ate Di High	; Intense water mo	wing very quickly
	1			ring tory quickly
15. Appearance of water flowing from end-of-pipe: Clear	🗹 Cloudy/Muddy 🗸	rery slutty		
16. Color of water flowing from end-of-pipe:	Colored	and the lot of the first	meand the re-	1000
17. Water Quality Analyses:				
Quality Control Sampl	es	Water Qual	ity Samples	1
Parameter Equipment Blank	Duplicate Sample	Parameter	Primary Sample	
pH [1 each before sampling event]	[1 each sampling event] T pH units	рH	7 pH unit	S d
Total chlorine C0.5 ppn	100	Total chlorine	20.5 ppn	n gree avail.
Detergents ∠0.05 ppn	0.45	Detergents Total copper	2005 ppn	<u>n </u>

20.1

7.94 ntu

ppm

Total phenols

Turbidity (outfall)

Turbidity

(upstream)

Fecal Coliform

ppm

Fecal Coliform Part 4. Comments:

Flow: 1 ft/sec 5" dup 18" vide Deplicak Samples taken

Total phenois

Turbidity (outfall)

Turbidity

(upstream)

20.1

0.03

5.7

.5

40-1 ppm

7.74 14

Municipality of			STONE'S	THER SCREEN	D	epartment of ublic Works	ATERSHED MANACEMENT
Outfall Number:	FUR 30	6-1					
art 1. General	Information						
. Date	06/12/17-	Time		1:20 PM		and and and	
					analysis asymptoted b	A Gonok	- Splara
. Field Grew <u>t</u>	Lynn sporter,			Water quality a	1	S. 6.05	LANS CH.
. How long sind		Training now		ss than 3 days	☑ 3 or more days	unknow	n
Size of last rai	in event. D.14	inches (Attach dat	a from	Anchorage International A	Airport or Girdwood, \	Websites provided o	n back of form.)
i. End-of-pipe d						Carly Southern	
	10 10 10		0	inches			
i. Depth of wate	er in end-of-pipe: _	feet		inches comple I nm			
Part 2. Visual C	Observations						
7. Photograph L	Log: Camera # and	frame number (s)					
Woter flowing	g from end-of-pipe	? 🗆 No	E Ye	0.0			
. water nowing				information in comments, a	and on to next outfall	IFN	/ES, continue.
IENO taka		i or oquali. Tecoro arry deri	ment	information in comments, a	and yo to next outial.		ES, conunde.
	and log photograpi		dv.	ing Kung departing	In commont coeffee.		
). Odors:		□ No	⊡ Ye		in comment section.	,	
). Odors:		□ No		es If yes, describe ving oily sheen □ Surface		Debris 🗹 Ot	her
9. Odors: 10. Floatables ir	n water flowing from	□ No n end-of-pipe: □ None E] Mov	ving oily sheen Surface	scum 🗹 Soapy suds	Debris DOt	her
 Odors: Floatables in Vegetation: 	n water flowing from	□ No n end-of-pipe: □ None E] Mov		scum 🗹 Soapy suds	Debris dOt	her
 Odors: Floatables in Vegetation: . Biology 	n water flowing from	□ No n end-of-pipe: □ None E] Mov	ving oily sheen Surface	scum 🗹 Soapy suds	Debris DOt	her
 Odors: Floatables in Vegetation: 	n water flowing from	□ No n end-of-pipe: □ None E] Mov	ving oily sheen Surface	scum 🗹 Soapy suds	Debris 🗹 Ot	ther
 Odors: Floatables in Vegetation: Biology Part 3. Field Additional Statements 	n water flowing from Mone nalyses	□ No n end-of-pipe: □ None E] Mov	ving oily sheen Surface	scum 🗹 Soapy suds	Debris 🗹 Ot	ther
 Odors: Floatables in Vegetation: Biology Part 3. Field An Flow: 	n water flowing from 	No n end-of-pipe: None OR] Mov 12. S	ving oily sheen □ Surface Structural Condition: <u>Parfa</u>	scum I Soapy suds		
 Odors: Floatables in Vegetation: Biology Part 3. Field An Flow: Low: Not inter 	n water flowing from <u>//one</u> nalyses gal/min; mse, water moving	No n end-of-pipe: None OR very slowly Mediu] Mov 12. S	ving oily sheen □ Surface Structural Condition: RA	scum I Soapy suds	Debris Ot	
 Odors: Floatables in Vegetation: Biology Part 3. Field An Flow: Low: Not inter 	n water flowing from <u>//one</u> nalyses gal/min; mse, water moving	No n end-of-pipe: None OR] Mov 12. S	ving oily sheen □ Surface Structural Condition: <u>Parfa</u>	scum I Soapy suds		
 Odors: Floatables in Vegetation: Biology Part 3. Field An Flow: Low: Not inter Appearance 	n water flowing from <u>Alone</u> nalyses gal/min; onse, water moving of water flowing fro	□ No n end-of-pipe: □ None E OR very slowly □ Mediu om end-of-pipe: ☑ Clear] Mov 12. S	ving oily sheen Structural Condition: Reference of the s	scum I Soapy suds	n; Intense water mov	
 Odors: Floatables in Vegetation: Biology Part 3. Field And Flow: Low: Not inter Appearance Color of wate 	n water flowing from <u>A/one</u> nalyses gal/min; onse, water moving of water flowing from end	□ No n end-of-pipe: □ None E OR very slowly □ Mediu om end-of-pipe: ☑ Clear] Mov 12. S	ving oily sheen Structural Condition: RA	scum 🗹 Soapy suds	n; Intense water mov	
 Odors: Floatables in Vegetation: Biology Part 3. Field An Flow: Low: Not inter Appearance 	n water flowing from <u>A/one</u> nalyses gal/min; onse, water moving of water flowing from end	□ No n end-of-pipe: □ None E OR Very slowly □ Mediu om end-of-pipe: ☑ Clear l-of-pipe: □ Clear] Mov 12. §	ving oily sheen Structural Condition: Reference of the s	scum 🗹 Soapy suds ect erate 🗆 Higt ery light Orange	n; Intense water mov	
 Odors: Floatables in Vegetation: Biology Part 3. Field And Flow: Low: Not inter Appearance Color of wate 	n water flowing from <u>A/one</u> nalyses gal/min; onse, water moving of water flowing from end	□ No n end-of-pipe: □ None E OR very slowly □ Mediu om end-of-pipe: ☑ Clear l-of-pipe: □ Clear Quality Control Sam] Mov 12. §	ving oily sheen □ Surface Structural Condition: Refe /ater moving at a moderate □ Cloudy/Muddy ☑ Colorede	scum 🗹 Soapy suds ect erate 🗆 Higt ery light Orange	n; Intense water mov	
 Odors: Floatables in Vegetation: Biology Part 3. Field And Flow: Low: Not inter Appearance Color of wate 	n water flowing from <u>A/one</u> nalyses gal/min; onse, water moving of water flowing from end	□ No n end-of-pipe: □ None E OR very slowly □ Mediu om end-of-pipe: ☑ Clear l-of-pipe: □ Clear Quality Control Sam Equipment Blank] Mov 12. § m: Wa	ving oily sheen □ Surface Structural Condition: Refe Vater moving at a moderate □ Cloudy/Muddy ☑ Colored Duplicate Sample	scum 🗹 Soapy suds ect erate 🗆 Higt ery light Orange	n; Intense water mov	
 Odors: Floatables in Vegetation: Biology Part 3. Field And Flow: Low: Not inter Appearance Color of wate 	n water flowing from <u>//ove</u> nalyses gal/min; ense, water moving of water flowing from er flowing from end ty Analyses:	□ No n end-of-pipe: □ None E OR very slowly □ Mediu om end-of-pipe: ☑ Clear l-of-pipe: □ Clear Quality Control Sam] Mov 12. § m: Wa	ving oily sheen □ Surface Structural Condition: Refe /ater moving at a moderate □ Cloudy/Muddy ☑ Colorede	scum 🗹 Soapy suds	n; Intense water mov ality Samples Primary Sample	ving very quickly
 Odors: Floatables in Vegetation: Biology Part 3. Field And Flow: Low: Not inter Appearance Color of wate 	n water flowing from <u>//ove</u> nalyses gal/min; ense, water moving of water flowing from er flowing from end ty Analyses: Parameter pH Total chlorine	□ No n end-of-pipe: □ None □ OR very slowly □ Mediu om end-of-pipe: ☑ Clear l-of-pipe: □ Clear Quality Control Sam Equipment Blank [1 each before sampling even N/A € 0.5 p] Mov 12. § m: Wa	ving oily sheen □ Surface Structural Condition: Refe Vater moving at a moderate □ Cloudy/Muddy ☑ Colored Duplicate Sample [1 each sampling event]	scum 🗹 Soapy suds	ality Samples Primary Sample 4 Primary Sample 4 PH units 40.5 ppm	ving very quickly
 Odors: Floatables in Vegetation: Biology Part 3. Field And Flow: Low: Not inter Appearance Color of wate 	n water flowing from <u>Alore</u> nalyses gal/min; ense, water moving of water flowing from er flowing from end ty Analyses: Parameter pH Total chlorine Detergents	□ No n end-of-pipe: □ None □ OR Very slowly □ Mediu om end-of-pipe: □ Clear l-of-pipe: □ Clear Quality Control Sam Equipment Blank [1 each bufore sampling ever N/A C 0.5 p L-0.05 p] Mov 12. § im: Wa ples nt]	ving oily sheen □ Surface Structural Condition: Rdde /ater moving at a moderate □ Cloudy/Muddy ☑ Colored Duplicate Sample [1 each sampling event] pH units ppm ppm	scum 🗹 Soapy suds	ality Samples Primary Sample F pH units 0.5 ppm	ring very quickly
 Odors: Floatables in Vegetation: Biology Part 3. Field And Flow: Low: Not inter Appearance Color of wate 	n water flowing from <u>Alore</u> analyses gal/min; anse, water moving of water flowing from er flowing from end ty Analyses: Parameter pH Total chlorine Detergents Total copper	□ No n end-of-pipe: □ None □ OR Very slowly □ Mediu om end-of-pipe: ☑ Clear I-of-pipe: □ Clear Quality Control Sam Equipment Blank [1 each before sampling even N/A © 0.5 p ∠-0.05 p	Mov 12. § m: Wa ples nt] pm pm pm	ving oily sheen □ Surface Structural Condition: Reference /ater moving at a moderate □ Cloudy/Muddy ☑ Colored Duplicate Sample [1 each sampling event] pH units ppm ppm ppm	scum 🗹 Soapy suds cd a rate 🗆 High a vicht Orange Water Qua Parameter pH Total chlorine Detergents Total copper	ality Samples Primary Sample Primary Sample Primary Sample Primary Sample COS ppm COS ppm COS ppm	ring very quickly
 Odors: Floatables in Vegetation: Biology Part 3. Field And Flow: Low: Not inter Appearance Color of wate 	n water flowing from //one malyses gal/min; mse, water moving of water flowing from er flowing from end ty Analyses: Parameter pH Total chlorine Detergents Total copper Total phenols	□ No n end-of-pipe: □ None E OR Very slowly □ Mediu om end-of-pipe: ☑ Clear I-of-pipe: □ Clear Quality Control Sam Equipment Blank [1 each before sampling even N/A < 0.5 p ∠-0.05 p ∠-0.05 p] Mov 12. § im: Wa ples nt]	ving oily sheen □ Surface Structural Condition: Rdde /ater moving at a moderate □ Cloudy/Muddy ☑ Colored Duplicate Sample [1 each sampling event] pH units ppm ppm	scum 🗹 Soapy suds cd a rate 🗆 High a rate 🕞 High Control of angle Water Qua Parameter pH Total chlorine Detergents Total copper Total phenols	ality Samples Primary Sample F pH units 0.5 ppm	ring very quickly
 Odors: Floatables in Vegetation: Biology Part 3. Field And Flow: Low: Not inter Appearance Color of wate 	n water flowing from //one malyses gal/min; mse, water moving of water flowing from er flowing from end ty Analyses: Parameter pH Total chlorine Detergents Total copper Total phenols Turbidity	□ No n end-of-pipe: □ None □ OR Very slowly □ Mediu om end-of-pipe: ☑ Clear I-of-pipe: □ Clear Quality Control Sam Equipment Blank [1 each before sampling even N/A ○ D.5 p ∠-0.05 p ∠-0.05 p	Mov 12. § m: Wa ples nt] pm pm pm	ving oily sheen □ Surface Structural Condition: Reference /ater moving at a moderate □ Cloudy/Muddy ☑ Colored Duplicate Sample [1 each sampling event] pH units ppm ppm ppm	scum 🗹 Soapy suds cd a rate 🔲 High a rate 🖾 High Concept Water Qua Parameter PH Total chlorine Detergents Total copper Total phenols Turbidity	ality Samples Primary Sample Primary Sample Primary Sample Primary Sample	ring very quickly
 Odors: Floatables in Vegetation: Biology Part 3. Field And Flow: Low: Not inter Appearance Color of wate 	n water flowing from //one malyses gal/min; mse, water moving of water flowing from er flowing from end ty Analyses: Parameter pH Total chlorine Detergents Total copper Total phenols	□ No n end-of-pipe: □ None □ OR Very slowly □ Mediu om end-of-pipe: ☑ Clear I-of-pipe: □ Clear Quality Control Sam Equipment Blank [1 each bufore sampling even N/A C 0.5 p ∠-0.05 p ∠-0.05 p	Mov 12. § m: Wa ples nt] pm pm pm	ving oily sheen □ Surface Structural Condition: Reference /ater moving at a moderate □ Cloudy/Muddy ☑ Colored Duplicate Sample [1 each sampling event] pH units ppm ppm ppm	scum 🗹 Soapy suds cd a rate 🗆 High a rate 🕞 High Control of angle Water Qua Parameter pH Total chlorine Detergents Total copper Total phenols	ality Samples Primary Sample Primary Sample Primary Sample Primary Sample COS ppm COS ppm COS ppm	ring very quickly
 Odors: Floatables in Vegetation: Biology Part 3. Field And Flow: Low: Not inter Appearance Color of wate 	n water flowing from //one malyses gal/min; mse, water moving of water flowing from er flowing from end ty Analyses: Parameter pH Total chlorine Detergents Total copper Total phenols Turbidity (outfall)	□ No n end-of-pipe: □ None □ OR Very slowly □ Mediu om end-of-pipe: ☑ Clear I-of-pipe: □ Clear Quality Control Sam Equipment Blank [1 each bufore sampling even N/A C 0.5 p ∠-0.05 p ∠-0.05 p	Mov 12. § m: Wa ples nt] pm pm pm	ving oily sheen □ Surface Structural Condition: Refe /ater moving at a moderate □ Cloudy/Muddy ☑ Colored //e Duplicate Sample [1 each sampling event] pH units ppm ppm ppm ppm	scum 🗹 Soapy suds	ality Samples Primary Sample Primary Sample Primary Sample Primary Sample	ring very quickly

Odors: nusty Fladalls: cregaric Sheen

Municipality of Anchorage	DRY WEATHER SCREENING FIELD DATA FORM
Outfall Number:	
Part 1. General Information	1:49
1. Date <u>06/12/17</u>	
2. Field Crew Lynn Spencer	Sam Grosenich Water quality analyses conducted by: Lynn Springer, A Soller, S.
3. How long since last rainfall?	□ raining now □ less than 3 days □ 3 or more days □ unknown
4. Size of last rain event. DIH	inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter:	feet inches
6. Depth of water in end-of-pipe:	feet2.5_inches
 9. Odors: 10. Floatables in water flowing from e 	□ No ☑ Yes f outfall, record any pertinent information in comments, and go to next outfall. If YES, continue. ☑ No □ Yes If yes, describe in comment section. and-of-pipe: ☑ None □ Moving oily sheen □ Surface scum □ Soapy suds □ Debris □ Other 12. Structural Condition:
Part 3. Field Analyses	
14. Flow: gal/min;	OR
Low: Not intense, water moving ve	
15. Appearance of water flowing from	
16. Color of water flowing from end-of	-pipe: 🗹 Clear 🗆 Colored
17. Water Quality Analyses:	

	Quality Control	I Samples	
Parameter	Equipment BI [1 each before sampli	Duplicate Sample [1 each sampling event]	
рН	N/A	1	pH units
Total chlorine	60.5	ppm	ррт
Detergents	20.05	ppm	ppm
Total copper	C0.05	ppm	ppm
Total phenols	(0.)	ppm	ppm
Turbidity (outfall)	0.03	all beau	
Turbidity (upstream)			
Fecal Coliform		1110 973	

Weather: 57°, Clarly

Water Quality Samples				
Parameter Primary Sample				
pН	B pl	H units		
Total chlorine	< 0.5	ppm		
Detergents	6.05	ppm		
Total copper	<0.05	ppm		
Total phenols	<0.1	ppm		
Turbidity (outfall)	2.4	Klat		
Turbidity (upstream)		Went		
Fecal Coliform		11000		

-16

C10

Part 4. Comments: Flow: 97 25 Dep 9' wide 1 # 15 Here

1

Municipality of		and the second se	ATHER SCREEN D DATA FORM	D	epartment of ublic Works	TIRSHED MANAGEMENT
Outfall Number:	FUR 332-1					
Part 1. General	Information				(Strain)	100 m 100 m
1. Date _(06/12/17	Time	700 pm			
		Sam Grosenick	Water quality a	nalyses conducted b	v. Luna Sparer 1	A.Gerlin
				malyses conducted b	S. GNDSE	arth
3. How long sin			caa ulan o daya	LI 5 6 more days		
4. Size of last ra	in event. D. 14	inches (Attach data from	m Anchorage International A	irport or Girdwood. \	Nebsites provided or	h back of form.)
5. End-of-pipe of		feet	6 inches		2	
		feet 4.5	inches			
Part 2. Visual						
7. Photograph I	Log: Camera # and	d frame number (s)	(0.0)	e Marcula de la composición de la composicinde la composición de la composición de la composición de l		
the second second second	g from end-of-pipe and log photograpi	? □ No		nd go to next outfall. in comment section.	If Y	ES, continue.
11. Vegetation: 13. Biology <u>Ma</u>	Veg Acating on S 110 Involubrets	mend-of-pipe: [] None [] Ma Inter Jalen Canel Calls 12.				
Part 3. Field A						
14. Flow:	gal/min;	OR				
Low: Not inte	nse, water moving	very slowly 🔲 Medium: V	Vater moving at a moderate	rate 🛛 High	; Intense water mov	ing very quickly
15. Appearance	of water flowing fro	om end-of-pipe: 🗹 Clear	Cloudy/Muddy			
	er flowing from end	1	Colored			0.47
						100.00
17. Water Qualit	ty Analyses:				11 m m	
		Quality Control Samples		Water Qua	lity Samples	
	Parameter	Equipment Blank [1 each before sampting event]	Duplicate Sample (1 each sampling event)	Parameter	Primary Sample	0.000
	рН	N/A	pH units	pH	8 pH units	
	Total chlorine	60.5 ppm	ppm	Total chlorine	20.5 ppm	free avail. 20
	Detergents	-0.05 ppm	ppm	Detergents	20.05 ppm	
	Total copper	20.05 ppm	ppm	Total copper	<0.05 ppm	
1 200	Total phenois	CO.1 ppm	ppm	Total phenois	<0.) ppm	and a state of the

Part	4.	Comm	ents:

Flow: 12.5" Wide 4.5" Deep mininal flow 2"/sec surface, not flowing

Turbidity

(outfall)

Turbidity

(upstream)

Fecal Coliform

0.03

Flootables: Biological flooting Scum, toologe Odor: Slight organics musity smell, almost metalik Weather's 59° S. Starting to come out Cloudy

Turbidity

(outfall)

Turbidity

(upstream)

Fecal Coliform

2.Jan-u

Municipality of Anchorage	DRY	WEATHER SCI FIELD DATA FO	5 SHE T 1971	D	epartment of ublic Works	TERSHED WANACTMENT
Outfall Number:	Am 105-1					
Part 1. General Information					• *** ********************************	601/1701 1970 - 1970 - 1970
1. Date 6/121	Tim	ie <u>1500</u>	1516	9 Presso	IFIE Day	an owned and
2. Field Crew 12 S					4 4 4	
		THE REPORT OF THE PARTY OF			S. PUDLI	OTCH.
3. How long since last rainfal	I? I raining now	less than 3 days	Ę	k3 or more days	D unknow	
4. Size of last rain event.), Minches (Attach	data from Anchorage Inter	national Airp	oort or Girdwood.	Websites provided or	n back of form.)
5. End-of-pipe diameter:	feet	inches				
6. Depth of water in end-of-p	ipe:feet	1.5 inches				
Part 2. Visual Observation	\$					SUL URAY
7. Photograph Log: Camera	# and frame number (s)	1 Pad				
 Water flowing from end-of If NO, take and log photo Odors: 	-pipe? □ No ograph of outfall, record any □ No	the state of the second		d go to next outfall. comment section.		ES, continue.
10. Floatables in water flowin	a from end-of-pipe: 🗖 None				and the second	ber
						ICI
11. Vegetation: <u>non c</u>		12. Structural Condition	n: <u>ana</u>	d		
13. Biology arang	e science					
Part 3. Field Analyses						
14. Flow: gal/min;	OR Con	wflow				
54-Low: Not intense, water m		edium: Water moving at a i	noderate ra	te 🖸 Hiot	h; Intense water mov	ina verv auickly
15. Appearance of water flow	ing from end-of-pipe: C	ear DKCloudy	Muddy C	nangish "		
16. Color of water flowing from	m end-of-pipe: 🛛 🖾 Cl	ear 🗆 Colore	d	11 42		ant congranting
17. Water Quality Analyses:						
	Quality Control S	amples		Water Qua	ality Samples	1
Paramete	er Equipment Blan (1 each before sampling			Parameter	Primary Sample	
pH	N/A	P pH u		pH	7 pH units	
Total chlor			pm 20.5	Total chlorine	<0.5 ppm	gree avail. 201
Detergen			pm	Detergents	0, 2_ ppm	0
Total copp			pm	Total copper	<0.05 ppm	
Total phen			pm	Total phenols	<0.\ ppm	

0.3

113 ntu

Turbidity

(outfall)

Turbidity (upstream) Fecal Coliform 89.2 ntu

Part 4. Comments:

Turbidity

(outfall)

Turbidity

(upstream) Fecal Coliform

Anchorage		3	ATHER SCREEN LD DATA FORM	D	epartment of ublic Works	TERSHED MANAGEMENT
Outfall Number:	ER D			1.00	10.10	
Part 1. General In	formation					
1. Date	3/1/17	Time	1025		11 YORK CONTRACTOR	
2. Field Crew	1. Gerle	K. L. Spencer	Water quality	analyses conducted b	r: A.Gelek C	Spencer
3. How long since l	lact minfoll?	N	less than 3 days	X 3 or more days		V
	010		iess triait o days	Et 2 OF MOLE Days		
4. Size of last rain e	event. U.L *	inches (Attach data fro	om Anchorage International		Vebsites provided or	h back of form.)
5. End-of-pipe diar	neter:	2feet(inches	le July		
6. Depth of water in	n end-of-pipe:	<u> </u>	inches			
Part 2. Visual Obs	servations		64			
7. Photograph Log	: Camera # and	d frame number (s) DAA	ill, Allow path, S	than notive	K wonthat	
 Water flowing from <i>If NO, take and</i> Odors: 		oh of outfall, record any pertine		and go to next outfall. e in comment section.	lf Y	ES, continue.
10. Floatables in wa	ater flowing fro	m end-of-pipe: 🖾 None 🗇 M	oving oily sheen 🗇 Surface	scum 🖾 Soapy suds	Debris D Ott	her
11. Vegetation: <u>YI</u>	WIDS JULL	ws along gloupath 12.	Structural Condition:	004		
13. Biology		9				1993
Part 3. Field Analy	yses					
		OR				
Part 3. Field Analy	_gal/min;		Nater moving at a moderate	e rate 🛛 🕅 High	; Intense water movi	ing very quickly
Part 3. Field Analy 14. Flow:	_ gal/min; , water moving	y very słowły 🛛 🗆 Medium: \	Nater moving at a moderate	e rate 🛛 🕅 High	; Intense water movi	ing very quickly
Part 3. Field Analy 14. Flow: Low: Not intense	_ gal/min; , water moving vater flowing fr	y very słowły ☐ Medium: \ om end-of-pipe: ⊠ Clear		e rate 🛛 🕅 High	; Intense water movi	ing very quickly
Part 3. Field Analy 14. Flow: D Low: Not intense 15. Appearance of v	_ gal/min; , water moving vater flowing fr owing from end	y very słowły ☐ Medium: \ om end-of-pipe: ⊠ Clear	Cloudy/Muddy	e rate 🕅 High	; Intense water movi	ing very quickly
Part 3. Field Analy 14. Flow: Low: Not intense 15. Appearance of v 16. Color of water flo	_ gal/min; , water moving vater flowing fr owing from end	y very słowły ☐ Medium: \ om end-of-pipe: ⊠ Clear	Cloudy/Muddy			ing very quickly
Part 3. Field Analy 14. Flow: Low: Not intense 15. Appearance of v 16. Color of water flo 17. Water Quality An	_ gal/min; , water moving vater flowing fr owing from end	y very słowły ☐ Medium: N om end-of-pipe: ☑ Clear d-of-pipe: ☑ Clear Quality Control Samples Equipment Blank	Cloudy/Muddy		; Intense water movi lity Samples Primary Sample	ing very quickly
Part 3. Field Analy 14. Flow: Low: Not intense 15. Appearance of v 16. Color of water flo 17. Water Quality Au	_ gal/min; , water moving vater flowing fr owing from end nalyses: Parameter	y very słowły ☐ Medium: N om end-of-pipe: ⊠ Clear d-of-pipe: ⊠ Clear Quality Control Samples Equipment Blank [1 each before sampling event]	Cloudy/Muddy Colored Duplicate Sample [1 each sampling event]	Water Qua Parameter	lity Samples Primary Sample	
Part 3. Field Analy 14. Flow: Low: Not intense 15. Appearance of v 16. Color of water flo 17. Water Quality Au	_ gal/min; , water moving vater flowing fro owing from end nalyses: Parameter pH	y very słowły ☐ Medium: N om end-of-pipe: ☑ Clear d-of-pipe: ☑ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A	Cloudy/Muddy Colored Duplicate Sample [1 each sampling event] PH units	Water Qua Parameter pH	lity Samples Primary Sample 7- pH units	ing very quickly
Part 3. Field Analy 14. Flow: Low: Not intense 15. Appearance of v 16. Color of water flow 17. Water Quality Au The second	_ gal/min; , water moving vater flowing fr owing from end nalyses: Parameter	y very słowły ☐ Medium: N om end-of-pipe: ⊠ Clear d-of-pipe: ⊠ Clear Quality Control Samples Equipment Blank [1 each before sampling event]	Cloudy/Muddy Colored Duplicate Sample [1 each sampling event]	Water Qua Parameter	lity Samples Primary Sample	
Part 3. Field Analy 14. Flow: Low: Not intense 15. Appearance of v 16. Color of water flo 17. Water Quality Au	_ gal/min; , water moving vater flowing fro owing from enc nalyses: Parameter pH otał chlorine	y very słowły ☐ Medium: N rom end-of-pipe: ⊠ Clear d-of-pipe: ⊠ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A <0-5 ppm	Cloudy/Muddy Colored Duplicate Sample [1 each sampling event] PH units / ppm	Water Qua Parameter pH Total chlorine	lity Samples Primary Sample 7- pH units < 0-5 ppm	
Part 3. Field Analy 14. Flow: Low: Not intense 15. Appearance of v 16. Color of water flo 17. Water Quality Au	_ gal/min; , water moving vater flowing fro owing from end nalyses: Parameter pH otal chlorine Detergents Total copper otal phenols	y very słowły ☐ Medium: N om end-of-pipe: ⊠ Clear d-of-pipe: ⊠ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A <0-5 ppm <∞.05 ppm	Cloudy/Muddy Colored Duplicate Sample [1 each sampling event] PH units Ppm ppm ppm	Water Qua Parameter pH Total chlorine Detergents Total copper Total phenols	lity Samples Primary Sample 7 pH units <0.5 ppm <0.05 ppm	
Part 3. Field Analy 14. Flow: Low: Not intense 15. Appearance of v 16. Color of water flo 17. Water Quality Au	_ gal/min; , water moving vater flowing fro owing from end nalyses: Parameter pH otal chlorine Detergents otal copper otal copper otal phenols Turbidity	y very słowły ☐ Medium: N om end-of-pipe: ⊠ Clear d-of-pipe: ⊠ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A <0.5 ppm <0.05 ppm <0.1 ppm	Cloudy/Muddy Colored Duplicate Sample [1 each sampling event] PH units Ppm Ppm Ppm Ppm	Water Qua Parameter pH Total chlorine Detergents Total copper Total phenols Turbidity	lity Samples Primary Sample 7 pH units <0.05 ppm <0.05 ppm <0.05 ppm <0.01 ppm	
Part 3. Field Analy 14. Flow: Low: Not intense 15. Appearance of v 16. Color of water flo 17. Water Quality Au	_ gal/min; , water moving vater flowing fro owing from enconstruction nalyses: Parameter pH otal chlorine Detergents Turbidity (outfall)	y very słowły ☐ Medium: N com end-of-pipe: ⊠ Clear d-of-pipe: ⊠ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A <0.5 ppm <0.05 ppm	Cloudy/Muddy Colored Duplicate Sample [1 each sampling event] PH units Ppm Ppm Ppm Ppm	Water Qua Parameter pH Total chlorine Detergents Total copper Total phenols Turbidity (outfall)	lity Samples Primary Sample 7- pH units <0.05 ppm <0.05 ppm <0.05 ppm	
Part 3. Field Analy 14. Flow: Low: Not intense 15. Appearance of v 16. Color of water flow 17. Water Quality Au Till T	_ gal/min; , water moving vater flowing fro owing from end nalyses: Parameter pH otal chlorine Detergents otal copper otal copper otal phenols Turbidity	y very słowły ☐ Medium: N om end-of-pipe: ⊠ Clear d-of-pipe: ⊠ Clear Quality Control Samples Equipment Blank [1 each before sampling event] N/A <0.5 ppm <0.05 ppm <0.1 ppm	Cloudy/Muddy Colored Duplicate Sample [1 each sampling event] PH units Ppm Ppm Ppm Ppm	Water Qua Parameter pH Total chlorine Detergents Total copper Total phenols Turbidity	lity Samples Primary Sample 7 pH units <0.05 ppm <0.05 ppm <0.05 ppm <0.01 ppm	

Flow path - cobdes, water ~ 1-4" cleep, flows steeply to 5.

S

Municipality of Anchorage		2)	ATHER SCREE	N	epartment of Public Works	ANTERSHED MAAAGEMEAT
Part 1. Genera	al Information					
1. Date	8/1/17	Time	1045			
2. Field Crew	A. Gerlek	, Lispencer	Water qua	ity analyses conducted I	y: A. Gerul	L.L.Spencer
3. How long sir	nce last rainfall?	I aining now	less than 3 days	☑ 3 or more days		
4. Size of last ra	10.1	2	om Anchorage Internation			
5. End-of-pipe		feet (data and the second sec	L 26 July	freballes profiled (on back of form.)
	ter in end-of-pipe:	0 175				
 8. Water flowin <i>If NO, take</i> 9. Odors: 10. Floatables i 	g from end-of-pipe and log photograp n water flowing fro	h of outfall, record any pertine	Yes Information in commen Yes If yes, descu oving oily sheen Surfa	ts, and go to next outfall ibe in comment section. ce scum ☐ Soapy suds	BIAMIC	YES, continue.
Part 3. Field A	nalyses					
14. Flow:	gal/min;	OR				
Low: Not inte	nse, water moving	very slowly 🛛 🖄 Medium: V	Water moving at a moder	ate rate 🛛 Hig	n; Intense water mo	ving very quickly
15. Appearance	of water flowing fr	om end-of-pipe: 📴 Clear	Cloudy/Mude	ly .		
16. Color of wate	er flowing from end	i-of-pipe: K Clear	Colored			
17. Water Qualit	y Analyses:					
		Quality Control Samples		Water Ou	ality Samples	
	Parameter	Equipment Blank [1 each before sampling event]	Duplicate Sample [1 each sampling event]	Parameter	Primary Sample	
	рН	N/A	pH units	рН	7 pH units	
	Total chlorine	<0.5 ppm	, ppm	Total chlorine	40.5 ppm	gree < 0.5

	-0.5	Phin 1		Abbin
Detergents	<0,05	ppm		ppm
Total copper	<0.05	ppm	/	ppm
Total phenols	< 0.1	ppm		ppm
Turbidity (outfall)	0.13			
Turbidity (upstream)	-			
Fecal Coliform				
(upstream)	-		/	_

Parameter	Primary Sample	
pН	7 pH units	
Total chlorine	<0.5 ppm	Ine <1
Detergents	<0.05 ppm	10
Total copper	<0.05 ppm	1
Total phenols	<0.1 ppm	
Turbidity (outfall)	0.48	
Turbidity (upstream)	-	
Fecal Coliform	1]

some uban debors on Slow path pelow out Jull-plastic bage glowpath - cobbles up horsetul + Epilobrum citiatum, salix bebbion 290 shope to S

Municipality of Anchorage			EATHER SCREE	/	epartment of Public Works	TTRENTD MANAGEMENT
Outfall Number:	ER I	375-99			12	urseuren 35rvillfaimi
Part 1. General Informa	ation					
1. Date <u>8/</u>	1/17	Time	1105			hind
2. Field Crew A. G	cilen,	L. Spencer	Water qual	ity analyses conducted t	y: A. Gereb	, L.Spencer
3. How long since last ra		🗘 raining now 🛛		12 3 or more days	🗆 unknow	
4. Size of last rain event.	017	r inches (Attach data	from Anchorage Internation		Websites provided or	n back of form.)
5. End-of-pipe diameter:		l feet C		ie Suly		
		O feet 2	inches			
Part 2. Visual Observa						_
		frame number (s) <u>0</u> H	Jall, downs	meam		
8. Water flowing from er	id-of-pipe?	No Contrall, record any pertin	LYes ent information in comment		If Y	ES, continue.
10. Floatables in water fl	owing from	end-of-pipe: []/None	Moving oily sheen 🗆 Surfa	ce scum 🗆 Soapy suds	🗖 Debris 🔲 Otl	her
11. Vegetation:	-	V .	2. Structural Condition:	the second second second second		
Part 3. Field Analyses						
14. Flow: gal/	min;	OR				
Low: Not intense, wate	er moving v	ery slowly 🔲 🗖 Medium	: Water moving at a moder	ate rate 🛛 😥 Higt	n; Intense water mov	ing very quickly
15. Appearance of water	flowing fron	n end-of-pipe: 🔯 Clear	Cloudy/Mudo	ly		
16. Color of water flowing	from end-c	of-pipe: 🙀 Clear	Colored			
17. Water Quality Analyse						
		Quality Control Sampl	es	Water Ous	lity Samples	
Parar	neter	Equipment Blank	Duplicate Sample	Parameter	Primary Sample	And the second second
p	-	[1 each before sampling event] N/A	[1 each sampling event] pH units	pH	7 pH units	
Total c		-<0.5 ppm		Total chlorine	<0.5 ppm	Free CO.
Deter		-40.05 ppm		Detergents	1 10.05 nnm	

Total copper	K0.05	ppm	
Total phenois	<0.1	ppm	
Turbidity (outfall)	0.13		/
Turbidity (upstream)	-		/
Fecal Coliform	-		2

Parameter	Primary Sample
pН	7 pH units
Total chlorine	< 0.5 ppm
Detergents	KO.05 ppm
Total copper	20.05 ppm
Total phenols	COIL ppm
Turbidity	
(outfall)	0.49
Turbidity	
(upstream)	<u> </u>
Fecal Coliform	1

no network shown in HGDB. Given temporary ID by HDR in _

ppm ppm

C15

Municipality of Anchorage		2	ATHER SCREEI	D	epartment of ublic Works	HATERSHED MANAGEDIEAT
Part 1. Genera	I Information					
1. Date _	8/1/17	Time	1120			
2. Field Crew	A. Gerle	24, L. Spencer	Water quality	v analyses conducted b	y: A. Gell	L. L. Spencer
3. How long sir	ice last rainfall?	raining now	less than 3 days	Ø 3 or more days	🗆 unkno	wn
4. Size of last ra	ain event. 0.(<u>A</u> inches (Attach data fro	om Anchorage International	Airport or Girdwood.	Nebsites provided	on back of form.)
5. End-of-pipe	diameter:	feet 6	inches	26 July		
6. Depth of wat	er in end-of-pipe:	feet	inches			
Part 2. Visual	Observations					
7. Photograph	Log: Camera # an	d frame number (s)	all downsto	ehm		
8. Water flowin	g from end-of-pipe	e? INo IQ oh of outfall, record any pertine	Yes nt information in comments		h	YES, continue.
	n water flowing fro	m end-of-pipe: 51 None 🗆 M			Debris D	Other
11. Vegetation:	Moss m hud silws	Pipe. 12.	Structural Condition:			
Part 3. Field A	nalyses			and the second s		
14. Flow:	gal/min;	OR				
Low: Not inte	nse, water moving	y very slowly 🔲 Medium:	Water moving at a moderat	e rate 🙀 Higi	; Intense water m	oving very quickly
15. Appearance	of water flowing fr	rom end-of-pipe: 🙀 Clear	Cloudy/Muddy			
16. Color of wate	er flowing from en	d-of-pipe: ¥ Clear	Colored			
17. Water Qualit	y Analyses:					
		Quality Control Samples		Water Quality Samples		
	Parameter	Equipment Blank (1 each before sampling event)	Duplicate Sample (1 each sampling event)	Parameter	Primary Sampl	e
		I to an bolor company orong	Tr outer ourinping openity		111	-

rarameter	(1 each before samplin	(1 each sampling event)		
pН	N/A		pþ	units
Total chlorine	K0,5	ppm	/	ppm
Detergents	< 0.05	ppm		ppm
Total copper	60.05	ppm	/	ppm
Total phenols	40.1	ppm	/	ppm
Turbidity (outfall)	0.13		/	
Turbidity (upstream)	-		/	
Fecal Coliform	-			

Water Quality SamplesParameterPrimary SamplepH7pH unitsTotal chlorine<0.5</td>ppmDetergents $\angle 0.05$ ppmTotal copper<0.05</td>ppmTotal phenols<0.1</td>ppmTurbidity
(outfall) $\mathcal{O}:\mathcal{UO}$ Turbidity
(upstream)Fecal Coliform

Free 20.5

Part 4. Comments:

high flow. Outgul perched 6".

Municipality of Auchorage DRY WEATHER SCREENING FIELD DATA FORM
Outfall Number: ER 1335-1 @ duplicate collected
Part 1. General Information
1. Date <u>9/1/17</u> Time <u>1205</u>
2. Field Crew A. Gerkek, L. Spencer Water quality analyses conducted by: A. Gerkek, L. Spencer
3. How long since last rainfall?
4. Size of last rain event. 0.13 inches (Attach data from Anchorage International Airport or Girdwood. Websites provided on back of form.)
5. End-of-pipe diameter: 4 feet 0 inches the July
6. Depth of water in end-of-pipe:
 Part 2. Visual Observations 7. Photograph Log: Camera # and frame number (s)
Part 3. Field Analyses
14. Flow: gal/min; OR
Low: Not intense, water moving very slowly 🕞 Medium: Water moving at a moderate rate 🛛 High; Intense water moving very quickly
15. Appearance of water flowing from end-of-pipe: Clear
16. Color of water flowing from end-of-pipe:
17. Water Quality Analyses:
Quality Control Samples Water Quality Samples
Parameter Equipment Blank Duplicate Sample Parameter Primary Sample

Parameter	Equipment Bla [1 each before sampling		Duplicate Sample [1 each sampling event]		Free	Parameter	Primary Sample	
pН	N/A		7 p	H units	10.5	pН	7 pH units	
Total chlorine	<0.5	ppm	< 0.5	ppm	~	Total chlorine	<0.5 ppm	FA
Detergents	20.05	ppm	0.05	ppm		Detergents	0.05 ppm	
Total copper	60.05	ppm	<0.05	ppm	1	Total copper	< 0.05 ppm	
Total phenols	<0.1	ppm	40.1	ppm		Total phenols	<oii ppm<="" td=""><td></td></oii>	
Turbidity (outfall)	0.13		1.62			Turbidity (outfall)	1.45	
Turbidity (upstream)	-		-			Turbidity (upstream)	-	
Fecal Coliform					1	Fecal Coliform	_	

2015

Part 4. Comments:

Arte hus Jallen aff. Lots of when allors in first + Jon path. When not slowing breatly to row. I philtrates in to pabiens ~ 20 St below Eop. train in Jon path, evidence of flow a wing high water. Then path regetited of Rich+ Cat can to ~ 100 & below FOP.

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Appendix D

Outfall Sampling Photographs

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Fish Creek 162-1. June 12, 2017.



Fish Creek 462-1. June 12, 2017.



Fish Creek 228-1. June 12, 2017.



Fish Creek 1287-994. June 12, 2017.



Fish Creek 1287-1858-1. June 12, 2017.



Furrow Creek 5-1. June 12, 2017.



Furrow Creek 1345-1. June 12, 2017.

Furrow Creek 1359-1. June 12, 2017.



Furrow Creek 306-1. June 12, 2017.

Furrow Creek 402-1. June 12, 2017.



Furrow Creek 332-1. June 12, 2017.

Campbell Creek 105-1. June 12, 2017.



Eagle River 303-1. August 1, 2017.

Eagle River 1417-1. August 1, 2017.



Eagle River 1375-99. August 1, 2017.



Eagle River 646-71. August 1, 2017.





Eagle River 1335-1. August 1, 2017.

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Appendix E

Laboratory Analysis Reports

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Laboratory Report of Analysis

To: MOA-Project Mnmt/Engr PO Box 196650 Anchorage, AK 99519 907-343-8058

Report Number: 1173239

Client Project: Dry Weather Screening

Dear Kristi Bischofberger,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Forest at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely, SGS North America Inc.

Forest Taylor Project Manager Forest.Taylor@sgs.com Date

Print Date: 06/14/2017 1:35:50PM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518 t 907.562.2343 f 907.561.5301 www.us.sgs.com



Case Narrative

SGS Client: MOA-Project Mnmt/Engr SGS Project: 1173239 Project Name/Site: Dry Weather Screening Project Contact: Kristi Bischofberger

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 06/14/2017 1:35:55PM

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Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <<u>http://www.sgs.com/en/Terms-and-Conditions.aspx></u>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
В	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.
Sample summaries which in All DRO/RRO analyses are	include a result for "Total Solids" have already been adjusted for moisture content.

Print Date: 06/14/2017 1:35:56PM

Note:

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Sample Summary									
Client Sample ID	Lab Sample ID	Collected	Received	Matrix					
FSH 1287-994	1173239001	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)					
FSH 1287-994 DUP	1173239002	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)					
FSH 682-1	1173239003	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)					
FSH 462-1	1173239004	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)					
FSH 228-1	1173239005	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)					
FSH 1287-1858-1	1173239006	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)					

Method SM21 9222D Method Description

Fecal Coliform (MF)

Print Date: 06/14/2017 1:35:57PM

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	Detectable Results Summary						
Client Sample ID: FSH 682-1 Lab Sample ID: 1173239003	Parameter	Result	Units				
Microbiology Laboratory	Fecal Coliform	1.0	col/100mL				
Client Sample ID: FSH 462-1 Lab Sample ID: 1173239004 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 4.0	<u>Units</u> col/100mL				
Client Sample ID: FSH 1287-1858-1 Lab Sample ID: 1173239006 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 5.0	<u>Units</u> col/100mL				

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Results of FSH 1287-994							
Client Sample ID: FSH 1287-994 Client Project ID: Dry Weather Screen Lab Sample ID: 1173239001 Lab Project ID: 1173239	R M S	eceived D	Date: 06/12/ Date: 06/12/ Par (Surface,	17 13:05			
Results by Microbiology Laboratory			_				
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 1.00 U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100r	<u>DF</u> nL 1	<u>Allowable</u> Limits	Date Analyzed 06/12/17 14:47
Batch Information							
Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 14:47 Container ID: 1173239001-A							



Results of FSH 1287-994 DUP						
Client Sample ID: FSH 1287-994 DUP Client Project ID: Dry Weather Screen Lab Sample ID: 1173239002 Lab Project ID: 1173239	R M S	eceived D	Date: 06/12/17 1 ate: 06/12/17 1; er (Surface, Eff.,	3:05		
Results by Microbiology Laboratory			_			
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 1.00 U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> D col/100mL 1	<u>Allowable</u> F <u>Limits</u>	Date Analyzed 06/12/17 14:47
Batch Information						
Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 14:47 Container ID: 1173239002-A						

SGS	

Results of FSH 682-1							
Client Sample ID: FSH 682-1 Client Project ID: Dry Weather Screen Lab Sample ID: 1173239003 Lab Project ID: 1173239	R M S	eceived D	Date: 06/12/ ate: 06/12/1 er (Surface,	7 13:05			
Results by Microbiology Laboratory			_				
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 1.0	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100n	DF nL 1	Allowable Limits	Date Analyzed 06/12/17 14:47
Batch Information Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 14:47 Container ID: 1173239003-A							

SGS	

Results of FSH 462-1 Client Sample ID: FSH 462-1 Client Project ID: Dry Weather Screen Lab Sample ID: 1173239004 Lab Project ID: 1173239	Collection Date: 06/12/17 11:25 Received Date: 06/12/17 13:05 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:						
Results by Microbiology Laboratory Parameter Fecal Coliform	Result Qual 4.0	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100r	<u>DF</u> nL 1	<u>Allowable</u> Limits	Date Analyzed 06/12/17 14:47
Batch Information Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 14:47 Container ID: 1173239004-A							

SGS	

Results of FSH 228-1							
Client Sample ID: FSH 228-1 Client Project ID: Dry Weather Screening Lab Sample ID: 1173239005 Lab Project ID: 1173239			eceived Da	vate: 06/12/13 ate: 06/12/17 er (Surface, E	13:05	nd)	
Results by Microbiology Laboratory							
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 1.00 U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100ml	<u>DF</u> 1	<u>Allowable</u> <u>Limits</u>	Date Analyzed 06/12/17 14:47
Batch Information Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 14:47 Container ID: 1173239005-A							



Results of FSH 1287-1858-1 Client Sample ID: FSH 1287-1858-1 Client Project ID: Dry Weather Screen Lab Sample ID: 1173239006 Lab Project ID: 1173239	C R M S L						
Results by Microbiology Laboratory Parameter Fecal Coliform	<u>Result Qual</u> 5.0	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100n	DF nL 1	<u>Allowable</u> Limits	<u>Date Analyzed</u> 06/12/17 14:47
Batch Information Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 14:47 Container ID: 1173239006-A							

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– Method Blank		·							
Blank ID: MB for HBN Blank Lab ID: 139053		Matrix: Water (Surface, Eff., Ground)							
QC for Samples: 1173239001, 117323900	02, 1173239003, 1173239004, 117	3239005, 1173239006	6						
Results by SM21 9222	D								
Parameter Fecal Coliform	<u>Results</u> 1.00U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100mL					
Analytical Batch: BTI Analytical Method: S Instrument: Analyst: K.W Analytical Date/Time:									

SGS

– Method Blank									
Blank ID: MB for HBN Blank Lab ID: 1390588 QC for Samples:		Matrix	Matrix: Water (Surface, Eff., Ground)						
1173239001, 117323900	2, 1173239003, 1173239004, 1173	3239005, 1173239006)						
Results by SM21 9222									
<u>Parameter</u> Fecal Coliform	<u>Results</u> 1.00U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100mL					
Batch Information									
Analytical Batch: BTF Analytical Method: SI Instrument: Analyst: K.W Analytical Date/Time:									

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Review Criteria	Condition (Yes,	s, No, N/A Exceptions Noted below				
Chain of Custody / Temperature Rec	quirements	y	es Exemption perm	itted if sample	hand carries/deliv	ers.
Were Custody Seals intact? Note #	# & location n/a	ABSENT				
COC accompanied	d samples? yes					
yes **Exemption permitte	d if chilled & colle	cted <8 hou	rs ago, or for sample	es where chillir	ng is not required	
	no	Cooler ID:	1	@	7.0 °C Therm. ID:	D12
	n/a	Cooler ID:		@	°C Therm. ID:	
Temperature blank compliant* (i.e., 0-6 °C a	after CF)? n/a	Cooler ID:		@	°C Therm. ID:	
	n/a	Cooler ID:		@	°C Therm. ID:	
	n/a	Cooler ID:		@	°C Therm. ID:	
*If >6°C, were samples collected <8 ho	ours ago? yes					
If <0°C, were sample containers	ice free? n/a					
If samples received <u>without</u> a temperature blank, t						
temperature" will be documented in lieu of the temperatur "COOLER TEMP" will be noted to the right. In cases where						
temp blank nor cooler temp can be obtained, note "a						
	"chilled".					
Note: Identify containers received at non-compliant tem	perature					
Use form FS-0029 if more space i						
Holding Time / Documentation / Sample Condition	Requirements	Note: Refe	to form E-083 "Sam	nle Guide" for	specific holding ti	mes
Were samples received within hold					specific fiolding th	1103.
Do samples match COC** (i.e.,sample IDs,dates/times c	collected)? yes					
**Note: If times differ <1hr, record details & login						
Were analyses requested unambiguous? (i.e., method is sp	·					
analyses with >1 option for						
						0 1)
	***	n	/a <u>***Exemption pe</u>	rmitted for met	als (e.g,200.8/602	<u>0A).</u>
Were proper containers (type/mass/volume/preservative						
Volatile / LL-Hg R						
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with						
Were all water VOA vials free of headspace (i.e., bubbles						
Were all soil VOAs field extracted with Met						
Note to Client: Any "No", answer above indicates	non-compliance	with standar	d procedures and m	ay impact data	a quality.	
Additio	onal notes (if a	pplicable)	:			



Sample Containers and Preservatives

Container Id	<u>Preservative</u>	<u>Container</u> Condition	Container Id	<u>Preservative</u>	<u>Container</u> Condition
1173239001-A	Na2S2O3 for Chlorine Redu	ОК			
1173239002-A	Na2S2O3 for Chlorine Redu	ОК			
1173239003-A	Na2S2O3 for Chlorine Redu	ОК			
1173239004-A	Na2S2O3 for Chlorine Redu	ОК			
1173239005-A	Na2S2O3 for Chlorine Redu	ОК			
1173239006-A	Na2S2O3 for Chlorine Redu	ОК			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

- BU The container was received with headspace greater than 6mm.
- DM- The container was received damaged.

FR- The container was received frozen and not usable for Bacteria or BOD analyses.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis



Laboratory Report of Analysis

To: MOA-Project Mnmt/Engr PO Box 196650 Anchorage, AK 99519 907-343-8058

Report Number: 1173247

Client Project: Dry Weather Screening

Dear Kristi Bischofberger,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Forest at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely, SGS North America Inc.

Forest Taylor Project Manager Forest.Taylor@sgs.com Date

Print Date: 06/15/2017 4:43:36PM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518 t 907.562.2343 f 907.561.5301 www.us.sgs.com



Case Narrative

SGS Client: MOA-Project Mnmt/Engr SGS Project: 1173247 Project Name/Site: Dry Weather Screening Project Contact: Kristi Bischofberger

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

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Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <<u>http://www.sgs.com/en/Terms-and-Conditions.aspx></u>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
В	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.
Sample summaries which i	include a result for "Total Solids" have already been adjusted for moisture content.

Print Date: 06/15/2017 4:43:40PM

Note:

All DRO/RRO analyses are integrated per SOP.

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Sample Summary								
Client Sample ID	Lab Sample ID	Collected	Received	Matrix				
FUR 402-1	1173247001	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)				
FUR 332-1	1173247002	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)				
FUR 306-1	1173247003	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)				
FUR 1359-1	1173247004	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)				
FUR 1345-1	1173247005	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)				
FUR 5-1	1173247006	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)				
CAM 105-1	1173247007	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)				
CAM 105-1 DUP	1173247008	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)				
FUR 1359-1 DUP	1173247009	06/12/2017	06/12/2017	Water (Surface, Eff., Ground)				

Method

SM21 9222D

Method Description Fecal Coliform (MF)



Detectable	Results	Summary
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Client Sample ID: FUR 332-1 Lab Sample ID: 1173247002 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 4.0	<u>Units</u> col/100mL
Client Sample ID: FUR 306-1 Lab Sample ID: 1173247003 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 4.0	<u>Units</u> col/100mL
Client Sample ID: FUR 1359-1 Lab Sample ID: 1173247004 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 65	<u>Units</u> col/100mL
Client Sample ID: FUR 1345-1 Lab Sample ID: 1173247005 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 169	<u>Units</u> col/100mL
Client Sample ID: FUR 5-1 Lab Sample ID: 1173247006 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 890	<u>Units</u> col/100mL
Client Sample ID: CAM 105-1 Lab Sample ID: 1173247007 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 6.0	<u>Units</u> col/100mL
Client Sample ID: CAM 105-1 DUP Lab Sample ID: 1173247008 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 5.0	<u>Units</u> col/100mL
Client Sample ID: FUR 1359-1 DUP Lab Sample ID: 1173247009 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 320	<u>Units</u> col/100mL

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SGS							
Results of FUR 402-1 Client Sample ID: FUR 402-1 Client Project ID: Dry Weather Screening Lab Sample ID: 1173247001 Lab Project ID: 1173247 Results by Microbiology Laboratory		Collection Date: 06/12/17 13:49 Received Date: 06/12/17 16:06 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:					
Parameter Fecal Coliform	<u>Result Qual</u> 1.00 U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100r	<u>DF</u> nL 1	<u>Allowable</u> Limits	Date Analyzed 06/12/17 17:31
Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 17:37 Container ID: 1173247001-A	1						

SGS	

Results of FUR 332-1 Client Sample ID: FUR 332-1 Client Project ID: Dry Weather Screer Lab Sample ID: 1173247002 Lab Project ID: 1173247 Results by Microbiology Laboratory	Collection Date: 06/12/17 14:00 Received Date: 06/12/17 16:06 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:						
Parameter Fecal Coliform Batch Information Analytical Batch: BTF15665	<u>Result Qual</u> 4.0	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100m	<u>DF</u> L 1	<u>Allowable</u> Limits	<u>Date Analyzed</u> 06/12/17 17:31
Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 17:31 Container ID: 1173247002-A							

SGS	

Results of FUR 306-1							
Client Sample ID: FUR 306-1 Client Project ID: Dry Weather Screen Lab Sample ID: 1173247003 Lab Project ID: 1173247	C R M Si La						
Results by Microbiology Laboratory			<u> </u>				
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 4.0	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100mL	<u>DF</u> . 1	Allowable Limits	Date Analyzed 06/12/17 17:31
Batch Information Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 17:31 Container ID: 1173247003-A							



Results of FUR 1359-1						
Client Sample ID: FUR 1359-1 Client Project ID: Dry Weather Screen Lab Sample ID: 1173247004 Lab Project ID: 1173247	Ca Ri M Sa La	·				
Results by Microbiology Laboratory						
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 65	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> DF col/100mL 1	Allowable Limits	Date Analyzed 06/12/17 17:31
Batch Information Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 17:31 Container ID: 1173247004-A						



Results of FUR 1345-1							
Client Sample ID: FUR 1345-1 Client Project ID: Dry Weather Screer Lab Sample ID: 1173247005 Lab Project ID: 1173247	Collection Date: 06/12/17 12:04 Received Date: 06/12/17 16:06 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:						
Results by Microbiology Laboratory			_				
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 169	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100m	DF nL 1	<u>Allowable</u> <u>Limits</u>	Date Analyzed 06/12/17 17:31
Batch Information Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 17:31 Container ID: 1173247005-A							

Results of FUR 5-1							
Client Sample ID: FUR 5-1 Client Project ID: Dry Weather Screening Lab Sample ID: 1173247006 Lab Project ID: 1173247		R M S	eceived Da	Date: 06/12/17 11:28 ate: 06/12/17 16:06 er (Surface, Eff., Gro		-	
Parameter Fecal Coliform	<u>Result Qual</u> 890	<u>LOQ/CL</u> 10.0	<u>DL</u> 10.0	<u>Units</u> col/100r	<u>DF</u> nL 1	<u>Allowable</u> <u>Limits</u>	Date Analyzed 06/12/17 17:31
Batch Information Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 17:31 Container ID: 1173247006-A							

SGS	

	Results of CAM 105-1 Client Sample ID: CAM 105-1 Client Project ID: Dry Weather Screening Lab Sample ID: 1173247007 Lab Project ID: 1173247								
			Collection Date: 06/12/17 15:10 Received Date: 06/12/17 16:06 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:						
	Results by Microbiology Laboratory <u>Parameter</u> Fecal Coliform	Result Qual 6.0	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100ml	<u>DF</u> 1	<u>Allowable</u> <u>Limits</u>	Date Analyzed 06/12/17 17:31	<
	Batch Information Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 17:31 Container ID: 1173247007-A								



Results of CAM 105-1 DUP								
Client Sample ID: CAM 105-1 DUP Client Project ID: Dry Weather Screen Lab Sample ID: 1173247008 Lab Project ID: 1173247	Collection Date: 06/12/17 15:15 Received Date: 06/12/17 16:06 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:							
Results by Microbiology Laboratory			_					
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 5.0	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100n	DF nL 1	<u>Allowable</u> <u>Limits</u>	Date Analyzed 06/12/17 17:31	
Batch Information Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 17:31 Container ID: 1173247008-A								

Print Date: 06/15/2017 4:43:44PM



Results of FUR 1359-1 DUP Client Sample ID: FUR 1359-1 DUP Client Project ID: Dry Weather Screen Lab Sample ID: 1173247009 Lab Project ID: 1173247	ning	C R M S Lo					
Results by Microbiology Laboratory <u>Parameter</u> Fecal Coliform Batch Information	<u>Result Qual</u> 320	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100n	<u>DF</u> nL 1	<u>Allowable</u> <u>Limits</u>	Date Analyzed 06/12/17 17:31
Analytical Batch: BTF15665 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 06/12/17 17:31 Container ID: 1173247009-A							

Print Date: 06/15/2017 4:43:44PM

SGS	

Method Blank Blank ID: MB for HBN 1760990 [BTF/15665] Blank Lab ID: 1390588		Matri	x: Water (Surfa	ace, Eff., Ground)	
QC for Samples: 1173247001, 1173247002, Results by SM21 9222D	1173247003, 1173247004, 1173	3247005, 1173247006	5, 1173247007,	1173247008, 1173247009	
Parameter Fecal Coliform	Results 1.00U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100mL	
Batch Information Analytical Batch: BTF1 Analytical Method: SM2 Instrument: Analyst: K.W Analytical Date/Time: 6	21 9222D				

47		- bage - of				REMARKS/ LOC ID			-								Data Deliverable Requirements:		18:	~	Chain of Custody Seal: (Circle)	INTACT BROKEN BSENT	
17324	out. S.												с. 				Data Deliv		cial Instructio		Chain of (INTACT (See attache	
	istructions: Sections 1 - 5 must be filled out. <u>Omissions may delay the onset of analysis.</u>	Preservative															DOD Project? Yes No		Requested Turnaround Time and/or Special Instructions:		o: 11-8-4012	or Ambient [] (See attached Sample Receipt Form)	http://www.sgs.com/terms-and-conditions
	Sections 1 nay delay ti																Section 4	Cooler ID:	Requested Tr		Temp Blank °C:	(See attach	http://www.sgs
S North America Inc. OF CUSTODY RECORD	Instructions: Omissions n	8		<i>3</i>	70	ه <u>ة</u> <u>ه</u>												:				al Due	
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SGS	<u>1942)4</u>	ķ	PROJECT MORA LOSM NAME: Dry WEATHOR SCN	REPORTS TO: MOIA-UDSM, INVOICE TO:	K. Bischoff here er		Fue	FUR	FUR	FUR	Fue	FUR	CAM	CAM	A FU	FUR	Relinquished By: (1)	X in	Relinquished(By: (2)	Relinquished By: (3)		Relinquished By: (4)	/. Potter Drive Business Driv
	CLIENT:	Alena - contact:	Section NAME:		K, Bi	RESERVED for lab use	ЮA	(2) H		noi A A			F	M		46	Relinquis		ion 5 Relinquist			Relinquisi	[] 200 M [] 5500 I

F083-Kit_Request_and_COC_Templates-Blank Revised 2013-03-24



e-Sam<u>ple Receipt Form</u>

1173247



Review Criteria	Condition (Yes	, No, N/A		Exception	ns Not	ed belo	w ·	•
Chain of Custody / Temperature Require			es Ex	emption permitted				vers.
Were Custody Seals intact? Note # & lo								
COC accompanied sam								
Yes **Exemption permitted if cl			irs ago	, or for samples w	here chi	<mark>lling is n</mark> o	t required	
	No	Cooler ID:		1	@	11.8 °C	Therm. ID:	D12
		Cooler ID:			@	°C	Therm. ID:	
Temperature blank compliant* (i.e., 0-6 °C after	CF)?	Cooler ID:			@	°C	Therm. ID:	
		Cooler ID:			@		Therm. ID:	
		Cooler ID:			@	°C	Therm. ID:	
*If >6°C, were samples collected <8 hours a	ago? Yes							
If <0°C, were sample containers ice f	ree? N/A							
		L						
If samples received <u>without</u> a temperature blank, the "c temperature" will be documented in lieu of the temperature bla								
"COOLER TEMP" will be noted to the right. In cases where neit								
temp blank nor cooler temp can be obtained, note "ambie	nt" or							
"ch	illed".							
Note: Identify containers received at non-compliant tempera	iture .							
Use form FS-0029 if more space is nee	eded.							
Holding Time / Documentation / Sample Condition Rec			r to for	m F-083 "Sample	Guide" f	or specifi	c holding ti	mes.
Were samples received within holding	time? Yes							
		L						
Do samples match COC** (i.e.,sample IDs,dates/times collec								
**Note: If times differ <1hr, record details & login per (
Were analyses requested unambiguous? (i.e., method is specified analyses with >1 option for analyses with >1 optio								
analyses with >1 option for ana	uyəiə <i>)</i>							
		N	/A ***	Exemption permitt	ed for m	etals (e.o	<mark>9,200.8/60</mark> 2	0A).
Were proper containers (type/mass/volume/preservative***)u	ised? Yes							
<u>Volatile / LL-Hg Requ</u>	irements							
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with sam								
Were all water VOA vials free of headspace (i.e., bubbles \leq 6r								
Were all soil VOAs field extracted with MeOH+	BFB? N/A							
Note to Client: Any "No", answer above indicates non-	compliance	with standa	rd proc	edures and may i	mpact da	ata quality	у.	
Additional	notes (if a	applicable	:					



Sample Containers and Preservatives

<u>Container Id</u>	Preservative	<u>Container</u> Condition	<u>Container Id</u>	Preservative	<u>Container</u> Condition
1173247001-A	Na2S2O3 for Chlorine Redu	ОК			
1173247002-A	Na2S2O3 for Chlorine Redu	ОК			
1173247003-A	Na2S2O3 for Chlorine Redu	ОК			
1173247004-A	Na2S2O3 for Chlorine Redu	ОК			
1173247005-A	Na2S2O3 for Chlorine Redu	ОК			
1173247006-A	Na2S2O3 for Chlorine Redu	ОК			
1173247007-A	Na2S2O3 for Chlorine Redu	ОК			
1173247008-A	Na2S2O3 for Chlorine Redu	ОК			
1173247009-A	Na2S2O3 for Chlorine Redu	ОК			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

- BU The container was received with headspace greater than 6mm.
- DM- The container was received damaged.

FR- The container was received frozen and not usable for Bacteria or BOD analyses.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis

requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.



Laboratory Report of Analysis

To: MOA-Project Mnmt/Engr PO Box 196650 Anchorage, AK 99519 907-343-8058

Report Number: 1173511

Client Project: PM&E WSM DRY Weather Screening

Dear Kristi Bischofberger,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Forest at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely, SGS North America Inc.

Forest Taylor Project Manager Forest.Taylor@sgs.com Date

Print Date: 06/20/2017 5:16:01PM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518 t 907.562.2343 f 907.561.5301 www.us.sgs.com



Case Narrative

SGS Client: MOA-Project Mnmt/Engr SGS Project: 1173511 Project Name/Site: PM&E WSM DRY Weather Screening Project Contact: Kristi Bischofberger

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

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Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <<u>http://www.sgs.com/en/Terms-and-Conditions.aspx></u>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.					
!	Surrogate out of control limits.					
В	Indicates the analyte is found in a blank associated with the sample.					
CCV/CVA/CVB	Continuing Calibration Verification					
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification					
CL	Control Limit					
DF	Analytical Dilution Factor					
DL	Detection Limit (i.e., maximum method detection limit)					
E	The analyte result is above the calibrated range.					
GT	Greater Than					
IB	Instrument Blank					
ICV	Initial Calibration Verification					
J	The quantitation is an estimation.					
LCS(D)	Laboratory Control Spike (Duplicate)					
LLQC/LLIQC	Low Level Quantitation Check					
LOD	Limit of Detection (i.e., 1/2 of the LOQ)					
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)					
LT	Less Than					
MB	Method Blank					
MS(D)	Matrix Spike (Duplicate)					
ND	Indicates the analyte is not detected.					
RPD	Relative Percent Difference					
U	Indicates the analyte was analyzed for but not detected.					
Sample summaries which include a result for "Total Solids" have already been adjusted for moisture content. All DRO/RRO analyses are integrated per SOP.						
AII DRU/RRU analyses are I						

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Note:



Sample Summary						
<u>Client Sample ID</u> FUR 5-1 FUR 5-1 DUP	Lab Sample ID 1173511001 1173511002	Collected 06/19/2017 06/19/2017	Received 06/19/2017 06/19/2017	<u>Matrix</u> Water (Surface, Eff., Ground) Water (Surface, Eff., Ground)		
<u>Method</u> SM21 9222D	Method Description22DFecal Coliform (MF)					

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	Detectable Results Summary			
Client Sample ID: FUR 5-1 Lab Sample ID: 1173511001 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 4.9	<u>Units</u> col/100mL	
Client Sample ID: FUR 5-1 DUP Lab Sample ID: 1173511002 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 6.6	<u>Units</u> col/100mL	

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Results of FUR 5-1	

Results of FUR 5-1								
Client Sample ID: FUR 5-1 Client Project ID: PM&E WSM DRY We Screening Lab Sample ID: 1173511001	eather	Collection Date: 06/19/17 16:00 Received Date: 06/19/17 16:58 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:						
Results by Microbiology Laboratory								
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 4.9	<u>LOQ/CL</u> 1.64	<u>DL</u> 1.64	<u>Units</u> DF col/100mL 1	Allowable Limits	Date Analyzed 06/19/17 18:30		
Batch Information Analytical Batch: BTF15689 Analytical Method: SM21 9222D Analyst: ACF Analytical Date/Time: 06/19/17 18:30 Container ID: 1173511001-A								

Print Date: 06/20/2017 5:16:09PM



Results of FUR 5-1 DUP							
Client Sample ID: FUR 5-1 DUP Client Project ID: PM&E WSM DRY W Screening Lab Sample ID: 1173511002	C R M S La						
Results by Microbiology Laboratory			_				
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 6.6	<u>LOQ/CL</u> 1.64	<u>DL</u> 1.64	<u>Units</u> col/100m	<u>DF</u> L 1	<u>Allowable</u> Limits	<u>Date Analyzed</u> 06/19/17 18:30
Batch Information Analytical Batch: BTF15689 Analytical Method: SM21 9222D Analyst: ACF Analytical Date/Time: 06/19/17 18:30 Container ID: 1173511002-A							

Print Date: 06/20/2017 5:16:09PM

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Method Blank]							
Blank ID: MB for HBN Blank Lab ID: 1392039	1761601 [BTF/15689] 9	Matrix: Water (Surface, Eff., Ground)							
QC for Samples: 1173511001, 117351100)2								
Results by SM21 9222	2D)							
<u>Parameter</u> Fecal Coliform	<u>Results</u> 1.00U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100mL					
Batch Information									
Analytical Batch: BTF Analytical Method: S Instrument: Analyst: ACF									
	6/19/2017 6:30:00PM								

Print Date: 06/20/2017 5:16:10PM

3511			Page				REMARKS/ LOC ID							Data Deliveratio Beautisementa.		tions: thank ucul	DCX000000	Chain of Custody Seal: (Circle)	INTACT BROKEN ABSENT (See attached Sample Receipt Form)		F083-Kit_Request_and_COC_Templates-Blank Revised 2013-03-24
1173511		5 must be onset of analysis.	Preservative											DOD Broloct? Voc No Data D		Requested Turnaround Time and/or Special Instructions:	Aleng 24hms 10 cm oddance	Temp Blank °C: 14,0 #)21 Chain		1	F083-Kit_Request
ca Inc. RECORD	Dereoning	Instructions: Section's 1 - 5 must be Omissions may delay the onset of analysis.	2 2		-780	·	20-1	×	×					Cantion A	-	Requested Turna	Pls. Cal	Temp Blank °C:	Vie	http://www.sgs.co	
SGS North America Inc. CHAIN OF CUSTODY RECORD	anthon 1		310^{-} Section 3 7-0387	* U	∘z⊦∢	- z ı	IE MATRIX E mental MM CODE S Solis	4	H2D (Received By:	Received By:	Received By:		Received For Laboratory By	43 Fax: (90⊄) 561-5301 903 Fax: (910) 350-1557	
	SM DRU		HAPPIRENCE OLD 7	PKOJECI/ PWSID/ PERMIT#:	Q E-MAIL: Aleina. gevlet@/hdrine.c	Bischishallharsher Ever more winn	ATION DATE TIME	06/19/17 11/00	DUP 06/19/17 1600						Date Time $(6/19/17 1/65)$	- Ti	Date		- Date Date Trime Date 10,58	e, AK 99518 Tel: (907) 562-234 ton, NC 28405 Tel: (910) 350-15	
S B S B S B S B S B S B S B S B S B S B	FDM4F (1)	CLIENT: HINR INC	Alenna Genlet	Development Develo		Kristi, Bischishal	RESERVED SAMPLE IDENTIFICATION	A FURS-I	34 FUR S-1						Relinguished By: (1)	Relinquished 8 y: (2)	Relinquished By: (3)		Relinquished By: (4)] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (902) 561-5301] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557	
	* (Gilios	S					2 no	itoə2	I	 ıl			 ב ו	ection	Page	9 of 10		



Sample Containers and Preservatives

Container Id	<u>Preservative</u>	<u>Container</u> Condition	<u>Container Id</u>	<u>Preservative</u>	<u>Container</u> Condition
1173511001-A 1173511002-A	Na2S2O3 for Chlorine Redu Na2S2O3 for Chlorine Redu	ок ок			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

BU - The container was received with headspace greater than 6mm.

DM- The container was received damaged.

FR- The container was received frozen and not usable for Bacteria or BOD analyses.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis

requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.



Laboratory Report of Analysis

To: HDR Alaska, Inc. 2000 W Intl Airport Rd # C-6 Anchorage, AK 99501 (907)222-9350

Report Number: 1175056

Client Project: Dry Weather Screening

Dear Lynn Spencer,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely, SGS North America Inc.

Justin Nelson Project Manager Justin.Nelson@sgs.com Date

Print Date: 08/04/2017 10:11:35AM

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Case Narrative

SGS Client: HDR Alaska, Inc. SGS Project: 1175056 Project Name/Site: Dry Weather Screening Project Contact: Lynn Spencer

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 08/04/2017 10:11:36AM

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Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

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!	Surrogate out of control limits.
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CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.
Sample summaries which ir All DRO/RRO analyses are	nclude a result for "Total Solids" have already been adjusted for moisture content. integrated per SOP.

Print Date: 08/04/2017 10:11:38AM

Note:

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Sample Summary								
Client Sample ID	Lab Sample ID	Collected	Received	Matrix				
ER1335-1 DUP	1175056001	08/01/2017	08/01/2017	Water (Surface, Eff., Ground)				
ER1335-1	1175056002	08/01/2017	08/01/2017	Water (Surface, Eff., Ground)				
ER1375-99	1175056003	08/01/2017	08/01/2017	Water (Surface, Eff., Ground)				
ER1417-1	1175056004	08/01/2017	08/01/2017	Water (Surface, Eff., Ground)				
ER303-1	1175056005	08/01/2017	08/01/2017	Water (Surface, Eff., Ground)				
ER646-71	1175056006	08/01/2017	08/01/2017	Water (Surface, Eff., Ground)				

Method SM21 9222D Method Description

Fecal Coliform (MF)

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	Detectable Results Summa	ary		
Client Sample ID: ER1335-1 D Lab Sample ID: 1175056001 Microbiology Laboratory	P UP <u>Parameter</u> Fecal Coliform	<u>Result</u> 410	<u>Units</u> col/100mL	
Client Sample ID: ER1335-1 Lab Sample ID: 1175056002 Microbiology Laboratory	Parameter Fecal Coliform	<u>Result</u> 690	<u>Units</u> col/100mL	

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Results of ER1335-1 DUP							
Client Sample ID: ER1335-1 DUP Client Project ID: Dry Weather Scree Lab Sample ID: 1175056001 Lab Project ID: 1175056	Collection Date: 08/01/17 12:05 Received Date: 08/01/17 12:57 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:						
Results by Microbiology Laboratory			<u> </u>				
Parameter Fecal Coliform	<u>Result Qual</u> 410	<u>LOQ/CL</u> 10.0	<u>DL</u> 10.0	<u>Units</u> col/100mL	<u>DF</u> 1	<u>Allowable</u> Limits	Date Analyzed 08/01/17 14:35
Batch Information Analytical Batch: BTF15842 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 08/01/17 14:35 Container ID: 1175056001-A							

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Results of ER1335-1							
Client Sample ID: ER1335-1 Client Project ID: Dry Weather Screen Lab Sample ID: 1175056002 Lab Project ID: 1175056	R M Se	eceived D	Date: 08/01/ [,] vate: 08/01/1 er (Surface,	7 12:57	,		
Results by Microbiology Laboratory							
Parameter Fecal Coliform Batch Information	<u>Result Qual</u> 690	<u>LOQ/CL</u> 10.0	<u>DL</u> 10.0	<u>Units</u> col/100m	DF nL 1	<u>Allowable</u> <u>Limits</u>	Date Analyzed 08/01/17 14:35
Analytical Batch: BTF15842 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 08/01/17 14:35 Container ID: 1175056002-A							

SGS	

Results of ER1375-99						
Client Sample ID: ER1375-99 Client Project ID: Dry Weather Screer Lab Sample ID: 1175056003 Lab Project ID: 1175056	iing	R M S	eceived D	ate: 08/01/17 11: ate: 08/01/17 12:{ er (Surface, Eff., G	57	
Results by Microbiology Laboratory			_			
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 1.00 U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> DF col/100mL 1	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u> 08/01/17 14:35
Batch Information						
Analytical Batch: BTF15842 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 08/01/17 14:35 Container ID: 1175056003-A						

Results of ER1417-1							
Client Sample ID: ER1417-1 Client Project ID: Dry Weather Scree Lab Sample ID: 1175056004 Lab Project ID: 1175056 Results by Microbiology Laboratory	ning	R M Se	eceived D	0ate: 08/01/1 ate: 08/01/1 er (Surface, I	7 12:57	und)	
Parameter Fecal Coliform	<u>Result Qual</u> 1.00 U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100m	<u>DF</u> L 1	<u>Allowable</u> <u>Limits</u>	<u>Date Analyzed</u> 08/01/17 14:35
Analytical Batch: BTF15842 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 08/01/17 14:35 Container ID: 1175056004-A							

Results of ER303-1							
Client Sample ID: ER303-1 Client Project ID: Dry Weather Scree Lab Sample ID: 1175056005 Lab Project ID: 1175056	ning	R M S	eceived Da	ate: 08/01/1 ate: 08/01/17 er (Surface, E	7 12:57		
Results by Microbiology Laboratory						Allowable	
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 1.00 U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100ml	<u>DF</u> L 1	<u>Limits</u>	Date Analyzed 08/01/17 14:35
Batch Information Analytical Batch: BTF15842 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 08/01/17 14:35 Container ID: 1175056005-A							

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Results of ER646-71							
Client Sample ID: ER646-71 Client Project ID: Dry Weather Scre Lab Sample ID: 1175056006 Lab Project ID: 1175056	eening	R M S	eceived D	0ate: 08/01/ ate: 08/01/ er (Surface,	17 12:57		
Results by Microbiology Laborator	y		_				
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 1.00 U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100r	<u>DF</u> nL 1	<u>Allowable</u> Limits	Date Analyzed 08/01/17 14:35
Batch Information Analytical Batch: BTF15842 Analytical Method: SM21 9222D Analyst: K.W Analytical Date/Time: 08/01/17 14:35 Container ID: 1175056006-A							

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- Method Blank					
Blank ID: MB for HBN Blank Lab ID: 140205	I 1765107 [BTF/15842] 56	Matrix	k: Water (Surf	ace, Eff., Ground)	
QC for Samples: 1175056001, 11750560	002, 1175056003, 1175056004, 117	5056005, 1175056006			
Results by SM21 922	2D				
Parameter Fecal Coliform	<u>Results</u> 1.00U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100mL	
Batch Information					
Analytical Batch: BT Analytical Method: S Instrument: Analyst: K.W Analytical Date/Time					

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– Method Blank					
Blank ID: MB for HBN Blank Lab ID: 1402340		Matriz	x: Water (Surf	ace, Eff., Ground)	
QC for Samples: 1175056001, 117505600	02, 1175056003, 1175056004, 1175	5056005, 1175056006	3		
Results by SM21 9222	D				
<u>Parameter</u> Fecal Coliform	<u>Results</u> 1.00U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100mL	
Batch Information					
Analytical Batch: BTF Analytical Method: S Instrument: Analyst: K.W Analytical Date/Time:					

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F083-Kit_Request_and_COC_Templates-Blank Revised 2013-03-24

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 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557



e-Sample Receipt Form

Workorder #:	
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SGS

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Review Criteria	s, No, N/A		Exceptions Noted below		
Chain of Custody / Temperature Requi	rements		Yes	Exemption permitted if sampler hand carries	s/delivers.
Were Custody Seals intact? Note # &		Hand De	ivere	ed	
COC accompanied sa					
			ours a	ago, or for samples where chilling is not requ	lired
	N			1 @ Amnient °C Therr	
		Cooler ID):	@ °C Therr	n. ID:
Temperature blank compliant* (i.e., 0-6 °C afte	er CF)?	Cooler ID):	@ °C Therr	
		Cooler ID	_	@ °C Therr	
		Cooler ID	_	@ °C Therr	
*If >6°C, were samples collected <8 hours					
		-			
If <0°C, were sample containers ice	e free?	A			
		-			
If samples received without a temperature blank, the	"cooler				
temperature" will be documented in lieu of the temperature b					
"COOLER TEMP" will be noted to the right. In cases where ne					
temp blank nor cooler temp can be obtained, note "ambi					
°C	chilled".				
Note: Identify containers received at non-compliant temper	rature .				
Use form FS-0029 if more space is n	eeded.				
Holding Time / Documentation / Sample Condition Re	equirement	s Note: Ref	er to	form F-083 "Sample Guide" for specific hold	ling times.
Were samples received within holding	g time? Ye	S			
Do samples match COC** (i.e., sample IDs, dates/times colle	ected)? Ye	S			
**Note: If times differ <1hr, record details & login per	r COC.				
Were analyses requested unambiguous? (i.e., method is speci	fied for Ye	s			
analyses with >1 option for an					
					0/00004)
			N/A	***Exemption permitted for metals (e.g,200.	<u>o/0UZUA).</u>
Were proper containers (type/mass/volume/preservative***					
Volatile / LL-Hg Req					
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with sar					
Were all water VOA vials free of headspace (i.e., bubbles ≤					
Were all soil VOAs field extracted with MeOH					
Note to Client: Any "No", answer above indicates no	n-complianc	e with stand	ard p	procedures and may impact data quality.	
Additiona	al notes (if	applicable	e):		



Sample Containers and Preservatives

Container Id	<u>Preservative</u>	<u>Container</u> Condition	Container Id	<u>Preservative</u>	<u>Container</u> Condition
1175056001-A	Na2S2O3 for Chlorine Redu	ОК			
1175056002-A	Na2S2O3 for Chlorine Redu	ОК			
1175056003-A	Na2S2O3 for Chlorine Redu	ОК			
1175056004-A	Na2S2O3 for Chlorine Redu	ОК			
1175056005-A	Na2S2O3 for Chlorine Redu	ОК			
1175056006-A	Na2S2O3 for Chlorine Redu	ОК			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

- BU The container was received with headspace greater than 6mm.
- DM- The container was received damaged.

FR- The container was received frozen and not usable for Bacteria or BOD analyses.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis



Laboratory Report of Analysis

To: HDR Alaska, Inc. 2000 W Intl Airport Rd # C-6 Anchorage, AK 99501 (907)222-9350

Report Number: 1175278

Client Project: Dry Weather Screening

Dear Lynn Spencer,

Enclosed are the results of the analytical services performed under the referenced project for the received samples and associated QC as applicable. The samples are certified to meet the requirements of the National Environmental Laboratory Accreditation Conference Standards. Copies of this report and supporting data will be retained in our files for a period of ten years in the event they are required for future reference. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. Any samples submitted to our laboratory will be retained for a maximum of fourteen (14) days from the date of this report unless other archiving requirements were included in the quote.

If there are any questions about the report or services performed during this project, please call Justin at (907) 562-2343. We will be happy to answer any questions or concerns which you may have.

Thank you for using SGS North America Inc. for your analytical services. We look forward to working with you again on any additional analytical needs.

Sincerely, SGS North America Inc.

Justin Nelson Project Manager Justin.Nelson@sgs.com Date

Print Date: 08/09/2017 2:19:06PM

SGS North America Inc.



Case Narrative

SGS Client: HDR Alaska, Inc. SGS Project: 1175278 Project Name/Site: Dry Weather Screening Project Contact: Lynn Spencer

Refer to sample receipt form for information on sample condition.

*QC comments may be associated with the field samples found in this report. When applicable, comments will be applied to associated field samples.

Print Date: 08/09/2017 2:19:08PM

SGS North America Inc.

200 West Potter Drive, Anchorage, AK 99518 t 907.562.2343 f 907.561.5301 www.us.sgs.com



Laboratory Qualifiers

Enclosed are the analytical results associated with the above work order. All results are intended to be used in their entirety and SGS is not responsible for use of less than the complete report. This document is issued by the Company under its General Conditions of Service accessible at <<u>http://www.sgs.com/en/Terms-and-Conditions.aspx></u>. Attention is drawn to the limitation of liability, indenmification and jurisdiction issues defined therein.

Any holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. Any unauthorized alteration, forgery or falsification of the context or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law.

SGS maintains a formal Quality Assurance/Quality Control (QA/QC) program. A copy of our Quality Assurance Plan (QAP), which outlines this program, is available at your request. The laboratory certification numbers are AK00971 (DW Chemistry & Microbiology) & UST-005 (CS) for ADEC and 2944.01 for DOD ELAP/ISO17025 (RCRA methods: 1020B, 1311, 3010A, 3050B, 3520C, 3550C, 5030B, 5035A, 6020A, 7470A, 7471B, 8015C, 8021B, 8082A, 8260C, 8270D, 8270D-SIM, 9040C, 9045D, 9056A, 9060A, AK101 and AK102/103). Except as specifically noted, all statements and data in this report are in conformance to the provisions set forth by the SGS QAP and, when applicable, other regulatory authorities.

The following descriptors or qualifiers may be found in your report:

*	The analyte has exceeded allowable regulatory or control limits.
!	Surrogate out of control limits.
В	Indicates the analyte is found in a blank associated with the sample.
CCV/CVA/CVB	Continuing Calibration Verification
CCCV/CVC/CVCA/CVCB	Closing Continuing Calibration Verification
CL	Control Limit
DF	Analytical Dilution Factor
DL	Detection Limit (i.e., maximum method detection limit)
E	The analyte result is above the calibrated range.
GT	Greater Than
IB	Instrument Blank
ICV	Initial Calibration Verification
J	The quantitation is an estimation.
LCS(D)	Laboratory Control Spike (Duplicate)
LLQC/LLIQC	Low Level Quantitation Check
LOD	Limit of Detection (i.e., 1/2 of the LOQ)
LOQ	Limit of Quantitation (i.e., reporting or practical quantitation limit)
LT	Less Than
MB	Method Blank
MS(D)	Matrix Spike (Duplicate)
ND	Indicates the analyte is not detected.
RPD	Relative Percent Difference
U	Indicates the analyte was analyzed for but not detected.
Sample summaries which ir All DRO/RRO analyses are	nclude a result for "Total Solids" have already been adjusted for moisture content.

Print Date: 08/09/2017 2:19:10PM

Note:

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Sample Summary										
Client Sample ID	Lab Sample ID	Collected	Received	Matrix						
ER 13357	1175278001	08/07/2017	08/07/2017	Water (Surface, Eff., Ground)						
ER 13357 Dup	1175278002	08/07/2017	08/07/2017	Water (Surface, Eff., Ground)						
Method	Method Des	scription								
SM21 9222D	Fecal Colifo	orm (MF)								

Print Date: 08/09/2017 2:19:10PM

SGS North America Inc.



	Detectable Results Summary								
Client Sample ID: ER 13357 Lab Sample ID: 1175278001 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 19	<u>Units</u> col/100mL						
Client Sample ID: ER 13357 Dup Lab Sample ID: 1175278002 Microbiology Laboratory	<u>Parameter</u> Fecal Coliform	<u>Result</u> 18	<u>Units</u> col/100mL						

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SGS	
Deputto of ED 422	E7

Results of ER 13357							
Client Sample ID: ER 13357 Client Project ID: Dry Weather Screen Lab Sample ID: 1175278001 Lab Project ID: 1175278	ning	R M S	eceived D	0ate: 08/07/17 ate: 08/07/17 er (Surface, Et	13:46		
Results by Microbiology Laboratory			_				
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 19	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100mL	<u>DF</u> 1	<u>Allowable</u> Limits	Date Analyzed 08/07/17 15:10
Batch Information Analytical Batch: BTF15861 Analytical Method: SM21 9222D Analyst: ACF Analytical Date/Time: 08/07/17 15:10 Container ID: 1175278001-A							

Print Date: 08/09/2017 2:19:13PM



Results of ER 13357 Dup												
Client Sample ID: ER 13357 Dup Client Project ID: Dry Weather Screen Lab Sample ID: 1175278002 Lab Project ID: 1175278	ing	Collection Date: 08/07/17 12:40 Received Date: 08/07/17 13:46 Matrix: Water (Surface, Eff., Ground) Solids (%): Location:										
Results by Microbiology Laboratory												
<u>Parameter</u> Fecal Coliform	<u>Result Qual</u> 18	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100mL	<u>DF</u>	Allowable Limits	<u>Date Analyzed</u> 08/07/17 15:10					
Batch Information Analytical Batch: BTF15861 Analytical Method: SM21 9222D Analyst: ACF Analytical Date/Time: 08/07/17 15:10 Container ID: 1175278002-A												

Print Date: 08/09/2017 2:19:13PM

SGS

Blank ID: MB for HBN 1768 Blank Lab ID: 1403621	5660 [BTF/15861]	Matrix	k: Water (Surfa	ace, Eff., Ground)	
C for Samples: 175278001, 1175278002					
Results by SM21 9222D					
Parameter Fecal Coliform	<u>Results</u> 1.00U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100mL	
Analytical Batch: BTF158 Analytical Method: SM21 Instrument:					

Print Date: 08/09/2017 2:19:15PM

SGS

Method Blank					
Blank ID: MB for HBN 1 Blank Lab ID: 1403623	765660 [BTF/15861]	Matriz	k: Water (Surf	ace, Eff., Ground)	
QC for Samples: 1175278001, 1175278002					
Results by SM21 9222D)				
<u>Parameter</u> Fecal Coliform	<u>Results</u> 1.00U	<u>LOQ/CL</u> 1.00	<u>DL</u> 1.00	<u>Units</u> col/100mL	
Batch Information					
Analytical Batch: BTF1 Analytical Method: SM Instrument: Analyst: ACF					
Analytical Date/Time: 8	8/7/2017 6:04:00PM				

Print Date: 08/09/2017 2:19:15PM

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SGS North America Inc. CHAIN OF CUSTODY RECORD



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		Page of				REMARKS/ LOC ID								Data Deliverable Requirements:		Requested Turnaround Time and/or Special Instructions: Aluss allows preum resolves as soon as	n(Custody Seal: (Circle)	INTACT BROKEN ABSENT
	ť												2 - - -	 Data Deli		A RS S	TANA	Chain of	INTACT
	filled ou analysis.													Yes No		nd/or Speci	Z	1	
=	structions: Sections 1 - 5 must be filled out. Omissions may delay the onset of analysis.	Preservative												 DOD Project? Yes No		ound Time a	Ma pr	Temp Blank °C: 10, 3 0-7	or Ambient []
	he .	Pre												 	Cooler ID:	Sted Turnar	alor volter	Blank °C: <u> </u>	or A
	:: Sectic s may de													Section 4	Cook	Reques	N N N N	Temp	!
	Instructions: Sections 1 Omissions may delay t			mrf	(jø))	DSF	*	*											
	Inst Or	Section 3		Type C = COMP	G = GRAB Multi	Incre- mental Soils	Ģ	ও	-					 _					Received For Laboratory BV
		ŭ	# U	o z ⊦	< - z	NXX XIX MXX MX MX MX MX MX MX MX MX MX MX MX M		-						 		eceived By:	ed By:		ed For Lap
		2112-		Whe pre-com	Scheen	MATRIX/ MATRIX CODE	H20	erH B						 Received Rv.		Receiv	Received By:		Receiv
		hh9't		y nr ge	Jeather	TIME HH:MM	anni	en 11						Time	Ithe	Time	Time		тіте 1346
		DNE NO: $d\hat{0}$	PROJECT/ PWSID/ PERMIT#:	C) ELAR. GERLENC CARDY	auote #: P.O. #: Dry Weather Schoen.M	DATE mm/dd/yy	09/04/17	t1/10/60	,					 Date	tlle)&	Date	Date	\	Date ビイロ
		CONTACT: APPOND GUCK PHONE NO: 907,644.21	B PROJECT WENT WOULD THE PARS	GRUL E-M	Q.9	SAMPLE IDENTIFICATION	1-5221	1335-1 DUP							Jeruk		((
	CLIENT: HDR	CONTACT: AU	MAME: DI A WE	REPORTSTO: ALVIN	INVOICE TO:	reserved sam	DA ER	2A EE						Relinquished Rv [.] (1)	allow	Relinquished By: (2)	Relinquished By: (3)		Relinquished By: (4)
		<u>ر</u> ا	uoitoe	<u>-</u>	<u> </u>	<u> </u>	\sim		2 u	ectic	S	L		 		<u>c</u> uoi	<u>, –</u> joect	1	0 of 12

http://www.sgs.com/terms-and-conditions

[] 200 W. Potter Drive Anchorage, AK 99518 Tel: (907) 562-2343 Fax: (907) 561-5301
 [] 5500 Business Drive Wilmington, NC 28405 Tel: (910) 350-1903 Fax: (910) 350-1557

(See attached Sample Receipt Form)

(See attached Sample Receipt Form)

elt/17 1346

E70



e-Sam<u>ple Receipt Form</u>

SGS Workorder #:	
------------------	--

1175278



Review Criteria	v Criteria Condition (Yes,			No, N/A Exceptions Noted below				
Chain of Custody / Temperature Require	Yes Exemption permitted if sampler hand carries/delivers.					ers.		
Were Custody Seals intact? Note # & loc	cation N/A	Absent						
COC accompanied sam	ples? Yes	5						
Yes **Exemption permitted if ch	nilled & coll	ected <8 hou	irs ago, or fo	or samples	where ch	illing is not re	equired	
	No	Cooler ID:		1	@	10.3 °C Th	erm. ID:	D07
		Cooler ID:			@	°C Th	erm. ID:	
Temperature blank compliant* (i.e., 0-6 °C after	CF)?	Cooler ID:			@	°C Th	erm. ID:	
		Cooler ID:			@	°C Th	erm. ID:	
		Cooler ID:			@	°C Th	erm. ID:	
*If >6°C, were samples collected <8 hours a	igo? Yes	6						
If <0°C, were sample containers ice fi	ree? N/A	Δ.						
If samples received without a temperature blank, the "co								
temperature" will be documented in lieu of the temperature bla								
"COOLER TEMP" will be noted to the right. In cases where neith temp blank nor cooler temp can be obtained, note "ambier								
	lled".							
	1							
Note: Identify containers received at non-compliant temperat Use form FS-0029 if more space is nee								
				00 10	e. Ossiala II.	(- I - I' 4'	
Holding Time / Documentation / Sample Condition Reg Were samples received within holding t			r to form F-U	183 "Sampi	e Guide"	for specific r	noiding tir	nes.
		-						
Do samples match COC** (i.e.,sample IDs,dates/times collect	ted)? Yes							
**Note: If times differ <1hr, record details & login per C								
Were analyses requested unambiguous? (i.e., method is specifie								
analyses with >1 option for anal								
	•							
			I/A ***Exem	ption perm	itted for n	netals (e.g,20	00.8/602	DA).
Were proper containers (type/mass/volume/preservative***)u								
Volatile / LL-Hg Requi								
Were Trip Blanks (i.e., VOAs, LL-Hg) in cooler with samp								
Were all water VOA vials free of headspace (i.e., bubbles ≤ 6n	· ·							
Were all soil VOAs field extracted with MeOH+E	BFB? N/A	A .						
Note to Client: Any "No", answer above indicates non-o	compliance	with standa	rd procedure	es and may	impact d	ata quality.		
Additional r	notes (if	applicable):					



Sample Containers and Preservatives

Container Id	<u>Preservative</u>	<u>Container</u> Condition	Container Id	<u>Preservative</u>	<u>Container</u> Condition
1175278001-A 1175278002-A	Na2S2O3 for Chlorine Redu Na2S2O3 for Chlorine Redu	ок ок			

Container Condition Glossary

Containers for bacteriological, low level mercury and VOA vials are not opened prior to analysis and will be assigned condition code OK unless evidence indicates than an inappropriate container was submitted.

OK - The container was received at an acceptable pH for the analysis requested.

- BU The container was received with headspace greater than 6mm.
- DM- The container was received damaged.

FR- The container was received frozen and not usable for Bacteria or BOD analyses.

PA - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt and the container is now at the correct pH. See the Sample Receipt Form for details on the amount and lot # of the preservative added.

PH - The container was received outside of the acceptable pH for the analysis requested. Preservative was added upon receipt, but was insufficient to bring the container to the correct pH for the analysis requested. See the Sample Perceipt Form for details on the amount and let # of the preservative added

requested. See the Sample Receipt Form for details on the amount and lot # of the preservative added.